

FEATURES

Code: The Novice Nemesis

DX Convention : Contest

Forum, '91 Yasme

DXpedition

HamVention '91: ARRL

Forum, Classroom

strategies, County Hunter's

Forum, FCC Forum, Mars

Forum, Youth Forum

Sacramento Railfair



Albania's on?? On Two Meters??

COLUMNS

- Aerials •Amateur Hi •Amsat-Oscar schedule
- Contests •County Hunting •Digital Bus •DX Prediction •DX World
- FCC Highlights •Hamfests •MARS •Mobile •New Products
- Off the Air •Product review •Propagation •Publisher's Microphone
- QCWA •QRP •Search & Rescue •Special Events •Station Appearance
- 10-10 International News •Traffic •VE Exams •Who's Who



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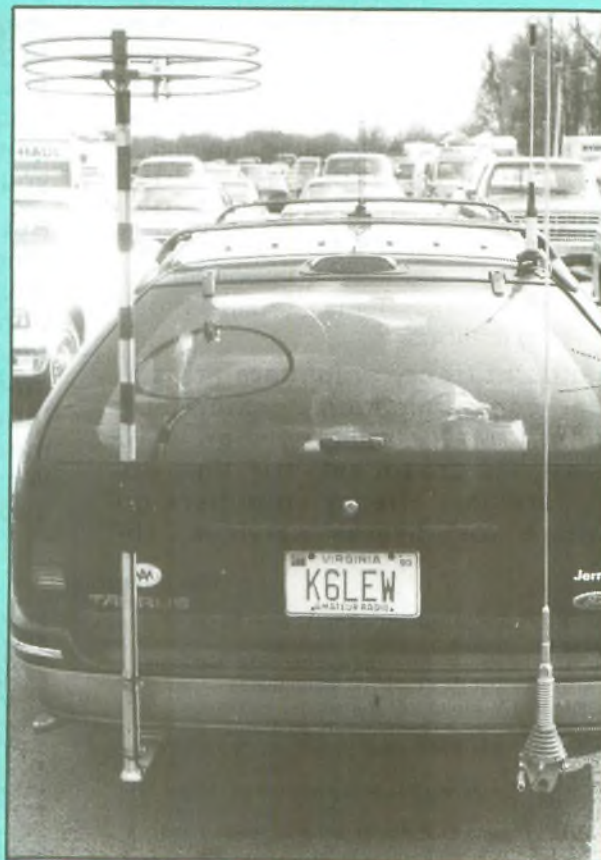
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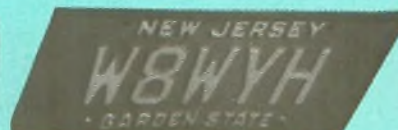
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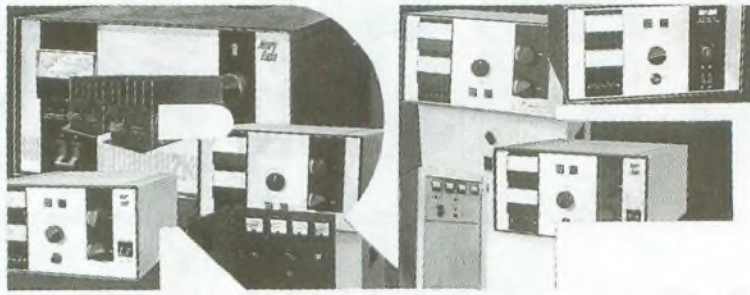
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1991 YASME DXpedition

JOHN F.W. MINKE, N6JM

Lloyd and Iris Colvin, W6KG and W6QL, are a well known part of the DX program, always taking off on or returning from another six-month or so YASME DXpedition. They recently gave a presentation at the International DX Convention in Visalia.

Lloyd and Iris always rotate their talk, each speaking on a particular country that they visited. The same usually applies for the calls they receive, (if the last country had the suffix KG the next would be QL. The first country (all of them in Africa) they visited was Tanzania, where they operated as 5H0QL.

The next country they visited was Malawi (pronounced Mah-low-wee). Lloyd said the license was no problem, as long as you could pay the price — \$215 each! They received the call 7Q7KG. There was a strict dress code in that country, Iris said. In fact, one native told her she wasn't dressed correctly to go out on the street.

Later, they passed through Zimbabwe, where they had operated 10 years earlier, and then on to Mozambique, where they received the call C9QL.

For their Walvis Bay operation they had to go to South Africa for the license. There they visited notable South African DXer Julius, ZS6AS, and another whose call was ZS6BTD. They then returned to Walvis Bay through Namibia via bus. During their trip someone stole all their coaxial cable, and it was replaced by a local DXer.

At Walvis Bay they were met by Captain John Smith, who prepared them a Thanksgiving dinner, even though it was not a local holiday. While at Walvis Bay they met the Penguin Island DXpedition team (N7NG, OH2RF, ZS9A and OH2BH), which was a complete surprise. They had to travel through Walvis Bay to get to Penguin Island. At Walvis Bay, Lloyd and Iris operated as ZS9/W6KG, which included the November World Wide DX Contest.

From there they travelled to the Congo for Christmas, where they were unable to obtain a license. The same applied to the next country, Zaire. They were hosted there by Charles "Sig" Signor, 9Q5EE. Sig was the former DX editor of a famous Amateur Radio publication. Lloyd and Iris had almost no photos for this location as picture taking is not allowed. Other DXers visited included 9Q5GG, 9Q5TE and 9Q5XO.

They also travelled through Rwanda where they met local DXers with the calls 9X5SW, 9X5HG, 9X5NH and 9X5SP. They had met 9X5HG in Sri Lanka several years ago. They didn't operate from here either.

Their last stop was Burundi, where they did receive a license to operate. Lloyd and Iris operated as 9U5QL and reported that they were the first station on in more than two years.

Their total number of contacts made for the six-month trip came to about 40,000. We must say, that is not bad for the two of them. Lloyd and Iris have been making YASME DXpeditions for extended periods for many years. They had been DXing long before many of our top DXers were born.

At the conclusion of their presentation the cocktail party came into full swing. One of the nicest things about the Visalia bash is visiting with other DXers who only see each other about once a year. The cocktail party is always a good place to do so. And, following that, there was a new addition this year to the convention. A delicious barbecue was held at the park adjacent to the hotel. There were also some midget car races at the track, making much noise. Kind of reminded us of what pile-ups must sound like at the DX end! □

Honest ham

The following letter was sent to John E. Raifsnider, WA8OKA, of Sturgis, Michigan:

Dear John:

It was brought to my attention that you found over \$1,700 in cash and two blank checks at the 1991 Dayton Hamvention.

In the best tradition of Amateur Radio, you turned in the money and checks to the Hamvention staff. You are a credit to all of us hams to live up to.

It is with great pleasure that we at Icom America present you with a hand-held of your choice.

After our telephone conversation of this date, you will be receiving an Icom IC-2SAT in the very near future.

Again John, congratulations on your honesty!

*73's, Chuck Northcutt, W7SRZ,
Manager, Amateur Division*

FEATURES

The ARRL forum — 6
Classroom strategies — 12
Code: the Novice nemesis — 54

Advertisers' Index — 74
Aerials — 63
Amateur Hi — 24
Amateur Radio Call Signs — 8
Construction — 16
Contests — 66
County Hunter — 44
Digital Bus — 48
DX Prediction — 37
DX World — 35
FCC Highlights — 8
Hamfests — 64
MART Classifieds — 72
Mobile — 42
New Products — 67

DX Convention, Visalia 1991 — 19
Ten-day Field Day — 18
1991 YASME DXpedition — 3

COLUMNS

Off the Air — 30
Product Review — 28
Propagation — 56
Publisher's Microphone — 4
QCWA — 50
QRP — 60
SAR Communications — 58
Special Events — 26
Station Appearance — 24
Traffic — 46
VE Exams — 71
When will AMSAT OSCAR-13
be in range? — 69
Who's Who — 34
10:10 International News — 62

CONTENTS

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Worldradio (USPS 947000) is an international conversation. You are invited to participate.

Our goal is to be a valuable resource of ideas and experiences beneficial to the Amateur Radio Community. We publicize and support the efforts of those who bring the flame of vitality to this avocation.

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

We emphasize the positive aspects of this great activity, and desire your contributions dealing with dramatic, personal and humanitarian uses of Amateur Radio.

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First we enshrine for posterity the most recent to become **Worldradio** Super-Boosters (lifetime subscribers):

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Donald Perry, WA6FFR, Paradise, CA;
Joyce Van Tuyl, KB7AIO, Pacific, WA.

We now present one of the more incredulous items. A photocopy of an Official Observer Advisory Notice was sent in. The ding or gig was for "Good Luck to you and yours—The 'and yours' constitutes third party traffic. The US has no third party agreement with SM prefix." A case of someone with not much to do.

A genteel reader in Oklahoma has commented that we lower ourselves when we comment on the inanities found in one particular radio journal. Possibly true. But, the latest one is just too good to pass up. On the very same page of the same issue was talk of "dwindling numbers" and "steady annual growth in Amateur Radio licensing." Come on, now. Which are we to believe? Amusing.

In the US there are about 1,700 daily newspapers and around 7,000 weekly newspapers. Just about all of them run some sort of community calendar.

You'll see listings for meetings of groups devoted to bridge, needlepoint, backgammon, barbershop singing, genealogy, pigeons, astronomy, judo, coins, photography, chess, cribbage, lapidary, stamps, scrabble, toy trains, and on and on.

In the listing in your newspaper is there a notice for Amateur Radio? And, if not, whose fault is it?

Probably the most spectacular of all the club bulletins is the *Key Klix*, produced by the Santa Barbara (California) ARC.

Chuck Prindle, W6JOX, of Santa Rosa, California, wrote in about how greatly pleased he was with his experiences with Larsen Antennas regarding replacement of an antenna he had accidentally damaged.

David Massy, VE7DWA, of Ganegs, British Columbia, told that of the 60 Amateurs on their island, 30 are formally organized as a group to provide emergency communications in the event of an emergency or disaster. They have two sites equipped with VHF, fixed antennas and backup power. They plan 10 more sites to handle inter-hospital and public welfare traffic.

When trying to recruit someone into this great avocation, should you be met with, "Oh, it's just so hard," you

may wish to recount the adventures of Henry Gorka of Harrison, Michigan, now proudly KB8LTJ:

"Two years ago my son Jim, N8MCF, received his General Class and urged me to get the Novice. I thought, being 70, I was "untrainable, but I took the \$20 he sent me for my birthday and purchased Gordon West's Novice book and tape. In eight weeks I took the code and written tests, and four weeks later I became KB8LTJ. I had so much enjoyment on 80 and 40, I suggested that my XYL should take lessons at the Gladwin Radio Club. She agreed and after six weeks of pizza suppers and radio classes, my dear wife, who wouldn't recognize an electron if it bit her, passed the 5 wpm and she missed only one out of the 30 Novice questions.

"My only comment to my son was, 'why didn't you introduce this hobby to me 25 years ago?'"

"Amateur Radio is a wonderful pastime but we must introduce it to the young people. Let's 'unstealth' it."

Among the many interesting devices at Dayton was a CW, RTTY, ASCII, AMTOR reader by Somerset Electronics, Satellite Beach, Florida.

While it reads incoming signals, it also can read your own sending. Illuminating. And, for some, possibly a little illusion shattering. How come when I sent that perfect letter "M" it came out as "T-T"? What, the punctuation mark didn't even register? Hmmm, but with a little better effort it registered on the display as what was imagined to have been sent.

As I said something like, I could use a little work," the man behind the counter replied that he had heard that about a thousand times so far that weekend.

Well, don't laugh at me unless you've listened to your own sending into a tape recorder lately.

—Armond, N6WR

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 incisors, which includes pines, and all others with the hares and pikas.
sim-plic-i-ty (sim-plis'e-tē) *n. pl. ties*
 dentate. — *n.* A simplicidentate rodent.
 state of being simple; freedom from adm.
 ornament, formality, ostentation, subtlety.
 difficulty; sincerity; unaffectedness. 2 FT-26
 FT-76 from Yaesu. See synonyms under other fi
 Also *sim'ple-ness*. [*<L simplicitas, -tatis*]
sim-ple-ty (sim-ple-tē) *n.* To make
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The ARRL forum

NORM BROOKS, K6FO

Linda Duncan, WD8JNR, stole the show at the ARRL Forum at the Dayton Hamvention on April 28. She was introduced as "1-800-Linda." As publicity chairperson, she gave us an interesting run-down of what was going to happen at the ARRL National Convention at Saginaw, Michigan on August 23, 24 and 25. Five area Amateur clubs are sponsoring the event. From their advance information, it looks like it rivals the Dayton Hamvention itself.

The Saginaw Valley Amateur Radio Assn., Genesee County Radio Club, Bay Area Amateur Radio Club, Shiawassee Amateur Radio Assn. and the Lapeer County Amateur Radio Assn. will be the hosts. The general chairman is Joe Turner, K8CQF. He is fortunate to have so personable a publicity person as Linda.

An innovation at this convention is a writing contest. You may have seen it announced in the January, '91 *QST* (page 45). The contest will commemorate Walter A. Tomkins, K6ATX, a Silent Key who is famous for his stories which included Amateur Radio.

Just like the Dayton Hamvention, you will have to choose from five different forums running simultaneously. The only forum that will have no competition is the ARRL forum. To get more information on the ARRL Na-



1-800-Linda

tional, call Linda's 800 number installed for this purpose: 1-800/444-9979.

The ARRL forum was headed by League First Vice President George Wilson, W4OYI; Great Lakes Division Director Allan Severson, AB8P; and Great Lakes Division Vice Director George Race, WB8BYG.

WARC 1991

George Wilson, W4OYI told us about the upcoming World Administrative Radio Conference (WARC) in 1992. You will recall it was the 1979



George Wilson, W4OYI, ARRL First Vice President

WARC that gave us three new HF bands at 30, 17 and 12M. In that conference, however, we almost lost our 40M band. This time, all the handwriting on the wall indicates that tremendous pressure will be brought to bear by the international propaganda broadcasters to take 7.1 to 7.3 away

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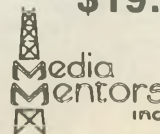


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from us. In its place our negotiators are hoping to get 6.9 to 7.1 as exclusively Amateur worldwide. In any case, don't lose too much sleep over this as the actual change would take place in the year 2007!

Packet message responsibility

You have no doubt heard about the questionable message transmitted on the packet network, and how citations were sent by the FCC to each system operator whose node retransmitted the message. The messages are sent automatically, and it would defeat the purpose of the system if someone at each relay point had to "censor" every message.

H.R. 73

This is the bill in the House of Representatives that purports to "save" Amateur frequency bands by requiring the FCC to replace frequencies taken away with frequencies equal in both size and characteristics. Your reporter has read the language in the proposed law, but it omits the word "characteristics." I see this as a big loophole that would allow replacing 200 kHz taken away at 7 MHz with 200 kHz in the satellite region. In any case, an insider told me nothing will come of this bill.

220 is gone

Our 220 to 221.99 MHz will be officially gone 120 days after a notice is published in the Federal Register. By the time you read this, publication should have taken place.

Notice of Inquiry 91-386

More and more cities and states are passing laws that give them the right to confiscate mobile or portable radios found able to tune in police frequencies.

All this, even though it is recognized that Amateurs using such radios have been known to provide a communications link between two emergency agencies who could not otherwise talk to each other. The proposal is to grant an FCC preemption excluding licensed Amateurs from such laws. It is known that two of the five FCC commissioners are not in favor of such a preemption. Kentucky has such a law but will not enforce it against licensed hams.

FCC fees

The idea of a \$30 fee for a ten-year Amateur license is still in the works. ARRL is fighting to eliminate this.

Q and A time

During the open discussion period, it was noted that there seemed to be more young people at the Hamvention than previously. Are we seeing a resurgence? (Dayton joke: Q: Do you know how to lower the average age of the ham population? A: Just run the Hamvention one additional day and the oldsters will drop off!)

Packetcluster

A packetcluster user (DXers' use of packet to announce DX stations) asked what plans are being made to put the SAREX on a frequency other than 145.97 MHz, which is being used continually for DX announcements? The answers were "Nobody owns a frequency," and (from AB8P) "For the short period of the flight, they (packet-clusters) ought to be shut off."

No-code hams

The secret to the success of the no-code program lies with us. If new Amateurs operate on the air in a faulty



Allan Severson, AB8P, Great Lakes Division Director

manner, call them on the phone and explain it to them. Invite them to our club meetings. Director Steve Mendelsohn, WA2DHF, startled everyone by standing up and shouting, "No-code is a fraud!" He explained that no-code appears to be a "bait and switch" operation. We bait the person to become a ham by eliminating the code. Then, when they learn on the air of the privileges available with code, and since no one is telling them they have to learn the code, they're asking "how can I learn the code, now?" It seems that without pressure, and if it is optional, they want to do it! □

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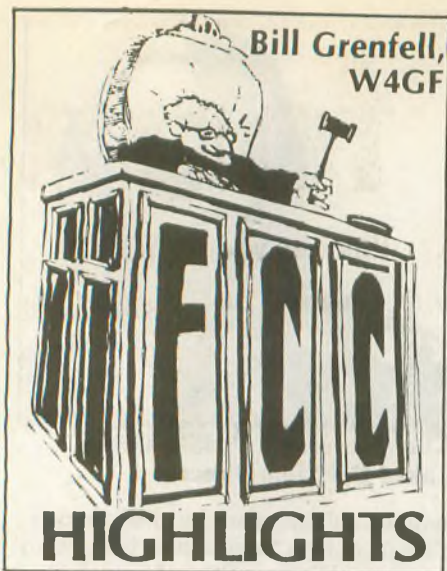


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WARC-92 satellite issues

The FCC has agreed to issue a supplemental Notice of Inquiry in General Docket 89-554 concerning preparations for next year's World Administrative Radio Conference. In the new document the FCC proposes a fourth option for the Broadcast Satellite Service and terrestrial digital audio broadcasting at 23.60-24.10 MHz, with existing primary services becoming secondary after a transition period.

The NOI also proposes geostationary Mobile Satellite Services (GSO-MSS) uplinks at 24.10-24.50 MHz, also with existing primary services becoming secondary after transition.

Unlike the previous second NOI, the new notice proposes to retain existing Amateur and Amateur satellite secondary allocations in the entire 23.00-24.50 range. Continued Amateur access would depend on Amateurs' ability to share.

Petition denied

The FCC has denied a petition by Michael R. Renyolds, W0KIE, which

requests amendment of the FCC regulations to permit one-way retransmission of live science and space updates from NASA to Amateurs and to local schools as well as one way retransmission of VOA (Voice of America) news on VHF/UHF frequencies.

Robert H. McNamara, FCC Chief, Special Services, ruled that "One of the fundamental principles of the Amateur Service is that the Amateur Service is reserved for bona fide Amateur Service communications. We believe that the types of communications that you request chip away at this fundamental principle." He added that VOA programming is already available via satellite and international (shortwave) broadcast stations.

Rumor control department

Unfounded rumors that the FCC plans to "ban scanners" are cluttering electronic mail and packet bulletin boards. The rumors are not true. Apparently what set them off was someone's hearing about, and misinterpreting, the FCC Notice of Inquiry in Docket 91-36 (which considers the possibility of relieving restrictions on the possession and use of Amateur Radio equipment in local jurisdictions having anti-scanner laws, through federal preemption).

Commenting on the rumors, ARRL Executive Vice President David Sumner, K1ZZ, said: "It's a shame that the FCC, in trying to do the Amateur community a favor, gets subjected to a lot of abuse just

because someone can't be bothered to check his facts before getting on the keyboard. This kind of rumormongering is just plain irresponsible."

Waivers for military personnel

The FCC advised that US military personnel whose Certificate of Successful Completion (CSCE) expired while they served in the Persian Gulf may ask their volunteer examiners to apply for a waiver of FCC rules section 97.505(a)(3). Such requests for waivers will be considered on a case-by-case basis, says the FCC.

First impressions of "power audits"

The FCC on April 5 released its preliminary conclusions from "power audits" which were conducted February 26 and 27.

The conclusions were based on visits to 209 Amateur stations, according to the Commission. Most were selected at random but 31 were chosen because "they were subjects of interference complaints (interference to home entertainment electronics devices)."

"The FCC made observations of the communications conducted at the power level usually used by the station and then made similar observations with the power reduced by one-half or more," the FCC said in a press release. The FCC noted the following "findings":

- 75 percent of the stations experienced no degradation in communications capability when the power was reduced by more than half.

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 May 1, 1991.

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	AA0EM	KF0RE	N0NQV	KB0IZM
1	WR1W	KD1BA	N1IYT	KA1YSX
2	AA2EF	KF2BO	N2MIO	KB2MVA
3	WN3D	KD3WU	N3JIM	KA3YYE
4	AC4FI	KO4BA		KC4ZYL
5	AA5YD	KI5PW	N5TEW	KB5PPE
6	AB6CK	KM6AK		KC6UQF
7	AA7IN	KG7PG	N7RMA	KB7NNH
8	AA8DO	KF8NE	N8OHD	KB8MMD
9	AA9AP	KF9DH	N9LEC	KB9GRW
North Mariana Is.	AH0K	AH0AH	KH0AN	WH0AAP
Guam	KH2R	AH2CJ	KH2FF	WH2AMU
Johnston Is.	AH3D	AH3AD	KH3AG	WH3AAG
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii		AH6LG	NH6ZY	WH6CMP
Kure Is.			KH7AA	
American Samoa	AH8D	AH8AE	KH8AI	WH8ABA
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• Lower power resulted in reduced interference to home electronic entertainment equipment in one-third of the cases.

• 70 percent of the Amateur operators interviewed stated that their stations normally transmit with less than 200W of transmitter power.

• Approximately two-thirds of the stations reported to be the source of interference to home electronic entertainment equipment were transmitting with 100W or less.

The FCC press release noted the following conclusions:

• Most Amateur stations are not operating at minimum power as required (Section 97.313(a).

• Reduced power can alleviate significant reception interference problems without degradation in communications capabilities.

• In addition to reducing transmitter power, other remedies such as transmitter or receiver filtering may be required to eliminate interference.

The Amateur community now awaits details of the methodology of the "power audit." The FCC has said it intends to release the study at a later date.

Commenting on the Commission's news release, ARRL Executive Vice President David Sumner, K1ZZ, said: "It is interesting to note that, according to the Commission's own figures, Amateur stations operating at 100W or less are as likely to be a 'source' of interference as higher-powered stations, and reducing power even further did not eliminate the interference in two-thirds of the cases. Anyone arguing for a reduction in Amateur transmitter power limits will find no support in this study."

According to FCC officials, these "visits," begun Feb. 28, are part of a program to gather data on the various services the Commission administers, to conduct enforcement as the need arises during the course of the project, and to educate its licensees.

Smith says this is not a case of the Amateur Service being singled out. He cites surveys of other services, including cable TV leakage, tower painting and lighting, AM broadcasting technician standards compliance, and land-mobile systems licensing.

The FCC also could use the audits as a basis for "educating" Amateurs about their rule to use the minimum transmitter power necessary to maintain communications.

The audit may have been prompted by increased complaints of RF interference to telephones, on the theory that if Amateurs used lower power levels there would be fewer complaints.

The League has pointed out that the FCC has not used its authority to require consumer electronics devices to be less susceptible to RFI. The League noted that asking Amateurs to reduce power in cases where their transmitters are not at fault would be unfair, although Amateurs often do so voluntarily.

The increase in telephone interference complaints may have been in part due to the deregulation of the in-

dustry; consumers no longer have a single point of contact—the local telephone company—from whom to get relief from interference problems.

FCC comments on packet violations

With reference to the violation notices issued in connection with an inappropriate packet message, the FCC has commented: "Up to this point, most Amateurs were of the opinion that only the originator of a prohibited transmission is responsible for its message content. Such is not the case . . . Our objective was to get the message across to Amateurs that you may not automatically retransmit prohibited communications."

Intruders

Here is the latest (March 11) list of intruders in HF Amateur Radio bands that the ARRL has asked the FCC's Treaty Branch to pursue with the US and other countries:

Freq.	Mode	Content
7008 kHz	F1B	Idling and traffic
18095.5 kHz	F1B	2 kHz shift coded traffic
18152 kHz	F1B	200 Hz shift traffic, idling
18164.25 kHz	NON/F1B	Steady carrier, traffic
21284 kHz	F1B	Idling and traffic

The information above is selected directly from recent issues of the following: ARRL Letter; Westlink Report; and W5YI Report. □

The FCC forum

NORM BROOKS, K6FO

Again this year at the Dayton Hamvention, the Federal Communications Commission put on a forum to give us the latest information about their activities. They were in Room 2 again, which I criticized last year for its noisiness. This year it was tolerable because they put a rug on the floor and changed the PA setup.

Again John Johnson, W3BE, chief of the FCC's Private Radio Bureau, was accompanied by Bill Cross, WA3LJP. They pointed out that they are two-fifths of the manpower at the bureau. The other three people are attorneys.

The Volunteer Examination Coordinators were honored by being seated at the front of the room. Last year the VECs processed applications to issue 125,000 Amateur licenses. 1990 was a

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record year. The VECs and Volunteer Examiners (VEs) held 6,250 examining sessions, with 65,000 examinees plus 25,000 under the Novice system.

Three Amateur volunteers who work with the FCC Field Operations Bureau were present and recognized for their important work in rule enforcement.

Numbers of Amateurs

On June 30, 1934, the year the FCC's predecessor was born, there were 46,390 Amateur licenses outstanding. Since some Amateurs had more than one license, there were actually about 45,000 Amateurs then. On February 22, 1939, there were over 51,000 Amateur operators. On March 29, 1991 we had 507,083 operators listed in the licensing data base. Add to this 2,000 more who are operating with reciprocal permits. Overall, this is a 1000 percent growth in Amateur Radio in the 57 years that records exist, averaging 4.46 percent per year. Over the past 40 years, 18 years have had above average growth, two years average, eight years below average, seven years no growth at all and five years with a net loss. The best year was 1977, when we gained 41,000 Amateurs. The worst year was 1973, when we lost 9,000.

New personal services

The Personal Radio Bureau administers two parts of the FCC rules. Part 97 includes the Amateur service, the Amateur Satellite service and RACES. Part 97 covers General Land Mobile service, Citizens Band, Radio Control and now two additional services are being considered: Personal Emergency Locator and Interactive Video Data.

We are all reminded that FCC rules require that each Amateur have a copy of Part 97, which is "our" part of the rules. The FCC Rule Book is available from ARRL, but Johnson likes the version put out by W5YI better, because it is loose-leaf and lies flat on the desk when open.

Interlopers and exploiters

Part 97 is based on the proposition that it is in the public interest to make spectrum available for technically inclined private citizens to use for self-training, intercommunicating and experimenting. Our service is unique in that the management of our slices of the spectrum is left entirely up to us. The Amateur service is for qualified persons only—that's why we have the extensive examination system. Johnson warns that there is a "threat" to all this. It is the loophole for third-party communications. Unless we are careful on how we handle third party traffic, we will end up with unqualified interlopers on our bands. The FCC provides channels for maritime, broad-

casters, common carriers, public safety agencies, business communications, etc. There are procedures for those with a genuine need for these channels to obtain licenses for their use. But frequently we see persons, often hams themselves, try to exploit the Amateur service by misusing its frequencies as an alternative to the proper channels. Part 97 tries to set reasonable general limits on what is proper and improper. The real limits are set by our good judgment and by our respect for those principles.

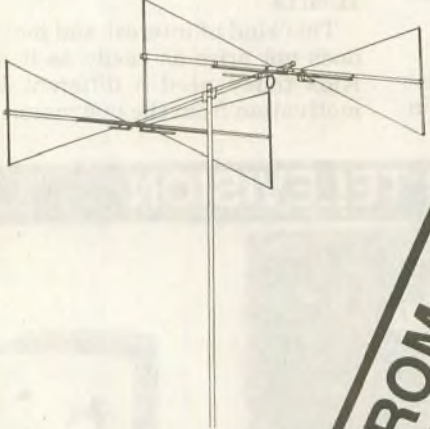
Code/no-code

The codeless proceeding had a number of surprises. In 1983, when a codeless license was proposed, comments ran 20 to one against the idea.

This time the comments were 70 percent in favor of the codeless license, and there were one-fifth as many comments filed as in 1983. This shows a dramatic shift in attitude toward the codeless license. However, the comments were strongly against making any changes to the Novice license. As a result, the codeless Technician license is not as "tidy" as we all might have liked, but it was the only practical thing to do. The bottom line is that we have a meaningful no-code Technician license at long last. Since there are wide month-to-month variations in figures, it is too early to tell the long-term outcome of the addition of the codeless Tech license. By this time next year we should know the trend. □

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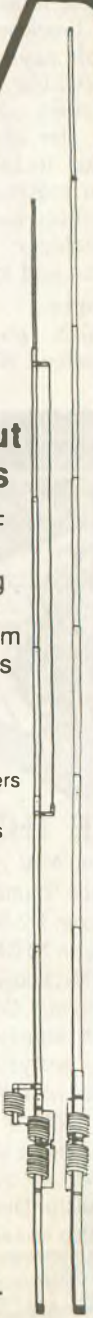
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Classroom strategies

ROBIN WORTLEY, KC6RUD

Carole Perry, WB2MGP, has been teaching sixth, seventh and eighth graders of Staten Island her "Introduction to Amateur Radio" classes for 11 years now, and the class has become part of the formal curriculum in New York City. Carole shared some of her experience and unique teaching strategies in her forum, "Ham Radio in the Classroom," at the 1991 Hamvention in Dayton, Ohio.

Her strongest suggestion was: "Get your Amateur Radio program into the school curriculum rather than introducing it as a club activity." In this way (because there are "no options") Carole says she's been able to expose 1,800 kids at a time. She does not, however, emphasize the goal of getting the kids licensed. Rather, she makes it her main objective to get them motivated and *learning*. Carole presented her own three-point formula to achieve this objective: smarts, hearts and sparkle.

Smarts

Think about what sparks kids' curiosity. Will they be interested in

opening an atlas and trying to understand the concept of distant lands and culturally different people? Maybe not. But what if they *meet* one of those people via an Amateur Radio QSO? Suddenly they want to know who this person is, what his people are like and how they live. Social Studies! Where exactly is he in relation to us here in America? Geography! (The atlas will suddenly become handy, rather than vast and boring.) Why does his English sound so funny? Foreign Languages! How long have they been there, and do they have the same rules? History! Government! Hey, how does this funny box work anyway? Propa-*what?* Science! Even *Math!*

And to make it even more fun, no textbooks are required in the program. The kids are given the opportunity to take the exam at the end of the class to acquire their ticket, but it is considered a privilege, not a requirement. This way, kids respond in a positive way, and they often want to prove themselves.

Hearts

This kind of interest and motivation does not arise as easily as it sounds. Kids today need a different kind of motivation from the instructor. Carole

advises, "They don't care how much you know. They want to know how much you care." It's essential that the kids grow to trust you and what you're saying.

Carole takes her students, groups at a time, to practice getting on the radio. It's important to be patient and allow them to overcome their shyness and lack of confidence. Intimidation is especially difficult for the girls to overcome, she says. It's important to try to relate the communication opportunities to something they're interested in. For instance, Carole might relate how Amateur Radio could be used to communicate in the mall.

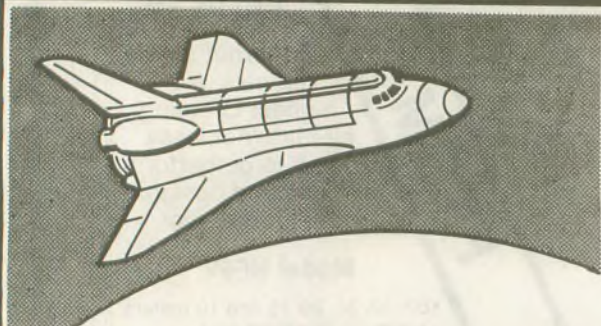
Sparkle

Everything Carole presents is somehow kid-related. The trick, she says, is to make Amateur Radio valuable and useful to them. One day, when one of the students had claimed to be home sick (but others knew he was playing hooky), Carole ran a phone patch with her hand-held radio and called him. When he answered the phone she said hello and asked how he was. He said he was just fine, enjoying a day home from school, and when he asked who was calling the whole class enjoyed listening as Carole busted him. This not only sparked interest in the kids, but the attendance improved dramatically.

In addition to making Amateur Radio fun and interesting to the students, Carole is clever in using practical materials. For instance, she's built a miniature code oscillator, complete with volume and tone adjustments and batteries, which is self-contained in an earring box. This metal box is not only small and easy to carry anywhere, it's nearly indestructible. As Carole says, "An elephant could step on it on the way to school and it would still be okay."

Kids are always more receptive to learning when presented with gadgets like this. And, Morse code is not presented as a requirement, nor is it presented as a controversial issue. It is entirely new to the kids; they don't know anything about it and since it's not something they've previously failed or done poorly in, they're not afraid of it. Instead, code becomes a secret, special language which they want to learn. Without even realizing it, they are learning careful listening and concentration skills. To maintain interest in practice sessions, Carole presents Morse code in a story form rather than random letter repetitions. To intensify this strategy, she cuts the story off at the height of the kids' excitement, collects the oscillators, and leaves them eager to continue the next day.

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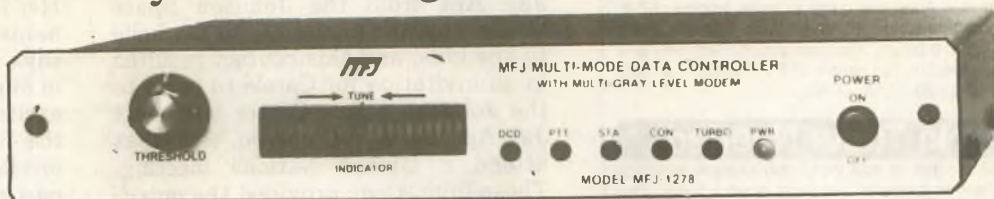
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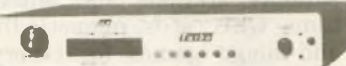
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Read what our satisfied customers wrote us about their genuine Garant Windom Antennas. All originals are on file for your inspection, as the FTC requires it. Fred_W8YFK: "I purchased one of your GD-9/2KW antennas. It works great. Nine bands, no external tuner. Who could ask for anything more?" Howard_W3HM: "on his GD-9/2KW: "Service was fast. The antenna is first class. It does all it was advertised to do. Now, I have one antenna, one feedline and all (9) HF amateur bands for the first time in 27 years of hamming. The xyl likes that too." John_KA3SDQ on his GD-8/500W: "Prompt delivery, helpful phone ordering and information, combined with a quality product. Garant truly has an unbeatable combination." Don_N01GE: "I am very pleased with the shipping speed, service and the GD-8/500W antenna. This is my only antenna for 10 to 80 meters. What a great performing antenna. I am very pleased." John_W0HBE: "I was extremely anxious to put my new GD-8/500W on the air. The instructions make the assembly fast and simple. I was impressed by the low SWR on all bands and comparison tests have proved to me that the Garant GD-8 windom is far superior to any other wire antenna." Paul_N1PL on his GD-8/500W: "The antenna is dynamite on 20 meters." Charles_W9JLZ: "Garant GD-8/500W antenna performs very well on all bands. Great antenna. Get great signal reports." Michael_N8BED: "Order received promptly as promised. GD-8/500W works as promised, using your measurements. No trimming required." Herbert_WD9GBH: "My GD-9/500W works fine. Great multi-band antenna." For more letters with genuine call signs see our free data report.

Free Data Report

Write, phone or fax for our complete data report on all our Garant Windom Antennas. It contains more technical data, actual SWR curves, customer comments and our low mail order prices. We ship worldwide. All our genuine Garant Windom Antennas are sold with a 10-day money-back guarantee. They come also with a 3-Year Limited Warranty.

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Carole runs a special net, the CQ All Schools Net (1630 UTC Tuesdays and Thursdays on 28.303 MHz), where kids from schools all over the US can talk to one another. Unexpected contacts frequently are made this way; Jay Apt from the Johnson Space Center checked in one day to say hello to the kids, and this contact resulted in an invitation for Carole to come to the Johnson Space Center and meet Jay Apt and Ken Cameron, as well as attend a United Nations meeting. These invitations provided the opportunity for the kids to write up questions for Carole to ask.

The kids often get involved in seeking out information. During natural disasters such as Hurricane Hugo and the Loma Prieta Earthquake they worked on all kinds of report projects such as comparison of media reports, geological and weather studies, hurricane tracking, electromagnetism studies, etc. The various aspects of Amateur Radio—current events, natural disasters, public service—all help to draw kids into the experience of learning. They craft models of satellite stations and antenna systems, QSL cards, phonetic flashcards and bingo games for theory definitions. They even publish their own magazine, *Ragchew*, twice a year. And they've developed a video for kids, not adults, explaining Amateur Radio and what it's done for them.

With all the fun these kids are having, Carole has made sure not to leave the parents out. Night classes, taught by retired hams, are offered to parents and community members. As they share common learning experiences, the parents become more involved with their kids and the kids become more involved with their parents. With age and experience next to youth and enthusiasm, this kind of community involvement through Amateur Radio supplements family connections. And, it builds parental support for the program. As Carole points out, "If something works in a school system, they'll let you do it again." She finds that this parental support is reflected and focused on in the efforts of the PTA which, after all, plays a significant role in funding such programs.

Carole says about 400 students (as many girls as boys) enroll in her program each year and, of those, approximately 100 take the exam for their license. An average of 85 of these pass and 10 percent upgrade afterward. Her homeroom this year is 65 percent hams—a powerful recruitment. Carole says the most important goal to keep in mind is to "do your part to get them excited enough to want their license in the first place." If it is viewed as a privilege rather than a mandatory part of the class, the accomplishment of getting a license will make the kids feel special and different. They may stray away from Amateur Radio and then come back to it later. But if they are encouraged to explore the many opportunities and find their own niche in Amateur Radio now, they are more likely to grow from the experience.



Carole Perry, WB2MGP: "The SAREX program is the ultimate in educational motivation."

Youth forum

Carole opened her "Youth in Amateur Radio" forum with the introduction of her special guest, Tony England, W0ORE, who related with nostalgia his longtime friendship with Owen Garriott, W5LFL. They both became interested in science and technology as a result of their introduction to Amateur Radio, and they both went on to become scientists. When they were kids, Tony says, each used to keep a straight key up his sleeve with a transmitter underneath so they could send code in secret. Tony also remembers making phone patches by laying antennas directly on the ice in cold winter months. In his opinion, the advantage of being an Amateur is that one is "always doing something, not pretending or attempting to do something."

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Tony's comments made a perfect introduction for the young hams whom Carole lined up to speak at this forum. As she herself commented, "The SAREX program is the ultimate in educational motivation."

Tom Tittle, KF7LX, shared some of his experiences in Amateur Radio. Tom is a senior in high school and holds an Advanced Class license. His interest in Amateur Radio was first inspired by his grandfather's net; he started checking into the net, and the members were impressed with his involvement and young age. He took over the job of secretary and treasurer to the net and, although members were at first opposed to such a young ham taking such a position, he did well and, after a few months, gained support.

Tom says Amateur Radio has been an important part of his high school years. He notes that it has been helpful to raise school spirit for clubs. One of his favorite club activities is presenting talks and demonstrations for local schools and science fairs. He says the kids will become curious about the Amateur Radio setups and land up in a QSO for hours, talking to someone far away. Tom's favorite part about his own operation is looking for new hams on 10M.

The 1991 Westlink Young Ham of the Year, Sammy Garret, AA0CR, was also present at the forum. Sammy is 13 years old and holds an Extra Class license. He says his first exposure to Amateur Radio came as a result of visiting his uncle in Florida and becoming intrigued with his station and operations. He got his Novice class materials but didn't pursue it further for a while . . . until he found



Tony England, W0ORE: "In Amateur Radio, you're always *doing something, not pretending or attempting to do something.*"

himself talking third party with people during the Loma Prieta Earthquake disaster. Now he's not only achieved his license and upgrading—he's started a radio class locally as well as a club at his junior high

school. He always operates the School Club Roundup and comments, "Kids will talk to *anyone.*"

Sammy has his own philosophy on motivating young people; he says it's most important to "be yourself." He observes that kids need to overcome the paranoia of not being accepted by adults in an "adult hobby." We must show kids that there's something for everyone in Amateur Radio, and there are even things in Amateur Radio that kids can do better than adults. He notes that kids will give 100 percent effort *if they want to*, but they can't be forced or they'll wind up hating their elders. In fact, once they become exposed and interested, kids will recruit for you because they're excited. Amateur Radio should not be considered a hobby for "geniuses or nuclear physicists." Once you make it exciting, kids will learn Ohm's law easily. But you must show them that 1) they *can* understand Amateur Radio and 2) you're their friend.

Lenny Mack, KB8KTC, related his experience of setting up a "moon-base," a simulation of moon existence complete with a fish hatchery, hydroponics, government, etc. They had in their setup a robotic arm, an IBM network, a satellite setup with tracking, an HF station, ATV, etc. The experi-

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ment received national television coverage, including CNN. As a result of the project, Lenny says, 60 students became interested in Amateur Radio and now have their licenses.

Willis, KB2LEP, related how he was drawn into Amateur Radio by his fascination with DX. His first contact was Czechoslovakia, and he'd secured contacts with eight other countries by the end of the day.

Brian Cresinzi, KB2GTD, also became fascinated with DX; he was impressed with how well foreign people speak English. Brian is almost 15 years old, a freshman, and holds an Advanced Class license, though he has been a ham for only two and a half years. He has the honor of being the initial contact of the STS-35. Ron Perise, WA4SIR, made contact from the shuttle and the kids were able to ask questions, but reception of replies to the questions kept breaking up because the shuttle was turning its direction relative to the Earth. Ron Perise is scheduled, however, to come to the school for a talk in September.

Aside from DXing, Brian likes to participate in contesting and disaster training drills, which he attends whenever he can. He was responsible for reporting information about Hurricane Hugo (such as speed and status) to his eighth grade social studies class and listening to the health and welfare traffic and giving updates. Brian says it's exciting to participate in drills, which are coordinated with hospitals. He also likes to work packet. Brian says he gets on the air every night for at least a half hour.



From right to left: Mary, KB21GG; Tony, W0ORE; Brian, KB2GTD; Willis, KB2LEP; Sammy, AA0CR; and Carole, WB2MGP.

Mary Ellestra, KB21GG, came to the podium with the warm smile and confident poise one would expect from a professional speaker. She attributes her confidence to Amateur Radio and related that although she expected it to be only a hobby, she found it to be much more in the contacts she made all over the world. She now finds courses much easier and promotes, "Amateur Radio will enable you to ex-

perience and appreciate what your school courses have to offer." Mary will attend a technical high school next year. She particularly enjoys the opportunity to participate in special events and help with public service. Mary left us with this message: "We will set examples later, so youth are the future of Amateur Radio. It's our duty to preserve it." □

CONSTRUCTION

Some guys always do things backwards

I must confess I have been in that boat many times. What am I talking about? Well, it is one of my favorite subjects—antennas. If you have the need to put up a vertical antenna, and if you are like most guys (no pun intended), you will lay out four radials and then spend the rest of the day tuning and pruning and otherwise messing around with the vertical radiating

antenna element until you are blue in the face!

You have it all backwards! The books I read say that you should be spending all day on the ground system, not the radiator! I wrote a program to figure out efficiencies versus radiation resistance and came up with a few examples:
(please turn to page 75)

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 - EJ-2U: Tone squelch Unit
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Ten-day Field Day

ROBIN WORTLEY, KC6RUD

Norman Lucas, WB6RVR, was the steam behind the rigorous 10-day operation of special event station WB6RVR during Railfair 1991 in Old Sacramento, California. Norm organized the event, appealing to Amateur Radio operators statewide for volunteers to help with radio communications. Filling the 100 operator positions proved to be no problem; Amateurs from all over California, not just nearby clubs, responded and volunteered their time to be guest operators.



For the last three years, Norm has been running a California State Railroad Museum special event station during the first weekend in May

to kick off the annual commemoration of the first steam engine operation. Steam engine train rides traditionally run on an excursion route throughout each weekend thereafter through the summer. This year is the museum's 10th anniversary as well as the 122nd anniversary of the Driving of the Golden Spike in Promontory, Utah, which marked the completion of the first transcontinental railroad.

As of the morning of May 10, the actual anniversary of the Driving of the Golden Spike, the Sacramento station had confirmed about 600 QSOs. They had already received many calls from around the world, from such places as Australia, New Zealand, Japan, South America, Costa Rica and Canada. In addition, the operators averaged 125 "sign-in QSOs" a day from many visitors who were both railroad enthusiasts and Amateur Radio operators.

The WB6RVR station was set up in the old, wood planked platform area. The operators, working two at a time, wore headphones to hear transmissions while locomotives chugged and whistled, slowly creeping past the



Operators received calls from around the world.

platform and into position for the musical review which was performed three times daily during the Railfair. Norm organized operation managers who worked four-hour shifts each day and were on hand to answer questions



Norm Lucas, WB6RVR, organized the Railfair '91 special event station.

to those inquiring visitors and to serve as operators when necessary. The operators themselves worked two-hour shifts. Norm likened this special event to one big 10-day Field Day.

Besides being the coordinator for this special event, Norm is a Union Pacific conductor and full-time representative for the Union Pacific labor union. During this 10-day operation, he continued working in all capacities. Norm has been an Amateur Radio operator since he was 14 years old, and he now holds an Extra Class license. His wife, Sheila, KB6PIN, has been an Amateur for three years and holds a General Class license.



Whether you operated the WB6RVR special event station from afar or came by for a personal visit and signed in, you will be awarded a special, commemorative QSL certificate. You may even find a surprise inside: California Railroad Museum excursion tickets. □

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DX Convention, Visalia, 1991

NORM BROOKS, K6FO

The two big DX clubs in California have done it again with a very successful International DX convention in Visalia, California on April 12, 13 and 14, 1991.

For those of you who are not familiar with this annual affair, let me give you some background. Forty-two years ago, the Southern California DX Club, centered in the Los Angeles area and the Northern California DX Club, centered in the San Francisco Bay Area got together to put on a big combined bash at the half-way point in Fresno, California. About 10 years ago, hotel facilities in Fresno were not available, and the convention was moved to the Holiday Inn Convention Center in Visalia, which is just south of Fresno. The get-together has been held here ever since, hosted alternately by the Northern and Southern clubs. About 700 people attended this year's event.

If you've been going to Amateur Radio conventions, you will find that a DX convention is different. For example, a large group of conventioners can sit down at a restaurant, and you will not see a single hand-held radio! After all, you don't work DX with a hand-held radio. Another difference is that attendees from the far corners of the world are treated like visiting royalty. The top players in this group are "King George" Lloyd Colvin, W6KG, and "Queen Lady" Iris Colvin, W6QL. They have now operated from 217 different countries, much to the delight of the DX enthusiasts. They were awarded a beautiful plaque engraved "Radio Ambassadors of the Decade 1980-1990" by the ARRL Board of Directors.

Of course, there were forums too. Fortunately, they were on "one track," which means one at a time, and you could sit in one chair all day and hear them all. Here are some notes from the ones I attended:

RTTY DX

The number of DXers using radioteletypewriters (RTTY) is increasing rapidly. This is because today's RTTY is vastly different compared to the "mechanical monsters" of yesteryear. No more noisy, clacking model 15s, 19s or 28s. Now computers have taken over, quietly and efficiently. Most of the "all-mode" packet radio modems also handle RTTY. If a DXpedition team takes a computer along to do logging on SSB and CW, it probably also has a major piece of equipment for RT-

TY. That's how a great many rare DX spots get on RTTY. So if you have the equipment to operate RTTY, why not fire it up and use it?

Bob Artigo, KN6J, as moderator of the panel, asked those holding RTTY DXCC to stand up. This was two-thirds of the people in the room! He raised the number in steps all the way to 250, and six people were still standing!

Bob gave us a simplified overview of RTTY. He pointed out that it is just one of the digital modes. The others are AMTOR, ASCII and packet. The difference between them is the code that is used. RTTY uses the Baudot code,


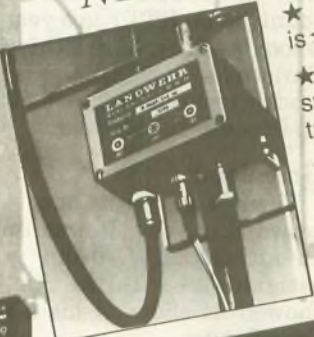

each letter consisting of a series of five marks or spaces. This coding has not changed for over 60 years. The original speed was 60 wpm (45 baud) and DX-ing is still done at that speed because there are still some of those mechanical machines out there. Russian Amateurs originally came on with 66 wpm (50 baud) but soon got in line with everyone else's 60 wpm. There are some RTTY bulletin boards using 100 wpm (75 baud), but no one will try to guess when RTTY DX will go to 100 wpm.

Most modern transceivers are made to do RTTY by giving them an audio tone that is shifted in frequency. This is called AFSK. Use the transceiver in

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WORLD RADIO, July 1991 19

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the lower sideband (LSB) mode to be like everyone else. Upper sideband (USB) will make your RTTY signals "upside-down," and others will tell you about it.

Bob introduced a panel of RTTY experts: Don, W6DGS; Deane, WA6DJR; and Eddie, G0AZT. They gave advice and answered questions from the audience.

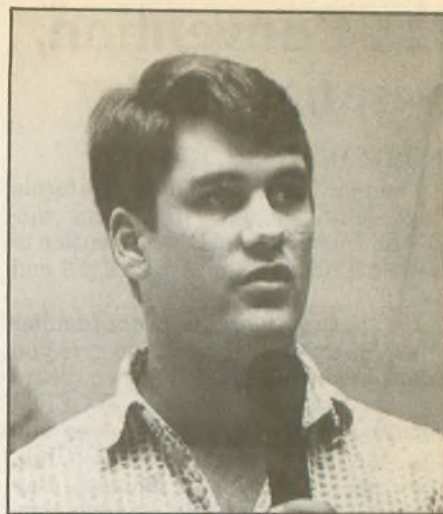
One of the carryovers from the mechanical machines is to send RYRYRY as a test signal. This was used to adjust the mechanical "range" control on the receiving machine to get the best accuracy. There is no need for RYRYRY with computers, yet many people keep sending it. It is a no-no to send RYRYRY while working DX in a pileup since it is an unnecessary waste of time. It is better to send your own call sign several times as an attention getter. It is okay for the DX station to use RYRYRY, as it then becomes his "signature." KN6J, however, prefers to use a series of dots (periods) as a signature when he is the DX station.

It is easy to work DX with RTTY. There are many RTTY contests throughout the year, and the DX stations make it a point to be on the air for them. At any one time there are about 150 countries on the air with RTTY. Now, with packet cluster announcing DX, you should be able to work 200 countries on RTTY in a year. The gang is looking forward to Ethiopia (ET2A), Christmas (VK9X), Clipperton, Kermadec and Sandwich islands to come up in contests this year.

Greenland

There was a new face in the DX crowd this year. It was John Beardshear, OX3EW. John is between assignments with the Air Force and showed us slides of his life at Thule, Greenland.

Greenland is the largest island in the world. It is owned and administered by Denmark. Getting an Amateur license is not difficult. It took John about



Giving the story about operating in the chilly clime of Greenland, John Beardshear, OX3EW

eight weeks. The fee was 300 Danish kroner, about \$50. There are five native Amateur operators there.

Thule is 700 miles north of the Arctic Circle, on the west side of the island. At this latitude, the sun never sets in the summertime. It just goes round and round, never getting higher than 45 degrees in the sky. It just doesn't come up at all in the winter months! The magnetic compass points to the Earth's magnetic north pole, which is directly west. Radio propagation is best when the sun is down. When it is up, radio conditions are only average. When there is a solar flare, radio signals are impossible to hear.

The buildings on the base are three stories high and made of fiberglass. John strung his antennas between their roof tops.

The only industry in Greenland is hunting and fishing. This, of course, is for the survival of the native population. Only natives may possess guns or other hunting weapons. If an American leaves his base for any reason, he must be unarmed and hope that he doesn't meet a polar bear.

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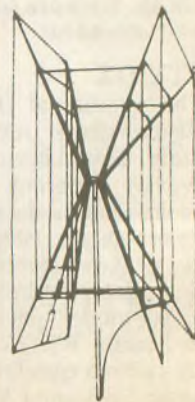
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There is a huge glacier near the Thule base. It is continually breaking up as it moves into the sea, and the noise of an iceberg breaking off sounds like bombing. The icebergs then float by, like ocean liners.

Greenland is green in the summertime. But the vegetation is primarily lichens, only two inches high. Trees grow to only a few inches. The wildlife, consisting of birds, hares, arctic fox and polar bears eat what little vegetation there is.

In the 10 months that he was there, John worked 4,400 stations. He didn't say so, but I get the impression he was not anxious to go back.

Jarvis Island (AH3C/KH5J)

Pete Grillo, AH3C, showed us slides and told us about the DXpedition to Jarvis Island.

Jarvis is an equatorial island 450 miles from Palmyra Island. DX country-wise, it is now grouped with Palmyra under KH5. However, work is progressing to classify it as a separate country.

A DXpedition is an expensive undertaking, and this one was no exception. It cost \$50,000, most of it up front for ship transportation. The group made 50K contacts. 10K were with Europe, 10K with Japan, 5K to miscellaneous

countries, and the rest to the US and Canada. So the cost of transportation alone came to \$1 per contact. Honolulu Electronic Supply helped considerably with equipment.

While the ship stayed in deep water, the landing had to be done in small boats. Reefs in shallow water had to be crossed. Rusted hulks of wrecked ships were visible, reminding the landing party to be careful.

Jarvis is a National Wildlife refuge, so a Park Ranger went along for ecological reasons. They found birds nesting on the ground just about everywhere. At first the birds shied away from the unexpected human visitors, but by the time the group left, the birds completely ignored them and went on with their nesting.

Banaba

Peter, OH1RY, showed slides of his group's three-week operation from a "ghost hotel" on Banaba Island in November, 1990.

This DXpedition location was unusual. A major part of a former population had left for greener pastures leaving only a small band behind. It appeared as if the building had been left there for the DXers' convenience. Slides showed empty buildings, a swimming pool without water, a tennis court overgrown with vines, a mailbox kiosk and traffic signs completely overgrown by the jungle. The main street looked like a Hollywood set waiting for the actors to appear.

Equipment was set up in the abandoned hotel. Even the sleeping quarters were "deluxe" compared to other DXpeditions. Over the course of three

weeks they put up 10 antennas, all with the attempt to get better coverage to different parts of the world. The location was on a hillside, which ruled out a vertical antenna.

Three weeks' operation netted 32,000 contacts all over the world. On November 20 the group took down all the antennas and returned on the schooner which came back for them. □

DX Pal

Hello, my name is Sergey, UL7GDI. I'm 27 years old, married, and I like to make equipment and QSO with DXers. I live in the USSR: Sergey Gost-juzhev, Box 51, Alma-Ata, 480124 USSR. □

More DXathon results

We've discovered that a line was missing from the 1990 DXathon results: Frank C. Westphal, KF6E, of California came in with 117 SSB, two CW and five RTTY for a total of 124 contacts. He has 125 nations confirmed. We're sorry your name was missed in the final printing, Frank. Congratulations on a fine outcome! □

.....
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Radio Club of America educational grants

America's oldest radio communications society, the Radio Club of America, founded in 1909, has announced that its Grants-In-Aid Program which was established several years ago has awarded financial grants to aid individuals in need of financial assistance to pursue their education in the field of electronic technology.

Grants-In-Aid Chairman Kenneth M. Miller announced that an award of \$1,000 has been given to The Radio Club of Junior High School #22 of New York City. The president of the club, Joseph Fairclough, WB2JKJ, underscored that the club's program of Education Through Communication is devoted to the training of high school students to become Amateur

Radio operators and reap the rewards of broadening their knowledge through international radio communications.

The Radio Club of America Inc. contributes several thousands of dollars each year to grantees from contributions made by the club's over 1,000 worldwide members, many of whom are licensed radio operators and who owe much of their successful careers to their experiences and training as Amateur Radio operators. □



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1.2 GHz		
IC-12GAT Super HT	529.95	Call \$

KENWOOD TS-950SD



HF Equipment	List	Jun's
TS-950SD New Digital Processor HF	\$4399.95	Call \$
TS-850S New All Mode All Band	1899.95	Call \$
TS-440S/AT Gen Cvg Xcvr	1449.95	Call \$
TS-140S Compact, Gen Cvg Xcvr	949.95	Call \$
TS-680S HF Plus 6m Xcvr	1149.95	Call \$
TL-922A HF Amp	1982.95	Call \$
Receivers		
R-5000 100 kHz - 30 MHz	1049.95	Call \$
R-2000 150 kHz - 30 MHz	799.95	Call \$
RZ-1 Compact Scanning Rcvr	599.95	Call \$
VHF		
TM-741A FM, 2M/440, Triple Receive	TBA	Call \$
TS-711A All Mode Base 25w	1059.95	Call \$
TR-751A All Mode Mobile 25w	669.95	Call \$
TM-241A 50w Mobile FM	469.95	Call \$
TH-27A Compact, 2m, HT	419.95	Call \$
TM-731A 2m/70cm, FM, Mobile	749.95	Call \$
TH-77A 2m/440 HT	599.95	Call \$
UHF		
TM-941A 2M/440/1.2 GHz	1199.95	Call \$
TS-811A All Mode Base 25w	1265.95	Call \$
TR-851A 25w SSB/FM	771.95	Call \$
TM-441A Compact 35w Mobile	479.95	Call \$
TH-47A Compact FM, HT	429.95	Call \$
TH-55 AT 1.2 GHz HT	524.95	Call \$
TM-541A Compact 1.2 GHz Mobile	579.95	Call \$
220 MHz		
TM-331A Compact Mobile	469.95	Call \$
TH-315A Full Featured 2.5w HT	419.95	Call \$

YAESU FT-1000D



HF Equipment	List	Jun's
FT-1000D Top Performer	\$4399.00	Call \$
FT-990 All Mode "NEW"	2399.00	Call \$
FT-747 GX Economical Performer	889.00	Call \$
FT-757 GX II Gen Cvg Xcvr	1280.00	Call \$
FT-767 4 Band New	2299.00	Call \$
FL-7000 15m-160m Solid State Amp	2279.00	Call \$
Receivers		
FRG-8800 150 kHz - 30 MHz	784.00	Call \$
VHF		
FT-2400 50 Watt, Mobile	419.00	Call \$
FT-411 New 2m "Loaded" HT	406.00	Call \$
FT-290R All Mode Portable	610.00	Call \$
FT-26 Mini, 2 Meter HT	329.00	Call \$
FT-23 R/TT Mini HT (351.00)	Call for special price!	
UHF		
FT-76 Mini, 440 MHz HT	359.00	Call \$
FT-911 Compact 1.2 GHz HT	505.00	Call \$
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FT-690R MKII, 6m, All Mode, port	752.00	Call \$
Dual Bander		
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FTR-2410 2m Repeaters	1154.00	Call \$
FTR-5410 70cm Repeaters	1154.00	Call \$
Rotators		
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G-800SDX med/hvy duty 20 sq. ft.	390.00	Call \$
G-800S same/G-800SDX w/o presets	322.00	Call \$

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 DR-110T, Value Loaded, 2M Mobile
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 DJ-120T, Mini Size, Maxi Feature, 2M, HT

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 C168A
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 C468A
 440 Mini HT \$1499.
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IC-2AT, HT	\$275.95	\$229.95
KENWOOD		
TH-26AT, HT	\$367.95	\$289.95
YAESU		
FT-23R, HT	\$306.95	\$219.95
ALINCO		
DR-590T, Mobile	\$649.95	\$589.95

Amateur "Hi"



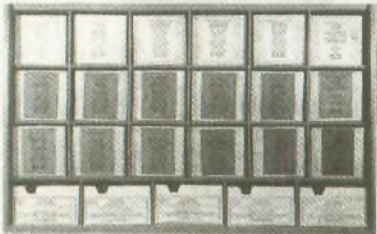
Ever had a funny or strange experience with Amateur Radio, either on or off the air? If so, type it up (or print neatly) and send it to us for consideration in our monthly AMATEUR "HI" contest. You could win a free year's subscription to Worldradio!

This month's winner is Bill Hammond, W7OTJ, of Fishtail, MT.

In the early days of SSB, we used to talk ourselves onto the same frequency and, when we got fairly close together, we would have our ragchew.

One of the bunch, George, was never happy — someone would always be "off frequency." So one morning George came on first and started calling CQ. After a pause somebody came on and said, "George, you're off frequency." □

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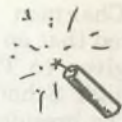
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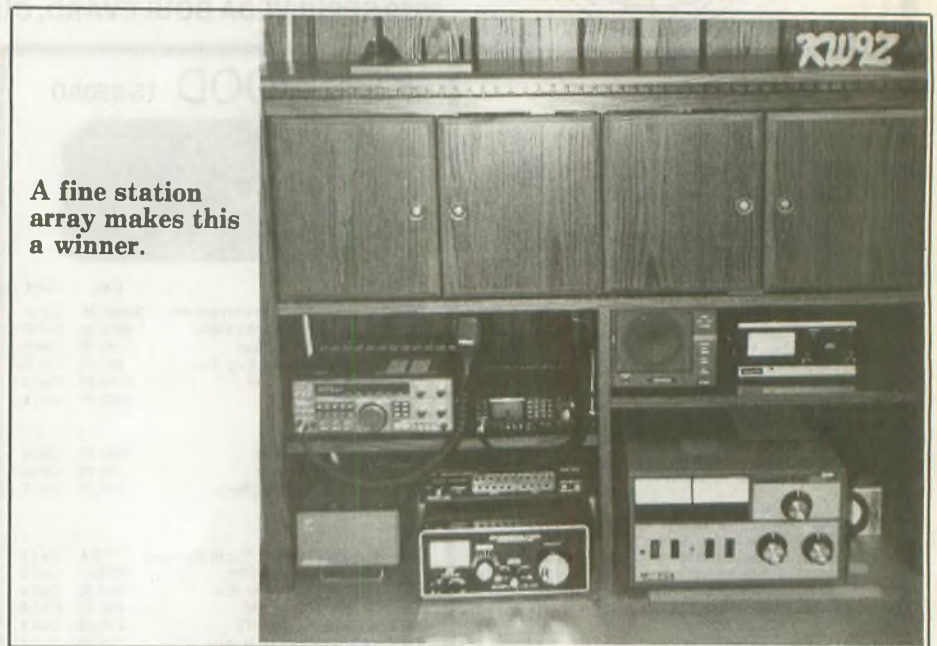
Brother David Naples, KW9Z

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.



A fine station array makes this a winner.



This month's winner is Brother David Naples, KW9Z, of Notre Dame, IN. He is president of Holy Cross College, where his shack is located.

The station is composed of: Kenwood TS 440S transceiver, Kenwood TM 2570A 2M FM transceiver, Kenwood PS 50 power supply, Kenwood SP-40 external speaker, Amp International LK550-NTC linear amplifier, MFJ differential tuner, PK 232 data controller.

The antenna system rests on the top of a 60 ft. free-standing tower, and consists of a multi-band Mosley Pro-67 beam and an AEA isopole 2M. □

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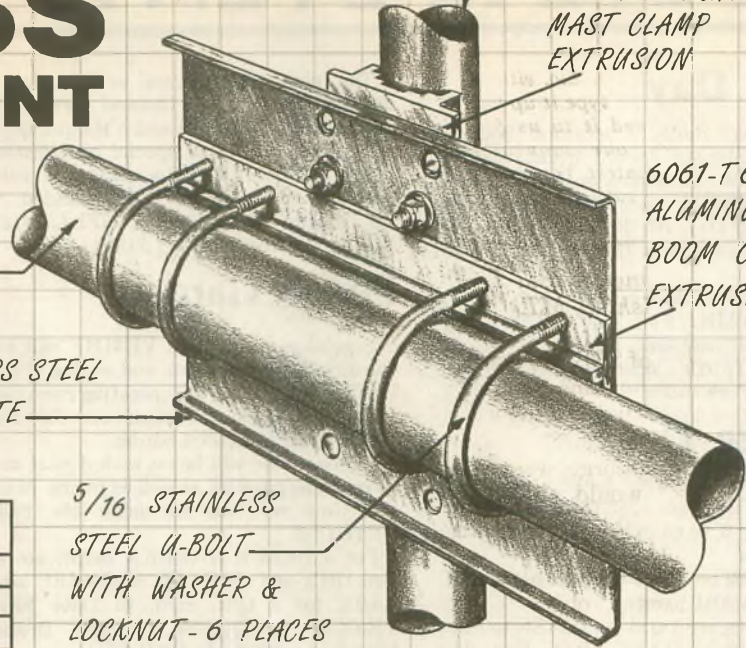
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HAM-PRO ANTENNAS

Drawing: Boom/mast	Date: 2-24-91
Antenna: H20-4	Scale: None
Engineer: Onnigian, P	Revision:

Ham-Pro Antennas are built to handle stress... ...so you don't have to!

With Ham-Pro, there's no need to worry if your antenna will stay up during the next wind or ice storm. All Ham-Pro antennas are manufactured to Electronics Industries Association (EIA) RS-409 specifications. We exceed these specifications by a large safety margin. All our antennas are rated for 87 MPH while our VHF antennas will safely withstand those winds with 1/4 inch of ice coating!

Computer Aided Structural Design

Using state of the art technology, Ham-Pro antennas are designed for maximum strength plus superior performance. Strong aluminum extrusions are used for boom and mast clamping. Swaged element reductions and vibration dampened where necessary insure years of stress free antenna enjoyment.

Ham-Pro's radiating elements are not split across the boom - providing greater strength at lower cost. Tube clamps to the boom feature half-round saddles using four SS U-bolts for optimum strength and longevity. Double bolted element step reductions eliminate all hose clamps. Very easy assembly. There is no tuning!

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In Ham-Pro monobanders there's no exposed copper wire connections to worry about. The patent pending unique feed system provides a balun and impedance matching arrangement in the same configuration. It is contained within the driven element and sealed against moisture. High power Teflon® coax cable runs inside the boom to a N input connector at the mast plate, eliminating all pattern skew and distortion.

VSWR is low, even at the band edges, so you can change operating frequency without bothering with a tuner...great for contests!

Buy With Confidence

Certified measured patterns, gains and VSWR values assure you the best monobanders money can buy. Backed by over 30 years of commercial FM and TV transmitting antenna experience, Ham-Pro offers the unique Balanced Double Gamma Feed System plus other new innovations, making these antennas superior to all others.

HAM-PRO MONOBANDERS

Model & Elements	Band	MEASURED		Price
		Gain dB/d	Max VSWR in band	
H20-4	20 m	9.23	1.61	\$530
H15-4	15 m	8.80	1.65	\$340
H10-3	10 m	6.46	1.79	\$190
H6-6	6 m	9.41	1.91	\$200
H144-15H	2 m	13.73	1.68	\$145
H144-15V	2 m	13.73	1.93	\$145
H220-17	1.25 m	13.53	1.29	\$150
H432-24	70 cm	16.14	1.76	\$145

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SPECIAL EVENTS

Racing Day

The Pioneer Radio Operators Society (PROS) will operate special event station N2IFG from the village park on July 28, joining the 15th annual celebration of the East Aurora Racing Day. At the turn of the century East Aurora was the trotting horse capitol.

Frequencies operated will be 3.853, 7.244, 14.244, 21.344 MHz, from 1600 to 2200 UTC.

For a special new QSL send an SASE to N2IFG, 42 North Willow Street, East Aurora, New York 14052. □

Heritage Days

The Middlesex Amateur Radio Group will operate KB4NGO from 1230 to 2030 UTC on Saturday, July 6, to commemorate Deltaville Heritage Days.

Operation will be in the General portion of the 80, 40 and 20M bands.

For certificate, send QSL and SASE to Fay Smith, KB4NGO, MARG, P.O. Box 88, Hardyville, VA 23070. □

Vermont's 200th Birthday

Throughout the coming year, special event stations from Vermont will be on the air to help Vermont celebrate its 200th birthday. A special 200th anniversary certificate is available. Vermont special event stations will be operating 25 kHz up from the bottom of the Novice and General band. RTTY, AMTOR, etc. will be in the digital subbands.

To obtain a special certificate, send \$1 and an SASE to: Amateur Radio Bicentennial Project, P.O. Box 200, Graniteville, Vermont 05654. Foreign stations, send only SASE and IRCs to cover postage.

On July 10 and 11 a special event station will operate for the State Capitol Building from 10 a.m. to 3 p.m.

The state of Vermont is also providing a special gift to be included with the certificate for those contacts made on the 10th and 11th. □

Fly-in Convention

On July 26 through 29, the Fox Cities ARC (Appleton, WI) will operate special event station W9ZL from the Experimental Aircraft Assn. Fly-In Convention in Oshkosh, Wisconsin.

This year, a special "Iron Annie" certificate will be issued to the stations contacting the W9ZL station operating from on board the Confederate Air Force Ju 52 Junkers Tri-Motor.

The club will operate primarily in the daylight hours in the General portion of 10, 15, 20 and 40M bands and VHF packet.

The club will issue special certificates for proper QSLs. All QSLs must use contact numbers and have an SASE included. Send to: Wayne Pennings, WD9FLJ, 913 N. Mason St., Appleton, WI 54914. □

Peace Garden

Special event station VE4IHF will be on the air starting at 9 a.m. and ending at 6 p.m. CST on July 12 and 13, operating from the International Peace Garden on the North Dakota and Manitoba border.

This year we will be on with digital modes as much as possible as well as phone. Most of the time we will be using the call of VE4IHF/0.

For a PEACE GARDEN certificate send two IRCs and an SASE, or one IRC and an SASE for a QSL card, to Dave Snyder, VE4XN, 25 Queens Crescent, Brandon, Manitoba, Canada R7B 1G1. □

Public Service Day

The Empire ARC will operate special event station N0AJM on June 29 from 1500Z to 2100Z acknowledging the annual Arvada (CO) Public Service Awareness Day.

Operation will be in the lower 25 kHz of the General portion of the 15, 20 and 40M bands, plus the 28.400 to 28.425 segment of 10M.

For a certificate, send QSL and SASE to Richard G.N. Paige, N0AJM, 3304 Meadow Ave., Broomfield, Colorado 80020. □

Hawaii solar eclipse

On July 11, 1991, the Big Island of Hawaii will experience a partial and total solar eclipse from 1630Z to 1837Z. Members of the Big Island ARC will man NH6ES from 0001 to 2400Z on July 11. The station will be set up in the path of the eclipse at Puako, Hawaii.

Look for NH6ES "eclipse station" in the Novice portion of the 10M band and in the General segments of the other HF bands.

Special QSL cards to those contacting NH6ES. QSL to: BIARC, P.O. Box 1938, Hilo, Hawaii 96721-1938. □

60th Anniversary

The Crystal Radio Club in celebration of its 60th anniversary will operate W2DMC on July 27 and 28 from 1200 to 2400 UTC both days.

Operation will be: phone—7.250-, 14.300- and 28.450 MHz; CW—7.050— and 14.050 MHz.

For commemorative certificate send QSL with SASE to W2DMC, P.O. Box 482, Valley Cottage, New York 10989. □

Air show

The Oswego County Amateur Radio Emergency Service (ARES) will operate KY2F on July 13 and 14 from 1300Z to 1900Z each day from the Central New York International Air Show at the Oswego County Airport.

Operation will be in the General 20, 15, 10 and 2M bands and the Novice portion of 10M.

For certificate, send your QSL card and a large SASE to Fred Swiatlowski, KY2F, P.O. Box 5227, Oswego, New York 13126. □

Jayhawk anniversary

The Jayhawk Amateur Radio Society of Kansas City will be operating a special event station to celebrate the 40th anniversary of the founding of the club.

The call sign to be used is W0LB, and we will be on the air from 2300 August 2 until 0300 August 4 (times and dates in UTC). We will be operating primarily SSB with main frequencies targeted as 14.325 and 28.325 MHz with some CW during the later hours around 14.050 and 7.040 MHz.

To receive a special QSL card, please send your QSL to Jayhawk ARS, P.O. Box 4282, Kansas City, Kansas 66104. Please include SASE for return. □

Yacht Race

The Eastern Michigan ARC will operate special event station K8EPV to commemorate the 66th Port Huron to Mackinac Island Yacht Race on July 27 and 28.

The station will operate from 1400 to 0200Z each day. Frequencies will be 3.910, 7.235, 14.235, 21.335 and 28.335 phone; and 3.710, 7.110 and 21.220 CW.

A certificate will be issued upon receipt of a large (#10) SASE with your QSL to K8EPV (Callbook) or 801 Range Road, Port Huron, Michigan 48060. □

Singing hams

When 10,000 barbershop singing enthusiasts from points around the globe converge during the first week in July, members of the Amateur Radio Transmitting Society of Louisville will operate a special event station from Louisville's Freedom Hall convention site to proclaim the barbershop society's theme: "Keep the whole world singing!"

Using the call sign W4CN, the station will operate July 4 through July 6 on 20, 15 and 10M SSB as well as 2M FM. SSB frequencies

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will be 14.225-14.245 MHz, 21.3-21.32 MHz and 28.3-28.32 MHz. Primary hours of operation each day will be from 8 a.m. to 11 p.m. EDT (1200-0300 UTC). FM operation will be on the Louisville 147.18 MHz repeater and 147.53 MHz simplex. (Talk-in will begin on Monday, July 1 on the repeater frequency.)

All amateurs contacting the W4CN barber-shop convention station on HF will receive a special commemorative QSL card, courtesy of Yaesu USA. □

20th Anniversary

The Delta County Amateur Radio Society will celebrate their 20th year by hosting special event station K8ZAS during the city's waterfront fair, Bayfest.

Times of operation will be from 1400Z July 6 to 0100Z July 7 and 1400Z July 7 to 0100Z July 8. Look for K8ZAS on 3.930, 7.280, 14.280, 21.357, 28.357 and 147.15/75.

A special QSL card is available via SASE addressed to: DCARS, P.O. Box 923, Escanaba, MI 49829. □

Itasca centennial

The Paul Bunyon ARC will operate a special event station July 20, 0000Z to July 21, 0000Z from the source of the Mississippi River to commemorate the Centennial of Itasca State Park.

Operation will be SSB in lower part of the General range on 80 through 10M bands (excluding WARC).

For a multi-color, 8½ × 11 certificate send QSL, SASE and contact number to KE0RR, R1, Box 152, Winger, MN 56592. □

BBQ days

The SMARTS Radio Club will celebrate the Bele Plaine Minnesota annual BBQ days on July 20 from 1400Z to 2200Z.

Operating frequencies will be in the lower portion of the General class subbands and 28.425 ±.

For a certificate send SASE to SMARTS Radio Club, Box 144, Chaska, Minnesota 55318. □

Football Hall of Fame

The Canton, Ohio ARC will operate special event station W8AL to celebrate the Pro Football Hall of Fame Greatest Weekend on July 27 and 28 from 1300 to 2300 UTC both days.

Frequencies of operation will be 28.350, 21.350, 14.270 and 7.270 SSB (±QRM). SWLs welcome!

For an unfolded certificate, send your QSL and a 9×12 SASE with two units of first class postage. For a QSL or folded certificate, send your QSL and a #10 (Business Size) SASE to Randy Phelps, KD8JN, 1226 Delverne Ave. SW, Canton, OH 44710-1306.

Man on the moon

The Reservoir ARA will operate a special event station to commemorate the 22nd anniversary of mankind's first walk on the moon by Neil Armstrong.

Operation will be on 40M phone and CW and 10M SSB.

For attractive certificate, send QSL and 9×10 SASE to K8QYL, 240 Lincoln Dr., Celina, OH 45822. □

25th Anniversary

The Christian Amateur Radio Fellowship (CARF) will operate WB0HWP from Denver, Colorado on July 9 through 12 to commemorate their 25th anniversary in conjunction with the North American Christian Convention.

Operating frequencies will be 14.293, 21.393 and 28.393.

For QSL, send QSL and SASE to CARF, 780 Mary Ave., Holland, MI 49424-1631. □

Demonstration

The Rotary Club of the Tonawandas, with assistance from the Amateur Radio Association of the Tonawandas, will demonstrate Amateur Radio during the annual Tonawandas Canalfest celebration. The festival takes place from July 21 through July 28 with daily Amateur Radio operations in the General portions of the 80, 40, 20, 15 and 10M bands.

For special QSL, send QSL and SASE to Richard A. Stein, K2ZR, P.O. Box 74, Tonawanda, New York 14150. □

Balloon race

The Longview East Texas Amateur Radio Club will operate N5KGN from 1700Z to 0130Z July 13 and 14 to commemorate the annual Great Texas Balloon Race. Operation will be: CW—15, 20, 40M; SSB—10 (Novice subband), 15, 20 and 40M (lower half of General Class bands).

Send QSL, contact number and #10 SASE to: LETARC Special Event, P.O. Box 5613, Longview, TX 75608. □

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Product Review

Stealth filter

JOE HANNIGAN, WY0H

I've decided the Datong Multi-Mode Filter, model FL-3, is to pesky audio signals as the F-117 Stealth Fighter is to radar. Both the FL-3 and the F-117 will alter your perception of reality. Fortunately, the FL-3 costs significantly less than the F-117, and you don't even need to keep it in a hangar. The FL-3's owner's manual is much less complex than the F-117's. Actually, the FL-3 does have an "auto pilot" (more of that later). Not long ago, I decided to buy my "dream machine," an ICOM IC-781. Moving to Hawaii shortly thereafter altered my perception of reality when I found out how much houses cost! Although still the dream, the IC-781 must wait. Improving my trusty old IC-701's audio response was the cheaper alternative. I decided it needed better signal presentation.

Somewhere in the shadows of my mind, a voice said "Datong ... Datong." Having frequently travelled through Great Britain, I recalled Datong made audio filters. It occurred to me that this might be a way to improve my tired old IC-701's performance. The next step was to find one. Sure enough, they are available from Gilfer Shortwave (52 Park Avenue, Park Ridge, NJ 07656; 1-800/445-3371) —price class: \$230.

Installing the FL-3 is a breeze. It goes between the receiver audio output and an external speaker. You don't have to modify your equipment. The FL-3 employs a 2W unity amplifier to power a speaker and a front panel headphone jacket is available for late night listening. Datong includes cables (fitted with RCA plugs) for input and output connectors on the back of the FL-3. A miniature phone jack is part of the package, although the connector for your rig may require a different plug. Five minutes with a soldering iron to prepare the cables and you're in business! The FL-3 needs a 12 VDC power source, available from Gilfer for a modest price. The Datong Multi-Mode Filter model FL-3 offers selectable reception modes for SSB (three modes), CW (two modes) and RTTY

(one mode). You choose the modes by combining the separately adjustable low pass, high pass, and notch filters with four push-button switches. The FL-3 offers just the right filter combination to eliminate virtually every form of QRM known to man.

Its most fascinating feature is the "auto pilot"—the automatic notch filter—a pure delight! When attacked by the automatic filter, fixed tones, carriers, heterodynes and computer generated "birdies" drop out of sight faster than the Dow Jones average in October 1987! Since my Zenith 386 and AEA PK-232 develop a few objectionable spots of RF in the ham bands, the automatic notch filter alone is worth the price of admission! The filter continually sweeps the audio spectrum from 200 to 3500 Hz, locking onto and eliminating QRM in less than one second. In case you forget the automatic notch filter is on patrol, an LED lights up when it finds a target, reminding you of what you are missing. When I first used the FL-3, I accidentally left the automatic notch filter on while tuning in a CW station. The filter is so fast it blanked out the CW signals! Beware—it has a similar effect on RTTY signals!

While the FL-3 is my temporary answer to an IC-781, there are some criticisms. The push-button switches were stubborn, not remaining in place when I selected certain modes (CW(2), RTTY and OUT). You engage these modes by depressing two buttons at the same time. Despite the praise bestowed upon the automatic notch filter, it imparts a weak, but perceptible, swept signal (inherent in its function) on the receiver audio while hunt-

ing for a signal to attack. Although someone with good ears can hear the sweep pattern, it wasn't a detriment to operating the FL-3. The instruction manual was a mild disappointment. After using the FL-3 for a short time, I quickly forgave its shortcomings. The Datong FL-3's housing is a very handsome silver anodized aluminum case (since it is made by the Brits, I suppose that should be "aluminium"). With its compact size, it fits easily on crowded desks. Another convenient feature is a tape output jack (RCA plug required) for recording those contacts or short-wave programs you want to keep (like my recent packet and FM voice QSOs with WA4SIR aboard the space shuttle).

I've found the Datong FL-3 has made hamming fun again! I operate every band from 1.8 to 440 MHz and greatly appreciate the FL-3's performance on CW, SSB, RTTY, AMTOR, ASCII, packet and FAX. I route the audio from my IC-701, IC-275A and IC-475A through a three-way switch box to the FL-3, which drives a single speaker. Instead of switching headphones among my various ICOM rigs, I simply leave them plugged into the FL-3. This flexibility is invaluable whether I'm working the HF bands or OSCAR. Although many audio filters are on the market, the Datong FL-3 offers a combination of features not found on other products. I believe, after trying it, you'll agree it offers F-117 performance at much less than F-117 prices. As I dream about the IC-781, the FL-3 makes the wait a lot more tolerable. Now, if only the FL-3 could do something about the price of houses in Hawaii! □

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The heart of the AL-811 power supply is its heavy duty power transformer with a



high silicone steel core weighing a hefty 17 pounds.

A full wave bridge using 52.5 ufd of total capacitance (four 210 ufd, 470 volt capacitors) produces 1500 volts under full load and 1700 volts no load. That's excellent high voltage regulation!

Full height computer grade filter capacitors with screw terminals are used — not short stubby, light duty soldered-in "high technology" capacitors that can't dissipate the heat generated by high current.

The rectifier diodes are rated for a massive surge current of 200 amps. They won't blow even if you accidentally short the high voltage supply.

Wire wound, 7 watt, 50 K ohm equalizing resistors safely protect each filter capacitor — not 2 watt, 100 K ohm carbon composition resistors that can open and cause your filter capacitors to explode or fail.

The Ameritron AL-811 power supply is built tough so you get peak performance year after year.

Tuned input provides excellent load for any rig

A Pi-Network tuned input provides a 50 ohm load for your rig. Even fussy solid state rigs can deliver their full drive to AL-811.

Low loss slug tuned coils — tunable from the rear panel — let you optimize performance. High quality low drift silver mica capacitors maintain proper tuning.

Output tank: optimum Q on each band

The low loss pi-network output tank of the AL-811 has been carefully designed for optimum Q on each band and built with quality RF components.

The result is peak performance over each band, wide impedance matching range and exceptionally smooth tuning with efficiencies close to 70%. Even a 3:1 SWR load won't damage the tubes or tank components.

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Quiet pressurized ventilation keeps your tubes safely cooled

A quiet fan pressurizes the cabinet with over 20 cubic feet per minute of cool air.

This large volume of air flow keeps the 811A tube temperature safely below the tube manufacturer's rating — even with a key down carrier at 500 watts output.

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Two illuminated meters give you a clear

picture of your AL-811 operating conditions so you can tell right away if something is wrong.

The Grid Current meter continuously checks for improper loading. The other meter switches between high voltage and plate current to warn of abnormal conditions.

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Too high line voltage stresses components and causes them to wear out and fail. Too low line voltage causes a "soft-tube" effect — low output and signal distortion.

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Packet equipment for the blind

I have some input for the makers of our Amateur Radio packet equipment. As you know, there are more and more hams who are blind and who use speech equipment heavily. Any voice synthesizer has trouble with abbreviations or letters which should be read as separate entities. I think the TNC could help with this.

For example:

1. On bulletin boards the word "subject" is spelled "sbtj." Can you imagine what the synthesizer does with that? Another one is "msg" for "message." These could easily be spelled out.

2. The *help* screens are of no help when the commands are written in two or three-letter designations (such as "rm" for "read mine"). Putting a space between, of course, corrects the problem, though I recognize that could be confusing to the sighted user, as they may assume a space is needed. Perhaps there are other ways that I do not know about.

3. The numbers of the messages are very hard to pick out from the many numbers listed. It would be helpful if the numbers were kept down by regular maintenance of the messages. It is hard to remember 65563 or sometimes an even larger number. Also, they could be preceded and followed by three stars to clearly designate them.

Just some suggestions, for what it's worth.

JOHN BLOOM, K0GCV
Fergus Falls, MN

Operator license limits

Like many Amateur operators, I've enjoyed operating Field Day and special event stations. On several occasions, however, I've left early because I saw violations of FCC Rules. The most common violation I saw was Amateurs operating beyond the privileges of their license class.

Some of the operation was accidental when, in the heat of the contest, an operator strayed beyond his license limits. But most violations were intentional and covered all of the bands because "we're using an Extra call for our site so we can operate anywhere an Extra can and it doesn't matter what our licenses are."

If it doesn't matter what class of license you have, then why have any license limits? Upgrading and earning more privileges won't have any meaning! We would need only one class of license (which would certainly reduce the FCC's workload).

However, the FCC still requires that we have five operating classes with certain privileges attached to each. Limits are clearly stated in six places of Part 97: 97.9(a), 97.105(b), 97.203(a), 97.205(a), 97.207(a) and 97.209(a).

So the next time you hear someone say that you can operate beyond your license limits, show them the rules and then tell them to get lost! Why should you risk losing your license through ignorance and bad operating practices?

EARL MEAD, WB6LFD
N. Highlands, CA

Balderdash! Rule changes

I've seen a lot of letters about how doing away with code will save ham radio. Balderdash! The easier the test, the more undesirables you will have. Of course there are some undesirables on

our bands; no filter is perfect, so a few chowderheads manage to get by all the screening in any activity there is. It does seem to have gotten worse as the testing procedure has gotten easier (and if you don't think it's easier, talk to a real old timer about tests that required essay answers and drawing schematics by hand).

The problem as I see it is that establishing a no-code license really divides the Amateur community. I have heard complaints about Extras looking down on lower classes, but I have never actually seen any such attitude in the 34 years since my first license. I really believe it's rare and exaggerated. I sure hope so, for I look upon anyone from Novice to Extra as a full-fledged ham. I will not, however, so consider anyone with a so-called "communicator" class license. How about a special test for those who only want to work CW? No questions on SSB, digital methods, EME, or any of the other modes. We could have a special test and license class for each mode! That would cure all the complaints. Let's even have one for rag-chewers who do not want to do any technical work at all. I have already heard arguments proposing that we do away with the technical requirement and test only on regulations.

I have taught classes in ham radio, helped others get into ham radio, and always actively recruited new hams. Most hams can't be bothered, and there is the real problem. There are too many hams who are too lazy to help anyone else get into the activity, but want somebody to "do something," just so they do not have to be the one to "do something." If this lazy bunch doesn't get off their collective duffs and get to work, all the rule changes the League or the FCC can dream up won't help—unless of course they do away with testing altogether. No doubt the bands would fill up then! These people who want something done are attracted by the idea of doing

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away with the code. Change the rules, solve the problem and they won't have to (Heaven forbid!) WORK, and ham radio will be saved! These are the hams who haven't even bothered to get their own kids into ham radio. They are always "too busy." If we cannot come up with a lot more helpful hams, then I fear our hobby is dead, and all the ill-advised rule changes will only accelerate the process. A far better approach than a silly new class license is to push for programs which we could present as volunteers on ham radio in the schools, especially in the elementary schools. This would be a far better approach and would lead to a long lasting group of hams.

FRANK W. SHELTON, NØFS
Warminster, PA

tracted by the prospect of very easily obtaining personal communication provided by 2M FM. Most of these persons will not have any technical expertise, and most will never acquire any. Most of these codeless licensees will not upgrade, and most will stay on 2M FM as in the UK.

In general, codeless licensees will be persons who perceive Amateur Radio in a limited, even selfish way, as a means of acquiring a conduit for their own personal use whether it be their computer hobby or their desire to talk across town on FM. Obviously, there will be some exceptions, with a broad interest in radio, but most of the exceptions would have come into Amateur Radio via the previous licensing structure anyway.

The resulting radio sales will greatly please the various importers, distributors, dealers and others with a vested interest who have pushed so very, very hard for the codeless license. The ARRL will put a happy face on the stinging rebuff they received from the FCC, and Amateur Radio will accelerate down the road to mediocrity.

With significant and growing political power within Amateur Radio, the codeless licensees will push hard for increased privileges with reduced licensing requirements. Reduction and/or elimination of all code proficiency requirements will soon follow. Reduction of both scope and difficulty of written examinations will likewise be targeted.

With visibly diminishing value to the nation as defined and required by Part 97, probable increasing enforcement

problems and the inevitable greater commercial pressures for reallocation of present Amateur spectrum, Amateur Radio will find itself increasingly in harm's way not very far down the road it now has embarked upon.

FRANK PITMAN, WD4DSS
Rome, GA

From an Extra without a key

I hear very few hijinks on the 10M Novice/Tech phone band as compared to the antics of the "get off my frequency" types of 75 and, more recently, 20M. The worst Amateur behavior of record took place on 14.145 MHz during the Bouvet DXpedition.

Just a few minutes before my August '90 issue of Worldradio arrived, I was tuning around on 20M when I came upon someone on the 14.300 maritime net trying to communicate with a vessel in a storm.

On the exact same frequency, I could hear machine-generated code about 20 wpm. Was this jamming or coincidence? I grabbed a pencil and copied it on paper. "Little Jack Horner sat in a corner . . ." de---(See "Net controversy response," August '90 Worldradio, p.18).

We need new hams with good operating and technical skills. A knowledge of CW has little to do with modern communications. If one really enjoys code and has an aptitude for it, let them use it. If they have no use for code, why put them through the ordeal of learning it? Amateur Radio may be a fraternity, but a code test should not be used as an initiation.

DONALD J. SINEX, KI6YE, an Extra without a key . . .

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On this road

On February 14, 1991 Amateur Radio in the US was changed forever. If experience with a codeless license in the United Kingdom (after 2M was added there) is typical, within five to 10 years the US Amateur population will increase significantly. In that time frame the number of codeless licensees will approach or even surpass that of traditional licensees as a percentage of the total.

Where will these codeless licensees come from? If the UK experience (in a society and culture similar to that of the US applies, the vast majority will be from the ranks of CB or from a segment of the population that is at-

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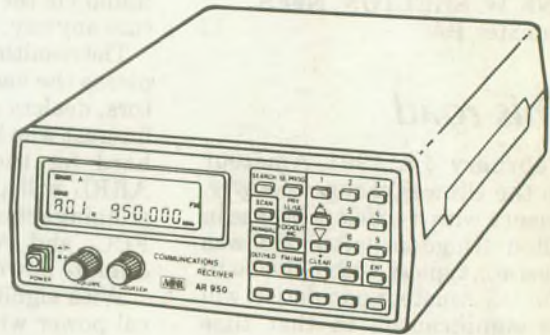
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- IF: 561.225, 58.075, 455KHz or 10.7MHz
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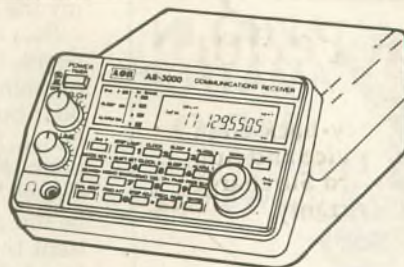
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- Increments: 10,12.5,25,30
- Audio: 1W
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 Speed: 38 ch/sec. scan. 38 ch/sec. search
 IF: 750.00, 45.0275, 5.5MHz 455KHz
 Increments: 5,12,5,25 KHz
 Audio: 1.2 Watts at 4 ohms
 Power: Input 13.8 V. DC 300mA
 Antenna: BNC
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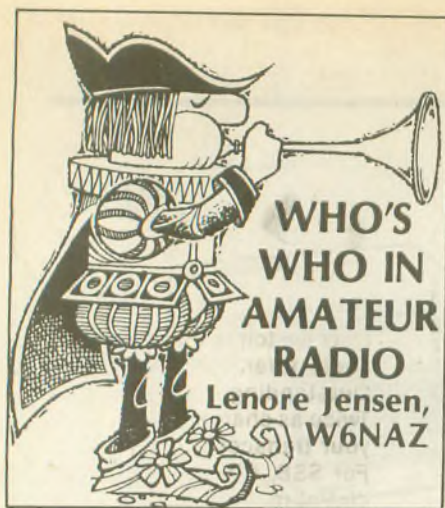
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Friends say of Robert P. Sutton, WA6CCN, "He can make or build anything, once he decides to do it!" It must be true, as this former head of the CBS Pacific Radio Network decided to build himself a 50 ft. powerboat and ended up cruising with it 60,000 miles, twice across the Atlantic.

He'd spent a lifetime in show business, starting as a child with his talented parents in vaudeville, traveling cross-country and around the world. "I did some hoofing and also worked as a straight man with a comic," he recalls. "When my folks signed in Hollywood with Johnny Murray's radio show *Sunday Night High Jinks*, they began to run out of material and asked if I could write some for them."

So he added writing to his talents, which also included going on the road as the pianist and emcee with a band. When his parents started a daily morning radio show in Minneapolis in 1939, he joined them, writing material and more for other performers. Before long he became the station's program director.

During WWII he was with Naval Air Transport Squadron VR 11 and flew the whole Pacific as a brass pounder, keeping hourly skeds in flight; he never missed one, using an old BC 375 and 348. That experience, plus a radio-telephone first class license, was to come in handy later in life.

His career as an executive eventually brought Bob to CBS' important Hollywood outlet, KNX, first as program director, then general manager, and finally he carried the load of the radio net's entire Pacific Coast. But fate stepped in with temptation when Bob and his wife, Mona, were invited to take a month-long cruise with a friend.

"Our skipper, Capt. Robert Beebe, had designed a 50 ft. powerboat, *Passagemaker*, to prove his theories of ocean-crossing powerboats. We were to bring her from the Canary Islands to Fort Lauderdale. From then on, our

lives were not to be the same." Understandable! Bob had taken along his little Atlas 210X transceiver, having recently earned his ham ticket. "DX-ing was great! On arrival in Miami, I called my boss at CBS and said, 'Start plans for my early retirement. I've found what I want to spend the rest of my life doing.'"

So, once free, he spent two and a half years, "eight hours a day," not only planning in detail a fiberglass 50 ft. boat but building it in rented space in Costa Mesa, southern California. To honor his wife, he decided to name the vessel *Mona Mona*. For the first year he did all the work himself but, impatient to get to sea, he came across and hired a young man to assist with carpentry and fiberglass work. Finally the vessel was pronounced seaworthy and declared by everyone as a thing of beauty, with much teak and walnut. Bob says his motto had always been, "build it slow, build it strong, build it simple!" Sailors are conservative people.

"She had a 160 HP diesel engine which cruised at 7½ knots," Robert says. "The tank held 1,200 gallons and we consumed three gallons an hour at 50 HP to travel 2½ nautical miles per gallon. The range was about 3,000 miles.

"I put in an auto-pilot and 'Flopper Stoppers' (stabilizing devices)." The well-equipped galley's cooking refrigeration units ran from 110VAC; lights, instruments and engine-starting depended on 24VDC to run the big batteries. "We found that 30V, 50W light bulbs gave us 40W brilliance and might last forever."

After a trial cruise through the canal and up the East Coast to Maine, they took the *Mona Mona* to the Mediterranean where she remained many years. The happy couple decided to spend six



Robert Sutton, WA6CCN, with one of his popular carvings.

months aboard in the Mediterranean and six at home in California.

Sutton installed a Kenwood TS 520 plus a tuner and linear to a long wire which worked well from 15 to 80M. (Nothing like being surrounded by water!) Bob greatly admires the generous hams who provide phone patches to maritimers "keeping us aware of how the folks at home were doing." Also, the Suttons would frequently invite one or two couples to fly over and stay on the boat for a while. The visitors would be thrilled with such patches as well as hearing the DX QSOs.

He made many friends among European Amateurs, of course, and visited many as they cruised the north coast of the Mediterranean "from Gibraltar to Cypress, back and forth, up and down the Dalmation coast of Yugoslavia, southern coast of Turkey, seeing sights many people have missed." This went on for nine years.

Visitors enjoyed hearing Mona play the electric piano aboard; she's a concert pianist and recording artist. For shore jaunts they might be taken in the little "home-brew" jeep Bob put together; it rode the ship along with everyone.

During the half years at home, Bob kept busy at another skill (and still does)—"I decided to 'whack a rock,'" he says. His stone carvings are in marble, alabaster, steatite, Italian crystal, etc., with a unique form and finish all his own. Connoisseurs are proud to secure one.

What's ahead? "Back in 1960 we did a series on KNX, wondering what the world will be like in the year 2000. I plan to be on hand when the capsule in the cornerstone at Columbia Square is opened to find out what we put in it!" □

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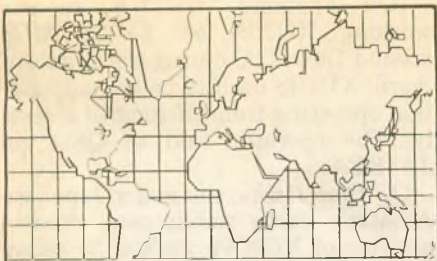
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DX WORLD

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Activities Calendar

- 01 July Canada Day Contest
- 06-07 July Venezuelan DX Contest (SSB)
- 13-14 July IARU HF Championship Contest
- 27-28 July Venezuela DX Contest (SSB)
- 03-04 Aug. Romanian DX Contest
- 10-11 Aug. DARC European DX Contest (CW)
- 07-08 Sept. JARL All Asian DX Contest (SSB)

Refer to your favorite contest section for details on contest activities. Notice the change of month for the All Asian DX Contest. JARL says, "the fourth Saturday of September to 2400 UTC next day (September 7-8, 1991)." We figure that to be the first Saturday. The CW portion used to be in August.

W100N

The following DXers were awarded *Worldradio's* Worked 100 Nations certificates as dated:

- 396) Robert Wartburg, K0LLO; Apr. 14, 1991.
- 397) Richard M. Snell, K7GQI; May 9, 1991.
- 398) John M. Kapinos, KA1SPO (all 10M SSB); May 9, 1991.
- 399) John R. Thompson, K6OHM; May 9, 1991.

Incidentally, one does not need to have an Extra Class ticket to qualify for this award. John, KA1SPO, holds the Technician Class and made all his contacts in the Novice portion of the 10M SSB band.

If you were active in last October's World Wide DX Contest and worked 4U1ITU, the operator may have been OK3LZ, shown here taking a breather. Miroslav Ivan was one of the four operators of the First Czechoslovakian Contest Expedition. They made over 10,000 QSOs in 86 hours of operation, most of them in the contest.

Miro is an electronics engineer, married with two children. He was first licensed in 1967 and held the call OK3CJC until 1982. He is also the QSL manager for the contest call OL8A, which is the same as the club call OK3RMM at Samorin. (Photo courtesy of OK3LZ.)



Miroslav Ivan, OK3LZ pauses during operation in October's World Wide DX Contest

Botswana (A22)

Old-timers know this one as Bechuanaland (ZS9). The name Botswana came into being in 1966 with its independence. Our trusty 1954 *Callbook* reveals that there were eight ZS9 calls listed for Bechuanaland. The 1991 *Callbook* lists far more than that. However, the activity doesn't seem to show it.

The most active call reported these past several weeks was A22AA. Operator Charlie was reported often on 10M SSB between 28.432 and 28.492 MHz from 1430 UTC. Try looking for him near 28.477 MHz. Charlie was also reported on other bands such as 14.026 or 14.187 MHz around 1500 UTC, 18.142 MHz at 2000 UTC and 24.935 MHz at 1530 UTC.

Another station which frequents 10M is A22JP, found near 28.485 MHz from 1700 UTC. And A24WF was reported in Japan on 28.595 MHz at 1900 UTC. Those A24 calls are Novice calls where the A22 call is a full privilege call.

Most active on the WARC bands is A22GH, as on the following:

10.104 MHz	0700 UTC
18.090 MHz	1930 UTC
24.911 MHz	1530 UTC

This station has also been handing out CW contacts as he has been reported on 14.008 MHz at 1530 UTC and 21.006 MHz at 1600 UTC.

Forty meter diehards might want to listen for A22OB, who has been found between 7.003 and 7.008 MHz after 0300 UTC.

Bahrain (A92)

Don Street, A92BE, continues to be active from this one. Look for him on

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the WARC bands between 18.130 and 18.140 MHz after 1930 UTC or between 24.935 and 24.950 MHz after 1500 UTC. Don was also found on 40M SSB working Japan on 7.045 MHz at 0600 UTC.

Calls reported from Bahrain include the following:

A92E	18.127 MHz	2015 UTC
A92EV	28.553 MHz	1200 UTC
A92FL	14.160 MHz	2130 UTC
A92FM	14.297 MHz	0100 UTC
A92FN	14.199 MHz	1500 UTC.

The prefix for this one prior to the release from British control was MP4B. We worked one of those former calls but were unable to obtain a QSL for the efforts. Would have been nice to have that prefix as it is no longer used. This prefix change came about around 1972.

San Felix Island (CE0X)

DX News Sheet reports that XQ0X has left the island but expects to return in October with RTTY and satellite equipment.

New Caledonia (FK)

If you need a CW contact from New Caledonia, try looking for the following:

FK8FG	14.017 MHz	1500 UTC
FK8FS	21.036 MHz	0300 UTC
FK8FU	7.013 MHz	1100 UTC
FK0BO	28.013 MHz	0030 UTC

That 40M QSO with FK8FU was made by one deserving DXer in West Virginia on April 20. Don't like CW? Then try SSB for these:

FK8EB	21.196 MHz	0800 UTC
FK8FS	14.222 MHz	0300 UTC
FK8GA	28.428 MHz	2300 UTC

The WARC bands have also been represented by FK8FS near 18.070

MHz between 0530 and 1100 UTC, and by FK8FU on 18.070 MHz at 0345 UTC.

Brunei (V85)

Brunei is a little nation along the northwest coast of the Island of Bornea. Older maps show it once was included with Sarawak; the nation gained independence by the end of 1983 and includes a population of about 250,000 residing in an area of 2,226 square miles. The capitol city is Bander Seri Begawan, abbreviated BSB. The former prefix for this one was VS5.

Reported often on CW is V85FC who can be found between 14.004 and 14.024 MHz after 1300 UTC. Also, check 21.006 MHz around 2130 UTC or 28.004 MHz at 2345 UTC.

A few other calls were reported on 20M which include:

V85AA	14.026 MHz	1300 UTC
V85HG	14.202 MHz	1400 UTC
V85JB	14.173 MHz	1415 UTC
V85PE	14.200 MHz	1145 UTC

There is also a station signing V85GA who favors Europeans. This one was reported on 18.125 MHz at 2030 UTC, 21.219 MHz at 1530 UTC and 28.507 MHz at 1730 UTC, all reported in *DX News Sheet*.

Kampuchea (XU)

Kampuchea, also known as Cambodia, was formerly part of French Indo-China (FI8) back in the 1950s. Club Station XU8DX, located in Pnom-Penh, has been busy on CW recently. Check the low end of 20M near 14.005 MHz around 1100 UTC. The station is managed by a YL operator, Sokun Pokmey (see our column in the December 1990 issue).

DX News Sheet reports that XU1DK with operators Boo and Phet has been active on RTTY. Look for them near 21.088 MHz after 1300 UTC. This station has also been reported on CW near 21.022 MHz around 1430 UTC and on SSB at 1500 UTC on 21.280 MHz.

Ron Faulkner, W6TUR, reports working XU1SS on 14.028 MHz around 1300 UTC during the middle of April. XU1SS used to be the only station operating from there until recently. The operator said to QSL via JA4KFA.

CQ Ham Radio, the major Japanese Amateur Radio publication, reports activity of XU0CW worked by many of the JA-deserving in March. This call was reported on 7.009 MHz at 2000 UTC, 14.197 MHz at 2000 UTC, 21.292 MHz at 1800 UTC and 28.001 MHz at 1700 UTC.

Incidentally, the XU prefix was once assigned to China. We have used several antique QSL cards in the past with that prefix.

Myanmar (XZ)

Also known as Burma, this one could come on the air in June. Romeo of 3W3RR fame, reports via *QRZ DX* that he and several other DXers will be operating from one of the islands off the coast of Myanmar. All donations will be appreciated to help in the cost of this one. Send your donations to Ed Kritsky, NT2X, P.O. Box 715, Brooklyn, NY 11230. The expected cost is about \$45,500.

Madagascar (5R4)

Alain, F6ACT, was to have signed 5R8AL for about a month in April and May according to *DX News Sheet* and others. He was usually found between 14.016 and 14.025 MHz from 1430 UTC.

Ron, W6TUR, reports working Frank, 5R8FT, on April 14 on 10M CW. According to the major DX publications he was to have cancelled his trip to Madagascar. We wonder if Ron worked Slim? Work 'em first and worry later is the true-blue DXer's motto.

The last call reported from Madagascar was 5R8JD, who was found in the E.T. Net on 14.160 MHz around 2030 UTC. He was also found on 28.510 MHz at 1630 UTC. *The DX Bulletin* reports that this one is not valid for DXCC as of yet.

IOTA

Here is some more reported activity of islands that have been chased by the island hunters recently.

AF-019	Linos Island	IG9/IT9SAZ
		21.232 MHz 0715 UTC
AS-005	Dikson Island	4K4BEU
		21.006 MHz 1730 UTC
AS-027	Wrangel Island	4K4/UA0KBZ
		14.226 MHz 0245 UTC
AS-036	Tsushima Island	JH6KIFY
		21.278 MHz 1630 UTC
AS-038	Chaunskaya Bay Island	4K4/UA0KW
		14.260 MHz 2030 UTC
AS-041	Oki Archipelago	JA4KBW/4
		21.260 MHz 0845 UTC
AS-043	Hachijo Island	JJ4GRU
		21.211 MHz 0615 UTC

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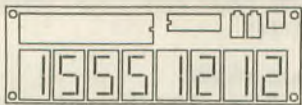
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DX Prediction — July 1991

AS-066	Petra Velikogo Bay Is	WU0MF/A
	28.083 Mhz	0815 UTC
EU-065	Quessant Island	FV6OST
	21.260 Mhz	1600 UTC
EU-111	Monach Islands	GM0KJW/P
	14.260 Mhz	1100 UTC
NA-036	Vancouver Island	VE7FNP
	21.032 Mhz	1530 UTC
NA-037	Shemya Island	AL7HS/KL7
	14.258 Mhz	0800 UTC
NA-075	Saltspring Island	VE7FEI
	21.257 Mhz	1515 UTC
NA-076	Cedar Key	KO4J
	21.260 Mhz	1615 UTC
NA-077	Anticosti Island	KJ8M/VA2
	14.260 Mhz	2230 UTC
NA-125	Sept Iles Archipelago	NU2L/VE2
	21.260 Mhz	1515 UTC
OC-065	Reef Island	H44MS
	14.260 Mhz	1900 UTC
OC-100	Nendo Island	H44MS
	21.258 Mhz	0830 UTC
SA-008	Tierra del Fuego	LU8XPD
	28.482 Mhz	2000 UTC
SA-009	Tobago Island	9Y4EEP
	28.480 Mhz	1930 UTC
SA-024	Combrida Island	ZW0ORF
	28.028 Mhz	2245 UTC
SA-026	Santa Catarina Island	ZW0JR
	28.492 Mhz	1600 UTC

Some of the above reports were that of DXpeditions, such as H44MS, KJ8M/VA2, NU2L/VE2 and KO4J. Always check the IOTA frequencies, 14.260 and 21.260 MHz for activity that may show unannounced. As for me operating from the Queen Charlotte Islands (NA-051) during Canada Day, it is still uncertain. However, Doc, KD7SO, reports that he will be there for five of six days during the first part of August. Peter, VE7EEK, is a permanent resident there.

Look for EJ7FRL operating from Fastnet Rock (EU-121) this July. A group of Irish DXers will operate both CW and SSB from the Fastnet Rock Lighthouse off the south coast of Ireland from July 9 for about 10 days. Stateside DXers should listen for them near 14.240, 21.275 and 28.450 MHz on SSB, and 10 and 30 kHz up from the band edge of 10, 15 and 20M. They will also be on the WARC bands, plus 2, 40, 80 and 160M.

A new IOTA Directory is now available from Roger Balister, G3KMA, at La Quinta, Mimbridge, Chobham, Woking GU24 8AR, England. This 50-page docket has been completely revised and costs \$12 (Europeans pay only \$10). North Americans may be able to obtain a copy from *The DX Bulletin*.

DXCC Project Activity Reports

The weekly progress reports from the DXCC desk continue. These figures have been continued from our last issue, with new applications and endorsements combined:

Week ending	R	P	B
Mar. 31, 1991	560	137	3,246
Apr. 7, 1991	196	266	3,176
Apr. 21, 1991	101	208	3,003

Maximum Usable Frequency from West Coast, Central U.S., and East Coast (courtesy of Engineering Systems Incorporated, Box 939, Vienna, VA 22180).

The numbers listed in each section are the average Maximum Usable 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.

JULY 1991 WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	22	*24	*21	(16)	*23
12	(20)	*19	*19	(17)	(21)
14	(26)	*22	*18	22	28
16	29	*22	(17)	25	33
18	32	19	(16)	26	*37
20	33	24	(24)	23	*39
22	28	*29	36	19	*36
24	24	*32	40	16	*32
2	(21)	*34	41	14	*27
4	*22	*34	40	20	*23
6	29	*32	*36	24	*21
8	26	*29	*26	*22	*19

CENTRAL USA

UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	(23)	20	*22	18	*18
10	27	*16	*20	(17)	*20
12	33	*19	*18	22	25
14	37	23	(17)	25	*31
16	40	22	(17)	27	*35
18	*40	(19)	(16)	26	*38
20	*33	25	31	24	*40
22	28	28	38	20	*37
24	24	28	40	18	*30
2	*21	27	40	*14	*26
4	*22	25	*38	*20	*22
6	29	24	32	*22	*20

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	(22)	20	*25	16	*19
9	25	(16)	*21	19	*20
11	31	(20)	*19	*23	24
13	36	24	(18)	*25	*30
15	*39	20	(17)	*27	*35
17	*40	(16)	(16)	*27	*38
19	*36	(19)	(23)	*26	*40
21	*30	23	35	*23	*38
23	25	25	39	*21	*34
1	*22	27	40	*18	*28
3	*18	25	39	*17	*24
5	26	24	34	*20	*21

As of April 21 the DXCC desk was only 10 days behind in processing new applications and they are all being entered into the data base. Near the end of the year they expect to do the same with the existing files. The backlog shown here is that of endorsements; they are about six months behind.

It is strongly advised when you do submit cards to the DXCC desk that you ask for a return receipt (to be included with registered, certified or insured mail). Otherwise enclose a return postcard, but we strongly suggest one of the former. The DXCC hasn't sent us a progress report since the latter part of April, so we assume they are no longer sending them out.

DX Nets

Dieter Konrad, OE2DYL, informs us that the 10th edition of his *DX Nets Around the World* is now available for \$4. If interested, write to him at Rosengasse 1, A-5020 Salzburg, Austria. He will not accept checks, so send 12 IRCs.

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2-BAND NO-TRAP DIPOLE - 160, 80, 40M	85 ft.	\$52.99
2-BAND SPACE-SAVER DIPOLE - 160 thru 10M	48 ft. long	\$33.99

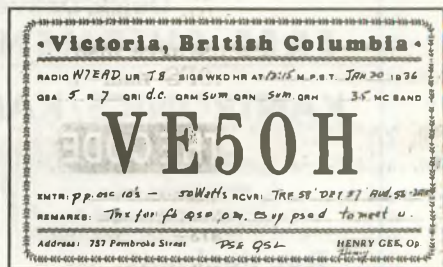
* Requires wide-range tuner (80, 40, 20, 15M without tuner)

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Antique QSL Department

The following two cards were submitted by Bud Masterman, K4HTO, of Oxnard, California. Although they are not necessarily DX cards, they are definitely classed as antiques. He had



recently cleaned out his mother's home in Portland and came across

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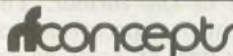
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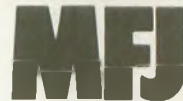
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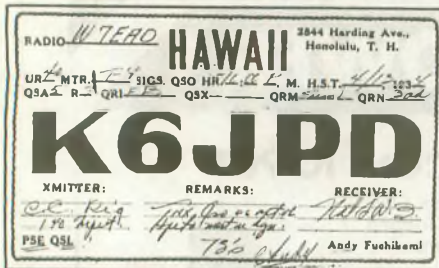
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some of his old QSL cards. Bud first came on the air in August, 1933.

Before the war, British Columbia was in the fifth Canadian call area. Bud, then signing with the call W7EAD, worked VE5OH of Victoria on Vancouver Island. Victoria is the capitol city of British Columbia. The QSO was made on the 80M band that early afternoon of January 20, 1936. The operator was Henry Gee, who probably later became a VE7.



Once upon a time the K6 prefix was that of Hawaii and the rest of the possessions in the Pacific (except for the Philippine Islands, which was KA). We don't remember when the change was, but it was probably about the time the newly created Novice Class ticket came into being. With an increase in licenses, they were running out of Ws and needed the Ks. Thus, the KH6 and others were born. K6JPD was the pre-KH6 call assigned to Andy Fuchikami of Honolulu, whom Bud worked back on April 13, 1934 on 40M.

A check with the 1991 *Callbook* indicates that none of the calls are in use today. W7EAD, of course, is now Bud, K4HTO. Henry, VE5OH, would have become VE7OH, but he is not the present holder. Andy, if still in Hawaii and active, would have become a KH6 with a two-letter suffix. K6JPD would later be assigned to a new California Amateur sometime after 1955. A check with a 1954 *Callbook* shows no K6JPD, W7EAD or VE7OH. And guess who the QSL manager was for the KH6

QSL Bureau in 1954? Yup, the one and only Andy H. Fuchikami, KH6BA.

QSL Information

We received a note from V. Kuznetsov, ES4RY, offering to help with getting those Soviet cards. We suggest you contact him at P.O. Box 117, Sillamae 202010, Estonia, USSR for more information.

Igor Kuzhelev, UQ2GJR, also writes that he handles the cards for the club station YL1WW (formerly UQ1GWW), including those special calls ER2Q, YL20LSF, YL75ID and RQ9W. Contact Igor at P.O. Box 418, Riga 226001, Latvia, USSR.

And the mail continues to come in from the Soviet Union regarding QSL services and such. Igor Kovalyov, UW6HWP, says he can help those trying to obtain QSL cards for the various Soviet awards. Contact Igor at P.O. Box 123, Stavropol 355042, USSR.

Vasil, UW6HS, and Konstantin, UA6HSN, offer their services too. They request no SASE as they use their own envelopes. Send address stickers only plus two IRCs for every 20 to 25 QSLs sent. Refer to the notes in the QSL routes for Vasil's address.

Mikhail Bliznivk, UT5-187-150, offers his services as a QSL manager in the USSR. We assume he will accept calls of stateside stations. If you need a QSL manager in the USSR, contact him at Stepaniana 9-26, Sevastopol 335038, USSR. Mikhail is also an operator at club station UT4JWL.

Kenton Dean, NK6F, provides an answer to the problem of Arnie Wolf, KD6LV, in his attempt to get a QSL from 3B8FK (see our column in the February issue). Kenton had visited with Patrick, 3B8CF, who said he never heard of EA4EGZ, who is listed as his manager. Patrick does not have any QSL manager. We suggest that Arnie try sending another QSL to 3B8FK direct. His address is correct in the 1991 *Callbook*. We also suggest not to show any indication on the envelope that Amateur Radio is involved.

The St. Maarten Amateur Radio Club informs us of an error in the April QSL routes. Do not send QSL requests for PJ7A to OH6FT. The club

has never heard of this call nor was permission granted for guest operation at the station. All QSL requests for PJ7A should be sent directly to the address in the *Callbook* (correct for the last 11 years).

Hans, DF2UU, reports that he is not the QSL manager for D68FT. He claims that the operator has been giving him as the manager for some reason or another. QSL requests for D68FT should be sent to DL7FT direct.

QSL Routes

A41KL	-N7RO	PJ2/OH6DO	-OH6QU
A51JS	-VK9NS	PJ5/N4XO	-N4XO
A61AD	-WB2DND	PW8XX	-PY1AJK
A92FN	-KI3V	PY0GCW	-PY2MT
AG9A/KH2	(see note 1)	PY0SK	-PS7KM
AH3C/KH5J	-OH2HB	PY0SR	-PS7KM
AH0K	-JE2JCV	PY0YP	-PY2MT
BT80TUA	-BY1QH	R1ATM	-U21TWW
CR5A	-CT1AHU	R6L	-U26LWZ
C30EUA	-HB9MM	R7RG	-UL7RE
C9CW	-DK7PE	R8RG	-UL8RWR
D68FT	-DL7FT	R9H	-RW9HZZ
	(see note 2)	R0C	-UW0CR
DX1HB	-JA1JK	RB3MO/UI9B	-UW6HS
EA8/G0HRC	-G4VIX		(see note 3)
ED51MM	-EA4KK	R16B	-UA3TT
ED71LP	-EA4KK	R1J1	-UJ8JMM
EF3CC	-EA3CCN	R14F	-UJ8JMM
EH5TCD	-EA5EGT	R14X	-UJ8JMM
EJ3GZ	-E13GZ	RK3CH	-RW3AH.
EJ7FRL	-E12BB	S21U	-JA1UT
EK0TAX	-UA0KBZ	S79QZ	-DJ0QZ
EL2FO	-N4TBB	S13SM	-SM3CER
EL2/KC4WCW	-N4TBB	S06R	-HA9AX
EM7BRN	-UB4RWW	S091F	-DJ01F
EN4AA	-UZ4AWB	ST2YD	-F6AJA
ET2A	-WA2NHA	ST0DX	-WA2NHA
EX1FFF	-UF6FF	SV2ASP/A	-SV2UA
EX1FWH	-UF7FWM	SV0HV/9	-KA5EJX
EX2FP	-UF6DZ	SV0MW/SV8	-K7MW
EX0FWM	-UF6PWM	SZ9A	-SV9AKI
FO0VU	-DB5UJ	T20AA	-N4FJL
FV6OST	-F9IE	T30A	-K7EH1
FW0BX	-ZL1AMO	T30NAD	-J01CRA
FW/JA1CMS	-JA1CMS	TA4/DF40Q	-DL1SBS
H44KA	-KC9V	TE5JS	-N2AU
H44SX	-G3SXW	TH6X	-F6CYV
H44VG	-GW3WVG	TL81M	-AC3D
H44VU	-DL4YAH	TO1W	-F1BEG
H44XF	-G3TXF	TV90IS	-FD1MRE
HG73DX	-HA5ML	UA2FGG	-UW6HS
HL0KTA/4	-HL1XP		(see note 3)
HS0E	-K9EL	UA6FGU	-UW6HS
HV3SJ	-I0DUD		(see note 3)
HV0HH	-IK6FHG	UA9YC/UA0K	-UW6HS
I200M	-I1RBJ		(see note 3)
IG9/IK8MVH	-IK8IUT	UA9YC/UA0Y	-UW6HS
I100NU	-I5KKW		(see note 3)
IJ4R	-I4ULG	UD6N/UZ3YWH	-UA3YBA
IY1MKK	-IK1BMN	UF6VBS	-WF2S
IY4FGM	-I4IKW	UH1E/UA9SAW	-UA9SAW
J28P	-F6FNU		(see note 2)
J37K	-W8KKF	UH2E/UA9TZ	-UA9TZ
J80B	-N6HVZ	UH7Y	-UZ4HWS
JW5QAA	-LA5QAA	UL1K/UA9SAW	-UA9SAW
JW9XG	-LA9XG		(see note 2)
JX3EX	-LA5NM	UV3DDC/UA01	-UW6HS
K9EL/V56	-K9EL		(see note 3)
KA8FTP/HZ	-KA8FTP	UZ2FXA	-UW6HS
KC6KW	(see note 1)		(see note 3)
KC6XX	(see note 1)	V31DF	-NF6T
KG6SS/NH6	-WA9AEA	V47EA	-N18L
KH2N	-KC5TA	V47MB	-SP5DYO
KH3AE	-K8CRM	V85CJ	-G3ORC
L2Q	-LU2OC	V85EB	-VK2KFS
L3S	-LU8DPM	VA100U	-VE31PR
L33F	-LU6FAZ	VC2A	-VY2AC
LW1DQK	-LU7DID	VK6BFX/VK9	-JA0GPT
LX9EG	-LX1AR	VK9KBE	-N4MQX
M0RSE	-RSGB	VK9VJ	-VK3AWY
NU2L/V2E2	-G3ZAY	VK0KC	-VK4BB
OD5EH	-UW6HS	VP3EOH	-K8BL
	(see note 3)	VP2VDX	-KT6V
OD5IG	-OE5BJL		(see note 4)
OG1M	-OH3MMM	VP5VDR	-N6ZJM
OH0MT	-OH3AC	VP5VDS	-N6ZJM
OK3CLA/5N0	-OK3LZ	VP5VDY	-WB9HRO
OK6CW	-OK1RR	VP5VEB	-AA4NG
OY/DK9FE	-DK9FE	VP5VEC	-AA4NG
OY/N6HR	-N6HR	VP5VED	-AA4NG
OY3QA	-OZ1ACB	VP5V	-AA4NG
PJ1A	-W1AF	VP8CFQ	-DK6AO

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VU3MRS	-VU2YZ	5R8FT	-DL7FT
WV9F/KH2	-JJ1NYH	5W1GY	-VK2BCH
XF4L	-OH2BH		(see note 2)
XU1SS	-JA4KFA	5W1IU	-JA1UZI
XU8DX	-JA1NUT	5W1KM	-JR30IB
XV5XA	-JA1AH	6G0V	-XE2GV
YJ0AAK	-JA1CMS	6W1QC	-JA8KJH
YL200SM	-UQ1WX	7J1AGE	-N2BA
YQ3R	-YO3CD	7J1A1K/JR6	-KB4OGI
ZB2X	-OH2KI	7P8EN	-ZS4TX
ZD8DX	-WB2K	7Q7CM	-GW3RYR
ZD8TG	-W01FR	7Q7W	-K7UP
ZD8WD	-G4RWG	7Q7MM	-N4RFN
ZV8WAS	-PY4AG	7Q7WL	-DL31AW
ZW0IM	-PY2MT	7S30WG	-SM3CVM
ZW0ORF	-PY2MT	7X5ST/3V8	-FE1NKC
ZW0JR	-PP5ATO	7Z1IS	-OE6EEG
ZX0KP	-PY2MT	8N6ARL	-JARL
ZY0NS	-PP5SZ	8P9BX	-W2HRX
1A0KM	-I01J	9H1ED	-UW6HS
3A200SM	-3A2LF		(see note 3)
3A/DK6AS	-DJ8MT	9H3AM	-G3VLX
3D2XV	-VK2BCH	9H3DN	-G4CYZ
	(see note 2)	9J2HS	-J14MTC
3Z0J	-SP5PWK	9K2/HB9CVN	-HB9CXZ
4K2FJL	-UV3AAC	9L/DL6NA	-DL6NA
4K4BEU	-UL7BL	9M2NA	-VE3CHZ
4L0DXC	-UT5HP	9M8BZ	-JA1VDJ
4M3B	-YV3BKC	9V1XT	-JH0JLP
BV3AI	-P.O. Box 731, Taoyuan, TAIWAN		
R21A	-P.O. Box 417, Leningrad 191011, USSR		
UH3E/UC2WL	-Victor V. Duka, P.O. Box 7, Vitebsk 210038, USSR		
UH8AAQ	-Jenny, P.O. Box 1, Ashkhabad 744003, USSR		
UH8EAU	-Sergej A. Semeikan, ul. Poltoratskogo 18-A kv 11, Mary 745408, Turkmen, USSR		
V51TX	-Giel Swart, P.O. Box 61, Gobabis 9000, NAMIBIA		
VP8CEN	-P.O. Box 260, MPA, Port Stanley, FALKLAND ISLANDS		
VP8CEX	-P.O. Box 260, MPA, Port Stanley, FALKLAND ISLANDS		
VP8CFV	-P.O. Box 260, MPA, Port Stanley, FALKLAND ISLANDS		
VP8CFW	-P.O. Box 260, MPA, Port Stanley, FALKLAND ISLANDS		
YL30WW	-P.O. Box 50, Riga 226010, Latvia, USSR		
ZD7CRC	-P.O. Box 58, St. Helena Island, South Atlantic Ocean		
4J0Q	-P.O. Box 50, Riga 226010, Latvia, USSR		
5N0RJM	-P.O. Box 28, Apapa, Lagos, NIGERIA		

Notes:
1. Contacts made on SSB go via W00G and CW go via AG9A.
2. Send QSL requests direct only.
3. For QSL requests to UW6HS, via Vasil M. Kasyanenko, P.O. Box 20, Georgievsk 357800, Stavropolskogo Kraya, USSR. Please QSL direct only.
4. New address for this manager: Tom Morton, 230 Emilia Lane, Fallbrook, CA 92028.

Many thanks to the following contributors: DF2UU, EI3GU, ES4RY, OE2DYL, OK3LZ, UQ2GJR, UW6HS, UW6HWP, UA9MFW, UA9SAW, UT5-187-150, AA4NG, K4HTO, NK6F, W6TUR, WD6GUD, American Radio Relay League (ARRL), St. Maarten Amateur Radio Club, International DX Association (W4WMQ), Western New York DX Association (KD2YP), Salt Lake City DX Association (KB2G), Northern Arizona DX Association (W7YS), Southern California DX Club (WB6PSY), Western Washington DX Club (K7WA), *CQ Ham Radio*, *The DX Magazine* (VP2ML), *Long Skip* (VE3IPR), *DX News Sheet* (G4DYO), *The Long Island DX Bulletin* (W2IYX), *InsideDX* (N2AU), *QRZDX* (W5KNE) and *The DX Bulletin* (VP2ML).

We have listed several Soviet DXers offering QSL services this month. However, we cannot endorse them or accept any responsibility for their reliability. Sending mail to other than Box 88, Moscow is something brand new and perhaps very inviting to postal workers there. We have suggested before to never enter any Amateur Radio information on the envelope to avoid the possibility of dishonest mail handlers taking someone else's mail. If you have used any of the services from the Soviets, how about letting us know the results?

Don't forget to keep your DXathon logs. I'm sure most DXers have some sort of computer program to keep track of the countries worked (we use *Word Perfect* for ours). All contacts count, regardless if they are reciprocal calls or made during contests. Have a good summer. Very 73 de John N6JM. □

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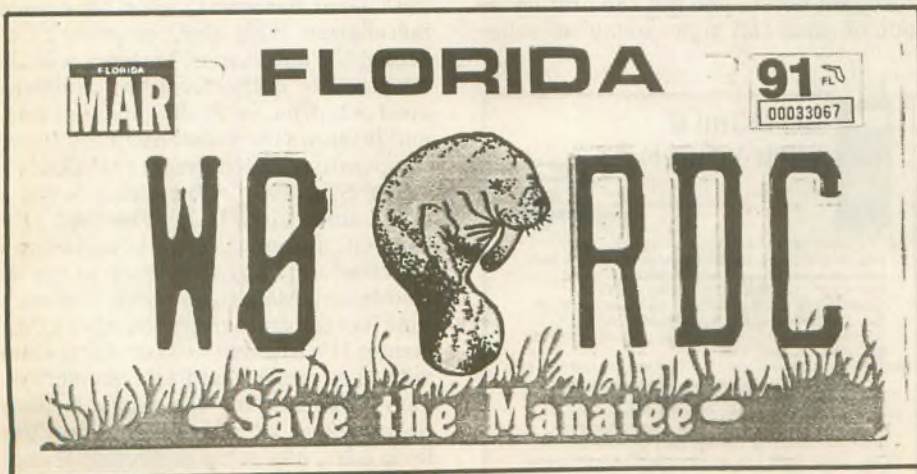


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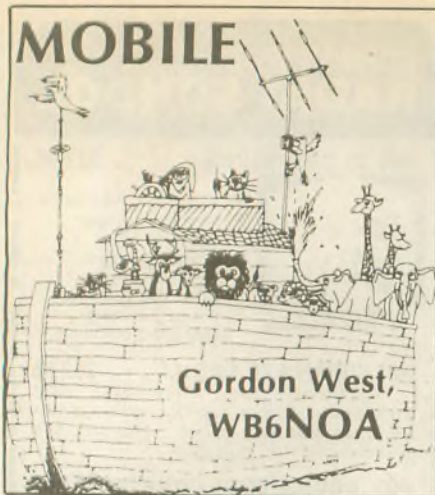
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This ham call license plate belongs to Keith Harpold, W0RDC, in Bradenton, Florida. For all he knows, it's the only "Save the Manatee" ham call plate in the state. □



Auto-tuned mobile whips

Imagine a 56-inch, stainless steel, Highway Patrol type whip tuned by a truck-mounted automatic antenna coupler for all-band operation from 1.8 MHz through 29.7 MHz! I can't wait to throw away all those huge center-loading coils and my arsenal of single-band and spider-type whip antennas that always look so ugly on my car. Gosh, all this for under \$600 for the automatic coupler, and \$5 for the stainless steel whip!

And how will this system work? LOUSY! Any time you shorten the active radiating element of a quarter-wave whip antenna, performance drops. And any time you try to base-load a high frequency whip antenna, performance drops even further below a center, top, or helical-loaded whip of the same length.

For 40M, a great whip to mount on your vehicle would be a 32 ft. non-loaded, quarterwave-length radiator. That's ridiculous—so settle for a monster "bug-catcher" type of whip with a



The SGC Model 303 HF whip installed on a van (tuner *inside* the vehicle).

big capacity hat, and you'll still have a fairly decent signal.

Switch down to a center-loaded Hustler or a skinny little Ham Stick, and you'll still have an okay signal. But anything shorter than the conventional 6 ft. whip or any type of base-loading into a stainless steel whip usually leads to marginal to poor results. So how are you going to get multi-band operation without having to jump out and screw in a new whip each time you change bands? One well-proven answer is the Spider™ antenna with multiple resonators sprouting out of a single shaft. It works well on any of four bands with a decent signal.

Another way to go is a Don Johnson "Big DK" all-band whip. "It's been around for 15 years, and it's still topping anything that is available commercially. Scores and scores of homemade ones abound in this area, and a nice thing about them is that you can change bands and be matched and resonant before you get the first letter out of your call sign—using no roller

coils or capacitors," comments Johnson. "No, I don't make or sell antennas—I get the fellows to come over, stay overnight if they have to, and I supervise while they use my machine shop to make their own—that's part of my hobby," adds Johnson, author of a terrific mobile antenna book that gives you all of the details on how to make your own HF whips (Don Johnson, W6AAQ, 26659 Capay Street, Esparato, CA 95627-0595).

Looking over his plans, the "Big DK" looks like an automatic Swantenna with a little 12V motor that screws a traveling something-or-other up and down the 15½-inch, #14 bare-wire-wound tube of which a 5 ft. whip sits on top. A little motor control allows the remote tuning of this antenna for proper resonance and minimum SWR. Remember, this is a build-it-yourself, so contact Don and bring your tools.

But wait—I just received a new SGC "HF Dual Resonant" whip for mobile installation with their popular SGC Model 230 auto-tuner. This new whip is designed to outperform any stainless steel whip on vehicular installations, and it allows the trunk-mounted tuner to operate at much greater efficiency.

The SGC-303 SSB antenna is not a stand-alone whip. It must be used with the SGC automatic coupler and allows for absolutely any frequency of operation from 2 MHz to 30 MHz. It stands nine feet tall and screws together in the center. It's a helical wind configuration with the primary loading resonance at 13.5 MHz and the secondary loading resonance at 22 MHz. This allows the little 6 lb., 9 ft. whip to develop exceptional field strength in the top section and deliver transmit and receive performance equal to an individual pre-tuned whip.



The Spider offers 4-band auto-tune without having to stop and change bands.

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 ICOM - Order Model I for all Icom (2AT/02AT). Slides on bottom of radio.
 TEMPO, SANTEC - Order Model T (Simple mod). Write for spec sheet/info on other radios.

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During our tests, we switched between the following antennas for signal comparison:

- SGC-303 whip and auto-tuner
- Multi-tap huge Swan antenna
- \$18 Lakeview ham whip
- 6 ft. Outback whip
- Hustler KW center-load whip

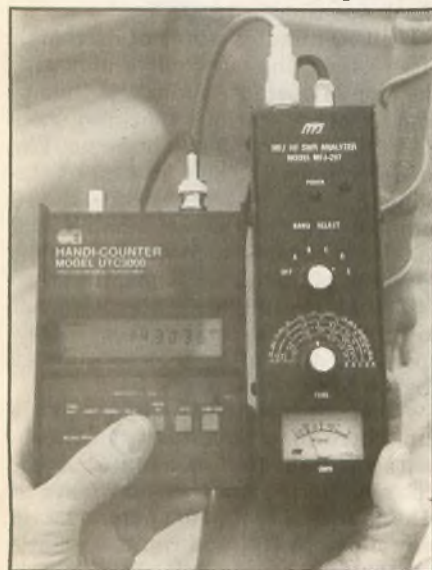
On 10, 15 and 20M, performance was almost identical among all of these six-footers. Of course, each time I changed bands, I would have to either change whips or resonant spots on each of the antennas, except for the automatic SGC tuner system. Using the MFJ multiple antenna switch, it was quick to check incoming signal strength of distant skywave stations, and quick to switch between antennas to get a relative received signal strength at the opposite end of the circuit.

On 40 and 80M, the SGC system was not quite as close as the individual band whips, but the slight decrease in both transmit and receive signal reports was not all that bad. It certainly wasn't as bad as when we tried another type of automatic tuner into a stainless steel whip—that was terrible.

We also tried the SGC auto-tuned new whip on marine bands at 4, 6, 8, 12, 16 and 22 MHz. The equipment we used was the Kenwood TKM-707 Part 80, type-accepted, marine transceiver on the ITU private coast station frequencies.

In this case, the automatic SGC system worked excellently over all other fixed whips because fixed whips normally don't come in marine band frequencies (except for the new Outbacker marine/ham combo or the stainless steel Spider antenna with marine resonators).

But the SGC Model 303 whip is several hundred dollars expensive.



Fixed mobile whips need to be tuned to the exact frequency you plan to operate on.

Combined with the cost of the \$555 auto-tuner that goes in the trunk, it's an \$800 system that allows for instant QSY without ever having to get out of your vehicle—but that's a lot of bucks to spend when a quick pit stop and whip change, or lead change, or resonator change, can do the same thing with just as good, if not better, results at a fraction of the price.

The test was interesting because it proved that a fully automatic antenna tuner can be a decent performer if the right type of short whip is attached. Of course, the SGC and ICOM automatic tuner certainly do a lot better if you can really get some wire on them, and this is why the automatic tuners are the ultimate performers for automatic band changing aboard sailboats and power boats.

So the bottom line is that a little stainless steel whip cannot be tuned for HF to 30 MHz bands efficiently. It takes some sort of center and top-loading in order to achieve the approximate performance as a dedicated single-band whip. And if you don't mind stopping the vehicle and changing whips or running the Spider whip with multiple elements, the pre-tuned whip system is the least expensive way to go.



"But band changing only takes 10 seconds!" comments Don Arnold of Outbacker Antennas.

However, if you want all-band operation, including marine band, all on one 6 ft. whip *without* having to stop your vehicle to change taps or resonators, then do consider the SGC auto-tuner coupled to their new SGC-303 center/top helical load matched whip. It works well. □



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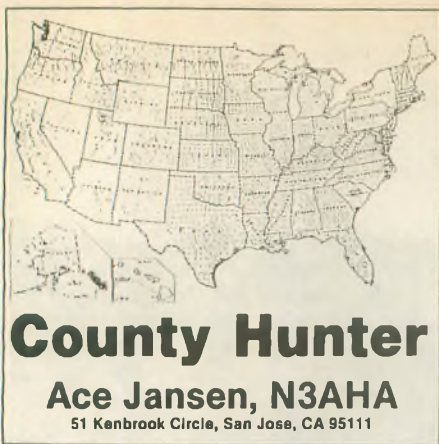
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In the premier County Hunter column in May, I discussed the USA-CA program and the County Hunters' Net, and recommended state QSO parties as another means of working counties. This time, I'll delve into the County Hunters' Nets with more detail on the style of operation. By the way, how many of you have tried the net and made a few new county contacts? If you haven't tried it yet, I hope you do soon.

Visalia

But first, I attended the 1991 International DX Convention in Visalia, CA April 12 to 14 and was amazed at how many county hunters I met. The DX convention always attracts the top DXers and Contesters from California and the rest of the country and some DX Amateurs. I recognized several county hunters as being participants on the County Hunters Net (14.336 MHz and 14.0565 MHz) such as W6TKV, W5FS, W6CF, W6ISQ and W6NNV. They are all accomplished DXers and most are members of the ARRL DXCC Honor Roll. My point is not to discuss DX in a county hunter column, but rather to point out who is county hunting.

There are three types of county hunters. First, there are Amateurs who have modest stations and decide that it is easier to achieve stateside awards than chase DX. Second, there are Amateurs who are chasing many awards concurrently such as USA-CA, DXCC, WAZ, WPX, IOTA, etc. Finally, there are DXers who have contacted all DX countries (or at least all that are currently active) and are look-

ing for another award challenge. Many DXers on the Honor Roll participate on the County Hunters' Nets.

One thing is for sure—county hunting is very addictive and some county hunters continue to hunt counties after completing USA-CA (working all US counties). Currently there are award sponsors for working all US counties a first time, a second time, a third time and a fourth time. Each time cannot be started until after completing the previous time. For example, I completed the USA-CA April 3, 1988 and began working on the second time award on April 5, 1988. If you haven't started or are just beginning to hunt counties, getting excited about contacting all US counties more than once is unimaginable and may sound downright ridiculous. County hunting is addictive because of the friendly people on the County Hunters' Net and the comradery of sharing a mutual interest. Which brings me to . . .

The Net

The Mobile Emergency and County Hunters' Net (SSB, 14.336 MHz) is a fun place to operate and a quick method of contacting all counties. As mentioned in the last column, the mobile operators check in with net control and then take turns "running" their county—making contacts and helping others to contact all counties.

A typical mobile run progresses like this: the net control will announce the mobile operator's call and county and exchange signal reports with the mobile. Then the assistant net control will also announce the call and county of the mobile and exchange signal reports. By announcing the pertinent information from two locations, most stations monitoring the net should be aware of the county about to be run. The net control then gives the mobile a start time in GMT (i.e. 1830Z) and says, "You have 10 minutes, go ahead and run the county." The mobile operator then has 10 minutes to operate as he pleases.

There are many operating styles (maybe as many as there are mobile operators) and it is best to listen to find out how a particular mobile likes to operate. The mobile operator may take a small list of calls or contact stations one at a time. The style may

depend on if the mobile operator is stopped on the side of the road or is in motion, and whether a tape recorder is available or another person is able to log contacts. Some mobile operators will work two or three stations at a time. For example, I might announce: "This is N3AHA mobile in Laramie county, Wyoming QRZ (who needs this county?)" Hopefully some stations will answer my call. Many may call at the same time. At this point, I could take a list of calls I hear calling or work more than one at a time. I like to work three at a time. After some time on the net, calls become very familiar and it is easy for me to pick up call signs with broken phonetics or just by voice. I will call one station, give a signal report, and then he will acknowledge my report and give me a report. For example, N3AHAM: "QRZ?"; I hear K2HVN calling me. N3AHAM: "K2HVN, you're 59"; K2HVN: "QSL 59, you're 57"; N3AHAM: "QSL 57, QRZ?"

This continues until the mobile operator has contacted all the stations he hears and then asks net control if there are any others still calling. Net control will then take a list of those stations who need help with a relay to the mobile. If there is time, the assistant net control will also take a list of relays. For example: NET CONTROL: "Ace, listen for a report from NV4Z. NV4G, go with a report"; NV4Z: "33, 33, 33, 33, 33 over"; NET CONTROL: "over"; N3AHAM: "QSL 33, you're also 33, 33, 33, 33 over"; NET CONTROL: "over"; NV4Z: "QSL 33"; NET CONTROL: "Good contact, any others for relay?" After 10 minutes net control will conclude the run by giving the mobile operator a check out time, i.e. NET CONTROL: "Ace, check out time is 1840Z."

If all 10 minutes were not used even after relays, the net control may give the mobile operator additional time to contact other stations that may have just tuned on frequency or do not like to use relays. If there are more stations that need the county after the 10 minutes are up, the net control will ask for someone to move the mobile operator off frequency, usually up to 14.339 MHz or higher. This allows net control to pick up another mobile operator and give that station a chance to run his county.

When the mobile has completed the run, there may have been 30-70 contacts made in the 10 minute period. The mobile operator then may move to other bands, i.e. 15, 10, and/or 40M or may move to CW and run the county for the CW county hunters. For the mobile operator, it's a glimpse of what it might be like to be rare DX with so many contacts in a short amount of

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time. In fact, I like to call county expeditions "the poor man's DXpedition." Typical signal reports given on the net are 59, 57, 55, 44, 33 or 22. Although there are many other possibilities, these are the most often exchanged. You may hear a station on the net respond with "QSL the 9 (59), you're also 9(59)." This is a method used by some operators to shortcut the contact, so the mobile operator has more time to make additional contacts in the 10 minute limit. I personally do not use this technique, I use full signal reports and confirm full signal reports. To each's own—as long as there is a shared meaning in the signal report exchange.

CW Net

The CW Net (14.0565 MHz) is very similar except some knowledge of Q signals is necessary to be proficient: QRV means ready to run a county; QSP means relay; QNI means check in; QRX means standby on frequency; QSY means move up or down frequency (usually ± 2 kHz); QNF means the net is in open session (no business); and QTA means scratch the contact, no longer copying. Q signals are meant for CW operation, but you may hear them used somewhat on SSB as well. The normal CW speed on the net is 18-25 wpm. Not to worry though, if your speed is slower, the net control and mobile operator will slow down for you. All you have to do is use the Q signal QRS, which means send slower. The CW county hunters are a very warm group. I believe that's because the net is not as crowded as the SSB net, so the group is very close. There are not as many mobile operators checking into the net on CW, so for the mobile operators it's great; there's little or no wait time. The SSB net may have a list of 10 to 20 mobiles, and at 10 minutes each, it gets to be awhile between run times. The CW net doesn't have a running list like the SSB net. Net control will ask, "Are there any mobiles QRV?" and then run any mobiles that respond. Usually there will be no more than three mobiles QRV at one time. Net control will then run one mobile operator on the net frequency and ask the others who are ready to QSY up or down 2 kHz.

As always, the best way to learn how to be a good operator on any net or any frequency is listen first for the technique of operation. Once you figure out the style of operating expected on a specific net or frequency, jump in and get your feet wet. After listening, the next best method of developing operating skills is to practice, practice, practice. The more you listen and the more you practice

operating, the better sharpened your operating skills become. This advice holds true for any net or operating event; listen first, then transmit.

Now, for you new county hunters, go make some contacts on the net. Don't worry about the QSLs, yet! Next time, I'll discuss QSL techniques and introduce you to the Mobile QSL Bureau, an invaluable service. In the meantime, write to MARAC at P.O. Box 64, Newport, MN 55055 (include an SASE) for a county hunter information packet. Until September, happy hunting! P.S. Thanks for the nice comments and letters on the first column! □

The county hunters forum

NORM BROOKS, K6FO

There are over 3,000 counties in the US and there is a large group of Amateur operators who have worked all of them. There are even a few who have worked all of them two or three times! How do they do it?

There is a large group of Amateur mobile operators, usually in RVs, who are willing to drive to remote counties to provide the other end of the county hunters' contacts.

Together, these county hunting enthusiasts had their own forum at the Dayton Hamvention on April 26, and Ron Toth, WB8NWK, was the moderator.

They call themselves "roadrunners," and they belong to a national organization called Mobile Amateur Radio Awards Club (MARAC). They meet annually in a convention to meet the people who gave them contacts and to receive the various awards given by the club. One doesn't have to be a member of MARAC to attend. This year's get-together will be at the Holiday Inn East on the eastern end of St. Paul, Minnesota, from July 10 to 13.

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The primary activities will be on Friday. There will be forums on computers, mobile antennas and mobile installations, as well as a CW forum and awards presentations. The MARAC general meeting will be on Saturday, with the convention banquet in the evening. Major prizes will be given out on Saturday. Six unique prizes are payment for hotel rooms for up to the four days duration of the convention.

The county hunting procedures were aptly explained by Joyce Boothe, WB9NUL. She explained that the SSB net is on 14.336 MHz whenever the band is open. It is basically an emergency net. Thus, mobile stations on the road can and should be tuned in to the net at all times, if only for safety reasons. However, the county hunting activities are carried on like this: two base stations, one on each end of the country, will control the frequency, giving each mobile about ten minutes to "run" the county he or she is in. Sometimes the mobile parks on a county line, and such contacts will count for both counties. Oftentimes, stations will ask the mobile to switch to another band, to give a contact needed for, say, a five-band award. When a mobile agrees to go to another band, the frequencies used are 28.336, 21.338, 7.236 and up or 3.865 MHz.

(please turn to page 66)

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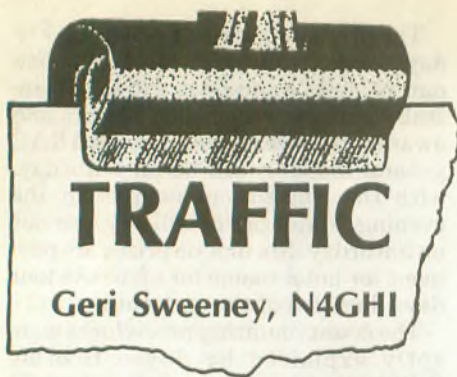
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There once was a bell made to ring,
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 Bewitching, this thing on a string.

GS

The telephone

The bottom line in traffic handling is to deliver a message to a person. This most commonly happens on the telephone. When all goes right, you pick up the phone and dial the number which was given in the message. The addressee answers and, after hearing the message, articulates something joyful like, "You made my day." As a bonus, you may even be requested to originate a message back. Ah, yes, life as a traffic handler is sweet. I particularly enjoy singing ARL Forty Six. There is your reward for all the time you have spent (no matter which mode) in acquiring this message. Your self-esteem grows in knowing that you have truly brought a little happiness into another person's life.

History

Recently I read a book by Watson's great granddaughter. She asserts that the historical account of Bell, in pain and shouting for help (after he knocked over a beaker of battery acid) and then heard over the wire in the next room by Watson, was just not true. But, the story emphasized how important the telephone could be in our lives. Our enchantment with this new mode of communication was immediate. In the beginning it was assumed that others would like to hear us speaking to them. We soon realized our error when they started 'unlisting' their numbers. Then came the age of the computer. As it became a dominant force in our lives, entrepreneurs quickly realized that

these marvelous machines were capable of spewing forth lists with our names on them (whether from a bank account, credit card or membership in an organization). In this perpetual spring, as fast as we have our name taken off one list, a new one sprouts. While these lists became one man's weed, they existed as another's rose. Profits were made by selling roses. In the next evolution, the computer was even trained to dial the phone number and talk to us. It appears, nowadays, that the only purpose an "unlisted" phone number serves is to keep your friends and traffic handlers from calling. We now live in a misty realm of reality wherein it's not always convenient or desirable to speak on the telephone. Since each radio message (traffic) is most often delivered by the telephone, we need to be aware of fast breaking telephone developments. But first, the telephone number.

For lack of a phone number

Many radio messages are sent without a telephone number. If there is no outlet locally and it's only a short long distance call (cheaper now than mailing), a person might be willing to phone, if they didn't have to incur another long distance call first to get the number from Information. And as the people in our society become more and more detached they maintain unlisted numbers. This can only be determined after Information is polled, often at a cost. (You never know if the addressee might have arrived after the last telephone book was printed.) One traffic handler here on the East Coast, who handles a lot of traffic in the New Jersey area, wrote me to declare that 33 percent of his requests for a phone number from Directory Assistance were unlisted. He is frustrated!

During the past several days, I have collected seven messages from the Northern Virginia area. One was delivered immediately. It had a phone number and the number was correct. Three had no phone numbers and three had phone numbers which were incorrect. How can we traffic handlers insure a phone number makes it with a higher degree of probability than one in four of being accurate? Should we start sending them twice? Should we use words as we do in ARL numbers? I find myself saving messages without phone

numbers or phone book listings until I have two of them. (Information here gives two numbers per call.) You only get a couple of Information calls per month before you are charged for this service.

A phone number contributes two useful aides besides making it easier (and perhaps cheaper) to deliver the message. It is particularly useful when part of the address is garbled, like the city, state or even the name. The area code and exchange can be used to get in range to dial. Many messages are addressed to foreign countries without phone numbers. This is doubly difficult as most countries don't have national traffic nets and it becomes extremely complex just to get the message to a particular city, let alone encourage someone to try to find the phone number. For lack of a phone number, some messages just aren't delivered.

Phone number included

But is it the right one? This gets tricky. You have dialed a number four days in a row with no answer. You are looking up another phone number in a telephone book and decide to check the one you have been dialing. You find it's incorrect. You really don't know you have an incorrect number until someone answers and tells you, or until you double check it in the telephone book, if it's listed. Do you double check phone numbers when you get any of the various prerecorded telephone messages explaining that the number was disconnected or not in service? While this puts you back to square one, at least it's clear the originator tried and you are thus in a better mood as you get out your phone book or dial Information. The most often "ARL Sixty Seven" is an incorrect phone number.

Answering machines

In the beginning, many hated to miss a single telephone call. Thus, the answering machine was invented giving 24 hour phone service. But, it came to pass that frustration with weeds made it even more valuable for many to be able to monitor society and maintain some space. Some people have figured out that "unlisting" their number doesn't help. Perhaps they are just tired of being bugged by vendors who "have a deal for them" at dinner-time.

There is no reason you can't just leave the message on an answering machine but you need some assurance that the answering machine you are speaking to belongs to the human to whom the message is addressed. Therefore, when (more and more often) you hear a message like, "Sorry we are not around just now. If you are interested in speaking to anyone here, just leave

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your name and phone number when you hear the beep," you are torn. Do you leave the message with possible strangers? What do you say (in 30 seconds) to a machine to convince its caretaker to call you back? Do you leave your name and phone number with an enticing message: "The person at this phone number has just been awarded a million dollars in the state lottery. Call 555-5555 and identify yourself for details."? Then they can call you and talk to your answering machine while you eavesdrop. Do you try calling when the answering machine is off and you can get a name? My experience is that answering machines which won't say who they are have been abandoned. Although the number is tried from 6 a.m. to 11 p.m. on weekdays and weekends, you cannot reach a human. Perhaps we need a new ARL gram which says "answering machine." All this would be unnecessary if you could just be assured that the phone number on the message was correct.

High volume traffic

Fairs, expos, special events, etc., should make every effort to get a phone number. Sponsors should examine the essence of an event to determine whether they are presenting this service to help humanity while gaining experience passing traffic and having a bundle of fun; or, primarily to gain lots of points without considering if the message ever gets there. It seems certain that stations who send "roster" traffic (QCWA, OOTC, Handi Hams, W3CVE, W1KX, K6UYK, etc.) do it to let others on the roster know that they are thought of as valued members and that membership should be a salient part of their life. These traffic handlers realize that, to maintain traffic nets, we need traffic. It thus assists in two ways: it gives nets something to do and it pleases many to receive such a message.

I have asked W1PEX why he doesn't include phone numbers in all of his messages. He tells me that he cannot obtain a national phone list from QCWA. Over the years, people who send roster traffic build their own lists but they need our help. Even if the addressee doesn't wish to originate a message back, it would be beneficial if we serviced back a message saying "no reply" and giving the phone number. This might even help you not to have to look up the phone number again next year. It would certainly be advantageous if roster organizations could make a phone list available to those who wish to send greetings and messages to members. Perhaps the rose value gets in the way.

There are times when you are not ex-

pected to know a phone number and you don't wish anyone to send it to you. An example is the "Thanks for the nice QSO message." Another example is when QSL bureaus and foreign station managers send Amateurs a notice that cards await their envelope. It's nice when different Amateur Radio activities, such as DXing and QSOing, can mingle. N4UZ merged traffic handling with contesting this year by inviting operators to join in on the fun and then thanking those who participated in the Alabama/Georgia QSO party. While we all have our favorite activities where we wish to devote the majority of our radio time, Amateurs who mingle just a bit must have a richer view from the shack.

A class reunion notice from Virginia was recently responded to by a station in California. He sent replies as well as explained who had moved where. While we don't expect anyone to become a detective, replies such as the above show how wonderful the traffic handling community can be. It did "make the day" of the Virginia operator when he received the reply.

The future

As the telephone and its attachments have evolved to be able to do

more and more things for us, we have evolved techniques to avoid many of them. Where does this leave the traffic handler? It's fast becoming too expensive to mail many messages. And many (especially in metropolitan areas) have a continuing problem trying to locate the addressee. We cannot expect a few to mail vast quantities of messages, especially as many of these are also returned. The telephone must remain the answer in the foreseeable future. The telephone number must be accurate to make this work. Even our latest device, FAX, is dependent on a correct telephone number.

The responsibility for this begins with the originator. He or she must examine why the message is being sent. If plausible, a telephone number should be included. The next step is with the liaison stations who pass the message along. (While packet generally passes along the message intact, originators make typos and should proof the message.) While guessing from the context in the text often yields the correct word, it doesn't help at all in the phone number. *You must be positive that each number you receive is correct.* Please help increase the odds from one in four phone numbers being correct to 100 percent.

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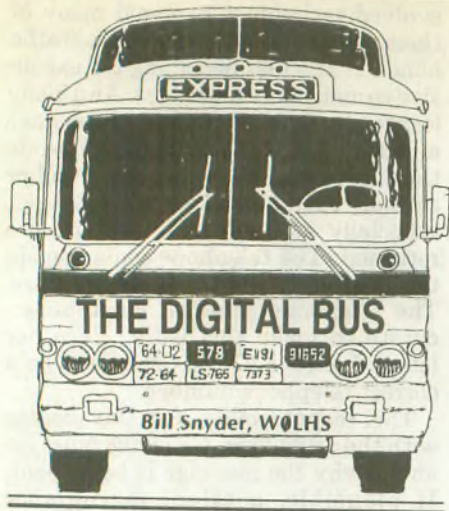
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Eavesdropping is a major international sport in ham radio. I don't know a single Amateur who does not eavesdrop when he has his ham rig turned on. This goes for CW, RTTY, SSB and even AMTOR, although AMTOR is not the best mode with which to do much poor-signal eavesdropping. Because of the nature of the AMTOR signal exchange system, good copy is usually only attainable when you have a first-class signal from one or both stations. Packet eavesdropping is done by looking at the junk mail stored in bulletin boards and, for the most part, it's dull stuff.

I've visited many ham shacks and watched the proprietor tinker with electronics while eavesdropping on nets, DX stations, etc. Many times I've ridden in autos with ham friends while constant chatter blared from their 2M mobile rig speaker. It's hard to really eavesdrop and have a conversation at the same time. I usually wish I could turn the radio off and simply talk with my host.

When I try letting my 2M mobile rig run when my wife is in the car, it doesn't take long for her to make a derogatory comment. After a couple of

"by gollys" by the "by golly boys," as she calls them, and a few minutes of listening to a discussion on the current weather, the state of the local repeater or what the conversing people had for dinner the previous night, Evie always says, "Turn that damned thing off!" And off it goes.

James Oberto, WA9YYV/7, who eavesdrops from Phoenix, Arizona, contributed the following bits of conversation that he heard on a Phoenix area 2M voice station. The operators were two KB7 calls, probably newcomers to the wonderful world of Amateur Radio. They were discussing a hi-tech subject—how to access a repeater—when Jim perked up his ears.

"They were stunned by our ZIA link out here," he writes, "and were taken back by hearing CW code on the repeater. As a matter of fact, operator A said to operator B: 'I thought this new ruling said we didn't have to know code, but that repeater is using code for something.' When station A turned it over to station B, the new op replied: 'I think they call that *ideaing*.'"

I really don't know what operator B meant by that, but it definitely sounds technical, doesn't it? The rest of the conversation dialogue, as reported by Jim, goes like this:

Station B: "Your new rig sounds good, but it's too loud at this end and it makes it hard to understand on this end. Turn down your volume a little bit."

Station A: "Okay, I turned the volume down a little bit. How do I sound now?"

Station B: "It's still too loud. Turn it down a whole lot and see what happens."

Station A: "Okay, it's down. How do I sound now?"

Station B: "Still way too loud. Turn it way down."

Station A: "Gee, if I turn it down any more I won't be able to hear you."

Station B: "Well, I guess you'll have to take it to somebody and have them

repair it. I don't know why turning your volume down should make it hard for you to hear me. I can't understand it. Maybe you got a bum rig."

Station A: "Yeah, just my luck. Oh, by the way, what is this 145.52 stuff? I can't understand why they number these channels like that. Do you know?"

Station B: "No, but I guess we'll find out. I don't know if I'm going to like this ham stuff or not. Bye bye and see you later."

Jim concluded his report with this statement: "Jeepers, I hope this isn't indicative of what we can expect with this no-code fiasco. Do you think prayer will help?"

Direction finding

Joseph Moell, K0OV, a professional engineer, writes an interesting column on the subject of radio direction finding in *73 Magazine*. Joe, who lives in Fullerton, California, called my attention to direction finding as a method to help eliminate malicious QRM on the HF bands. I'm somewhat aware of DF ability to locate stations on HF. I once called the FCC monitoring station in Grand Island, Nebraska and had them and the other FCC stations triangulate a QRming station on an RTTY band. It turned out to be a bulletin board station that was stuck in the transmit mode. Guess where they located it? Central America.

Years ago, I had to demonstrate my ability to fly using automatic direction finder (ADF) radio equipment. That happened when I took my instrument rating check flight with the FAA inspector. I should say two inspectors, because the boss of the Fargo FAA General Aviation District office asked if I would permit a newly recruited inspector to ride in the back seat of my aircraft and observe how an instrument test should be given. When we were airborne, the FAA man put me through a series of maneuvers designed to get me off course and somewhat disoriented. He then asked me to tune in the low frequency radio beacon, estimate how long it would take to fly there, and then execute an ADF approach to the local airport.

I tuned in the Fargo low frequency beacon station, heard the CW identifier send the code letters FAR only once, and then turned the volume completely off. I went into my flight pattern designed to estimate the time to the radio station. Right in the midst of that maneuver the inspector said to me, "How do you know you have the right station to home in on?" I think he wanted me to compare the Morse code for FAR with the little picture of dots and dashes drawn on the maps to help those pilots who don't know the code.

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"I identified it by listening," I said. "Yes," the inspector remarked, "but I didn't see you confirm it."

Then I realized what he was looking for, so I said, "Dit dit dah dit, dit dah, dit dah dit spells FAR, and that's the identification letters for the Fargo radio beacon."

"You must know the code?" he asked.

"I have an ARRL certificate for 35 words per minute."

I had the instrument flying hood on so I couldn't see his face, but I really would like to have seen it when he said, "Oh, that's nice." That ended that.

I passed the test even if my "brain turned to concrete" when the inspector asked me to hold on the 218 degree radial of the Fargo visual omni range (VOR). I had practiced on the 270 degree radial and the new numbers threw me for a moment.

A simple way to find the reciprocal, the 90 and the 270 quadrants from any compass heading is to add the first two digits together. For example: the first two digits of 360=9, 090=9, 270=9 and 180=9. Another example: 310, 040, 130 and 220, each beginning digits add up to 4. Believe it or not, this procedure works all the way around the 360 circle. Using this little algorithm, my 218 degree radial called for a reciprocal heading of 38 degrees. When the concrete in my head dissolved, I had no problem with the test.

To get back to Joe, ham radio direction finding and malicious HF QRM, I quote from Joe's letter: "Perhaps you aren't aware that an organization exists to combat the problem. The ARRL and FCC cooperatively formed the Amateur Auxiliary and Volunteer Monitoring program several years ago. Unfortunately, only a handful of hams have made the effort to equip themselves for Radio Direction Finding (RDF) on the DX bands, even though it's not hard to do so, technically."

Joe's column in 73 covers considerable DF ground. He also has written a book on the subject entitled *Transmitter Hunting—Radio Direction Finding Simplified*. It's published by TAB Books and available from ham book sources.

Our local ham club has recently rediscovered hidden transmitter hunts and the fun involved in the sport. With the coming of summer the activity in this area has picked up again. Until last fall, I think it has been about 50 years since we held the Fox Hunt competition. Fox hunting can be fun.

Eavesdroppings

"MY WIFE SAYS NO GOOD REPUBLICAN SHOULD READ KITTY KELLY'S BOOK ON NANCY ... THE CITY COMMISSION IS

TRYING AGAIN TO GET AN ORDINANCE PROHIBITING USE OF RADIO SCANNERS IN AUTOMOBILES ... MY SON IS STUDYING KINESICS IN COLLEGE—HE SAYS IT'S HIS GIRL'S BODY LANGUAGE ... IT IS HARD TO TYPE WITH ONE ARM IN A SLING ... HIS SIGNAL IS KNOCKING YOURS INTO A CLOCKED HAT' ... MY WIFE SAYS MY SHACK IS SO DIRTY I SHOULD GO IN FOR DUST TOP PUBLISHING ... I HATE TO CORRECT YOU BUT IT IS SOFTWARE NOT SOFTWARE ... SOMETHING IS WRONG WITH MY SPELLING CHECKER, I CAN'T FIND IT ANY MORE ... THE BAND HAS BEEN SO BAD LATELY THAT I HAVEN'T BOTHERED TO HOOK UP MY ANTENNA TO CHECK IT OUT ... I LIKE SHAREWARE PROGRAMS FOR COMPUTERS BECAUSE YOU DON'T HAVE TO PAY FOR THEM WHEN THEY DON'T WORK ... I WENT TO MY COLLEGE CLASS' 50TH REUNION THE OTHER NIGHT AND WAS AMAZED AT HOW MANY OLD FOLKS WERE THERE ... I MADE A BAD MISTAKE IN THE LAST RTTY CONTEST, I FORGOT TO SEND IN MY SCORE ... MY DAUGHTER GOT HER TECHNICIAN'S LICENSE WITHOUT

CHEATING ONE BIT ... I'VE WONDERED WHICH CONTINENT THEY ARE REFERRING TO WHEN THEY CALL A LITTLE DINKY SWEET ROLL AND COFFEE A 'CONTINENTAL BREAKFAST' ... OLD AGE CAN BE THE BEST YEARS OF A YOUNG MAN'S LIFE IF HE GETS THERE ... LET'S SAY 73 AND ALL THAT GOOD STUFF BEFORE I FALL ASLEEP."

Thanks to W0HAH, W7VFR, W7NSU and a bunch of people I managed to copy on various bands and modes. They unwittingly supply strange bits of gossip and wisdom for this column. Pass the good ones you hear along by writing to me, Bill Snyder, W0LHS, 1514 South 12th Street, Fargo, ND 58103. My packet address is W0LHS @ W0LHS.ND.U.S.A.N.A if you care to communicate by the automated system. 73 de Bill. DIT DIT. □

Resistor tip: Here's a tip from George Lehtinen, W8IOC: When you grind or file a carbon resistor to raise the value, keep the ohmmeter clipped to it to keep a close watch for the change you want.

—Hiawatha ARA, Ishpeming, MI □

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Fifty-seven new members joined QCWA at the Dayton Hamvention! The irresistible team of President Harry Dannals, W2HD, and General Manager Ted Heithecker, W5EJ, had people lining up at the QCWA display booth throughout the convention. Director Lew McCoy, W1ICP, also spent a good deal of time at the booth and attracted still more prospects, and members of the South Ohio Chapter #9 (formerly Dayton-Cincinnati Chapter) were on hand as usual to provide every possible assistance. Over 500 application blanks disappeared from the table. Obviously, 1991 is going to be a banner year for QCWA. We are looking for a record turnout at the convention in Canton, Ohio on September

27 and 28, so get your reservations in early.

New Chapters also continue to spring up all over the country. The latest addition to the list is South Willamette Chapter #178 in the Eugene, Oregon area. If you don't have a QCWA chapter within easy commuting distance, ask Headquarters for information about starting one. It only takes 10 members of the national association to start a chapter.

QCWA anniversary awards

Are you passing up an opportunity to receive some of the QCWA anniversary awards? Many of our members are eligible but are not requesting their certificates. Here is a quick review of what is available. (Also see the back page of any issue of the *QCWA Journal*.)

The QCWA Golden Anniversary Award is issued on the basis of your being licensed as an Amateur Radio operator at least 50 years ago. It doesn't matter if you were't issued a separate station license back in the good old days. If you can prove you had an operator's license, you are eligible. In the early days only one station license was issued to a given address and if more than one person operated from that station, the primary operator got the station license and any other licensees only got operator licenses. It is sometimes pretty hard to provide proof of an operator license since lists were rarely published, but if you can come up with any evidence

that you were operating legally at that time, you can qualify for the Golden Anniversary Award. Also, the regular Golden Anniversary Award does not consider any breaks in holding a license. If you were licensed 50 years ago, you are eligible.

A 50 year Continuously Licensed Award, is issued to those who have proof they were licensed *continuously* for 50 years (and are still licensed). Either a Golden Anniversary Award or a 50 Year Continuously Licensed Award will be issued without charge. If you want both certificates, however, you will have to pay \$5 for the second one. Applications are available from Headquarters. A request is required.

Are you eligible to receive a Century Award? Get out your adding machine and add your age and the number of years you have been a QCWA member. If you get a total of 100, you are eligible. Since the average QCWA member got his license when he was in his teens or 20s and joined QCWA at the age of around 40 to 55, he will be eligible for a Century Award sometime in his 70s. If you are eligible, send a request to Headquarters. They will make an effort to have the award presented to you at some special activity in your local area. It is an impressive looking certificate.

All this recognition of antiquity makes me wonder if we shouldn't also consider some recognition for the "young squirts" who are coming into QCWA at such an early age. Some of these youngsters who got their licenses at seven and eight years old are fully qualified to join QCWA when they are only in their early 30s! Maybe we should consider a special certificate or endorsement for those who join QCWA while still under the age of 40! They are, after all, the future leaders of QCWA. We need them and we should make a special effort to make them feel not only welcome but sincerely wanted in our organization.



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ALABAMA

Montgomery Amateur Radio Club (W4AP). P.O. Box 3141, Montgomery, AL 36109. Meets 3rd Mon./monthly, 7 p.m., State Trooper Dist. Office, Coliseum Blvd. & Federal Dr. Nets Sun. 8:30 p.m. 146.84- and Thurs. 8:15 p.m. 147.18+. Info: Fred, K8AJX, (205) 270-0909.

ALASKA

Arctic Amateur Radio Club. Geophysical Institute West Ridge U of A, P.O. Box 81389, College, AK 99708. 1st Fri./monthly, 7:30 p.m.

ARIZONA

Cochise Amateur Radio Assn. Meets 1st Mon./monthly, 7:30 p.m. at club facility on Moson Rd., Sierra Vista, AZ. Net: WOLKI info Net every Thurs., 7 p.m., WA7KYTR 146.16/146.76 rpt.

Scottsdale Amateur Radio Club. Meets 1st Wed./monthly, 7:30 p.m., 7375 E. 2nd St. in Scottsdale, AZ. Net is Mon., 9 p.m., 147.18 rpt.

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

Western Arizona Radio Club. Meets 2nd & 4th Thurs./monthly, 7:30 p.m., First Baptist Church, 1700 Palma Rd., Bullhead City, AZ. Net Tues. 7 p.m. on 147.12+600. Info call Dave Adams, W6DRM, (602) 758-5171.

CALIFORNIA

Amador County Amateur Radio Club. P.O. Box 1094, Pine Grove, CA 95665. Senior Citizens Center, Jackson, CA. Meets: first Thur./monthly, 7:30 p.m. WA6WYR rpt., 146.835, 146.235. Net Tues. 7:30 p.m.

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

Butte Amateur Radio Club. Meets 1st Fri./monthly, 8 p.m. at Chico Community Hospital Conf. Cntr., 670 Rio Lindo, Chico, CA 95926.

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

Contra Costa Communications Club, Inc. W6EZZC/Rptr. P.O. Box 661, San Pablo, CA 94806. Meets 2nd Sun./monthly at 9 a.m. Hickory Post Restaurant/Lucky Lanes. Nets: 07:10-08:30 M-F; 7:30 Thur. eve. all 145.110. 224.300 & 444.275 w/possible PL 82.5. Info call Ed, KA6OFR, (707) 996-0962.

Downey Amateur Radio Club. Meets 1st Thurs./monthly, 1930 in the Cafeterium of South Middle School, 12500 S. Birchdale Ave., Downey, CA.

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

The Electronic Museum ARC. Meets 1st Fri./monthly, 7:30 p.m., Electronic Museum at Foothill College, Los Altos, CA 94022. Call-in 145.27/144.670.

Fullerton Radio Club, Inc. W6ULI. P.O. Box 545, Fullerton, CA 92632. Meets: 3rd Wed./monthly, 7:30 p.m., Sr. Citizens Center, 340 W. Commonwealth, Fullerton. Net ea. Tue., 8 p.m. 147.975 (+600). Info, Phil Gray, KJ6UV (714) 524-5223.

Gabilan Amateur Radio Club GARC. P.O. Box 2178, Gilroy, CA 95020-2178. Meets: South Valley Jr. High School, 385 I.O.O.F. Ave., Gilroy. 2nd Thur./monthly. 7:30 p.m. Talk-in 145.47/144.87.

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

Hilltop Amateur Mastertie System (HAMS). Informal mtgs. weekly/Mon. 5 p.m. at Shakey's Pizza, 12924 Washington Blvd., Mar Vista, CA, except 3rd Mon. Call for location. Info, N6FD 213/823-0767.

Kern River Valley Amateur Radio Club. P.O. Box 2611, Lake Isabella, CA 93240. Meets 4th Sat./monthly at 4 p.m. (Pot Luck). Veteran's Hall, Lake Isabella WB6ODZ Rptr. 224.50 down 1.6 low-level, 144.50 simplex.

Livermore Amateur Radio Klub, (LARK). Meets 3rd Sat./monthly, 9:30 a.m., City Council Chamber, 3575 Pacific Ave., Livermore, CA. Net Mon. 1900 on 147.12+. For info: LARK, 859 Chippewa Wy., Livermore, CA 94550.

Marin Amateur Radio Club (MARC) W6SG. Box 1231, San Rafael, CA 94901. Meets 1st Fri./8 p.m.; MARC Clubhouse Bldg. 549, HAFB, Novato, CA (415) 883-9789 (Summer exceptions; contact Pete N6IYU, 924-1578). Sun. AM Club at Red Cross, San Rafael.

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

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

North Hills Radio Club. Meets 3rd Tue./monthly, 7:30 p.m., Elks Lodge, on Cypress at Hackberry in Carmichael, CA. Net K6IS Thurs., 8:00 p.m. 145.190. 220 Net, Tue. 8 p.m. 224-7800.

North Shores ARC. Meets 1st Tues./monthly, 7:30 p.m., So. Clairemont Rec. Cntr., 3605 Clairemont Dr., San Diego, CA. Info: (619) 224-1294.

Orange County Amateur Radio Club. Meets 3rd Fri./monthly, 7:30 p.m., Mercury Savings & Loan, 1895 Irvine Blvd. (4th becomes Irvine), Tustin, CA 92680. Net each Wed., 9 p.m., 146.55 Simplex.

Radio Amateur Mobile Society. P.O. Box 214091, Sacramento, CA 95821-10091. Meets 2nd Tue./monthly, 7:30 p.m., Carmichael Elks Lodge, 5631 Cypress Ave., Carmichael, CA. Net Saturday a.m., 224.84 at 8:30 & 146.79 at 9:00.

River City A.R.C.S. Meets: 1st Tue./monthly, 7 p.m. SMUD Bldg., Room B & C, Elkhorn & Don Julio, Sacramento, CA. For info: (916) 483-3293.

Sacramento Amateur Radio Club. Contact: Gary Bryant, KB6KZZ, (916) 646-1171. Meets Sacramento Blood Bank, 32nd St. & Stockton Blvd., Sacramento, CA, 2nd Wednesday/monthly, 7 p.m. Info net every noon on Rptr. W6AKR 146.910.

Sacramento "Old Timers" Ham Radio Brkfst. Club and Sacramento Valley Chapter #169 QCWA (Quarter Century Wireless Assn.). Meets 2nd Wed./monthly, 8 a.m., Lyon's Restaurant, 1000 Howe Ave. For info contact Paul Wolf, W6RPL (916) 331-1830.

San Fernando Valley ARC. Meets 3rd Fri./monthly, 7:30 p.m., Red Cross, 14717 Sherman Wy., Van Nuys, CA. Net every Thur., 8:00 p.m. KB6CR/147.735(-).

San Gabriel Valley ARC. P.O. Box 88, Monrovia, CA 91017-0088. Meets 1st Tues./monthly, 7:30 p.m. (except Dec.) at Bowling Green Clubhouse, 405 S. Santa Anita Ave., Arcadia, CA 91006. W6QFK, Rptr. 147.165/765.

Santa Clara County Amateur Radio Assoc. (SCCARA) W6UW & W6UU. P.O. Box 6, San Jose, CA 95103-0006. (408) 249-6909. Meets: 2nd Monday/monthly, 7:30 p.m. at Agnews Developmental Center Aud., corner of Circle Dr. & Palm Dr., Santa Clara. Net all other Mon., 7:30 p.m. W6UUR 146.385+ / 442.425+ PL 107.2

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

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

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

Sierra Amateur Radio Club. Meets 3 Mon./monthly, 7 p.m., Hamilton Branch Fire Dept., Big Springs Rd., Lake Almanor, CA 96137.

Simi Settlers Amateur Radio Club. P.O. Box 3035, Simi Valley, CA 93063. Meets: 2nd Thur./monthly, 7:30 p.m., at Seventh-Day Adventist Church, 1636 Sinaloa, Simi Valley. Rptr. 147.93/33.

Southern California Amateur Transmitting Society, SCATS, WB6LRU. P.O. Box 1770, Covina, CA 91722. Meets 1st Mon./monthly, Community Presbyterian Church, 540 E. Vine St., West Covina, CA. Net, Sun., 7 p.m. 147.765-; W6QFK/R. Classes. Contact: Pat McNulty, N6GXZ (714) 622-8315.

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

Stanislaus Amateur Radio Assoc. (SARA). P.O. Box 4601, Modesto, CA 95352. Stanislaus Co. Administration Bldg., 12th & H Streets, 3rd Tues./monthly, 7:30 p.m. 145.39 MHz W6EJF, 223.68 MHz.

Tehama County ARC. Meets 1st Fri./monthly, 7 p.m., Sept.-June, CA Div. Forestry Training Rm., Antelope Blvd., Red Bluff, CA. For info: 145.850/145.50 W6SYY/R.

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

Tri-County Amateur Radio Assoc. P.O. Box 142, Pomona, CA 91769. Meets: 2nd Mon./monthly, 7:30 p.m., 703 N. College Way, "The Faculty House," (lower level), Claremont, CA.

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

Vaca Valley Radio Club. Meets 2nd Wed./monthly, 7 p.m., Vaca Fire Dist. Stn. on Vine St. in Vacaville, CA. Repeater: WX6F 147.475 (-1 Meg) PL 107.2. Ph: (707) 447-0163.

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

West Coast Amateur Radio Club. Serving the Greater LA/Org. Co. area and beyond on 145.44-/4zpl. Meets 3rd Thurs./monthly, nets ea. Mon. at 01715 pldst/ on 144.335.

West Valley Amateur Radio Assoc. 18011 Saratoga — Los Gatos Road, Los Gatos, CA 95030. Meets: 3rd Wed./monthly, 7:30 p.m. W6PIYR. Net Tue., 8:30 p.m., 147.39+, 223.96-.

Yucaipa Valley Amateur Radio Club. Meets 3rd Mon./monthly, 7:30 p.m. at Far West Savings, 1195 Callmesa Blvd., Calimesa, CA.

CONNECTICUT

Middlesex Amateur Radio Society, (MARS). 5 North Rd., Cromwell, CT 06416. Meets Tues./weekly 7 p.m., Portland Methodist Church, Main St., Portland, CT. Novice classes, VE sessions monthly. Contact Jack, WA1K, (203) 347-8754. Rptr. 147.090+.

Tri-City Amateur Radio Club. P.O. Box 686, Groton, CT 06340. Meets 2nd Tue./monthly, 7:30 p.m. Alternating, Groton Public Library at Rt. 117 & St. Lukes Lutheran Church at Rt. 12. Novice classes. Info, contact Bob, KA1BB, (203) 739-8016.

DELAWARE/PENNSYLVANIA

Penn-Del Amateur Radio Club. P.O. Box 1964, Boothwyn, PA 19061. Sponsor of KA3TWG/Rptr. on 224.220 serving all of S.E. Penn. and Northern Del. Info/net every Thurs. at 20:00 hrs. or call Hal Frantz (302) 798-7270.

FLORIDA

Gulf Coast ARC, Inc. P.O. Box 595, New Port Richey, FL 34656. Meets 4th Mon./monthly, 7:30 p.m., Colonial Hills Civic Ctr., 87 Peacock Dr., New Port Richey. WA4GDN Rptr. 146.67/07.

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

Platinum Coast Amateur Radio Society. P.O. Box 1004, Melbourne, FL 32902. Meets 2nd Mon./monthly, 7:30 p.m., Brevard Co. Red Cross Hdqtrs. Bldg., 1150 Hickory St., Melbourne, FL. Talk-in on 146.25/85 or 146.01/61.

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

West Palm Beach Amateur Radio Club, Inc. W4HAW. P.O. Box 6834, Southboro Station, W. Palm Beach, FL 33405. Meets 2nd Tue./monthly, 7:30 p.m., Palm Beach Co. Emergency Op. Cntr., 3723 Belvedere Rd., W. Palm Beach, FL. Rptr.: 147.135 MHz. Info: Jeff, WB2OUK, 586-5120; Charlie, K2GNZ, 582-1164 or Henry, WA4HXZ, 655-4632.

GEORGIA

Dalton Amateur Radio Club (DARC). P.O. Box 143, Dalton, GA 30722-0143. Meets 4 Mon./monthly, 7:30 p.m., Dalton College Voc. Tech. Bldg., Dalton, GA. Info net: Sun. 9:30 p.m., 145:230 MHz; Wed. 9 p.m., 147.135 MHz.

HAWAII

Big Island Amateur Radio Club. P.O. Box 1938, Hilo, HI 96721-1938. Meets: 2nd Tue./monthly, 7:00 p.m., Helco Auditorium, 1200 Kilauea, Hilo. Talk-in on 146.76(-).

ILLINOIS

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

Bolingbrook Amateur Radio Club. Meets 3rd Mon./monthly, 7:30 p.m., Bolingbrook Pk. Dist. Rec. Ctr., Briarcliff Rd., Bolingbrook, IL. Info net Thursdays, 8 p.m., WD9AKO/R 147.33 MHz +.600 and WA9DIP/R 224.54 MHz -1.6. Info hotline (708) 759-7005. ARRL affiliated club.

Central Illinois Radio Club, W9AML. Meets 4th Wed./monthly, 7:30 p.m. (from Sept. to May), McLean Co. Law & Justice Center, ESDA Rm., Bloomington, IL. Club Rptr. 146.94 - 600kHz.

DuPage Amateur Radio Club, (DARC). Meets 4th Mon./monthly, 7:30 p.m., Holy Trinity Catholic Church, 111 S. Cass Ave., Westmont, IL. Club rptrs. are 145.25, CTCSS 107.2; 224.68- and 442.55+ CTCSS 114.8.

Elgin Amateur Radio Society. P.O. Box 1351, Elgin, IL 60120. Meets in EOC Rm. of Elgin Municipal Bldg. 2nd Fri./monthly, 8:00 p.m.

Fox River Radio League. Valley National Bank, Lower Level, Northgate Shopping Ctr. & RT. 31, Aurora, IL (312) 584-4925 for more info. Meets: 2nd Tue./monthly, 7:30 p.m.

Hamleters Radio Club, W9AA. P.O. Box 42792, Chicago, IL 60642. Meets 1st Fri./monthly, 8 p.m., Crestwood Civic Center, 139th & Kostner Ave., Crestwood, IL. Nets: Sun. 8 p.m., 28410 MHz and Mon. 9 p.m., 146.43 MHz.

Northwest ARC/W9LM. Meets: 2nd and 4th Tue./monthly, 7:00 p.m., Oehler Funeral Home downstairs community room, Lee & Perry Street, Des Plaines, IL. Net 28.375, 8:30 p.m., non-meeting Tuesdays.

Peoria Area Amateur Radio Club. Meets 2nd Fri./monthly, 7 p.m., Red Cross Bldg., corner of Knoxville & Armstrong, Peoria, IL. Info on W9UVI rptr. 146.250/146.850.

Schaumburg ARC (SARC). Meets: Schaumburg Park District Community Rec. Cntr. at Bode and Springinguth Roads, Schaumburg, Illinois. Third Thur./monthly, 7:30 p.m. Net 28.350, 8:00 p.m. Thur.

Six Meter Club of Chicago K9ONA. Bank of Lyons, Lower Level, 8601 West Ogden Ave., Lyons, IL. 2nd Fri./monthly, 7:30 p.m. Club Rptrs: 146.37/97, 448.30/443.30.

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

York Radio Club. Meets: 3rd Fri./monthly, 8 p.m., Elmhurst College (Science Bldg.) Elmhurst, IL. Net Mon., 8 p.m. W9PCS/147.42 simplex.

KANSAS

Pilot Knob Amateur Radio Club. Meets 1st Thurs./monthly, 7 p.m., 525 Shawnee St., Leavenworth, KS. ARES net every Thurs., 7:30 p.m. 147.60/147.00. For info call (913) 682-6904.

LOUISIANA

Southwest LA Amateur Rptr. Club, Inc. (SWLARC). Meets 4th Tues./monthly, 7 p.m. in the EOC Rm. Net ea. MWF, 7:30 p.m. Rptr. 146.730 minus 600.

MARYLAND

Peninsula Radio Operators Society, Inc. (P.R.O.S.) Salisbury, MD. Quarterly dinner mtgs. & VE Test sessions. Spring & fall classes. Rptr. K3SVA 146.325/146.925; KC3UV 449.05/444.05. Info: (301) 749-7444.

MASSACHUSETTS

Mohawk Amateur Radio Club. P.O. Box 532, Athol, MA 01331. Meets: 4th Wed./monthly, 7:30 p.m., at the Athol American Legion Hall, Exchange Street, Athol, MA.

MICHIGAN

Hazel Park Amateur Radio Club. Hoover Elementary School-Hazel Park, P.O. Box 368, Hazel Park, MI 48030. 2nd Wed./monthly, 7:30 p.m. Sept. thru May. 147.51 Simplex Call-In. WB9JXU Club Call.

Oak Park Amateur Radio Club. Oak Park Community Center, 14300 Oak Park Blvd. (same as 9 1/2 Mile Rd., west of Coolidge). Oak Park, MI 48237. 2nd Mon./monthly, 7:45 p.m. Talk-in on our 224.36 MHz or 146.64 MHz.

MINNESOTA

Minneapolis Radio Club. P.O. Box 25167, Minneapolis, MN 55458. Meets 3rd Fri. (exc. June, July, Aug.), Mpls. Red Cross, 11 Dell Place, Mpls, 7:30 p.m. Making waves since 1916.

MISSOURI

Joplin Amateur Radio Club. Meets 2nd and 4th Tue./monthly, 7:30 p.m. at Joplin Municipal Bldg., (basement), 303 E. 3rd, Joplin, MO.

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

NEVADA

Sierra Intermountain Emergency Radio Assoc. (SIERA). P.O. Box 2348, Minden, NV 89423. (702) 882-0451. Meets: 2nd Tue./monthly, 7:30 p.m., Douglas County Lib., Minden, NV. Talk-in: 147.330.

NEW HAMPSHIRE

Great Bay Radio Assn., WB1CAG. P.O. Box 911, Dover NH 03820. (603) 742-0130/742-1374. 2nd Sun./monthly, 7:00 p.m. Dover City Hall. Talk-in 147.57.

NEW JERSEY

Bayonne Emergency Mgt. ARC (BEMARC). 16th St. & Ave. A Firehouse, Bayonne, NJ 07002. Meets 2nd Tue./monthly, 7:30 p.m. Tri-Band linked repeaters: 145-430/224.280/445.575 MHz.

Delaware Valley Radio Assoc. (DVRA). Our Lady of Good Counsel Church, 137 W. Upper Ferry Rd., West Trenton, NJ 08628. Meets: 2nd Tues, Wed./monthly, 8 p.m.

Garden State Amateur Radio Assoc., W2GSA. Meets 1st & 3rd Wed./monthly, 8 p.m. at Bicentennial Hall, Fair Haven, NJ. All are welcome.

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

NEW YORK

Communications Club of New Rochelle, NY. Harrison Street Firehouse. Richard Sandell, WK6R, (914) 834-2322. Meets: 1st Mon./monthly, 8 p.m.

Genesee Radio Amateurs (GRAM). N.Y.S. Civil Defense Center, State St., Batavia, NY 14020. Meets: 3rd Fri./monthly, 7:30 p.m. 147.285+ W2RCX.

Hall of Science Amateur Radio Club. P.O. Box 131, Jamaica, NY 11415. HOSARC, 2nd Tue./monthly, Hall of Science Bldg., 47-01 111 St., Flushing Meadow Park at 7:30 p.m. For info call Arnie, WB2YXB, (718) 343-0172.

Lockport Amateur Radio Assoc. (LARA) Meets last Sat./monthly, 7:30 p.m., Mt. Olive Church, Chestnut Ridge Rd., Lockport, NY. Info net Sun. 9 p.m. on W2RUI/R (146.82-). Contact Jim, KB2CUX, (716) 433-8564.

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

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

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

Suffolk County Radio Club. 3rd Tue./monthly, 8 p.m. Bohemia Rec. Ctr., Ruzicka Wy. W2DQ/R 144.610/145.210, 223.080/224.680 rptr. Info call Jim Heacock (516) 473-7529.

Westchester Amateur Radio Assoc. (WARA). Scarsdale Village Hall, Scarsdale, New York. Meets: 1st Wed./monthly, 8:00 p.m. For info call Dan Grabel, N2FLR, Pres. (914) 723-8625.

Westchester Emergency Communications Assn. (WECA) 147.66/147.06, 222.80/224.40, 447.475/442.475. Meets: 2nd Mon./monthly, 7:30 p.m., Westchester County Ctr., White Plains, NY. Info: P.O. Box 831, N. Tarrytown, NY 10591. (914) 631-7424.

NORTH CAROLINA

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

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

OHIO

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

Clyde Amateur Radio Society (C.A.R.S.) Meets 2nd Tue./monthly, 7:30 p.m., Municipal Bldg., Clyde, OH 44811. NF8E Rptr. 144.75/145.35. 444.60 (+5 MHz). Net Sun. 9 p.m.

Dayton Amateur Radio Assoc. P.O. Box 44, Dayton, OH 45401. Meets 1st & 3rd Fri./monthly (Sept. thru June) 8 p.m., Career Academy on River Corridor Dr. Info on W8BI 146.34/94 & 222.34/223.94.

Lancaster & Fairfield County A.R.C. Meets 1st Thur./monthly, 7:30 p.m., City Hall, Basement Club Rm., Broad & Main. Info Net every Mon., 8 p.m. K8QIK/R 147.63/03 Rptr.

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

Toledo Mobile Radio Association. P.O. Box 273, Toledo, OH 43697. Meets 2nd Wed./monthly, 7:30 p.m., Luke's Barn, Lucas County Rec. Ctr., 2901 Key St., Maumee, OH. W8HHF 147.87/27 Rptr. Rptr. info/swap & shop, Sundays, wkly - 8:30 p.m.

Triple States Radio Amateur Club. Meets Wed./weekly on 28.480 at 8:30 p.m.; 7259 at 9 p.m. Rptrs. 146.31/91 and 146.115/715. P.O. Box 240, Rd. #1, Adena, OH 43901. (614) 546-3930.

Warren Amateur Radio Assn. Meets 1st & 3rd Tue./monthly, 7:30 p.m. at Kent State Univ. Trumbull campus, Rt. 45 in Champion, OH. Club rptr. W8VTD 146.97MHz.

OREGON

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

Keno Amateur Radio Club. P.O. Box 678, Keno, OR 97627. Meets 3rd Thur./monthly, 7 p.m., Keno Fire Station. Rptr. 147.32+ W7UFM. Info: Tom Hamilton, WD6EAW, (503) 883-2736.

Umpqua Valley Amateur Radio Club. Meets 3rd Thurs./monthly 7:30 p.m., Douglas County Courthouse, Rm. 311, Douglas St., Roseburg, OR. Info W5PII/R 146.90/30.

PENNSYLVANIA

Butler County Amateur Radio Club. P.O. Box 1787, Butler, PA 16003-1787. Meets 1st Tue./monthly, 7:30 p.m. at Red Cross Bldg., 312 Mercer St., Butler PA 16001. Call-in: W3UDX 147.96/36. Net 10:10 p.m. nightly.

Mercer County Amateur Radio Club W3LIF. P.O. Box 996, Sharon, PA 16146. Meets 4th Tue./monthly at 7:30 p.m., Shenango Valley Med. Center, Farrell, PA. Net, Thur. 9 p.m. on 147.75/15 W3LIF, Digi. 145.010.

RF Hill Amateur Radio Club. Meets last Thurs./monthly, 7:30 p.m. at First Federal Savings & Loan of Perkasie, 600 Market St., Perkasie, PA. Nets: Wed. & Sun., 8 p.m. on 144.71 - 147.310.

Warminster Amateur Radio Club, WA3DFU. P.O. Box 113, Warminster, PA 18974. (215) 443-5428. Meets 1st Thurs./monthly, 7:30 p.m., Neshaminy-Warwick Presbyterian Church, Warminster, PA. Net on 147.690/147.090 Wed. 8:30 p.m.

TENNESSEE

Nashville Amateur Radio Club. Meets 3rd Thurs./monthly at Lock 2 Metro Park off Pennington Bend Rd. Grilled hamburgers at 6 p.m., mtg. at 7 p.m. Call Jerry, KK4TV, at 754-2326 for info.

TEXAS

Arlington Amateur Radio Club, (AARC). Meets 3rd Fri./monthly, 7:30 p.m., Arlington Human Resources Bldg., 401 Sanford, Arlington, TX. Talk-in---444.2, 224.8 and 147.14.

Beaumont Amateur Radio Club. Meets last Tues. of each month at the GSU Aud., South and Oxford Streets, Beaumont, TX, 7:30 p.m. Talk-in on 146.16/76 or 146.10/70. Join the fun!

Brazos Valley Amateur Radio Club (B-VARC). P.O. Box 1630, Missouri City, TX 77459. Meets 2nd Thur./monthly, 7:30 p.m., upstairs at Missouri City Fire Station, 1 1/2 miles south of US 90A on FM 2234. Talk-in 145.47, 442.5 rptr.

Sun City Amateur Radio Club. Meets 1st and 3rd Fri./monthly, 7:30 p.m., 3709 Wickham Ave., El Paso, TX. K5WPH 147.240/147.840 Rptr. with remote operation on 220, 440, 6M, and 10M.

VIRGINIA

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

Virginia Beach Amateur Radio Club (VBARC). Open Beach Chapel, 3177 Virginia Beach Blvd., Va. Beach, VA. Meets First Thur./monthly, 7:30 p.m. For info (804) 497-1235.

WASHINGTON

The Mike & Key Amateur Radio Club. Meets 3rd Sat./monthly, 10 a.m. United Good Neighbors Cntr., 305 S. 43rd, Renton, WA. Talk-in on 146.82 rptr.

WEST VIRGINIA

Jackson County Amateur Radio Club. Robert D. Morris, WA8CTO, Sec.-Treas. 308 Edgewood Circle, Ripley, WV 25271. Meets 1st Thur./monthly, 7:30 p.m., United National Bank of Ripley. Net Mon. 9 p.m. on 146.671.07 W8BJNU/R.

Tri-state Amateur Radio Assn. Meets: 3rd Tue./monthly, 7 p.m., Green Valley Vol. Fire Dept., Norwood Rd. & 16th Street Rd., Huntington, WV. ARES net Thur. 9 p.m. on 146.76(-) W8VA/R. Info KB6EHJ (304) 824-5958.

MARS forum

NORM BROOKS, K6FO

The following is a condensed transcript of the remarks made by Vice Admiral Jerry O. Tuttle at the Combined MARS forum at the Dayton Hamvention on April 27.

I'm delighted to be here and honored to speak before the granddaddy of the hamfests, the Dayton Hamvention.

This year, the theme of Armed Forces Day is "Eternal Vigilance the Price of Liberty"—one in which I will cast my remarks.

The United States just won a war, an electronic war. The events from downtown Baghdad became the fantasy of the couch potatoes as the number of TV prisoners mounted. And MARS was there.

During the past nine months, the United States—your military, and MARS has learned a lot. We found the air/land battle doctrine is effective. Many of our weapons systems which had not been battle-tested worked extremely well. And the death of American patriotism had been prematurely reported, and grossly exaggerated, by the nay-sayers. The American people demonstrated a unity and determination in support of our armed forces which had not only resulted in resolve on the part of the military men and women but also reminded the world of the determination of the American spirit when faced with crisis or injustice.

No other country would have attempted Desert Shield, halfway around the world. No other country could have conducted Desert Storm. The United States is clearly the world military power.

Volunteerism—American volunteerism—is no better displayed than by the MARS system. Out of approximately 9,400 MARS volunteers in the three MARS systems, if we were to assume the average volunteer has \$5,000 invested in his station, we could conclude that there is a capital investment of over 47 million dollars bought and maintained by MARS volunteers to provide services to the US military. Additionally, there are annually in excess of over half a million operating hours handling hundreds of thousands of MARSgrams and phone patches. In the Navy/Marine Corps alone, these services are valued at nine million dollars. The three MARS Chiefs will tell you that MARS is one of the best returns on investment of the Department of Defense, and I totally agree.

I do not want to leave you with the impression that MARS just provides morale and welfare services. Its

primary mission is to augment communications of the military services and they do that professionally and with great regularity.

The Fall of 1989 provided the bumper crop of national disasters, with hurricane Hugo and the San Francisco earthquake. MARS operators provided vital communications for the military as well as local government when normal communication systems had been destroyed or severely disrupted. In the early days of Desert Shield, the US Navy ship, *Antares*, a supply ship, went dead in the water well out in the Atlantic. The Coast Guard was having difficulty establishing communications with the US Navy ship, *Joshua Humphrey*, and all were in the same general area. They wanted to have the *Humphrey* go to the aid of the stricken ship. A MARS member heard this difficulty and through the MARS station of the *USS Forrestal*, the carrier in Florida, got word to the *Humphrey* to meet the Coast Guard ship on a MARS frequency. Even then, conditions were not great, so a gent named Warren Hogan, a MARS member in Kentucky, relayed for all those involved for nearly three hours until the *Humphrey* had the *Antares* in sight and the Coast Guard search and rescue aircraft was overhead.

On March 16 of this year the *USS W.S. Simms*, a fast frigate, was about 50 miles east of Guadelupe in the windward passage of the Caribbean when they suffered boiler problems, in fact it was catastrophic. It means that they were without propulsion power or electricity. A MARS operator named Lin Richardson in Rhode Island was working phone patches with several ships when the *Simms* interrupted him and told him that they were in an emergency situation and the only communication was the MARS station being powered by batteries. Lin alerted the Coast Guard and the Commander in Chief Atlantic Fleet Headquarters and during the remainder of the night, along with other MARS members, maintained contact and relay with all those involved until the Coast Guard



Vice Admiral Jerry O. Tuttle spoke at the MARS forum.

cutter *Spencer* arrived, airlifted a generator and fuel to the *Simms* station and took the *Simms* in tow. By this time, a seagoing tug *US Asago* put out from Puerto Rico to take over the tow, and again Lin relayed between *Asago* and *Spencer* to coordinate the rendezvous.

Are Lin and Warren unique in MARS? No way. They are among the most active in our afloat network, but their effort and professional contributions are found throughout the Navy/Marine Corps MARS and I am confident are echoed in the other MARS systems.

Let me tell you something about my job. You are surely aware the military services are experiencing budget reductions. I look at that as a reward for a war won. A fifty year war, if you care. And we deserve to turn this back to the taxpayers. We are gravitating to the poor side of the trough. If we are to continue to provide our great country with an effective and credible military force, we must constantly improve the way we do business and get better with less. I am Navy Director for Space and Electronic Warfare. My area of responsibility spans from trans-oceanic cables to the *Voyager* on the far side of Pluto. My frequency spectrum concerns DC to light. And my systems responsibilities range from satellites in deep elliptical orbits to the line user of the weapons system. My job is ex-

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ceedingly and extremely exciting, causing my joy meter to be fully pegged. I'm approaching my second year on the job. My job is exciting because in the information management arena we are in about the same place the Navy was when they converted from sail to steam, or when the first airplane flew from a ship. Both of these changes affect the way the Navy does business in a way the pioneers could not possibly have imagined. Information management has the same potential to change not only the way our armed forces fight, but also the way they are supported.

Because technology changes so rapidly, we must now think in terms of changes to a system, even before we have taken delivery, and no longer think in terms of a generation of equipment or procedures which remained the same for a number of years. One of the answers is to drive the technology, rather than react to it and it is imperative we change in the military acquisition procedures to allow us to do this. During the Iraqi war we all witnessed a significant advancement in information exchange. While we watched much of the war in real time on television, so too were the tactical commanders, watching what the enemy was doing through a television camera mounted on a small, almost model sized unmanned airplane, launched and recovered from the shore units and aboard the battleships *Wisconsin* and *Missouri*. There were no written words or numbers, and no time-consuming relays. It was instantaneous transport of information from the battlefield into the minds of the commanders for processing and making quick decisions. And folks, that's quick.

MARS operators are learning and incorporating new technology on a continuing basis. A year ago, very little MARSgram traffic was received from ships at sea but, with the introduction of a new protocol and the establishment of electronic mailboxes, stateside traffic has been increasing at an exponential rate. To the MARS members on behalf of a grateful nation, particularly the military, our appreciation and admiration for your magnificent contributions. To those of you who are not MARS members, try it, you'll like it. I thank you for your invitation and hospitality, and for your attention. □

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CAROL KOWALSKI, KA9KZN

Dah-dit-dah-dit, dah-dah-dit-dah; dah-dit-dah-dit, dah-dah-dit-dah; dah-dit-dah-dit, dah-dah-dit-dah . . . The barely audible transmission filled the room. Yet it had that definite rhythm. Was someone calling me? My ears perked up, a slight uneasiness nagged at my soul. There it was again. Dah-dit-dah-dit, dah-dah-dit-dah; dah-dit-dah-dit, dah-dah-dit-dah; 7½ wpm for sure. This time the pitch grew in intensity as the fear grew in my body. Perspiration slightly moistened my arms, my hands, my brow. The large house was otherwise quiet, pitch black in the early morning darkness. The red numerals on my bedside clock indicated that it was 3 a.m. Outside, through the overhead window, thunder rolled at a distance and an occasional lightning failed to fill the sky.

Quietly I tiptoed through the upstairs so as not to awaken the others. Dah-dit-dah-dit, dah-dah-dit-dah; dah-dit-dah-dit, dah-dah-dit-dah; dah-dit-dah-dit, dah-dah-dit-dah. The increasingly loud call lured me from one room to the next, breathlessly seeking the source of the oh, so familiar, CQ.

Naturally, my first thought was that I had accidentally left my transceiver on. But within a minute I surveyed my shack; it was quiet, motionless, all disconnected as it should be. Quickly, carefully, I turned from my shack, satisfied that I had at least remembered to close down my equipment. But then, where was the source of this CQ? Who was calling at 3 a.m.? Piercingly, I again heard that familiar, rhythmic pulsation. How could I answer? Who would I answer? Who was calling? Where was it coming from? A deluge of questions without answers obsessed my mind.

After what seemed to be hours, I stood outside a door; the call was

definitely coming from within. Cautiously I opened the door, half expecting someone or something to pounce upon me. Standing there in the darkness, I listened. My older brother was snoring—loudly, yes, rhythmically, yes, but definitely not the CQ rhythm. Quietly I closed the door; my search began anew.

Down a flight of endless, carpeted stairs, turning a 45 degree angle to the east, I entered the kitchen. A water faucet dripped—drip-dip; drip-dip! Perhaps I had found the source of my CQ, nothing more than a leaking faucet. My anxiety turned to disappointment as I fixed the drip and headed back up the stairs for more sleep before my 7 a.m. alarm commanded me to rise for the day.

I eased my head onto my pillow and pulled my warm blanket over my shoulders. Soon I heard it again. But this time it was different, not the same rhythmic CQ as before, but a more definite QSO. Letters seemed to pour out of the walls—dit-dah-dit: R; dah: T. Slowly at first, but at a regularly increasing rate, they came. I took the pad of paper and pen forever at my bedside, trying to copy. There was a definite call sign—KA9KZN—but after that I could not be certain. Was that dah-dit or dit-dah? A dah-dit-dah or a dit-dah-dit? Horror filled my soul; it was not as easy as I hoped it would be. The letters that I did manage to copy could not be divided into words—how could words be spelled without vowels? I tapped out with my pencil but it was not heeded. The pace quickened. R-S-T-M-N-P-W-Z-D, it must be an Amateur, Extra Class. C-K-T-V-Z-M-P, the letters raced on until it seemed that the entire room shook. I yelled for it to stop, but no audible sounds came forth from my mouth. My voice froze in fear. My panic intensified. Perhaps someone was being held prisoner within these walls, trapped when this house was built, decades ago, possibly frozen at that time to be revived this night, and needed desperately to contact someone on the outside. I must help. Now the north wall of my room took up the beat, moving in and out with the dits and dahs. Seconds later it was joined by the south wall, then by the east wall and ultimately by the west wall. My door slammed to the beat. My pillow joined the ruckus. The corners of my bed raised off the floor, emphasizing the message. The red numerals of my bedside clock faded light, bright, light, bright, light, bright, (please turn to page 75)

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Contest Forum

JOHN F.W. MINKE, N6JM

The Contest forum, always a popular program at the annual Visalia gathering, was moderated by Jack Troster, W6ISQ, president of the Northern California Contest Club. Gathered together for the forum were famous testers Tom Taormina, K5RC, editor of *National Contest Journal*; Bob Wilson, N6TV, forum leader; Bob Cox, K3EST, representing CQ; and three other leading contest types: Fred Laun, K3ZO; Dick Norton, N6AA; and Rusty Epps, W6OAT.

Tom addressed the forum with a short talk, "Contesting in the 90s; the Challenge of Change." He talked of days past and reminisced about early items such as the TO keyer that would revolutionize the hobby. The reaction was that they didn't want one of those, as it would "ruin the hobby." The same reactions applied with the introduction of SSB and the iambic keyer. Now we have the PC, the TS-940 and the Alphas. Technology is changing at an incredible rate and that's what makes it a great hobby.

Panelists were asked for their opinions on several items. The first was the two World Wide DX contests last fall concerning the East German multiplier. The SSB segment of the contests included Y2 as a multiplier as the contest occurred too soon after the Germany unification date. However, it was felt that enough time was allowed for Y2 to count the same as DL for the CW segment. This led to confusion. One week the word was that it would count and the next it wouldn't. Fred was the last polled and answered that he wasn't worried, as he had deleted Y2 from both contests.

The second was the condition of the ARRL DX contests where it was felt that they are "chronically ill" with not much interest anymore. There were no suggestions on how to improve on the contest, however, and the feeling was to not make any changes.

The third item was rather interesting; should there be more barefoot contests? The general feelings were to not allow power limits in the major contests.

Packet racket! Packet radio has found its way into contesting with mixed feelings. Rusty remarked that it was the best thing that ever happened to contesting. Fred had no objections, Dick wasn't too sure, and Bob Cox saw it as just a new tool in a more efficient way of listing information.

Other comments and suggestions were heard. One concern was the recent lack of JAs in the contests. It was

felt that they had worked enough W6s already. Another suggestion was that no CQs should be allowed in ARRL contests. This does not apply to the DX stations. It was felt that only the big gun DX stations would be in there and not the little pistol types.

Finally, there was concern over how to promote more DXpeditions for the contests. It was felt that if their score was allowed to be included in clubs, scores might be an incentive.

As in last year's contest forum, the clubs presented plaques to the top scorers for their efforts in the DX contests, and the Northern California Contest Club in the California QSO

Party. There were many!

The forum ended with Phil Goetz, N6ZZ, presenting the CW Pile-up Contest. Jim Neiger, N6TJ, usually handled this event but could not attend the convention this year. Phil said that there were 125 different calls on the tape. It began with a real easy one, "HC5Z," that everyone should have copied. There was even an "Hola, hola" in there (voice), and it ended with "HC5Z QSO B4." This was not an easy contest, as several calls were run together at different pitch and different speeds, and some were unstable. It was fun just listening, even if you didn't do well. □

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seems that we want to forget one solar cycle when it's done and look forward to the next one, something like "The King is dead; Long Live the King!"

Now let me go on record to say that I'm the exception; I'm collecting memorabilia from solar cycles past. Thus, I'm busy badgering friends for their old copies of ionospheric predictions from the Central Radio Propagation Laboratory. My prize items are a small booklet, "Basic Radio Propagation Predictions for July, 1962," dated April, 1962, as well as a set of instructions for using that kind of prediction material dated August 27, 1947 and a 200-page paperback book, *Ionospheric Radio Propagation*, sold by the US Government Printing Office for \$1.25, dated June 25, 1948.

Historians say it all the time and I believe them; it's amazing what can be learned from such historical documents. For example, Universal Coordinated Time (UTC) had not been invented by '47, perhaps not even Greenwich Mean Time (GMT). Thus, the global predictions in the '47 document were given in terms of Local Time in three zones (E, W and I, with "I" broken into two parts, Afro-European and Pacific).

I was only kidding about UTC and GMT not being invented, but in '47 only four maps of critical frequencies were issued per month, each centered on a different region of the Earth's magnetic field. With the aid of plastic overlays, the user filled in the details using Local Time. That continued until at least '62, with predictions issued three months in advance. But that was in contrast to later practice, say in '65, when twelve global maps were issued with two-hour steps in UTC.

And, by golly, at first glance it would seem that there must have been a lot of polar exploration between '62 and '75 as the ionospheric predictions for July '65 included maps of critical frequencies in the north and south polar regions, even at two hour intervals of UTC! (Just kidding again.) Actually, there was a lot of ionospheric exploration but that started back in '57, during the International Geophysical Year (IGY).

Before that time, the principal countries of the world had their own ionospheric observation programs, though limited largely to locations accessible on a routine basis. That changed with the IGY, but it took a lot of time to digest all the data from more than a hundred vertical sounders scattered around the globe, even on remote islands and isolated sites in the polar regions.

On another subject, you might be interested in knowing how ionospheric jargon has changed in the course of time. Thus, going to my '47 artifact which included work sheets for solving transmission problems, I see first the case of paths 4000 km or less and then (get this) "long-paths" over 4000 km, like Washington, DC to Trieste, Italy. Now when you and I talk about long-path, we really mean LONG-PATH, distances greater than 20,000 km. Maybe that definition hadn't been developed in '47 either. But more than likely, it wasn't relevant to reliable communications and thus was omitted from the discussion.

Going on, an early theme in those old documents was that of Es, the sporadic E-layer. I've even seen a world map for July '43, showing predictions of the approximate percentage of time that sporadic-E reflections were to be expected. My best guess is that sporadic-E really aggravated people then, mainly by its sudden appearance and adverse effects on traffic circuits. During wartime years that information was prepared by the Interservice Radio Propagation Laboratory (IRPL) and, obviously, was classified material.

In any event, such world maps helped rationalize what happened on HF radio paths and being related mainly to meteorological factors, both organized by seasons and geographic coordinates, the worldwide predictions were given in one map for each month, based on Local Time. By way of contrast, the geomagnetic control for the more enduring layers of the ionosphere required a different approach for their prediction, as cited above.

To wind up on Es, I should say that there was nothing about it in the maps in the July '65 "Ionospheric Predictions." Indeed, reading the introduction to that document, I find not a word

Question: in what ways are dancing and DXing similar? I bet you never thought of that one but I did recently. I think it all started when I remembered how I disliked dancing. Part of that is due to the fact that I have "two left feet" and no sense of rhythm. But dancing had its merits; after all, it was the social ritual that got boys and girls together. Also, it had its own medium, music that you could sing in the shower. I suppose saying that really dates me.

In some ways DXing is a ritual too. Indeed, it's a rather complex one with mob scenes, just like the Saturday night dance in the school gym, and elusive contacts, like that shy girl from the other part of town. I could go on drawing more parallels but you know what I mean. And it has its own medium, the ionosphere.

But talking about music, perhaps you've noticed there's a whole industry out there, eager to help people like me re-live those days. Thus, we're bombarded by offers of tapes and cassettes full of "Golden Oldies," sing-alongs to listen to and hum while driving down the road. Not so for the ionosphere. It

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about Es. It looks like people had come to equilibrium on Es. But that applies not just to the West. As you may recall from an earlier article here, my friend Herman, UA3AOW, sent me a booklet of Russian ionospheric predictions for April 1990. That was an expression of glasnost and on looking through it, I find no mention of Es in there either. So in the East, they must have come to equilibrium on Es too.

Now I come to the most powerful aspect of this entire discussion: graphics. I say "powerful," as it dominates all the documents: maps for the F-layer critical frequencies, for the E-layer, for sporadic-E, nomograms, great-circle overlays, etc. Graphics, graphics, graphics! And there are worksheets which feed on those graphic displays. It is all so easy: start with the termini, put on the great-circle overlay to pick a point here and there, find the critical frequencies, and you're in business. Instant communication!

By way of comparison, the section on "Ionospheric Absorption and Sky-Wave Absorption" in *NBS Circular 462*, dated June '48, rated equal space but was much more complicated and, in the final analysis, lost in the shuffle because it was long and tedious. So it's no wonder that our present-day Ama-

teur Radio literature is so full of MUF curves and precious little else on signal strengths. I have to think we're like children staring at the TV; after a while we come to think that what we see time after time is the real world.

Myself, I'd like to change that situation in Amateur Radio, mainly along the lines the Germans follow in their magazine *CQ-DL*. There, you'll recall from an earlier article, propagation predictions are given in terms of signal strengths in S-units (when the band is open) as well as signal/noise ratios. What could be more relevant, I ask you? Don't think that what I say is idle chatter; I'm really working on the idea and have great hopes for the future.

While all that is percolating, however, I have slipped over into a "sing-along" mode, re-living past solar cycles in my life. The one I have concentrated on is Cycle 19, the "mother of all solar cycles," to quote a person of recent notoriety. There, I have used my MAXIMUF propagation program to create displays in color graphics of the F-layer critical frequencies, showing the growth and decay of the ionosphere on a global basis as Cycle 19 evolved.

The growth manifests itself in two ways: the rise in critical frequencies at a given location and the expansion in

size of the area with a given critical frequency. And the decay is just that process but in reverse order. Luckily, with Cycle 19, the decay rate was about half the growth rate; thus great DXing continued through and well beyond Solar Maximum.

Everything considered, that was nothing short of spectacular as Cycle 19 started with a sunspot number of four in '54, went like a shot to a SSN of 201 by '58, and then slowly sagged back to a SSN of 13 by '65. Oh, those were the days for DXing! As the old-timers say, "You could work the world with a quarter-watt and a wet noodle!" So you can understand why I sing and tap my feet to Tommy Dorsey's "The Sunny Side of the Street" while watching the computer go through that one.

Finally, when not running my Cycle 19 disk on the computer, I am thinking about how to get signal strength information on the screen. My friends from Radio Netherlands sent along a program, *Footprint*, which shows just that—a signal strength pattern on the globe out to three hops for a given antenna heading. That was in black and white but I have to think color graphics would be more powerful. And don't forget, color graphics or not, it's still *signal strength* that counts. □

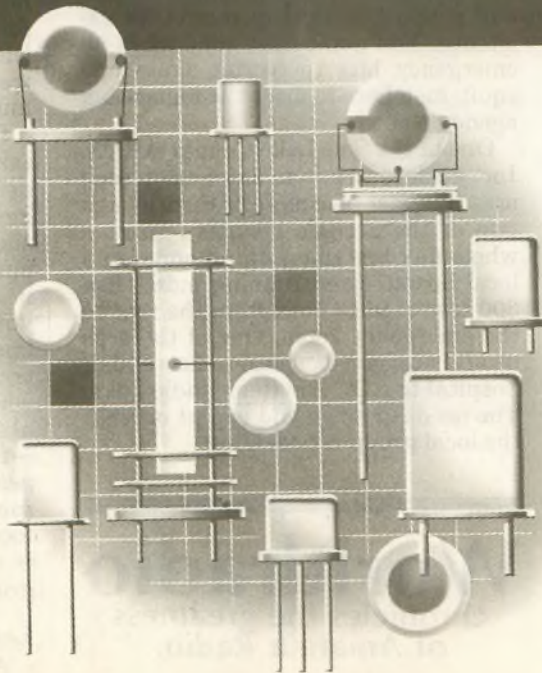
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Wellman's Law of public transportation: "Either you choose who you'll sit by or you're stuck with whoever decides to sit by you." You climb on the bus. There's an empty bench. You sit there. Gee, the bus is filling up fast. Next person on is a heavy smoker who just came from the tavern. Who does he sit by? You guessed it.

Does this apply to search and rescue? You bet! It's in the proficiency level and standards your group embraces. It also encompasses the standards which the sheriff, highway patrol or other agency expect when they call upon your services. In a proactive arena the best choice is that which fits your needs or expectations. On the bus, if you want to avoid the smelly drunk, you'll sit by someone who appeals to you. If the sheriff doesn't care about proficiency when he calls for help, he'll get what shows up. If your group has no proficiency requirements, "you'll get what you get."

Our standards, expectations and behavior relate to our bottom line purpose. Why does our group exist? What community needs (or personal needs) are we here to meet? This is called your "mission statement" and it's critical to your group's survival.

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Mission statements should be specific. Your Amateur Radio group may have a mission statement to provide a pool of licensed radio operators for the county emergency services department, but that in itself can be accomplished with little or no effort. But if you specify that the county wants a pool of 100 trained, self-sustaining, disciplined, self-equipped, licensed communicators who could work 12-hour shifts in the emergency operations center during an emergency, *that's* a mission statement which is based on the *needs* of whoever is going to call upon the group.

Proactive effort

So the mission statement must be a proactive effort—the needs of the potential requesting agency tempered by what we as an Amateur Radio group could realistically supply. It may be a negotiation process where the county wants 100 people and we only have 20. The county may say it's okay to have 35 this year but it needs at least 50 next year. Armed with a fairly specific mission statement, you know what direction you've got to take. Knowing you're going to be in an EOC will now guide you as to what equipment you'll require in each member's grab-and-go kit.

Each member of your group must understand and support the mission statement to meet the requirements. These are the people who will attend training, have grab-and-go kits ready, have equipment with standard connectors, and respond when called. Part of your education (and selection) of new members is ensuring they understand and support the group reason for existence. You don't have time when an emergency hits to recruit, train and equip members to meet the requesting agency's needs.

One of the Salt Lake County ARES, Inc. goals is to put an antenna on each area hospital. A couple of months ago two of the group's members spent a whole day installing an antenna on a local hospital and running more than 300 feet of 9913 coax from the roof to the emergency room. One of the area needs is to have hospital-to-hospital or hospital-to-EOC Amateur Radio links. The need is known and is part of what the local group is providing.

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What would happen if the need were known but the group reacted *after* the emergency hit! Imagine the confusion of installing a good antenna in a hospital immediately after a disaster—it took all day during "normal" conditions. When communications are needed, they're needed *now*, not after a day or two of rounding up coax, antenna, mounting hardware and connectors. The group has the capability now in several major hospitals and each is tested on a regular basis. The Amateur Radio operators know how to connect to the antenna, the hospital staff get to know the Amateur Radio capabilities and local coverage areas are explored.

Having a mission statement also means you must teach it to your members. Take some time to find (or develop) your group's mission statement. Now spread the word to members and potential requesting agencies. At your next meeting spend time getting everyone up to speed about why your group exists. There is no better glue for a volunteer public service group than having members fully support the mission statement. They will be motivated and inventive. They'll also be better prepared to respond when needed.

Existing groups

Ask members of a group that's been around awhile (Amateur Radio, Civil Air Patrol, Mountain Rescue, etc.) why they joined and you'll often get a very general reason ("I'm here to save people") or a lot of personally defined reasons. Often these reasons have no relation to why the group exists. (Are we a flying club that goes on search missions or a trained search team that flies? Are we a communications outfit that might be able to respond or a trained group that could provide communications with 30 minutes' notice?)

Often a normal filtering process takes place with changes in club presidents, state or region commanders or key members moving away. If the mission statement is a verbal one or not out in front it becomes cloudy. Maybe it is not made important and then you'll see all sorts of non-productive busy-work happening. There will be training sessions at random or only when there's nothing else to do. You'll also experience crisis conferences—those meetings when nothing is happening because the effort is so unfocused. Having a solid purpose focuses your efforts. Regular training is scheduled in support of what the group does.

Leader lip service

Another non-motivator is leader lip service but no action. "Yes, communications people are important."

(But we'll alert pilots and observers and just hope communications shows up for the next search mission.) "Yes, we need trained operators!" (But if you have a pilot's license you're exempt from communications training.) "Yes, we need good equipment for a field response!" (As long as it is in the airplanes and not in ground vehicles or our command post.) You get the idea.

What is important to the group's leaders is communicated loudly to members not by word but by deed. If the group's leaders are into the pomp and circumstance of just being in charge, you can bet they'll attract members of the same caliber. If they're leading the group because they're into public service, they will attract members willing and ready to respond. How do you measure up? Ask the person in the mirror. (Want to shake up your commander? Ask for a copy of the group's mission statement and have the commander explain it without reading it first.)

Random thoughts

If you're involved in providing communications, a great book is the *ARRL Special Events Communications Manual*. Get it, read it, learn from it!

Civil Air Patrol celebrates its 50th anniversary December 1. I remember doing newspaper layouts for the 30th and 40th anniversaries and would be remiss not saluting many members (and friends) who keep at it—often without much recognition. (It may not be easy but it's worth it!)

I enjoyed reading Bob Boyd's, VE3SV, ARES column in the *Canadian Amateur Radio Magazine* and reading the *Communicator* from the Mountain Amateur Radio Club in Colorado. Best newsletter I have received in a long time was *Rumor Control* from Michigan (CAP) Wing Headquarters. There was a wealth of information and lots of "rumor control" by putting out timely and accurate information for Michigan CAP members. Good Job!

I sure enjoy your letters and comments, and I enjoy corresponding back. Best comment came from John Alexander, W8GZF, who said I struck a tender spot in the April column. He said, "You must be a member of our group—otherwise, how would you know so much about the quirks of our people!" John went on to say: "There are times I wonder if it is all worth it, but then, there is always the personal satisfaction gained from working with dedicated people."

How true! It's the folks with a good grip on what we're doing and why who make the effort fun and rewarding. Keep it up and use Amateur Radio to help others—it's a great way to get a healthy high! □

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Necessity is the mother of invention and this statement is especially true when dealing with the Ten-Tec Argonaut series of QRP transceivers. I have had a long-time love/hate relationship with the venerable "Argo." Having owned three 509s and two 515s I can speak with some authority as to their ruggedness and their need to be modified in order to function as originally intended.

Without a doubt the cute little Argo is one of the cornerstone rigs of low power operation. Unfortunately Ten-Tec was unable to "get it right" on three successive models of this transceiver. The Argonaut is an SSB/CW transceiver that features full QSK (break-in) keying and is a real joy to use on CW. However, poor receiver performance renders the receiver section in dire need of modification. The transmitter puts out a very clean signal and about the only mod needed is the addition of a Curtis Keyer chip (8044) inside the rig and replacement of the key jack with a stereo (tip-ring-sleeve jack) for the paddle input. The mods discussed in this article will consist of the following:

1. Replacement of the MPF 132 RF amplifier with a 3N211 MOSFET;
2. Installation of RF attenuators on the receiver input;
3. Replacement of the IF filter with an eight-pole crystal filter;
4. Addition of an active AF filter inside the receiver;
5. Addition of a crystal calibrator inside the receiver;

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6. Replacement of the antenna connector with an SO-239 or BNC:

7. Addition of the Curtis 8044 keyer chip inside the radio.

Receiver sensitivity is fair on the Argonaut 509 but downright poor on both model 515s that I've owned. Replacing the RF front end device (an MPF-132 on the front end board) in the Argo with a hot 3N211 MOSFET will cure this problem. The 3N211 has a much better noise figure, higher gain and is diode protected on the input. In order to replace the existing RF front end device the RF front end assembly section must be disassembled and the RF front end board lifted partially out to get at the MPF 132 and de-solder it. The new 3N211 is popped right into the existing holes (all dual gate MOSFETs have the same pin-out) and soldered into place. This is a tedious mod, so work carefully and take your time. Once installed, follow the instructions in the Argonaut manual for retuning the RF front end.

It is absolutely amazing what 10dB and 20dB attenuators can do on a crowded band like 40M. Unusually high signal levels can actually degrade receiver performance dramatically. Attenuation of these signals will allow the receiver to perform very well under crowded band conditions and restore a bit of dynamic range to the receiver. Figure 1 shows the back side of the left hand end panel with the 10 and 20dB pads in place. Two small pi-network at-

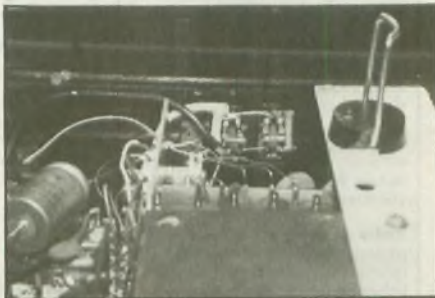


Fig. 1: 10dB and 20dB RF attenuators glued to the left end panel of an Argonaut 509. Using data from the *ARRL Handbook*, these pads keep a constant 50 ohm impedance at the input to the receiver RF section.

tenuators (one 10dB and the other 20dB) are constructed on the back side of two small slide switches using formulas in the current *ARRL Handbook* (Ch. 25, p. 25-38 in the 1991 edition). These switches are mounted on either

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end panel of your Argo (I chose the left end panel as it is closer to the RF front end board). DaTak press-on lettering is used to label the end panel. The pads are placed in the receive antenna line coming from the control board on the top side of the Argo chassis. The RG-174 coax run between the control board (top of chassis) and the RF board (bottom side of chassis) must be replaced to accommodate this mod. The mod requires lifting several boards off of the chassis to re-route the coax. Again, take your time and work carefully. The pads will allow the Argo to function well in a large signal environment while permitting the S-meter to function normally with full AGC action.

Ten-Tec offers an eight-pole crystal filter replacement (including instructions) for the Argonaut 509 and 515. As of last check this replacement filter was approximately \$70 ordered directly from Ten-Tec. This is a de-solder and drop-in mod, so details won't be covered here. The combination of this mod and the addition of the 10 and 20dB pads make the Argo receiver a very respectable performer.

Ten-Tec had a real desire to sell add-on boxes for their Argonaut series transceivers. They offered two different active AF filters, a crystal calibrator, antenna tuner and an RF power meter. If you ever took this mess into the bush for a weekend camping trip, you got a real feel for the obvious: Ten-Tec should have included these options *inside* the Argo case.

Addition of an active AF filter is pretty straight forward. The Ten-Tec add-on box (AF Filter model 208) was designed to connect to the rig via a rear panel accessory connector which placed the filter right in the AGC loop, where it belongs. There are loads of good two and three-pole AF filters (mainly for CW use) in *QST*, *CQ*, *73* and the *QRP Quarterly*. Pick one that will fit (try to keep the dimensions about 2x3 inches or smaller) and wire it into

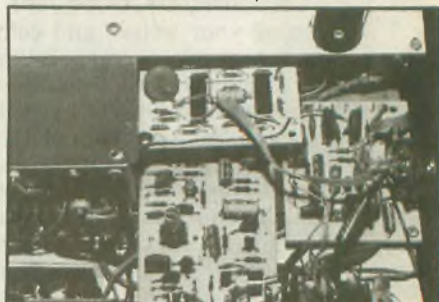


Fig. 2: The active audio filter board is shown at the top center of the photo. The four-position rotary switch which selects the AF bandwidth is located on the right end panel. In/output, Vcc and ground are picked up from the rear panel accessory jack.

the AGC loop using the accessory socket on the back panel. Figure 2 shows the audio filter sitting on the bottom side of the Argo, bolted to the VFO housing. Cable for switching filter poles is routed to the right end panel and a four-position rotary switch selects the proper filtration. The Argo manual provides excellent diagrams of the unit. Just connect the filter input to pin 5 (filter Input) and the output of the filter to pin 4 (filter Output) as shown in the manual. Vcc (+12VDC) is picked off of the center pin on the accessory socket and pin 1 is ground. All that is left is to route the AF bandwidth switch to a nearby end panel, cut a hole, mount the switch and use the DaTak press-on lettering to label the filter positions.

A crystal calibrator is an absolute necessity with any version of the Argonaut. VFO tuning calibration shifts several kHz between bands, and on 10M (with models 505 and 509) the tuning ratio increases by a factor of four. Each dial revolution on 80 to 15M equals 25 kHz. On 10M each dial revolution equals 100 kHz! The calibrator I used was an old MFJ crystal calibrator that I picked up at a flea market. The box was discarded and the calibrator board was placed inside the Argo on the top side of the chassis, just above the control board assembly and held in place by a standoff glued to the board; +8 VDC and ground were picked off of the control board pins and an ON/OFF switch was mounted on the left end panel near the RF attenuator pads. Calibrator output was coupled to the attenuator coax going to the RF front end section. Figure 3 shows the crystal calibrator in place above the



Fig. 3: The de-boxed MFI crystal calibrator board is shown at the top left; Vcc and ground are taken from the control board which is directly beneath the crystal calibrator. Output is coupled to the RF attenuator coax going to the RF front end board.

control board. Notice the three LEDs glued to the back side of the S/RF meter. These LEDs (green, yellow and red) are controlled by the AF filter switch and give a visual indication of the audio bandwidth selected by the audio filter (ie: green = wide; yellow = narrow; red = extremely narrow). This allows the operator to visually check

the setting of the AF filter switch.

Figure 4 shows the back of the Argo and the replacement of all RCA phono connectors with the proper RF, audio and power connectors. The replace-



Fig. 4: Here's the Argonaut rear panel. Note the antenna jack has been converted to an SO-239. Power connector and key jack have also been modified to replace the standard RCA phono jacks.

ment of the antenna connector merely consists of enlarging the existing hole and putting an SO-239 or BNC chassis connector in place. I absolutely detest the practice of using RAC phono connectors for RF and power connections. They are lousy at RF and exhibit impedance "bumps" that vary with frequency. Getting the proper connector on the RF output will go a long way toward getting maximum RF out of the antenna.

Referring to the *ARRL Handbook*, Ch. 29, p. 29-4 shows a quick and dirty hook up for the famous Curtis 8044 keyer-on-a-chip. This is an ideal chip for use in the Argo. It can be powered from the regulated 9 VDC source inside the radio. Connections are straight forward with the normal keying jack replaced by a stereo jack wired for dot and dash paddle contacts. Output is taken (via a keying transistor and/or relay combo) to the keying line inside the Argo. Another possibility is the Super CMOS memory keyer detailed in the Nov. '90 issue of *QST*. This is a one-chip contest keyer that uses digital input from the paddles to control all func-

tions of the keyer including speed, tune-up, sidetone, etc. Either keyer can be mounted on the underside of the chassis and wired into the necessary voltages.

Figure 5 shows the front view of my last Argonaut 509. Note the AF filter switch on the right end panel and the new knobs (available from Radio Shack). While the mods contained herein provide some real improvement in operating, you obviously do not need to undertake them all. If I had a choice



Fig. 5: Here's the finished product—a highly modified Argonaut 509 that will hold its own in a contest or ragchewing on 40M.

and could only do one or two of these mods, I would definitely perform the IF filter replacement and the AF filter mod. These two are the biggest bang for the buck. Till next time, 73s es gud DX. □

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10-10 INTERNATIONAL News

Chuck Imsande, W6YLJ
10-10 19636

Expanded 10M phone is dead

In the July and August 1990 columns I reported that a Petition for Rule Making had been submitted to the FCC requesting that the rules for the 10M band be revised to permit all classes of licenses to operate in the phone portion of 28.300 to 29.300 MHz. This proposal would have allowed Novice and Technician Class licensees to operate over the entire frequency range noted above rather than 28.300 to 28.500 MHz as is now authorized.

After due consideration, the FCC has released their ruling on the Petition—against the subject change. The FCC decision stated, in part, the following:

"The Commission's rules for the Amateur service are designed to encourage and improve the service by providing for advancing skills in both the technical and communications phases of the radio art. Additional frequency privileges represent a significant part of the incentives that the Commission's rules offer licensees to upgrade to a higher license class, thereby demonstrating that the licensees have advanced their skill in the radio art.

"In 1986, the Commission proposed authorizing Novice and Technician Class control operators analog emission privileges in the frequency segment 28.300 to 28.500 MHz. Although more than 80 percent of those filing comments supported this proposal, the commenters expressed great concern that excessive privileges could effectively diminish the incentive for Novice Class operators to upgrade to a higher license class. The rules must strike the correct balance between the privileges of each class of operator license while still providing a strong incentive for licensees to further their level of skill and knowledge. For this reason, the present segment was determined to be the proper analog privileges for Novice and Technician Class operators in the HF spectrum."

In order to accommodate the large influx of operators in the Novice and Technician portion of the 10M band, 10-10 has aggressively encouraged 10-10 chapters to hold net meetings in

the Novice portion of the band. The 10-10 Net itself has an alternate net in the Novice subband every Monday at 1800 UTC on 28.380 MHz with Dusty, K6MPN, as net control. The 10-10 Net manager, Sherm Sherman, K6PTF, has been looking for additional net control stations who are willing to conduct a 10-10 net in the 28.300-28.500 MHz subband on other days of the week in order to make the 10-10 International Daily Net available to a larger segment of the membership. If you would be interested in becoming a net control station and are willing to commit a couple of hours one day each week (never on Sunday) write to Sherm Sherman, K6PTF, 179 N. Sunkist Ave., West Covina, CA 91790 for information about the requirements of becoming a 10-10 net control station. If you have one day a week, except Monday which already has an "alternate net," how about getting yourself involved? Remember, 10-10 is interested in supporting our Novice and Technician members.

New VP-WAS Award

Another new award, the 10-10 VP-WAS Award, has been added. Work a VP member in each of the fifty states and this new award is yours. After many months of research on the *Callbook* by Roy, VE4ROY, 10-10 #42913, to make sure that there is in fact a VP member in each state, the award is a reality. This award will be a real challenge with 57,000 10-10 numbers for the Worked all States Award and 2,400 VP numbers for the new VP-WAS Award. The Worked all States Award has issued almost as many certificates as there are VP numbers issued!

For our new members who are wondering what a "VP Number" is, perhaps this is a good time to review how to obtain a VP number of your

own. Each time you contact 100 10-10 members and send your log information to the 100-900 bar manager you receive a "bar" denoting that you have completed contacts for that bar. When you have completed 500 contacts and received your 500 Bar, you automatically become a member of the International 500 Club and are assigned an Honorary VP Number in addition to your 10-10 number. This now makes you eligible to add VP awards to other 10-10 awards. VP awards are issued for contact with each 100 VP members, the same as the Bar Award, and now you can contact a VP member in each of the 50 states for the new VP-WAS Award. For complete rules and an application for the 10-10 VP-WAS Award, send a business size (#10) to the VP awards manager, Hiram E. Wolf, W4NWP, 125 W. 37th Street, Riviera Beach, FL 33404-2214.

The highest number

Many of you are interested in the highest 10-10 number issued, so here it is: based on Lee Pasewalk's (10-10 records manager) April report, the highest number issued was 59600 on April 30, 1991. This number was issued to N5MMQ. (One special event number above 59600, #61994, has been issued to NY6JUN in Normandy, France.)

At the rate numbers are being issued to new members, another milestone will be reached soon when 10-10 reaches number 60000. As a matter of fact, this may already have happened by the time you read this!

Finally

If you want information about 10-10, send me a \$1, two first class stamps and an address label to 18130 Bromley Street, Tarzana, CA 91356-1701. For a new 10-10 Information Manual, which will not fit into a #10 business size envelope, please send only \$1 plus stamps to cover cost of printing and postage. You will receive the new 10-10 Information Manual and a copy of the latest issue of *The 10-10 International News*, 10-10's official 32 page quarterly magazine. Please include an address label for use in returning your info package. This can be the "return address" label that you use for placing on the upper left of your personal mail or any other address label you have. Believe it or not, many send the address label from *Worldradio*.

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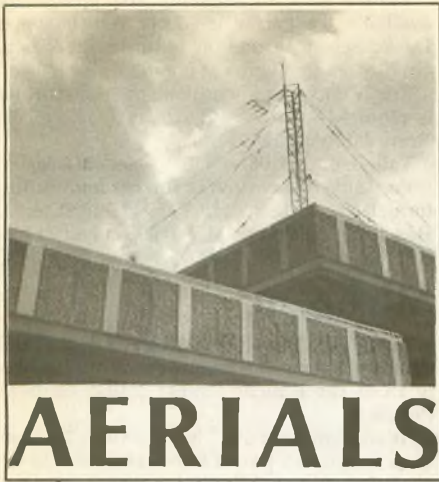
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KURT N. STERBA

It's good to be back. Where have I been? I'll never tell. There's a clue in the picture above, but no one has ever asked what or where that is, so don't ask.

I decided to get Lil a pair of earphones for her keyboard. (That Stravinsky stuff she plays just about drives me whacko. Give me some good ol' boogie-woogie.) Looking at the specifications, I see that one pair claims a frequency response of 20-20,000 Hz. Pretty good, huh?

Wait! It should read 20-20 kHz at some reference like "flat within one dB," or two dB or *something!* Why, with no reference it could be 20-20,000 all right, but down 30 dB at both ends. Who knows? Pretty bum, I'd say. They may fool the hoi polloi but not the astute.

I see magazines and spec sheets doing the same thing. "This here vertical gives 9 dB gain," it says.

Hey, there Bob. Nine dB gain over *what?* A half-wave dipole? A quarter-wave vertical? A rubber duck? A dummy load?

Unfortunately, another obligation prevented me from attending a great convocation of Amateurs. However, some literature was picked up and sent to me.

One antenna manufacturer claims 6 dB gain. Now, who do they think they are talking to? Do they think we all just fell off the turnip truck? What kind of dB, pray tell. dBi? dBd? dBdl?

There's a new book out now—mucho mistakes. You know, I've offered to

read books prior to their being published and point out the errors. (No charge! FREE!) No takers so far. They can just go on embarrassing themselves, then.

To me, books are a precious thing. Books live. Why, 20 or 30 years from now that same bum dope book might end up in someone's hands at a flea market.

There is one new, good book, though—*Practical Antenna Handbook*—which Joseph Carr wrote and TAB printed. On the chapters that I feel qualified to judge, it's very, very good.

While I do books for free, manufac-

turers' flyers are \$100 a pop. That's a lot less expensive than having hams read it with disbelief, as the credibility of the company goes right down the sink. I saw one so grotesque that it was stomach-turning.

OK, you are asking, what does that old grump like?

Butternut. I like Butternut. Budwig. Budwig, real good. And, I've mentioned other good stuff in the recent past.

Thanks to all who wrote.

Kurt N. Sterba, masked man, a man of such elevated tastes that he, many moons ago, enjoyed Spam and chipped beef on toast. □

Program correction

It has come to our attention that there were errors in the mobile antenna pocket computer program presented by C.W. Steart, KD5DL, in the May issue Aerials. He explains:

The program was written in Casio BASIC for their line of pocket computers. Since some earlier models of their computers had very limited memory, I tried several tricks to minimize memory use. In the original trial I had line 70 read:

```
70 I=SQR ((A*1/TAN B)^2-(E*TAN G)^2):
Q=300
```

In later listings I discovered the "...A*1/TAN B..." could be changed to "...A/TAN B..." thus saving a little more memory. When I proofread the copy for the article I missed deleting the "*" sign.

The other error, in line 90, is a missing closed parenthesis ")" sign. Line 90 should read:

```
90 N=I/(2*PI*F)*M: PRINT "Lc=";INT
(100*N)/100; "uH"
```

As to line 60, most BASICs allow using the same variable numerous times in a calculation. If you are experiencing problems here, it may be because my listing uses Casio's degrees mode (MODE 4 in line 10), while most personal computers work in the radian mode.

I also discovered that all of line 100 will not fit on some of the earliest pocket computers. It will, however, if the line number is changed to 95 and all spaces are deleted.

Dimensional units are according to the illustration—diameters are input as inches and lengths as feet.

Several readers have asked about converting the program to other forms of BASIC. As it is, the program solves trigonometric equations in the degree mode, while most personal computers work in radians. For them, the program may be modified by dividing the variables following the trigonometric signs by 57.29577951 (the equivalent of 180/π), and changing "LN" in line 40 to "LOG."

Anyone wanting a listing for IBM-type or Commodore BASIC may send me an SASE for a free listing; C.H. Stewart, KD5DL, P.O. Box 30316, Midwest City, OK 73140. □

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HAMFESTS



Arizona

The AMATEUR RADIO COUNCIL OF ARIZONA will hold their largest hamfest of the year on July 26, 27 and 28 at Fort Tuthill in Flagstaff. Events will include an ARCA meeting, repeater owner meeting, YLRL meeting and a kids' program. VE exams will be given on Saturday.

Tickets are \$2 each or three for \$5. Tailgater fees are \$10 per space and \$5 to camp overnight.

Talk-in on 147.68/147.08 and 447.125/442.125.

For further information contact Clifford E. Hauser, KD6XH, 8741 N. Hollybrook Ave., Tucson, AZ 85741. □

Colorado

The MOUNTAIN AMATEUR RADIO CLUB will sponsor a hamfest on July 13 and 14 at the Red Rocks campground in Pike National Forest, just north of Woodland Park. Features will include dealers, flea market, refreshments, Saturday night cookout and camping in the pines.

Admission is free, but there is a camping fee of \$7.50 with reservations required. There is a selling fee of \$7.50 per tailgate space (no double fee if camping and selling).

For camping reservations or further information, write to MARC, Box 1012, Woodland Park, CO 80866 or call Joe Tafoya, N0CMD, at 719/687-3641 or Bob Whipple, N0FCR, at 719/687-9025. □

Florida

On August 3 and 4, eight Amateur Radio clubs of the greater Jacksonville area will combine efforts to present the 18th annual Greater Jacksonville Amateur Radio and Computer Show at the downtown Prime Osborn Convention Center.

Exhibitor booths, swap tables, forums and group meetings will be featured; FCC exams will be offered, and a Sunday auction is scheduled. There will also be a banquet on Saturday evening.

Doors will be open on Friday from 2 to 7 p.m. and again on Saturday from 7 to 9 a.m. for set-up. They will be open to the general public from 9 a.m. until 5 p.m. on Saturday and until 3 p.m. on Sunday.

Admission is \$5. Swap tables are being reserved now at an advance rate of only \$15 for the weekend.

For advance tickets, send an SASE with payment to Greater Jacksonville Amateur Radio and Computer Show, P.O. Box 10623, Jacksonville, FL 32207. □

Illinois

The HAMFESTERS RADIO CLUB, INC. will hold its 57th annual hamfest and computer festival on Sunday, August 4 at the Will County Fairgrounds in Peotone.

Set-up will be from 6 p.m. to midnight on Saturday. Gates will open to the public at 6

a.m. on Sunday, rain or shine.

Donation is \$4 in advance or \$5 at the gate; children under 12 enter free.

Talk-in on 146.52-146.76 (tone).

For reservations or further information, contact David Brasel, NF9N, 7528 W. 109th Pl., Worth, IL 60482; 708/448-9432. □

The DU PAGE AMATEUR RADIO CLUB will hold its ninth annual hamfest featuring electronics, computers and ham equipment on Sunday, July 14 at the American Legion Post 80 in Downers Grove.

Set-up for dealers and the fleamarket begins at 6 a.m., and the gates will open to the public at 8 a.m. Tickets are \$3 in advance or \$4 at the gate.

Talk-in on 145.250(-), 224.68(-) and 442.55(+) PL114.8.

For tickets or indoor table reservations, send an SASE to P.O. Box 71, Clarendon Hills, IL 60514 or call Ed Weinstein, WD9AYR, at 708/985-9256. □

Iowa

The DES MOINES RADIO AMATEUR ASSOCIATION will hold its Hamfest 1991 on July 6 from 8 a.m. until 3 p.m. at the Sacred Heart School Gym in West Des Moines.

Set-up will begin at 7 a.m. Indoor tables are available for \$5, and tailgating is free. Admission is \$5.

Talk-in on 146.34/94 W0AK.

For tables or further information contact Mark Chappelle, N0KLLK, 636 40th St., Des Moines, IA 50312; 515/266-6930. □

Maine

The fourth annual Union Hamfest and Computer Fair, sponsored by the MAINE HAMFEST ASSOCIATION INC., will be held at Union Fairgrounds on Saturday, July 20 from 8 a.m. to 2 p.m.

Admission is \$2 for sellers and \$3 for non-sellers. Tailgate set-up begins at 7 a.m. Free parking, refreshments, breakfast and lunch will be available. FCC Amateur VE exams will be given. Camping and RV spaces are available for Friday and Saturday.

For more information contact Rod Scribner, KA1RFD, 19 South Grove Street, Augusta, MN 04330; 207/622-9197. □

Maryland

The BALTIMORE RADIO AMATEUR TELEVISION SOCIETY will sponsor the famous BRATS Maryland Hamfest and Computer Fest on Sunday, July 28 at the Maryland State Fairgrounds in Timonium.



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Tables with or without AC power are available. Tailgating is \$5 per vehicle space. Dealer set-up begins on Saturday at 2 p.m. Sunday set-up begins at 6 a.m.

Free VE exams will be held; pre-registration is required—write to: BARC, P.O. Box 120, Reisterstown, MD 21136.

Talk-in on 147.03/+, 443.4/+ and 224.96/-.

For table reservation or further hamfest information, write to BRATS Hamfest, P.O. Box 5915, Baltimore, MD 21208 or call Franz, N3HFS, at 301/583-9147. □

Michigan

The STRAITS AREA AMATEUR RADIO CLUB will sponsor a hamfest on Saturday, July 13 at the Emmet County Fairgrounds in Petoskey.

Admission is \$2.50. The doors will be open from 8 a.m. to 1 p.m. Tables are available for \$3. RV parking is available on the grounds.

Talk-in on 08-68 or 52.

For reservations or more information, contact Clark Rouse, KA8TIL, at 616/582-6455. □

The AU SABLE VALLEY ARC will sponsor its fourth annual Swap-Shop on Saturday, July 20 at the Mio-AuSable High School in Mio. There will be plenty of free parking.

Doors will open at 7 a.m. for vendors and at 8 a.m. for the general public. Tables are \$4 each; trunk sales: \$2. General admission is \$3 at the door.

Talk-in on 145.35/144.75 or 146.52.

For more information send an SASE to AuSable Valley ARC, P.O. Box 1, Mio, MI 48647 or call 517/826-5549; 848-5996; or 826-6454. □

THE COPPER COUNTRY RADIO AMATEUR ASSOCIATION, INC. located in the northern most part of the Upper Peninsula of Michigan will be hosting the 1991 Upper Peninsula Hamfest on Saturday, August 3 at the Houghton County Arena in Hancock.

A banquet will be held on Saturday evening following the hamfest at the Ramada Inn in Houghton.

For further information please call 906/337-5537 or write to Howard D. Junkin, N8FHF, Copper Country Radio Amateur Assn., P.O. Box 217, Dollar Bay, MI 49922. □

Missouri

The ZERO BEATERS AMATEUR RADIO CLUB will hold its 29th annual hamfest on Sunday, July 21 at Bernie H. Hillerman Park (Washington Fairgrounds) from 6 a.m. to 3 p.m.

There will be food and refreshments, flea market (flea market parking is \$2 a space), VE exams (walk-in basis starting at 10 a.m.), seminars, dealer displays, non-ham displays and free parking.

Admission is free.

Talk-in on 147.240 repeater.

Contact Ed Southall, WD0ELL, Rt. 1 Box 105, New Haven, MO 63068 or call 314/459-6581 for further information. □

Nevada

The SIERRA NEVADA AMATEUR RADIO SOCIETY will sponsor its Hot August Hamfest on August 3 at the site of the Reno National Air Races 10 miles north of Reno.

Admission is \$3. The grounds will be open from 8:30 a.m. to 3 p.m. VE exams will be given at 12 noon, and pre-registration is strongly suggested.

Bring your own tables and chairs. Make overnight reservations early, as the Reno area will also be having their three-day Hot August Nites vintage car celebration.

Talk-in on 146.61- or 147.00-.

For reservations or further information, contact E.J. "Curly" Silva, K7HRW, 3780 Hummingbird Dr., Reno, NV 89506; 702/827-8450. □

North Carolina

The North Carolina chapter of the TRIPLE STATES RADIO AMATEUR CLUB will sponsor the Firecracker Hamfest on July 6 from 8 a.m. to 4 p.m. at the Civic Center in Salisbury.

Tickets are \$3 in advance or \$4 at the door. Tables are available for \$5 (inside, air conditioned). W5YI VE exams will be held at 1:30 p.m.; preregistration is required.

For further information or preregistration, contact Walter Bastow, N4KVF, 3045 Highrock Rd., Gold Hill, NC 28071. □

North Dakota-Manitoba

North Dakota and Manitoba's biggest and best hamfest will be held at the Peace Garden on the US/Canadian border, North Dakota and Manitoba, on July 12, 13 and 14. This is the 28th annual hamfest.

Registration will start on the afternoon of July 12.

Lots of activities are planned such as transmitter hunts, mobile judging, a giant outdoor flea market, dance, bingo for the ladies and games for the kids. There will also be a breakfast for all on Sunday morning. A special event station operating under the call of VE4IHF/O will be on the air on Friday and Saturday.

It will be a great weekend for camping and hamming. For further information, contact John A. Swanke, KA0SLI, Box 304, Lakota, ND 58344. □

Ohio

The WOOD COUNTY ARC will sponsor its 1991 Ham-A-Rama at the Wood County Fairgrounds in northwest Bowling Green.

Doors will open at 8 a.m. Tickets are \$4 in advance or \$5 at the door. Tables are \$10.

Talk-in on 147.78/18 K8TIH. For tables or further information, contact Bob Fyfe, KA8YWQ, at 419/352-3260. □

The ASHTABULA COUNTY AMATEUR RADIO CLUB announces the Ashtabula

County Hamfest and Computer Show to be held this year on July 21 from 8 a.m. to 3 p.m. at the Ashtabula Branch of Kent State University.

Admission is \$3.50 in advance or \$4 at the door. There is plenty of indoor space for vendors in the air conditioned building and a large paved flea market area. There will be many prizes, food services and overnight parking available. Flea market spaces are \$4 and indoor 8 ft. tables are \$8 for the first one; extras are \$6. Advanced reservations are requested for tables.

Talk-in will be on the county repeater on 146.715.

For more information and reservations, contact Ken Stenback, AI8S, 722 Lyndon Ave., Ashtabula, OH 44004 or call 216/964-7316 from 9 a.m. to 9 p.m. □

The 18th Annual Ham Holiday 1991 and ARRL Convention, sponsored by CENTRAL OKLAHOMA RADIO AMATEURS, will be held on July 27 and 28 in the Hobbies, Arts & Crafts Building at the Oklahoma State Fair Park in Oklahoma City.

Doors open at 8 a.m. both days. Features include technical and non-technical programs, new and used equipment dealers, flea market, VE exams both days, Saturday evening banquet (tickets \$8.50), AMSAT, OKDX, QRP and National Weather Service forums, ORSI meeting, hourly drawings and major prizes, including a scholarship fund prize.

Admission is \$6 in advance or \$8 at the door. Tables are \$5 in advance or \$7 at the door.

Talk-in on 147.03/63 and 444.20/449.20; PL is 141.3.

Send registration to CORA Ham Holiday 1991, P.O. Box 95942, Oklahoma City, OK 73143-5942. □

Oregon

The COOS COUNTY RADIO CLUB will be presenting their first annual Swapfest on July 27 at the North Bend Jr. High School in North Bend. Features will include free RV parking, VE exams, dealer sales and door prizes.

Admission is \$5 at the door or \$4 in advance. Tables (8 ft. X 30 in.) can be reserved for \$15.

Talk-in on 146.01/61 or 146.52.
For further information call 503/888-2317 or write to the CCRC, P.O. Box 3494, Coos Bay, OR 97420. □

Pennsylvania

The HARRISBURG RADIO AMATEUR CLUB will sponsor a hamfest on July 4 at the

Bressler Picnic Grounds in Harrisburg.

Admission is \$3. Tailgating is \$3, or tables can be reserved in the pavillion for \$10 in advance or \$12 on Thursday. No on-site overnight camping will be allowed. There are local campgrounds and motels nearby.

Talk-in on 147.30/90 and 52/52.

For further information or reservations, contact Dave Dormer, KC3MG, at 717/939-4957 or write to Richard Kerlin, K34M, 635 Lenker Rd., Harrisburg, PA 17111. □

The NORTH HILLS AMATEUR RADIO CLUB of Pittsburgh will hold its sixth annual hamfest on July 7 from 8 a.m. until 3 p.m. at the Northland Public Library.

Admission is free, and there will be free outside tailgating (one space per vendor). A limited number of indoor tables are available for \$10 each.

Talk-in on 147.69/09.

For further information or table reservation, contact Bob Ferrey, N3DOK at 412/367-2393 or write to him at 9821 Presidential Dr., Allison Park, PA 15101. □

Vermont

The NORTHERN VERMONT MIDSUMMER HAMFEST COMMITTEE will sponsor a hamfest on July 20 from 8 a.m. to 3 p.m. at the South Burlington Middle School.

Admission is \$3. Tables are available. Features will include indoor and outdoor flea markets, forums, demos, dealers, information tables and VE exams.

Talk-in on 145.47/-600 or 146.85/±600.

For further information contact Joe Tymecki, N1DMP, at 802/893-6458 or Tom Taylor, N1EXY at 802/893-4834. □

West Virginia

The WEST VIRGINIA STATE AMATEUR RADIO COUNCIL will sponsor the West Virginia State ARRL Convention on July 6 and 7 at the Jackson's Mill State 4-H Camp near Weston.

Doors will open on Friday for dealer set-up from 5:30 to 11 p.m. Flea market tables are free with admission.

Admission is \$5. Features include forums on DX, ARRL, ARES and RACES; a CW contest; and an equipment auction on Saturday evening. VE exams will be given at 8 a.m. on Saturday (pre-registration is required).

Talk-in on 144.79/145.39.

For advance tickets, write to Sue Goodwin, N8JNL, 103 Cleveland Ave., Nitro, WV 25143. For further information, contact Chuck McClain, K8UQY, at 304/366-5401. □

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YL OM SSB Sprint

Sponsored by the Young Ladies Radio League, this contest is open to all licensed men and women throughout the world. This contest will be held on August 6 from 1400 to 1800 UTC.

Procedure: OMs call "CQ-YL" and YLs call "CQ-OM."

Operation: All HF bands may be used. The maximum power output that may be used at any time during the contest is 1500W PEP.

Exchange: Station worked, QSO number given and received, RS or RST given and received and ARRL section/province/country. Entries in log must also show time, band, date and transmitter power.

Scoring: YLs may count only OMs and OMs may count only YLs for QSO points. A) A station may be worked once on each band. For each band count the number of different stations worked. Add the QSO points for each band together for the total QSO points; B) *Alpha-numeric multiplier:* Using the last number and the first letter following that

number of a call sign, there are a total of 200 possible combinations (i.e.: W2GLB/7 is a 1X; W2GLB/7 is a 2G; 9Y4A is a 4A, etc.). Add the number of different alpha-numeric combinations worked on each band. Add the total for each band together for your alpha-numeric multiplier; C) Low power contestants may multiply the results by 1.5 low-power multiplier; D) Total score is the total QSL points times the alpha-numeric multiplier times low-power multiplier.

Awards: Certificates will be awarded to the three highest scoring OMs and YLs. The top scoring YL and OM from each district/province/country will also receive certificates, providing there are at least 10 valid contacts.

Suggested frequencies: CW—80M—3.540 to 3.570; 40M—7.040 to 7.070; 20M—14.040 to 14.070; 15M—21.120 to 21.150; 10M—28.180 to 28.210. SSB—80M—3.940 to 3.970; 40M—7.240 to 7.270; 20M—14.250 to 14.280; 15M—21.380 to 21.410; 10M—28.380 to 28.410 MHz.

Note: Since band allocations in other countries are often different than the United States, North American operators should look for DX contacts in other parts of the bands, especially on 40 and 80M.

Logs: All logs must show claimed score. File separate logs for each contest. If you have 200 or more QSOs, submit a separate log for each band and submit a "dupe sheet." Please type or print. Do *not* send carbon copies of logs. Logs must be signed and no logs will be returned. Mail logs to YLRL Vice President Dana Tramba, NØFQY, RR 1, Box 213, Peck, KS 67120. □

County hunters forum

(continued from page 45)

"Andy" Andersen, W3XE, explained how the CW county hunters operate. "We do things a little differently," he said, "and here are some of the differences: first, we talk with our fingers!" The net frequency is 14.076.4 ± MHz. It is important to be exactly on the net frequency. They operate with or without a net control station. The NCS asks for mobiles ready to run, the mobile gives his call, and proceeds to make contacts. When there are more than one mobile station, they QSY up or down or wait for a turn on the net frequency. There is no time

limit; they make contacts until they run out of people. If a county is "rare" it is popular, and the mobile will be able to make calls for 20 minutes or so. CW counties hunters are different in that, if they already have a county, they will *not* call a mobile there. It helps if you know the ARRL "QN" signals, as they are used a lot. For example, QNI means, "I am checking into the net," while QNI? means, "Who is checking into the net?" All this is found in ARRL's Operating Aid #6.

If you are interested in county hunting, you are urged to send an SASE to MARAC, Box 64, Newport, MN 55055 for information. □

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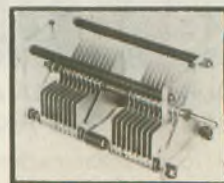
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NEW PRODUCTS

Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

Reflections: Transmission Lines and Antennas

Many hams swear by their SWR. After they read a new ARRL League publication, *Reflections: Transmission Lines and Antennas*, by Walt Maxwell, W2DU, they may swear it off!

This new book debunks popular but erroneous thinking about standing waves, antenna tuners and reflected power. In doing so, it shows how many of us have been wasting our time worrying about achieving a 1:1 SWR.

The first seven chapters are based on the author's *QST* series, "Another Look at Reflections." The remainder of the book presents a wealth of related information on matching networks, antennas and the use of the Smith Chart.

This 384 page hardcover book is available for \$20 from the ARRL, order #2995. A companion 5 1/4-inch diskette is available for use on IBM/R/PCs and compatibles; \$10, ARRL order #3118. When ordering from ARRL, add \$2.50 (\$3.50 for UPS) for shipping and handling. □

Antenna static discharger

Static Busters Inc. introduces their new precipitation/corona static device. The AS-1, designed by The Truax Company, is a static discharge wick. It will provide a path for electrons or static charge dissipation on towers and antennas of all types. It will significantly reduce or eliminate corona noise and precipitation static, thereby reducing the undesired electrical noise that results in receiver desensitization. During p-static or corona charging

conditions, the discharger can improve the noise level up to 20-30 dB or more, depending on the frequency.

This is the same type device that has been used by the aircraft industry for years to minimize electrostatic interference to airborne and ground station equipment. The only difference is that this model has been optimized for antennas to insure no detuning of the antenna even if element mounted. The discharger is maintenance free and requires only a single 1/8 inch hole for mounting.

The AS-1 discharger is priced at \$12.95 (plus \$1 shipping and handling). For more information or to place an order, contact Static Busters Inc., 3535 Shepherdsville Rd., Elizabethtown, KY 42701; 502/769-2244. Quantity discounts and dealer pricing is available. □

Natural voice recorder

QRZ Industries announces the availability of the VB-8A natural voice recorder as a fully assembled kit in a desktop enclosure with RFI/EMI protection. The VB-8A can digitize and store up to 16 dynamically allocated messages or phrases in stand-alone mode, or 100 messages in a computer controlled "template" mode. A message can be as long as the total message allocation of 100 seconds. Using a 40 kHz digitizing rate and



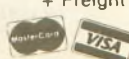
14 orders of audio filtering, the VB-8A provides crisp, clean audio to both a 600 ohm balanced output and an 8 ohm monitor output. A built-in keypad controls the VB-8A in stand-alone mode, or a computer can optionally control the VB-8A via a built-in RS-232 serial port using simple ASCII character commands (baud rates are selectable from 300 to 57,600 baud). A list of valid keypad commands broken into logical groups is silkscreened on the front sloping face of the enclosure.

Completely microprocessor controlled, the



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S & S Fabrication Inc. P.O. Box 891
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1-800-433-5842 9-5 CST Monday-Friday!

VB-8A features an auto-incrementing serial number (also using the user's voice), one-touch message playback, dual message banks, selectable voice trigger during recording, individually selectable auto-repeat control for each of the 16 dynamically allocated messages (with variable pause between playbacks), "look-ahead" capability to select the next playback message while another message is still playing, voice data download/upload capability to/from a computer, a beacon/voice ID mode with up to 60 minutes between beacon playbacks, selectable PTT/VOX operation, four auxiliary audio inputs for monitoring multiple receivers, DX alert nets or a spotter microphone, positive or negative PTT output keying and 14 LEDs showing individual message playback and other status information.

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The VB-8A requires a 12 Volt dc supply and can be powered directly from transceivers that have an auxiliary 12 Volt dc output or a dc wall pack. If main power is accidentally lost, a watchdog system switches the VB-8A to a low power standby mode using a backup battery (built into the desktop enclosure) until main power is restored, preserving all messages, current operating modes and settings. The back panel uses standard connectors for the microphone, audio output, auxiliary audio inputs, monitor output, auxiliary PTT input (for a foot-switch), and RS-232 connection (for optional computer control).

The introductory price of the fully assembled desktop enclosure kit (which is tested and burned-in) is \$375, which includes a full memory configuration and an audio/PTT output cable for any standard Amateur transceiver (specify make and model). Factory assembled VB-8a kits are backed with a 30-day money back guarantee and a one-year warranty. To order or request more information, contact the Micro Shop Inc., 220 South Main St., Maudlin, South Carolina 29662 or call 803/234-5371. □

Preamplifier

The WBA1500, introduced by IDC Communications, is a wide band mast mounted RF preamplifier designed to be used with wide-band receivers, scanners or even TVs and stereos to improve performance and make up for long antenna cable runs.



The WBA1500 covers 2 MHz through 1.5 GHz. A bench type version, WBA1500B, is also available for frequency counters, oscilloscopes, spectrum analyzers and related test equipment. The WBA1500 system comes complete with amplifier module, DC supply module and AC adapter. The WBA1500 comes standard with BNC connectors, but "F" type jacks are available.

The WBA1500 utilizes a state of the art low

noise MMIC for the amplifier device along with surface mount devices and strip line circuitry to yield an amplifier with wide bandwidth, high gain and low noise figure.

The WBA1500 sells for \$77.95, and the bench top model, WBA1500B, sells for \$56.95, prepaid. For more information write to IDC Communications, 2745 Winnetka, Ave N., Suite 205W, New Hope MN 55427; 612/888-7456. □

Battery discharger

D'CHARG has revolutionized the maintenance of NiCd batteries.

NiCd batteries cannot be completely recharged unless the battery has been discharged to a low level. If an attempt is made to recharge a partially charged battery, the battery will not receive a full charge. A "short-term" memory is created within the battery, which is the battery telling the battery charger that it is completely charged when it is not. If a battery is continually subjected to these short charges, the lifespan of the battery is reduced dramatically.

It is important to note that a NiCd battery should never be completely discharged. A completely discharged NiCd battery will create a condition known as "cell reversal." Once cell reversal occurs the battery will no longer hold a charge. Protection against cell reversal is a built-in feature of D-CHARG.

D'CHARG discharges NiCd batteries to a very low level charge, thus enabling the battery to be recharged to its full capacity. D'CHARG fits directly onto the battery without the use of any clips, wires or other fixtures. D'CHARG is completely service free.

For further information, write or phone Rost Corporation, 9940 E. Costilla, Ste. L, Englewood, CO 80112; 800/848-6648. □

Great circle map

A great circle map that shows true compass headings and distance for beam positioning is now available from Vector Control Systems.

The map is plotted in four colors and countries are identified by prefix. Plastic laminate adds to the durability of this 22 x 24 inch Great Circle Map, suitable for framing.



The cost is \$35 postpaid and it can be ordered from Vector Control Systems, 1655 No. Mountain Suite 104-45, Upland, CA 91786; 714/985-6250 or FAX 714/985-3482. □

Go ahead — drill that hole!

There was once a feeling that if you drilled a hole in the middle of the roof of your new car, you would decrease its trade-in value. Whether this is true or not is now moot. Modern technology has come to the rescue.

You may now drill the hole and mount the Amateur antenna. Later, when you trade in or sell the car, simply change the antenna to the cheapest cellular car-phone antenna you can find. You now have a car with an extra selling point: your car has the cellular antenna already installed! —Norm, K6FO □

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When will AMSAT-OSCAR-13 be in range?

ROSS FORBES, WB6GFJ

Those just starting out in the world of OSCAR communications would like to know when they can hear a satellite. The following charts are produced to give you a rough idea as to when OSCAR-13 will be within range of your location. The three charts as printed are centered on the following geographic locations: East = New York City; Mid = St. Louis, MO; West = Reno, NV.

As you read the chart nearest your location,

keep in mind the following details — all dates and times are given in UTC. The date is printed on the left hand column and the UTC hour along the top.

A dash mark indicates the satellite is out of range and therefore not able to be heard. The letter "B" indicates OSCAR-13 is audible at that location and signals should be heard between 145.810 and 145.880 MHz (SSB and CW). A letter "O" indicates the satellite is audible, but the only signal you will hear is the

telemetry beacon on 145.810 MHz. The letter "L" indicates the satellite is audible but you will hear signals between 435.650 and 436.000 MHz (SSB and CW).

Remember, if a letter is printed on the chart, you should be able to hear OSCAR-13.

For more information about OSCAR, please send a SASE to either of the following: Project OSCAR, P.O. Box 1136, Los Altos, CA 94023-1136; AMSAT-NA, P.O. Box 27, Washington, D.C. 20044. □

Station East	HOUR - UTC																								
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
8/01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/02	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/03	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/04	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/05	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/06	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/07	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/08	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/09	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/13	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/23	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/24	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Station 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
8/16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/23	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/24	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Station West	HOUR - LOCAL																								
	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
8/01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/02	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/03	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/04	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/05	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/06	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/07	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/08	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/09	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/12	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/13	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/23	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/24	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8/25	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8/31	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Station Mid

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Worldradio, 2120 28th St., Sacramento, CA 95818.

Please mark the envelope "VE Exams."

List the location, any information examinees should have (advance registration, etc.) and the name and telephone number of a person to contact for further information.

p/r=pre-register

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Date	City	Contact	Notes	Date	City	Contact	Notes
Arizona				Missouri			
Aug. 3	Tucson	K7OPX (602) 886-7217	w/i only	Aug. 31	Antonia	Jim WD0GDY (314) 671-4243	no w/i
California				Aug. 8	Granite City	Larry NZ0P (314) 524-3254	w/i OK
Aug. 3	Burbank	KE6AR (818) 349-0927	w/i	Aug. 3	Kimberling City	NQ0G (417) 739-2888	w/i
Aug. 10	Camarillo	N6SR (805) 484-4461	p/r pref; w/i OK	Aug. 25	St. Charles	Eric NF0Q (314) 946-0948	w/i only
Aug. 31	Carson	AA6TC (213) 830-0242	w/i OK	Nevada			
Aug. 24	Chula Vista	(619) 465-EXAM	p/r by 8/14	Aug. 17	Reno	K7HRW (702) 827-8450 day, or (702) 972-3933 night	p/r 30 days prior, w/i OK
Aug. 3	Concord	Gene (415) 254-5090	w/i only	New Jersey			
Aug. 3	El Cajon	(619) 465-EXAM	p/r by 7/24	Aug. 17	Bayonne	WA2QYX (201) 451-9471	w/i OK
Aug. 31	Escondido	KB6WB (619) 465-EXAM	p/r by 8/21	Aug. 15	Bellmawr	WA2VQG (609) 546-7710	w/i
Aug. 31	Fairfield	Jerry (916) 662-0801	w/i only	Aug. 10	Cranford	N2XJ (201) 635-7686	
Aug. 15	Fountain Valley	KI6WK (714) 846-6984	p/r	Aug. 14	Fort Monmouth	WB2YS (908) 532-5353	w/i
Aug. 29	Long Beach	KA6HOQ (714) 897-6331	w/i OK	Aug. 5	Sayreville	K2FD (201) 442-9215	w/i
Aug. 18	Porterville	Pat (209) 539-2429	w/i	July 13	West Trenton	Don Wright (609) 737-1723	
Aug. 17	Redwood City	Dudley (408) 245-4801	w/i only	New Mexico			
Aug. 17	San Diego	KB6WB (619) 465-EXAM	p/r by 8/7	Aug. 31	Alamogordo	WA5IPS (505) 437-5896	w/i
Aug. 3	San Dimas	K6THQ (714) 596-9383	p/r 1 week prior	Sept. 1	Alamogordo	WA5IPS (505) 437-5896	w/i
Aug. 17	San Dimas	K6THQ (714) 596-9383	p/r 1 week prior	New York			
Aug. 10	San Marcos	(619) 465-EXAM	p/r by 7/31	Aug. 10	Greenvale	WA2BGE (516) 921-0085	w/i OK
Aug. 10	San Pedro	N6DYZ (213) 325-2965	w/i OK	Aug. 25	North Babylon	KA2RGI (516) 957-0218	w/i OK
Aug. 10	Santa Maria	KI6XG (805) 922-8509	w/i OK	Aug. 4	Yonkers	AC2V (914) 237-5589	w/i OK
July 6	Sonoma	Darrel Jones WD6BOR (707) 996-4494	w/i	Ohio			
Aug. 17	Stockton	Vern K6DOP (209) 887-3297	w/i	Aug. 31	Canton	WB8UVN (216) 453-5896	
Colorado				Aug. 3	Cincinnati	Herb WA8PBW (513) 891-7556	p/r pref.; w/i OK
Aug. 12	Boulder	N0BWS (303) 530-2903	p/r pref.; w/i OK	Aug. 24	Fremont	W4SIG (419) 332-2473	
Aug. 10	Denver	W0IJR (303) 366-9689	w/i OK	Aug. 4	Marion	WS8S (614) 499-3565	
Aug. 17	Westminster	N0CFM (303) 451-1231; N0HNR (303) 278-4280	p/r or w/i	Aug. 3	Mentor	Scott KD8O (216) 256-0320	
Connecticut				Aug. 3	North Olmstead	Dan KB8A (216) 267-5083	
Aug. 17	Gales Ferry	Walter (203) 442-2206	w/i	Aug. 10	Toledo	NC8M (419) 825-3423	
Aug. 25	Milford	NB1M (203) 933-5125; WA1YQE (203) 874-1014	w/i	Oregon			
Aug. 28	Shelton	WJ1T (203) 736-0488	w/i pref.	Aug. 10	Bend	N7DDS (503) 549-9480	p/r or w/i
Idaho				Aug. 10	Portland	WT7S (503) 760-7545	no p/r
Aug. 10	Boise	W7JMH (208) 343-9153	w/i	Pennsylvania			
Illinois				Aug. 3	Erie	W3CG (814) 665-9124	w/i
Aug. 10	Belleville	John Sundstrom WA0LIS (618) 397-7235	w/i	Aug. 5	Pennsburg	K3ZXQ (215) 679-5764	
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Aug. 17	Morton	NT9C (309) 266-6756	w/i OK	Tennessee			
Aug. 10	Oak Forest	KA9HDN (312) 247-0650	w/i	Aug. 3	Memphis	Harry W4MI (901) 357-8148	p/r by 8/1/91
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Aug. 4	Terre Haute	K9EBK (812) 466-2122	w/i OK	Aug. 10	Midland	KT5G (915) 694-9450	w/i OK
Iowa				Aug. 31	San Antonio	K5JWK (512) 657-1549	w/i
Aug. 23	Sioux City	NF0N (402) 494-6070	w/ OK	Virginia			
Aug. 24	Council Bluffs	AA0BS (712) 322-1454	w/i OK	Aug. 17	Hampton	N4BDH (804) 487-8611	
Maryland				Aug. 10	Harrisonburg	Marshall N4ZKH (703) 856-8012	
Aug. 10	Laurel	NT3Z (301) 761-7115	w/i	Aug. 3	Middletown	NC4B (703) 869-5241	p/r pref
Aug. 17	Laurel	WB3GXW (301) 572-5124	p/r pref	Washington			
Massachusetts				Aug. 17	Renton	WA7UVJ (206) 854-4031	w/i only
Aug. 5	Boston	WN1U (617) 436-2413	w/i	West Virginia			
Aug. 21	Cambridge	KA1MQX (617) 253-3776	w/i	Aug. 10	Huntington	K8KVVX (304) 736-6542	w/i OK
Aug. 17	Melrose	WB1F (617) 322-7654	w/i OK	Wyoming			
Mississippi				Aug. 3	Jackson	Dan (307) 721-2871	w/i OK
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A shy young man was too timid to ask a father for his daughter's hand, so he telephoned.

“Is it all right for Janet and I to get married?”

“Yes,” replied the father. “Who's calling?” *WVARA, Terre Haute, IN*

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- | | | |
|--|--|---------------------------------------|
| A & A Engineering — 40, 60 | Engineering Systems — 18 | New Dimension QSL — 48 |
| Ace Communications — 32, 33 | Fallert's Engraving — 31 | P.C. Electronics — 12 |
| Alabama Amateur Electronics — 58 | Gem Quad Products — 20 | Palomar Engineers — 6, 20, 24, 35, 66 |
| Alinco — 17 | Gene Hansen Co. — 63 | Pass Publishing — 15 |
| Allband Radio Products — 14 | GGTE Morse Code — 36 | Personal Database — 22 |
| Amateur Radio Bookstore — 59 | Glen Martin Engineering — 63 | QCWA — 10 |
| Ameritron — 29 | Gordon West Radio School — 65 | Radio Engineers — 69 |
| Anne Wright, N6BOP — 35 | Grapevine Group, Inc. — 31 | Radio Place — 47 |
| Antennas West — 28, 44, 46, 54, 63, 67 | HAAM Radio 4+6+9 — 18 | Radio Works — 50 |
| Antennas, Rudy Plak — 3 | Ham Radio Outlet — 38, 39 | RLD Research — 50 |
| Antique Radio Classified — 30 | Ham-Pro Antennas — 25 | Russ Rennaker, W9RC — 14 |
| B.A. Fox, Inc. — 56 | Handi-Tek — 42 | S & S Fabrication — 67 |
| Battery Tech — 27 | Henry Radio — 2, 19 | Signon — 8 |
| Bilal Company — 40 | Home Power Magazine — 54 | Synthetic Textiles, Inc. — 62 |
| Brian Beezley, K6STI — 34 | ICM — 57 | Texas Towers — 21 |
| Broadcast Tech. Services — 64 | ICOM — 76 | Tiare Publications — 10 |
| Butternut Electronics — 11 | IMRA — 56 | Tibi Productions — 37 |
| C.A.T.S. — 24 | Jeff's Electronics — 30 | TNR Technical, Inc. — 45 |
| Cabel X-Perts — 45 | Jim Queen, KB3Y — 50 | Unadilla Antenna Mfg. Co. — 49 |
| Callbook — 41, 70 | Jun's Electronics — 23 | Universal Radio — 61 |
| Collins Electronics — 16 | Kilo-Tec — 66 | Van Gorden Engineering — 7 |
| Comm-Pute Inc. — 67 | Lakeview Co. — 4, 22, 43 | VIS — 30 |
| Courage Center — 60 | Lance Johnson Engineering — 28 | Visit Your Local Radio Club — 51, 52 |
| Cubex Co. — 61 | Lanz Company — 24 | Visit Your Local Radio Store — 68 |
| Delta Ant Products — 26 | M. Bohnhoff — 66 | W5YI Group — 18 |
| DeVry Amateur Radio Society — 55 | Maxcom — 46 | W5YI-VEC — 16 |
| Electron Connection — 48 | McClaren Sales — 69 | W9INN Antennas — 37, 44 |
| Embroidery Warehouse — 6 | Media Mentors — 6 | Williams Radio Sales — 7 |
| | MFJ — 13, 29 | Yaesu — 5 |
| | Mobile QSL Bureau — 26 | ZCo Corporation — 69 |
| | MoTron Electronics — 36 | |
| | N4EDQ Amateur Radio Sales & Service — 53 | |

Code

(continued from page 54)

light, visually blinking out a similar message.

Everything in my room jumped as I sat motionless, frozen in a fetal position, panic-stricken while perspiration oozed from every part of my body. I was unable to move, to scream; ready to collapse in fear. The rocking, banging, knocking continued. Would it ever end? Was no one else awakened by this maddening scene? Or were they, too, paralyzed with fear? How would I be saved? Could I be saved? Saved? From what? From the pieces of furniture in my once familiar, serene, comfortable bedroom which was now wild with CW? How could anyone find me? They couldn't get through a door banging out senseless letters at a rate of 35 wpm. I thought I

must be crazy. That's what this was, an hallucination! But hallucinations aren't real and this definitely was real. My bed, my pillow, my clock were trying to tell me something, talking to me. If I survived I could never tell anyone about this; If I survived—would I survive?

Buzz, buzz—a new, different sound came through the overwhelming din. There it was again—buzz, buzz. Yet somehow this was more familiar, almost soothing. It was to be my savior, my way out of this jungle of madness. Buzz, buzz—the all too familiar sound from my alarm clock. Slowly my left hand reached out to hit the snooze alarm while I composed myself. Cautiously I peeked out at the now motionless alarm clock: 7 a.m. on the dot. Slowly I surveyed the whole room. My bed was level, all four legs solid on the floor; the door was slightly ajar but otherwise without movement.

The window was closed and in the distance I heard a low roar of thunder accompanied by an effortless flash of lightning. Clouds hung low in the sky. So it was a dream, no, more like a nightmare. I dragged myself to a sitting position, positively exhausted from what was very real to me just a minute before. I tried to focus my mind on the day's activity, entering reality again. What was that, what did I have to do at 7 p.m.?

Then I remembered. Tonight I was to take my code test for my Novice license, a mere 5 wpm. No problem! Grandiose ideas, overconfidence entered my mind. A mere 5 wpm, it should be a snap. After all, hadn't I just copied as many as 35 wpm as it pounced at me in the midst of terrible disaster-like conditions? As I made my way to the shower, a new confidence pervaded my soul. □

Construction

(continued from page 16)

Radiation resistance	Max loss permitted	Efficiency (percent)
99	11	90
40	10	80
35	15	70
30	20	60
25	25	50

Notice in the first four examples the SWR would be progressively worse as the losses increased. Where do these losses come from? They come in the form of losses in the ground system. That is why you must establish a radial system that won't quit to be effective. It goes hand in hand with low ground losses and high radiation resistance.

I have what I think is an adequate solution to the ground loss situation. See Figure 1. The radiating element is

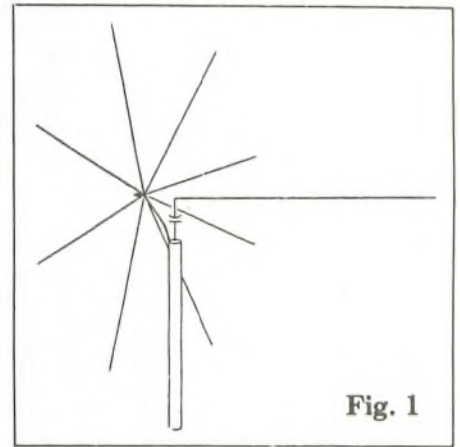
too long, thus raising its total radiation resistance. This of course makes it non-resonant and a good mismatch (if there is such a thing). The capacitor will "shorten" the element back to resonance but do nothing to its higher impedance. That's where the quarter wavelength of co-axial cable comes in. Those of you who are fans of Q-section transformers know that a quarter wavelength of coax will match a higher impedance to a lower one. If we use 75 ohm coax for the Q-section we can match 112.5 ohms. So all you need is a radiator that is in the neighborhood of 112.5 ohms. I have listed the formulas for each element of the antenna:

Radiator length - $274.17/F$ (MHz)

Capacitor - $3080/F$ (MHz)

Q-section - $164/F$ (MHz)

Oh yes, one more thing: lay in a big



supply of radials for the ground system, and mount the whole array up as high as possible. 73 de George Myers, KA6WZR.—Overmodulation, *Poinsettia* ARC □

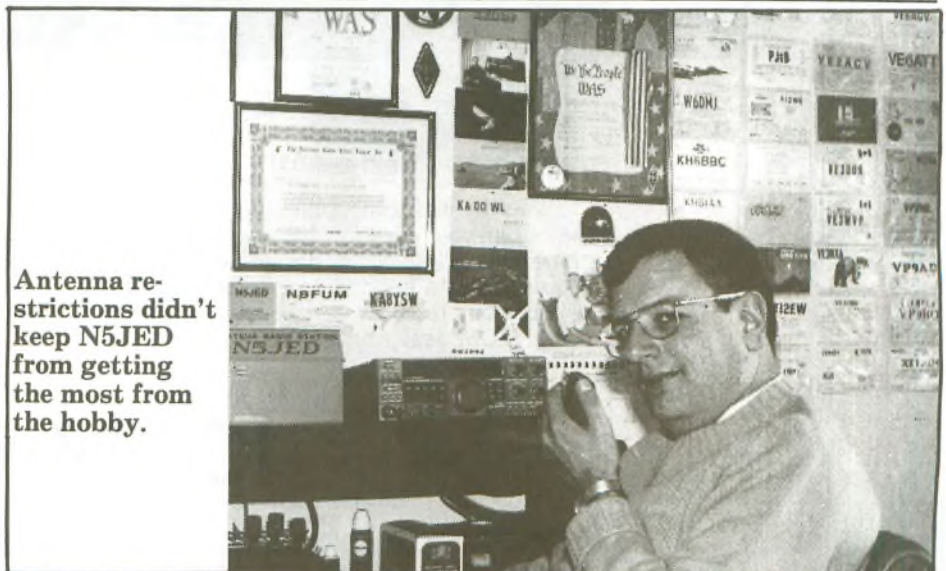
Beating the odds

CHUCK JOSEPH, N5JED

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I didn't think an indoor 54 inch portable antenna (MFJ 1621) and 100W barefoot would work. However, much to my surprise, I've been able to work 134 DXCC countries (123 confirmed) on 20, 15 and 10M SSB. Also, I was able to earn WAS on 20M SSB and WAC on the phone bands.

Moral of story: Don't throw in the towel until you're sure the bathtub's been drained, or something to that effect. □



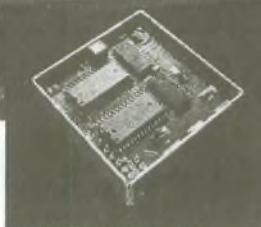
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