

Worldradio

Year 22, Issue 2

August 1992 • \$1.25

FEATURES

Arlington, TX — HamCom
and the YL

Berkshire, England — The
VRS antenna

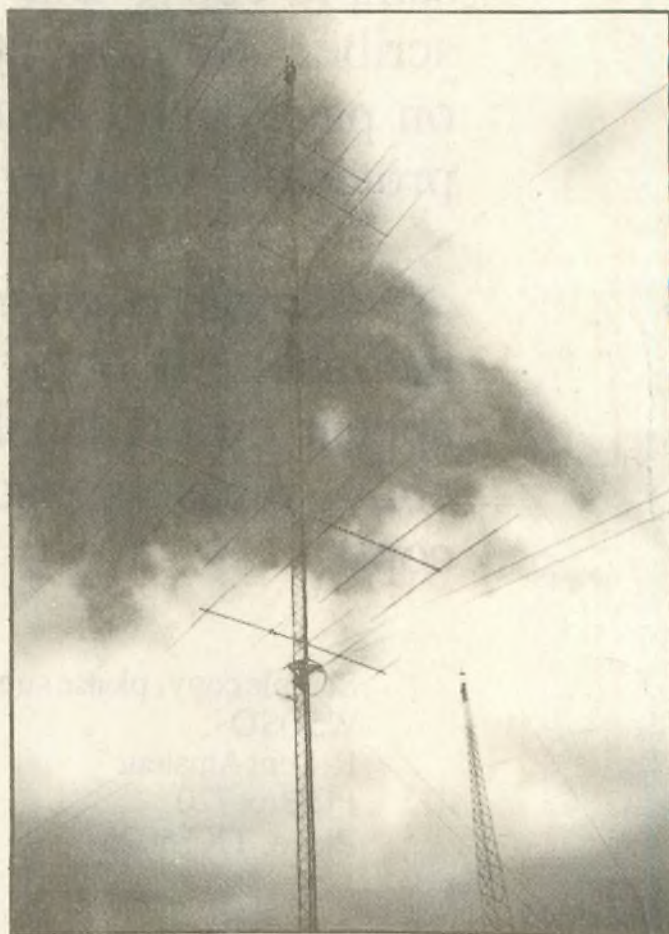
Kalamazoo, MI —
Kalamazoo skyhook

Kilauea, HI — Volcano
voice

Newark, NJ — Bells,
whistles and S-meters

Normal, IL — RAP 1-2-3

Oahu, HI — Doolittle
honored



COLUMNS

- Aerials •Amateur Hi •Amsat-Oscar schedule •Amateur Radio Callsigns •Construction
- Contests •Continuous Wave •Digital Bus •DX Prediction •DX World •FCC Highlights
- Hamfests •Mobile •New Products •Off the Air •Old Time Radio •Product review
- Propagation •Public Service •Publisher's Microphone •QCWA •QRP •Search & Rescue
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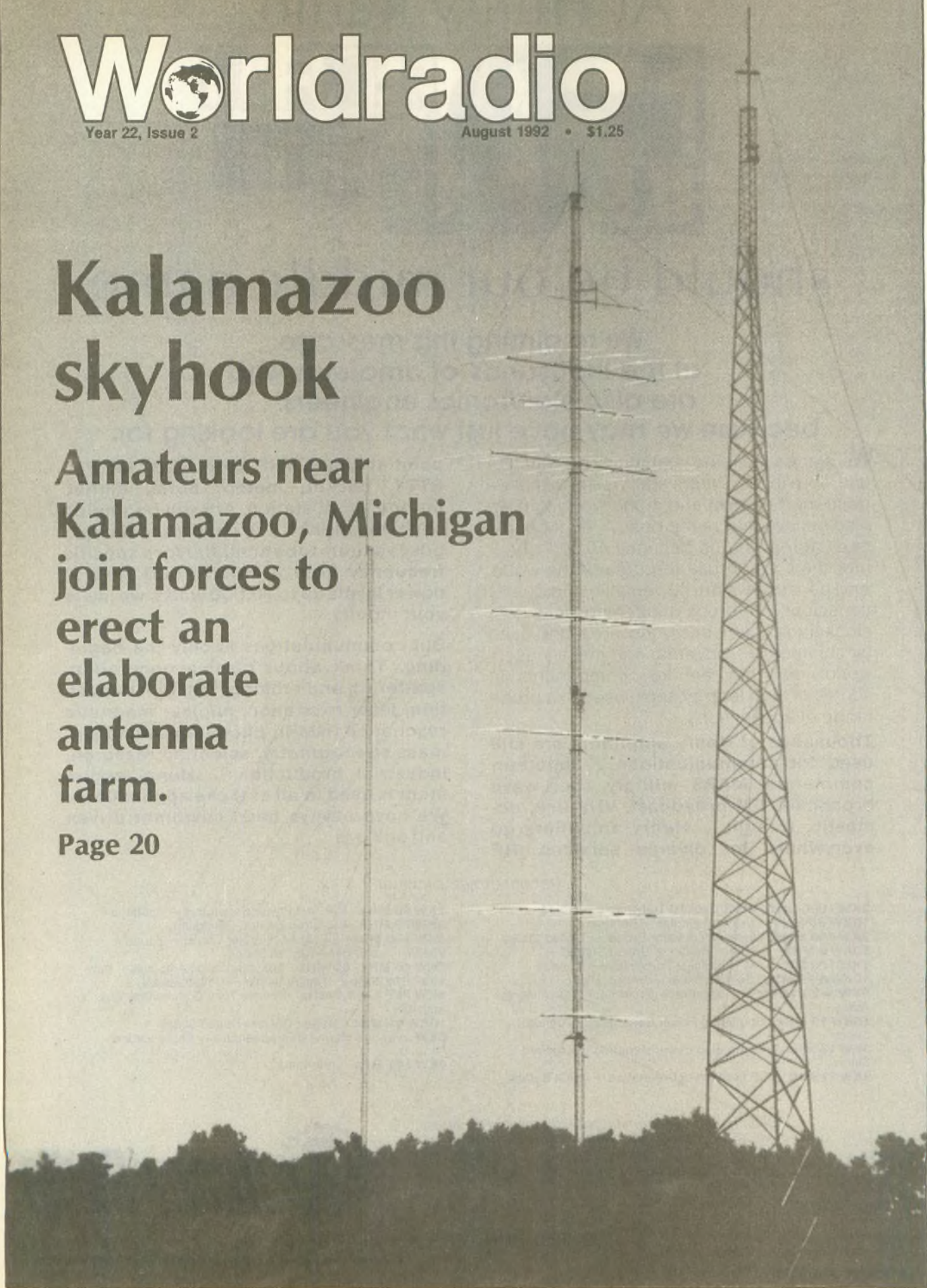
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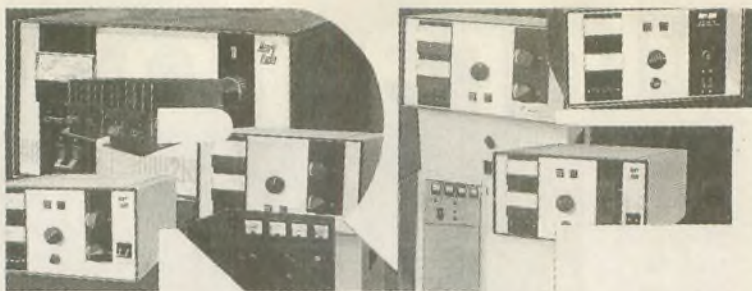
Kalamazoo skyhook

Amateurs near
Kalamazoo, Michigan
join forces to
erect an
elaborate
antenna
farm.

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At Henry Radio,



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**We're aiming this message
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RAP 1-2-3—radio appreciation program in three steps

JOHN E. GERCKEN, KA9EPO

On Saturday, March 28, Cub Scout Pack 19 of Bloomington—Normal, Illinois, presented an excellent program introducing Amateur Radio to their fellow scouts and guests. The program was held in the gymnasium of the First United Methodist Church and Wesley Foundation in Normal. The age range of the scouts in attendance were seven to ten years old and included Wolf, Bear, and Webelos ranks.

The program was produced and coordinated by George Baker, KA9FXV, who is an active leader in the pack. He made good use of his time, while he was laid off from his job for 10 months, by putting this program together. George created all of the computer graphics and coordinated all of the music and video to produce the program. He and the scouts spent many hours practicing to get everything timed right and running smoothly.

The RAP control operators were Matt Ackerman, special effects; Chris Baker, audio; Travis Thacker, video; and Andy Lahr, computer graphics. Their equipment included an Epson Equity III Plus computer, a VCR with small color TV monitor, two stereo cassette decks, two 25 in. color monitors, spot lights, strobe light and multicolored light array.

RAP 1 and 2 consisted of a trip back in time via "the time machine" (mak-



Special effects were used in a skit to take a trip back in time, rediscovering the work of Benjamin Franklin and Alessandro Volta.

ing use of the special effects) to look at the history of radio beginning with the discovery of electricity by Benjamin Franklin and the invention of the battery by Alessandro Volta. Two (quite humorous) skits were presented by George and his RAP control operators dealing with these two events.

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RAP 2 dealt with the introduction to Morse code in which a history of the code was presented via the time machine on video. After the video was over, everyone was invited to go to the (please turn to page 26)

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

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

We emphasize the positive aspects of
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tions dealing with dramatic, personal and
humanitarian uses of Amateur Radio.

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seventh game of the World Series . . .

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and, doing good things for our country,
Vincent Sipple, NJ1B, USNS Marina, FPO.

Continuing with a comparison of
"the good old days" and today, let's go
back to 1975.

Look at a hand-held FM transceiver:
six channels (yes, *six*). Crystals were \$8
a pair. It was as big as a brick and
weighed over a pound. Price? \$200, and
the battery charger was \$30 (batteries
not included).

Today's hand-helds run twice as
much power, they're on every channel,
have MARS splits, reverses, scans,
digital readouts, touchtones, mem-
ories, and more, all for the same price as
was charged in 1975!

How many hours did the average
person have to work to buy that (by to-
day's standards) primitive radio? How
many hours does the average person
have to work today to buy a hand-held
with features undreamed of in 1975? A
whole lot less.

However, we are hearing grumbles
about the prices of HF transceivers.
One solution may be to buy a rig from

your buddy. Offer him the same price
as the store offered him for trade-in
value. The store would probably be
just as happy. Probably happier, in
that they don't have to put it through
all the testing and then have money sit-
ting on the shelf, depreciating.

There is also older, used gear. The
Atlas transceivers are going for a bit
over \$200. What's the price today on a
National NCX-3? That was one rugged
rig. And, those old tube rigs have
another virtue: We can fix them our-
selves without having to ship them
back to the manufacturer.

Every so often the ill wind from the
North brings word that with cellular
phones, satellites and the like, Ama-
teur Radio will no longer be able to
justify its existence based on emergen-
cy response.

Well, there are no cellular phones out
in the middle of the ocean. I'm sitting
here looking at an article about how
amateurs saved seven people out in the
Pacific.

Ken Johnson, W6NKE, Simi Valley,
California, sent in an article from
Police Times about the critical com-
munications provided by Amateur
Radio operators in the Oakland fire

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which killed 25, injured 150, and
destroyed 3,000 homes.

More than 150 amateurs, over 10
days, performed the duties which, ac-
cording to some, we are not needed for
anymore.

Here's a group that (judging from
their newsletter) is having *lots* of fun.
It's the BMHA — Bicycle Mobile
Hams of America! No, there's a lot
more to it than a hand-held on the
handlebars.

How 'bout a 5/8-wave 2M antenna?
How 'bout an HF mobile antenna?
Yep, HF mobile on a bicycle. How
'bout CW while in motion?

The group has a quarterly newsletter
(nicely done), as well as a forum and
get-togethers at Dayton. If this pulls
your chain or is something you have
spoken about with interest during this
sunspot cycle, contact Hartley Allen,
NA0A, at P.O. Box 4009, Boulder, CO
80306.

There is a very important purpose
with your potential to encourage or
even instruct others to become Ama-
teur Radio operators.

Do you feel your life would be a bit
emptier if it were not for Amateur
Radio? The necessary continuing of
learning, the challenges, the sense of
identifying with others, the friends
made . . . what else comes even close to
comparing?

So, one should want to pass such a
dynamic activity on to others. It could
mean as much to someone else as it
means to you. —Armond, N6WR

QSL STS-45

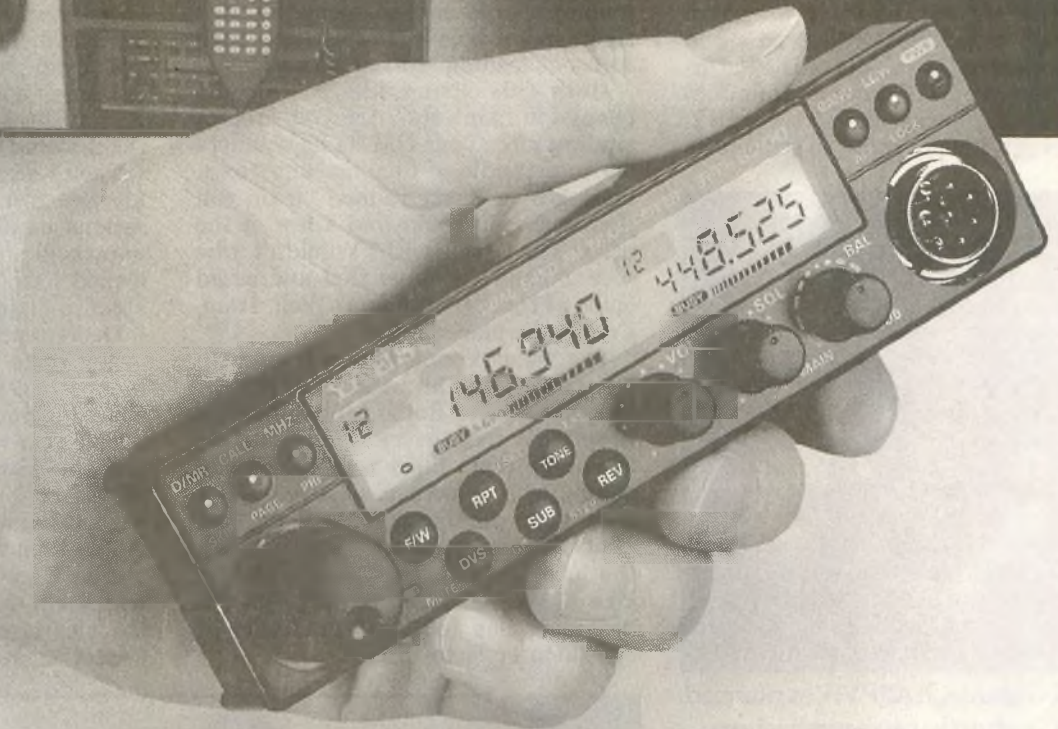
If you made contact with the
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mode of contact (RTTY, phone, etc.)

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- Odd splits on any memory
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- Full Duplex Cross-Band Operation
- Built-In Antenna Duplexer
- Backlit DTMF Microphone
- Automatic 8 Level Display Dimmer
- Built-In Cross-Band Repeat
- **RF Output Power:**
 - 2M: 50/5 watt (high/low)
 - 70 cm: 35/5 watt (high/low)
 - 23 cm: 10/1 watt (high/low)
- **Accessories:**
 - FRC-4** DTMF Paging Unit
 - YSK-1L** 20' Trunk Mounting Kit
 - FTS-22** CTCSS Dual Decoder
 - SP-7** External Speaker
 - DVS-3** Digital Voice Recorder Unit
 - MW-1** Wireless Microphone /Controller

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HamCom and the YL

MAUREEN McCLAIN, N5FFB

Some people will do anything to ensure the success of their program. Karen Pittman, N5VAW, even stood on her head in the middle of the Saturday afternoon YL Forum at HamCom in Arlington, Texas, June 5 through 7.

All right, it's not quite as strange as



Vikki Gigante, KA3PVS, explained GARC's shuttle retransmissions.

it sounds. The forum was on emergency preparedness for YLs, and Karen was showing her 72-hour emergency kit. It's all stored in a large trash barrel, and as she got down to the bottom, she was literally standing on her head to reach the last items. Incidentally, that was an amazing kit . . . there was

every item needed to last a family through 72 hours, and as Karen kept pulling things out, someone asked if there was a hole in the bottom, with someone feeding stuff up to her!

Does this sound like a welcome change in hamfests? Are you tired of trailing after your OM as he wanders through endless flea market rows, lusting over dusty radios? Or do you just wish you could find a few of the other YLs to talk with? Wouldn't it be nice to have a seminar that addressed some of the YL interests? Well, HamCom is the place for you!

The Texas Young Ladies Round-Up Net (TYLRUN) and the YL Roses of Texas Amateur Radio Club sponsor a hospitality room every HamCom. This is a large room filled with tables and chairs, where you can sit down, gloat over your purchases, rest your feet, visit with friends, or all of the above. In the afternoon, there is a seminar for YLs (OMs, too, if they wish) that addresses areas in Amateur Radio of special interest to YLs.

This year Connie Dunn, KB5LES, and Karen Pittman, N5VAW, talked on emergency preparedness for YLs. Connie discussed the importance of preparation, and showed an emergency kit that had everything but an HF rig to get you on the air in an emergency. This kit included a weather radio and a 2M hand-held, as well as wire, insulators, and tools, all donated by Radio Shack and given away during the drawing for door prizes.

Then Karen brought out her 72 hour kit and discussed survival during a serious emergency. She also had an amazingly huge first-aid kit that looked like it could handle anything short of major surgery.

Door prizes ranged from the emergency kit to "I Love Amateur Radio" bumper stickers, and everyone took something home!

This year was the second annual YL National Meeting held at HamCom. A breakfast for YLs (and OMs, if they wished) followed by a speaker started it off, and another speech followed later during HamCom. This year's speaker was Vikki Gigante-Hueber, KA3PVS, the vice president of Goddard Space Center Amateur Radio Club. Vikki is in



Connie Dunn, KB5LES; Patty Martin, KB5AZO; Judith Jaksa, N0IDR; and Dorothy Jones, KA5DWR gather at Hamcom's YL Forum.

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charge of all re-transmissions of space shuttle communications to Amateur Radio bands, and her speech was fascinating.

Radio Shack donated a 2M hand-held, Texas Towers gave a 1992 *North America Callbook*, and Vikki brought several personally autographed

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photographs of Ron Parise, WA4SIR, one of the astronauts. There were also several smaller prizes and, again, everyone left with something.

On Sunday, Vikki spoke again, this time on "Space to School." This discussion of the SAREX (Shuttle Amateur Radio Experiment) program in the schools drew a sizable number of OMs in the crowd.

The YL National Meeting is organized and run by a board consisting of Judi Jaksa, N0IDR, director; Connie Dunn, KB5LES, program director; and Dorothy Jones, KA5DWR, hospitality director. The YL Meeting went very well, and there are rumors of DX-YLs for speakers next year. Connie stressed to be sure to pre-register for the breakfast next year, as many were turned away at the door due to lack of reservations!

HamCom is the second largest hamfest in the country, and certainly no one can say that the YLs are left out. Perhaps the reason lies in the organization of HamCom. The steering committee is made up of representatives from clubs all around the area, and they make many of the decisions involved. John Fleet, WA5OHG, chairman of the board, said that he had always wanted a program for licensed women at HamCom, so he was delighted when TYLRUN first approached him about having one. That eventually evolved into the hospitality room, where the OMs are as welcome to sit and visit as the YLs. Barney Boone, KJ5AE, program director, agrees that the hospitality room and the YL forums fill a necessary gap between the interests of the OMs and those of the YLs. He stresses that HamCom will always support the YL interests in every way possible.

So if you haven't been to HamCom, contact them before next June. Write: HamCom, Inc., P.O. Box 861829, Plano, TX 75086-1829. After all, where else can you find a YL program where they'll even stand on their heads to please you? □

Empire of the Air

On August 5 the Public Broadcasting Service will again be distributing Ken Burns' *Empire of the Air: The Men Who Made Radio* to PBS stations throughout the nation. As this is a highly commended documentary, it is likely that the station in your locale will air the program again within a few months of its redistribution date. Check your local public television scheduling for air dates in your area. This is a great, informative show. Don't miss it! □

Is Amateur Radio a great hobby?

ETHEL SMITH, K4LMB

I'm convinced Amateur Radio is the greatest hobby in the world. There are so many facets that can provide appeal to everyone, regardless of age, gender, race or economic status. It provides so many challenges as well as so many opportunities to have fun.

Often the biggest draw to the hobby is the recreational aspect—the fringe benefits and all the fun one will surely have. But I am becoming concerned that we are losing track of the first and most important purpose of Amateur Radio: community service. Amateurs are licensed with the understanding that communication services will be provided in time of need, and it is important that we keep that in mind. It is not just the fun aspects of Amateur Radio that justify our existence and the retention of our precious frequencies; when we go to WARC or to our own Congress to promote and protect the Amateur Service, it is not the fun in the hobby which commands their respect; it is the realized and potential service we provide.

Let's emphasize this in our recruiting programs and our training programs. There is nothing wrong with talking about how much fun can be had and what a wonderful hobby Amateur Radio is, but remember to make the point that the basic purpose of Amateur Radio is *service*.

Amateur Radio is the greatest hobby in the world, not just because amateurs have so much fun, but because amateurs—well, *most* amateurs—are will-

ing to come forth to help out when needed. That service has far-reaching effects. For the past 60 years, amateurs have always been at the forefront in any major disaster relief effort. Amateur Radio is frequently the only means of communication in the first critical hours of an emergency, and it continues to supplement normal communications which often become overloaded in the following hours or days.

Amateur Radio also provides a vast "field testing laboratory" where new ideas and new techniques are tested and developed by amateurs on their own time and at their own expense. It doesn't cost the taxpayers a penny. It gives school kids an immediate appreciation of math, geography, grammar, and even spelling if they operate CW! It encourages interest in science and technology and often leads licensees into some type of technical and/or communications career. The very possession of an Amateur Radio license is often a key to opening doors to employment opportunities.

An Amateur Radio license is a very valuable possession. Let's treat it as such. □

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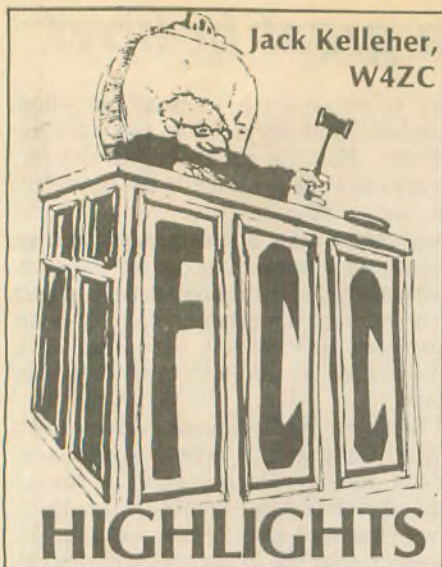
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Freebanders (part II)

In last month's column we reported the latest FCC action against some of the more blatant operations in the 27 MHz range, between the CB band and the 10M amateur band.

The freebander nets are continuing, with the enforcement action the primary topic of discussion. On-air conversations monitored by *Westlink Report* appear to center on ways that the freeband operators can "get even" for the government enforcement action. *Westlink* says, "A number of those making the most noise appear to be stations cited who say that they will not pay any forfeiture notice they might receive." One operator identifying only as "Marty the Michigan Double Zero on the Side" said that he didn't go to the FCC to get no (expletive deleted) license to buy no (expletive deleted) radio and that he "ain't gonna pay them a (expletive deleted) red penny cent now either." His sentiments are echoed by numerous other freebanders in their on-air comments. The most interesting and possibly the most radical comments are those of the

group hanging out on 27.925 MHz LSB. They say that it is time for freebanders to "take over the ham radio frequencies, claiming that there are probably a hundred times more of them than there are hams."

Despite this "outcry," at *Westlink's* presstime NALs (Notices of Apparent Liability to Monetary Forfeiture) were being readied for mailing. It appears that these scofflaws feel that there is safety in numbers. Apparently they have overlooked another saying, that the mill of the gods grinds slow but exceedingly fine. (*Westlink Report*, 5/14/92)

Drug abuse

The FCC, by public notice released April 30, has announced its policy regarding the applicability of section 5301 of the Anti-Drug Abuse Act of 1988 to the private radio services. Until FCC forms (such as the 610 used by amateurs) are updated to include the explicit certification, FCC will treat an applicant's signature on an application form as constituting certification that the applicant has not been denied federal benefits as a result of federal or state court action following conviction for the possession or distribution of controlled substances. Applications for which there are no Commission forms, such as requests for special temporary authority, will require submission of a signed statement that neither the applicant nor any party to the application is subject to denial of benefits under section 5301. In certain emergency cases, verbal certification may

be acceptable (*The ARRL Letter*, 5/12/92)

K3VOA

The FCC has granted the Voice of America Radio Club station in Washington DC the call K3VOA. Although specific call signs for amateur stations have not been available for more than a decade, FCC Chairman Sikes made an exception for the VOA club in this, the 50th anniversary year of the VOA. (*The ARRL Letter*, 5/12/92)

The FCC at Dayton

Personal Radio Branch chief John Johnston and analyst William Cross gave an excellent overview of Amateur Radio issues before the Commission. They congratulated the many hams who devote their time to the volunteer examining program; they made the case for why Novice examining would benefit from being brought into the VE program; and they described the VE program as superior to the previous FCC system in many respects. They invited the Volunteer Examiner Coordinators to give short presentations on the operation of the question pool committee and the Tech-plus database. Fred Maia, W5YI, responded on behalf of several VECs.

They diplomatically encouraged amateurs not to file rulemaking petitions unless the petitioners have thought through all of the regulatory implications, done adequate research and have obtained support of fellow hams before filing; many petitions are simply attempts to deal with limited,

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 June 1, 1992.

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	AA0IP	KF0YP	N0SUJ	KB0KID
1	AA1CH	KD1IR	N1MOA	KB1ACZ
2	AA2JL	KF2IF	N2QZQ	KB2OXR
3	WZ3X	KE3DB	N3MJJ	KB3ADA
4	AC4QR	KO4YG		KD4OVF
5	AB5FW	KJ5AU		KB5SUU
6	AB6LK	KM6VJ		KD6JYA
7	AA7PF	KI7DC	N7YRL	KB7PBY
8	AA8HM	KF8UY	N8TYP	KB8OBE
9	AA9ED	KF9JO	N9PQH	KB9HXE
North Mariana Is.	AH0O	AH0AJ	KH0AT	WH0AAR
Guam	KH2Y	AH2CP	KH2GE	WH2AMY
Johnston Is.	AH3D	AH3AD	KH3AG	WH3AAG
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii		AH6LX	WH6GU	WH6CPL
Kure Is.			KH7AA	
American Samoa	AH8D	AH8AE	KH8AI	WH8ABA
Wake Wilkes Peale	AH9B	AH9AD	KH9AE	WH9AAI
Alaska		AL7OF	WL7DN	WL7CFN
Virgin Is.	NP2T	KP2BZ	NP2FJ	WP2AHQ
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local squabbles, with little thought given to how the rule change would affect the national amateur community.

William Cross described the major increases in the fines being imposed on violators of FCC rules, saying in part: "Until now, your forfeitures generally have been too small for the FCC to involve the Department of Justice. That has changed, quite obviously. So pass the word. It's going to cost you big bucks to violate the rules. You should also give more thought to whether you really want more rules before you shoot off that (rule making) petition. Ask yourself if you really want to run the risk of being socked \$10,000 for violating the rules you proposed."

Johnston and Cross also noted that the most often asked question is "How can I get a specific call sign?" Many years after the FCC switched to an automated system that issues call signs according to well known rules, staff members are still getting requests for exceptions.

The station call is only changed when you check the box in item 2E on Form 610. Each change in call sign is processed using the procedure for a new call sign; thus, amateurs cannot change their calls back to the one they used to hold, or to calls held by famous Silent Keys, or to other desired combinations.

A ham's license information is kept in the FCC's database for two years beyond expiration. This provides a grace period for those who forget to renew their expired licenses. The two-year grace period was added when the FCC started issuing licenses for 10-year terms.

At one time the operator portion of the license had a five-year grace period. There is a "grandfather" provision for those who held five-year term licenses at the time the switch to the two-year grace period was made. The FCC will still allow you the old five-year grace period to renew the operator portion,

which means retaking the examinations will not be necessary. However, if you file for renewal more than two years after your operator's license expires, the call sign must still be processed as a new call sign. (W5YI Report, 5/15/92)

FCC commends amateurs

FCC's Ralph Haller, N4RH, chief of the Private Radio Bureau, on May 12 sent letters of commendation to nine members of the California-Hawaii Maritime Amateur Radio Net for their efforts in assisting two private yachts in September of 1991.

The week-long saga began when a Pacific storm caught two boats, the *Molly Sue* and the *Dauntless*, east-bound from Hawaii to California. The *Molly Sue*, a 50-ft. ketch skippered by Ron Bodeen, WA7PGH, also carried his wife, Molly, and a Hawaiian crewman. The *Molly Sue* and the *Dauntless* had intended to travel together but the *Dauntless*, a 65-ft. schooner, outran the other boat by some 500 miles in the storm, out of marine radio range.

The *Molly Sue* had been in ordinary contact with the California-Hawaii Net. Strong winds ripped the *Molly Sue*'s sails and broke her halyard, injuring the crewman in the process. His injuries appeared serious. The US Coast Guard in Hawaii was alerted and its station came up on the net frequency, 14.340 MHz. The Coast Guard then diverted a freighter, the *Cape Bover*, which was in the vicinity of the *Molly Sue*. After sending a diver down to untangle the *Molly Sue*'s lines, the *Cape Bover* departed.

Unfortunately, three days of work failed to repair the *Molly Sue*'s sails, and she did not have enough fuel on board to steam to the US mainland. Upon hearing this, the California-Hawaii Net called the Coast Guard in San Diego to relay word from skipper Bodeen that he had spare sails in his back yard there. A local amateur, hearing this on the net frequency, went to Bodeen's home, retrieved the sails, and delivered them to the Coast Guard. The sails and additional fuel were then flown to the *Molly Sue* and successfully parachuted to her.

Meanwhile the *Dauntless*, back in radio range, had reported to the *Molly Sue* that she was taking on water and

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running out of fuel. The net relayed this word to the Coast Guard, and the *Dauntless* was towed to San Francisco. The *Molly Sue*, fitted with new sails, proceeded uneventfully to San Diego.

According to net member Stan Black, KF7BT, the net suspended its

normal operations for the duration of this dual emergency for nearly seven days. During this crisis amateurs were exemplary in keeping the net frequency clear, Black said. This event has been reported in *Yachting* magazine. (*The ARRL Letter*, 5/26/92) □

bones a chill. By chance, just before the clouds obscured the view, he saw fountains shoot out from the western slopes of Pu'u O'o and called me on the local 2M repeater. He had just seen the goddess of the volcano, Pele, awaken. Episode 51 had started up again. His journey was not in vain.

It took a little while for his HT to dry out, but all in all his equipment worked well and it provided the observatory with some good data. His observation correlated well with an increase in harmonic tremor, the seismic signal that indirectly reveals the movement of magma just beneath the surface.

But Tom was still "cold" and needed the warmth of 2000-degree pahoehoe lava to warm him up. Later, after wandering around up at the summit trying to find my office at HVO, we talked about him making the 20-mile round trip hike to the eruption site the next day. This was no easy task, as I knew from personal experience, and I gave him all the warnings necessary when venturing into a wilderness area. He followed them precisely and in the end, barring hardship and more rain, he was the eyes and ears at the site of volcanic upheaval.

A lot of amateurs listened in, too, because he and I used the local 2M repeater (AH6P/R 146.76) that can be

Volcano voice

GREG POOL, WH6DT

When Tom Segalstad, KH6/LA4LN, finally showed up at my office door, he was wet and lost. His first concern, however, was whether his HT was still working after having been in the steady rain falling on Kilauea Volcano.

Tom is a Norwegian geologist who, last February, was in Hilo, on the Big Island of Hawaii, for a conference on the interaction between volcanoes and climate. But Tom was not one to wallow in the philosophical ramblings of academia without grounding himself in fact. He wanted to see lava.

After the conference was over, Tom made his way up to the summit of Kilauea, an undaunting trip if you expect the topography to reveal the drama of the world's most active volcano. Kilauea (4,078 feet), like Mauna Loa in its background (13,661 feet), is a low-lying shield volcano that issues forth relatively fluid lavas. These flows often travel many miles, sometimes to be quenched in the blue waters of the tropical Pacific. So Tom, with two days left in paradise and with the knowledge that Kilauea is broader than it is high, had a lot of land to cover to feel the heat.

Whetting his appetite, Tom drove down the Chain of Craters Road in the Hawaii Volcanoes National Park to the site of the 1969-1974 Mauna Ulu eruption, the previous record-holder for magma output at Kilauea. On top of an old cinder cone that was once the best spot to view Mauna Ulu's lava fountains and flows, he spent about an hour gazing 10 miles to the east at the new record-holder.

Since 1983, the combination of lavas erupting from the Pu'u O'o cinder cone and the Kupaianaha lava shield has made 1,900 million cubic yards of mess along Kilauea's East Rift Zone, four times that of Mauna Ulu. The eruption has also caused the destruction of over 180 homes, including the entire village of Kalapana.

Before Tom arrived, scientists at the US Geological Survey's Hawaiian Volcano Observatory were able to document 51 distinct episodes in the eruption. Just before Tom arrived the 51st had stalled, which at this point

was to be expected. Kilauea's three-mile-deep summit magma chamber acts like a post office: it holds the molten rock generated 40 miles beneath the island and then sends it on to the East Rift Zone via a two-mile-deep pathway it carved out in 1983. Since that time, Kilauea's summit has deflated, relatively, because of all the erupted lava. Like a house with low water pressure in its pipes, it's becoming hard for Kilauea to keep the flow going.

Tom was enjoying the grand irony of weather at Kilauea. At this elevation, the tropical climes longed for on a visit to Hawaii are absent and replaced by an atmosphere more comparable to San Francisco or Seattle. Despite the low clouds and drizzle, Tom stuck it out. His HT gathered moisture and his

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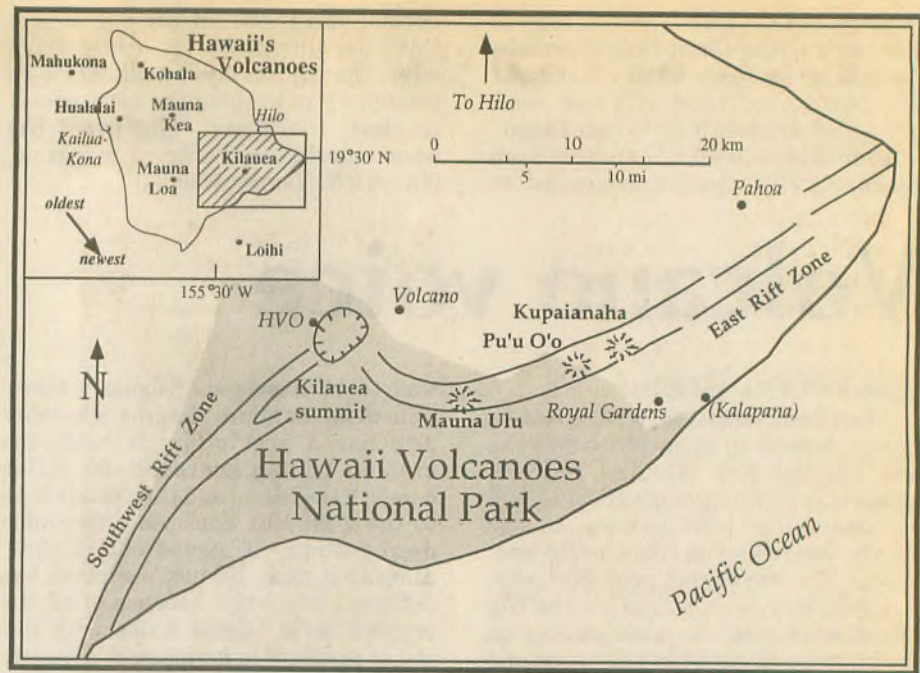
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heard throughout the eastern part of the Big Island. A number of hams have asked me about the QSOs and thought it was the most interesting thing heard on radio in a while. Tom provided a big service to a lot of people.

Tom made the four-hour trek out and then called. Never in any real danger, he noted where the new lava flow was going and how fast. He gave us estimates of dimensions and locations that are valuable when trying to piece together the geological history of an episode. We commonly use government radios and frequencies when out in the field, so I passed his observations on to our radio log at HVO.

He was very excited and although he could have melted his HT at one point, he had a good time. The flow was yet another short spurt that would cool when the vent turned off again a few days later. Tom was witnessing a small scale version of Kilauea being built in front of him. Fluid lava had been erupting from a fissure near the western slope of the Pu'u O'o cone and after many weeks, a fan-shaped blanket of cooled lava flows had made a broad and low shield in the middle of rainforest, 2,000 feet above the Pacific Ocean. At this moment, episode 51 continues to erupt in the same manner. To Tom, however, this was the most novel thing



he had ever seen. I know exactly how he felt.

Tom was the sole observer for the observatory those two days, mostly because the inclement weather hampered our own efforts to see the eruption site. I'm glad that we had enough in common besides geology to make a

friendship and use Amateur Radio for an unusual purpose. When he handed me his QSL card, it was evident that Tom had already been graced with a number of acquaintances from all over the world: he's held over 20 different calls. I'm sure this wasn't the first time he's almost destroyed his HT.

Pitcairn award update

Molly Reed, KF2GS, of Scotch Plains, New Jersey, reports that after much ado, she has received a refund of her award money from Dr. Gary O'Toole, KB6ISL. She had requested a refund several times over the last few months, and she says that it took two weeks after her last request to receive the refund.

Other sources report that the award certificates are in the final stages of production and should be out soon (if not already by the time this notice is circulated). If anyone receives their award certificate or a refund from the Pitcairn operation, please notify *Worldradio* as Molly did so that we can accurately report its status. □

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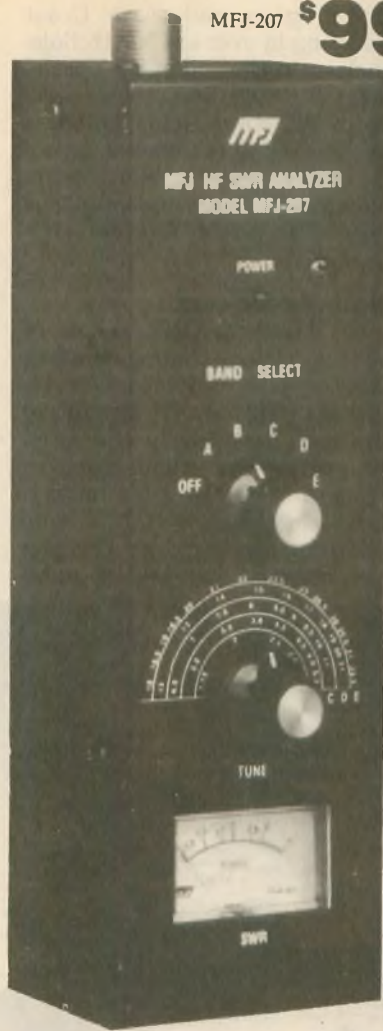
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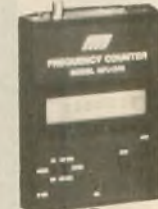
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Gen. Doolittle honored

ANN SHAVER, AH6KH

"Hey, are we transmitting into dummy loads? Nobody's answering out there." wondered Nobu Nihei, KH6BBK, who helped open WH6D, the special event station to commemorate the 50th anniversary of Doolittle's token raid on Tokyo. Sponsored by Army MARS, the station was open to hams all over the state of Hawaii. In addition to the Army MARS station at Schofield Barracks in central Oahu, operators worked from various locations on Oahu and the neighbor islands.

"Ann, you get on. They don't seem to want to talk to us. Maybe a wahine can lure them," suggested Shige Tsuruda, KH6V.

"Don't bother," moaned Tom Boyles, KH6KX. "I can't even read CW beacons."

Despite the slow start, KH6D operators managed to log over 1,500 contacts on a variety of modes during the special event station's 24 hours on the air. Tough propagation conditions prevailed during the entire operating period—until the last few minutes when a great pileup developed, in-

cluding European and East Coast signals coming in over the North Pole. Nevertheless, at the end of the special event contacts had been made with stations in all states and Canadian provinces and on all continents. In addition to CW and SSB phone, many contacts were made by digital modes including RTTY, AMTOR and HF packet.

Historical ragchewing

Part of Army MARS' series of special event stations commemorating people and events of World War II, WH6D (We Honor 6 Doolittle) operators were particularly interested in learning if anyone calling had particular ties to Doolittle or his raiders. Indeed, Edwin Miller, W7GMH, who operated from his home on the Big Island of Hawaii, had been a radio



operator stationed on an island in the North Pacific at the time of the historic flight. "We were part of the support group, you might say," he explained, "but of course we maintained radio silence during their daring flight."

"I talked to so many people with great stories," said Lee Wical, KH6BZF, who operated from his home in Kaneohe, in eastern Oahu. "The most dramatic, though, has to be the veteran of Doolittle's raid who told





Shige Tsuruda, KH6V, persists as Nobu Nihei, KH6BBK, sits ready to log contacts. Despite poor propagation, WH6D made more than 1,500 contacts on CW, phone and digital modes.

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me they had a fine, old bottle of brandy with cups placed all around it. Seven are turned upside down but 39 are still standing. When only two remain, the two survivors will drink a toast to their comrades."

"I enjoyed hearing someone tell of the reaction of the workers at Pearl Harbor," remarked Al Shaver, AH6KH, coordinator of the special event. "When they learned of Doolittle's accomplishment, cheers went up all around. Just imagine their excitement, standing there amid the great devastation! After all, this happened just four short months after the attack."

Surprises and Coincidences

Part of the fun of Amateur Radio is running across friends in unexpected "places." "Lots of people recognized my voice from working me during various contests. Of course this time I used a different call sign," Wical said. "This wasn't a contest, though, so I worked a little slower—I averaged only 28 per hour."

"I was certainly surprised to hear ZL1AIR. The beam was pointed to the mainland, and I really didn't expect to hear any signals from his direction.

His station isn't particularly powerful, which made the contact even more surprising," explained Shaver. "Brian and I are great friends, and we talk on sked several times a week. When he and his family were here in Honolulu last summer, we even visited Schofield. I told him we'd be operating the WARC bands, but I had no specific operating time. He wasn't sure he could get out on 17M. I couldn't believe my ears, but there he was, barefoot, loud and clear."

Later in the day I had my own

operating coincidence: "Name is Tom and I'm in Largo, Florida. You're coming in 5/7." That sure broke my stride!

Trying not to belie my excitement, I answered in my coolest manner, "Right, Tom, WF3E. I know you. Anyhow, you know my husband—you made some QSL cards for my husband. I mean, what a surprise! How's Lori and how are things with the Clearwater Club?" So much for grace under pressure! A few minutes later I did work Lori, WR9O, fair and square.

For Ken Wells, V73CT, operating



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(Close-Out)



Gabriel Keress, N6VQE, quickly learned RTTY.

WH6D at all was something of a serendipity. "What a coincidence to get to come up here and operate during a layover in my trip back to Kwajalein. Al and I chatted a week ago on 2M when I was passing through the Honolulu airport eastbound. He told me about the special event station, and it sounded like a fun thing to do. He invited me to come to Schofield,

but he never asked if I was a MARS member. Well, it just so happens that I applied to Army MARS a few weeks ago, but I never expected to come to headquarters to have my MARS call sign issued! Besides the fun of participating, I got to 'custom-make' my

own MARS sign—'CT,' the same as my amateur suffix."

Learning a new mode

"Ken's a skillful operator, but he's also lucky," Marcus Reed, WH6D, regional director of Army MARS observed. All morning long Shige and Nobu wrestled with RTTY without any success. In the afternoon, Ken arrived and got us up on it in nothing flat. The exciting part is that he taught the mode to Gabriel, who taught it to Joe and Tom. No doubt we'll dedicate an operating position to RTTY the entire time during our next special event."

"RTTY is fantastic—all it takes is two keys, F-3 and F-4. That's all there is to it. It's a good thing, too, because I am a two-finger typist!" laughed Gabriel Keress, N6VQE.

"That Gabriel is something else!" agreed Joe Hao, WH6F, state MARS director. "Once he got going, there was no prying him loose. He stopped long enough to show Tom Boyles and me the routine, but basically he operated all night long. The rest of us took turns catching a little shut-eye, but not Gabriel. I really developed respect for him here."

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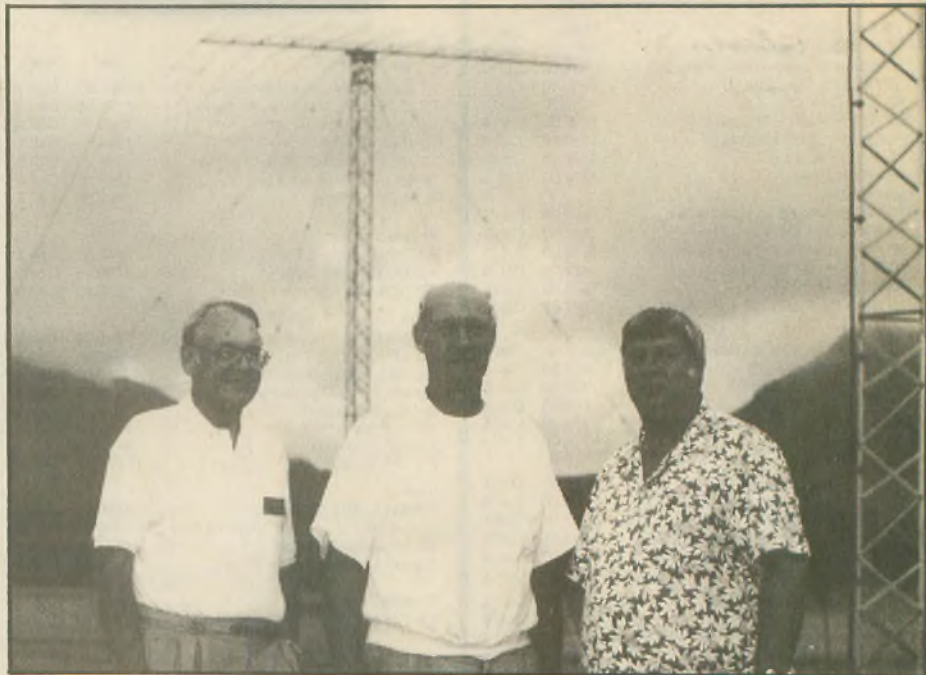
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Al Shaver, AH6KX; Marcus Reed, WH6D; and Tom Boyles, KH6KX, in the middle of the Army MARS antenna farm at the base of the Waianae Mountains.

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"I stretched out, but I couldn't sleep," confessed Boyles, who was the station's primary CW operator. "I shut my eyes, but I kept hearing WH6D being sent in code faster than I had ever heard it before. I thought I must be hallucinating after operating since eight in the morning. I finally

(please turn to page 61)



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CARY MANGUM, W6WWW

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Right action? NO, wrong action in most instances.

Your first act should be to assess the situation, *not* jump in the car in reaction. Are you *authorized* to respond. What skills are needed? Do you really have those skills? Was the call-up for registered emergency responder members of a trained group (or groups) only? Do you know? Did you check?

Will your departure place your family in a vulnerable condition? Was there prior preparation to decrease or

remove that vulnerability? Are they trained in how to handle matters in your absence—or injury or death if that happens on a response?

How are *you* prepared? Are you experienced in the Incident Command System? Do you even know what it is? Do you know the significance of, and difference between, "break" and "over"? What is a shadow? Have you handled ICS-type traffic? Have you used tactical calls and understand why they are used? How do FCC identifications required for amateurs apply to emergency communications and tactical calls?

Are you an experienced net control operator—in a time-limited and stress-simulated exercise or the real thing? Do you know why VHF net control differs quite significantly from HF net control?

How do you react to stress? Does your mind go wild with concern, worry, fear or other energy-depleting reac-

tions? How do you feel inside: calm; mildly shaky; a case of jitters; or climbing the wall? How might you respond to severe pressure at an EOC or a field post miles from your family, worried about whether they are safe, with no way to find out?

How are you responding to these questions? Do they irritate you? Why? Because you don't want to think about this, just act? Isn't that a warning?

Why are you responding? Because you're trained and know your abilities and limits? Or because of an urge to help, even untrained? Do you think training is unnecessary? After all, you talk on the radio all the time and know how to operate, so do you really need training? Is the urge to respond a guise to see the damaged area more than it is to help?

Is *your* need (whatever its basis) more important than the need of the community? Be candid! You'll be the benefactor, as well as your community. If you're not properly trained, most times it's best to stay out of the way. More than one EOC, RACES, ARES or search and rescue unit has found it necessary to refuse help after experiencing once too often the untrained, unprepared response from fellow hams who turn out for personal reasons unrelated to the real need.

Unless you're trained and prepared for, and assigned to, instant response, don't jump in the car and head out to the scene. Rather, *coordinate* and *investigate*. What skills are needed? When? Usually it's a coordinated group of responders capable of serving on scheduled shifts at appointed locations. Who has the operations schedule? Contact that person and ask what skills are needed, when and where.

Normally, the worst possible action is to go to the scene unless that is the specific request from an experienced EC/RO with whom you've verified that unusual need. Don't respond to second, third or fourth-hand so-named call-ups or requests without verification. An agency or official government call-up can be verified. In California, at the state level, mutual aid call-up is assigned a mission number. Don't expect to hear the mission number over the radio. It'll be on the written resource order issued to responders.

A well-intended call-up can turn into an unfounded rumor quicker than a cat can sneeze. Even a phone referral can be twisted into a "call-up" in ways you can't believe could happen. On one occasion we had a phone referral turn into a rumor that state OES issued a call-up and had a huge Air Force plane standing by to airlift hams into Yosemite National Park—with no airfield and in the midst of mountains where only an air-drop would have worked!

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This article is NOT saying we're not needed in sometimes unusual situations, but that in the norm, emergency needs fall into a pattern. The observation of, and compliance with, that pattern helps all to better respond. The worst action we can take is to jump in the car and head for a scene if that is not part of a pre-planned task force arrangement. Certainly, there are people who are trained for immediate or strike-team type responses who jump in the car and head for their assigned response point *once they have verified* the call-out. But we are not talking about that level of trained responder in this article. Here we refer to the untrained responder answering some inner need to help out, though not prepared to do so with any degree of forethought or effort, and often not registered as a responder with any agency or group.

In general, the only time an untrained responder is useful is when you call in and let the coordinator or radio officer know the degree of your inexperience and lack of training, but willingness to help if needed, and then await the call for the time and place where you can be best utilized.

In writing this, I realize it can vary from state to state. I grew up in the "volunteer state," Tennessee. But in

the west, and in California particularly, today's scenario is quite different from an earlier century when that state got its motto from its emerging citizenry's propensity to volunteer for service in a war between states.

The urge to volunteer our efforts is deep, and it's stronger in some of us than others. For those who have that interest and drive, I hope you will reinforce it by registering with an emergency response group of your choice. If there is a problem finding one, shop around. There is more than one group, and more than one approach; just as there is a need for skills other than

operating the radio. Contact the EC or RO in an adjacent area if the one in your area doesn't respond or you cannot establish a rapport. Those near Sacramento can contact me and I'll help if I can; there may be openings at the state level, or another jurisdiction may be in need of your talent and interests.

73, Cary, W6WWW @ KD6XZ. #NOCAL.USA.NA; phone 916/427-4281 at OES.

Cary Mangum, W6WWW, is chief radio officer at the Auxiliary Radio Service, California Office of Emergency Services. □

Emergency Response Institute

The seventh annual Emergency Response Institute will be held in Northern California on August 15 and 16 in Menlo Park. Presented by the ARRL Training Department and the San Mateo County Office of Emergency Services, this ERI will feature workshops on responsibilities of the emergency coordinator; working with governmental officials; mutual aid in disaster management; disaster management and response; conducting drills and exercises; ARES in public service events; keeping volunteers mo-

tivated; disaster stress management; and Incident Command System.

The workshop will run all day Saturday and a half day on Sunday. Registration is \$15. Registration confirmation will include an agenda, driving directions and other information. Information on hotel accommodations will also be included as requested. Registration payments (to SVECS-ERI '92) or further inquiries may be directed to Dave Larton, N6JQJ, 353-C East Tenth St. #124, Gilroy, CA 95020. □

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FLOYD SOO, KF8AT

In the fall of 1990 a handful of amateurs gathered together at an antenna farm near Kalamazoo, Michigan, belonging to Earl Phillips, W9EP. The occasion that brought us all together that morning was the installation of a KLM 3-element 80M beam on top of a 180 ft. Rohn tower. This feat was the culmination of a lot of preparation and perseverance despite some minor setbacks.

There are few amateurs who have not dreamed of having an elaborate antenna system, and Earl was no different. The problems with realizing these dreams for most operators are numerous, ranging from crowded subdivisions to a limited pocketbook. Earl has always wanted to put together a truly unique and effective system. Originally licensed in 1958 as K9MBR at the age of 13, Earl finally earned his Extra Class ticket in 1965. Since then, he has steadily gained the equipment, knowledge, and resources to finally assemble that very unique and well-planned antenna system.

The first problem to overcome was that of space and aesthetics in his suburban neighborhood. The purchase

of 70 acres of farmland several miles outside of town solved that problem, but it also introduced its own shortcomings, which will be covered later.

The antenna project started in the spring of 1988 with the assembly of the self-supporting 180 ft. Rohn SSV tower and four 50 ft. sections of the 200

ft. Rohn 55G. The 55G has a rotating base at the 50 ft. level and rotating guy rings at the 100, 150 and 200 ft. levels. Next on the list was to pour the footings and to prepare 5,800 feet of 1/4 in. EHS guying cables with 155 strain insulators and 2,780 feet of Phillystran non-conductive guying cable.

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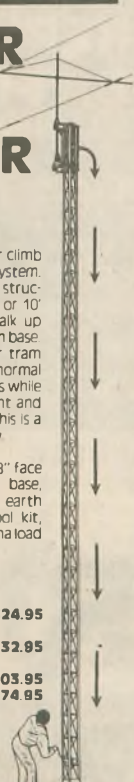
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vertical and set it on its base. Then the bottom 50 ft. section of the rotatable tower, with the rotating base attached to the top, was lifted onto its base. The second, third and fourth sections were then placed on top of the rotating base successively and guyed as they went up. On top of the final section was the Diamond X500A 2M/70cm repeater

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tached to a four-wheel-drive vehicle. These antennas consisted of a Cushcraft 18-element, 2M Boomer sidearm mounted at the 185 ft. level; a KLM 4-element, 40M beam (weighing 85 pounds) at the 175 ft. level; a Cushcraft 6-element, 6M Boomer at the 160 ft. level; a Telrex 6-element, 20M beam (weighing 160 pounds) at the 150 ft. level; a CreatDesign 7-element, 10M beam at the 100 ft. level; another Telrex 6-element, 20M beam mounted at the 70 ft. level, phased with the matching antenna at the 150 ft. level. These two 20M beams are relay controlled to allow selection of upper/lower or both antennas in phase or out of phase. The final antenna is a Hy-Gain 5-element, 10M beam at the 50 ft. level.

The next phase of the antenna system was the installation of two more Rohn 200 ft. towers, a 45G and a 55G. These towers were erected section by section using a gin pole and a 4WD vehicle. Once the towers were assembled and guyed, a Celwave 10dB gain repeater receive antenna was mounted on top of the 45G. Assembly of the 160M antenna and ground system was then begun. The antenna is a Foursquare system consisting of four quarter-wave (125 ft.) wire verticals spaced a quarter-wave apart and arranged in the shape of a square. The counterpoise is composed of 60,000

antenna already mounted. The last thing the mobile crane was used for was the installation of a Telrex 8-element 15M beam (weighing 160 pounds) at the 125 ft. level of the rotating tower. The Hy-Gain HDR-300 rotator was also installed at this time. The rotor drives a two-to-one reduction gear through a motorcycle chain! Two of these rotators are used, one to turn the rotating tower and the other to turn the 80M Yagi.

During the next 10 months, the remaining antennas were assembled and mounted from top to bottom using two guide ropes and a single lifting rope at-



The 80M beam is gently lifted from the ground as it is prepared to be hauled to the top of the tower

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From atop the tower Earl gives the 80M beam a helping hand on its way up the tower

feet of #18 copperweld wire elevated 13 feet above the ground. The 160M receive antenna consists of two 1,000 ft., 2-wire Beverages oriented for 45/225 and 135/315 degrees.

The final antenna for the current system is the aforementioned KLM 3-element, 80M Yagi. This 270-pound monster has 30 square feet of surface area, three 90 ft. elements and a boom length of 60 feet. In August of 1990, the first attempt was made to install this beam atop the self-supporting 180 ft. tower. Using a pair of 4WD vehicles and two guide lines, the beam was hauled up to the top of the tower. Just as preparations were made to secure the antenna to the mast, the uphaul snapped and the big KLM took a 180

tion! the worst part of the whole ordeal was that it took over a year for the next installation attempt.

With a video camera capturing the moment, the second attempt began on the morning of September 29, 1990. With the two 4WD vehicles properly positioned, the uphaul and guide lines were routed and manned. The uphaul ran from the top of the beam through a block on the mast, down to a pulley at the base of the tower, and was hooked to the first 4WD vehicle. A second line was fastened from the boom of the antenna to the other 4WD vehicle. This second vehicle was positioned away from the tower in relation to the beam. Its purpose was to pull the antenna

away from the tower as the first vehicle hauled the antenna up. With the helping hands of Earl, Dick Larsen, K8MW, and Don Pyne, KR8W, the KLM went up this time without incident. Gary Kaser, AB8Y, joined Earl on top of the tower and assisted in securing the antenna to the mast and connecting it to the feedline. By afternoon the installation was complete.

As far as antenna performance is concerned, let us just say that almost all frequencies are open to almost all parts of the world almost anytime!

The only other pieces of the system not covered so far are the rigs. In dealing with the minor shortcomings of an antenna farm located several miles




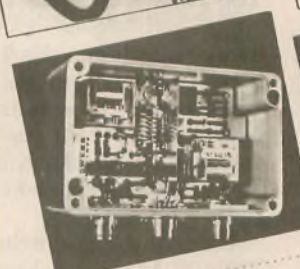
Way up there! Earl stands on top of the tower platform while Gary stands just below, preparing to bolt the 80M beam to the mast

ft. freefall to the ground. Luckily no one was injured and, amazingly, the damage to the antenna was minor. A \$25 part was the only thing necessary to return the beam to like-new condi-

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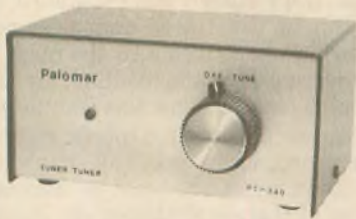
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The system is always being evaluated for possible improvements in the future. The 160M antenna, for example, has not been finalized. New configurations are being experimented with constantly so, as with many Amateur Radio projects, this one is ongoing. How Earl is going to improve upon *this* system is worth watching for!

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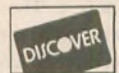
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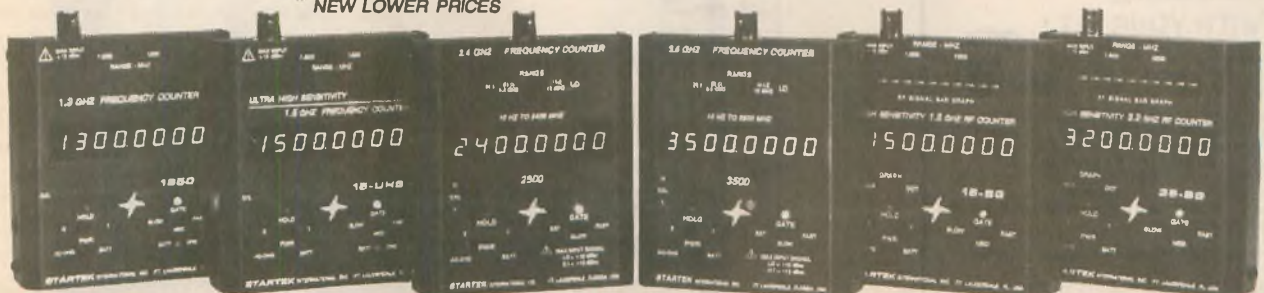


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RAP 1-2-3

(continued from page 3)

tables which were set up at the rear of the room to build a code key out of a soda pop can (quite ingenious!) and practice some code.

The soda pop can key consisted of two wires threaded through a hole in the side of the can at the bottom edge and up through the drinking hole. The red wire was fastened to a screw under the tab which was insulated from the can via a plastic screw anchor. The black wire was fastened to another screw elsewhere on the top of the can providing the path to ground. When the tab was pushed down onto the in-



Code keys were handily built from soda cans

ulated screw, the circuit was completed and activates the Radio Shack electronic buzzers on the black box in the middle of each table.

Each person was given a piece of paper with a character and a number on it. When the number was called out by George, that person was to send



Scouts learned to send CW with the help of Bob Risser, KB9BOJ.

that letter in code by following the list given on the back of the Archie comic book about Amateur Radio. While everyone was practicing their letters, it sounded like a CW contest on 40M! After a break, RAP 3 began.

Everyone was divided up into three-man teams with one group leader. Then they went to each of the four learning stations, which included electronic safety, logbook instruction, crystal radio kit construction, and a



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look at the ARRL video *The New World of Amateur Radio*. Group leaders were given a schedule that contained eight "shifts." Each station lasted about 20 minutes, and when the leaders were ready, the next shift was called. The scouts checked with their leaders to find out where to go next.

The whole purpose was to keep all scouts *active* and to keep things rolling to the end. Another reason was to give the scouts something to work up to. The safety session and other stations were mandatory before anyone could reach the grand finale . . . getting *on the air* with the help of Bob Risser, KB9BOJ, and his new Kenwood TS-690S rig.

Some 22 contacts were made, most of which were DX because of the CQ WW WPX Contest going on as well as good propagation. Wide eyes and surprised looks were on every kid's face when Bob told them what country they were talking to! After each QSO, the scouts filled out special QSL cards commemorating the event, to be sent to the DX stations. QSLs contained the scout's name, Bob Risser's or George Baker's call and other pertinent information. The call signs given to each scout at the sign-up table were not to be used on the air. They were used only to group the scouts together.

Sponsors included Alexander Mfg. Co. of Towanda, Illinois, who provided the screwdrivers and door prizes. Bernardi Printers of Normal, Illinois, provided writing pads for RAP 2. WYZZ FOX 43 of Bloomington provided the countdown clock preceding the videos. Curtis Mathes of Bloomington provided a free days' rental on the TV monitors. The ARRL provided hand-out material, video, slides, and ARRL posters. Other posters and catalogs were provided by Icom and Kenwood.

This was the best demonstration of Amateur Radio this ham has ever seen! It had a good mix of humor and facts to keep the participants' attention. I asked my seven-year-old son, Scott, what he thought of it, and he loved it. I couldn't believe how quietly he sat—that is not normal for a kid as active as he is.

A good deal of credit goes to the Pack 19 committee, chaired by Sharon Keist, and Cubmaster Ed King for having the insight to approve this program to be demonstrated for the entire pack.

Having seen this program first hand, I would like to see it go to a national level for all scouts to see. The ARRL says we need to encourage more young people to get interested in Amateur Radio. Well, I can't think of a better way to do it than through our scouts! □



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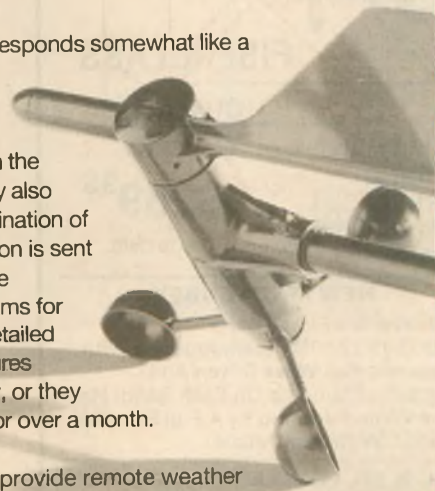
The Weathernode is not a TNC. It is a data gathering device that attaches to your TNC and station computer. The internal program is set to gather data from several types of sensors: internal and external temperature, wind speed, wind direction and rainfall. The temperature sensors come with the unit. The anemometer, for wind measurements, and the rainfall gauge are optional and are available from your favorite dealer or the factory.

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Swapmeet specials

MIKE CAFFERKY, AA6WQ

Ah, the Amateur Radio swapmeet: an amazing institution in society. Face it: You go to the swapmeet to look for good deals. The swapmeet also is a good place to have eyeball QSOs with friends, get out of the house for a couple hours of relaxation or just soak up a little business savvy.

A stop at the donut table gets you going down the rows of tables, pickup truck beds, station wagons and open trunks on the hunt. There you find loads of items you have been seeking for at least a year as well as loads of stuff you didn't even know existed. You'll always find something you need for a homebrew project or a repair. If for no other reason, you can take something home as a "conversation piece" to a shack where no one else goes because it's filled with useless conversation pieces.

Operators with their hand-held radios give instructions on bargains they see to mystery amateurs nowhere in sight. Other operators confer over their HTs with "the boss" regarding offers made by prospective buyers.

Over the last few months of attending swapmeets I have recorded some of

the statements of sellers as they ply their salesmanship skills. You have heard some of these and many more yourself. To help you when you attend your next swapmeet, consider this small satirical dictionary of swapmeet idioms. With each quotation from the swapmeet, I give my own version of the *real* meaning of the message. This collection serves as a tongue-in-cheek version of the old warning for purchasing any kind of used merchandise: Buyer beware. For the record, I have purchased almost all of my radio gear at swapmeets. It all works great.

Product quality

1. "I've had this radio only two weeks." (I bought it off a guy who had it for two years.)

2. "It works like a charm." (Get out your good luck charms on this one, baby.)

3. "It's as good as new." (Except for the display which has a dead spot in the upper left corner, the loose knob on the RF gain...)

4. "This rig had only one owner who took care of it very well." (Try to disregard the scratches, dents and smoke damage.)

5. "I want to sell this hand-held because I realized that I don't need a swapmeet radio." (I bought the wrong rig here last month, one that didn't work. I don't know why we bring radios to swapmeets anyway.)

6. "This antenna will double the gain you presently have." (This antenna will likely double your grief.)

7. "There is nothing wrong with this piece." (I've never turned it on. As far as I can tell, it looks like it will work.)

8. "I took it on a DXpedition last fall." (I've never been on a DXpedition.)

Customer service

9. "You won't have any trouble matching this with your computer."

(You have to buy another "black box" in order to get this to work on your computer.)

10. "If you have any trouble, just bring it back. I'll be here next month again." (If I see you coming, I'll drive the other way.)

11. "Sure, I'll be glad to help you set up this tower." (I live 100 miles away. If you bring the tower to me, I'll show you how to set it up.)

Availability

12. "If you don't buy it now, it will be gone in another few minutes." (I'm leaving in a few minutes if I can't sell it to you.)

13. "Get 'em while they last." (Why aren't people interested in this? Some guy told me they were hot sellers.)

14. "I've got a dozen more of these at home I can sell any time for \$20 each." (If I could find a dozen dumbos, I might sell one for \$5.)

15. "You want what? Oh, you're not going to find anything like that here." (I saw a box full of those last month. I hope they aren't here again today.)

16. "This is the last one I have." (Nobody will buy it.)

Price

17. "You would pay twice as much at the radio store for the same thing." (Why would you want to help them make a profit when I am trying to achieve the American Dream?)

18. "I'll let it go for half price." (I bought it for half price.)

19. "I won't take anything less than \$125." (I'll take nothing less this month.)

20. "At that price I would be giving it away." (It was given to me.)

21. "I can't even buy it myself for that price." (Don't go down the next row. You will find it there for half that price.)

22. "I've got to make a couple of pennies on it too." (If you'll buy it now I can make a couple of bucks. If you wait I probably won't be able to sell it at all.)

23. "I'll meet you half way." (With any luck at all, you will go away so I can sell it for the price I want to sell it for.)

Keep in mind that these are just-for-fun comments. Though buyers of used equipment should be careful to inspect gear as closely as possible, swapmeets are most often a great place to find some real deals! □

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Bells, whistles and S-meters

DAVID L. WIESEN, K2VX

One of the oldest of the "bells and whistles" accessories on communications receivers is the S-meter, which has the added distinction of having remained pretty much unchanged throughout its time.

The basic rule, not always followed, was that S9 is 50 microvolts at the antenna and that each S-unit is 6dB. Collins set this standard prior to WW II. Today, Ten-Tec specifies that S9 level is 50uV at the antenna terminals and strong signals will generally run well over it.

There were fewer beams and kW amplifiers in 1938. This leads to all of the "dB over S9" readings. In fact, on 80M, with most receivers S9 is just an average signal and S6 to 7, which should be average, is not only weak, but often in the noise.

Another problem is that most amateurs won't give the meter reading if it conflicts with their subjective judgment. They are quite right, since the subjective reading is more meaningful. The only place for the S-meter is in comparisons, "amplifier on/amplifier off," "antenna 1/antenna 2," and then only if you know what each S-unit represents and if the dB over 9 markings are accurate.

At one time I had a panoramic display on my receiver and I used to give signal reports in dB over the average level on the band segment. This was not an accurate dB reading, since I was merely "eyeballing" the "average level," but it gave the other fellow a better idea of how good his signal was than a straight S-reading would.

As long as we have different locations, antenna heights, antennas and changing conditions, all absolute standards which are preset in a receiver will be poor. What is needed is a reading which will tell the other operator how he is doing relative to other stations, under band conditions at the time.

For example, on 10M, when the band is near dead and the noise level low, one may hear signals which don't move the S-meter, but which are R5. A signal which is S6 will be blasting in. It would be proper to give that station an S9 report (extremely loud signal).

The original S-scale—before meters—was used this way. When the S-meter was introduced, the technology of the time forced the manufacturers to relate it to a single absolute parameter.

We need no longer live with this since we can have a meter which will permit the comparison readings, as the present ones do, but will also evaluate

signal strength the way a human would, with the accuracy of a meter calibrated in dB. Bear in mind that absolute does not mean accurate. Unless we have standard antennas, QTHs, etc., readings based on a specific number of uV at the antenna are based on an absolute and are absolutely meaningless. They could even be absolutely wrong.

The use of the S-meter for comparisons should be retained and we should establish a standard for the S-unit. I've used a signal generator calibrated output and a calibrated attenuator and found that on two Ten Tec transceivers and a Drake receiver, S9 on 14 MHz was about 50uV and each S-unit was 5 to 6dB. However, on a Heathkit, each step was only 3dB. This would translate to a change of 100 percent in terms of transmitting power, but very little in terms of voltage at the antenna. Additionally, the range of S1 to S9 becomes a mere 27dB.

Six dB gives us 54dB in that range and, with some dB over S9, is in line with the dynamic range of most receivers. In fact we might go to a 10dB per S-unit measurement and get rid of some of the dB over S9.

What do we want this meter to measure or compare? The signal in question versus the average level of signals on the band at the time; if no signals are on the band at the time, then versus the noise floor.

Present S-meters operate on the AVC voltage. The stronger the signal, the higher the AVC voltage. There is no reason not to continue to use this as the measurement parameter, but it should now become one of the parameters. The pick-off point should be (as it now is) after the last stage of selectivity, the output of the last IF filter or the audio filter when the AVC is audio derived.

This provides the reference for the signal under evaluation.

The second parameter should be derived from a wide band point, such as the output of the first mixer. This is where we will get our sample of the signal levels on the band.

I also believe that we should not use as our wide band standard a simple sweep on either side of the listening frequency, since at the band edges, the absence of signals may give a false high reading to the signal under study, or the presence of a very strong commercial signal could give a false low reading. Therefore, on each band, after the first mixer we need a fixed tuned circuit centered on the band center, which then feeds the "wide-band" input of the differential amplifier. The other input would be the narrow band signal under study.

My proposal, therefore, is to:

1. Standardize the number of dB per S-unit.

2. Change S9 from an absolute "voltage-at-the-antenna" based reading, to one based on an agreed upon number of dB over surrounding signal or noise floor—whichever is stronger. This can be done either with a wide band reference, as described above, or with a digitally sampled sweep. The latter would be more complex, but would eliminate the need for compensating amplifiers to adjust the gain of the "wide" reference voltage to make it into a suitable average against which to measure the "narrow" voltage.

These changes will permit signal reports which accurately reflect how well a signal is doing and will eliminate the effects of location, antenna and conditions. They will also do a better job of showing differences between antennas, power, etc., at the transmitting end. □

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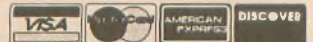
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Silent Keys

Franklin Cassen, N6AT

Franklin Cassen, N6AT, ex-W4WBK, passed away on April 15, 1992, at his home in Fallbrook, California, at the age of 88.

Initially interested in Amateur Radio during his high school years (pre-1920), Franklin passed his government exam then but didn't receive call letters, since he didn't have a station. He was finally licensed as W4WBK in 1952, later as W6PZU, and finally as N6AT.

Franklin was active in the Mid-South Amateur Radio Association (MARA) in Memphis for about 20 years, holding several offices. He also served as ARRL Vice Director of the Delta Division in the 60's and was a charter life member of the ARRL as well as a lifetime subscriber of *Worldradio*.

In addition to this he was active in public service and emergency coordination throughout his career, and he was active in traffic nets since retiring to California in 1973. He was a life member of the Mission Trail Net.

He is survived by his wife, Margaret, son Quent, N6AF, and daughter, Katy Sexton, as well as four grandchildren, including Jill Cassen, KC6AFN. —*Information submitted by Quent Cassen, N6AF.* □

Andy Anderson, K0NL

Ralph "Andy" Anderson, K0NL, died in Holton, Kansas, on May 4, 1992. He was 82 years old. Born in Oneida in 1909, Andy graduated from Oneida High School in 1927. Having been interested in Amateur Radio since an early age, he taught himself Morse code and passed the exam to become a licensed operator.

He joined the Naval Reserve in 1929 and was commissioned an officer in the early '30s. With a love for music as well as radio, he worked for an electric company and then a music shop, as well as maintained his own radio repair business in Hiawatha until 1940, when he volunteered for active duty in the Cryptology Division in Washington, DC.

Andy stayed with this throughout the war years and in fact spent 25 years in the cryptology division, developing devices to produce secret codes and ciphers. He continued in the Naval Reserve and was also in charge of the Air Force MARS at Bolling Field; he formed the Maritime Mobile ARC in the late '40s; and he wrote a regular column for *CQ*. He started *Auto-Call* in

1952 and he published the *Amateur Radio News Service Bulletin* for 23 years.

Andy's interests ranged from music to electronics and computers, and after retiring to Holton in 1965, he transformed his basement into a workshop and printing center. There he worked on radios and computers and stored an expanse of collected equipment and inventions. He also ran his own printing center and generated newsletters for

Ken Taylor, W6WT

When Ken Taylor, W6WT, died recently at age 89, he had been a licensed amateur since 1921, gaining his ticket as a high school boy in Los Angeles. Always known as a gentleman with kind words for everyone, devoted friends still called him "Water Tank."

He was a graduate of UCLA and held a Master's degree. His career was varied, starting in 1924 as assistant to a couple other hams who were running station KGFJ. Then he worked for the *Pasadena Star News*, doubling as a news announcer and even helped put

several local service groups.

Andy was generous with his time and his expertise. He was always on hand to help out, often loaning his own equipment, demonstrating the use of personal computers to those learning, producing publications for various efforts, and offering advice in many areas.

Andy Anderson was a life member of the ARRL and served as director of the Foundation for several years. He was also a life member of the QCWA, Old Timer's Club and the Rotary Club. —*Information submitted by Dennis White via Lenore Jensen, W6NAZ.* □

an early Rose Parade on the air. Going on to KMPC, he mixed sound and occasionally was a DJ; he recalled doing commercials for drink mixes in prohibition days, resorting to fancy double talk.

As a good engineer, he specialized in dangerous high voltage work and antenna adjustments. After hours, he'd moonlight for KMTR (now KLAC) or at the station of Aimee Simple McPherson, who was said to leave his pay tucked inside a bible.

Ken also worked for the Los Angeles County Sheriff Department. When he (please turn to page 32)

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Thomas P. Roscoe, K8CX STATION APPEARANCE

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

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

My two main interests are DXing and contesting. I have worked all 322 countries on the ARRL DXCC list. My first contest was the Novice Roundup in 1963. My first win was the CQ Worldwide DX CW contest in 1967. I am currently having fun as a member of the North Coast Contesters.

I am active on all nine HF bands



and use all modes including RTTY, AMTOR and packet.

The shack is wired with two separate 220V lines, two separate 110V lines for the equipment, a

separate 110V line for the computers, a separate 110V line for the lights and a ground system that starts one foot past the paneling. (Photo by Jim Benson, WB3JNF) □

Silent Keys

(continued from page 31)

decided to retire, Loyd Sigmon, W6LQ, urged him back as a transmitter engineer at KMPC. And, then full circle, he helped automate with modern gear the station at which he had started, KGFJ.

Always active in Amateur Radio, his favorite story concerned answering an early CQ from Zane Grey's yacht, then recognizing the operator's fist as that of a friend. At the time, the Navy was sending a fleet of planes around the world but they had lost contact with headquarters. The yacht picked up their information as to the fleet's whereabouts, and relayed it to Ken, who personally delivered it to Naval authorities.

Ken Taylor was always visible at amateur clubs and conventions and is remembered by all as a very special person. He is survived by his wife, Gladys. — Information submitted by Lenore Jensen, W6NAZ, and Ron Plummer, K6GJN. □



Amateur "Hi"



John Stephenson, AC4JO, relates this tale of a confusing encounter.

My son, Tyler, and I received our licenses at the same time. He was KB4GGE and I was KB4GGD. This was a real godsend for me because when we went somewhere, a 40-year-old dad did not have to keep up with an energetic 10-year-old, but it led to some unusual incidents. I simply gave him a 2M HT and let him wear himself out.

Once, when we were visiting Mammoth Cave, Kentucky, he was up near

the Ranger who was guiding the tour while I was near the back of the rather large group. Suddenly a stranger came up to me and asked, "Is that a ham radio?"

"Yes, it is."

"How are you getting out down here, and to where?"

"My son is at the head of the group with another HT. I'm talking to him."

"Thank God. I just told my wife she was right—I'm spending too much time on the radio; I'm hearing QSOs going on down in this cave." □

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Ameritron's new . . .

AL-811 linear amplifier gives you plenty of power to bust thru QRM.

You get a quiet desktop linear that's so compact it'll slide right in to your operating position -- you'll hardly know it's there . . . until QRM sets in. And you can conveniently plug it into your nearest 120 VAC outlet -- no special wiring needed.

You get three tough 811A transmitting tubes, extra heavy duty power supply, all HF band coverage, pressurized ventilation, tuned input, dual illuminated meters, adjustable ALC and much more . . . for an incredible \$649 . . .

The first 600 watts makes the most difference

The AL-811 gives you 600 watts PEP output -- that's nearly 2 full S-units over your barefoot rig.

That could mean the difference between hearing, "You're Q-5 armchair copy" and, "Sorry can't copy you, too much QRM."

Now you won't have to stand aside while the "big guns" steal your DX. You'll be able to log some of those stations first.

Going from 600 watts to the full legal limit gives you less than one S-unit increase. But is that fraction of an S-unit worth the 3 to 4 times more money it'll cost you?

The AL-811 gives you a powerful punch at a price that's easy on your wallet.

All band, all mode coverage

The AL-811 covers all HF bands (10/12 meters with easy user mod). There's no compromise on WARC and most MARS bands -- you get a 100% rated output.

You can operate the AL-811 on all modes. You get 600 watts output PEP SSB and 500 watts output CW. You even get 400 watts on demanding continuous carrier modes like RTTY, SSTV, FM and AM.

How the low cost 811A tube resists premature failure - even when your amplifier is mistuned

811A tubes resist premature failure in two ways.

First, they're constructed with widely spaced elements that minimize the chance of elements touching and causing a short -- even if the plate gets hot enough to melt.

Second, they use a directly heated thoriated tungsten filament cathode that prevents the electron emitting layer from instantly stripping off -- even if mistuning causes a sudden, severe current overload.

Indirectly heated oxide cathode tubes (like the \$400 3CX800A7) can be rendered instantly useless if their electron emitting layer is stripped off because of a severe current overload due to mistuning.

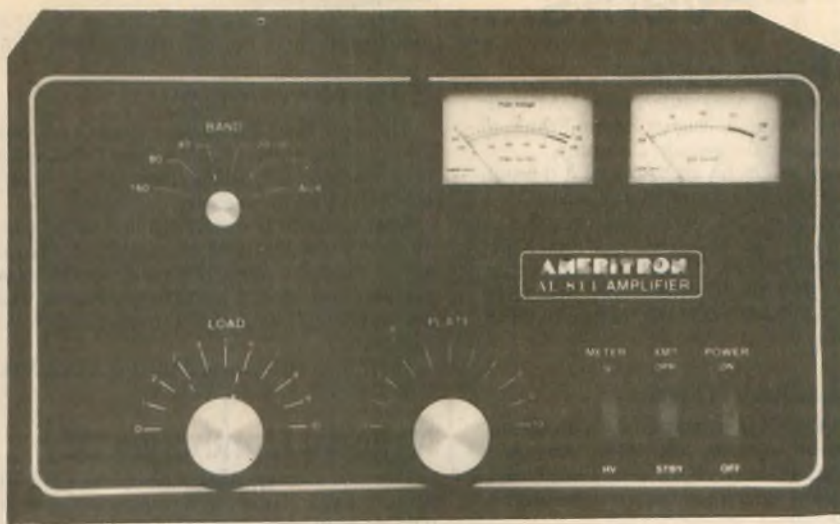
The Ameritron AL-811 is excellent for the newcomer because it's tough enough to withstand momentary mistuning. And the tubes are so inexpensive that you can replace one for mere pocket change.

The Ameritron advantage: extra heavy duty power supply that gives you peak performance year after year

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

Two illuminated meters

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.

Ameritron exclusive

Adapt-A-Volt™ power transformer

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.

Ameritron's exclusive Adapt-A-Volt™ power transformer has a special buck-boost winding that lets you compensate for stressful high line voltage and performance robbing low line voltage.

This makes your components last longer and gives you peak performance -- regardless of your line voltage.

Plus more . . .

An Operate/Standby switch lets you run barefoot, but you can instantly switch to full power if you need it.

A transmit LED tells you when your rig is keying your AL-811.

A 12 VDC keying relay makes it compatible with all solid state and tube rigs. A built-in back-pulse cancelling diode protects your rig's keying circuit.

Shielded RF compartment. One year limited warranty. Compact 16" D x 13 3/4" W x 8" H. 30 pounds. UPS shippable. Shipped with transformer installed and wired for 120 VAC. Draws 8 amps at 120 VAC. Export model AL-811X wired for 240 VAC and includes 10 and 12 meters.

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Only the Ameritron AL-811H gives you four fully neutralized 811A transmitting tubes. You get absolute stability and superb performance on higher bands that can't be matched by un-neutralized tubes.

Ameritron mounts the 811A tubes vertically -- not horizontally -- to prevent hot tube elements from sagging and shorting out. Others, using potentially damaging horizontal mounting, require special 811A tubes to retard sagging and shorting.

A powerful 20 CFM computer grade blower -- not an open frame phonograph motor -- draws in cool air to pressurize the cabinet and efficiently cool your 811A tubes for extra long life.

You also get efficient full size heavy duty tank coils, full height computer grade capacitors, heavy duty high silicon core power transformer, slug tuned input coils, operate/standby switch, transmit LED, ALC, dual meters, QSK compatibility with QSK-5 plus much more.

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.

A ball bearing vernier reduction drive makes plate tuning precise and easy.

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.



Special Events...

From Frankenstein

The Wiesbaden ARC will operate DA1WA/P from July 31 through August 2 from Frankenstein castle near Darmstadt, Germany.

Operation will be on all bands 80M through 10M, CW, SSB, Packet and digital modes.

For QSL, send QSL and SASE with two or three IRCs or "greenstamps" to Rob Kipp, DJ0PU, Huegelstr. 25, D-W06070 Langen, Germany, or Ronald H. Kellerman, DA1RO/KD4DNA, 435 TAW/WXF, PSC 5, Box 38, APO, AE 09057

Bob Burns' 101st

The Amateur Radio operators of Van Buren, Arkansas, will operate N5TKO on August 1 from the home of the late Bob Burns, yesteryear's radio and silver screen celebrity, celebrating his 101st birthday.

Operation will be in the lower portion of the General 15M and 20M phone subbands and 10M voice phone subband from 1500Z to 2300Z.

For QSL, send self-addressed label to Jim Habersetter, 609 N. 8th, Van Buren, AR 72956.

Texas Dog Days

The San Benito ARC will operate WA2VJL on August 1 and 2 to celebrate the "hot, humid, dog days of South Texas." The station will be operated by the hams (all under 15) of the Faulk Intermediate Junior High School Radio Club, SBARC's adopted school.

Operation will be on or near 28.360 and 21.325 MHz.

For a certificate, send QSL with a business-size SASE for a folded certificate or 9½ X 11 for flat mailing to Dog Days QSO Party, P.O. Box 1382, San Benito, TX 78586.

Canoe Championships

The Juniata Valley ARC will operate special event station K3DNA from August 1 through 16 in the Lewiston, PA, area to celebrate the 25th anniversary of the US Canoe Association National Championships.

Operation will be in the General portion of the SSB band as well as on CW. The members will operate when time permits. Most operation will be the week of August 1 through 8.

For a certificate, send SASE to K3DNA, P.O. Box 73, Yeagertown, PA 17099.

Whale Festival

The Hervey Bay ARC will operate VI4FOW from Hervey Bay August 1 through 31 to celebrate the Whale Festival.

Operation will be on 3.794; 7.100; 14.235; 21.250; 28.495 MHz, and Australian Novice frequencies will be activated as the band permits.

For award and QSL card, write to Hervey Bay ARC, P.O. Box 829, Hervey Bay, Queensland 4655, Australia.

Lum 'n Abner

The Ouachita ARA will operate KG5QO/5 from August 6 through 8 honoring local celebrities Chet Lauck and Norris Goff, "Lum 'n Abner" of early broadcast radio fame, and commemorating the 50th anniversary of their first motion picture. Operation will be from the original "Jot

'em Down Store" in Pine Ridge, Arkansas.

Operation will be on the lower 25 kHz of the General phone bands and 10M Novice band from 1300 to 2400Z.

For QSL, send QSL and #10 SASE to: KG5QO, Jack Brewer, Rt. 1, Box 137, Hatfield, AR 71945.

ETS, New Jersey

The Electronic Technology Society of New Jersey will operate AA2AV August 7 through 9 from Skeleton Hill Island, New Jersey, to celebrate its 25th anniversary.

Operation will be on CW: 3.530; 7.035; 7.135; 10.150; 21.035; 21.135; 28.035 and 28.135. Phone: 3.875; 7.275; 14.235; 21.335 and 28.335. Also 146.94. Credit for Iota NA111. Operation will be from 2200UTC August 7 through 2200 UTC August 9.

For QSL, send QSL and SASE to AA2AV, P.O. Box 1233, Piscataway, NJ 08854.

National Lighthouse Day

The Old Barney ARC will operate W2OB August 8 and 9 from the Barnegat Lighthouse (Old Barney) to celebrate National Lighthouse Day.

Operations will be on CW: 7.040, 14.040, 21.040, 28.040; phone: 7.225, 14.290, 21.390, 28.390, 146.52, 146.835/R from 1200Z to 2300Z.

For QSL, send QSL and 9 X 12 SASE for unfolded certificate to Joe Fleishinger, NU2F, 75 Joshua Dr., Manahawkin, NJ 08050.

Merchant Marines reunion

Gallups Island Radio Association will hold a reunion August 28 through 30 at the Ramada Renaissance Hotel in Long Beach, California. The group is composed of Merchant Marine radio operators who graduated from the US Maritime Service radio school on Gallups Island in Boston Harbor during 1940 to 1945.

Reunion chairman is Bob Clough, K6RS, 1324 Buckingham Dr., Thousand Oaks, CA 91360.

Trainfest

Amateurs from NE South Dakota will operate NOJUO August 8 and 9 during the 8th annual Trainfest at Milbank, South Dakota.

Operations will be in the General phone subbands and in the Novice portion of 10M.

For certificate, send QSL and 9 X 12 SASE to NOJUO, P.O. Box 189, Wilmot, SD 57279-0189.

Firelands

The Firelands ARA will operate WB8LLY August 11 through August 16 from the Heritage Barn at the Erie County Fair to commemorate

the 200th anniversary of the Connecticut legislature setting aside the Firelands.

Operations will be in the lower 50 kHz of the General phone subbands on 80, 40, 20, 17, 15, 12 and starting on the 10M Novice phone subbands (28.400) daily during the fair. Radiograms for the Erie County area will be accepted via WB8LLY at WB8JUI packet station.

For certificate, send 9 X 12 SASE with two postage stamps and QSL with contact number to Tim, N8AHK, 1307 Fifth St., Sandusky, OH 44870-4201.

Seattle Museum of Flight

The Boeing Employees ARC will operate a special event station August 14 through 16 at the Seattle, Washington, Museum of Flight commemorating the 50th anniversary of the first flight of the B29.

Operations will be on 28.400, 21.360 and 14.280 MHz from 1700 to 2400 UTC.

QSL card with black and white glossy photo of the B29 in flight will be sent to all who contact the Boeing ARC special event.

Antique Aircraft Fly-in

The Clark County ARC will operate W7AIA August 15 and 16 from Evergreen Flying Field, east of Vancouver, Washington, to commemorate the 33rd edition of the Antique Aircraft Fly-in.

Operations will be in the lower portions of the 40, 20 and 15M bands (phone) and some operation on the 75M phone band during the night is expected.

For certificate, send SASE to CCARC, P.O. Box 1424, Vancouver, WA 98668.

Hamcon '92

Hamcon, Inc. will operate W1AW/6 August 22 and 23 from the 1992 ARRL National Convention.

Operations will be in the General subband of 80, 40, 20 and 15M, Novice subband of 10M and the VHF/UHF bands.

For certificate, send QSL and a 9 X 12 SASE to Hamcon, Inc., attn. Dick Bruno, N6ISY, P.O. Box 570756, Tarzana, CA 91356.

Mount Davis, Pennsylvania

The Somerset County ARC will operate KC3XD August 8 and 9 from the highest point in Pennsylvania at Mount Davis.

Operations will be on the lower 50 kHz of the General Class phone bands of 10 through 80M as conditions allow.

For QSL, send QSL and SASE to KC3XD, Sherman Gary, 708 Casselman St., Confluence, PA 15424.

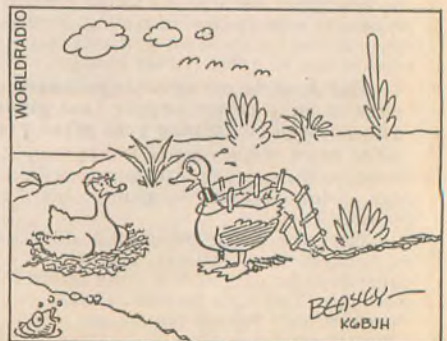
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SORRY I'M LATE ON THE MIGRATION, MADGE---
I PICKED UP ABOUT 65 FEET OF LADDER LINE
OUTSIDE OF DES MOINES!



A tuner simplified

The article by W9RCS on antenna tuners makes very complicated what is really a very simple device.

At the input to a feedline to an antenna, the impedance seen (or measured) is a combination of reactance and resistance, depending on the antenna, frequency and the length and impedance of the feedline.

All the antenna tuner (or more properly, transmatch) does is convert that impedance to 50 ohms, or close to it, so that the transmitter is properly loaded. There are various combinations of inductance and capacitance that can be used to perform this conversion. The voltage and current on the transmission line cannot ever be exactly 90 degrees out of phase if any power is to be sent to the antenna.

JAMES N. THURSTON, W4PPB
Clemson, SC

The color purple

The Defense Department is taking quite a beating in the budget this year and will for a few more to come until things settle down, another war starts or gas goes up 20¢ a gallon. One of the places they could cut dollars is in the MARS programs. MARS needs to be purple and get rid of the old service rivalries. Oh, you'll hear the "Navy missions are different than Army," or "Air Force missions are unique to the service," but that's the same crud the bureaucrats have been feeding us for years to save their jobs while strangling the programs.

The Army still fails to recognize the Amateur Service as a training area for MARS. All you have to do is note their record on military recreation station licenses and the outdated or contradictory information in regulations. While Desert Storm/Shield may have given MARS a shot in the arm, the services failed to capitalize on the opportunity that was presented. Army MARS stations in the continental US were rare to find on phone patch nets, and passing traffic into Germany was almost impossible until the VII Corps got into the act.

Unless the DoD can get the services to forget the blue and green suit bab-

ble, find real leadership for MARS and make an effort to promote the system, the frequencies would be better off in the amateur spectrum for NTS or other organized purposes. Of course DoD may want to look for someone who can balance a checkbook to take over too! (Even the president has a hard time finding good, reliable secretaries . . .)

ROBERT GODLEWSKI
Ft. Lewis, WA

Robert Godlewski is the trustee of the Fort Lewis Amateur Radio Activity and was the Army MARS Director in Saudi Arabia from Sept. '90 thru Nov. '90 as an additional duty.

Fees for cleanup

I have been a licensed amateur since 1926, my call then was 1BMG (no prefix). In those days no one would ever call in on a frequency that was in use, let alone deliberately cause QRM.

The deliberate interference on the 20M band is a disgusting situation.

Apparently the FCC does not have either the time or the manpower to curtail it.

I would like to suggest that we pay for our licenses and the money to be used by the FCC to monitor and control the bands.

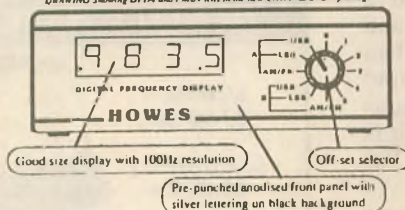
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To make the DFD4 even more suitable, we now offer the **PMB4** Programmable Matrix as an optional kit. This enables you to switch between six different programmed offsets, so the DFD4 can be used with more than one radio, and to compensate for IF frequency differences when switching modes. Also new is the **CA4M** "hardware package." This contains a custom made case with pre-punched anodized aluminum front panel (see drawing above), plus switch, knob, BNC socket, nuts and bolts, etc. to enable you to achieve a high standard of finish for your project.

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Nothing else is free in this country, so why not charge a fee for it? If it would clean up this mess I think it would be well worth it.

CHARLES H. STEVENS, W1HWG
Stafford Springs, CT

Weak signal spots

Regarding weak signal spots (*Worldradio* April issue, FCC Highlights, p.10): I would like to add my two lines worth for RM7869.

1. There should be weak signal spots on all the bands.

2. To the opposed group, "some day that weak signal may be your own."

DAVE ATKINS, W6VX
Los Angeles, CA

Policing new hams

It was with considerable trepidation that I read the letter of Art Byrnes, KA4WDK, in the June issue criticizing some individuals for their overzealous activities as "police hams."

First, I would like to say that his point is well taken on the over-reaction of some hams in their interpretation of FCC rules and regulations.

However, I would point out that the influx of new operators under the relaxed "no code" license provisions is presenting a challenge to all existing amateur operators.

This challenge is manifest by the incorrect procedure and improper use of the amateur bands. Use of CB lingo, ten-signals and failure to identify at proper intervals are only a few of the areas needing improvement.

It is incumbent on all hams to join in the task of educating these newcomers for the benefit of everyone in the hobby.

If this activity earns the epithet "police ham," so be it! Somebody has to do it!

HOWARD CHAMBERS, W7DC
Cottonwood, AZ

20M interference

Does anybody have an explanation for the following nonsense?

On May 19, 1992, from 23:10 to 23:57 EDT, a frequency spectrum ranging from approximately 13.980 to 14.015

MHz, with apparent center frequency of 14.005 MHz, was completely jammed by a high-power transmission. A scope display of its audio signal showed an inverted saw tooth of 50 Hz repetition rate, with a pulse width of 5 ms, and a sharp negative transition at the leading edges. The signal exhibited an AM modulation and a slow FM audio sweep. Due to the nature of a saw tooth, uncounted harmonics occurred.

Signal strength at this location was S9+ 15dB at center frequency. At 23:57 EDT, it was switched to lower power, though still molesting the 20M amateur band.

On May 20, at 23:50 EDT, there was a similar occurrence with same signal strength. Even European stations complained about this interference which rendered the 20M band useless up to 14.018 MHz.

On May 21, 1992, at 02:10 EDT, the same transmission ran for five minutes.

I thought FCC is in control of transmissions and frequency allocations; what about H.R. 73 and S.1372?

HELMUT K. SEIKE, AA8GQ
Toledo, OH

VE free

The ARRL and Fred Maia, W5YI, have separately petitioned the FCC to incorporate the Novice Amateur Radio test into the same volunteer examiner (VE) system presently being used for all other license classes.

There is nothing wrong with our present system of allowing any two hams to administer the Novice test, just as long as they hold General Class or above licenses and are not related to the candidate. In many rural areas, and in a surprisingly great number of urban areas as well, it is hard enough to find just two General Class or higher hams to administer the Novice test, but it is much more difficult to find a VE testing session.

The present Novice testing procedure should be retained because it provides many more opportunities for testing sessions than the limited number (and often inconvenient location) of VE tests. Incorporating the Novice test into the VE system would be acceptable if it were in addition to our existing Novice testing procedure,

so that the new Novice VE testing system would supplement the existing one instead of replacing it. Otherwise, we run the risk of destroying this traditional entry level for new hams by making it overly difficult to find and travel to a VE testing session.

The FCC intends to issue a Notice of Proposed Rulemaking later this year, with a 60-day public comment period. Whether or not you support the petition, consider writing the FCC and asking them to keep the Novice test free of all VE fees, just as it is now.

STEVEN L. KARTY, N4UHO
Vienna, VA

Cash for parts

Electronic material industries, specializing in electronic component parts, is offering cash for parts of all types—capacitors, resistors, transistors, diodes, ICs, connectors, relays, switches, surface mount components, etc.

For further information call 818/842-5953 or FAX 818/845-3613.

RICHARD MAXWELL
Burbank, CA

No photos? Before submitting a plain-text story to *Worldradio*, see if other local amateurs or club members happen to have photos available.

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Product Review

TOM TORGERSON, N0MOP

This is the third in a series reviewing commercial "physically short or unique" HF antennas. (See "QRV DX Halfsquare," Dec. '91, and "The W9INN Broadbander," May '92.)

The W9INN MPD-5C Max-Performance dipole is a five-band wire antenna for 80, 40, 20, 15, and 10M. It is very broad banded and you specify upon ordering for what frequency in each band you would like it cut.

Theory

Half-wave dipoles can be "tied" together at the common feedpoint, giving multi-band operation from one feedline. Many hams use this trick, but in this case only two wires per side give you five-band capability. To quote W9INN's own description of performance, "This antenna is designed to provide maximum performance possible for its size. Bandwidth and efficiency are almost indistinguishable from a much larger antenna."

You get extra wire if splicing is needed, a roll of tough Dacron line for installing, and two end stubs used for pruning SWR. The instructions are clear and well done with diagrams to show any potentially tricky areas, like spacer placement.

Assembly

The only assembly to be done is inserting three spacers on each side to keep the two antenna wires separated. Figure 1 is a rough diagram showing the two-wire-per-side arrangement used. The top wire handles 80 and 20M operation, and the shorter bottom handles 40, 20, and 15M radiation. The two are separated by a space of one foot.

There are three "Resonators" used on each side, giving a total of six for the entire antenna. As stated in the documentation, this method of adding bands is preferred over additional traps or Resonators, as it maintains the maximum bandwidth of the primary element (top wire) and secondary element (bottom) and provides perfect insulation between the two.

The insulator is a W2AU "ANsulator" that has no balun in it but does have a built-in lightning arrester. You merely plug your PL-259 into it; no soldering is needed but I would recommend using some sealer compound around the plug for weather protection. You can order the same antenna that uses twin lead also—just ask for model MPD-5RTS.

Installation

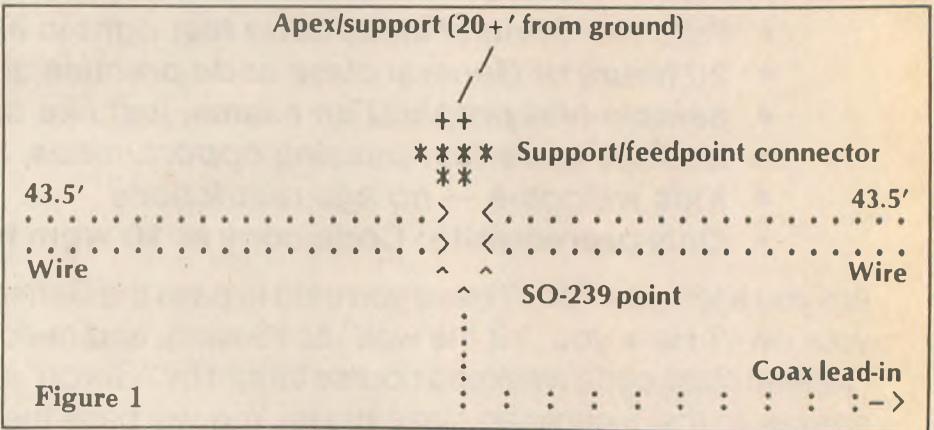
About 90 feet of horizontal space is needed to install the antenna if used as in Figure 1, much less if used as an inverted V. For test purposes I fed the MPD-5C about 15 feet off the ground in the front yard, went up to a chimney mast for the apex (27 feet from ground),

the sloping roof, not so parallel to its slope, and a bit higher, all was now set for serious on-air test operation and comparisons.

Actual test bandwidths with less than or equal to 2:1 SWR were: 80M, 140 kHz; 40M, 100 kHz; 20M, 350 kHz; 15M, 450 kHz; 10M, 700 kHz.

Performance

Despite the smaller size, overall performance and reports received on all bands compared equally or better with the other antennas tested so far in this series. Some of the other antennas may have had a bit better performance in some bands, but for ease of use, coverage, low SWR, small size, con-



and down the other side to the backyard, tying it off to a pole 15 feet high.

At first I had the ends lower, giving me a typical inverted V, except the sides were sloping near parallel with the slope of the roof and the bottom wire of the antenna was within two to three feet from the roof proper. Even though this worked all right and SWRs were pretty good, I thought I could do better, especially since on 20M (barefoot) I would modulate the upstairs fire alarms—the XYL loved that!

By changing the parameters to values mentioned above I cleared up the talking smoke alarm problem and results all around were better from signal reports to SWR bandwidths. By getting the antenna further away from

struction and on-air performance the MPD-5C really shines through.

I was really pleased to see the low SWR on the bands and how wide the usable bandwidth was. It already is short if mounted horizontally but, as with regular dipoles, it can be installed in many configurations such as an inverted V or L to fit nearly anyone's small lot. Extra material is included in the package, and lots of information about antennas in general is given in the pamphlet, *The Easy Way*.

It is a pleasure to use five bands with a solid-state rig and not have to use a matcher to bring the SWR down on every band change. What is even nicer are the reports I receive. My main band is 75M and I have no problem with people not hearing me with this test antenna. I can't tell much, if any, difference between it and my own 75M system, which is installed about 10 feet higher than the MPD-5C.

You needn't have to think about any changes to the antenna if you are using, or in the future will use, an amplifier, since this antenna will take legal power plus. A 20 to 50 ft. + apex and 100W is all you need to work both next-door and worldwide stations.

The MPD-5C Max-Performance Dipole will need 50 ohm coax lead-in and is priced at \$105. Contact W9INN Antennas, P.O. Box 393, Mt. Prospect, IL 60056; 708/394-3414. □

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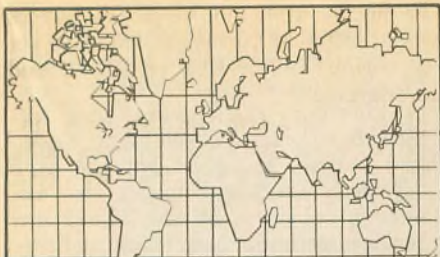
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- July 11-12 IARU HF World Championships
- July 24-26 Northwest DX Convention, Renton, WA
- Aug. 28-30 New Orleans DX Convention
- Sept. 12 W9DXCC Convention, Glen Ellen, IL
- Oct. 10-11 DXPO 92, Washington, DC

Refer to your favorite contest section in *QST* or *CQ* for details on the above contest activities.

W100N

The following DXer was awarded *Worldradio's* Worked 100 Nations Award during this past period:

431) George Florinskij, UB5LRS, June 8, 1992.

Botswana (A22)

Dave Heil, A22MN, formerly 9L1US, continues to hand out Botswana to the deserving. During a 15M run one Saturday afternoon recently, one inquiring DXer asked Dave why not A22US this time. Dave said that when he requested the call there was no "U" block available. So, it's back to "mother nature."

Be aware that Dave uses a computer logging system. Dave commented so to me when I worked him on 15M, and he already had my name from the 20M contact made 10 hours previously. In other words, if you have already worked Dave on a particular band/mode, give someone else a chance without making a pest of yourself.

Three other stations were reported from Botswana this past month, including the following:

A22BW	3.792 MHz	0015 UTC
A22GH	7.002 MHz	2200 UTC
A22SG	14.034 MHz	1400 UTC

Canary Islands (EA8)

Much of the DX worked, such as Germany, Japan, England, etc., is considered "garden variety" and is never reported. When we began collecting data the end of the previous month we decided that the Canary Islands would be a good one to include, as that one is reported in the DX newsletters.



Ron Faulkner, W6TUR, is also a political history buff.

Meet Ron Faulkner, W6TUR, one of our regular contributors. Ron's Amateur Radio days date back to the early 1950s in upstate New York, but he didn't really get into the DX swing until after his move to California. Ron's DXCC count is presently at 223, mostly CW.

The photo also shows Ron's other hobby—political history—with a selection of presidential material. Some of his items date back to Zachary Taylor. Ron also likes to read about World War II. Ron, do you subscribe to *Military*, our sister publication?

Two of Ron's sons are also hams, KA6UFK and KA6UTE.

Perhaps the Canary Islands are also that "garden variety"; most of the calls were reported only once.

EA8AB	7.003 MHz	0030 UTC
EA8AN	21.237 MHz	2215 UTC
EA8AT	21.004 MHz	1730 UTC
EA8BDX	14.010 MHz	0245 UTC
EA8BET	28.491 MHz	1230 UTC
EA8BGY	18.131 MHz	2100 UTC
EA8BNC	14.025 MHz	0030 UTC
EA8BVC	21.345 MHz	1815 UTC
EA8BWE	14.160 MHz	2245 UTC
EA8BWP	21.023 MHz	1700 UTC
EA8BYR	14.269 MHz	0315 UTC
EA8GQ	21.245 MHz	1845 UTC
EA8IE	14.024 MHz	1015 UTC
EA8LS	14.187 MHz	0715 UTC
EA8PP	7.180 MHz	0615 UTC
EA8PR	28.012 MHz	1700 UTC
EA8UK	21.017 MHz	2200 UTC
EA8US	21.006 MHz	2000 UTC
EA8ZO	18.160 MHz	1623 UTC

French Polynesia (FO)

Very active recently has been FO5BI, who has been island hopping to satisfy the IOTA types. Most of his

activity has been restricted to CW except for an occasional shift to 20M SSB. Other activity from this nation has been supported by the following calls:

FO4DC	21.277 MHz	0245 UTC
FO4DL	21.277 MHz	0245 UTC
FO4OA	14.118 MHz	0630 UTC
FO5DV	14.007 MHz	0645 UTC
FO5EV	14.020 MHz	0700 UTC
FO5IA	14.202 MHz	1030 UTC
FO5IV	21.026 MHz	0145 UTC
FO5JR	14.010 MHz	1300 UTC
FO5NL	14.216 MHz	0715 UTC
FO5NT	28.059 MHz	0145 UTC
FO0PT	10.102 MHz	0945 UTC

Some of the above frequencies and times may be unfavorable to your location. We obtain these reports from several of the DX newsletters, some from the other side of the world. These sources are listed at the end of our column.

St. Pierre (FP)

Ralph Hirsch, K1RH, reports that he plans to operate from St. Pierre in

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2 80, 40M	85 ft. ..	\$62 ..
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Ski on French Frigate Shoals

N6JM,

I'm the "Ski" you mentioned as being the operator of KH6ABH, French Frigate Shoals, in your April column. I have no logs from there, as KH6ABH was a military club station and the logs stayed with the station. The LORAN station closed in 1979, and there's no telling where the logs would be today. But I have tales to tell of being a newly licensed Novice on that same rock pile in 1961.

About six months out of Coast Guard Electronics School, I arrived at the Navy base on Midway Island on December 24, 1960. The next day, Christmas day, I was flown to Kure Island, about 50 miles west of Midway. Civilian contractors were on Kure Island building the new Coast Guard LORAN C transmitting station. Everybody was living in tents, including about a dozen Coast Guardsmen. The commanding officer had already obtained a military club station Amateur Radio license, call sign KH6EDY. A couple of the guys had amateur tickets, but nobody knew much about DX, and there was not much ham activity. I knew next to nothing about ham radio or any other kind of radio at that time.

Three months later, about April 1, 1961, two other fellows and myself left Kure Island (the day the guys moved out of the tents and into modern barracks) and went back to Midway Island to set up a LORAN C monitor station

to watch what Kure was beginning to transmit.

As fate would have it, the other two guys were both hams, and the room that the Navy gave us to set up our LORAN monitor receiver was right across the hall from the Navy club station, KM6BI. I had to start learning Amateur Radio, or go talk to the gooney birds for company. I learned my 5 wpm code, and Bob Huard, WA6PUC, gave me the Novice test. Then the fun began. I ordered a Heathkit DX-60 transmitter and a Drake 2B receiver from Lafayette Electronics. (Remember them?)

Before my ticket came back from the FCC, we closed down the LORAN C monitor station at Midway Island, and I was transferred to French Frigate Shoals. There were no other hams there, and when my Novice ticket finally came (WV2TQR) I became chief (and only) operator of KH6ABH.

I tied my DX-60 and 2B to a 40M dipole, using a toggle switch for a T/R switch, and I was on the air with an S9 noise level from the LORAN A signal that was being transmitted on about 1750 kHz. From that first experience, I now know how much every new Novice needs a helping hand when he first goes on the air. For the first month I remained scared to death. Somebody would come back to me, sending too fast for me to copy, and I didn't know "QRS." I would send "QRM OM, 73" and run from the shack as if they were

going to reach out from my speaker and grab me by the throat.

Then there were the Novices with the "bugs," (speedkeys) and an expert couldn't copy the slop that they sent. God, how I hated those bugs! Then I had a time trying to get the QTH "French Frigate Shoals, Hawaii" across to some of the other new Novices without them thinking that I was just sending dirty words.

I persevered, I survived and, after a few months, the Coast Guard radio-man tested me at 13 wpm, and the commanding officer administered the written test, and the FCC mailed me a Conditional License. (Remember those?) I left French Frigate Shoals in January of 1962, happily thinking that I would never see the place again.

I stayed active in Amateur Radio through about 1969, including 18 months as ZD8SKI on Ascension Island in 1966 and 1967. (That's another good story.) I started raising a family and forgot to renew my license in 1971, so it expired.

In 1978, I received orders to return for another tour on French Frigate Shoals. I didn't want to go back there without a ham license, and I couldn't copy 13 wpm of code. Luckily, the FCC had changed their rules, and I was able to get a second Novice license. I again spent three months on French Frigate as a Novice, then wrangled a set of orders into Honolulu for a few days and passed the General and Advanced tests at the FCC office.

It took me 14 more years, but I passed the Extra Class exams in May of 1992, and I am now KD5NJ/AE. 73, Al (Ski) Klapetzky. □

September, probably signing FP/K1RH. Look for Ralph from September 9 for about seven days of operating.

Others do appear from this one, such as FP1AW on 14.035 MHz at 1400 UTC; FP5CW on 21.018 MHz at 2015 UTC; and FP/VE1KM on 14.009 MHz at 0030 UTC.

Solomon Islands (H44)

A few calls were reported active from the Solomon Islands recently that include the following:

H44AP	14.029 MHz	1130 UTC
H44BC	14.321 MHz	0715 UTC
H44JC	14.240 MHz	1030 UTC
H44JR	14.162 MHz	0930 UTC
H44JS	14.050 MHz	0315 UTC
H44MS	14.250 MHz	1130 UTC

Notice that at least three have been in the General Class portion of the band.

Lebanon (OD5)

HaGAL reports that OD5NG is off the air after many years of giving

Lebanon on RTTY, AMTOR and packet as a new one to the deserving DXer. According to the article, "Thomas 'Tom' Graham, who was known to use the call sign OD5NG, was forced to curtail his clandestine operations from a small village located

in the northern part of Israel. During the first part of February, the Israel Ministry of Communications raided his station and confiscated all of his equipment . . . He had acquired various awards as if he was the single entry from Lebanon and had worked many stations giving them 'credit' for working Lebanon." Graham was an elderly man who was packed to leave Israel, where he had been living for several years, for his home in South Africa. He had never held an Amateur Radio license.

The May/June issue of *RTTY Journal* claims that this OD5NG was legal and John Troost, TG9VT, editor of the "DX News" column, claims he even received a QSL card from him via the Lebanese bureau. However, is this proof of a station being in Lebanon?

As for other legal stations in Lebanon the Association Des Radio-Amateurs Libanais (RAL) reports via *QRZ DX* an official list of stations that were licensed as of February

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1992. The suffixes of these OD5 calls include the following: AW, BE, BU, CN, CX, EI, EP, ET, EX, FB, FE, FG, FH, FI, FZ, GI, HC, HD, HO, HQ, HU, IG, IM, IZ, JA, JE, JI, JL, JM, JU, JW, JZ, KB, KI, KO, KS, KV, KZ, MA, ML, MM, MP, MS, MU and NE. Any calls not on this list are most likely pirates or operators with self-assigned calls on the air without official permission. There also could be a chance that calls not on the list were licensed after the date of the published list. It has also been reported that the list only contains members of RAL. Such is the case of OD5ZZ, operator Walid, who claims to have a legal ticket from the Ministry of PTT.

Anyway, here is a selection of the calls reported recently, with most of them not on the "official legal" list:

OD5BU	14.152 MHz	0345 UTC
OD5ET	21.223 MHz	0500 UTC
OD5IZ	18.136 MHz	1800 UTC
OD5KU	21.300 MHz	1700 UTC
OD5PL	14.009 MHz	0345 UTC
OD5QX	21.334 MHz	1200 UTC
OD5SK	21.091 MHz	1730 UTC
OD5ZZ	21.277 MHz	2330 UTC

That OD5RAK special call worked by many of the deserving the last weekend of May was to commemorate President Karami, according to *DX News Sheet*.

Bangladesh (S2)

The DXCC desk reports that the recent S2/HA5BUS operation has been accredited for DXCC purposes. Therefore, if you worked this one, it now counts for DXCC.

Afghanistan (YA)

The DXCC desk also reports that the present OK1IAI/YA operation has been accredited for DXCC purposes and will be accepted for DXCC credit.

The Long Island DX Bulletin reports that Pavel was active until June 7.

Albania (ZA)

Last month we listed all the present activity from this one. Now maybe you would like to go there. The ARRL reports that now reciprocal operating licenses are available for visiting DXers in Albania. The licenses for foreign radio amateurs are issued for a period of three months and cannot be renewed during the same year. The foreign licensees will sign with their own call, preceded with ZA/, such as ZA/N6WR.

The General Directorate of the Albanian PTT is preparing a packet of laws that include Amatur Radio communications. License applications must be sent to the Albanian Radioamateur Association (AARA), P.O. Box 66, Tirana, Albania. The AARA will handle the necessary pro-

cedures for obtaining the license from the Commission.

There is an Albania island group in the Adriatic Sea. We wonder who will be the first to activate that one for IOTA purposes.

Tanzania (5H)

According to *QRZ DX*, 5H3LE is a new station active from Tanzania, operated by Lyndell Enns, N4ZLT. He is located in Dodoma and runs 40W to a dipole. When Lyndell isn't playing with his radio he is busy as an aircraft radio technician.

One very active call reported this past couple months has been 5H3RA, who has been on both CW and SSB. Look for this one near 7.004 MHz around 2000 UTC; on 20M between 14.005 and as high as 14.062 MHz from 2130 to 0230 UTC; 21.267 MHz around 0100 UTC; and 28.023 MHz at 2030 UTC. Also, check the new bands near 10.106 MHz at 2130 UTC; 18.071 and 18.154 MHz around 2200 UTC; and 24.899 and 24.954 MHz after 1645 UTC. Other calls from Tanzania include the following:

5H3GM	28.532 MHz	1000 UTC
5H3JD	28.515 MHz	1730 UTC
5H3OH	14.197 MHz	1415 UTC
5H3SW	21.240 MHz	1800 UTC
5H3TY	21.032 MHz	1700 UTC
5H3YT	21.015 MHz	1915 UTC

There will be some IOTA activity from this one in July. Refer to the comments under that subject.

Singapore (9V1)

Twenty meters is a good band to check if you need Singapore; the following calls have been reported:

9V1EW	14.227 MHz	1400 UTC
9V1JY	14.021 MHz	1400 UTC
9V1UD	14.242 MHz	1615 UTC

9V1WW	14.005 MHz	1415 UTC
9V1XR	14.015 MHz	1230 UTC
9V1XW	14.226 MHz	1430 UTC
9V1YC	14.038 MHz	1345 UTC
9V1YQ	14.185 MHz	1030 UTC
9V1YR	14.019 MHz	1115 UTC

Fifteen meters is another band to check. Here is what has been found on that band:

9V1UU	21.195 MHz	1445 UTC
9V1WW	21.313 MHz	1400 UTC
9V1YC	21.025 MHz	1630 UTC
9V1YW	21.083 MHz	1745 UTC

On the new bands 9V1OK has been busy on 17M working CW between 18.078 and 18.081 MHz after 1800 UTC. Also look for 9V1YR, who was working into Europe one Saturday afternoon at 1630 UTC on 18.075 MHz.

Ten meter buffs might check for these three:

9V1NQ	28.379 MHz	2345 UTC
9V1WW	28.016 MHz	1645 UTC
9V1YC	28.009 MHz	1000 UTC


Snake Island (4K5ZI)

The Ukrainians will again activate Snake Island this summer. As the scheduled dates are July 5 through 25, they should be on right now, on all bands and modes.

DXCC country status is still awaiting the political status within the CIS (between Russia and Ukraine). However, this is up to the recommendation of the DX Advisory Committee. Snake Island doesn't count for IOTA either.

IOTA

As the summer months come, so does the IOTA activity, IOTA DXers on holiday often journey to these offshore spots to give a contact to their fellow deserving IOTA types. Besides,



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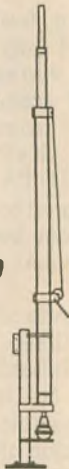
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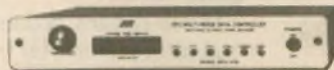
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it sounds like a lot of fun—a mini-DXpedition.

Here is a list of some of the activity that has been reported from mid-May through early June:

AF-044 Principe Island	S92QM	
21.260 MHz	2130 UTC	
AS-055 Vise Island	4K4BVI	
14.018 MHz	0500 UTC	
AS-087 Arkticheskogo Island		
UA9LEG/0 14.160 MHz	2230 UTC	
EU-035 Novaja Zemlya	4K3OQL	
10.100 MHz	2200 UTC	
EU-039 Chausey Island	TM5CHA	
21.259 MHz	1530 UTC	
EU-050 Tremiti Island	IL7IA	
21.010 MHz	1815 UTC	
EU-055 Karmoy Island	LA4DM	
14.259 MHz	2245 UTC	
EU-064 Plier Island	TM5IDP	
14.262 MHz	1245 UTC	
EU-064 Noirmoutier Island	TM5NMT	
14.270 MHz	0030 UTC	
EU-070 Isla de Cal	EA1FDE/P	
14.262 MHz	0545 UTC	
EU-094 St. Nicholas Island		
FD1MKD/P 14.262 MHz	1615 UTC	
EU-095 Vert Island	FF1NEH/P	
14.255 MHz	0815 UTC	
EU-095 Les Embiez Island	TM1EMB	
14.260 MHz	0445 UTC	
EU-100 Cerbricales Island	TK/I2YYO	
14.220 MHz	1700 UTC	
EU-105 Batz Island	FE1OGG	
21.006 MHz	2145 UTC	
EU-131 Lido Island	IK3PQH	
14.260 MHz	0600 UTC	
EU-142 Mouro Island	ED1EK	
21.259 MHz	1915 UTC	
EU-149 Aegna Island	ES1RA/1	
14.259 MHz	0400 UTC	
EU-152 Los Terreros Island	ED7ITE	
21.260 MHz	1030 UTC	
NA-039 Adak Island	WH6ASW/KL7	
14.265 MHz	0215 UTC	
NA-046 Nantucket Island	KC1YR	
14.260 MHz	0030 UTC	
NA-054 Berry Island	C6A/G4AML	
21.260 MHz	1730 UTC	
NA-058 Cumberland Island	W51JU	
14.261 MHz	2100 UTC	
NA-059 Unalaska Island	W0GLG/KL7	
14.260 MHz	0045 UTC	
NA-111 Long Beach Island	WF1N/2	
14.260 MHz	1615 UTC	
NA-148 Isle of Shoals	WB1ASL/1	
14.261 MHz	1630 UTC	
NA-149 Vache Island	HH6JH	
14.226 MHz	2330 UTC	
NA-171 Isla de Altamura	XF1IA	
14.260 MHz	0600 UTC	
OC-012 Yap Island	V63OM	
14.255 MHz	0630 UTC	
OC-066 Nengonengo Atoll	F05BI/P	
14.016 MHz	0515 UTC	
OC-119 Jolo group	DU9AOU/DU8	
21.370 MHz	1800 UTC	
OC-130 Mindanao Island	DU8AN	
21.260 MHz	1630 UTC	
OC-139 Kangaroo Island	VK5ACY	
14.258 MHz	0600 UTC	

We asked Ralph Hirsch, K1RH, who has activated several of the North American Islands, what his chances were of heading out to the Connecticut group (NA-136), as they were in his backyard. Ralph says that the Thimble Islands are all privately owned and

no one has offered to let him stay for a few days. This is often the case with some of the other island groups; many of them are restricted.

Another attempt was made by the VE7 boys to land on the Estevan Group the weekend of May 16 to 18. Unfortunately, the weather had other ideas and VB7C will have to try again later. The Estevan Group is about halfway between Prince Rupert and Port Hardy, east of the Queen Charlotte Islands. The area about Hecate Strait is known for the sudden storms.

QRZ DX reports that members of the Royal Omani Amateur Radio Society will activate Zanzibar Island (AF-040) with the call 5H0ROA during the period July 16 to 31, as well as 5H0ROA/A from Pemba Island (AF-032) July 21 to 27.

The Russians are planning a few IOTA DXpeditions in June and July that will include 4K4A from Arkticheskogo (AS-087), 4K4D from Dickson Island (AS-005), 4K4N from the Nordenshel'da group, and 4K4P from Prodigolgovatyy. No IOTA reference number has been assigned to the last two and probably will not be assigned until after the islands have been activated.

If you need those offshore islands of Norway, look for John Nilsen, LA4DM. John is on Karmoy Island (EU-055) and is one of the five to 10 amateurs on the air out of a possible 70. Karmoy Island has a population of about 35,000 within 200 square kilometers. John has been an amateur since 1969.

QSL cards

Most DXers collect QSL cards for various reasons. Of course, the prime reason for most of us is the requirement for DXCC. However, there are many other DX awards out there that require QSL cards, submitted with the award application or not.

We recently received a QSL card from N4RP/C6A for his recent Bahamas operation. That is all it indicated—Bahamas. Nowhere on the card did it indicate what island he operated from. For IOTA purposes, the Bahamas is composed of several island groups. This particular card is

good for nothing other than DXCC. His card indicated his equipment and antenna and his home address in Maryland. But for many, it is more important that the actual location of the operation be included.

Dick's card isn't the only incomplete QSL card we have received for DXpeditions. Most of these appear to be contest DXpeditions. Please include your actual operating location in your QSL design. Most people have worked the Bahamas anyway, so why would a QSL request be made unless they are looking for particular islands, such as for IOTA? It makes about as much sense as if we indicated on our QSL cards just "United States of America."

WPX

DX News Sheet notes that stations in Spain and its territories are using a variety of special calls in connection with the Olympic Games in Barcelona this summer. Such prefixes include AM1, AM25, AM4, AM5, AM7, AM8, AM9 and AM92. The prefixes AN and AO are also authorized.

The special prefixes EH92 followed by a single letter suffix commemorate the Olympic Games from June 20 through July 17. There should be 15 of them, each from a different location.

Those VK0 calls

Neil Penfold, VK6NE, provides us with a list of the latest legal calls which may have been heard this year. Neil says he is not aware of their operating schedules:

VK0AW	N. Mantle	All bands
VK0CE	C.Hobbs	All bands
VK0CN	P.Smyth	All bands
VK0DI	D.Mehonoshen	All bands
VK0KZA	A.Cramond	Novice bands (Australian)
VK0NE	G.McDiarmid	All bands
VK0ZCM	C.Mohring	50 MHz and above
VK0ZJH	J. Hunt	50 MHz and above

The only call Neil has heard is VK0NE. He says VK0ML has returned home to Tasmania and will not be returning "south," as three times was enough. VK0WW were the actions of Slim.

Regarding the operations of VK0HI 10 years ago, Neil still has the logs for that one.

Book review

Tom McShane, NW6P, sent us a copy of *User's Guide to the DX Packet Cluster* for review. This is Version 5 of the *PacketCluster*, written by Pavillion Software, who has authorized the Northern California and Nevada DX Packet Spotting Network users group as distributor.

The manual is divided into three sections: introduction; user topics; and

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user command reference. In addition there are two appendices: general user commands and DXCC countries. A total of 57 pages make up this manual, with an index included. The manual is pre-punched for installation in a three-ring binder.

Those DXers who are into packet radio may wish to purchase a copy. Copies may be ordered for \$12.50 each, which includes postage and handling when mailed within the US. California residents should add 8.25 percent sales tax. The cost to Canadians is \$13 and \$17.50 to the rest of the world. Please allow two weeks for delivery. To order please include a check or money order made out to DXPSN-UG and mail to: DXPSN-UG, P.O. Box 1077, Los Altos, CA 94023-1077.

One of these days this DX editor will have to get with packet. We already have some of the equipment but have not gotten around to it. Excuses!

Antique QSLs

Here is another one of Al Miller's antique cards. The year was 1935 when VE5KC of Vancouver, British Columbia, worked X1AY of Mexico City. The operator is given as B.J. Kroger, W6EPR.



This is one of the many pre-war cards Al has shared with us. Al now lives in Penticton, to the east of Vancouver, near the center of the province. Of course, Al now signs VE7KC, after the call area restructuring several decades ago.

QSL information

We made a big blunder in one of our QSL routes in the June issue. The QSL route for XT2FU is *not* K3ZO. Fred Laun, K3ZO, knows nothing about this station and thinks he may be a pirate. So far Fred has received 15 QSLs for this one, all from Japan. Sorry about that Fred. The input for this one came from one of our readers. The *W6GO/K6HHD List* also lists this one as a pirate.

Manmuka Kordzakhia, RF6FM, sends information that there is no national QSL bureau for Georgia, and suggests two routes: GNRC (Georgian National Radioclub) UF7FXC, P.O. Box N 123, Tbilisi, Georgia 380004;

and FWW RC (Friendship Worldwide Radioclub) RF0FWW, P.O. Box N 1, Tbilisi, Georgia 380002. They are also looking for help in joining IARU.

David Block, KA0VCW, is looking for help with KH7N, whom he worked during the World Wide contest in November, and A56JF on February 16 on 20M CW. We checked our sources and found nothing. Either you copied the calls wrong or you worked Slim! We don't know of any two-by-one calls issued by the FCC for Kure Island. The same applies for your A56JF which would have been Bhutan. Perhaps it was AH6JF you worked?

Eric Aubery, N6WFK, says that the address given over the air for Erik, OX3EN, is incorrectly given as P.O. Box 351, Nuk, Goenland. The box holder has received several requests for this station. The address in the *Callbook* differs, so maybe you can try that route.

The mail service to the former Soviet Union seems to have become a complete disaster. Has anyone had any success with direct QSL routes? If so, did you use green stamps, IRCs or what?

Neil Penfold, VK6NE, reports that he is the QSL bureau manager for the VK9 and VK0 calls. He reports that many holders of other calls are visitors and have long left the area after the cards for them arrive at the bureau. Many have indicated the manager on the card (the manager being other than VK9 or VK0). This is one of Neil's gripes as the cards have to again be forwarded and at his expense. Neil gives an example: "N6JM works VK9LA. VK9LA has a German manager, DJ5CQ. N6JM writes DJ5CQ's call sign on the card as manager. The N6 bureau sends the card to the VK9 bureau (VK6NE). The VK9 bureau is expected by DJ5CQ to send all these VK9LA cards to him in Germany, free. The N6 bureau could have sent the card to the DL bureau. Does DJ5CQ collect cards from the bureau?"

With the above example the error would have been with the originating bureau (the N6 bureau in this example, which would really be ARRL headquarters). If the manager, DJ5CQ, was listed on the card as stated in the example, it would have gone to the DL bureau. This makes no difference if DJ5CQ collects cards from his bureau or not. If not, then the cards are most likely trashed!

The correct procedure here would have been to place the call DJ5CQ in the upper right corner (or VK9LA via DJ5CQ). If the outgoing bureau has trouble with this, they are reading the wrong information on the card. The

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DX Prediction — August 1992

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

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

CENTRAL USA

UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	23	17	*27	16	*20
10	27	*15	*24	(16)	*22
12	35	*19	*21	23	25
14	40	24	(19)	26	*32
16	41	20	(18)	27	*37
18	*41	(17)	(17)	26	*40
20	*33	26	34	23	*42
22	28	30	40	18	*43
24	*24	28	43	16	*35
2	*21	26	42	*15	*29
4	*22	25	*40	*22	*25
6	27	20	33	18	*22

WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	(18)	*22	*26	16	*23
12	(23)	*19	*23	(16)	(20)
14	(29)	*22	*20	23	29
16	33	21	(19)	26	35
18	35	(17)	(18)	25	*39
20	34	25	26	23	*42
22	28	*31	38	19	*41
24	24	*34	42	15	*38
2	(21)	*36	43	(18)	*31
4	*22	*34	42	*22	*26
6	24	*32	*40	*22	*23
8	(21)	*26	*32	18	*21

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	23	17	*27	15	*21
9	25	*15	*24	19	*22
11	33	*20	*22	*24	24
13	*39	21	(20)	*27	*32
15	*41	17	(18)	*28	*37
17	*40	(15)	(17)	*27	*40
19	*37	(19)	(27)	*25	*42
21	*30	24	38	21	*41
23	*26	27	42	*18	*39
2	*22	26	42	*15	*32
3	*18	24	40	*17	*27
5	26	20	33	*17	*23

PY0TY	-PY1CFN	VP9YL	-WB2YQH
R9H	-RW9ZZ	VQ9WM	-K7100
RA3MZ/UA0K	-RA3MZ	VR2/ON5NT	-ON5NT
RH8KA	-UB5EOB	VU2LE	-K6JG
RT4UA	-DK1RV	XE1/JA1QXY	-JA1HG
RU4F/UM9MWB	-UA4FLA	XF1A	-XE2EAA
S79DEQ	-GM3UWO	XJ3S	-VE3VM
S79EC	-DF3EC	XT2BW	-WB2YQH
S79FI	-HB9AFI	XU7VK	-HA0HW
S79HP	-JA10EM	XU8CW	-FD1GTR
S92QM	-ON4QM	XX9TNT	-ONSNT
SO3JE	-SP3GVX	YB0AVR	-N4AA
SV9/W0CG	-KQ8M	YJ0AXV	-VK2BCH
SV0HS/SV5	-DJ8MT	Z21BA	-W0ZUZ
SV0HW/SV9	-KA6EJX	ZA1TAD	-IK2FCO
SV0IG/9	-IK0EFR	ZA1TAN	-IK2FCO
T27JA	-JG1FNG	ZD7GT	-WB2K
T30AA	-VK2BCH	ZDBOB	-G0NWK
TE5T	-SM0RBO	ZD5A	-K3ZQL
TK/G3PJT	-G3PJT	ZF1M	-KT6V
TL8NG	-WA1ECA	ZF1DX	-VET7AGC
TL8GR	-F5XX	ZF1JE	-VET7JG
TL8XX	-FC10MZ	ZF2QP	-W8BLA
TM5CHA	-F6BFH	ZF2QV	-KT6V
TM5NMT	-F6CCZ	ZP8AA	-ZP5AA
TP1CE	-F6FQK	ZY1XZ	-DL4AAZ
TR8ZH	-FF6KSE	ZY1RR	-PY1AA
TU2WZ	-I0WDX	ZZ1FZ	-PP1CZ
TU4BI	-IK3HAT	ZZ1Z	-PY1NEZ
TU4SR	-OH8SR	3Z0M	-SP5PWK
TX4B	-F6A0J	4J1FS	-OH2BU
U1RC	-KA1DWX	4J3GT	-UG6GAW
UA9QCP/R10	-UA9QCC	4K1YAR	-UA3YAR
UB9X/UB2KA	-UB6KDD	4K5ZI	-DF8BK
UD6DKW	-Y42DA	4K3OQL	-RA10A
UD6DR	-GW3CDP	4S7UK	-G8PDW
UF6VM	-WF2S	4S8UF	-G8DPW
UI8ZAA	-K9FD	4U1WB	-KK4HD
UX1A	-UW1AE	4Z70F	-4X1IF
V21CG	-I0WDX	5H3JD	-DK9MA
V31LM	-W0IIM	5H3RA	-JA3PAU
V47GW	-JL3UIX	5H3SW	-SM7OXT
V47YO	-JL3UIX	5N0CEP	-KI5FN
V63BJ	-JG3RPL	5Z4B1	-W4FRU
V63BW	-W5EW	7Q7CM	-N2AVR
V85CJ	-G30RC	7Z2AB	-AA0BC
V63SM	-JQ3EEL	8Q7PW	-JH1PWA
V63XB	-JJ3RYO	8Q7WP	-JA1WPX
V12RC	-VK2DEJ	9J2HN	-JH8BKL
VK0NE	-VK9NS	9K2HA	-ON6BY
VK9LV	-K1JB	9K2WR	-N6UXB
VP2EOH	-K8BL	9L3BM	-VE3VON
VP2EOH	-K8BL	9M8AJ	-AA5AZ
VP2MBO	-W9PTO	9M8DX	-VK2DXI
VP8CKW	-G0HJR	9X5JA	-W0ZUZ
VP9OM	-WB2YQH	9V1XI	-JR1MOO

cards we use at N6JM are one-sided, with call of the recipient in the upper right on the blank side.

This brings up another subject on the design of the data portion of QSL cards. Let's hear from some QSL managers on that one.

The D2ACA QSL cards for the June 1991 DXpedition should be in your hands by now. We received ours June 6.

QSL Routes

A22MN	-WA8JOC	C6AFQ	-K1TN
A46XD	-DF1KK	C9RAJ	-LA4VL
A71AZ	-SP9UO	CO2FS	-I0WDX
AA7LB/NH0	-JH4WEE	CT2A	-CT1AHU
AM1BCH	-ED1BCH	CT3M	-CT3EE
AM25AT	-EA5AT	CU0WFX	-KB3RG
AM25DVP	-EA3DVP	CY2C	-VE7EME
AM25ENR	-EA3ENR	D68BD	-DJ6SI
AM25OLV	-EA6FCJ	D68BR	-DJ30S
AM25PVX	-EA5FCO	D68WN	-DJ8CR
AM25TSV	-EA5TS	DK8WF/CT3	-DK8WF
AM25YJV	-EA5FYJ	EA1FDE/P	-EA4KK
AM4BB	-EA4BB	ED5BYP	-EA5BYP
AM5AH	-EA5AH	EG4MC	-EA4CP
AM5CZ	-EA5CZ	EG4MC	-EA4CP
AM5UB	-EA5UB	EJ3HB	-E16ES
AM92EL	-EA7EL	EJ5TCR	-E18GP
AM92EM	-EA7EM	EO1AZM	-UZ1ZWA
AM92FUN	-EA7GCF	EO8BD	-UB4EZZ
AM92TV	-EA7TV	ER4L	-RW4LZZ
AN1DWJ	-EB1DWJ	EU00/LY2B0	-K4RK1
AO1ABM	-EC1ABM	EU10	-K4RK1
AO1DEO	-EC1DEO	EX3A	-UW3AA
AO5CON	-EC5CON	F61RF/4U	-FD1GTR
AO5CTH	-EA5DXD	FK8GJ	-F6CXJ
BT4GXU	-JA9GVU	FKJE2WMV	-JE2WMV
BV4FH	-KA6SPG	FO9PT	-DJ0FX
BZ4RCW	-BY4WNG	FR/DJ30S	-DJ30S
C6AFP	-N4JQQ	FR/DJ6S1	-DJ6S1

GB1RS	-G3MCX	K5BDX/C6A	-NA5U
GB5VJ	-G4ZVJ	KA3HMS/KH3	-KA3HMS
H2STT	-5B4AS	KH2T/KH0	-AA4UJ
HB0/HA0ET	-HA0HW	KH6JEB/KH7	-KH6JEB
HB0/HA0KB	-HA0HW	KK6RT/KH0	-JL1EE
HB0/DA1WA	-KN6G	LZ1KOZ	-LZ1YE
	(see note 1)	OA4JR	-KC9CQ
HB0/HA0HW	-HA0HW	OD5/SP7LSE	-SP7EJS
IA1A	-I1RBJ	OH4YR/OH0	-OH4YR
I19ITU	-I19TQH	OH0BBF	-OH2BBF
IL7IA	-I0IA	OJ0/SM0FWW	-WA4JTK
IU4MM	-I4JEE	OJ0/SM0ZZZ	-SM0ZZZ
IU9MM	-I0VPK	F31A	-YU2AJ
J28YC	-FD10NC	F40WF	-WA01WF
J5UA1	-NW8F	PA6WPX	-PA3CAL
JD1BFI	-JA6FFJ	PJ2/OH6DO	-OH1VL
JD1/JA3GEP	-JA3GEP	PJ4/W1XP	-W1XP
JW/DL6DBN	-DL6DBN	PJ9X	-OH1VL
K1EFI/VP9	-K1EFI	PP0MAG	-PP1CZ
K4RK1/EW60	-K4RK1	PY0MAG	-PP1CZ

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5H3LE	-Lyndell Enns, P.O. Box 491, Dodoma, TANZANIA
5N0ZKJ	-P.O. Box 1009, Lagos, NIGERIA
9K2JR	-Jamal, P.O. Box 15403, Daiva 35455, KUWAIT

Notes:
1. This route applies for North America only; all others via DJ0LC, or via the bureau to DA1WA. Also, the ZIP code for KN6G in the Callbook is in error and should read 09192.

(please turn to page 67)

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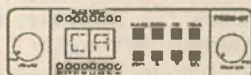
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Computers & BASIC STUFF

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BASIC thinking

If you are someone who uses a computer to enhance your enjoyment of Amateur Radio, then *Worldradio* has a deal for you! Starting with this issue, you now have a forum for sharing BASIC programming ideas and applications; a place to perhaps discover something new, and a place to ask questions, provide advice and give opinions.

Your responses to *Worldradio's* last reader survey and your letters to the editor helped make this possible. Some of you might remember that I've had several BASIC (Beginner's All-purpose Symbolic Instruction Code) articles and programs in previous issues ("QRP Computers" and "Short Dipoles," April '91; "Mobile Antennas," May '91; and "Great Circles to DX Success," September, '91). So when the editors went looking for someone to help with this column, my name was probably somewhere on their list.

I'm not really a computer whiz, an electronics expert, or even a very accomplished radio op. As a matter of fact, my life's work has been in aircraft navigation and newspaper photo-journalism. But you and I share similar interests: Amateur Radio and, perhaps, BASIC programming. When

I wrote those articles I felt I was not only learning more about BASIC, but I was also gaining a better understanding of electronic and physical theory. And that's the point I'd like to get across; each time I start a new programming project it somehow turns into a rather interesting challenge. Solving the problem is part of the fun, and the rest of the enjoyment comes from working out the finishing touches.

To show you what I mean, let's take something simple, like how much wire does it take to wind a coil? Most of us don't care. We start with a long piece of wire, and when we get done we cut off the excess. No big deal.

But what about a real big coil, such as a loading coil? Don Johnson, W6AAQ, uses such a coil in his Big DK3 mobile antenna. It calls for 150 turns of #16 bus wire, spaced 10 turns per inch, wound on about a 1.8 in. coil form. So how much wire does it need?

Fortunately, Don's plans tell you. But what if they didn't? You could guess, and hope you'd be right. You could try to find a formula in a data reference book (I couldn't in any of mine). You might be able to make an educated estimate, and be fairly close. Or you could use some basic math knowledge and BASIC writing skills to think the problem out and develop a formula to solve it.

An educated estimate is easy. If we remember that one turn of wire will be at least as long as the circumference of the coil, then 150 turns will be at least 150 circumferences long. Since the circumference of any circle (or cylinder) is pi times the diameter, then our circumference is roughly 3.14×1.8 , or about 5.65 inches. Therefore, our wire

must be at least 5.65 inches \times 150 turns long, which works out to about 848 inches, or almost 71 feet. That puts us somewhere in the ballpark.

Now to build a BASIC formula. There may be several approaches to solving the problem, but since we've already considered the circumference idea, let's see if we can improve on it.

So far we haven't said much about the wire itself, but it contributes several factors to the equation. The big factor is wire diameter, because it obviously adds to the coil's circumference, and because it determines how many turns there will be in an inch. Another factor, to a lesser extent, is the wire's ability to stretch. Stretch is no problem if we assume that there isn't any. And if there isn't any, then the outside curve of the coiled wire will become the new circumference.

Now visualize the coil form wound with the wire; its outside diameter is now the diameter of the original form plus two diameters of wire. It might not seem like much, but the tenth of an inch that #16 wire adds to the form increases its circumference by more than 5.5 percent and overall adds nearly four feet to our minimum length requirement!

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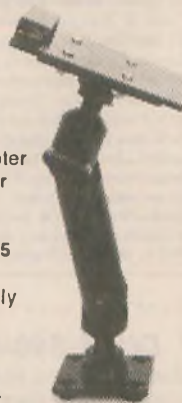
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skew: a turn of wire doesn't end exactly where it started; it has to move over a little bit to start the next turn. If the turns were close wound, the skew might be insignificant. But a coil with a large turn spacing will require a longer length of wire per turn.

So, how can we measure this offset? One way is to visualize the coil as a cylinder which can be cut on its long axis, "unrolled" and laid into a flat rectangle. Now visualize that what had been turns of wire on the cylinder are now diagonal lines on the rectangle.

Bingo! The Pythagorean theorem was made for something like this. It says that the length of a diagonal will equal the square root of the sum of the adjacent sides squared, or something like that. In BASIC it is $L = \text{SQR}(A^2 + B^2)$. Of course, one of the sides is the coil's circumference, and the adjacent side is the distance between the centers of each turn.

Now we're ready to cook. We've established that we need to know 1) form diameter; 2) coil length; 3) number of turns; 4) wire diameter; and, of course 5) pi. Now let's work on writing the program.

We can use one line (line 10) to define pi and to input data. Line 20 uses a routine I gave you in the short dipole article to convert AWG sizes to diameters, and then sees if the wire size is compatible with the turns-per-inch ratio. If not, you get a chance to redo your inputs.

Line 30 computes the outside diameter of the coil, uses the Pythagorean formula to compute the one-turn length, multiplies that length by a number of turns, and converts the answer to feet/inches format. The result is rounded up to the nearest whole inch. Finally, line 40 displays the answer, then returns the program to line 10 for another run. The answer

is the length of wire on the coil itself; you still need to add the lead lengths.

That's it! You might have done it differently, and that's okay too. The point is, we encountered the problem, and we found that it was relatively easy to work out a solution. Now here's a challenge for you: think of a way to determine how much wire is needed to wind a toroid core, and write a BASIC program to solve it.

Every other month we'll "think BASIC" in this column. If you have a contribution, a problem, a solution, or whatever, send it in. Remember, this is your column, so use it. You already have *Worldradio's* address; mine is P.O. Box 181, Duncan, OK 73534. □

Know Metrics

Tera, giga, nano and pico sound like the latest bevy of European movie starlets. Actually, they comprise the latest scientific terminology for denoting the very large and the very small. The four prefixes were adopted by the International Committee on Weights and Measures, and are now being used by the National Bureau of Standards. They are in addition to the eight prefixes now in common use.

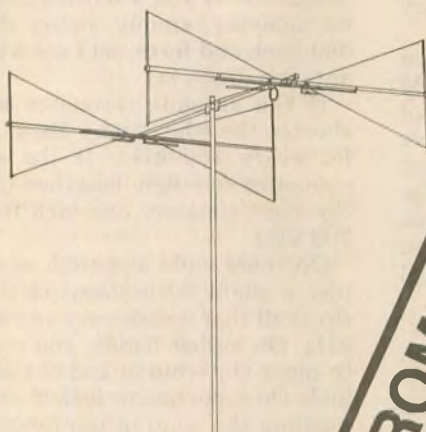
Tera indicates a trillion and giga a billion, nano a billionth and pico a trillionth. For your information, the following shows both old and new prefixes followed by the multiple or submultiple denoted by figures:

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Exa	10^{18} — E
tera	1,000,000,000,000 — T
giga	1,000,000,000 — G
mega	1,000,000 — M
kilo	1,000 — k
hecto	100 — h
deka	10 — da
deci	0.1 — d
centi	0.01 — c (cm)
milli	0.001 — m (mm)
micro	0.000,001 — m
nano	0.000,000,001 — n
pico	0.000,000,000,001 — p
Femto	10^{-15} — f
Atto	10^{-18} — a

—Submitted by Guenter Steuer, N6YEC □

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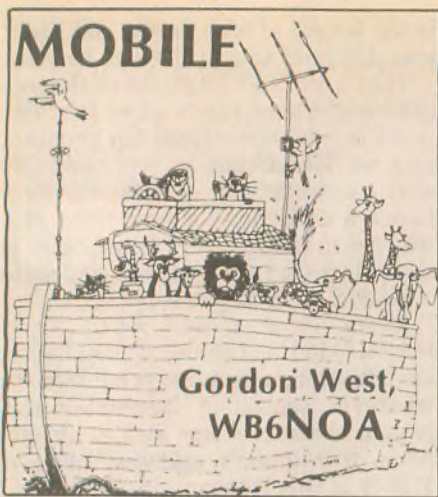
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How to tune an HF whip

There are some tricks in tuning a high frequency mobile antenna that may save you countless hours and trips back to the whip. These tuning steps work for the majority of high frequency mobile whips—Hustler antennas, Mobile Mark helical whips, Lakeview ham sticks, Valor whips, Outbacker, Spider antennas, Mosley whips—you get the idea.

Putting a high frequency whip on your vehicle to cover 10 through 80M will generally require some sort of whip tip adjustment. Most whips have an adjustable stainless steel tip that may be moved in or moved out for precise frequency resonance. Some top-loaded whips may require you to remove a few windings of the helical wire.

Do it right and don't "auto-tune" your mobile high frequency whip with an antenna tuner built into your HF rig. Sure, the rig may illustrate a perfect match, but you may still have a relatively high SWR throughout your antenna system. The built-in mobile tuner doesn't fool your feedline, your ground, or your whip into resonance—it simply presents to your transceiver a perfect match, while standing waves are running all around the inside of your mobile unit or marine station.

Tune the whip, *at the whip*. This means loosening up the little Allen screw, or loosening up the nut at the top of the whip, and adjusting the tip in or out.

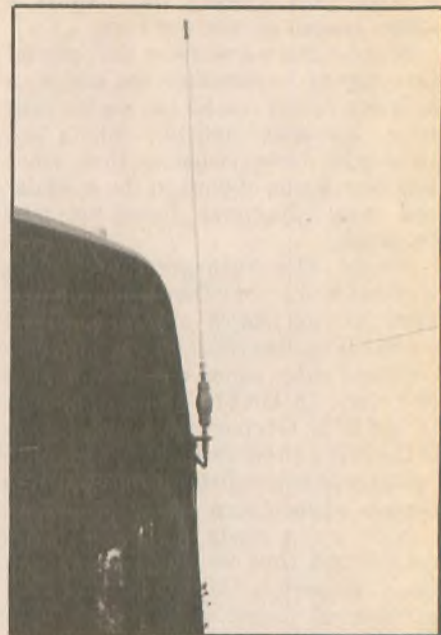
Tuning adjustments are simplified by not going on the air with your regular transceiver on AM. Tuning a whip on the air causes QRM, and probably violation of the rules as you transmit outside your band limits. A nice device is the MFJ-247 antenna analyzer with built-in signal generator, built-in SWR bridge, and built-in frequency counter. It's battery operated and gives you everything in one nice neat package.

In order to find out where your present whip is resonant on a particular band, you will need to sweep the legal portion of the band from side to side and watch for the dip in SWR. If you do this with a rig, you will probably cause QRM. But if all you have is a transceiver, and no MFJ antenna analyzer, it may be the best way for you to go. Go to ultra-low power on AM, set your SWR needle to the "set" mode, switch to reflected power, and then (while transmitting AM), sweep the big tuning dial and see where the SWR dips. At the lowest dip point, reconfirm your forward power at "set," and note the frequency of best resonance. If you are using the antenna analyzer, simply sweep the tune dial back and forth, and see where the antenna drops in.

If the antenna resonates too low, shorten the whip tip by about an inch for every 100 kHz. If the antenna resonates too high, lengthen the whip tip approximately one inch for every 100 kHz.

On 160M, 80M and 40M, sometimes just a slight adjustment of the whip tip is all that's necessary to cover 100 kHz. On higher bands, you may need to move the whip in and out about an inch. On some hollow helical antennas, pushing the whip in too far may lead to no change in resonance. This is because the bottom of the whip enters the inside of the antenna coil, and this

throws the entire whip whacko. In rare cases, you may need to hacksaw an inch or two off the bottom portion of the stainless steel tip in order to achieve resonance.



This helical loaded 20M whip was mounted too low for a perfect SWR.

Warning: Never snap a whip off with big wire cutters. The cut portion of the whip goes airborne and becomes a dangerous projectile. No kidding here, folks—never whack off a portion of a tip using diagonal cutters. Use a hacksaw, and make sure everyone working around you is wearing protective safety glasses.

If your whip doesn't dip in SWR anywhere near its resonant frequency, better check out that you have the right whip for the right particular frequency band. Do you have the right loading coil on? Do you have the right length tip? Has water pooled inside a hollow helical antenna? (This happens in areas with large rainfall where the water trickles down the stainless steel tip, into the hollow fiberglass shaft, and pools at the base of the whip like a rain gauge. The water either ruins the whip base, or causes it to go off frequency.)

If your whip is mounted too low on your vehicle, it may not resonate at all. If you have a camper, with the whip mounted on your rear bumper, forget about it loading. Sure, you could probably load it with a built-in auto tuner inside your rig, but you really aren't getting a resonant feedpoint. You're simply loading up your entire vehicle and coax feedline. The best bet is to change your mounting location, and try the whip up higher on your vehicle.

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If you still have problems, meter out your coax connections from the PL-259 at the end of the cable. Never measure coax continuity at the antenna feedpoint—you could damage the front end of your transceiver by running an ohmmeter through it. Rather, unscrew the coax from your mobile unit, and measure for less than 1 ohm resistance when someone else shorts out the feedpoint. If the feedpoint remains shorted after your helper has let go of the jumper, chances are you may have a bad connection at your PL-259, or a bad connection at the feedpoint.

Take a look and see where the exposed wire disappears in the bottom of your mobile mount. If you can see exposed wire, chances are your feedpoint is waterlogged. You'll need to change out the entire coax line. *Never* leave the wire exposed out in the open.

In rare cases, you may need to add a matching network at the base of your antenna system. On some of the big mobile antennas, like the Texas Bugcatcher, they have provisions for this. But on smaller mobile antennas, it is seldom necessary, and adding those little tiny disk capacitors in shunt across the feedpoint can be a real hassle. Better yet, find a new feedpoint location.



The MFJ SWR analyzer is easy to use to tune your HF whip.

Once again, to raise the resonant frequency of a mobile whip, shorten the whip tip by about an inch for every 100 kHz. To lower the resonant frequency of a mobile whip, lengthen the whip tip about an inch for every 100 kHz. On 40, 80 and 160M, a very tiny adjustment of the whip tip will make a big difference on where your antenna performs with maximum forward

power, and minimum reflected power.

Finally, don't sweat it if your SWR won't dip below 1.5:1. As long as it takes a nice nosedive at resonance, you are all set. You will still have a great signal as long as that dip is right in the middle of where you plan to operate. Use the new analyzers from MFJ rather than sweeping the band, annoying everyone. □

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YLs on the Air

Kay Eyman, WA0WOF
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If you've come to this page in search of the YL Roundup column, you are in the right place. As you see, the column has taken on a new look, and a new author. Connie Dunn, KB5LES, has opted to pull a few irons from the fire to accommodate her busy schedule; though she has set aside the YL Roundup column, she will continue her YL News column in QST. We will miss Connie's terrific contributions, and we wish her the best of luck.

A YL forum with all the news and events will continue in Worldradio with YLs on the Air by Kay Eyman, WA0WOF...

I've been licensed since 1969 and have always been especially interested in working and meeting YLs. My first operation was as KR6HB on Okinawa, and upon our return to the US in 1972, I joined the Young Ladies Radio League and have been an active member since then. I'm YLISSBer #8704, 10-X #23802, and a member of the ARRL, the Irish Radio Transmitters Society, The British Young Ladies Amateur Radio Association, the Japanese Ladies Radio Society, the Canadian Ladies Amateur Radio Association, the Buckeye Belles, and the Texas YL Round-Up Net. I hold an Extra Class license, and my second call is EI7HQ. My husband, Mike, W0XM, and I were also active in AF MARS for many years, and we are now semi-retired on a farm in Kansas, with plenty of time for Amateur Radio.

Amateur Radio has changed in many ways during the past 75 years, but at least one thing remains constant. Lifetime friendships can still result from a chance QSO. Distance doesn't matter because it's easy to keep schedules with other amateurs in any part of the country or even in another country. And there's always the chance of meeting someday.

One of the earliest recorded meetings of YLs in different countries who met on the air, kept schedules, and then finally got together for a visit was between Liz Zandonini, W3CDQ, and Nelly Corry, G2YL, in the summer of 1937, when Liz traveled to Europe. They had been meeting on 10M and

then finally have a chance to meet in person.

And 1993 is going to offer several chances to do just that. There will be large YL meetings on at least three continents. The first one will be the Asian YL Meeting '93 in Osaka, Japan, scheduled for April 3 through 5, during the cherry blossom season. A welcome party, an OM-YL banquet, a YL meeting, tours and sightseeing are planned, and the JA-YLs extend a cordial invitation to all YLs, their friends and families. Kyoko Miyoshi, JR3MVF, is the main organizer, and her address is 4-16 Kokawa, Chuouku Osaka 540, Japan. Kyoko would like to have your registration form by August 31, 1992,



Kay Eyman, WA0WOF, has been an amateur since 1969.

both YLs were already well-known around the world. Nelly was the first European station to work all continents on 10M and she did it in just a little over six hours on October 27, 1935. Liz, who was to operate CW only for 67 years, had been licensed since 1922 and had earned her commercial ticket in 1917, while she was still in high school. What a meeting that must have been!

Of course, YL operators were scarce on the bands in 1937, and there were no organized activities such as the YL contests and nets that make it so much easier for YLs to find each other today. But it's still just as exciting to make that first contact on the air, get better acquainted through the years, and

so if you'd like to attend, please contact her soon. I will make copies of the form for you if you don't have one.

In Europe, over 300 YLs will gather next summer at Friedrichshafen in Germany. The DL YLs sponsor a YL meeting here annually, and last year there were YLs from 15 countries attending. Plans are also underway for another all-YL meeting to be held in Europe in 1994 or 1995, as a follow-up to the very successful YL World '91, held in Stockholm last June. The date and location haven't been announced yet.

And, in this country, Wichita, Kansas will be the site of the Young Ladies Radio League convention on July 9 through 11, 1993. If past conventions are any guide, there will be several DX YLs attending, as well as many of the US YLs you've talked to on the air. Dana Tramba, N0FYQ, the YLRL president, is working on the arrangements for this meeting, and I'll have more details for you as they become available. Don't miss this one!

In addition to these major YL meetings, there are YL get-togethers in

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1992 at many of the local and regional hamfests. Mary Winter, N7RGD, is chairman of the High Cascade Hamfair in Bend, Oregon, on August 8 and 9, and she has several YL activities planned. Beanie Lofthouse, N7NJS, will host a YL meeting at 4 p.m. on August 15 at the WIMU92/ARRL Rocky Mountain Division Convention in Park City, Utah.

But you don't have to travel to meet YLs. There are several YL activities planned for this fall, and it's not too early to mark your calendar now. First, YL Activity Day is the sixth of each month. Call "CQ YL" on the hour, every hour, on any frequency ending in 88.

Howdy Days, sponsored by the Young Ladies Radio League (YLRL), will run from 1400 UTC, September 9 until 1700 UTC, September 10. This is always fun, and the top-scoring YLRL member wins her choice of a YLRL pin, charm, or stationery, and the top scoring non-YLRL member wins a one-year membership in YLRL. (The rules for this and the events listed below are usually published in the major Amateur Radio magazines, but I'll also be

glad to send you complete details.)

YLRL's biggest event of the year is the YL Anniversary Party. The CW portion will begin at 1400 UTC on October 14 and end at 1700 UTC, October 15. The SSB portion is from 1400 UTC, October 28 to 1700 UTC, October 29. We all look forward to this one.

In between these two events, the Japanese Ladies Radio Society (JLRS) will sponsor the 21st JLRS Party Contest. The phone section will begin at 0300 UTC, September 26 and end at 0300 UTC, September 27. The CW section will begin at 0300 UTC, October 3 and end at 0300 UTC, October 4. All

OMs and YLs are invited to participate.

Also open to both OMs and YLs is the Australian Ladies Amateur Radio Association (ALARA) contest from 0001 to 2359 UTC, November 14. Each station worked can be counted twice on each band for credit, once on phone and once on CW. I hope to hear you in all these events.

I recently ran across this poem, written by Raymond Cotton, W1BTY, almost 40 years ago. It is still very timely, and Raymond has given his permission to reprint it here. Thanks very much, Raymond.

My Gal

The final's plates may seem to drip
From running too far off the dip;
The modulator makes with chatter
For loading is a minor matter.

The bath's hung full with lingerie
That somehow wasn't put away;
I don't ask why, 'cause I can guess
This was her day as NCS.

My wilted shirt will have to go
Me, for another day or so.
"I would have fixed one for you, pet,
But today the YL ham club met."

Tonight I dined on beans and bread,
Did the dishes, made the bed;
She'd taken off just after dawn
To get the CD station on.

But when I spend a wad of cash
On mobile gear and such like trash
That might have bought an evening dress
Or a new coat — sure, nothing less

She smiles and strokes her VFO,
And says in voice both sweet and low,
It's okay, dear, the old things will do."
God bless her soul — she means it, too!

And when I sit up till the dawn,
When the annual SS is on,
She never scolds or spoils my plans
Because the good gal understands.

So I've no cause the day to rue
I taught her code and theory, too.
We now see all things eye to eye;
A lovely gal, a lucky guy.

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Visit Your Local RADIO CLUB

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

ALABAMA

Montgomery Amateur Radio Club (W4AP). P.O. Box 3141, Montgomery, AL 36109. Meets 3rd Mon./monthly, 7 p.m., State Trooper Dist. Office, Coliseum Blvd. & Federal Dr. Nets Sun. 8:30 p.m. 146.84- and Thurs. 8:15 p.m. 147.18+. Info: Fred, KB8JX, (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. (CARA). Meets 1st Mon./monthly, 7:30 p.m. at club facility on Moson Rd., Sierra Vista, AZ. WA7KYT/R 146.16/76 rptr.

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

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

ARKANSAS

Central Arkansas Radio Emergency Net, (CAREN). Meets 1st Thurs./monthly, 7 p.m., 1111 West Capitol Ave., Little Rock, AR. Thurs. night net, 8 p.m., 146.940, swap net afterward. Severe WX net anytime 146.940. Code 8 theory classes continuously. Info, KB5IDB, Bob Hancock, (501) 771-2617.

CALIFORNIA

Amador County Amateur Radio Club. P.O. Box 1094, Pine Grove, CA 95665. Meets 1st Tues./monthly, 8 p.m., Jackson Sr. Cntr., 229 New York Ranch Rd., Jackson, CA. Info: call 146.835.

Amateur Radio Club of El Cajon. W6BGS. P.O. Box 50, El Cajon, CA 92022. Meets 2nd Thurs./monthly, 7 p.m., La Mesa Church of Christ, 5150 Jackson Dr., La Mesa, CA. Rptrs. 147.675(-), 224.080(-). PL 107.2. Nets 147.570 Wed./Sat., 7 p.m. Info: (619) 697-2700.

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

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

Corona Norco ARC, (CNARC). Meets 1st Mon./monthly, 7:30 p.m., The Pizza Palace, 1197 Magnolia Ave., Corona, CA 91719. Talk-in 146.535 S.

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

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

Escondido Amateur Radio Society (E.A.R.S.). Meets 4th Mon./monthly, 7:30 p.m., North County Blind Activities Center, 157 E. Valley Pkwy., Ste. 1B, Escondido, CA 92025. Info Net Sundays, 8 p.m. 146.88(-) or 743-4212.

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

Gabilan Amateur Radio Club GARC. P.O. Box 2178, Gilroy, CA 95020-2178. Meets: First Interstate Bank, 751 First St., Gilroy, CA, 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.

Hercules Amateur Radio Club. P.O. Box 5043 Hercules, CA 94547. Meets 3rd Sun./monthly, 6 p.m. at Ohlone Community Center, 190 Turquoise Dr., Hercules, CA. Info: Noel, AB6AC, (510) 799-4458.

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.

Livermore Amateur Radio Club, (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: Rosalie Powers, KC6RKY, c/o LARK, P.O. Box 3190, Livermore, CA 94551-3190. (510) 447-3815.

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

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

Mount Diablo Amateur Radio Club. P.O. Box 23222 Pleasant Hill, CA 94523. Meets 3rd Fri./monthly, 8 p.m., Our Savior's Lutheran Church, 1035 Carol Ln., Lafayette, CA. Net Thurs. 7:30 p.m. on 147.06(+). Info, George KI6YK, (510) 837-9316.

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

Orange County Amateur Radio Club. Meets 3rd Fri./monthly, 7:30 p.m. at Republic Fed. Savings Bldg.—corner of Seventeenth St. and I-55 Freeway in Tustin. Call in on 146.55 simplex. Contact Ken Koehechy W6HHC at (714) 541-6249.

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. W6AK/R 146.910.

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

San Gabriel Valley ARC. P.O. Box 88, Monrovia, CA 91017-0033. 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 United Way, 1922 The Alameda, San Jose. Net all other Mon., 7:30 p.m. W6UU/R 146.385+ /442.425+ PL 107.2

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

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

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

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

Southern California Six Meter Club. P.O. Box 10441, Fullerton, CA 92635. USB Net Tue., 8 p.m., 50.150. FM Rpt. Net Thur., 8 p.m., 51.80/51.30 tx. FM Smpix, 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 W6DEJF, 224.14 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: 144.850/145.450 W6SYY/R.

The Trinity County ARC. P.O. Box 2283, Weaverville, CA 96093. Meets 2nd Wed./monthly, at the CD Hall in Weaverville, 7:30 p.m. WA6BXN Rptr. 146.1373.

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 127.3. Ph: (707) 447-2680.

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

COLORADO

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

CONNECTICUT

Middlesex Amateur Radio Society, (MARS). 5 North Rd., Cromwell, CT 06416. Meets Tues./weekly 7 p.m., Portland Methodist Church, Main St., Portland, CT. Novice classes, VE sessions monthly. Contact Jack, WA1K, (203) 347-8745. Rptr. 147.090+. **Tri-City Amateur Radio Club.** P.O. Box 686, Groton, CT 06340. Meets 2nd Tue./monthly, 7:30 p.m. St. Lukes Lutheran Church at Rt. 12. Novice classes. Info, contact Bob, KA1BB, (203) 739-8016.

DELAWARE/PENNSYLVANIA

Penn-Del Amateur Radio Club. P.O. Box 1964, Boothwyn, PA 19061. Sponsor of KA3TWG/Rptr. on 224.220 covering Delaware & Tri-state area. Info/net Thurs/wkly, 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., 3852 Prime Place, New Port Richey. WA4GDN Rptr. 146.671/07.

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

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

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

GEORGIA

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

Metro Atlanta Telephone Pioneer Amateur Radio Club. Meets 1st Tues./monthly alternately between 12 p.m. at 675 W. Peachtree St. and 6:30 p.m. at Morrisons on Jimmy Carter Blvd., Atlanta, GA.

HAWAII

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

ILLINOIS

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

DuPage Amateur Radio Club, (DARC). P.O. Box 71, Clarendon Hills, IL 60514. Meets 4th Mon./monthly; 7:30 p.m., Holy Trinity Catholic Church, 110 Cass Ave., Westmont, IL. Sun. net on 145.25 MHz PL 107.2 at 2100 hrs. local time. Rptrs. 145.25 MHz PL 107.2, 224.68 MHz, 442.55 PL 114.8. Info: (708) 985-9256.

Fox River Radio League. Old Bank Bldg., 900 N. Lake St., lower level, Northgate Shopping Ctr. & Rt. 31, Aurora, IL. Meets 2nd Tue./monthly, 7:30 p.m. VEC Xams 3rd Tue./monthly, 7:30 p.m.

Hamfesters Radio Club, W9AA. P.O. Box 42792, Chicago, IL 60642. Meets 1st Fri./monthly, 8 p.m. Crestwood Civ. Ctr., 139th & Kostner, Crestwood, IL. Nets: Sun. (local) 0100 UTC, 2nd 410 MHz; Mon. 9 p.m. 146.43 S.; Packet Mailbox 145.07. Info: (708) 535-3496.

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

Schaumburg ARC (SARC). Meets: 3rd Thurs./monthly, 7:30 p.m., Schaumburg Park Dist. Community Rec. Cntr. at Bode & Springinguth Rds., Schaumburg, IL. Net 145.23, 8 p.m. Thurs. Info (708) 213-0910.

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

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

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. Rptr. 442.875

IOWA

Central Iowa Radio Amateur Society (CIRAS). Marshalltown, IA. Meets 3rd Sun./monthly, 6:30 p.m., Community College, Rm. 612, (except July & Aug.) Sun. Net 8 p.m. local 146.88. For more info: WB0ZKG, (515) 484-4837.

LOUISIANA

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

Southwest LA Amateur Rptr. Club, Inc. (SWLARC). Meets 4th Tues./monthly, 7 p.m. in the Parish EOC Rm. W5B11/R 146.073/146.013. Net MWF, 7:30.

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. W8JXU 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 583281, Minneapolis, MN 55458-3281. Meets 3rd Fri. (exc. June, July, Aug.), Mpls. Red Cross, 11 Dell Place, Mpls, 7:30 p.m. Making waves since 1916. Net 147.03(+), 7 p.m. Mon.

MISSOURI

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

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

NEBRASKA

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

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

NEVADA

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

Sierra Intermountain Emergency Radio Assn. (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., W8ICAG. P.O. Box 911, Dover NH 03820. (603) 332-9137/332-7343. Meets 2nd Sun./monthly, 7 p.m., Rochester Court House/City Hall. Talk-in 147.57.

NEW JERSEY

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.

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

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

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

NEW YORK

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.

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, 7:30 p.m. Bohemia Rec. Ctr., Ruzicka Wy. W2DQR 144.610/145.210, 223.080/224.680, 441.625/446.625 rptrs. 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.

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

NORTH CAROLINA

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

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

OHIO

Amateur Radio Fellowship, (ARF). Peggie Hough, Sec., 3888 Stow Rd., Stow, OH 44224. Meets 1st Sat./monthly, 10 a.m., Country Manor Restaurant, 1225 W. Main St., Kent. KA8YKT rptr., 147.075.

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. NFBE Rptr. 447.625/442.625. 444.60 (+5 MHz). Net Sun. 9 p.m.

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

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

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

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

Silvercreek Amateur Radio Assn. (SARA) Meets 3rd Thur./monthly, 7:30 p.m., Doylestown Village Hall, Doylestown OH. WD8PNI/R 147.99/39 rptr. For info call (216) 574-2573.

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

Toledo Mobile Radio Association. P.O. Box 273, Toledo, OH 43697. Meets 2nd Wed./monthly, 7:30 p.m., Luke's Barn, Lucas County Rec. Ctr., 2901 Key St., Maumee, OH. 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.; 7260 at 9 p.m. Rptrs. 146.31/91 and 146.115/715. P.O. Box 240, Rd. #1, Adena, OH 43901. (614) 546-3930.

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, Inc. 450 S.E. Leland St., Roseburg, OR 97470. Meets 3rd Thurs./monthly, 7:30 p.m., Douglas County Courthouse, Rm. 311, Douglas St., Roseburg, OR. Info: W5PII/R 146.90/30.

PENNSYLVANIA

Butler County Amateur Radio Assn. P.O. Box 1787, Butler, PA 16003-1787. Meets 1st Tue./monthly, 7:30 p.m., Boy Scout Cntr., 850 Morton Ave., Butler, PA. 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.

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

TENNESSEE

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

TEXAS

Brazos Valley Amateur Radio Club (B-VARC). P.O. Box 1630, Missouri City, TX 77459. Meets 2nd Thur./monthly, 7:30 p.m., Sugar Land Community Cntr., 226 Matlage Wy., 3 blks SW of Imperial Sugar Co. at HWY US-90A & Brooks St. (HWY 58) in Sugar Land, TX. Talk-in 145.47, 442.5 rptrs. Sun City Amateur Radio Club. Meets 1st and 3rd Fri./monthly, 7:30 p.m., 3709 Wickham Ave., El Paso, TX. K5WPH 147.240, 443.4 with remote operation on 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, Inc. (VBARC). Open Door Chapel, 3177 Virginia Beach Blvd., Va. Beach, VA. Meets First Thur./monthly, 7:30 p.m. Info on WA4KXV rptr, 146.97/37.

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.

North Seattle Amateur Radio Club, (NSARC). Meets 3rd Tues./monthly (except July, Aug., Dec.) at First Interstate Bank, 2825 N.E. 125th St.

WEST VIRGINIA

Jackson County Amateur Radio Club. Clark Stewart, W8TN, Pres., 104 Henrietta St., Ravenswood, WV 26164. Meets 1st Thur./monthly, 7:30 p.m., United National Bank of Ripley. Net Mon. 9 p.m. on 146.67/07 W8JNU/R.

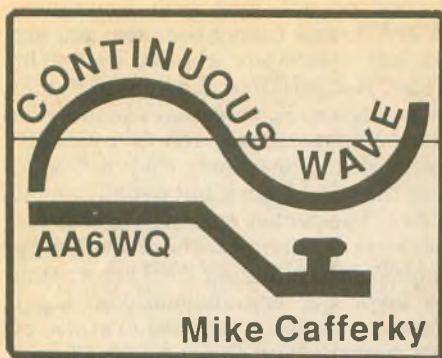
Tri-state Amateur Radio Assn. Meets: 3rd Tue./monthly, 7 p.m., Green Valley Vol. Fire Dept., Norwood Rd. & 16th Street Rd., Huntington, WV. ARES net Thur. 9 p.m. on 146.76(-) W8VA/R. Info Bud Cyr, KB8KMH (304) 522-1294.

WYOMING

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

PUERTO RICO

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



Phonics for CW

I can still remember my second grade teacher's voice. "It's time for our phonics lesson. Students, please take out a sheet of paper and a pencil. Let's begin today with the letter 't.' When we say the sound of the letter in a word we put our tongue behind our upper teeth on the roof of our mouth and gently blow a puff of air out as the tongue drops down. It sounds like this: 'tuh.' The *name* of the letter is 'tee,' but the *sound* it makes when we speak is just 't.'"

I know some of you are asking, has Mike gone crazy here? What in the world does this thing called "phonics" have to do with CW operation? Stay with me because it has a whole lot to do with it. Phonics will help you learn to copy code in your head. With practice, you will be able to copy whole words in code. (Whole words make sense to us, not just the individual letters.) You will be able to put your pencil down and save your paper. When you hear an abbreviation on the air, you will be able to more quickly figure out the word it represents. You will improve your ability to spell. You will copy code in a more relaxed manner, improve your confidence in copying and improve your over-all ability to copy.

What is phonics?

Let's start with something we already know about: phonetics. When we studied for our radio licenses, we learned the phonetic alphabet: Alpha, Bravo, Charlie, etc. The phonetic alphabet helps us communicate with precision when we wish to spell a spoken word.

Phonics is the science of learning and using the phonetic value of alphabet letters and letter groups (the sounds we make when we speak) to help us read. This translates into efficient copying "in your head" without lifting a pen off the table. Although there are just 26 letters in the English alphabet, there are over 40 different sounds we make when we speak. Phonics is the method of learning these sounds, how they are made and

how they build words. In reading, the challenge is to learn these sounds so we can recognize them quickly and use them to sound out the words we *see* on paper. In practicing CW the challenge is to learn these sounds so we can recognize them quickly and use them to sound out the words we *hear* in code.

Language is essentially an exercise in combining phonetic values into meaningful groups. In early childhood we learned to communicate by learning to speak words. Building on this knowledge, we learned to read. If we were lucky, we were taught phonics in elementary school. Eventually we learned to read silently. But silent reading still involves the mind creating the sounds of the letters and letter groups as our eyes scan a printed page.

With practice we can also learn to copy code silently as the mind decodes the dit-space-dah combinations into their phonetic values which we already understand as words. Copying whole-word Morse code becomes a process of decoding from something we hear into something we hear and understand.

Consonants

The alphabet is made up of two categories of letters: consonants and vowels. It is the consonants which form the structure of words. Consonant sounds should be learned before vowel sounds.

The letter "t" was one example of the phonetic value of a letter. Another example is the letter "m." The *name* of this letter is called "emm," but the *sound* it makes (its phonetic value) is when we put our lips together and make a quick sound with our throat. When we see "m" in a word, we don't think "emm." Instead, we think in terms of the sound the letter makes as it is connected with other letters in the word. You may notice that these two letters have the sound they make embedded in their names. Fifteen of

the 26 alphabet letters are like these two. They are the easiest to learn: b, d, f, j, k, l, m, n, p, r, s, t, v, x, z. You can quickly identify the phonetic value of these letters by pronouncing them slowly. For example: b-ee, d-ee, e-ff, j-ay, k-ay, e-ll, e-mm, e-nn, p-ee, aw-r, e-ss, t-ee, v-ee, e-xx, z-ee. Instead of saying the name of the letter, practice making the sound of the letter as it appears in a word.

There are other consonants which do not have the sound they make embedded in their names. These are a little more difficult to deal with but there are only six of them: c (pronounced "sss" as in "cereal"); g (hard sound make at the back of the mouth as in "go"); h (an open-mouth breathy sound as in "horse"); q (a hard sound blending "k" and "w"); w (an open mouth sound as the mouth quickly changes shape from almost closed to wide open as in "want"); and y (an open mouth sound as the tongue and lower jaw drop quickly). Again, it is important to practice making the sounds of these letters rather than saying their names.

Some consonants are combined together to create different sounds. The easy ones to learn are the consonants which are joined to make an entirely new sound: ch, sh, th, wh. The more difficult ones are when two consonants are joined together so that their phonetic values are blended: bl, br, cl, cr, dr, fl, fr, gl, gr, pl, pr, sc, scr, sk, sl, sm, sn, sp, spr, st, str, sw, tr, tw. It bears repeating: practice the sounds these groups of consonants make (not their names) when they are blended in natural speech.

Practical suggestions

What can you do right now to begin learning to apply the incredible power of phonics to your code proficiency?

1. Learn the basic alphabet in code first.
2. After the alphabet is learned in code, begin practicing with consonants.
3. Practice making the phonetic values represented by the dits and dahs (the *sounds* the letters make when they are copied) instead of the *names* of the letters.
4. Practice orally to get the sound correctly. Yes, at first, sound them out loud until you have them right. Put down your pencil and sound out the phonetic value of each code character.

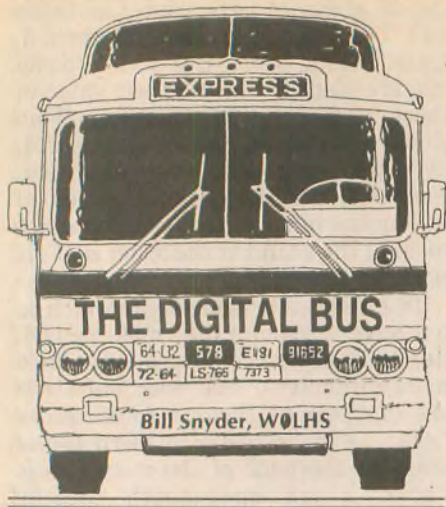
Next time, in the October issue, I'll clarify how to apply these important basics of phonics to in-the-head code copying. ☐

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In my long association with Amateur Radio I have heard a number of "dead band" stories which go something like one I recently experienced. It happened while I was testing an RTTY program that I was in the process of installing on my computer.

The program, written by Ray Ortgiesen, WF1B, is essentially a contest utility to log contacts and compute scores for the various RTTY contests that are held throughout the year. If you are like me, a person who enjoys contesting but hates the scoring and dupe sheet checking that goes with the game, then you'll probably like the program I put in my computer.

A few days before last winter's RTTY Roundup, I received the first release of *RTTY BY WF1B*, as the program is titled. I had trouble getting it to handshake with my PK-232 tuning unit. I was unaware of a couple parameters that were blocking the handshaking. So, I promptly forgot the program until I met the author at Dayton. He showed me the latest version and explained why I had trouble. I got the latest version of the software and installed it with only minor troubles, one of which was accidentally plugging the keying signal line into a wrong jack in my complicated console wiring system.

To check it out as a contest program I had to simulate a contest, so I made a land-line call to my good friend, Marlowe Parries, W0ML, who lives across town. At that very moment Marlowe was hooking up a brand new Kenwood TS-950 with all the optional goodies installed. He had it wired to his RTTY tuning unit but had not made a contact.

I listened across the 10M band; it was completely dead—not a signal of any kind. Marlowe and I attempted RTTY contact while we were talking on the telephone. Marlowe's signal was

upside-down and he was trying to correct it. I had the book for the RTTY program in my hand, and Marlowe had the book for the new 950 in his.

After a few minutes of study, Marlowe solved his problem and we were able to communicate. I sent him, "CQ CONTEST DE W0LHS," he answered with his call, then we traded contest exchange data and so on. We kept talking over the telephone, when suddenly I saw a "QRZ QRZ?" on the screen. "Did you send that QRZ?" I asked Marlowe.

"No, I saw that, too," he answered. "Some local teasing us, I suppose."

At that point the screen again came to life. I tweaked the tuning dial on my ICOM-765 and saw "DE CE0ZAM" on the screen.

"I think that's Easter Island," said Marlowe.

"I got that island years ago when Carmen, CE3CEW, flew there," I said.

"Got it, too," said Marlowe.

"My beam's on Japan," I said, "and I'm only running 7W."

"I'm backed down to the bottom of my output too," Marlowe said over the phone.

"Let me call him," I said. "I'll swing my beam." I started the beam turning and grabbed the program documentation to figure out how to talk in the chat mode with the contest program. The book said ALT-K would do it.

I tapped the ALT and K keys and called the CE0. Back he came. His name: John. His QTH: Robinson Crusoe Island in the Juan Fernandez group. I also had that country confirmed by Carmen many years ago. John said he had trouble with English, so I signed and Marlowe called him.

John came back to Marlowe and the two traded reports. When they finished I asked Marlowe if he had Juan Fernandez. "By golly," he said, using the jargon of a genuine sidebander (which he isn't), "I don't think I do." He looked at his DX list and finished with, "By golly, that's a new one!"

And so, by golly, the moral of this story is this: A ham band ain't a dead band just because you can't hear anything on it. Try a CQ and you might be surprised. And you might find a "new" one, too!

Friendships

I don't know if it is some kind of

record or not, but Bob Lawrence, W7VFR, and I have been exchanging packet messages almost daily for years. Bob is retired and lives in Pasco, Washington. His messages to me take the same path, six relays by BBS, every day. Sometimes they arrive in less than four hours, but usually about a day. The packet system works great because I suspect the forwarding tables of the handling BBS are written to favor our communications. I get other messages from the state of Washington, and they wander all over the USA. But it was not always that way with W7VFR to W0LHS traffic; at the beginning of our daily message passing, the packets wandered all over in random style, some getting lost in the process.

In the RTTY room at the recent Dayton Hamvention Larry Workman, KA0JRW, who runs a BBS in Glenwood, Iowa said to me, "I surely enjoy reading those messages you get from that guy in Pasco, Washington. I look forward to reading them when they pass through my BBS."

I know they're fun to read because Bob has a peculiar sense of humor, and he's not afraid to use it when he types in his daily message to me. I don't think Bob sleeps too well; his messages are mailed at very early hours of the day. Having monitored the dull messages that most hams send via the packet network, I can assure you Bob's messages to me are fun to read. Bob has been reprimanded by one BBS SYSOP for getting a touch risqué in a message or two, though well under the law.

For Larry, I'm sorry to say, Bob's traffic to me now is glued into the same route day after day, and it goes via a northern route so Larry is not going to get to read the good stuff that flies through the air between us unless something breaks down in the path we have at the moment.

One of the BBS relay stations in the current path between Bob and my station is run by Bill Kurtti, WC0M, the genial ARRL section manager for North Dakota. Thus Bill gets to read all my traffic to and from W7VFR as it passes through his computer. Now Bill also has a great sense of humor, and because packet is something like the old North Dakota farm telephone party line, Bill now is swapping messages with Bob and, of course, with me.

Bill, a North Dakota farmer of Finnish extraction, apparently invented a wind-powered tractor to help him with his grain and cattle farming chores. With the prairie wind sometimes gusting above 40 knots, Rocklake, North Dakota, where Bill lives, is a great place for a wind-powered device

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of any kind. Over the years that Bill and I have packeted back and forth, Bill has kept me apprised of the adventures of "Old Windy," as he calls his wind-driven tractor. Here's a sample:

"I loaned Old Windy to a neighbor to help him finish his spring plowing, but last night, when it got dark, he quit and inadvertently ran the tractor into the machine shed. When he went out this morning to continue plowing he couldn't get it started."

Well, as you probably imagine, Old Windy stories continually pass back and forth on the North Dakota section of our packet network. And now W7VFR is in the act so it might spread further. Bob has more than once complained to me about the wind in central Washington.

A side note: In my 59 years of ham radio, I can't recall a more enjoyable section manager for the North Dakota section of the ARRL. Bill Kurtti is a real gem! I used to think radio itself was the glue that held ham radio together, but I now believe it's the wonderful friendships one makes in the hobby!

Eavesdroppings:

"I BUILT TWO MORE WIND-POWERED TRACTORS FOR MY

NEIGHBORS, BUT THEY DIDN'T ANCHOR THEM PROPERLY AND THEY BLEW AWAY. I HEARD THEY WERE LAST SEEN GOING THROUGH TEXAS... THERE IS A NEW RUSSIAN STATION ON RTTY FROM SOME ISLAND I CAN'T SPELL, PRONOUNCE OR FIND ON THE MAP... HE'S A REAL DX HOG—HE WAS THE NEXT TO LAST STANDING AT THE DX BANQUET... MY WIFE IS ON HER WAY BY AIRLINE TO HELP A SICK SISTER AND SHE LEAVES ME WITH A SICK POCKETBOOK AFTER I BOUGHT HER TICKET WHICH BRINGS UP ANOTHER REASON FOR REGULATING THE DAMNED AIRLINES... A CD-ROM IS SURE A GREAT INVENTION, YOU CAN GET THE CALLBOOK ON ONE DISK AND WITH THE TOUCH OF A BUTTON FIND OUT WHEN THE OTHER GUY'S HAM LICENSE EXPIRES... I FINALLY GOT MY QSL CARD FROM WORKING THE RUSSIAN MIR SPACE STATION BACK IN 1989... BOY, YOU'RE SPRINKLING RF AROUND LOONG ISLAND IN FINE SHAPE... YOUR SIGNALS ARE 5 AND 9 IF AND WHEN I CAN READ YOU WHICH

ISN'T VERY GOOD... AT LEAST THOSE QRMING JERKS SIGN THEIR CALLS... BUY THE WAY, MY WIFE BUYS THE WAY ALL THE TIME... SHE PRAYS SO MUCH SHE HAS CALLOUSES ON HER PRAYER BONES... WELL, THAT IS QUITE A BRAG TAPE, BUT DIDN'T SEE WHAT KIND OF COAX YOU HAVE TO YOUR ANTENNA OR THE MAKE OF THE CABLE TO YOUR MIKE OR THE COLOR OF YOUR DOG'S EYES... CAN YOU TELL THAT I'M A HUNT AND PECK TYPE OF GUY?... I'M OFF THE AIR WITH A DEDICATED TV... I CAN'T GET A PERSONAL QSO OUT OF A PACKET—IT'S TOO IMPERSONAL... WHIP ME—BEAT ME—WRITE ME SOME BAD CHECKS!... MAY THE SUN SHINE ON YOUR FACE, THE RAIN FALL ON YOUR FIELDS, AND THE QRM STAY OFF YOUR DX."

Thanks to WA6YOO, KB5QAI, AA7AJ, W0PCI, KD4IPG, N0BCW, and W0HAH. Write me: Bill Snyder, W0LHS, 1514 South 12th Street, Fargo, ND 58103. My packet address is: W0LHS @ W0LHS.ND.U.S.A.N.A. 73 DIT DIT. □

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PATRICK W. TICE, WAØTDA

Radio Camp—Is it really camping?

Picture it: You really want to upgrade your ticket, but you feel that you need a bit of extra help. Well, okay, maybe a lot of extra help! You've heard of Handi-Hams Radio Camp, and you think that it might be a good place to get that sort of help, but gee, you really don't know . . .

You remember that camping trip with the Scouts when you were a kid and think, "What if I have to sleep in a tent? I don't think I'm up to that!" And what about the food? Will you have to subsist on dried fruit and powdered milk for a week? Will you have to get up when they blow the bugle at 5 a.m., throw ice-cold water over your face and boil coffee over a fire? What if it's like the Army, and you have to hike 20 miles before breakfast?

And what if you need special help? Will anybody be there to help you?

If these are the sorts of things you've been thinking about when someone mentions "radio camp," you're not alone. Most folks are nervous about attending camp for the very first time, and understandably so! Who, after all, isn't a bit uncomfortable when trying something new? And while no one really expects Radio Camp to be like a Scout camp or like the Army, some people have a genuine concern about leaving the security of their homes for a place where they might not be able to move about freely or where they might not have the assistance they need.

Not to worry. Handi-Hams Radio Camp is user-friendly. It is certainly a good place for the physically disabled to learn about Amateur Radio, because the instructors, dedicated volunteers, know how to teach the upgrade classes with patience and flexibility. The camp staff are professional counselors and caregivers who are skilled at caring for those with severe disabilities, so you don't need to worry about bringing along a person to do things for you. The camp itself is easy to use; paved trails make it easy to get around by yourself, but if you need help, it will be there. There are fine, sturdy cabins for your accommodations, so if you had your heart set on sleeping in a tent, you're out of luck. And the food is outta sight! Special diets can be catered to, and if you are taking medications with meals, the staff will see to it that you are provided with them at mealtime. Guide dogs are welcome everywhere.

A typical day at camp goes something like this:

8 a.m. Breakfast in the dining room. There's plenty of time to chat with fellow campers and instructors over coffee. Rigs are available if you want to operate.

9 a.m. Classes are in session. You go to your assigned upgrade class in a completely accessible area. Special

learning aids help you to get a firm grasp on the material.

10 a.m. Time for a short break, a cup of coffee, and then back to work!

Noon. You've been working hard at your studies all morning, so you have a leisurely lunch in the dining hall, then take your pick of recreational activities—a boat ride, a field trip, a nature hike, or maybe a nap! As before, rigs are available if you care to get on the air. This is, after all, a *radio* camp.

3:00 p.m. No more goofing off, because classes are in session again.

5 p.m. Break for dinner, which is served "family style," as are all meals at camp. What a great time it is to meet your fellow hams and enjoy a meal spiced with fun and camaraderie! After dinner there may be extra class sessions, individual study, or just rest and relaxation. We may even roast marshmallows, play the piano, or push around some checkers. The rigs are ready and waiting.

Bedtime is whenever, but you've got to be ready to get up in time for breakfast, because you won't want to miss any of that good cooking!

At the end of the week, VEs will appear, and you can take your upgrade exams right at camp. If you don't want to test, that's okay too. You will test when you feel ready, and we can even help you with extra study material after you return home.

So what do you think? Does Radio Camp still sound like "camping"? Hey, pass me a marshmallow while I think about that!

If you want to attend Radio Camp, Courage Handi-Hams offers two of them. Minnesota Camp at Lake George, near the headwaters of the Mississippi, runs from August 30 through September 6, 1992; California Camp at Malibu, on the Pacific Coast, runs from January 10 through 16, 1993. Handi-Hams also provides year-round educational services, adapted equipment and specialized services to the physically disabled. Interested? Contact us for information. Your club or group may wish to borrow one of our videos: *Making Contacts*, *Making Friends—The Courage HANDI-HAM Story* or *Courage In The North—Radio Camp Experience*. Contact Courage Handi-Hams, 3915 Golden Valley Rd., Golden Valley, MN 55422; 612/520-0515. □

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The CW numbers game

GENE DODGE, WD8PTN

I am a General Class licensee who was born dyslexic. Dyslexia is often referred to as a reading disability, while in fact it affects many different learning abilities. The numerical aspect of the international Morse code always presented me with the greatest difficulty. Numbers were almost impossible for me to memorize in code.

If I could be confused by numbers, I thought, others might share my problem. So I set out to discover an impact approach to learning. I developed a new learning system for myself, and with it I learned 10 individual CW numbers so fast that I startled even myself! I'd like to share my system here.

You can use this method to teach CW numbers to yourself and/or to others. Learning CW numbers with this system is a game; it has three rules. In CW numbers, one or both of the CW tones, dit (•) and dah (—), will make up a five-character Morse code number. The dit is a short, quick tone, and the dah is a tone held three times as long as a dit. The three rules are as follows:

- 1) All dahs before a dit have a counting value of two.
- 2) All dits have a counting value of one.
- 3) All dahs following a digit or standing alone have a counting value of zero.

Add the sum of the tones and you've got your number. For example, dah-dah-dah-di-dit (— — —•), rules one and two apply: $2+2+2+1+1=8$. Just listen to the tone sounds and add by the applicable rule. For di-di-dah-dah-dah (•• — — —), rules two and three apply: $1+1+0+0+0=2$. For dah-dah-dah-dah-dah (— — — — —), rule three applies: all dahs standing alone have a counting value of zero. See how easy it is to learn CW numbers by my simple-math "impact system"?

CW numbers one through zero form the basis for all Morse numerical expressions. Applying these three simple rules gives the CW student a surprisingly fast system of learning CW numbers. Apply the proper rule to the following numerical characters one through zero:

- (1) • — — — — = $1-0+0+0+0$
- (2) •• — — — = $1+1+0+0+0$
- (3) ••• — — = $1+1+1+0+0$
- (4) •••• — = $1+1+1+1+0$
- (5) ••••• = $1+1+1+1+1$
- (6) —•••• = $2+1+1+1+1$
- (7) — —••• = $2-2-1+1+1$
- (8) — — —•• = $2+2+2+1+1$
- (9) — — — —• = $2+2+2+2+1$
- (0) — — — — — = $0+0+0+0+0$

Students learn by association of dit and dah tones, the application of the three simple rules, and by adding the individual counting values of each tone. Flash cards get to be real fun here. Try hiding the number in paren-

theses and quiz a few friends. Or, put the CW dits and dahs up on your school or club chalkboard and flash-quiz with a pointer stick.

Learning CW numbers with this method is fast and fun, and I expect it will offer immeasurable help to those who may have thought that they'd never be able to learn the CW numbers.

Doolittle

(continued from page 16)

looked around and saw smoke coming from the key. When it cleared, there was Joe, blazing away at 60 wpm!"

"In the beginning we were looking like a 'do-little' station all right," commented Reed. "I thought maybe I would have to paper my office with the 1,000 QSL cards I'd ordered. Now it looks like Danny is going to have to make us a bunch more." Danny Gomes, no call yet, created the commemorative cards. Gomes visited the station but declined to wrestle with the QRM and QSB.

Plans for future special event stations

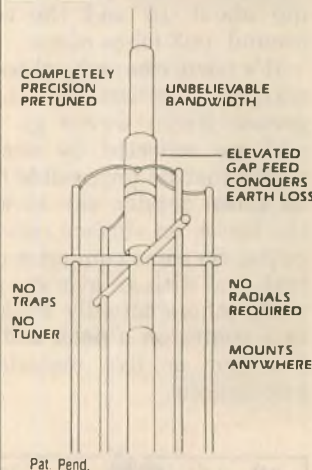
During the final hour of the Doolittle special event, Hao, Reed, and Shaver began planning to com-

memorate another milestone in World War II. "I'd like to do these regularly," Reed commented. "They provide a great opportunity to do meaningful training, and they're a lot of fun. It's important that hams realize we're a part of the amateur community, not off in our own little world."

"We're excited about our future plans," Shaver declared. "We thought perhaps our next theme would be the 50th anniversary of the rescue of Eddie Rickenbacker, but that's not until November. Then Dennis Morisada, NH6NJ, suggested a great idea. He reminded us that the heroic 100th Battalion, the first Americans of Japanese ancestry permitted to serve in the armed forces after Pearl Harbor, trained right here at Schofield. Now we're planning to remember them and their patriotism on the Fourth of July." □

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In the course of history, there have been ages—The Age of Reason, The Age of Enlightenment, The Age of Revolution. Now, of course, we are into a time when the populace is concerned about the environment.

In Amateur Radio there are environmental factors, even concerns, and they show up in interesting ways. For example, in civil life, we are concerned about the ground around us, whether it is polluted by wastes or jeopardized by runaway development. But we in radio usually ignore the ground beneath our feet, at least from an operating standpoint, and only think about obstructions. We get concerned when some rare DX station has a mountain between him and our QTH. A good example of that was during the recent DXpedition to South Georgia Island (VP8) where a mountain stood in the path to most of the US.

But that is a narrow view and we should think more about the very dirt around us. For one thing, it has important electrical properties, both conductivity and a dielectric constant, which affect our radio transmissions. Thus, in the immediate vicinity of our antennas, the ground around them determines their feedpoint impedances.

Like everything in this world, the complexity of the answer you get to a question depends on who you happen to ask. Thus, if you go to *Terman's Handbook*, a venerable source of all sorts of information, you'll find ground constants for 11 types of material. They range from water, fresh or salt, to what you'd find in the industrial areas of a city.

But Terman's book was written in the dark days of WWII and people longed for "Home Sweet Home." Thus, in his discussion of ground constants, you'll find curious mention of such settings as "the pastoral low hills

with rich soil, typical of Dallas, Texas, and Lincoln, Nebraska." Then at another extreme is "the rocky soil and steep hills, typical of New England." See what I mean?

Anyway, the various types of ground were all characterized by dielectric constants, ranging from 80 for water, fresh or salt, to 3 for the industrial areas of the country. And the electrical conductivities of the surroundings ranged from 5 mhos/meter for salt water to .001 mhos/meter for typical industrial areas. In between those extremes were items like "the flat country, marshy and densely wooded, typical of Louisiana near the Mississippi River" with a dielectric constant of 12 and a conductivity of .008 mhos/meter.

I think it's fair to say that we've all been raised to think that salt water is the greatest thing to have under an antenna, serving to make it behave just like the textbook examples with an infinitely conducting plane beneath them. But Terman's book made no mention of those salt marshes that played important parts in the early days of radio on the East Coast where Marconi set up his stations and on the West Coast where RCA set up its overseas facilities. Curious, but true.

We find that people concerned with radio propagation consider only four or five categories of ground, starting with salt water and ending with the polar ice caps. The latter have a very low dielectric constant, close to 1, and the conductivity is low too, .0001 mhos/meter. Interestingly enough, sandy desert material is much like rocky soil, the dielectric constant being about 10 and the conductivity around .002 mhos/meter.

It's fairly clear why those concerned with propagation have so few categories: Radio waves go everywhere and are reflected by everything. It would just be impossible to deal with all those details, say in working out the losses on surface reflection along paths. So some computer calculations just deal with an average ground loss while others actually work out reflection points on a path and use one of the four or five materials for the calculations.

This discussion has dealt with two regions of an antenna, the near-field region and the radiation field region. It should be noted that near the antenna, but not right under it, is another important region, where the RF has its first reflection. That sets what one can expect from an antenna. Let me give you an example. My beam looks south over salt water or north over a wooded hillside. The amplitude and phase of the first bounce of my RF depends on the properties of those materials. Thus, I get a better reflect on the first bounce off salt water than I do off the ground to the north. That serves to give not only a better signal to the south but a lower radiation pattern as well.

Everything considered, I've made a case for choosing a small, verdant island surrounded by salt water as the ideal QTH from an operating standpoint. There are islands in the middle of fresh water lakes but from an operating standpoint they'd be environmental disasters because of the water's low conductivity.

So an island surrounded by salt water would be great to visit on a DXpedition, but there's more to consider than just the prefix you'd be using. Take Comoros (D6), for example. That's a rare prefix that draws a crowd every time it shows up on the bands. And, when last surveyed, it had a population of 300,000 spread over an area of 838 square miles; that's a bit crowded, about 360 persons per square mile. And it's off the coast of Africa, 12 degrees south latitude and 45 degrees east longitude. Being close to the equator, I have to think it would be rather hot and humid.

People do survive in those circumstances, but Comoros Island has one serious limitation from the radio standpoint: a huge dose of QRN! That's right, it's in a terrible location when it comes to electrical noise of atmospheric origin. Global surveys show that thunderstorm activity in that region is the highest in the world, at least for nine months of the year. The peak is in their summer season, December through February, when there's an average of two thunderstorms every three days. In their spring and fall the thunderstorm rate is down a factor of about two. So if you're going on a DXpedition to Comoros, try their winter, June through August.

On the basis of the electrical activity that would come crashing down around your ears, as it were, you'd have to scan the horizon for threatening clouds before putting the antenna on the rig. But if you think all's safe, you're still in for a surprise when you




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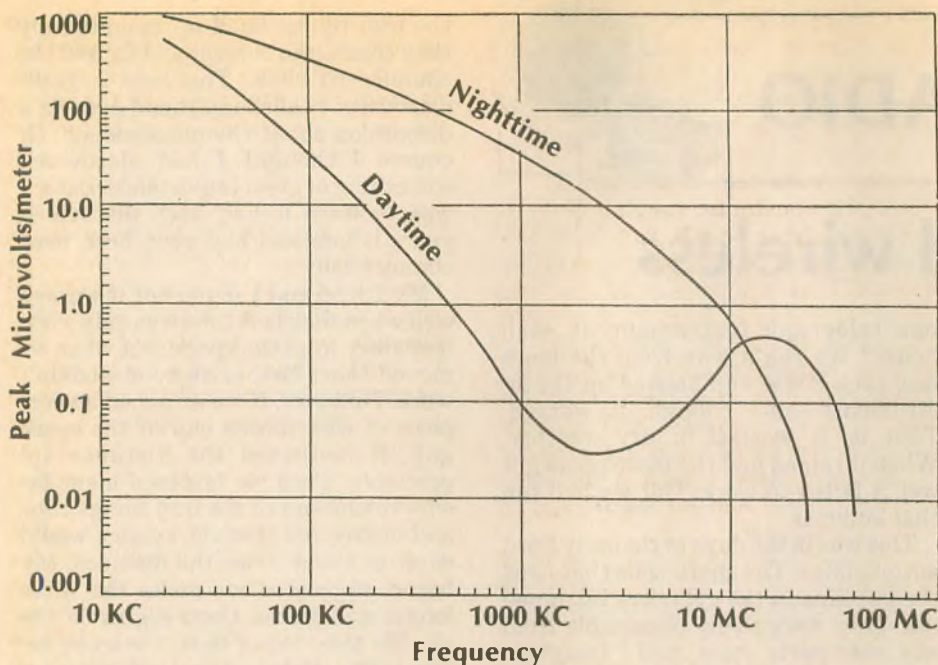


Figure 1. Frequency distribution atmospheric noise (median values)

listen on the bands. The QRN will still be there, no doubt about it.

The problem is that noise of atmospheric origin is propagated just like any other radio signal, so it can come in from over the horizon, even on a clear day. As a matter of fact, thunderstorm activity is much more frequent over land than over the sea, so the isolation of Comoros Island is illusory, the QRN coming in from places like Madagascar, Zambia and South Africa at the height of the summer season.

To put all these matters in perspective, noise surveys have been conducted over the years. The need for continual monitoring of the noise situation is that changes occur, mainly from man-made noise relative to the population of receiving areas. Thus, in considering HF propagation it is important to consider where the receiving station is located, noise levels increasing as one goes from locations which range from remote to rural, then residential and finally industrial.

But atmospheric noise is studied on a wider, perhaps coarser scale. In the first efforts to study noise after WWII, global noise maps were divided into zones, rated 1 through 5. Those

zones most remote from thunderstorm activity were in the first category and the noisiest zones were in the fifth category. Going back to summer on Comoros Island, that would rate about 4, below the noise level in the

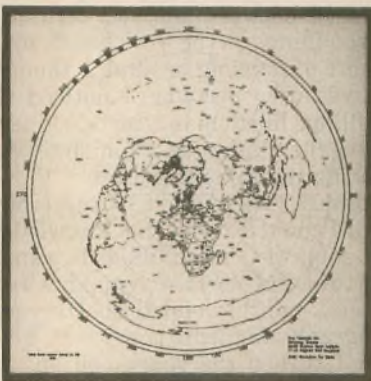
area around Zambia. Bringing those ideas closer to home, the noisiest areas in the US during the summer are along the Gulf Coast, between Texas and Florida and rating about 3.5 on a scale from 1 to 5. I'm sure many of the readers would agree with that.

We should not leave this topic without touching more on the propagation aspects. Thus, we should consider two things, how the F-region plays a role in the propagation of noise, and the D-region in its absorption. In regard to the former, noise cannot be propagated above the MUF for a path from its source region to elsewhere. But that statement has to be tempered by the realization that the noise source, say a lightning discharge, is not located at ground-level like our transmitting antennas. In fact, lightning strikes are like a tall, vertical antenna, and I mean TALL! In spite of that, there's a finite range to noise propagation, although it is greater during daytime because of MUF considerations.

While there is little D-region absorption of noise at night, the absorption of propagated noise does increase during daylight. So, like other ionospheric problems, we have a competition between the two regions of the ionosphere—the F-layer propagating noise to higher frequencies during daytime but the D-region absorbing more noise in those hours.

All of this can be summarized in one figure, shown here, which gives the frequency distribution of atmospheric noise. To be sure, this figure is more representative of the problem than exact, finer details being found on noise maps according to region and time of day. But the story is there, so keep it in mind when you listen on the bands. And when you plan your next DXpedition, consider more than just the airline connections. If you don't, you may find a surprise waiting for you when you arrive at your destination—noise, and lots of it! □

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How I invented wireless

RUSS RENNAKER, W9CRC

It was quite by accident that I became involved in radio. I was a 10-year-old kid on a farm in central Indiana. The year was 1916, just a year before we entered the First World War.

Like most 10-year-olds I was an inquisitive youngster. I liked to see how things worked. I ruined many of my toys by tearing them apart to see how they worked. The first thing I remember destroying was an alarm clock. I never did get it back together, but I found out what made it work.

I had a friend my own age who lived down the road about a half mile from our farm. He was interested in the same kinds of things that I was, and we made a great pair.

We decided we needed some kind of communication between our houses and we thought up all kinds of schemes. At one time we had a set of colored flags which we could hoist in view of both houses. We used different colors for different messages. Blue would be "Can you come over?" and so forth. This didn't work out too well, as we couldn't just stand in our front yards and wait for a flag signal.

My friend's uncle was a telegrapher in the railway station in the little town a few miles from where we lived. We loved to sit in the station and listen to the telegraph instruments click out their messages. We actually learned the Morse code that summer. My friend's uncle said that what we needed was some practice of our own, so he gave us some old used instruments and showed us how to hook them up.

We had a lot of fun with the telegraph sets, but it didn't improve the communication between our two houses. One day my friend had an idea: Why not use the top wire of the fence that ran past both our houses and put

one telegraph instrument at each house? We ran a wire from the fence into each house and hooked up the instruments—sure enough, it worked. That is, it worked in dry weather. When it rained and the fence posts got wet it failed to work. But we had fun that summer.

This was in the days of the early Ford automobiles. The spark coils that fired the gasoline in the cylinders intrigued me. They were easily obtainable from any auto parts store, and I bought a couple to play around with.

One thing I liked to do was hook the spark coil up to some object in the workshop and then ask whoever was my playmate that day to bring the object to me. Just as he picked it up I would apply the battery to the coil and, of course, he would get quite a shock.

Being on a farm it was natural for my father to have quite a workshop. One day when I was playing with the spark coil in the workshop I discovered that when I turned it on and a spark was produced between the two terminals the iron filings on the work bench acted up, sort of dancing around. I thought this was very peculiar. I noticed the iron filings lined up in a certain kind of pattern, like lining up a bunch of kids all facing the same direction.

I thought there must be something useful I could do with that knowledge. I put some of the iron filings in a small glass tube and inserted a copper wire in each end, and then added a battery and a telegraph sounder to the circuit. Then when I turned the spark coil on, the sounder clicked. It appeared that when

the iron filings lined up magnetically they conducted current and caused the sounder to click. This was a great discovery. I called my friend over for a discussion about the phenomenon. Of course I thought I had discovered something of great importance. Later I was to learn it had been discovered years before and had even been used commercially.

My friend and I found out it worked well when the glass tube was only a few feet away from the spark, but when we moved them farther away it wouldn't work. However, if we attached a short piece of wire to one end of the spark gap, it increased the distance appreciably. Then we fastened a similar wire to one end of the iron filings tube and discovered that the system would work at about twice the distance. My friend suggested we make the wires longer and fasten them higher in the air. We then found that it worked between the workshop and my bedroom in the main house, about 300 feet away.

Then we became bold. We moved one set of instruments over to my friend's house and ran the wire out a window to the top of their barn. At my house we ran a wire out of the workshop window and up to the top of our house. It worked. The only problem was that we still couldn't send Morse code, as the

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sounder stayed down until someone disconnected the battery.

Well, anyhow, we then had a communication system between our houses. We replaced the telegraph sounders with door bells and rigged the clapper on the bell so that it tapped the glass tube when it rang, and this disturbed the iron filings and interrupted the circuit, thus stopping the bell from ringing. One bell meant, "Can you come over?"; two bells meant, "I'm coming over there"; three bells meant, "Let's meet at the big oak tree."

The following summer I read about crystal detectors, galena rocks, and resonant wavelengths. I also read where iron filings detectors, called coherers, and the clapper to disconnect the circuit, called a decoherer, had been used in some wireless experiments in England a few years earlier. That didn't help my ego any—I thought I had invented it.

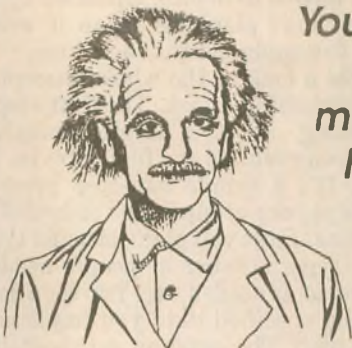
So crystal detectors became common and were still widely used in 1920 when KDKA began the first commercial broadcasting station. The old Ford spark coil was still an important item in my "wireless" room, for we did not have electricity at that time and the only power I had was a storage battery. Of course I had to charge the battery from time to time. I rigged a Ford generator up to the gasoline engine my father used to pump water for the livestock, and ran some wires over to my radio shack and connected them to the battery. When he pumped water my battery got charged.

The spark coil worked fine as a transmitter, and with some luck and many unscientific experiments I managed an inductance coil of 1/4 in. copper tubing that could be tuned somewhere close to the 200M amateurs were allowed to use. No one had any way of actually measuring the wavelength anyway. The word "frequency" did not come into common use until some years later.

But "wireless" as a means of communication was here to stay, even though it became "radio" a few years later, and the crystal detector was replaced with vacuum tubes. The humiliation of knowing I did not invent wireless soon wore off, and I've stayed in the communications field until this day.

Those interested in old-time radio may want to obtain W9CRC's book, *A Radio Journal, which includes many anecdotes of early radio. For further information about A Radio Journal, contact R & R Publishing, 1011 Linda Dr., Kokomo, IN 46902.* □

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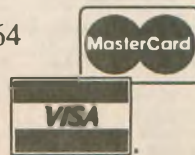
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Does your group hold planning meetings? What do you plan? I'm often amazed during meetings when I see the same agenda items month after month. I've checked with a few of you who have contacted me and I'll suggest this is not an isolated scenario.

Planning is not only underemphasized during search missions, but it's misunderstood in general. What is planning? Isn't it a means to an end? This indicates that following "planning," some action might occur. One could call the next step "implementation." This is the getting-it-done stage.

How much planning does an event take? It's been said that if you wait for ideal conditions, it will never happen. I'm in favor of the "DO IT" philosophy. If it needs doing, let's simply

get it done. If the task is simple, the planning need not be extensive (i.e. there's no need for a massive work project and extensive coordination). It frustrates me greatly when simple tasks are put off and "re-planned" from month to month. Often we spend more time "planning" than it would take to simply get the task done.

Take a look at the whole concept of accomplishing a task. The first step is planning. Next is implementation, then you evaluate and finally revise the plan. It's a simple four-step process. Perhaps your group wants to install an antenna. First you plan: antenna type, coax type, number of people needed, where, tools needed, etc. You set a date. On the specified date you implement your plan. The antenna gets installed (or maybe doesn't get installed). Your next task is to evaluate. What went right? What went wrong? If we do this again, what would we change? If the antenna didn't get installed, what else needs to happen?

Lastly you revise, if needed. If the installation was a great event, you need only congratulate everyone and keep your notes for the next antenna installation. If it didn't go well, you revise your plan and, most importantly, learn.

The last two steps are pretty easy. Everyone will be eager to offer an opinion and help revise the plan (they'll even share the credit). The difficult step is getting it done. My advice to all your pending projects? DO IT!

Emergency credentials

I was troubled at the receipt of an offer by mail last week where I could be "registered" and "certified" as an emergency services person. The company would, for a fee, certify me for two years in a search and rescue specialty. "Who are these folk?" I asked. Check-

ing with local sheriff SAR people, the CAP and Mountain Rescue, no one had heard of this group. Nor would they accept their certification.

"Certification" would be carried out, the letter said, by someone locally who could confirm that I was active in SAR and then administer a 100-question test. Once I had passed the test, and paid my dues, I would be certified.

I've not had a chance to check this group further. Yet it's a little worrisome when someone who is not a member of their local rescue community claims to be involved to the point of pushing a national certification program. Their goals are admirable. That they want to publish technical materials and set "professional" standards is also good.

The worrisome part comes when someone who claims their certification makes mistakes. Would this "certification" cover the liability? If a group, such as the CAP, were to accept these credentials at face value, who would be responsible when mistakes are made? There are some scary things here.

There are many recognized groups, courses and certifications that do have backing and value. The National Park Service and NASAR (National Association for Search and Rescue) have an excellent course, "Managing the Search Function." This course was born from experience and honed over many years. The CAP and Mountain Rescue have certifications as well. There are disaster planning courses available from FEMA and taught at many colleges and universities.

It's tempting for someone new to SAR to send in for "credentials" that promise to make you an expert overnight (like those mail-in applications to be a minister). Being a good SAR person (such as coordinator, team member, technical climber, dive specialist, communicator or planner) means you've spent time in the trenches; you've done more than take a test and have a good buddy vouch for you. Be careful when you seek certification. Look for some standards that are accepted. Look to some groups (such as ARES) that have some organization beyond paying dues and taking tests.

A knotty topic

Charlie, W7KCH, led a training session last month that focused on a few "Amateur Radio knots." Super idea! He demonstrated how to coil coax and rope for easy use. Such knots as the bowline and the sheet bend were demonstrated and their applications to radio explained.

If you're needing a training night, tie some knots! You'll find books on knots at the library (I recommend *Ashley's Book of Knots*) and you can have a fun

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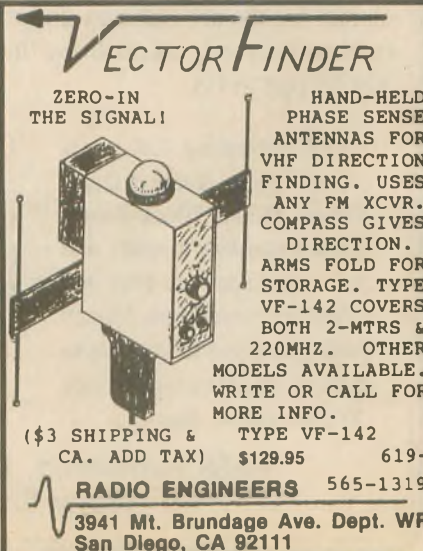
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evening by bringing a bunch of short ropes and practicing. See if you can tie a bowline with one hand! Find out why the overhand knot and the square knot aren't the best knots to use. If you get stuck, contact W7KCH care of WB7ULH or the WB7ULH.SLC. UT.USA.NOAM packet BBS.

Public relations

Don't forget the media! You're doing great things out there. Media contact isn't a complicated or unpleasant task. Steve Mansfield, ARRL public relations, has established some great stuff on how to get the Amateur Radio story told by the media. He's also got a media handbook written by Gene Pressler, W3ZXV. The media handbook is super! A lot of work and thought have gone into it and it's right on for getting involved with the media.

There's a lot going on just in the public service arena for you Amateur Radio operators—you're just not getting your local media involved and informed. There's nothing wrong with blowing your own horn and getting some credit for your hard work. It's not a difficult skill, but there are some tricks of the trade. If your group needs help, contact Steve at the ARRL headquarters in Newington, Connecticut. He's got a lot of good stuff and good ideas that will help you out.

Do it right

Some of your meetings might be dedicated to contingency planning. This is where you throw out a scenario and your group suggests a response plan. Maybe you're planning to help on

the next large forest fire or respond during an earthquake. Select a moderator and a recorder. Have your members suggest equipment, methods, repeaters, NCS techniques, contact points, coordination sites, staging areas, etc. Write it down.

You could start this process by listing as many emergency situations as you can that you might respond to. Go through each one and talk about it. Several things will happen. The experienced people will share their first-hand knowledge. Inexperienced people will ask questions and offer their perspective. Everyone will gain an understanding of what might be expected and encountered. If you take

DX World

(continued from page 46)

Many thanks to the following contributors: LA4KM, RB5FF, RF6FM, UV3DHP, VE7KC, VK5ZN, VK6NE, K1RH, K3ZO, NW6P, W6TUR, N6WFK, N7NZ, KA8RAM, KA0VCW, Western Washington DX Club (K7WA), Salt City DX Association (KB2G), North Arizona DX Association (W7YS), American Radio Relay League, HaGAL (4X1AT), Long Skip (VE3IPR), The DX Magazine (VP2ML), CQ Ham Radio (JA3BG), The W6GO/K6HHD List, DX News Sheet (G4DYO), The Long Island DX Bulletin (W2IYX), QRZ DX (W5KNE), and The DX Bulletin (VP2ML).

One thing that disturbs us is the unnecessary questions and comments

good notes, you'll have some contingency plans you can share with other groups and new members.

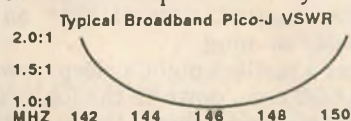
Without a plan, the group's response won't be as effective as it could be. Planning isn't a luxury item, it's a necessary step in being prepared. Being prepared, by the way, is doing it right! If you're going to use the air search frequencies (122.9 and 123.1 MHz) or the national SAR frequency (155.160 MHz) get the appropriate licenses, read the appropriate rules and use accepted equipment. There's no reason to claim ignorance during an emergency, especially for professional—and experienced—communicators. Until next month, 73. □

during a pileup. To ask the operator his name or how to spell his island, or what his country is, is wasting time and depriving others the chance to work him. We hear questions asking what the QSL route is immediately following a previous contact's same question. Short comments and questions are certainly okay, if there is no pileup, but most of the unnecessary transmissions could be avoided if many DXers would only listen first. 73 de John, N6JM. □

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Every time I sit down in front of my PC to write a column, I am thankful that I have this medium of communication with the thousands of you out there who regularly read this column. Having met a number of readers at Dayton this year, and hearing the comments about my QRP column and my new book, *Low Power Communications*, I am indeed blessed to be able to write about my favorite facet of our hobby. Thanks go to you, the reader, for without your continued support, ideas and feedback, this column would not be possible.

Dayton was, in a word, amazing! Since this was my very first Hamvention, I was shocked at the vastness of the event. Tricia and I arrived at 5 a.m. on Thursday morning only to find that our room wasn't ready (not at all surprising). We napped fitfully for about four hours in the car, had breakfast, and then lugged our suitcases up to the sixth floor of the Knights Inn South. After a brief nap (trying to recover after nine and a half hours of straight driving) we started meeting other QRPers who had begun to arrive. By 6 p.m. the antennas had been installed on the roof of the hotel, feedlines run into the hospitality suite and homebrew QRP rigs were being set up. By 8 p.m. there were at least 40 people in the QRP hospitality suite! It was the biggest turnout ever on a Thursday evening.

After a restless night's sleep, it was up at 6:30 a.m., down to the lobby for breakfast and then out to the Hamvention via the trusty bus. Unfortunately, we were riding "the bus from hell"! Not only was our driver unfamiliar with the bus route, a swarm of wasps had built a nest in the bus' heating vent. As soon as the heat came on, out came the wasps. Enter-

tainment was provided by a couple gentlemen who did their best to kill the wasps and not get stung.

The flea market was awesome! I found a couple deals that I could not live without, one of which was a Tektronics dualtrace storage scope purchased from Bob Garcia in the flea market. Bob and Allen Bond are out of Marietta, Georgia. They travel to the major hamfests and sell reconditioned Tek and HP scopes and plug-in modules. The scope, a model 564, was in excellent condition, good tube, and came complete with two probes for \$125. For further information on their line of reconditioned test equipment contact Bob Garcia or Allen Bond at 221 Greencrest Court, Marietta, GA 30068-3825 or call them at 404/977-5701. They are good people to deal with.

Since I have needed a dual-trace scope for some time, I gladly parted with the money. Besides, Roy Lewallen, W7EL, was coming to this year's Hamvention and, since he still worked for Tek, I figured that if anything was really wrong with the scope, Roy could fix it in his spare time. (Hi!)

The Hara Arena opened at 12 noon and it was an absolute madhouse. The mob scene reminded me of my many trips on the Tokyo train system during rush hour. During the course of the next three days I managed to meet many of the manufacturers whom I have dealt with over the past five years writing this column. Robert Fox from MFJ Enterprises was showing off their latest QRP transceiver, the MFJ-9020. This new rig came complete with a matching QRP wattmeter and AC supply with battery case and charger. MFJ provided the QRP AR-

CI with a unit for raffle on Saturday evening at the hospitality suite.

The little rig was used by many of the QRPers while on display in the suite on Friday and Saturday evening. Consensus among the QRPers using the MFJ-9020 was that it lacked adequate audio output from the receiver, and overall receiver performance was a bit lackluster for a highly publicized product featuring a superhet design. I asked to take a rig for review but MFJ said they were being taken back to the factory for more work.

There was a tremendous gathering of the clan on Friday and Saturday evenings at the QRP hospitality suite. Doug DeMaw, W1FB, Roy Lewallen, W7EL, George Dobbs, G3RJV, and Randy Rand, AA2U, were inducted into the QRP honor roll during Saturday's festivities. This honorary award has been around for many years, but until this year at Dayton, no one had submitted any serious nominations for the award. These four world-class QRPers were recognized for their intense devotion to the advancement of low power communications and operating achievements. All four were present to receive their awards and the British contingent was extremely impressed that a member of their club would be so honored.

To prove the adage, "It's a small world," I ran into someone I had not seen in almost 20 years. Gary Zimmet, WA8TJL, was stationed with me in the Azores. Gary's call was CT2BG and mine was CT2BH. The two of us, along with Marv Feldman, CT2BC, worked our fair share of DX and contests from Lajes Field. I found Gary in the flea market quite by accident. We had an all too brief reunion and made plans to meet on the air soon. Gary is currently the airway facilities manager of the Akron-Canton Regional Airport. Not a bad step up for an old "dirt radio" troop from Lajes Field!

During the Dayton Hamvention I had the pleasure of meeting Bill Hickox, K5BDZ, of Houston, Texas. Bill is the head honcho of Tejas (pronounced Tay-hoss) RF Technology that markets a nifty little single-band QRP transceiver called the Backpacker-1. Bill had two offerings (a 40M and a 20M rig) for use at the hospitality suite. Both rigs were impressive in their simplicity of design and ease of operation. Receiver performance was very good for a direct conversion design.

Bill patterned his Backpacker-1 after Roy Lewallen's design presented in the August 1980 *QST* article titled, "An Optimized QRP Transceiver." Roy just happened to have the original rig in his bag so we all got a

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chance to play with the "real thing." The basic concept that Roy puts forth in his article—good performance does not necessarily mean complicated design—is as valid today as it was 12 years ago. Bill was kind enough to let me borrow the 40M rig for testing at K7YHA. Both Fran, KA3WTF, and I have had a chance to use the little rig and are very favorably impressed with initial performance characteristics.

One interesting note on the Tejas Backpacker-1 transceiver, there seems to be no AM breakthrough. Since I have a 5kW AM broadcast station only a mile away from my location, the immunity from AM breakthrough in the Backpacker-1 is a very good sign. The little transceiver features a lightening-quick full break-in (QSK) keying circuit that is every bit as good as the one on the legendary Ten-Tec Argonaut. The case is made of anodized aluminum and has very crisp silk-screening on the front and back panels.

Plenty of room exists inside the Backpacker-1 case for addition of a keyer, SWR/PWR metering, possibly an antenna tuner, NiCd or gel-cell power pack, etc. Bill's philosophy is to encourage experimentation. The Backpacker-1 comes as a kit with all parts, boards, case, connectors and knobs. Price is \$139.95 plus shipping. As soon as I receive the kit version of the 20M rig, I'll be writing a full blown product review on the transceiver. Fran and I took a set of these little transceivers out on Field Day. If you worked us during FD, most likely you were working the Backpacker-1 transceiver.

Another prolific kit supplier whom I met at Dayton was Dick, Pascoe, G0BPS, of Kanga Products. Regular readers will recall my comments in this column (and volume one of my book) regarding the Stockton RF Power meter kit by Kanga. I have used this meter for many months and find it to be extremely easy to construct and very accurate, down to the milliwatt range.

Kanga offers a wide selection of kits. Their marker generator kit is the focus of an upcoming product review. This kit is a very straightforward project which will provide 10 MHz, 1 MHz, 100 kHz and 10 kHz marker signals from HF through VHF. The generator is built on one board and features a 10 MHz crystal oscillator which is divided down to provide the other marker outputs. A word of caution: this is not a Heath-style kit. Only the parts and PC board are furnished. You have to provide the case, switches and connectors. Instructions are a bit spartan. A simple kit, it should provide an ex-

cellent first project for anyone who wants to give homebrewing a try.

To say that Dayton Hamvention '92 was a blast would be an understatement. Not only did I meet some legends in the QRP world, I managed to have a lot of fun and pick up a few trinkets, too. Since Tricia and I enjoy traveling, the nine-and-a-half-hour ride each way was no big deal. The journey was made more enjoyable by several of the places where we ate. The crew at the Waffle House was quite helpful at 4 a.m. when we pulled off I-71 to take a break and get some grub. The night

manager insisted that he call our hotel and obtain specific directions for us. The Waffle House bunch off I-75 on the way to the Hara Arena was also very cheerful and the food was delicious. Three evenings in a row we ate at the Spaghetti Warehouse about eight blocks away from the Kings Court hotel. Their fettucini alfredo and lasagna were world-class! I can hardly wait for Dayton '93. In the meantime I have to get on the exercise and burn off some pounds so I can enjoy the food next year!

72 and 73, Rich, K7YHA

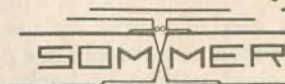
DJ2UT - Multiband Beam

Series XP70 - 6 m / 20-Foot Boom

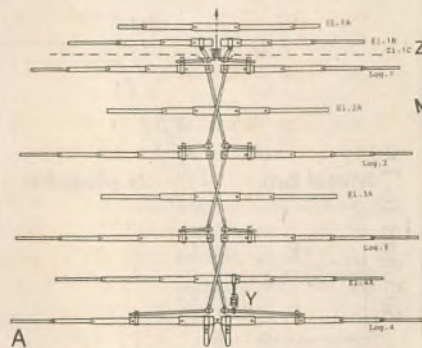
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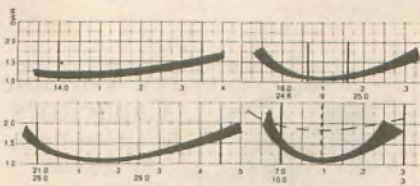


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Band	10	12	15	17	20	30	40
Gain dB/d*	9.5	7.5	9	9	9	0.3	0-2
l/b-r.**	15	to	30	0-10	0
Power-r.	2 kW out cont.						
Impedance	50 Ohm Coax + Balun 1 : 1						
Physical Dimensions	704 + 30 m + 40 m			+ 17 m			
Net weight***	37 kg - 82 lbs			40 kg - 90 lbs			
Wind load***	124 dm ² - 13 ft ²			134 dm ² - 14 ft ²			
max. El. length	11.6 m - 38 ft						
Turning radius	6.6 m - 21.5 ft						

Remember, a 3 el. monoband beam has 4 to 6 dB/D (see ARRL Antenna Book)



Beam Series Available:

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The XP 70 series beams are designed for the amateur with all-out performance in mind. Although the boom-length is only 20 feet, XP 70s have easily outspaced much larger, conventional antennas in careful testing. The key is the TOTAL elimination of traps, which rob performance from even the largest of multiband antennas. Because of their high efficiency, XP 70 series antennas suitably replace 4- and 5-element antennas of conventional design.

The model XP 704 antenna is shown in figure A. In this configuration the 20 m band is using 4 actively driven fullsize elements and turns out a solid 9 dB/D forward gain.

For the 15 m (and 17 m) bands, 4 directly fed 5/8 elements in conjunction with elements 1B/4A form a typical band gain of 9 dB/D as well. The operation on 17 meters requires an optional 8.2 m (26 ft) element at boom location 'Z' which does not influence the 10 - 20 m settings but has the same properties as in 15 meters.

It should be stressed that ALL elements are working in the 10 and 12 m bands and contribute to a 9.5 dB/D gain.

Moreover, a coaxial stub which is housed in a plastic box, enables the operation on the 30 m band without any mechanical extension. By this, the typical gain is about 2 dB/D. The 40 m band is activated by use of an individual power-coil being mounted at location 'Y' and which yields a 0 to 2 dB/D gain on this band.

* Gain determined in the main lobe as described in the ARRL Antenna Book, 14th ed. pg. 15-23. Measurement accuracy acc. to CCIR ± 2dB

** F/B ratio and SWR varies according to conditions such as θ, electrical height above ground

*** ± 10 %

CONSTRUCTION

The VRS antenna An antenna for any space

RICHARD Q. MARRIS, G2BZQ

The VRS (very restricted space) is an antenna designed for use *in-room* in an apartment. It can be used successfully simply by hanging it out of a high window. It can, of course, be used anywhere indoors or outdoors in a postage stamp sized garden or backyard. It should, therefore, be of interest to that majority of HF TXers who have antenna space problems or official restrictions.

Though specifically intended for 80M CW, it can also be used on the 20, 40 and 160M bands (and no doubt other bands) with simple matching and loading changes.

The VRS is low-cost, simple to construct, easy to use and very effective. No complicated problems should arise. It is easy to get on the air. Figure 1 shows the circuit of the VRS as used on the 80M CW band at this QTH, with 10 to 15W input CW. It consists of 30 feet, four inches (10 meters) of 300 ohm impedance translucent twin ribbon feedline, and is matched to 80M with a simple L-match ATU.

The first configuration used at this QTH was a zig-zag diagonally across the room. This was achieved by running two lengths of fish line from opposite corners.

The antenna was attached between these lines, with an overall physical length of about 10 feet (3.3 meters). This compacted antenna was easily loaded and worked quite well. It had a usable bandwidth of about 50 kHz without retuning the ATU and would be useful in a very small room.

Figure 2 shows the final layout ultimately used at this QTH. The antenna sweeps around in an approximate arc, with a drop down to the ATU at one end and a short drop down, at the far end, to facilitate adding 160M loading coils later.

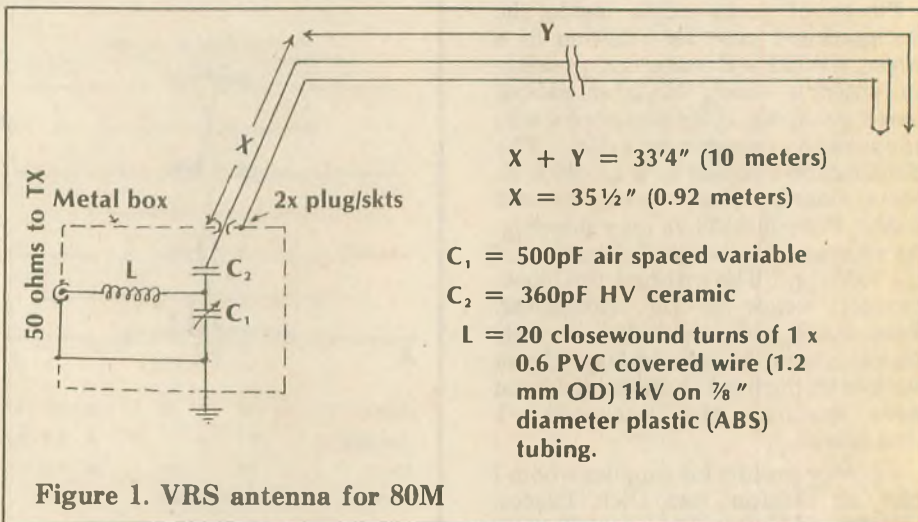
The antenna position, relative to a compass bearing shown here, and the VRS appear to be omni-directional. This configuration is shown as a typical practical example of what can be done using the VRS antenna techniques. The antenna is suspended with plastic curtain rings supported by

lengths of nylon fishing line. These rings facilitate free-running simple erection without twists in the cable.

It will be seen that on the 80M band, the antenna is physically about 1/8-wave long but is, in fact, capacitive linear loaded, by virtue of the core-to-core capacity of about 5.8pF per foot. The far ends of the ribbon cable are

capacitor C_2 , all in a metal screening box, with suitable plugs and sockets. C_1 could be 250 or 350pF. L_1 is made from a 3 in. length of 7/8 in. OD ABS plastic wastepipe, onto which are wound 20 turns (close-wound) of 1×0.6 mm PVC covered wire (1.2 mm OD) per kV, the winding being about two inches wide. A short length of RG58 coaxial feedline connects the ATU to the transmitter, which has a pi-network output. Fifteen feet of stout flex is connected from ATU to a metal waterpipe as the ground connection. It is stressed that the specified ATU is for the 80M band only. Any alternative good ATU would suffice, either LC or T-match.

Bearing in mind that the antenna can be erected in a few minutes, it is a good idea to experiment with alternative physical configurations, but at all times keeping the antenna as far as possible from walls, ceilings, wiring,



shorted together and suitable plugs fitted to the twin core ends at the ATU. One core is connected to the ATU LC match and the other returns to ground at the ATU, i.e. the antenna is folded back.

The L-match ATU consists of inductance L_1 and a good quality 500pF airspaced variable capacitor C_1 ; a series high voltage 350pF ceramic

metal pipes, etc. When working outdoors keep it as clear and as straight as possible.

High transmitting power is not advisable indoors, in the interests of domestic safety, but 10 to 15W CW will be adequate to work DX. By setting up the ATU transmitter at 3550 kHz, it can be found that C_1 requires no further adjustment between 3500 and 3650 kHz. A small adjustment is required for 3650 kHz upwards.

Other bands may be worked successfully using the same flat twin VRS antenna (see Figure 3). A slight adjustment will enable you, for instance, to work 20M. By shortening both ends of the 300 ohm ribbon feeder, the VRS works as an end-fed half-wave antenna with a suitable ATU. On 40M no ATU should be required when using a transmitter with a pi-network output. The VRS works as a folded back

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quarter-wave and matches the coaxial feedline. Any additional small length required can be achieved with a few turns of 16 AWG wire coil between the ground connection on the coaxial socket and the antenna end.

For 160M, again using the small flat twin antenna, there are three alternatives, each of which has advantages and disadvantages.

As shown in Figure 3, alternative A is similar to the 80M version, with a load coil inserted at the ground end of the antenna. This with a suitable ATU works well, but it was found that the large loading coil was a nuisance near the transmitter.

Option B has a far end loading coil. The coil can be wound on a large diameter former or high grade ferrite rod. It is a convenient arrangement, as the coil can be simply clipped on when required. The arrangement loads well with a suitable ATU.

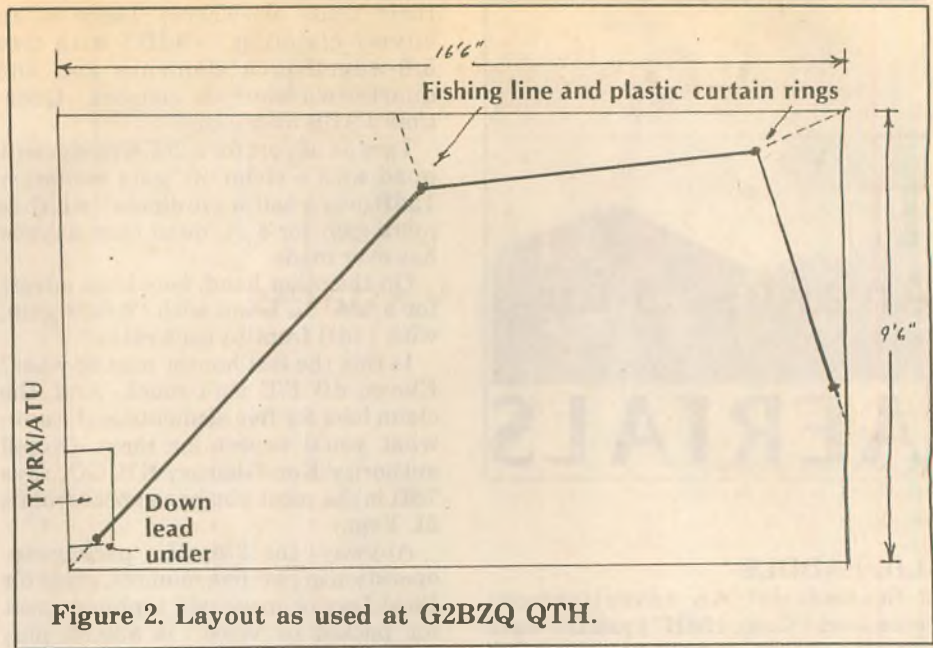


Figure 2. Layout as used at G2BZQ QTH.

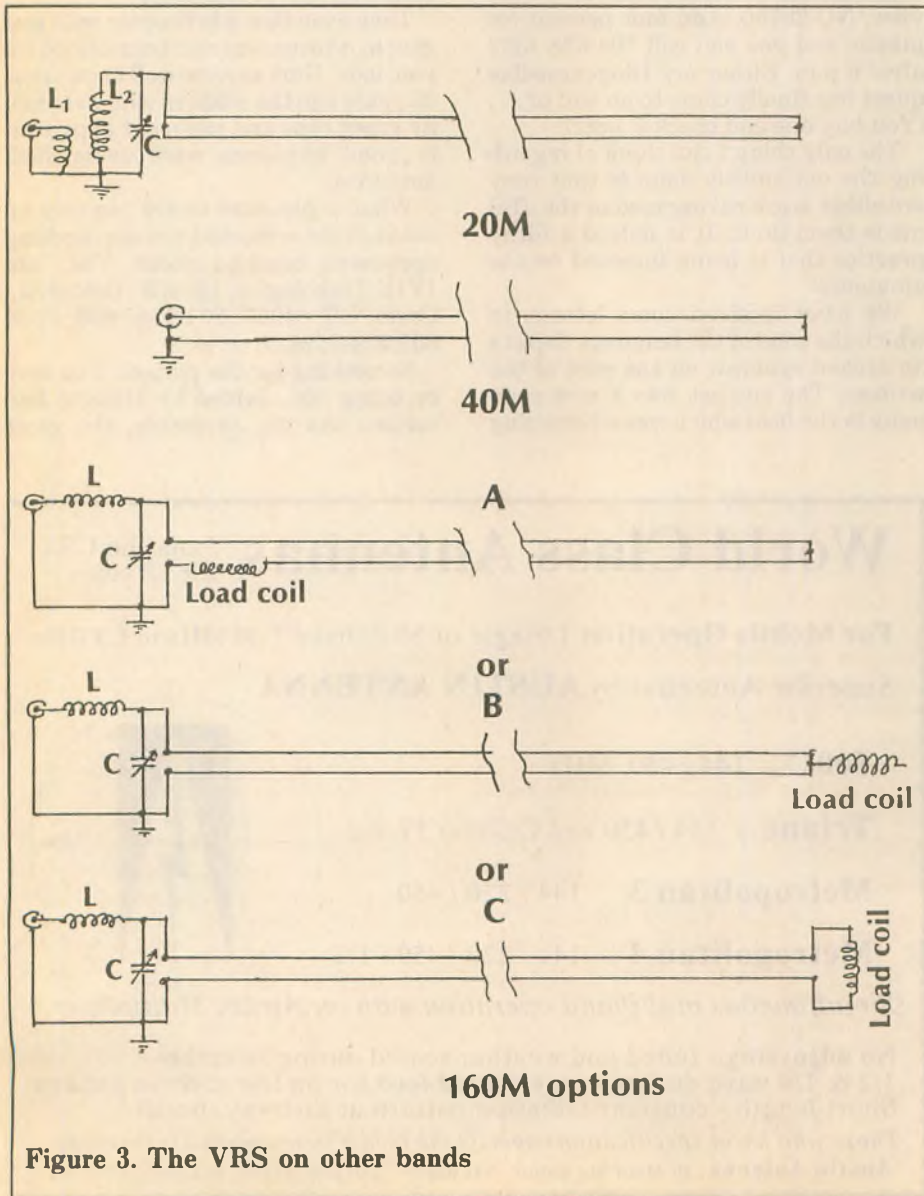


Figure 3. The VRS on other bands

Option C uses a far end series loading coil. Tuning can be facilitated by fitting a small VC across the coil. The great disadvantage is the necessity to proceed backward and forward to the far end VC to make adjustments. It is easy to load the antenna, however. Whichever of the above three arrangements is adopted will depend on local circumstances and personal preferences.

The VRS has a great deal of potential for the many who either cannot or are not allowed to erect a large antenna outdoors. It can be zig-zagged or otherwise compacted into a small space, even a small room, and gives good results. The best results will probably be obtained if the VRS is absolutely straight. No doubt it could be fitted, hidden under the roof overhang. □

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LIL PADDLE

Scoundrels! An advertisement promised, "Gain: 10dB" (quarter-wave ratio) with, "Type: half-wave for 2M." Sadly, a major hammymag carried the advert.

First, for the newcomers among us, allow me to explain what 10dB really is: 10dB is going from 100W output to 1,000W output. Dear logic itself should tell you that doubling a length of wire is not the equivalent of the big bottles in an amplifier.

Here is another example of what 10dB truly is: going from a dipole to a four-element cubical quad! We also see claims of 10dB gain for two 5/8 elements. This is a tad over two half-wave dipoles.

How can these vulgarians claim such? And, why does the magazine accept the word of such shady characters?

Thankfully, much to the discomfort of the disreputable, there is a place where you may check for yourself, the "actuel" of antennas: *The ARRL Antenna Book!* (I bought it myself, they didn't even send me one. We sent them a copy of *our* book.)

Look at page 13-2 (16th edition). If you ran a wire out 10 wavelengths (around 700 feet on 20M or 68 feet on 2M) you would get about 7.5dB gain over a dipole. How, therefore, do these antenna firms make such outlandish claims for miniscule devices on 2M?

I'm looking at the claims of a well-known antenna manufacturer. They claim (for their 2M vertical which is 7'6" long) 6dBd. That is, 6dB over a dipole. Now, a half-wave dipole at 2M is about 3 1/4 feet. At slightly more than double that, a gain of 6dB?

Insulting! Do they think we're just a bunch of know-nothing twits? Are we truly held in such dire contempt? They owe all amateurs a printed apology.

Are they so shallow that they don't realize that the cognoscenti will take

their trade elsewhere? There is an advert claiming "+9dB" with two 5/8-wavelength elements and one quarter-wavelength element. Question: +9 dB over *what*?

I see an advert for a 2M, five-element quad with a claim of "gain *minimum* 12dB over a half-wave dipole," which is more gain for a 5L quad than anyone has ever made.

On the other hand, here is an advert for a 2M, 5L beam with "6.6dB gain, with 11dB front-to-back ratio."

Is this the last honest man or what? Eleven dB F/B isn't much. And, the claim here for five elements is closer to what you'd expect for three. (Noted authority Ken Glanzer, K7CGO, says 7dB is the most you can expect from a 3L Yagi.)

Anyway, the 2M, 5L "package-to-operation in just five minutes, great for Field Day or mountain topping, great for packet or voice" is \$39.95 plus \$3.50 shipping and handling from W.W. Sales, 57 Echo Lake Dr., Fairview, NC 28730. Add four percent for plastic and you can call 704/628-1352 after 6 p.m. Either my Diogenese-like quest has finally come to an end or . . . (You buy one and check it out?)

The only thing I can think of regarding the outlandish claim is that they are either stark raving mad or the dBil made them do it. It is indeed a filthy practice that is being imposed on the amateurs.

We have received some letters, in which the tone of the language depicts an arched eyebrow on the part of the writers. The subject was a new company in the field which was advertising

antennas that lay right on the ground.

The data sheet from the company states that at 15 MHz, 20-degree elevation, the radiation would be 13dB less than an isotropic.

If one gets the antenna up off the ground and elevates it two feet, it is now 6dB down from an isotropic.

Fair enough. It certainly rings with *vérité* far more than one manufacturer who, regarding its antenna says: "Gain over dipole—depends on elevation."

Really now! Elevation of which, pray tell? And by how much for what result? What they should say is, "We *measured* our compact antenna and found that it was 2.618dB stronger than a \$16 vertical using four French fries for radials."

I dearly like this statement from the lay-it-on-the-ground company. Read it carefully: "The following specifications are derived from actual antenna test range measurements. The specifications are *not* the result of computer modeling and predictions."

They even flew a helicopter with test gear in it to measure patterns. Good for you, lads. Kurt says he well knows that 25 years ago the soldiers who wear funny green caps and jump out of perfectly good airplanes were using such antennas.

What a pleasure to see honesty instead of the wretched wonder-working apparatus bandied about. They are IVIE Technologies, 1366 W. Center St., Orem, UT 84057; 801/224-1800; FAX 801/224-7526.

Something for the purists: You may be using 300 divided by MHz to find meters. As my professor, the great

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Ludwig Von Mises, taught me, it is not 300. Instead you should use 299.793077.

Our *nom de plume* paladins joust (and jest) against the Pinocchio antenna companies. A letter came in last month asking if they were really Wayne Green, to which they reply, NO! A flag with a big "E" flies over our house and only an "A" at his.)

An expert looks at the antenna tuner

The following is a rebuttal to W9CRS's June article, "The Layman Looks at the Antenna Tuner," the printing of which illustrates common misconceptions of "the layman" versus the professional engineer or expert antenna tinkerer. If the article got you riled, you're probably on the right track.

WALTER MAXWELL, W2DU

An article entitled, *The Layman Looks at the Antenna Tuner*, by Gordon Beeman, W9CRS, appears in the June 1992 issue of *Worldradio*. His article purports to explain the theory behind the operation of antenna tuners, but his explanation fails because nearly all of his statements are false and appear to be based on a misguided perception of transmission-line theory and practice. The article is also misleading, because it refers to *The ARRL Antenna Book* as if his material was taken from the *Antenna Book*. This is ironic, because the misinformation presented here is so patently wrong it would never have appeared in any League publication.

Among other erroneous statements, Mr. Beeman states: "Contrary to the 'books,' standing waves are not caused by reflected power. Obviously standing waves are caused by the current and voltage in the feedline and on the antenna being 90 degrees out of phase."

I cannot imagine where these misconceptions of transmission-line practice originated, unless he fell for the writings of DeLaMatyr, W5GO; Woods, W9IK; and Drumeller, W5JJ, all claiming that standing waves are not the result of reflected power, because they say that since the current and voltage on the line are 90 degrees out of phase, reflected power doesn't exist—all of which is totally untrue. References for the erroneous writings of these authors, and my response to

The book, *Aerials*, by Lil Paddle and Kurt N. Sterba (a collection of their earliest columns in their 10-year reign), is available for \$10 plus \$2 postage and handling. Californians add 78 cents. Be sure you get the first edition; the second printing will be \$11! Check, credit cards (number and exp.) to Worldradio, 2120 28th St., Sacramento, CA 95818. □

their errors, appear in my ARRL book, *Reflections—Transmission Lines and Antennas*. Of course reflected power exists, as real power, and standing waves are the direct result of reflected power, for gosh sakes!

Despite still other of Mr. Beeman's erroneous statements to the contrary, in obtaining the conjugate match the antenna tuner *does indeed* tune both the antenna and the feedline to resonance, and neither the antenna nor the feedline requires altering its length to be made resonant, though Mr. Beeman claims it does. For any reader who doubts that this is true, there are detailed explanations in my book *Reflections* and in many other sources. I would ask Mr. Beeman how many antenna towers in the AM broadcasting service have heights which are a resonant length? Most do not. So how does he think they are made resonant? Certainly not by altering their lengths! —Walter Maxwell, W2DU, ARRL TA for antennas and transmission lines □

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Illinois

THE GREATER JACKSONVILLE AMATEUR RADIO AND COMPUTER SHOW will take place from 9 a.m. to 5 p.m. August 1 and from 9 a.m. to 3 p.m. August 2 at the Prime Osborn Convention Center. Features include displays by major manufacturers and vendors, forums, and programs on DX, antennas, packet, ATV, traffic handling, emergency communications and operating techniques. VE exams will be conducted on Sunday. Admission is \$5 at the door. Swap tables are \$15 each for the weekend. Vendor set-up time is 1-8 p.m. on Friday. To order tables, write Greater Jacksonville Amateur Radio and Computer Show, P.O. Box 11882, Jacksonville, FL 32239. For other information, write P.O. Box 10623, Jacksonville, FL 32207. Include SASE with all correspondence.

THE FOX RIVER RADIO LEAGUE is holding their 1992 hamfest August 2 from 8 a.m. at the Waubensee Community College. Features include commercial dealers, food vendor, indoor and outdoor flea markets and VE exams at 10 a.m. Admission is \$4 in advance or \$5 at the gate. Indoor tables are \$10. Vendor set-up times are Saturday after 7 p.m. and Sunday 6-8 a.m. Talk-in on W9CEQ 145.470 (-600). Contact Fox River Radio League, 1744 South 7th Ave., St. Charles, IL 60174.

THE HAMFESTERS RADIO CLUB is holding their 58th Annual Hamfest and Computer Festival on August 9 from 8 a.m. to 3 p.m. at the Will County Fairgrounds in Peotone. Features include air-conditioned exhibit building that is handicap accessible, food and beverages, manufacturer displays and swappers row. Admission is \$4 in advance and \$5 at the gate. Children under 12 free. Set-up time is 6-8 a.m. Talk-in using FM Stars and Kars repeaters: Stars 146.64(-), Kars 146.94(-). Club call is W9AA. Contact David F. Brasel, NF9N, Hamfesters Radio Club, 7528 W. 109th Place, Worth, IL 60482; 708/448-9432.

WESTERN ILLINOIS ARC is sponsoring the 7th annual Tri-States Swapfest on August 16 from 8 a.m. to 2 p.m. at the Eagles Alps Lodge in Quincy. Features include outdoor tailgate area, indoor vendor tables, an ARRL table, forums, VE testing and XYL activities. Admission is \$2.50 in advance and \$3 at the door. Talk-in on 146.63/03, 146.34/94. Contact Jim Funk, N9JF, c/o WIARC, P.O. Box 3132, Quincy, IL 62305-3132; 217/336-4191.

Indiana

TIPPECANOE ARA is holding its 21st annual Lafayette Hamfest on August 16 from 6 a.m. at the Tippecanoe County Fairgrounds in Lafayette. Features include forums, prizes, VE exams and activities for XYLs and children.

Admission is \$4. Vendor set-up is Saturday 5-8:30 p.m. No rental tables are available. Talk-in on 146.730/52. Contact Bruce Stewart, N9GKE, 315 Hamilton St., West Lafayette, IN 47906; 317/463-2379.

Massachusetts

THE BRISTOL COUNTY REPEATER ASSOC. AND FALL RIVER ARC will hold a flea market and hamfest on August 30 from 9 a.m. to 1 p.m. at the Bank Street Armory in Fall River. Features include free parking and VE exams at 10 a.m. Admission is \$2. Dealer spaces are \$5 each with set-up at 8 a.m.; bring your own tables. Talk-in on 145.150(-) with 123.0 CTCSS and 444.350(+). Contact Tom LaPointe, WAILBK, 40 Albin St., Fall River, MA 02723; 508/674-4163.

Michigan

EASTERN MICHIGAN ARC is sponsoring Swap '92 Hamfest on August 2 from 8 a.m. to 2 p.m. at the St. Clair County Community College Student Center in Port Huron. Features include Skywarn class, DX forum, packet forum, air-conditioned building and walk-in VE session. Admission is \$3 in advance and \$4 at the door. Tables are \$12. Vendor set-up time is 6 a.m.

Talk-in on 147.300(+), 444.550(+) and 146.52. Contact Hank Kohl, K8DD, 1640 Henry St., Port Huron, MI 48060; 313/982-7088.

Missouri

THE ST. CHARLES ARC will sponsor Hamfest '92 on August 23 from 6:30 a.m. to 3 p.m. at Blanchette Park in St. Charles. Features include forums, family activities, food concession for early morning coffee and lunch and VE exams at 10 a.m. Admission and parking are free. Handicap parking will be available. Talk-in on 146.67 and 444.65 repeaters and 146.52 simplex. Contact Ron Ochu, KO0Z, #5 Cricklewood, St. Peters, MO 63376; 314/278-2510, or Eric Koch, NF0Q, 314/946-0948 evenings.

New Mexico

THE DUKE CITY HAMFEST will be held August 15-16 at the New Mexico National Guard Armory in Albuquerque. Features include a swap meet, technical classes, demonstrations and VE exams. Contact Duke City Hamfest, P.O. Box 6552, Albuquerque, NM 87197.

Ohio

PAULDING COUNTY ARG is holding their 2nd annual hamfest on August 9 from 8 a.m. at the Paulding County Fairgrounds in Paulding. Features include overnite camper parking, hourly door prizes, 50/50 drawing, food service and VE exams. Admission is \$3 at the gate. Under 12 free with one adult. Inside table is \$10. Outside spaces are \$4 plus admission. Set-up time is 6 a.m. Talk-in on 146.865/444.225(+). For exam pre-registration, call or send SASE to Bob High, 12838 Tomlimson Rd., Rockford, OH 45882; 419/795-5763. For advance tickets or information, contact Jerry Rhodes, KB8MAF, 10392 SR 500, Paulding, OH 45879; 419/399-3641.

UNION COUNTY ARA is holding their 16th annual Marysville Hamfest and Computer Show on August 23 at the fairgrounds in Marysville. Features include free entertainment on Saturday night, electronic flea market, and overnight camping with electric and water hook-ups on first come basis. An air show, hot air balloon rally, demonstrations and more will be held Friday, Saturday and Sunday at the near-by airport. Admission is \$4 in advance or \$5 at the gate. Vendor space is \$5 for a 10 X 10 ft. area. Contact Gene Kirby, W8BJN, 13613 US 36, Marysville, OH 43040; 513/644-0468.

W8VTD, THE WARREN ARA is holding a hamfest on August 16 from 6 a.m. to 4 p.m. at the Trumbull Branch Campus of Kent State University in Warren. Features include an air-conditioned indoor exhibit area, 5-acre flea market on campus grounds, meeting rooms, alternate activities, food and refreshments, free parking and VE exams at 9 a.m. Admission is \$4. Children under 12 free. Exhibitors 8 ft. tables are \$6 and 10 ft. flea market spaces are \$2. Talk-in on 146.37/97 and 448.00/443.00. Contact Dave Metzendorf, KD8JJ, Warren ARA Hamfest, P.O. Box 809, Warren, OH 44482; 216/395-5416.

Oregon

CENTRAL OREGON RADIO AMATEURS is sponsoring the 3rd annual High Cascade Hamfair on August 8 from 9 a.m. to 4 p.m. at Mt. Bachelor's Sunrise Village. Features include flea market, packet DX, antenna, commercial exhibits, fashion show, High Desert Museum

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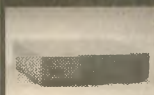
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presentations and VE exams (pre-registration required). Admission is \$5, \$7 at the door. Flea market tables are \$10 each. Free overnight, secured parking for self-contained RVs. Talk-in on 147.06(+600). Contact Don Harrington, N7ION, 69706 W. Meadow Parkway, Sisters, OR 97759; 503/549-7951.

Pennsylvania

THE SKYVIEW RADIO SOCIETY is sponsoring the annual Swap and Shop on August 2 from 8 a.m. to 3 p.m. at the club grounds off Rt. 366 in New Kensington. Features include hourly prizes and food sold by the club. Admission is \$2. Talk-in on 146.04/64, 223.04/64 and 443.45+. Contact John Thompson, 1014 Cable Ave., Blawnox, PA 15238; 412/826-5699.

THE MID-ATLANTIC ARC Hamfest will be held on August 9 from 8 a.m. at the Bucks County Drive-in Theater in Warrington. Admission is \$4, \$3 for each tailgate space. Set-up time is 7 a.m. Talk-in on 147.66/147.06 and 146.52. Contact Al Maslin, W3DZI, MARC, Box 352, Villanova, PA 19085; 215/446-4936.

Tennessee

SHORT MOUNTAIN REPEATER CLUB is sponsoring a hamfest on August 30 from 7 a.m. to 3 p.m. at Cedars of Lebanon State Park in Lebanon. Features include outdoor facilities only with space available on a first come basis, food and drinks. Admission is free. Talk-in on 146.91. Contact Mary Alice Fanning, KA4GSB, 4936 Danby Dr., Nashville, TN 37211; 615/832-3215.

Texas

THE PANHANDLE ARC is holding their annual Golden Spread Hamfest on August 15 at the Amarillo Civic Center in downtown Amarillo. Features include VE exams and handicap accessibility. Admission is \$6 in advance and \$7 at the door. Tables are \$5. Talk-in on 146.92(-). Contact Leland Carpenter, N5VRN, Golden Spread Hamfest, P.O. Box 1524, Amarillo, TX 79105-1524; 806/352-8759.

Washington

MOUNT BAKER ARC is sponsoring the 3rd annual Bellingham Radio Fleamarket on August 22 from 9 a.m. to 4 p.m. at the Ferndale Band Boosters Bingo Hall in Ferndale. Features include a country store, computers, club and repeater info, RV/SC free parking, ham dealers, snack bar and VE exams. Admission is \$3. Vendors \$20. Talk-in on 146.74/14R. Contact Mount Baker ARC, c/o Gary Prowse, KB7IGR, 7646 Terrace St., Ferndale, WA 98248; 206/384-3204.

West Virginia

TRI-STATE ARA is sponsoring Hamfest '92 on August 8 from 8 a.m. at the Huntington Civic Center in Huntington. Features include, food, forums, flea market, walk-in W5YI testing, handicap accessible, YL and XYL activities and vendor exhibits. Admission is \$5, children under 12 free. Vendor set-up is 6 a.m. Talk-in on 146.76(-). Contact TARA, Box 4120, Huntington, WV 25729.

Photographers! If you fancy yourself the qualified photographer among club members, volunteer to get out there and cover the events!

Kantronics Technical Seminars

Presents

"Packet/Digital Communications"

Kantronics invites you to attend a free technical seminar "Packet/Digital Communications" presented by Karl Medcalf (WK5M), Kantronics Customer Service Manager. Karl will focus on how to make packet work for you. Seminar attendees have a chance to win a Kantronics KPC-2, D4-10, DE, KTU, KAM or other similar hardware at prize drawings at the end of each session. Check the schedule below for city and date.

- 1 Overview of Packet Radio - 9:00am-10:30am**
This session introduces Packet Radio, explains how packet works and defines what is required to set up and operate your own packet station.
- 2 Connecting your Equipment - 11:00am-12:30pm**
The mysteries of connecting your computer to your TNC and your TNC to your radio are revealed. Detailed examples using state of the art computer and radio equipment, make it easy for you to get your station up and running fast.
- 3 Getting on the Air - 1:30pm-3:00pm**
Included here are the basics of your first connect, digipeating and the meaning of the indicators on your packet TNC. Additional topics such as gateway operation, networks and packet bulletin boards will be discussed.
- 4 Open Forum - 3:30pm-5:00pm**
The signaling techniques and operating practices of the "other" modes of operation including WEFAX, RTTY, ASCII, AMTOR, NAVTEX/AMTEX and CW are discussed.

Kantronics Technical Seminar Schedule

Minneapolis	MN	Mar 92
Denver	CO	May 92
Birmingham	England	May 92
Louisville	KY	Jul 92
Columbus	OH	Sept 92
Chicago	IL	Oct 92
Houston	TX	Jan 93
New York	NY	Mar 93

please call for exact date & location 30 days prior to the scheduled seminar date shown above.

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New Jersey QSO Party

The Englewood Amateur Radio Association Inc. invites all amateurs the world over to take part in this 32nd annual event from 2000 UTC Saturday, Aug. 15 to 0700 UTC Sunday, Aug. 16, and from 1300 UTC Sunday, Aug. 16, to 0200 UTC Monday, Aug. 17.

Rules: Phone and CW are considered the same contest. A station may be contacted once on each band, phone and CW are considered separate bands. CW contacts may not be made in phone band segments. New Jersey stations may work other New Jersey stations. General call is "CQ New Jersey" or "CQ NJ." New Jersey stations are requested to identify themselves by signing "DE NJ" on CW and "New Jersey calling" on phone.

Suggested frequencies: 1.810, 3.535, 3.950, 7.035, 7.135, 7.235, 14.035, 14.285, 21.100, 21.355, 28.100, 28.400, 50/50.5 and 144/146. Suggest phone activity on the even hours: 15/10M on the odd hours (1500 to 2100 UTC); 160M at 0500 UTC.

Exchange: QSO number, RST and QTH (ARRL section or country). New Jersey stations will send county for their QTH.

Scoring: Out-of-state stations multiply number of complete contacts with New Jersey stations times the number of New Jersey counties worked (maximum of 21). New Jersey stations—W-K-VE-VO QSOs count as one point; DX stations count as three points. Multiply total number of points times the number of ARRL sections (including NNJ and

SNJ). KP4, KH6, KL7, etc. count as three-point DX contacts, as well as section multipliers.

Awards: Certificates will be awarded to the first place station in each New Jersey county, ARRL section and country. In addition, a second place certificate will be awarded when four or more logs are received. Novice, Technician and mobile operator certificates will also be given. A total of four plaques have been donated by the ARRL section managers for NNJ and SNJ to the highest scoring single operator station residing in each of their sections (separate for Novice/Technician and all other classes).

Logs: Must also show the UTC date and time, band and emission and be received not later than Sept. 12. The first contact for each claimed multiplier must be indicated and numbered and a check list of contacts and multipliers should be included. Multi-operator stations should be noted and calls of participating operators listed.

Logs and comments should be sent to: Englewood Amateur Radio Association Inc., P.O. Box 528, Englewood, NJ 07631-0528. A #10 SASE should be included for results.

Stations planning active participation in New Jersey are requested to advise EARA by Aug. 1 of your intentions so they may plan for full coverage from all counties. Portable and mobile operation is encouraged. □

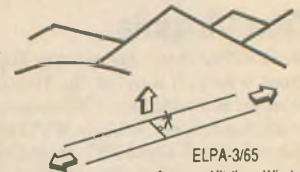


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- U.S. Patents: 4,809,010 5,829,310 4,743,917 4,839,661 4,825,224 4,750,001.
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Information in "New Products" is supplied by the manufacturers to acquaint Worldradio readers with new products on the market.

Icom HF transceiver

At the Dayton Hamvention, Icom America introduced the new IC-728 HF all-band transceiver with high performance features previously available only on higher priced models. List priced under \$1,100, the IC-728 provides advanced operators, DXers and Novices alike with features they may not have been able to afford previously, such as triple conversion, tunable memories, receiver passband tuning, and a 100W transmitter with speech compressor.

The IC-728 all mode transceiver with a general coverage receiver is packed with more of the features hams purchase a radio for—to hear and be heard.



The IC-728 is the only rig in its class to have *triple conversion* for improved incoming signal quality and better interference suppression. *Passband tuning* dramatically improves an operator's ability to capture signals they might have missed otherwise. Even in crowded band conditions, simply push the PBT button to narrow the IF passband width, cutting out nearby signals and zeroing in on the one desired. A *speech compressor* effectively increases the transmitter output signal strength, giving the extra punch needed to cut through heavy traffic.

Direct digital synthesis, originated by Icom, is a microprocessor-boosted tuning circuit that provides the channel selected instantly. DDS also improves carrier-to-noise ratio by blocking interference, and gives the fast switching times needed for packet radio. A *noise blanker* reduces pulse-type noise interferences instantly. *Band stacking register* automatically snaps the operator back to the last frequency and mode he was using. This is ideal for contesting and multibanders.

The ideal mobile or Field Day rig, the IC-728 is compact and lightweight with an LCD display which is easy to read in almost any condition. Other features include 26

memory channels, three types of scanning, plug-in CW filters, and great Icom service. The optional new AT-160 antenna tuner can be "built on" to the IC-728 for optimal base station operation.

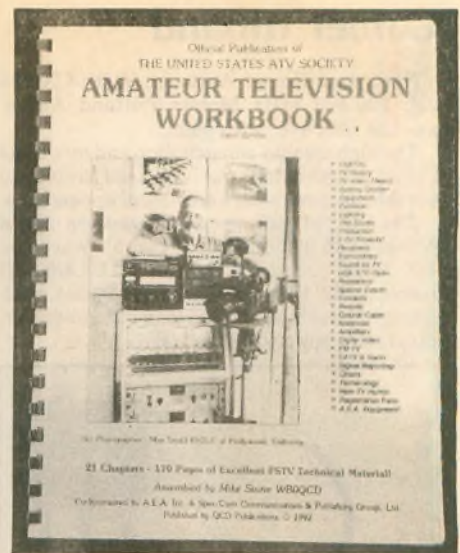
IC-728 HF transceivers are available at Icom dealers now for under \$1,100! Information is available through the Icom brochure hotline: 800/999-9877. □

ATV workbook

Two years in production, a new highly-technical (yet easy to read and understand), updatable Amateur Fast Scan TV book has been released to the electronic hobbyist marketplace. Truly a group effort, this book is authored by 10 well-respected, national ATV authorities: WB0QCD, KA0JAW, KB9EPQ, N2IRZ, K6RFK, KA2CWL, K2MQL, W9NTP, K8OCL and N0IVN, plus DJ6PI from Germany. The book includes everything from the history of early TV, TV signal video theory, how to get started, building projects, repeater and club directories, digital video, cameras, preamps, amplifiers, antennas, coaxial cable, tables and charts, and lots more! *ATV Workbook* is assembled by Mike Stone, WB0QCD.

This impressive, 170-page, 21 chapter manual is certain to become the bookshelf bible for thousands of ATVers now active (or interested in getting active) in UHF visual-image TV and audio communications! ATV is one of the hottest growing modes today in Amateur Radio!

The manual is available in GBC plastic spiral softbound editions (suggested retail: \$14.95) and 1/2 in. 3-ring notebook hardbound editions (suggested retail: \$18.95). Advanced



Electronic Applications of Lynnwood, Washington, and Spec-Com Communications in Dubuque, Iowa, are co-sponsors of this well-written manual.

GBC plastic spiral softbound book purchase discount prices (add \$4 per book for three-ring notebook editions): 06-12 \$10.95 each; 13-24 \$10.50 each; 25-36 \$9.95 each; 37-48 \$9.50 each; 49-60 \$8.95 each; 61-72 \$8.50 each; 73-84 \$7.95 each; 85-96 \$7.50 each. For larger quantity orders and prices, call us. Payment must accompany order or payable at time of delivery. CODs accepted. Master Card or Visa payment is available (5% added). Contact Spec-Com Bookstore, P.O. Box 1002, Dubuque, IA 52004-1002; 319/557-8971. □

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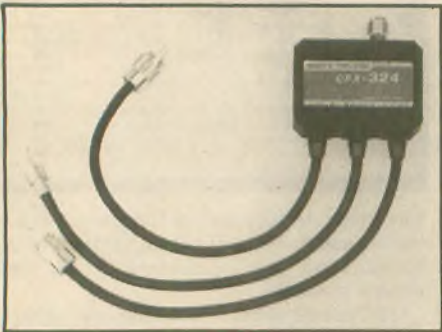


Comet triband

New, from Comet Antenna, is the CX-224 2M, 220/440 MHz Mobile TriBand Antenna—the first ever with gain.

The high-quality construction and materials Comet is known for have been used to create a durable antenna with exceptional appearance.

The CX-224 radiates a half-wave on 2M, a 5/8-wave on 220 MHz, and two 5/8-waves on 440 MHz, producing gain of 2.15/3.6/6.0dB respectively. Overall length is 37 inches, with a hinged base to allow the element to fold over. Maximum power input is 100W.



Two models are available: The CX-224 has a PL-259 connector; the CX-224NMO has an NMO connector. Triplexers are also available: CFX-324A, all UHF connectors with coax leads; CFX-324B, all UHF connectors without coax leads.

Comet was the first company ever to develop a VHF/UHF triband antenna, and they continue to advance communication technology with the new CX-224. Antennas and triplexers are now available from most Amateur Radio dealers, along with a wide variety of trunk-lip, hatchback, magnetic and rain gutter mounts for easy, no-holes-to-drill installations.

It is easy to create a modern high performance amateur station with Comet antenna products. Contact your favorite dealer or NCG Company for a dealer near you: 800/962-2611. □

MFJ Pocket Roll-up J

MFJ Enterprises, Inc., announces the new MFJ-1730 Pocket Roll-up "J" 2M antenna for \$14.95.

MFJ's new 1730 2M half-wave vertical J antenna is terrific for traveling, vacationing,



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and motel use when attending hamfests. You can roll up this half-wave 2M gain antenna, stick it in your pocket, and go! Using the MFJ-1730 is a cinch: Just hang it in a convenient spot, plug the handy BNC connector into your hand-held, and enjoy base station performance almost anywhere!

The MFJ-1730 Roll-up antenna really adds big-time performance to your hand-held. It is omni-directional and does not need an

awkward groundplane. It works indoors and outdoors and with all 2M hand-helds, with good gain characteristics and classic half-wave "J" design.

It comes with MFJ's full year unconditional guarantee. For more information or to order, contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762; 601/323-5869; FAX 601/323-6551; or order toll-free at 800/647-1800. □

Book review: Aerials

R.P. HAVILAND, W4MB

The following is a review of Kurt N. Sterba's Aerials, Volume I.

For the radio newcomer, HF broadcasting antennas can get large. One form uses arrays, typically six or eight dipoles in a line, with four lines stacked vertically, forming a "curtain." These are sometimes known by the method of feeding the dipoles, an example being the Sterba Curtain. Ergo a useful name for an author who wants to be really free.

The avowed purpose of the series of column reprints which form this first volume of *Aerials* is "puncturing the balloon of antenna mythology." Or maybe there are three balloons: on-the-air myths, manufacturers' phony claims, and books and articles by peo-

ple who should know better.

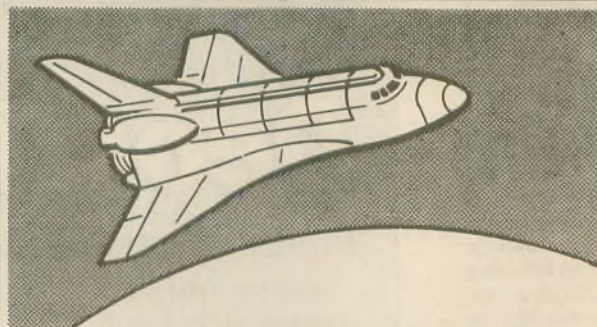
The author takes up this task with enthusiasm and humor, as well as occasional doses of general sarcasm and well aimed barbs—with, I should add, considerable skill at bringing complex technical matters to their simplest terms. His XYL and replacement columnist has the same goals but depends on more subtle persuasion.

The publisher puts it that the book is sold only for its entertainment or amusement value. But it's more than that. It's also a good course in how to look at complex problems simply.

A warning, though: The deflatory propensity could be catching, to the point you find why the author uses a pseudonym!

W4MB has been a guest antenna lecturer at the Dayton Hamvention many times. *Aerials* can be ordered through Worldradio, P.O. Box 189490, Sacramento, CA 95818. □

AMATEUR TELEVISION



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Many ATV repeaters and individuals are retransmitting Space Shuttle Video & Audio from their TVRO's tuned to Satcom F2-R transponder 13. Others may be retransmitting weather radar during significant storms. If it is being done in your area on 70 CM - check page 413 in the 91-92 ARRL Repeater Directory or call us, ATV repeaters are springing up all over - all you need is one of the TVC-4G ATV 420-450 MHz downconverters, add any TV set to ch 2, 3 or 4 and a 70 CM antenna. We also have downconverters and antennas for the 900 (33CM) & 1200 MHz (23CM) bands. In fact we are your one stop for all your ATV needs and info. Hams, call for our complete ATV catalog - antennas, transceivers, transmitters, amplifiers, etc. We ship most items within 24 hours after you call.

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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																									
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VE exam schedules

As a service to our readers, Worldradio presents a feature listing those VE exams, times and locations which are sent to us. Please remember that our deadline for publication is three months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid June.

Worldradio, 2120 28th St., Sacramento, CA 95818.

Please mark the envelope "VE Exams."

List the location, any information examinees should have (advance registration, etc.) and the name and telephone number of a person to contact for further information.

p/r=pre-register

w/i=walk-in

Date	City	Contact	Notes	Date	City	Contact	Notes
Alabama				Illinois			
Sept. 19	Tuscaloosa	Kelly Bruce, WD4DAT 205/339-7882	w/i OK	Sept. 15	Aurora	N9AKE 708/892-1252	w/i pref
Arizona				Sept. 12	Bloomington	NX9M 309/662-3910	w/i OK
Sept. 5	Tucson	K7OPX 602/886-7217	w/i only	Sept. 19	Bolingbrook	NM9J 708/442-7100	
Sept. 19	Tucson	Robert Olson, WV7P 602/577-1050	w/i OK	Sept. 19	Chicago	312/929-8500, ext. 2221	w/i
Arkansas				Sept. 26	Chicago	KE9X 312/233-0605	w/i
Sept. 19	Little Rock	Chuck, KI5HA 501/888-7517	w/i OK	Sept. 4	Elgin	K9WMP 708/888-8333	w/i
Sept. 12	West Memphis	Gene Bagley, AB5BL 501/739-4029	w/i OK	Sept. 18	Elmhurst	WK9U 708/833-7371	p/r
California				Sept. 19	Godfrey	KF9F 618/466-2306	p/r no-code
Sept. 5	Burbank	KE6AR 818/349-0927	w/i OK	Sept. 5	Hoffman Estates	NO9A 708/593-8658	w/i
Sept. 26	Fairfield	Jerry 916/662-0801	w/i only	Sept. 12	Joliet	Bob Stevens, WR9M 708/739-6015	w/i OK
Sept. 1	Fremont	KJ6EP 510/791-6818	w/i only	Sept. 24	Lombard	KD9I 708/495-0498	w/i
Sept. 12	Hemet	714/925-3502		Sept. 19	Loves Park	Paul, WB9HGZ 815/987-6754	p/r; w/i
Sept. 12	Hesperia	NF6I 619/241-4732; K6BET 619/244-6080	w/i OK	Sept. 12	Mt. Prospect	WA9DLI 708/437-1464	w/i
Sept. 7	Lancaster	805/948-1865	p/r	Sept. 3	Mundelein	K9IW 708/367-6303	w/i
Sept. 13	Loma Linda	714/825-5341		Sept. 12	Oak Forest	KA9HDN 312/247-0650	w/i OK
Sept. 24	Long Beach	KA6HOQ 714/897-6331	w/i OK	Sept. 26	Oak Forest	WG9R 708/687-0511	w/i
Sept. 5	Los Angeles	Ali Hassan, AA6WC 213/778-6226	w/i OK	Sept. 6	Paris	WO8X 217/463-2213	p/r; w/i
Sept. 12	Modesto	W6XX 209/883-2968	w/i	Indiana			
Sept. 5	Northridge	818/348-4457	w/i OK	Sept. 12	Hammond	WO9H 219/738-2728	w/i
Sept. 12	Novato	Nels, N6AQY 415/897-8950	w/i OK	Sept. 5	Portage	KE9I 219/762-0580	w/i
Sept. 5	Ontario	Harry J. Kozlowski, KM6LO 818/810-0442	w/i OK	Sept. 5	South Bend	NI9Y 219/259-9445	w/i OK
Sept. 19	Rancho Palos Verdes	310/644-2271	w/i OK	Iowa			
Sept. 19	Redwood City	Dudley, WB6WAU 408/245-4801	w/i only	Sept. 20	Des Moines	NA0R 515/964-0900 or 515/967-3890	w/i
Sept. 5	Riverside	714/780-2680	p/r 7 days prior; w/i space permitting	Sept. 18	Sioux City	NF0N 402/494-6070	w/i OK
Sept. 12	San Pedro	N6DYZ 213/325-2965	w/i OK	Kansas			
Sept. 19	Santa Clarita	818/884-8030	w/i OK	Sept. 29	Emporia	K0JDB 913/343-2158	w/i OK
Sept. 19	Santa Maria	805/929-3710	w/i OK	Sept. 2	Great Bend	WA0PSF 316/792-5363	p/r pref.; w/i limited
Sept. 19	Signal Hill	NN6Q 310/420-9480	p/r pref; w/i	Sept. 25	Kansas City	NC0M 913/262-0631	w/i OK
Sept. 19	Stockton	Ed, N6XMA 209/952-5996	w/i only	Maine			
Sept. 5	Visalia	209/734-9516	w/i OK	Sept. 5	Auburn	WM1C 207/583-6187	w/i OK
Sept. 19	Westminster	Walt, KM6MQ 714/373-6077	w/i only	Sept. 30	Newcastle	KA1DAX 207/563-8512	w/i OK
Sept. 12	Willits	Don, WA6ACX 707/459-3980	w/i only	Sept. 23	South Paris	KA1REB 207/583-6915	w/i OK
Colorado				Maryland			
Sept. 27	Boulder	Barbara, N0BWS 303/530-2903	p/r pref; w/i OK	Sept. 12	Davidsonville	NT3Z or NS3V 410/761-7115; or WC3I 301/262-5083	w/i OK
Sept. 12	Denver	Glenn Schultz, W0IJR 303/360-7293, 24-hr. voicemail	w/i OK	Sept. 19	Laurel	WB3GXW 301/572-5124	p/r pref
Sept. 19	Westminster	N0BLU 303/650-6826; N0HNR 303/278-4280	p/r or w/i	Sept. 12	Salisbury	KB3MT 302/436-8360	w/i
Connecticut				Sept. 25	Springfield/Holyoke	WA1ZUH 413/245-3228	w/i OK
Sept. 27	Milford	NB1M 203/933-5125; WAIYQE 203/874-1014	w/i	Michigan			
Sept. 23	Shelton	WJ1T 203/736-0488	w/i pref	Sept. 12	Dearborn	313/676-6248	
Florida				Minnesota			
Sept. 14	Dunedin	Marv, WC2G 813/938-7810	p/r or w/i	Sept. 15	Eden Prairie	Tom, AA0GP 612/448-2074	w/i
Sept. 22	Fort Pierce	Fred Newmann, W2EUX 407/340-1069	w/i OK	Missouri			
Sept. 19	Melbourne	WB9IVR 407/724-6183	w/i OK	Sept. 5	Hillsboro	WD0GDY 314/671-4243	p/r only
Sept. 27	Miami	Norm Ward, K4RBR 305/823-5437	w/i only	Sept. 12	Independence	K0LXC 816/373-8976	w/i OK
Georgia				Sept. 5	Kimberling City	NQ0G 417/739-2888	w/i OK
Sept. 27	Atlanta	Dale Gaudier, N4REE 404/396-1332	w/i OK	Sept. 12	Sullivan	N0GLN 314/764-2777	p/r only
Sept. 12	Augusta	Jim Abercrombie, N4JA 404/790-7802	w/i	Montana			
Idaho				Sept. 19	Billings	WB7H 406/656-6987	w/i OK
Sept. 12	Boise	W7JMH 208/343-9153	w/i	Nevada			
80 WORLD RADIO, August 1992				Sept. 19	Minden	W7QO 702/265-3430	w/i
				New Jersey			
				Sept. 19	Bayonne	WA2QYX 201/451-9471	w/i OK
				Sept. 17	Bellmawr	WA2VQG 609/546-7710	w/i
				Sept. 12	Cranford	24-hr hotline: 201/377-4790	
				Sept. 9	Fort Monmouth	WB2GYS 908/532-5354	w/i
				Sept. 19	Pennington	AA2F 609/737-1723	p/r pref; w/i OK
				New Mexico			
				Sept. 5	Alamogordo	WA5IPS 505/437-5896	w/i

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Date	City	Contact	Notes	Date	City	Contact	Notes
New York				Sept. 19	Sumter	Dan Mask, WB5SGH 803/775-9106	w/i
Sept. 12	Greenvale	WA2BGE 516/921-0085	w/i OK	South Dakota			
Sept. 17	Lower Westchester Co.	WK6R 914/834-2322	w/i OK	Sept. 11	Rapid City	NU0F 605/348-6564	p/r 30 days prior; w/i OK
Sept. 26	Potsdam	Dave, K2LMG 315/265-3491	w/i	Tennessee			
Sept. 6	Yonkers	AC2V 914/237-5589	w/i OK	Sept. 25	Carter County	Joe Hopkins, K4BKI 615/543-4022	w/i
North Carolina				Sept. 7	Chattanooga	Alan Painter, WA4QCH 404/866-1200	w/i
Sept. 13	Hendersonville	W2YTO 704/891-4359	p/r pref; w/i OK	Sept. 26	Greeneville	Jack Creed, K4EPC 615/638-7056	w/i OK
Sept. 12	Leicester	Larry, WB4PLA 704/683-1400	w/i OK	Sept. 13	Jasper	Charles Wooten, KD4XX 615/942-5116	p/r pref
Sept. 13	Salisbury	Isabelle, AB4UX 704/284-2414	w/i OK	Sept. 19	Knoxville	Ray Adams, N4BAQ 615/688-7771	w/i OK
Ohio				Sept. 14	McMinn County	Evan Ray, WA4PN1 615/263-9300	w/i OK
Sept. 5	Cincinnati	Herb, WA8PBW 513/891-7556	p/r pref; w/i OK	Sept. 12	Morgan County	Paul Seavers, AA4UP 615/435-0080	w/i OK
Sept. 17	Youngstown	Lou 216/788-1618	w/i limited	Sept. 3	Morristown	Roy Zeigler, KF4CB 615/586-3491	w/i OK
Oregon				Texas			
Sept. 9	Glide	AA7GC 503/672-7564; W6OFF 503/673-0558	w/i OK	Sept. 8	Houston	ND5F 713/464-9044	p/r pref; w/i OK
Sept. 12	Klamath Falls	KB7DWX 503/882-1300; NN7K 503/883-2472	w/i OK	Sept. 12	Houston	Jim, KB5WAM 713/486-2032	w/i OK
Pennsylvania				Sept. 19	Irving	Hall Bond, K5ZSB 214/255-1077	w/i OK
Sept. 5	Erie	W3CG 814/665-9124	w/i	Sept. 12	McGregor	AB5BA 817/859-5374	w/i OK
Sept. 19	McKeesport	KQ3W 413/466-5204	p/r 2 days prior	Sept. 12	Midland	KT5G 915/694-9450	w/i OK
Sept. 3	Philadelphia	ND3Q 215/482-0386 or 215/879-0505	w/i	Sept. 26	San Antonio	K5JWK 512/657-1549	w/i
Sept. 30	Warminster	WA3TQJ 215/343-3494		Vermont			
Rhode Island				Sept. 19	Berlin	WB1AJG 802/433-6172	p/r pref.; w/i OK
Sept. 10	Providence	NN1U 401/231-9156 or 401/454-6848	w/i OK	Virginia			
Sept. 26	Slatersville	W1YRC 401/333-2129 or 401/333-2373	w/i OK	Sept. 20	Virginia Beach	Ed, W4RTZ 804/898-8031	w/i OK
South Carolina				Wisconsin			
Sept. 19	Charleston	Pat Foster, AC4IH 803/553-3871	w/i	Sept. 5	Racine	NW9P 414/658-8390	w/i
Sept. 12	Greenville	John E. Chism, ND4N 803/288-0136	w/i OK				

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