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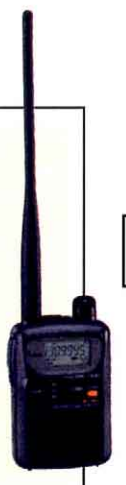

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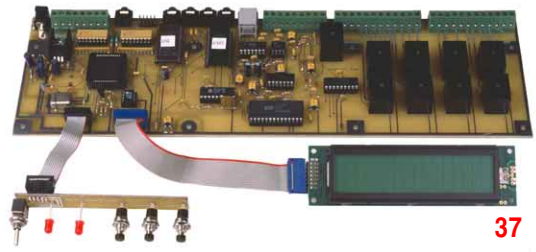

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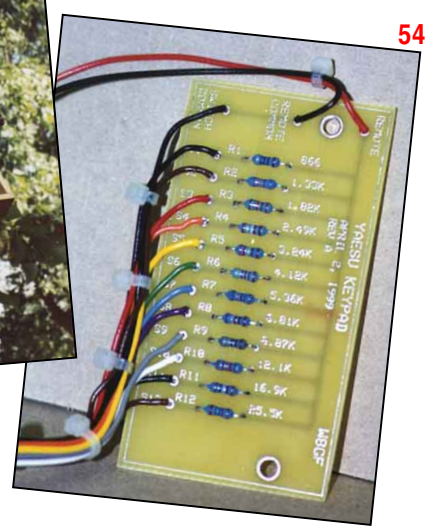

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Departments

Our Cover

Joel Thurtell, K8PSV, captured this photo of a very special Collins 75A-4 receiver. Read the story of this classic radio, and the remarkable "mystery man" who built it *by hand*, in this month's *QST*.

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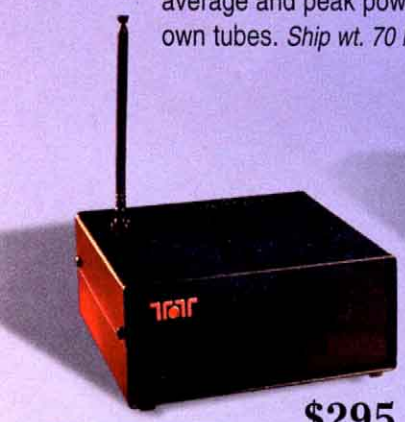

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"IT SEEMS TO US..."

Reasonable Accommodation

Amateur station. A station in an amateur radio service consisting of the apparatus necessary for carrying on radiocommunications.—*FCC Rules, §97.3(a)(5)*

As anyone who is familiar with radio knows, an antenna is "necessary apparatus." An antenna is essential for both radio reception and transmission. A radio without an antenna is as useless as a car without wheels, as pointless as having a boat with no way to get it into the water.

The Communications Act requires that radio stations be licensed, authorizes the FCC to grant such licenses, and requires that the FCC "generally encourage the larger and more effective use of radio in the public interest." It only stands to reason that the FCC must have an interest in ensuring that the stations it licenses include antennas that are appropriate for the services they are expected to provide. In the case of the Amateur Radio Service, that interest was formally expressed in 1985 by means of an FCC declaration of limited preemption of state and local regulation commonly known as "PRB-1."

PRB-1 has assisted many amateurs, including the undersigned, in their negotiations with local land use authorities. It is an enormous help, but is not a panacea. Some courts have misinterpreted PRB-1. Some local authorities have tried various ways to thwart its clear intent. A large and growing group of radio amateurs is beyond the pale of its protection: those who must live in areas with restrictive covenants.

Based on more than a decade of experience with PRB-1, in 1996 the ARRL requested some clarifications and fine-tuning of the FCC's preemption policy. Nearly four years later, in November 1999, the Commission finally got around to saying no—that PRB-1 is fine just the way it is.

In one major respect, we agree that PRB-1 couldn't be clearer. In our clarification request we had asked that the FCC emphasize that the local authority must not engage in a balancing of its interests against those of the federal licensee. Our reason for making this request was not that the FCC itself had been unclear or ambiguous the first time. Rather, it was that some federal courts have misinterpreted PRB-1 and have held that it is sufficient if local authorities engage in such a balancing of interests. The correct conclusion was reached in a 1994 case, *Pentel v. City of Mendota Heights, Minnesota*, in which the 8th Circuit U.S. Court of Appeals held that the FCC had done the balancing itself and that it was the absolute obligation of the municipality to make reasonable accommodation for the amateur communications.

On this point, at least, the FCC's Order dismissing our clarification request offers some assistance. The Order states in part: "We do not believe a clarification is necessary because the PRB-1 decision precisely stated the principle of 'reasonable accommodation.' In PRB-1, the Commission stated: 'Nevertheless, local regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to **accommodate reasonably** amateur communications, and to represent the **minimum practicable regulation** to accomplish the local authority's legitimate purpose.' Given this express Commission language, **it is clear that a 'balancing of interests' approach is not appropriate in this context**." (Emphasis added.)

Coincidentally, a Florida case was at just the right stage to offer an opportunity to use this new tool. ARRL member Lenard J. Persin, WB4HZQ, applied to the Seminole County Board of Adjustment for a special exception to a 35-foot height limitation so he could erect an 80-foot tower on a treed, 7/8-acre residential lot. Initially his request was granted, but a neighbor appealed and on appeal his application was denied. He then sought relief in the U.S. District Court for the Middle District of Florida. ARRL Volunteer Counsel Eric Ludin, N2EL, handled the case; ARRL submitted a brief *amicus curiae* prepared by General Counsel Chris Imlay, W3KD.

To make a long story short, on November 2, 1999, the Court granted summary judgment in favor of the County "because the undisputed evidence shows that the County properly balanced Mr. Persin's interests with the needs of the community." As it happens, this is precisely the erroneous "balancing of interests" approach that the FCC said "is not appropriate in this context." Thus, an appeal of the Court's decision offers an extremely timely opportunity not only to correct this particular decision, but to use the FCC's "non-clarification" to extend the earlier favorable decision in Pentel to another part of the country. At its December 4 meeting, the ARRL Executive Committee voted to authorize funding of the appeal.

In two other important respects, PRB-1 does require extension or clarification.

One has already been mentioned: recognition that the FCC's interest in effective amateur communication extends to those amateurs who must live in homes that are subject to restrictive covenants. In 1985 the FCC went out of its way to exclude these amateurs from PRB-1 protection because it believed it did not have any jurisdiction to preempt private land use regulations. Since that time, however, it has become clear that the FCC does have such jurisdiction if necessary to further an important federal interest.

The second is that some local land use regulations or authorities impose unreasonable costs, either in the form of excessive fees or overly burdensome requirements for screening or other mitigation of the visual impact of an antenna. Guidelines have been developed to control such costs in other services and should also be available to the Amateur Radio Service.

On each of these two points, the ARRL is seeking reconsideration of the Commission's denial.

PRB-1 is a good tool. All we are asking is that what has been learned since 1985 be used to make it even better.—*David Sumner, K1ZZ* QST

We're At Your Service

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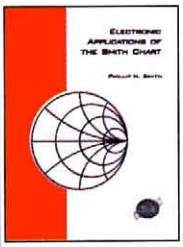

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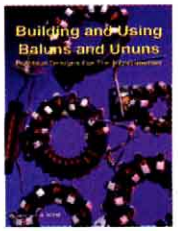

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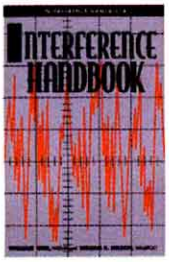

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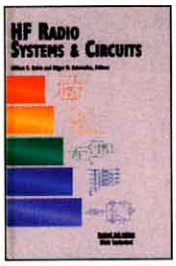

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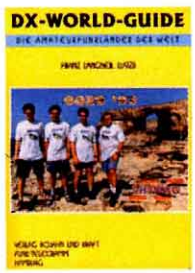

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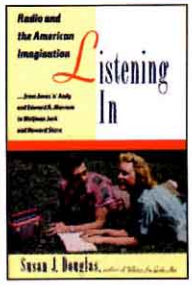

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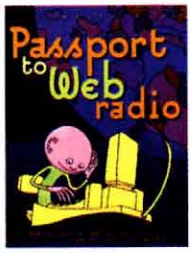

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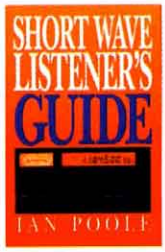

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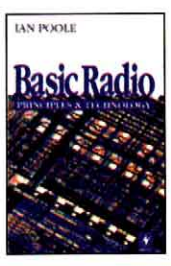

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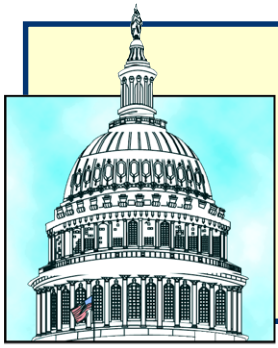

DC Currents

By Steve Mansfield, N1MZA
Manager, Legislative and Public Affairs

Just as radio waves aren't constrained by artificial boundaries, neither is ARRL's government relations effort. "DC Currents" covers behind-the-scenes activity you need to know about in Congress, at the FCC and other regulatory agencies, as well as at worldwide bodies such as the International Telecommunication Union.

HR.783 Senate Companion Bill in the Pipeline

As Congress shrugged off the New Year celebration and returned to the grind, there was little visible forward motion on the cosponsor list for HR.783, the Amateur Radio Spectrum Protection Act, but work continues behind the scenes. (See page 16, January 2000 *QST* for a reasonably up-to-date co-sponsor list.) The ARRL continues to visit offices on the House side and is currently working with a member of the Senate on the introduction of a Senate companion bill, which we hope to be able to announce shortly. We have been harping to you about the Senate bill for quite awhile now, but the long year-end legislative break put a damper on our efforts to bring it to fruition. We're assured that the bill is "in the pipeline." Watch this space for more news.

Back on the other side of The Hill, if HR.783 is to reach the floor of the House before the anticipated October 2000 adjournment, it will need to be approved by the House Telecommunications Subcommittee and the full House Commerce Committee. According to insiders, that may not be a simple task due to the large work load of both the subcommittee and the full committee, as well as some apparent disagreement among committee leadership as to how much of the agenda for the remainder of the session will consist of telecommunications matters. Telecommunications Subcommittee Chairman Billy Tauzin (R-LA-3rd) is said to have a more ambitious agenda for telecommunications legislation than that of Commerce Committee Chairman Thomas Blilely (R-VA-7th). Some we've spoken to say the impasse has the makings of a deadlock. Others are more optimistic.

ARRL members are encouraged to write to their members of Congress regarding cosponsorship of HR.783, and particularly those who live in Congressman Tauzin's or Congressman Blilely's districts. You can check current cosponsors from a link found on the ARRL Web site at **http://www.arrl.org/govrelations/hr783.html**. Your own Congressman's mailing address may be found at **http://www.house.gov/writerep/**.

Maine Hams Help Build Support for Senate Spectrum Bill

● ARRL members in Maine took the initiative with one of their own Senators in support of our efforts to get a Senate companion bill to HR.783. One ham family, Roberta ("Bobbie") and Tom Donohue (W1JX and W1QU respectively) of Ellsworth, invited US Senator Susan Collins to visit their Amateur Radio station the next time she was back from Washington. Senator Collins accepted their written invitation and dropped by the Donohue home early in December. Tom and Bobbie report that the Senator's visit lasted about 20 minutes.

"We began with a basic overview of what an Amateur Radio station is and how it functions," Tom says. "We emphasized the volunteer service aspects such as emergency communications and the national traffic system. The Senator seemed to be familiar with our long history of support to such activities and their importance, but she seemed to be taken aback and genuinely impressed with how high tech our activities can be and how valuable amateur radio research, experimentation and development activities have been over the years."

Tom reports that Bobbie also chatted with the Senator about her relatively recent introduction to Amateur Radio (about three years ago) and her participation in the YLRL, NTS, Women Radio Operators of New England (WRONE) net and similar activities.

To provide a first-hand illustration of how hams in Maine provide emergency communication and other volunteer services and the benefits of these activities to the state, the Donohues had prearranged a 2-meter repeater QSO with Max Soucia, N1KGS, the Maine Section Emergency Coordinator.

"This clearly was one of the highlights of Senator Collins' visit," Tom reports. "She seemed to enjoy operating a small H-T, and asked pertinent questions during her dialogue with Max. During the QSO, Max effectively covered the range of services ham operators provide. We advertised the fact that we were going to have such a QSO in advance so hams throughout the state were able to listen in and participate."

Bobbie Donohue, W1JX (left) and Senator Susan Collins (right) pose for a photo during the Senator's visit to the Donahue home.

Near the end of the Senator's visit, the Donohues got the chance to make their case about the need for spectrum legislation. Senator Collins indicated she'd take an active role in its cosponsorship. Tom provided the Senator with a prepared package, containing a copy of HR.783 and the backgrounder taken from the ARRL Web site.

"My impression is that everything went well," Tom says. "Amateur Radio has gained a valuable ally in terms of future support for amateur radio activities in the US Senate and in our collective efforts to protect Amateur Radio use of the frequency spectrum through appropriate legislation."

If You Decide You Want to Become Involved…

♦ If you decide to contact your Senator or Representative on behalf of Amateur Radio, here are a few simple "rules" to keep in mind:

When writing

Remember that letters have a visible, tangible presence that other forms of communication generally lack. While e-mail has become vastly more popular on The Hill in recent years, nothing beats paper.

If you decide to write, consider using the sample letter on the ARRL Web page as a starting point (see **http://www.arrl.org/govrelations/hr783.html**). Feel free to modify the letter with local information.

If you decide to draft your own letter, be succinct, jargon free, polite and use local examples. Before you commit it to the mail, edit your letter one more time to weed out any lingering negative phrases, threats or ultimatums. Members of Congress are criticized so often they've already heard any such insights you might have to offer.

Keep a sense of perspective. Remember that Amateur Radio is a very specialized topic compared to some of the massive issues Congress regularly deals with, like health care, national defense and taxes.

Expect to wait a long time for your answer. Congressional offices receive hundreds, sometimes thousands of letters a week on hundreds of topics.

When telephoning

Unless the elected official knows you personally, you will always be referred to a staff member. Ask for the aide who handles telecommunications issues.

When you are connected to the appropriate person, identify yourself, note that you are a constituent, and give a brief message on the issue. For example: "Please tell Senator/Representative (name) that I support HR.783 (or the Senate bill, when it has a number)."

State your reasons for support, from a local point of view if possible. Try to keep your call under three minutes. These are busy people.

While the staff member may simply make a note of your concerns, it is also possible that he or she might question you closely. If so, maintain your composure (especially if contradicted). Remember that they are only doing their jobs.

For A Face-to-Face Visit

Politicians are gregarious by nature. They actively seek out opportunities to meet and talk with the people they represent. Many elected officials actively seek to talk with large groups, which may be an added attraction for Amateur Radio clubs with large memberships. Addresses and phone numbers for your Senator and Representative may be found at **http://congress.nw.dc.us/c-span/search.html**.

If you plan an office visit, it's likely that you'll meet with a staff member. If you meet with your elected representative, it's likely to be brief, so prepare a one minute "pitch" to ensure that your story gets told, and don't be offended if the representative cuts the meeting short. Always call ahead for an appointment—and be patient. Being overscheduled is a chronic condition in Washington. Although they may be late in arriving, or early in leaving the meeting, you must be on time and available until the very end.

If you want to set up a district meeting, plan ahead. Know who's going to do the talking, what your key points are going to be, and what you expect from your elected official. Will there be a speech? A radio demonstration? A question-and-answer session? Schedule well in advance, and make sure that the representative knows what the topics will be and approximately how many people he or she will be meeting. It is possible that a staff member will contact you for background information before the meeting. To set up a district meeting, call the district office or the appointments secretary first.

Regardless of whether you want a personal meeting in the elected official's Washington office, or a presentation at next month's club meeting, be prepared and know the issues backward and forward. Print some succinct summaries to leave behind for the elected representative or staff member's use.

Broadband Bill Moves Slowly as More Cosponsors Pile On

♦ The bellwether telecommunications issue in the House of Representatives during the second session may turn out to be "broadband regulation." This is capitolspeak for deregulation of the Internet.

The focus of debate right now is HR.2420, the Internet Freedom and Broadband Deployment Act of 1999. This bill, introduced by House Telecommunications Subcommittee Chairman Tauzin and a long list of cosponsors headed by Representative John Dingell, (D-MI-16th) Ranking Minority Member of the Commerce Committee, would essentially deregulate high speed data and internet access services and clarify the rules under which Internet service providers and phone companies can interconnect. Some members of the subcommittee have felt that the bill is being blocked by Commerce Committee Chairman Bliley, who is said to be anxious to give the 1996 rewrite of the Communications Act a chance to work before making any significant modifications. Indeed, it appears that the more cosponsors the bill gains (it had 144 on a bipartisan basis when we went to press) the slower it goes.

The issue of wireless broadband also appeared to be gaining momentum as the first session of the 106th Congress wound down. Senator Sam Brownback (R-KS) introduced the Third Generation Wireless Internet Act of 1999 that is intended to facilitate the development of new commercial wireless broadband internet services. The fear among manufacturers and service providers has been that, if they invest heavily in the development of so-called 3G devices, they may be unable to secure sufficient spectrum to make the devices commercially viable. Under current FCC rules, commercial mobile service providers can't use more than 45 MHz of combined cellular, broadband PCS and SMRS spectrum within a given geographical area. The Brownback bill, S.1923, would prevent the FCC from imposing these "spectrum aggregation limits" to spectrum assigned by auction after 1999.

Media Hits

- ARRL Past Director Rush Drake, W7RM, was shown at the base of his 72-foot tower in an article in the Vancouver, Washington *Columbian*. He also owns several other towers, including a 175 footer. The article noted that Drake, who lives in La Center, a suburb of Vancouver, gets along well with his neighbors because he goes out of his way to help them.
- *The Colby* (Kansas) *Free Press* reported on local participation in the joint National Weather Service/American Radio Relay League operating event that took place November 27. The article quoted Scott Mentzer, KB0WPY, of the NWS concerning a tornado that struck Colby in 1996: "The first reports we received came from Amateur Radio operators."
- "Popularity of Ham Radio is on a Comeback Here," proclaimed the headline on an article in the *Fayette Neighbor*, of Marietta, Georgia. The article quoted Ed Ferguson, N4YTR, county ARES coordinator, who urged non-active hams to get involved in SKYWARN, and invited nonhams to licensing classes.
- The *Chicago Tribune* reported that hams were standing by if the Y2K bug disabled telephone lines. The article quoted the emergency coordinator for the Illinois State Police and the director of the Illinois Emergency Management Office as stressing the importance of Amateur Radio to emergency preparedness efforts.
- Jay Bookwalter, KC8GNL and Paul Picking, WD8OJL were shown working the network control center in *The News Journal* of Mansfield, Ohio. The effort was part of a storm scenario to test MedCentral/Mansfield Hospital's disaster coping skills.
- Frank Shaw, KN4QG and Dan Bigio, AD4ZK, got the opportunity to explain licensing, emergency communication, SAREX and ham radio history in the *Norfolk Compass* section of the Norfolk, Virginia *Virginian Pilot*. The article features excellent photos of Shaw and Bigio in their shacks.

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Eight band AV-640 vertical antenna covers 40, 30, 20, 17, 15, 12, 10 and 6 Meters

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- **No traps**
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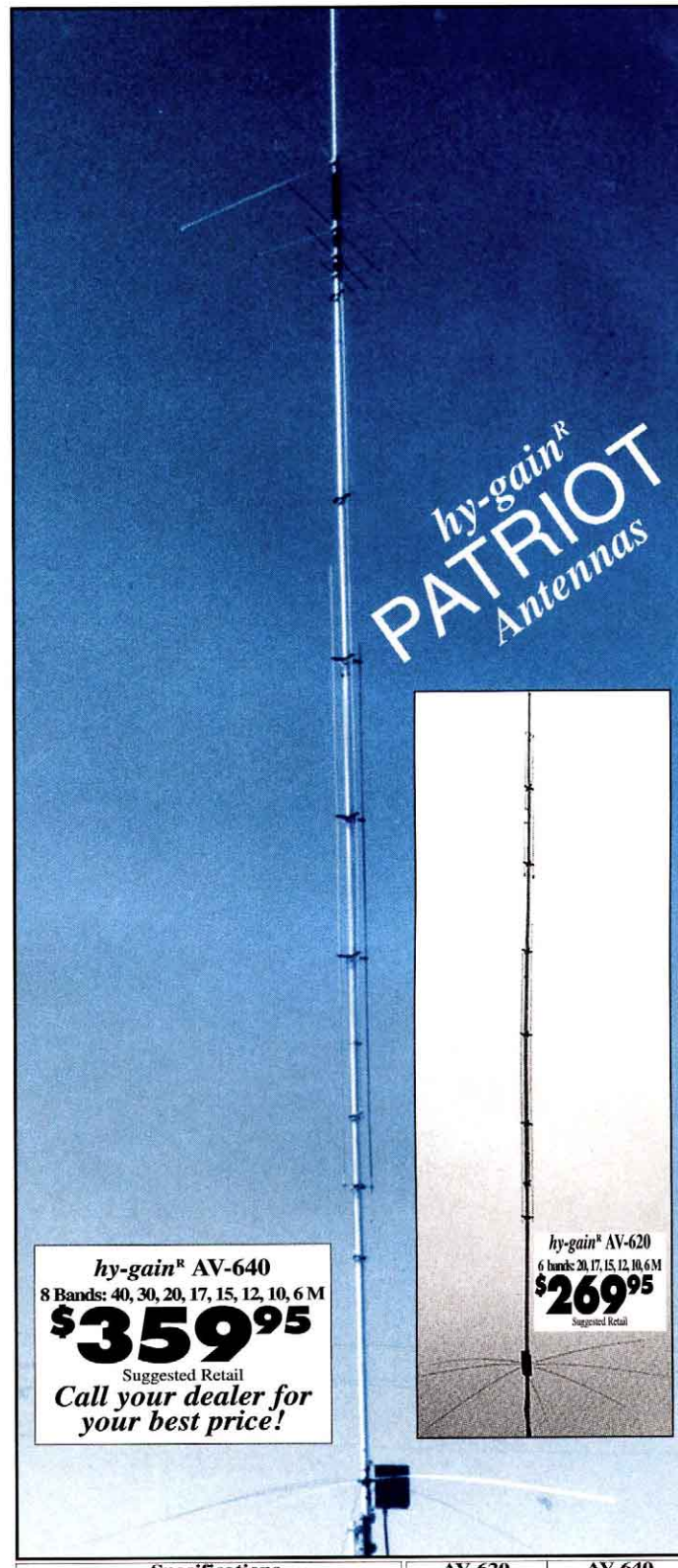
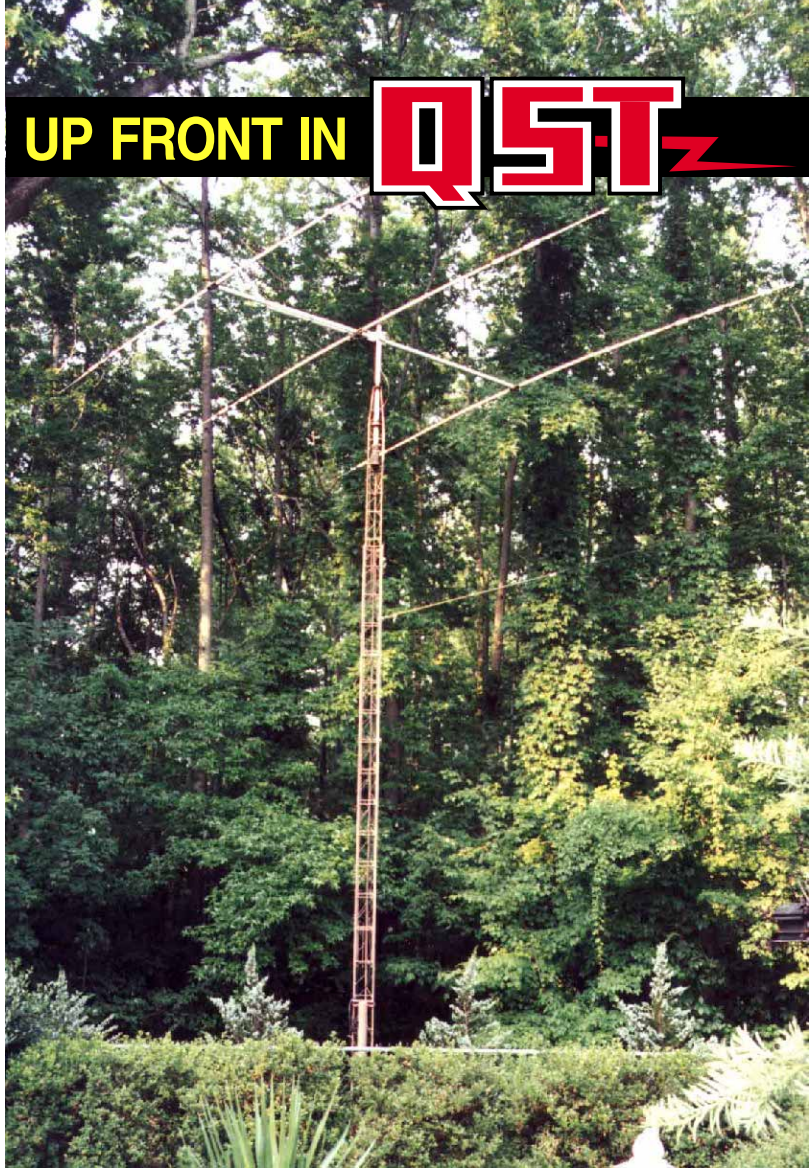


Specifications	AV-620	AV-640
Bands covered (meters)	6,10,12, 15,17,20	6,10,12,15, 17,20,30,40
2:1 VSWR Bandwidth (KHz)		
40M	N/A	150
30M	N/A	175
20M	500	500
17M	500	500
15M	500	500
12M	500	500
10M	1500	1500
6M	2000	1500
VSWR at resonance (typical)	1.5:1	1.5:1
Power handling (watts output) key down 2 minutes	1500	1500
Vertical radiation angle (degrees)	17	17
Horizontal radiation angle (degrees)	360	360
Height (feet)	22.5	25.5
Weight (pounds)	10.5	17.5
Wind surface area (square feet)	2.4	2.5
Wind survival (mph)	80	80

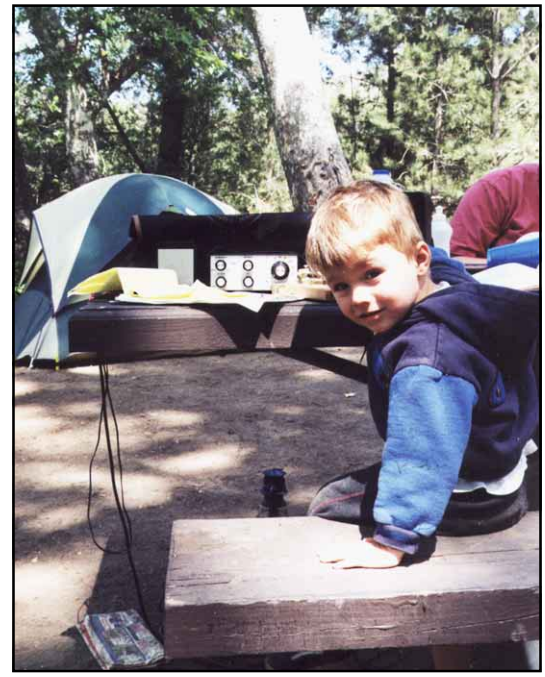
UP FRONT IN QST



CQ microwave. Stefano, son of Sergio, I1KFH, takes the helm of Dad's microwave station during an Italian contest.

Here's an antenna installation that would make any ham "green" with envy. Lush vegetation provides the perfect cover for K4GAW's 40-foot crank-up tower and tri-band beam antenna.

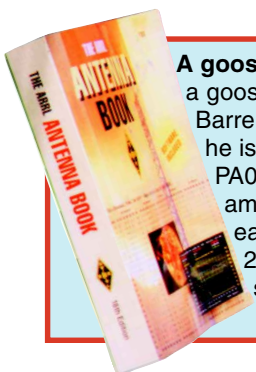
He may not be Billy Joel, but "piano man" Bill, W2BH, performed as a pianist/entertainer aboard the private luxury train *American Orient Express* last summer. Bill says he enjoyed a number of "railmobile" contacts with his H-T as they journeyed across the country. He also carries his H-T when traveling as the Music Director/Conductor for entertainer John Davidson.



QRP is cool! KO6TT's son Chad tried his hand at the key of his father's QRP station at a campsite on Mt Figuroa in California.

KT5RR enjoyed the old Bluejacket, Oklahoma railroad depot so much, he purchased the structure and had it moved three miles to his home! During a painstaking restoration, Ken divided the depot into three rooms: workshop, ham station and storage. The cozy radio room (left) is in the center portion of the building.

And you think *you* don't like doing antenna work in cold weather? The lonely figure on the rooftop is Bruce, N0NHP. He's repairing a random-wire antenna for his monitoring receiver at McMurdo Station, Antarctica. Actually, the weather wasn't all that bad—it was a balmy 0° Fahrenheit.



A goose with good literary taste, not a goose that tastes good! This Cape Barren goose is named Oene, and he is the companion of Joop Mutter, PA0JMV. Joop is a very active amateur in the Netherlands, earning his WAS and DXCC on 2 meters with a moonbounce station consisting of only two Yagi antennas.

Talk about wrapping yourself in the flag! A sudden gust of wind produced an interesting backdrop as the shutter opened for this photo of W0AIH. He was proudly showing off a delicious cookie creation at the W1AW/9 operation at Eau Clair, Wisconsin during the IARU HF World Championship last summer.

Official Observers in Ohio will be assisting the FCC. James Bridgewater (left) of the Federal Communications Commission's Detroit Field Office shakes hands with Joe Phillips, K8QOE, ARRL Ohio Section Manager (right), after they both signed a Memorandum of Understanding between Ohio Official Observers and the FCC Field Office. The Memorandum confirms the relationship between the OOs and the FCC as they work together to clean up the airwaves.

Last October Princess Elettra Marconi visited the 1903 Marconi Station in Wellfleet, Massachusetts to rededicate the bust of her father on the 125th anniversary of his birth. The Marconi Radio Club operated special-event station W1AA during the celebration.

Perfect pair of plates. Joe, WN9BDN, has had a call sign plate on his truck for some time. His wife Liz decided she wanted a similar plate, and since she wasn't a ham, they settled on "XYL." She often has to explain the significance to nonhams, but Joe's friends understand right away.

FT-50RD
This durable, multi-featured 5 Watt Dual Bander is manufactured to rigid MIL-810 standards. Featuring wideband frequency coverage,* CTCSS/DCS operation, Dual Watch, 112 memory channels, and Digital Voice Storage.

FT-51R
This full-featured 5 Watt Dual-Band Handheld includes dual receive, 120 memory channels (80 if Alphanumeric), Auto Tone Search, Spectra Scope, and V/V, U/U and V/U operation.

VX-1R
The pocket-sized VX-1R is small in size only. Featuring Smart Search,™ DCS/CTCSS, Dual Watch, ARTS,™ wide-band coverage (76–999* MHz plus AM BC). The VX-1R provides 291 memory channels, and puts out ½ Watt (1 Watt w/optional E-DC-15 DC Adapter).

* Cellular Blocked

FT-11R
This compact 2M Handheld features 150 memory channels (75 if Alphanumeric), 10-memory DTMF Autodialer, Automatic Battery Saver (TX/RX), backlit Keypad, and are available in 1.5 Watt and 5 Watt versions.

FT-23/33R
These ultra-compact, 5 Watt VHF FM Handhelds feature rugged die-cast aluminum cases, 10 memory channels, optional CTCSS, and multiple scan modes. The FT-23R (2M) and the FT-33R (222 MHz) are easy to operate, and give outstanding performance.

FT-411E
The affordable FT-411E is compact and durable. This 5 Watt VHF FM Handheld features a die-cast case, 40 memory channels, 10 DTMF memories, built-in VOX, CTCSS, and multiple scan modes.

FT-10/40R
These single-band handhelds are manufactured to MIL STD 810 specifications, featuring either 30 or 99 memories, CTCSS/DCS operation, Dual Watch, and are available in 2.5 Watt or 5 Watt versions, with four keypad options.

VR-500
This miniature Handheld Receiver provides FM, AM, SSB and CW reception on 100 kHz–1300 MHz, with 1091 memory channels, Smart Search,™ versatile Dot Matrix display, Band Scope, and Dual Watch.

VX-5R
Although Yaesu's newest Tri-Band Handheld Transceiver is the world's smallest, it offers the performance of a full-size unit. The VX-5R operates on the 50 MHz, 144 MHz and 430 MHz bands with 5 Watts of power output, along with ultra-wide receive coverage of the VHF and UHF spectrum, plus AM medium- and short-wave broadcast reception. The VX-5R is military rated, so its durable, lightweight design allows you to take it anywhere. It is equally suited to walking through the concrete jungle as it is to forging the raging rivers of a real one. Along with a temperature display, the optional barometer pressure sensor unit gives a read-out of barometric pressure and altitude.

TOUGH GUYS.

When you're small, you get picked on. Isn't that how it goes? Well not in Yaesu territory, because not only do we design compact handhelds for efficiency, but we give these clever little guys plenty of muscle. Yaesu handheld transceivers have earned the bragging rights for being the smallest handhelds with the most durable water resistant casings ever created. And packed inside the brawn are engineering accomplishments in performance that are unmatched in the industry. Our high-tech handheld transceivers provide clean power output on the VHF and UHF bands and offer revolutionary features that allows these tough guys to continually outperform the competition. Learn more about Yaesu products on the web at www.yaesu.com

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FT-8100R
The versatile FT-8100R Dual Band Mobile offers rugged RF design, 50 Watt (VHF)/35 Watt (UHF) power output, 310 memory channels, Dual Receive (VV/UU/VU), Enhanced Smart Search,™ CTCSS Encode, and a TX Time-Out Timer. (ADMS-2E programming software available.)

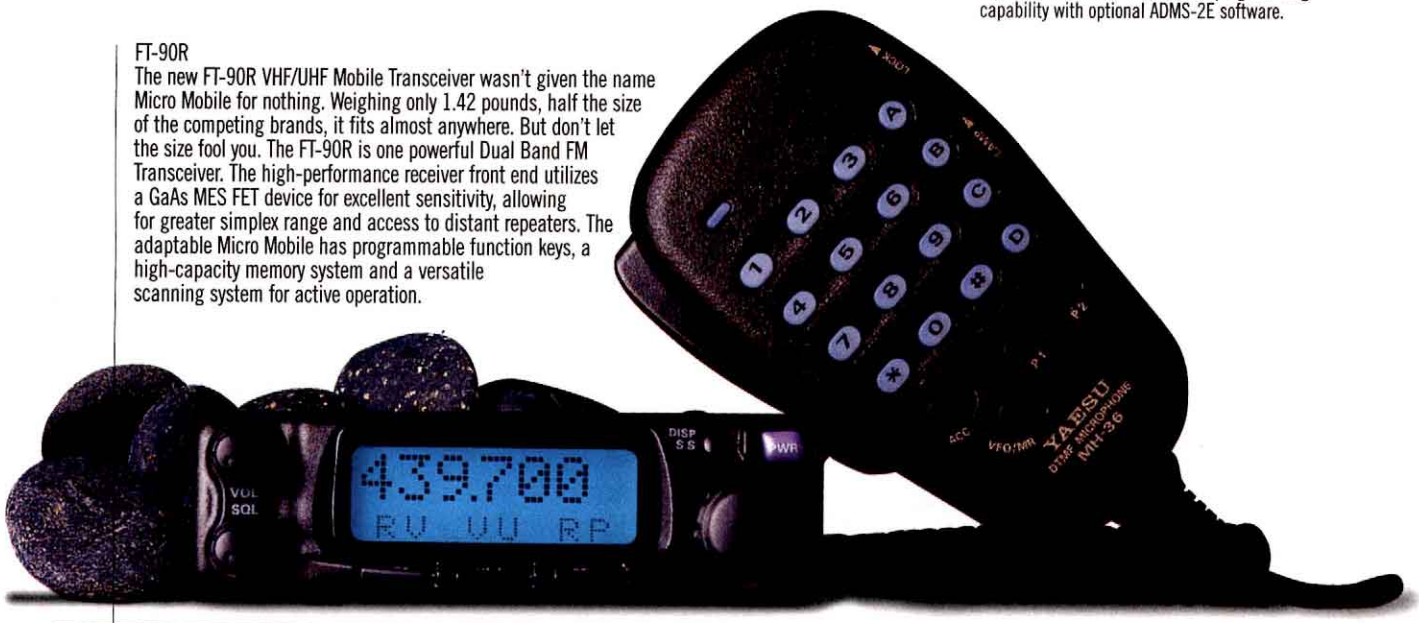
FT-100
This ultra-compact HF/VHF/UHF 100W Transceiver provides SSB, CW, AM, FM and AFSK coverage of the HF, 6M, 2M and 70 CM bands. Features include 300 memory channels, built-in Electronic Memory Keyer, DSP, IF Shift, IF Noise Blanker, and CTCSS/DCS.

FT-3000M
This 70W high-powered 2M FM Mobile provides extended UHF receiver coverage, AM Aircraft RX, and is MIL-STD approved. The FT-3000M features 81 memory channels, Smart Search,™ CTCSS/DCS, optional ADMS-2E programming software, and is 1200/9600 Baud Packet compatible.

FT-290RII
Ideal for base, vacation, or expedition use, this 25 Watt 144 MHz Multimode Transceiver is outstanding for emergency, travel, or weak-signal DX work. Optional battery pack allows over-the-shoulder portable use for search-and-rescue operation.

FT-2600M
This heavy-duty VHF FM Mobile is encased in a durable aluminum die-cast chassis/heatsink assembly, and manufactured to MIL-STD 810 requirements. Features include 60 Watt power output, 179 memory channels, direct keypad frequency entry from microphone, Alphanumeric memories, and PC programming capability with optional ADMS-2E software.

FT-90R
The new FT-90R VHF/UHF Mobile Transceiver wasn't given the name Micro Mobile for nothing. Weighing only 1.42 pounds, half the size of the competing brands, it fits almost anywhere. But don't let the size fool you. The FT-90R is one powerful Dual Band FM Transceiver. The high-performance receiver front end utilizes a GaAs MES FET device for excellent sensitivity, allowing for greater simplex range and access to distant repeaters. The adaptable Micro Mobile has programmable function keys, a high-capacity memory system and a versatile scanning system for active operation.



LITTLE BIG MOUTH.

Life is an adventure. So whether you're on expedition or vacation, you will probably encounter some rough going along the way. And when you do, you'll be glad that your mobile transceiver is a Yaesu. With units small enough to install almost anywhere and rugged enough to achieve military approval for shock and vibration, Yaesu is the obvious choice for dependability. Its exceptionally clear signal and wide dynamic range tame even the most crowded bands, and provide outstanding protection from intermodulation in urban areas. Learn more about Yaesu products on the web at www.yaesu.com

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We read every letter received, but we can only publish a few each month. We reserve the right to edit your letter for clarity, and to fit the available page space. Of course, the publishers of *QST* assume no responsibility for statements made by correspondents.

APRS FOR OTHER COMPUTERS, TOO

♦ As a long-time packet-radio meteor-scatter enthusiast, I applaud W2EV's article, "An Automated Meteor-Scatter Station" in November 1999 *QST*. However, I take exception to the author's statement that you need a *Windows* computer to participate in this endeavor (in order to use the *WinAPRS* software).

In addition to *WinAPRS*, there are versions of *APRS* for *DOS* (called simply *APRS*), the 3Com Palm III PDA (*pocketAPRS*), the Macintosh OS (*MacAPRS*), as well as another *Windows* version (*APRS+SA*). Not to be left out, there is a *Windows CE* version (*APRS/CE*) and two *Linux* versions (*XAPRS* and *XASTIR*) that are currently in beta test. So, hams fortunate/unfortunate enough to own computers that don't do *Windows* can also have an automated meteor-scatter station.

By the way, the *DOS* version of *APRS* has a built-in meteor scatter mode to simplify set-up and operation. Also, *WinAPRS* is actually a "port" of the *MacAPRS* code. Many of the screens and windows in *WinAPRS* and *MacAPRS* are the same and most of the instructions in the article concerning the set-up of *WinAPRS* also apply to *MacAPRS*.—*Stan Horzepa, WA1LOU, Wolcott, Connecticut*

TECHNOLOGY TASK FORCE

♦ I'm glad to see that an effort has been put forth by ARRL to request proposals from the amateur community on future technology directions ("Sharpening the Edge of Amateur Innovation" by Peter Coffee, AC6EN, November 1999 *QST*).

The flat growth of licensed amateurs over the past year illustrates very clearly that it is difficult to recruit new people into the hobby. At the heart of the problem is the state of technology that is Amateur Radio. We simply cannot continue to rely on outdated modes and expect to attract new blood. Face it, SSB, AM, CW and even FM and repeaters are ancient technology compared to what the commercial radio services have. Simply put, mainstream Amateur Radio today can no longer claim to be cutting-edge technology.

I think amateurs need to forge a new path into our future, a path that includes high-speed digital technology to deliver multimedia content. I'm not suggesting that analog modes should go the way of Latin, just asking that we consider moving mainstream Amateur Radio into the digital era. Our future is digital, be it on the airwaves or on the Internet. If we don't start to innovate, experiment and push the envelope of radio technology, or begin to utilize our UHF and above allocations, we may lose it all to the highest bidder.—*Bryan King, K1SNH, Goffstown, New Hampshire*

CW AND FIELD DAY—REACTIONS

♦ I would like to respond to the comments of Earle Laycock, VE3XEL, in the November 1999 "Correspondence". I agree that when using CW hams should slow down when requested, and when replying to a slower operator. (I always slow down in this situation.) I'm sorry he and others may have had a bad experience with the higher speed CW operations that take place in Field Day and other contests. Field Day is one of my favorite activities and I would be happy to slow down for anyone that responds to my calls at a slower speed. My experience tells me that this is more the norm than the exception.

I also understand that in some of the more competitive contests computers are often used for logging and sending CW. It is hard to compete with the big guns if you don't use a computer to at least log.

I take issue with Mr. Laycock's conclusion that just because an operator is sending 25-30 WPM that he must be using a computer. I find this is usually not the case, although there are exceptions. I operate QRP CW exclusively and usually breeze along at between 20 and 30 WPM in both ragchews and contests. I have worked very hard to achieve this level of proficiency and it is unnerving to hear others state that I, and others like me, must be using computers. Not so!

I think the ARRL and RAC have a fine Field Day CW strategy and I think that true operator skills are rewarded. Maybe Mr. Laycock and others would enjoy many of the QRP CW contests where the atmosphere is more relaxed.—*Steve Yates, AA5TB, Fort Worth, Texas*

♦ Concerning VE3XEL's comments about CW and Field Day, I say "amen!" The high-speed computer-generated CW is a symptom of a larger problem.

Several years ago I met an amateur who likened contest activity to a bullpen with mad men clubbing each other. Some had big clubs; some had small clubs. The ones that outlasted the others won the affair. How true!

We have enough contest activity with Sweepstakes, DX contests et al to satisfy the owners of the "California kilowatts" and the computer freaks. Field Day was never intended to be a contest. Would it not be nice if Field Day rules were changed to eliminate the competitive aspect and make it a test of equipment and ability rather than a scoring match?—*John McKinney, W0AP, Dannebrog, Nebraska*

WHY MODIFY? WHY NOT?

♦ The letter from Darren Zimmerman, KL0PE, in the November 1999 "Correspondence" ("Why Modify?") demands an answer. In his letter, Darren implies that amateurs commit some impropriety when they dig into their "expensive radios" and extend transmit or receive coverage.

There are many, many legitimate reasons why amateurs might want extended frequency coverage (e.g. IF service for the wide VHF bands, with an attenuator as the universal "ham's signal-generator/spectrum analyzer" etc.), but the real reason hams should be encouraged to modify their equipment is far deeper.

Amateurs are not just end users of technology designed and built by someone else. We as a community are responsible for pushing the state of the art. Often our first tentative steps into a science or engineering career involve modifying an existing piece of equipment so that it will do something its designers never intended. I tapped my parents' phone and built a crystal radio to listen to forbidden rock stations under the covers at night in my formative pre-teen years. My parents reacted with the appropriate levels of consternation and veiled pride.

There are two vocal "anti-modification" camps active in Amateur Radio. The first is the hard-core appliance operators, who worship guys who actually design radio circuitry. The second is the collectors, who worship dead guys who used to design radio circuitry. What both groups are missing is the fact that Amateur Radio is the school where we learn and practice our art, and the first lessons involve modifying existing gear to improve its performance or make it cover new frequencies. Respect for expertise and a desire to preserve past creations both have their place, but neither is as important as encouraging learning by experimentation.

Modifying radios so that they are capable of being used illegally is a legitimate activity. If we acknowledge the limitations on our behavior set by our laws and licenses, then owning a radio that could be used illegally is no more improper than owning a car that could exceed the speed limit. The most talented electrical engineering students

come from the ranks of high school students who tear apart radios and over-clock computers, just as the most talented automotive engineers started out by putting loud exhaust systems on their cars. These borderline "there-ought-to-be-law" activities are critically important in developing creative thinking in engineering and the sciences.

Why modify? Because we are hams, and that is what we do. If you choose to leave your radio in the condition some semi-talented, budget-constrained designer left it when the development clock ran out, that is your right—but you are missing much of the joy of this technical adventure we call ham radio.—*Rick Campbell, KK7B, Portland, Oregon*

MEMORIES OF K2ORS

♦ Learning of the loss of Jean Shepherd, K2ORS, last October brought back poignant memories of this leading-edge humorist. Years before the stardom of Bill Cosby and his stories of childhood, Jean was spinning yarns of his schoolroom buddies, service history and ham radio. I would be listening to WOR radio out of New York, under the bedcovers with a flashlight and a basic crystal set, an earphone quieting the audio but not my laughter.

He was the "hip" humorist of the 1950s. School lunchroom chats were often rife with references to the previous night's performance. He was one of the factors that brought ham radio to our attention and led many of us to pursue licenses.

But my best experience was his dinner speech in the late 1960s at the New York Radio Club. He reminisced about early experiences with tuned feeders, arcs and sparks, neighbors who did not appreciate RFI and parents who wanted him to do something serious.

The world lost a man with a sense of humor, ham radio lost a friend.—*Bill Waller, WB2HLM, Cooperstown, New York*

CALL SIGN CONFUSION: A SIMPLE SOLUTION

♦ I must disagree with the comments of Joe Abad, K4OLA, in the November "Correspondence" concerning the so-called "mess" that the FCC has created by allowing hams to retain their call signs when they move to different call sign districts. Changing one's call sign isn't always a trivial exercise. After you carry your call sign for many years, it becomes synonymous with your identity, not unlike your name. To me, and for many others I'm sure, it would be like changing your name just because you moved.

Sure, I've become excited more than once while hearing a station signing an AH6 prefix on six or 10 meters. And as I turned my beam toward Hawaii his signal dropped and I quickly discovered that he wasn't in Hawaii at all. But a contact is still a contact.

What would easily cure this "mess" would be for the Amateur Radio operators to sign their calls like I did when I was in the 5th district for about ten months. I used AB7RG/5—very simple, and everyone who knew my call knew that it was me, and anyone who heard me at all knew that I was in the 5th call sign district.

So it all boils down to good operating practices. If you move out of your call sign district you should always identify the district that you're in. It's a pretty simple concept, doesn't waste perfectly good call signs, nor do other fellow Amateurs have to learn your new call in order to know it's you when they hear you on the air.—*Clinton Herbert, AB7RG, Cottonwood, Arizona*

THE CABRILLO FILE FORMAT

♦ The ARRL recently announced that beginning with November 2000 Sweepstakes, it will only accept electronic logs that conform to so-called "Cabrillo" format. While I am fully aware of the need to standardize electronic log formats for contests, I am disappointed with the implementation of the format and the haste with which this announcement was made prior to any substantial discussion in public.

The ARRL, along with CQ Publishing, which may take similar action, are undoubtedly the two major organizations hosting most popular Amateur Radio contests in the world. When such influential parties adopt standards for electronic log formats, they should pay close attention to the flexibility and applicability of such formats to not only the contests they host, but also to the numerous other contests held worldwide.

Unfortunately the currently proposed Cabrillo format lacks flexibility and may hamper adoption in many other contests. For example, the Cabrillo format requires fixed columns for each specific field. While this makes the life easier for the host organizations, it is not difficult to see that many contests simply are not amenable to such templates due to longer exchanges, or even special call signs longer than the 10 characters offered in the Cabrillo format. Omissions of new multiplier and point fields from the log also require the contest organizers to recalculate the scores for the submitted logs. That may not always be an option for those without necessary resources.

It is obvious that the Cabrillo format was not designed for universal acceptance and use in non-ARRL contests. That is a pity. Instead, it will add to the already confusing blend of contest log formats.—*Yohei Yokobayashi, AD6AJ, San Diego, California* QST

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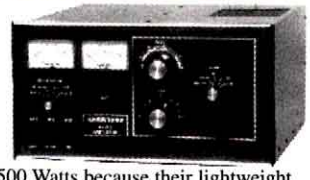

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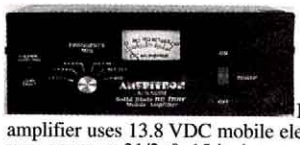

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By Joel Thurtell, K8PSV

A 75A-4

One Piece at a Time

The thought of building a modern ham transceiver from factory parts is pretty far-fetched, even for experienced builders. But in the late '50s, as an employee of Collins Radio, if you had patience, dedication and a little luck, you could assemble your dream radio one piece at a time…

His longing for the finest ham receiver came at the worst of times. It was 1956. "K" (he asked that I avoid using his name in this article) was low on cash. Married, with a baby, the 23-year-old ham radio operator and University of Iowa student dropped out of school and started looking for a job. But K did not go out and buy his dream radio. He couldn't afford to.

No, he put it together, piece by piece.

In the mid-1950s, the mainline amateur receiver makers all vied for top place in the hearts of hams. There was National, the venerable pioneer of receiver design, still flaunting its line of HROs. Hammarlund had its HQs and Super Pros and Hallicrafters seemed to have topped everyone with its humongous SX-88. But for K, there was no doubt which radio was tops. A year earlier, in 1955, Collins Radio Company whetted the imaginations of thousands of hams by announcing the latest version of its famous 75A series of ham receivers.

QST ads and the owner's manual boasted that Collins' 75A-4 was *the* radio. The instruction book shrewdly hyped the A-4 in good old American car buying terms.

"What does it have that last year's model didn't have?"

"Passband tuning ... is so new that it was necessary to coin a new name to describe its function," the book bragged.

"Separate detectors for SSB and AM reception, a Q-multiplier Bridge-Tee filter, a new AVC system that works on SSB, a new low-cross modulation RF tube, a noise limiter that works on SSB, a built-in crystal calibrator ... all built into a cabinet nearly four inches narrower than the 75A-3."

All the pioneering features of the earlier 75A receivers were still in that smaller, lighter package: dual conversion for better image rejection, crystal-controlled conversion and a permeability-tuned oscillator for increased stability. Now, instead of two choices of mechanical filter, as in the 75A-3, the A-4 offered as many as three of the steep-skirted Collins mechanical filters for unbeatable selectivity.

But K had another reason for wanting a 75A-4: "I had an SX-71."

His supposedly deluxe Hallicrafters receiver "didn't have 15 meters," said K. Calibration was far from exact. "You didn't know where the band edges were."

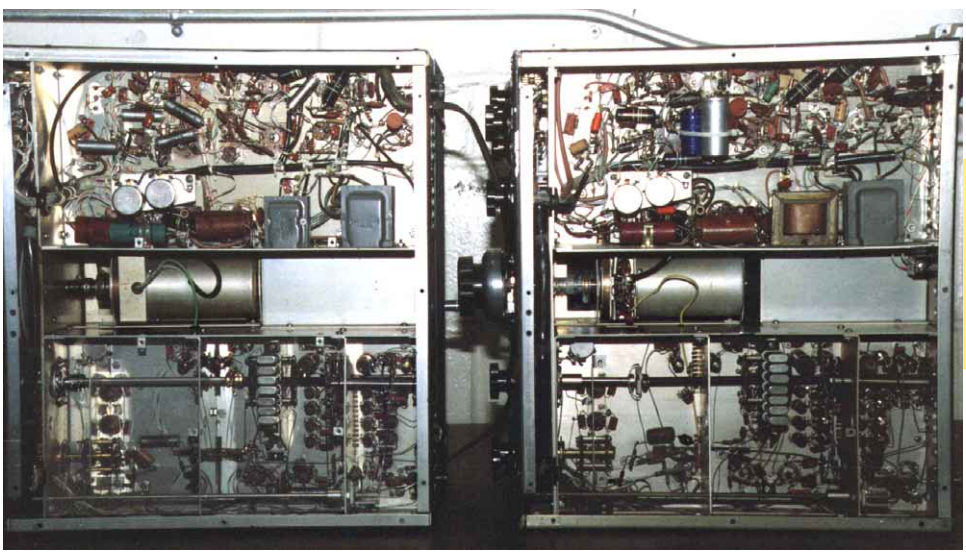
"Compared to a 75A-4, it was an S-38," Hallicrafters' cheapest, least desirable receiver. "It was the pits."

The 75A-4 had everything—including a price tag in its early days of more than $500.

K could daydream, but his ever-present cash flow problem was forcing him out of school. He needed a paycheck.

Suddenly, Collins Radio was there, but not in fantasy.

"I had to go to work somewhere," recalled



Which is real, which is the phony? On the left is a factory-made 75A-4. On the right is K's version. The most obvious difference is the lack of a bottom cover on the PTO front.

K. "There was an ad in the newspaper for a drafting school being run by Collins, and I applied. They tested me and found out I would be a better lab technician than a draftsman."

K went to work making prototype radios at Collins. "I worked for them for one year as an engineering technician—till I got enough money to go back to school."

You don't get closer to your dreams than this. Imagine a Cadillac or Ford or Studebaker buff working in the very factory where his dream machines were made.

There it was, on the assembly line, the wonderful 75A-4. By now, there was no other receiver for him. "I was exposed to it by working there. There was a ham station set up in the engineering building and hooked up to a God knows how big antenna with a KWS-1 as a transmitter and a 75A-4 as a receiver. During my noon hours I'd go over and work CW. The 75A-4 was the best receiver in the world at that time.

"I just wanted the best, and I knew this would be my only chance."

K began to plan.

"At that time, you were allowed as an employee to purchase one per year of anything they made at whatever the inventory cost was."

K guessed a new 75A-4 would cost him, as an employee, about $350.

"Even that was too much."

K had a fallback plan, otherwise known as the old ham approach.

Home-brewing.

"The only way was to use my labor and their parts. We were allowed to purchase the parts for products the company made during our noon hour. We could go to the parts supply room and offer a list of part numbers and we had to pay cash for them as our paycheck permitted."

First, K bought a set of 75A-4 blueprints.

An Intriguing History Discovered

I learned of K's quest and of his unusual solution in the mid-1980s when he responded to my *QST* want ad for a 75A-4. He was apologetic. He had a 75A-4, he said, but he doubted it was worth much. It was not made in the factory. It had no serial number, so he figured it had little value to a collector. But he explained that in every other way—almost—his radio was a ringer for a factory-built 75A-4. The panel and cabinet were standard issue. The components were, well, not exactly the same—some of his components were of better quality than the production units. And there were three small holes in the rear panel where he once fed the receiver's high-frequency output to a home-brew SSB exciter.

Only the knob was different. Yes, K homebrewed that, too.

As you can imagine, I think the 75A-4 is a marvelous radio. The first ham station I ever saw, about 1958, used the 75A-1, a precursor to the A-4. Ever since, I was focused on the 75A receivers. In my mind, when I'm tuning an imaginary receiver, it is a 75A. By 1959, when I was licensed, I could dream about owning a 75A-4, but even though they were a couple years out of production, I was a teenage boy with a paper route and, like K, I could not afford an A-4. My own solution was to buy a second-hand 75A-2—a darn fine radio, but still a long way from a 75A-4.

By the mid-1980s, when K phoned me about his ersatz A-4, my own admiration for the receiver had seasoned more than a quarter century. The idea that somebody had homebrewed a 75A-4—literally built it in his basement—fascinated me. To K, though, his accomplishment was no big deal. He made it sound routine.

"In the year I worked for Collins Radio, there were at least half a dozen engineering lab technicians who were building their own as well. There's nothing distinguishing about this. I don't know why you think this is so noteworthy—at Drake you would find the same thing. It's not a novelty—there are other ones out there, you bet. It was just economy."

I believe it. In fact, another collector once told me he bought a 75A-4 with wiring that appears home-brew and without a serial number. That makes two, maybe.

In spite of his modesty, K's roll-your-own approach goes to the very core of what makes ham radio a unique hobby. The proof is sitting in my shack, plugged into AC, a 75-meter sloper and connected to my factory-built KW-1. Over the years, I've referred to it as my "counterfeit" or "bootleg" 75A-4. Forty-four years after it was basement-built, it works great.

I could not convince K to take credit in print for making the receiver. The last thing he wanted, he said, was calls from readers. "There's a quip that applies to my feelings about class reunions—I don't want to be with all those old people. It's like being an habitué of the local pub—you hear the same people telling you the same lies all over again."

This story first appeared in the May 1992 issue of *Electric Radio*. While polishing the text for *QST* last fall, seven years after it first appeared, I decided to call K and see if he would relent about using his name. A woman answered the phone. There was silence on the line as I asked for K. Then she gave me the sad news: Her husband died five years ago.

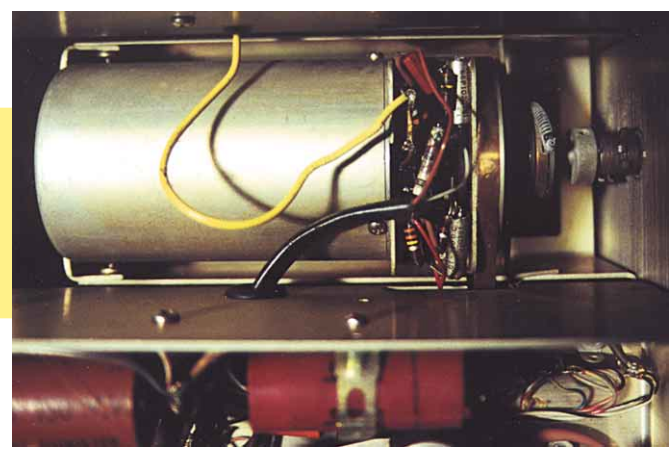
Lovingly Handcrafted, With a Personalized Touch

Remember the Johnnie Cash song about the mythical autoworker who smuggles parts out of a plant one piece at a time to build a car? At Collins, said K, "You couldn't smuggle anything out. They searched you every time you went in or out. If you carried anything, you had to have a receipt or you didn't get out with it. If you wanted to take your tools out, you had to get a pass from the supervisor and the guard inspected you on your way out. They would occasionally just pick people at random and pat them down."

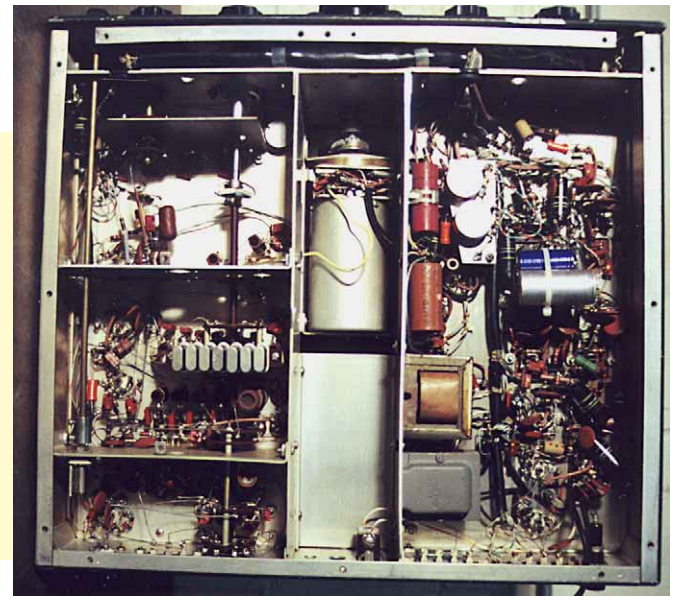
Building the bogus A-4 "took most of the year," K said. "Nine months or better, because you weren't always able to get parts when you went to the counter. Sometimes you had to wait because they were being used in production."

One part never was for sale—the famous Collins permeability-tuned oscillator, or PTO.

Detail of the homemade gear reduction assembly and hand-milled knob skirt for K's homebrew 75A-4.



A close-up of the homebrew PTO. Note the opening on the bottom where K could not make the plate fit over wiring.



The author and his "counterfeit" 75A-4.

Another view of K's craftsmanship (the underside of the 75A-4).

"It was never available as an assembly. I had to build that, too. The slug in that thing moves up and down on a lead screw through the coil, which is powdered iron with a brass core. I can remember borrowing a double star tap from somebody and threading the slug because the main shaft for the PTO is double star-threaded. Then I had to assemble it all and calibrate it. I did it in the ovens in the engineering lab on my noon hour. There's a corrector stack in there for correcting nonlinearity ... It was never perfect, and Collins' engineers designed it so as the slug moved in and out, a little arm with a roller on it bore against a series of discs that were mounted on a long screw with two rather heavy plates on either end. Rotating corrected for displacement versus frequency error. I remember sitting there for hours with that thing held in a vise and a big two-foot wheel with 0-360 marked on it and I was turning that wheel while I watched a frequency counter. Once you got it right, you baked it in an oven and that's the way it was. If you ever lose the seal, put it in an oven for an hour at 150°and put the cover on.

"My wiring wasn't as neat as it should have been. There's a PTO cover to go over all the wiring, but I couldn't get the cover under the tube sockets for the tubes in front of the PTO."

"I used different capacitors than Collins did. Collins used a lot of paper and disc ceramics. There's a mixture in mine. I changed some of them to hermetically sealed, oil impregnated Sprague capacitors."

K made the under-chassis wiring harness from Collins drawings. "You drive little inch finishing nails into the drawing with rubber bands at the top and lay wires in with branches as specified. When you're all done, you tie it. Collins does not lace, they tie. Lacing fails. If one lace fails, the whole thing unravels. You must spot tie, also. This one is that way.

"There's a tale, true or not, I don't know, about a test Art Collins used to administer while walking through the engineering lab. If he found a piece of equipment he wanted to test, he would pick up the unit by its harness and shake it. If anything broke loose, you would do it over again."

One thing K didn't like about his new 75A-4: The main tuning knob turned the PTO too fast for comfortable SSB tuning. "Collins built a good radio when they built the A-4, but they screwed up. When they realized they'd made an error (in the tuning rate), they had to come out with this accessory knob."

Collins offered 75A-4 owners an optional add-on black plastic knob and a 4-to-1 gear reduction mechanism that could be mounted on the front panel in place of the original knob.

"It was an afterthought," said K. "It should have been done inside, with a gear train."

But K built his 75A-4 early in the production run of 75A-4s, and the knob and gear mechanism weren't yet offered. He had his own solution.

"I had left Collins and returned to school, but I had a junkbox full of stuff from the vernier mechanics of old (military surplus) BC-375 units."

K built his own gear-reduction mechanism. Here, again, he did Collins one better. His gear system has a 7-to-1 turns ratio—verrrrry slow.

He turned his drive with a big black plastic knob similar to the big knobs on the KW-1. "For years I ran it with just that knob on the vernier drive."

But the knob didn't hide the gear assembly.

"I got tired of looking at it and decided, 'I've got to have something prettier than that.'" K found a bar of aluminum. He spun it on a lathe, creating a shiny metal skirt to back the knob and hide the gears.

"What you see is what you get."

What I got is a standard-looking 75A-4 with a distinctive black and silver knob that tunes nice and slow.

Through the years, K modified his radio. "The 15-meter band was moved slightly in later models, and later models have different dial decals and different crystals. I changed mine from old to new. It has a circa 1961 dial."

K also replaced the mixers with quieter tubes. "Those 6BA7 mixers are bad news—they hissed and roared at you all the time."

K doesn't know how much money he saved. But he notes that 75A-4s were selling for $695 towards the end of production in 1957.

"I like to think the changes I made to it improved its longevity."

Collins built a great radio in the 75A-4.

So did K.

Joel Thurtell was licensed as KN8PSV in 1959. His first receiver was a three-tube Knight Ocean Hopper, soon replaced with a National NC-173. Eventually, by mowing lawns and peddling newspapers, he raised money to buy a second-hand Collins 32V-1 and 75A-2. He worked lots of DX with that station, mostly on 10 meters in the early 1960s. The 32V-1 communicated with lots of TV sets, too, and the neighbors' QSLs were not always fun. He received a BA degree from Kalamazoo College in history and German and an MA in history from the University of Michigan. As a Peace Corps volunteer, he built a school and a well in Togo, West Africa, where he held the call sign 5V7JT. He has been a newspaper reporter for more than 20 years at the South Bend Tribune *and now at the* Detroit Free Press. *His work also has been published in the* New York Times, The Progressive, Electric Radio *and other newspapers and magazines. He is fascinated with old tube radios. In 1995 he founded a used ham radio business, The Radio Finder. His first* QST *piece was a Hint and Kink in the early 1960s. This is his third feature article for* QST.

All photos by Adam Thurtell. You can contact the author at 11803 Priscilla Ln, Plymouth, MI 48170; **finder@radiofinder.com**; **http://www.radiofinder.com**

By Mike Kerr, ZL2BCW

The Quartz Hill Story

What would you say if offered the chance to restore and operate from a unique, remote, history-laden radio site that sprouts Voice of America-size Vs and rhombics by the dozen? Although their future use of the site is in question, this dedicated group of ZL hams voiced a resounding "yes!"

Quartz Hill is the name of a small hill 974 feet above mean sea level in the southwest corner of the North Island of New Zealand that overlooks Cook Strait in an area named Makara, some 25 miles from Wellington city. The hill is located on an ancient elevated plain that is heavily eroded in parts, with an average height of about 800 feet. This plain is mostly covered in grass, with many outcrops of quartz, which also forms a large part of the underlying strata and traps rain water, causing the ground to be boggy in some places. Gold mining was popular here in the last century.

Although only 30 minutes by car from the center of Wellington, New Zealand's capital city, Makara is sparsely populated and almost free of high-voltage transmission lines. It's also far from major roads, population centers and suffers relatively few electrical storms. Ambient electrical noise levels are extremely low—so low that two separate MF/HF receiving stations were built at this isolated spot in 1944, one to receive overseas shortwave news services at Quartz Hill itself, and another for fixed and maritime services.

But times change. Satellite and international cable links spelled the end of MF/HF for services such as point-to-point fixed links, maritime mobile, news gathering and re-broadcasting and so on. The facility for fixed and maritime services was closed down completely and its antennas removed. The Quartz Hill installation was poised to suffer the same fate.

Wellington Amateur Radio Club

For much of its 72-year history, the club has met in rooms rented or made available just for meetings, so there was no permanent club radio station. In 1995, club members began searching for a permanent, practical club station.

What appear to be telephone poles are actually supports for the feed line to the rhombic antenna. ***Title photo:*** **The station building at Quartz Hill.**

Nearly a year went by before a chance meeting between Brian Miller, ZL1AZE, and Bob Stewart, ZL2AMI, led to the discovery that the MF/HF receiving facility at Quartz Hill was being closed down and the site sold off. The club's executive committee agreed that this "news" should be pursued on the chance that the club could make some use of the site. Brian, ZL1AZE, took up the task.

Brian quickly discovered that the site was being sold to a power utility company "as is" for possible future use as an electric generator "wind farm." He then lodged a draft proposal with the new owners on behalf of the club, offering to manage the site until it was required for the wind farm. In return, the club would be allowed to use the station building and the antenna farm, provided that the antennas and the building were kept in a safe and tidy condition. All this took place from mid-October to early November 1996.

Things were moving quickly! The next task was to sell the idea to the club's full membership. The site was of no use for ordinary club meetings because it was well out of town with "country road" access—but we could certainly use those lovely, big antennas!

"Pole 6" at Quartz Hill.

Mike Woods, ZL1AXG, at the operating position.

Some of the 60 or so members endorsed the idea enthusiastically, while others were just as strongly against it. It was truly a daunting task for a small club with many older members. How much would it cost? And could we afford it? Did we have enough active bodies to tackle the physical work that had to be done—and could we keep up the effort?

A majority emerged in favor of taking up the opportunity. Members felt that this was a unique chance to "own" a large antenna farm on a scale beyond the wildest fantasies of any individual ZL—even if only for a relatively short time. Who has not dreamed of taller masts, longer wires and higher-gain beams for every band aimed toward every major point on the compass? Other radio clubs might want to share the facility, too.

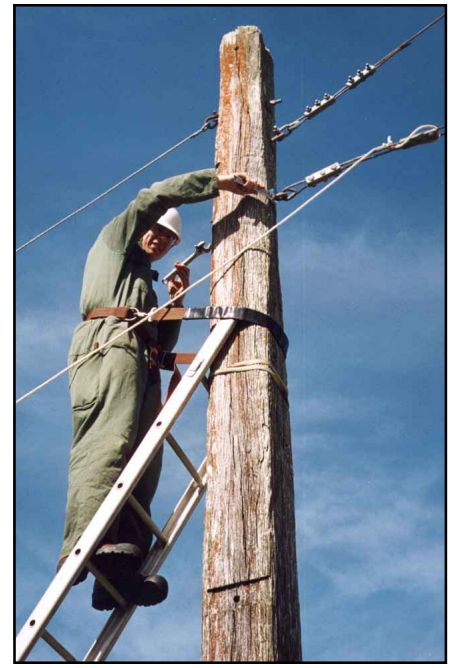
After the initial proposal to the site's new owners, the Club followed up with a revised proposal a few weeks later. To our delight, the owners were more than happy with the ideas we presented, and access to the site was gained in January 1997. Urgent maintenance work was the order of the day, pending the drafting of a formal lease. By February 1997, the Club had formally decided to go ahead, turned itself into an Incorporated Society—a necessary step for legal and insurance reasons—signed a three-year "peppercorn" lease with the owners and started rejuvenating the antenna farm and the building. All of this had taken less than five months.

The Prize

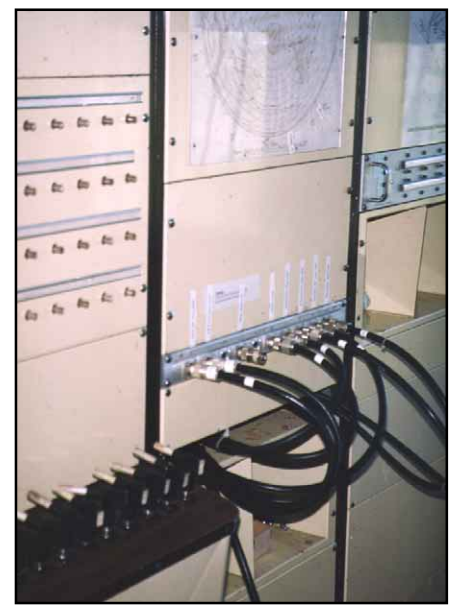
So what did we get for our efforts? The antenna farm covered about 240 acres. It contained several reversible rhombics, mostly in a poor condition, a bunch of terminated **V** beams with leg lengths of up to 900 feet, a Beverage antenna that had seen better days and miles of open-wire feeders. The open-wire feeder runs, supported on 20-foot telegraph poles, came back to gantries on each side of the station compound. At the gantries, the feeders were terminated in baluns and connected to the antenna termination room in the station building via underground runs of coax.

The 2000-square-foot station building was generally sound, with lots of room, including a bathroom, a kitchen, a storage room and a workshop. It was equipped with its own 13,000-gallon water tank, a sewerage system and three-phase power fed from an underground cable that had been buried to help maintain low electrical noise levels. The building needed major cleaning and all kinds of minor maintenance, plumbing, lighting, fittings and so forth. The site also contained a lot of technical debris left behind by the previous owners. Even for hams, this was a challenge.

At Quartz Hill, the isolation and the relatively harsh environment of frequent, very strong, cold winds, occasional ground-level clouds, an exposed and elevated site and proximity to the sea, meant corrosion and damp air would be an ongoing battle inside and outside the station building. The main antenna poles, however, were more than three times as high as the ones most of us had at home—and there were lots of them. Plus, the ambient noise level barely moved the S-meter on *any* band. On a fine calm day, the view of Cook Strait, separating the northern and southern islands of New Zealand, was magnificent.



Brian Miller, ZL1AZE, making a few repairs to the lower end of the sloping V antenna.



The antenna terminal room.

The land underneath the antennas is leased to a farmer who has numerous sheep and cattle as part of an ongoing farming operation, so the livestock had to be safe from the antennas, and vice versa. Some of us were fairly keen to be safe from livestock, too! The bulls are very large!

The Work

There was nothing left but to get on with it. The top priority was to make the antenna farm safe by recovering fallen wire, replacing any mast stays that were corroded or

damaged, and recovering any reusable hardware from the fields. Then work began on identifying, testing and marking the feeder runs and building new high-power terminations and baluns to replace the receiving-only types. Inside, workers cleaned the building, fixed the plumbing and cleared the cable ducts of hibernating possums.

Nobody in the club knew much about rigging antennas on the scale we faced at Quartz Hill. Handling 8- or 10-gauge copper wire (soft-drawn for the feeders and hard-drawn for antennas) was a challenge, especially when lengths reached many hundreds of feet. The stranded galvanized wire used for guying the larger poles was a lot heavier than most of us were used to. Nevertheless, many lengths were cut and tied off to insulators, thimbles and eyebolts, and tensioned without any accidents to ourselves, the poles or the livestock.

By April of 1997, the urgent maintenance work was completed and it was time to celebrate. An official opening day was held on the afternoon of April 25. Although the weather was wet and the site shrouded in clouds, more than 60 people turned out to visit the station, peer through the mist at feeders disappearing into the distance and admire the 70-foot poles close by the station building. A special "1944-era" afternoon tea was served to amateurs, friends and ex-station staffers. An inaugural QSO was conducted on 80 meters with Jim Meachem, ZL2BHF, in Auckland—using our massive rhombic, of course! We were up and running.

Site Development

Once the site had been made safe, the best antennas repaired and the building cleaned up, the next task was installing new antennas to suit our needs as hams. Andrew, ZL2BBJ, started building new 50- to 600-Ω transmitting baluns and Bob, ZL2CA, began modeling the various antenna configurations that had survived and any new antennas that were being considered. The usually calm discussions about what might be best raged on. Everyone had opinions, but there were more mundane problems.

Building new antennas was physically demanding, partly because vehicle access to some parts of the antenna farm was difficult or impossible. This meant that some poles had to be manhandled into position. Feeder poles weren't too hard, but wooden poles longer than 30 feet required gear we didn't have. The sensible approach was to weigh the most desirable antenna options against the 14 existing major masts and other hardware to come up with the best solution. Because we had become accustomed to raising and lowering wires in excess of 900 feet in length, sloping, unterminated **V** beams generally won hands down.

We wanted separate feeders to each antenna so we could operate from at least three simultaneous positions in the station building. A simple antenna patch panel in the termination room allowed any antenna to be routed to any of three operating positions. It also avoided placing switching gear outside, which would have increased maintenance problems dramatically. The exception to this rule is the rhombic, which has its reversing switch remotely controlled by a dc signal sent over a dedicated open-wire pair.

Results

So, what happens when you finally sit down, tune up on the rhombic (short path on 20 meters to Europe) and take a listen? First, everything seems quiet—too quiet. It *is* quiet, and there's very little ambient radio noise. You anxiously wonder if you've selected the right antenna. A signal is heard, but it doesn't seem all that loud. Even 12 dB of antenna gain doesn't do much good if propagation is poor. It's easy to forget that at home, perhaps, you wouldn't hear anything. Gradually, you discover that the beams *do* work, and that the big antennas produce consistently good signals in and out. Call CQ on any band and stations appear out of nowhere.

Do this at the right time on 80 meters and you may generate a DX pileup (instead of perhaps one QSO from your home station). If necessary, you can select long path or short path directions on 80 through 10 meters.

Some hams who are unable to operate from their home shacks operate from "up the hill" whenever they can. Others go there to work particular skeds with old friends around the world. An ad hoc group of contest enthusiasts competes in selected events. A special call sign, ZL6QH, fans the flames in the pileups. QRP operators try out their few watts on the big antennas. The NZ Vintage Radio Society occasionally takes some of its prized treasures up there to try out the old radios and experience the booming signals as though the rigs were made only yesterday. Some other local radio clubs have also joined in.

Still others find that once they've have had the satisfaction of actually having a huge rhombic or **V** beam all to themselves, it doesn't matter so much anymore and they're happy to go back to their home stations and operate as before.

The isolated and rugged site has a spell all its own. Some members of the Quartz Hill User's Group (Q-HUG) find working out in the open air exhilarating, even when the weather is bad, and they relish the hard work of repairing existing antennas and raising new ones. It's difficult not to feel a thrill as 1000 feet of hard drawn copper or steel wire rises into the air—and stays there!

Future

Our current lease expires in February 2000. The early word is that the power company is likely to extend our lease by 18 months. In the meantime, the club plans to have a millennium station on the air for at least 12 hours before the big event. LF operation on the ZL 1800-meter band (165-190 kHz) using the Beverage and some of the long wires is producing promising results. We hope that VKs will soon be granted a matching frequency allocation. LF DX anybody? We do know that the past three years were more fun than any of us ever imagined, and we are most grateful to the power company for allowing us this chance, which we would not have missed for the world. We also acknowledge that the leadership of Brian Miller, ZL1AZE, and his small team of dedicated helpers, supported by Quartz Hill User Group members, well-wishers and the Wellington Amateur Radio Club, made this all possible.

You can contact the author at 40 Rodrigo Rd, Kilbirnie, Wellington 6003, New Zealand; **loisd@voyager.co.nz** QST

NEW PRODUCTS

ISOTRON 6 SUBCOMPACT 6-METER ANTENNA

◊ Bilal expands its line of remarkably compact antennas with the addition of a VHF antenna—the Isotron 6 for 50 through 54 MHz.

At just 16 $^1/_2 \times 2 \times 4$ inches and weighing a mere 1.5 lbs, this antenna should fit the requirements of even the most severely antenna-restricted ham.

The Isotron 6 comes with two "capacitive hats"—one for 50 through 52 MHz and a second that can be substituted for 52 through 54 MHz coverage. The provided U-bolt mast clamp will secure the antenna to masts up to $1^1/_2$ inches in diameter. The Isotron 6 can also be used for mobile applications with a suitably designed mount.

The antenna can be erected in any position; the radiation pattern is described as omnidirectional with random polarization. The maximum power handling capability is specified at 300 W—but the manufacturer cautions against high-power indoor use due to RF exposure considerations.

Price: $69.95 plus $8 shipping (in the continental US). Shipping to Alaska, Hawaii, Puerto Rico and Canada is $12. For additional information contact Bilal Co, 137 Manchester Dr, Florissant, CO 80816; tel 719-687-0650; **http://www.catalogcity.com** (keyword: Isotron). QST

Next New Product

By L. B. Cebik, W4RNL

2×3=6

A simple equation? Indeed! Here are two three-element Yagi designs for 6-meter fun!

Yagi antennas provide good forward gain in a favored direction and excellent front-to-back ratio (F/B) for unwanted-signal rejection. A three-element Yagi for 6 meters is a simple construction project and can make use of readily available materials. However, newer antenna builders are often faced with the question, "Which design should I use?"

To help you make the decision, let's look at two quite different designs. Each antenna is a bit over six feet long. One presses for maximum gain and a good F/B, but sacrifices bandwidth. The other achieves total coverage of 6 meters, but surrenders some gain in the process. By comparing the antennas' capabilities with your operating requirements, you can select the one that best suits your needs.

Despite the similar boom lengths, the two designs have quite different profiles, as shown in Figure 1. The wideband model places more distance between the reflector and the driven element and decreases the driven-element-to-director spacing. In contrast, the high-gain model sets the director far ahead of the driven element and decreases the spacing between the driven element and the reflector. The reflector-to-driven-element spacing not only has an impact on gain, but affects the array feedpoint impedance as well. In general, reducing the reflector-to-driven-element spacing lowers the feedpoint impedance.

Gain

Let's first look at the high-gain model to see what we can achieve and what it will cost. A three-element Yagi is capable of exhibiting a free-space gain of 8 dBi with a F/B greater than 20 dB. However, these figures can be sustained for a bandwidth of only little over ±1.5% of the design frequency. Across this span, the antenna's gain tends to increase, while the F/B peaks at over 25 dB near the design frequency.

Our sample high-gain Yagi is adapted from an optimized 20-meter design by Brian Beezley, K6STI. His original design covers all of 20 meters, but that band is narrow compared to 6 meters. When we scale the antenna for 51 MHz, its bandwidth is only about 1.5 MHz while retaining the desired operating characteristics. Table 1 shows the antenna dimensions for a design using 1/2-inch-diameter tubing. Single-diameter elements are quite practical in VHF Yagis, but before we're finished, we'll see what to do should we decide—or need—to use *two* tubing sizes for each element.

Table 2 shows the antenna's anticipated performance characteristics, as modeled using *NEC 4*. The driven-element length is set near resonance on 51 MHz, and the feedpoint impedance is about 25 Ω. That value isn't a direct match for the 50-Ω coaxial cable normally used in amateur installations. If we shorten the driven element, we can install a beta match. If we lengthen the driven element, we might use a gamma match or a **T** match. If we leave the driven element length as is, we could employ a 1/4-λ, 37-Ω matching section made by con-

Table 1
Element Lengths and Spacing for the High-Gain 6-Meter Design with 1/2-inch-Diameter Elements

Element	*Length (inches)*	*Spacing from Reflector (inches)*
Reflector	114.26	——
Driven Element	108.96	37.8
Director	102.43	77.94

Table 2
Modeled Performance of the High-Gain 6-Meter Design from 50 to 52 MHz

Frequency (MHz)	*Gain (dBi)*	*F/B (dB)*	*Feedpoint Impedance (R ± jX Ω)*	*25-Ω SWR*
50	7.92	16.55	26.9 – *j* 20.2	2.14
50.5	8.07	22.59	26.4 – *j* 11.6	1.57
51	8.24	25.86	24.9 – *j* 2.4	1.10
51.5	8.43	19.33	22.8 + *j* 7.8	1.40
52	8.64	14.66	20.3 + *j* 19.2	2.34

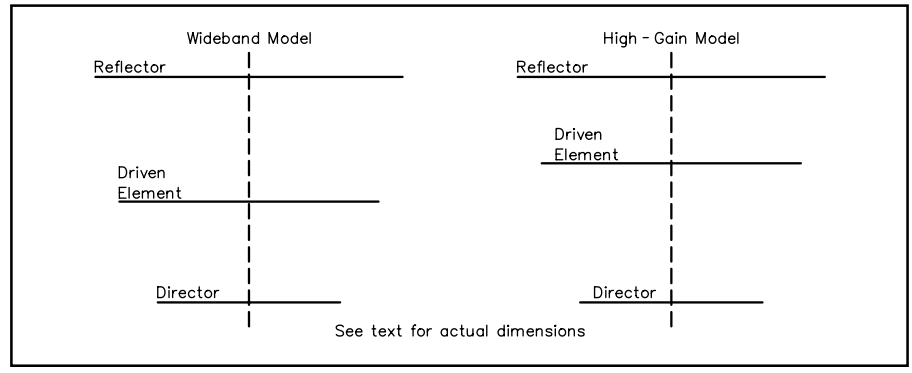


Figure 1—General outline of the wideband and high-gain three-element 6-meter Yagis.

Table 3
Element Lengths and Spacing for the Wideband 6-Meter Design with 1/2-inch-Diameter Elements

Element	*Length (inches)*	*Spacing from Reflector (inches)*
Reflector	116.80	——
Driven Element	108.10	40.7
Director	96.10	73.5

Table 4
Modeled Performance Figures for the Wideband (50 to 54 MHz) 6-Meter Design

Frequency (MHz)	*Gain (dBi)*	*F/B (dB)*	*Feedpoint Impedance (R±jX Ω)*	*50-Ω SWR*
50	7.00	14.90	48.4 – *j* 21.2	1.54
51	6.92	18.08	51.9 – *j* 9.9	1.22
52	6.96	20.31	51.9 + *j* 1.7	1.05
53	7.13	21.02	48.8 + *j* 15.0	1.35
54	7.44	18.40	43.0 + *j* 31.1	1.96

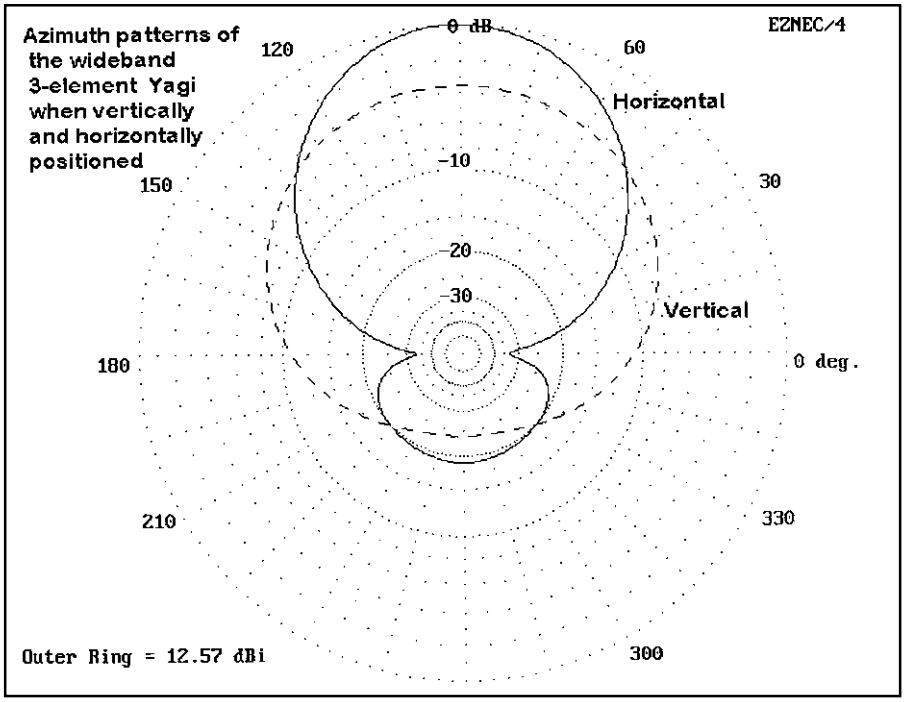


Figure 2—Modeled azimuth patterns for the wideband three-element 6-meter Yagi in horizontal and vertical positions at 30 feet above average earth.

necting two lengths of RG-59 (or RG-11 for high-power operation) in parallel. All of these matching systems are described in *The ARRL Antenna Book*.[1]

The table of projected gain and F/B values shows the rise in gain across the passband, as well as the peak F/B near the design frequency. Notice that the F/B drops rapidly as we approach frequencies only 1 MHz from the design center. For point-to-point communications at the low end of 6 meters, however, the narrow passband—combined with the higher gain—may be just what we need.

[1]Notes appear on page 36.

The target center frequency can be adjusted up or down within 6 meters by adjusting all three element lengths by the percentage of frequency change. To change the design frequency to 50.5 MHz to cover the 50 to 51-MHz range, increase all lengths by about 1%. If we stay at the low end of the band, we need not change the element spacing or diameter.

Builders who are more interested in raw gain than F/B can scale the performance at 52 MHz (or a bit above) down to the desired frequency. Simply scale the antenna dimensions, as given for the 51-MHz design frequency, to about 50 MHz or just a bit lower. You can adjust the driven-element length to resonance or use your favorite matching system. Changing the driven-element length to vary the feedpoint impedance by as much as 25-30 Ω has very little effect on the other performance figures.

Bandwidth

Suppose we want to cover the entire 6-meter band with a well-matched Yagi having relatively constant performance all the way. Although this 4-MHz span represents a ±4% bandwidth relative to a design frequency, we can redesign the Yagi to achieve this goal. However, we'll pay for the bandwidth with reduced gain and a lower peak F/B. The gain drops about 1 dB and the F/B is perhaps 5 dB off the peak.

From the same 1/2-inch-diameter aluminum tubing, we can build a three-element Yagi with a free-space gain of about 7 dBi and a F/B of up to 21 dB. This antenna exhibits a feedpoint impedance that permits direct connection to a 50-Ω coaxial cable (with a suitable choke to attenuate common-mode currents). The design dimensions shown in Table 3 are adapted from a design for another band originally developed by Bill Orr, W6SAI.[2]

The modeled performance parameters appear in Table 4. Notice that the gain curve is not a single rising line, but has a slight dip toward the low end of the band. The F/B peak has been set at the midband frequency because it tends to taper off fairly equally above and below the design frequency. Most notable are the feedpoint impedance and SWR values. If we insulate the driven element from the boom, we can avoid the use of a matching network altogether.

The wideband model is suited to operators who want to cover the entire 6-meter band. However, effective use may require a mechanical scheme that lets you flip the beam from horizontal to vertical. In the vertical position, as shown in Figure 2, at a height of 30 feet above average ground, the pattern is wider and less strong than when the antenna is used horizontally. Still, these beams are both simple and inexpensive. Hence, you might want to build a high-gain model for the low end of 6 meters and a wideband model to cover the upper 3 MHz of the band.

Figure 3 overlays free-space azimuth patterns of both beams at their design frequencies. The patterns will give you a good idea of their relative performance potentials.

Stepped-Diameter Tubing

The beam dimensions for both models used uniform 1/2-inch-diameter elements. A common building practice is to use at least two tubing sizes in 6-meter beams. Most often, we start with 1/2-inch tubing at the center and use 3/8-inch tubing for the ele-

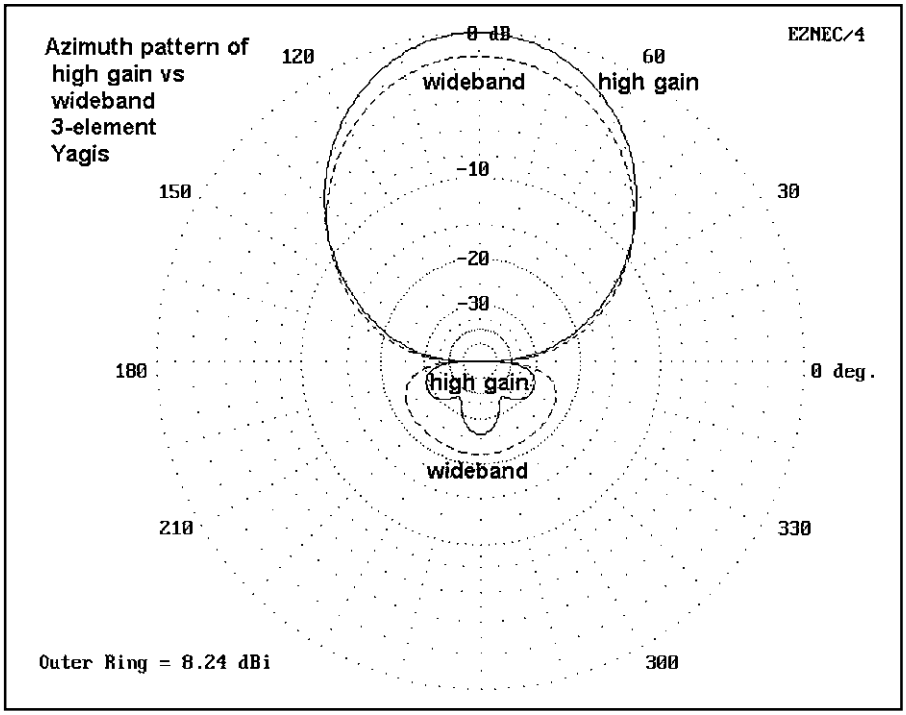


Figure 3—Overlaid models of free-space azimuth patterns for the high-gain and wideband 6-meter designs at their design frequencies.

Table 5

Half-Element Lengths for Uniform Half-Inch and Stepped 1/2-Inch to 3/8-Inch-Diameter Elements

High-Gain Design

Element	*Uniform Diameter Length*	*Stepped-Diameter Length*
Reflector	114.36	116.4
Driven-element	108.96	111.0
Director	102.43	104.0

Wideband Design

Element	*Uniform-Diameter Length*	*Stepped-Diameter Length*
Reflector	116.80	118.6
Driven-element	108.10	110.0
Director	96.10	97.6

Note: All dimensions are in inches.
For the stepped-diameter elements, the inner 36-inch length uses 1/2-inch-diameter tubing, with 3/8-inch-diameter tubing used for the remainder of the element.

ment ends. Let's suppose we make the center portions of each element from 6-foot lengths of 1/2-inch tubing—3 feet of tubing on each side of the boom. What happens to the overall element lengths?

Table 5 compares the element lengths from the boom outward for each beam (commonly called "element half-lengths"). One model uses 1/2-inch-diameter tubing throughout, and the other uses 3/8-inch-diameter tubing for the ends. The stepped-diameter lengths are chosen so that the antenna performance is essentially the same as with uniform-diameter elements. Note that the element lengths become significantly longer when we step the element diameter downward on the way to the element end. The amount of change differs for each element.

You can calculate the end lengths by subtracting 36 inches from the overall element length. However, be sure to add about three inches per end section to allow for telescoping the tubing.

I'll leave the remaining construction details up to you, since there are many acceptable ways to construct either of these Yagis. Again, *The ARRL Antenna Book* and articles in *QST* and recent editions of *The ARRL Antenna Compendium*[3] are full of good ideas. Simply select those that best fit your available materials and individual skills.

Both of these Yagis—adapted from the work of veteran antenna designers—are good designs. Which you choose will depend on what you want to do on 6 meters during the present sunspot cycle and beyond.

Notes

[1]ARRL Publications are available from your local ARRL dealer or directly from ARRL. Mail orders to Publication Sales Dept, ARRL, 225 Main St, Newington, CT 06111-1494; tel (toll free) 888-277-5289, 860-594-0355; fax 860-594-0303; e-mail to **pubsales@arrl.org**. Check out the full ARRL publications line on the World Wide Web at **http://www.arrl.org/** and the Bookcase in each issue of *QST*.

[2]Bill Orr, W6SAI, Ham Radio Techniques, "May Perambulation," *ham radio magazine*, May 1990 pp 56-61.

[3]See Note 1.

An ARRL Life Member and educational advisor, L. B. Cebik, W4RNL, recently retired from The University of Tennessee, Knoxville, to pursue his interests in antenna research and education, much of which appears at his Web site (**http://www.cebik.com**). *A ham for over 45 years, his articles have appeared in several League publications including* QST, QEX, NCJ *and* The ARRL Antenna Compendium. *You can contact L. B. at 1434 High Mesa Dr, Knoxville, TN 37938-4443;* **cebik@utk.edu**. QST

NEW PRODUCTS

NEW ATV TRANSCEIVER FROM PC ELECTRONICS

◊ PC Electronics has recently released a new version of their popular TC70-10 70-cm amateur television transceiver—the TC70-20. The new model includes a more powerful output module that's capable of providing over 20 W PEP, about twice that of the earlier unit.

The manufacturer estimates that the clear picture line-of-sight simplex range, using 14 dBd or greater directional antennas, will exceed 100 miles. The power output is adjustable down to 2 W.

The TC70-20 contains a GaAsFET downconverter that tunes from 420 to 450 MHz. Received ATV signals are converted to TV channel 2, 3 or 4 for full-color viewing on your connected television. One transmitting crystal is included—your choice of 439.25, 434.0, 427.25 or 426.25 MHz. A second crystal can be ordered for an additional $20 and is selectable from a front panel switch.

Video and line level audio can be input from a camcorder, camera or VCR. A separate low impedance mike input, with a separate volume control, is also provided—very handy for adding voice-over information to prerecorded video.

The TC70-20 ATV Transceiver is packaged in a rugged die cast aluminum box measuring approximately 7 1/2×7 1/2×2 3/4 inches. Simply connect a 70-cm antenna, TV, camera (or other video source) and 13.8 V dc at 5 A and you are on the air.

Price: $529. For additional information contact PC Electronics, 2522 Paxson Ln, Arcadia, CA 91007; tel 626-447-4565; fax 626-447-0489; **tom@hamtv.com**, **http://www.hamtv.com**. QST

Next New Product

By Dwayne Kincaid, WD8OYG

A Repeater Controller Accessory: The RCA

Although designed initially for use with repeaters, this flexible controller can be adapted to many other applications. Let your imagination be your guide!

At 10:30 PM, the phone rang. It was Gene, one of our repeater-control operators. He said he was getting reports that our local repeater was hard to hear in the southern part of the county. I told him I would check it out.

Ordinarily, I would have had to stuff a bunch of test equipment into my car and drive about 30 minutes to the repeater site to analyze the problem. I would also have had to lug along a bunch of common replacement parts in case I could fix the problem on the spot. It could easily take two hours or more to check the system.

Tonight, however, would not be the norm. There would be no need to drive to the site to perform the check-up—we had just installed a Repeater Controller Accessory. I simply reached for my H-T, pushed a few keys on the pad and the repeater *told* me what the problem was! Tonight, the repeater's power amplifier had kicked itself off-line and the repeater was operating using only the exciter. With a few more keystrokes, I reset the power amplifier and the repeater was back up to full power.

JOE BOTTIGLIERI, AA1GW

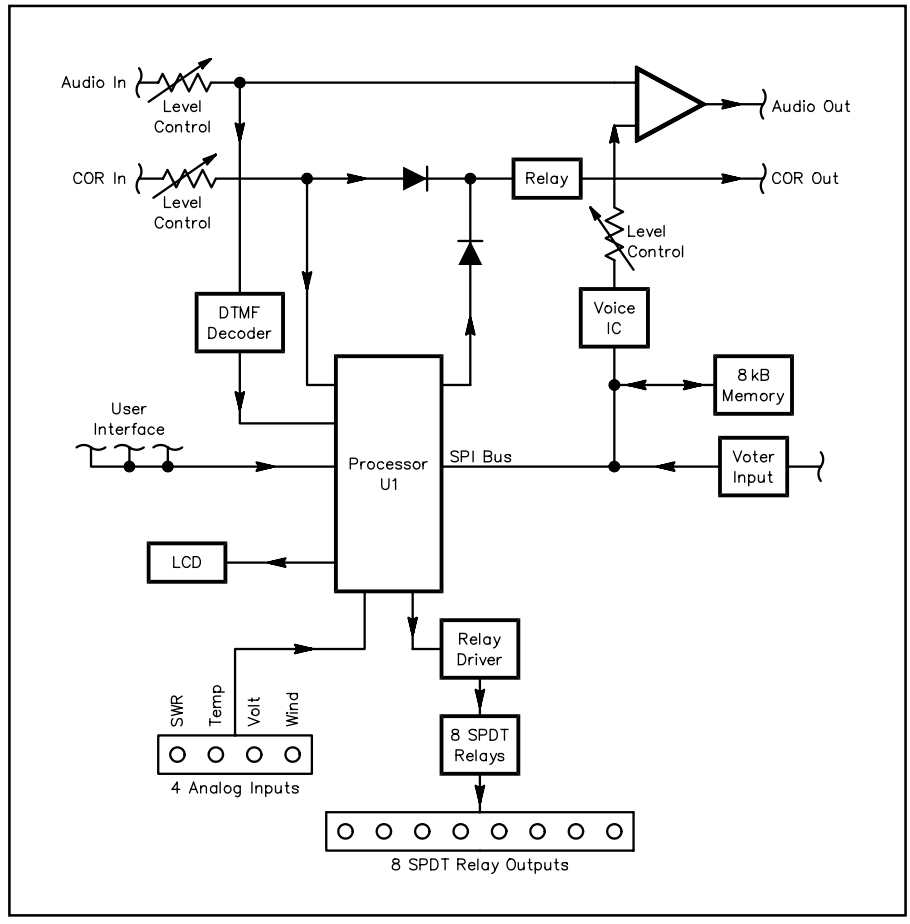


Figure 1—Block diagram of the Repeater Controller Accessory.

How Did I Do That?

Necessity is the mother of invention—and that's how the Repeater Controller Accessory project began a few years ago when I got involved in building repeaters. I really enjoy repeaters—when they work—but *keeping* them working is another story! By the time I was caring for seven repeaters at three remote sites, I needed an easy way of keeping tabs on *all* of the equipment.

I researched some remote telemetry systems, but didn't find anything that met my needs. Many of the systems require phone lines and computers, and are way out of my price range. There are a few systems available that can be built around packet

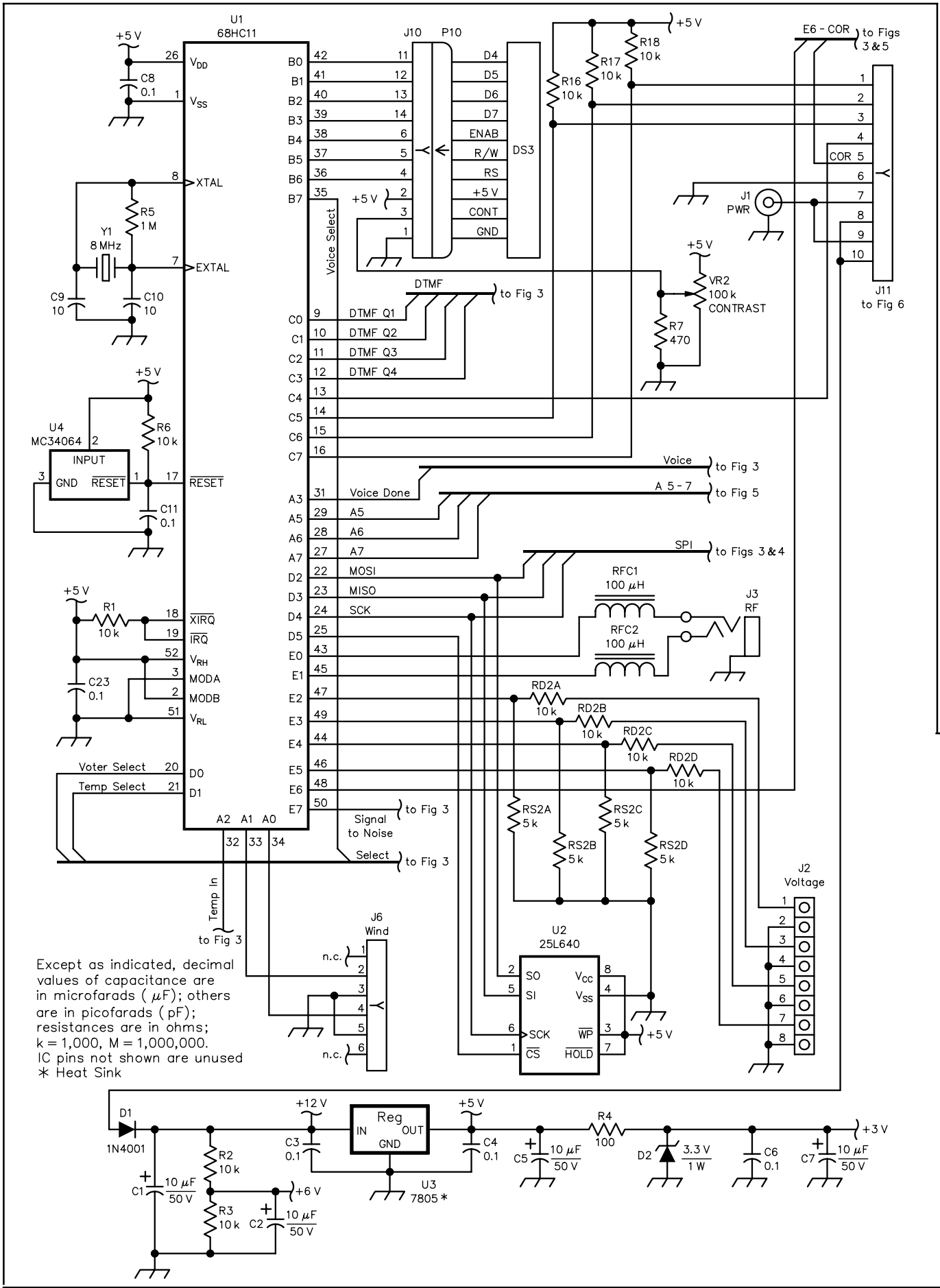
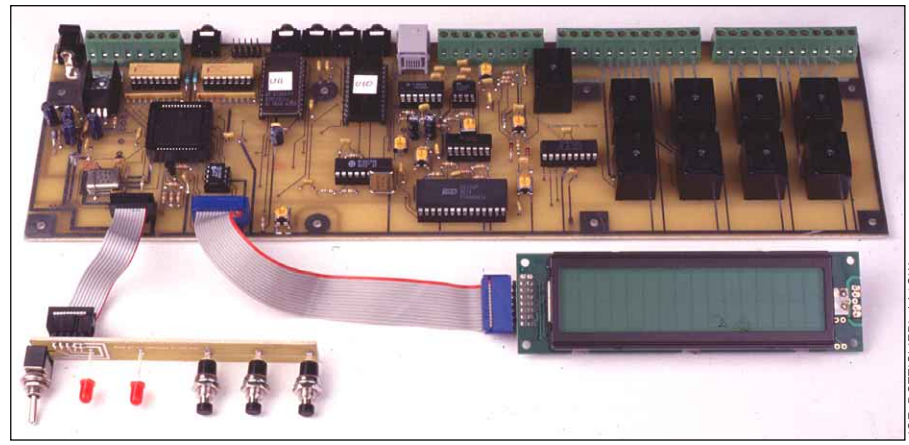

U1
68HC11
+5 V
C8
0.1
VDD
VSS
XTAL
EXTAL
Y1
8 MHz
R5
1 M
C9
10
C10
10
U4
MC34064
INPUT
GND
RESET
R6
10 k
C11
0.1
R1
10 k
C23
0.1
XIRQ
IRQ
VRH
MODA
MODB
VRL
Voter Select
Temp Select
D0
D1
A2 A1 A0
Temp In
to Fig 3
Except as indicated, decimal values of capacitance are in microfarads (μF); others are in picofarads (pF); resistances are in ohms; k = 1,000, M = 1,000,000. IC pins not shown are unused
∗ Heat Sink
J10
P10
DS3
B0
B1
B2
B3
B4
B5
B6
B7
D4
D5
D6
D7
ENAB
R/W
RS
+5 V
CONT
GND
Voice Select
R16
10 k
R17
10 k
R18
10 k
E6 - COR
to Figs 3 & 5
COR 5
J1
PWR
J11
to Fig 6
VR2
100 k
CONTRAST
R7
470
DTMF
to Fig 3
DTMF Q1
DTMF Q2
DTMF Q3
DTMF Q4
C0
C1
C2
C3
C4
C5
C6
C7
Voice
to Fig 3
A 5 - 7
to Fig 5
Voice Done
A5
A6
A7
SPI
to Figs 3 & 4
MOSI
MISO
SCK
RFC1
100 μH
RFC2
100 μH
J3
RF
RD2A
10 k
RD2B
10 k
RD2C
10 k
RD2D
10 k
RS2A
5 k
RS2B
5 k
RS2C
5 k
RS2D
5 k
A3
A5
A6
A7
D2
D3
D4
D5
E0
E1
E2
E3
E4
E5
E6
E7
Signal to Noise Select
to Fig 3
J2
Voltage
J6
Wind
n.c.
U2
25L640
SO
SI
SCK
CS
Vcc
Vss
WP
HOLD
D1
1N4001
C1
10 μF
50 V
R2
10 k
R3
10 k
C2
10 μF
50 V
+6 V
+12 V
C3
0.1
Reg
IN
OUT
GND
U3
7805 ∗
C4
0.1
C5
10 μF
50 V
R4
100
D2
3.3 V
1 W
C6
0.1
C7
10 μF
50 V
+3 V

Figure 2

radio, but those approaches require considerable customization and the installation of *more* radios and antennas. Not for me…

The system I had in mind had to be very flexible—flexible enough to work with all of the different repeaters and remote receivers that I cared for. I wanted something I could use without a computer and telephone lines. The ideal system would also provide me with the information about the status of transmitters, antennas, feed lines, power amplifiers, power supplies, air conditioners, heaters, back-up batteries and be able to control some of those things.

With nothing in the market available at a price that I could afford, I wound up designing what I needed: a tone-controlled *talking* telemetry system. The result is the Repeater Controller Accessory described here. The project's name derives from the three parts to which the unit interfaces. The first is pretty obvious: a repeater. There are definitely other applications for this project, but the repeater is the main target. Next is the Controller. This unit works with all of the controllers that are used with Amateur Radio repeaters. It accomplishes this by requiring only audio and COR signals. Finally, there's Accessory. I didn't want to design a repeater controller; a multitude of very good controllers is already available. There was no sense reinventing the wheel, so this unit is an *accessory* for existing repeater controllers and interfaces to the other accessories that repeaters need to operate.



JOE BOTTIGLIERI, AA1GW

The main board and user interface.

Figure 2—The microprocessor section of the Repeater Controller Accessory schematic; the main-board schematic extends through Figure 6. Unless otherwise specified, resistors are 1/4-W, 5%-tolerance carbon-composition or film units. Equivalent parts can be substituted; n.c. indicates no connection.

C1, C2, C5, C7—10 µF, 50 V electrolytic
D1—1N4001
D2—3.3-V, 1-W Zener diode
DS3—2-line, 16-character LCD
J1—PC-mount coaxial power connector
J2—8-position screw-type PC-mount terminal block
J3—3-circuit phone jack
J6—6-conductor, PC-mount RJ-11 jack (connects to wind sensor)
J10—2-row, 7-position PC-mount header (mates with DS3).
J11—2-row, 5-position PC-mount header (mates with P11, Figure 7).
RFC1, RFC2—100 µH
RD2—10-kΩ DIP-16 resistor package
RS2—5-kΩ SIP-10 resistor package
U1—*Programmed* 68HC11 microcontroller (see Note 5)
U2—25L640 SPI serial EEPROM
U3—7805 5-V, 1-A positive regulator with heat sink
U4—MC34064 undervoltage sensor
VR2—100-kΩ PC-mount pot
Y1—8-MHz crystal, HC-33/U holder

With a little thought, you're sure to find the RCA flexible enough to remotely control a number of things, including HF station equipment at home or at another location.

Features

My features list started out being pretty generic, but I quickly added some of the other things that I've wanted for our local repeaters. The main task remains: reporting telemetry. The repeater-site items I wanted to monitor include: transmitter and amplifier RF power (forward and reverse); SWR (to determine the state of the antenna and feed line); power supply and back-up battery input voltages, and temperature readouts of power supplies, heat sinks, air conditioners, heaters and the inside and outside air temperatures.

I also wanted *built-in* relay-contact interfacing. If there's one thing that I feel can be improved on in today's repeater controllers, it is the "outside-world" interface. Most controller interfaces have just an open-collector transistor or a TTL output. Both of those are just about useless when connecting to the outside world. With other controllers, you have to add a relay, a voltage source and connectors for each item you want to control. What a mess! I wanted to have the relay contacts available and have easy connections to them—an arrangement in which you could merely connect a pair of wires to a device and the controller would control it. The RCA has eight SPDT contacts, each capable of handling 10 A. The normally open and normally closed contacts are brought out to compression-screw terminal blocks for device interconnection.

Another feature accommodates repeaters that have voters. A few years ago, I designed a repeater voting system,[1] but omitted any way to distinguish which site was being polled. Because the RCA can speak, it can use the voter data to indicate which site is selected. Of course, this feature can be turned on and off remotely.

In addition, I added the ability to measure the signal-to-noise ratio (S/N) of an audio signal and present it as an analog voltage to the microprocessor. The S/N converter is similar in design to Mark (WB2WHC) Kolber's audio-noise-based voting circuit.[2] As in Kolber's design, the S/N converter uses an input buffer, a three-pole high-pass filter, a noise rectifier and a smoothing circuit for each channel. The RCA goes one step further by allowing the output of the converter to give a voltage representation of the S/N. This is a 0.5 to 4.0-V signal that is read by the microprocessor's ADC. More noise on the audio yields higher voltage to the ADC.

Almost as an afterthought, I included a weather-sensor interface. Some of the better repeater controllers have this feature; adding it here makes weather reporting much more affordable. A simple phone-line interface jack (an RJ11) and a Peet Brothers sensor[3] (about $100) easily adds wind speed and direction reporting. Peet Brothers also supplies a model equipped with a heater for use at the more-northern latitudes. Both units provide a wind-direction resolution of about 2°.

Controller Design

The block diagram (Figure 1) and schematic (Figures 2, 3, 4, 5, 6, 7, 8) detail the system layout. Six major subsystems neighbor the microcontroller in the RCA: the analog sensors, relay driver, DTMF decoder, voice chip, voter input and the user interface. The microcontroller uses inputs from the DTMF decoder, analog inputs, voter input and the user interface to drive the voice-chip and relay-driver outputs.

Analog Inputs

There are four analog sensor inputs: RF power, voltage, temperature and wind. U1's

[1]Notes appear on page 45.

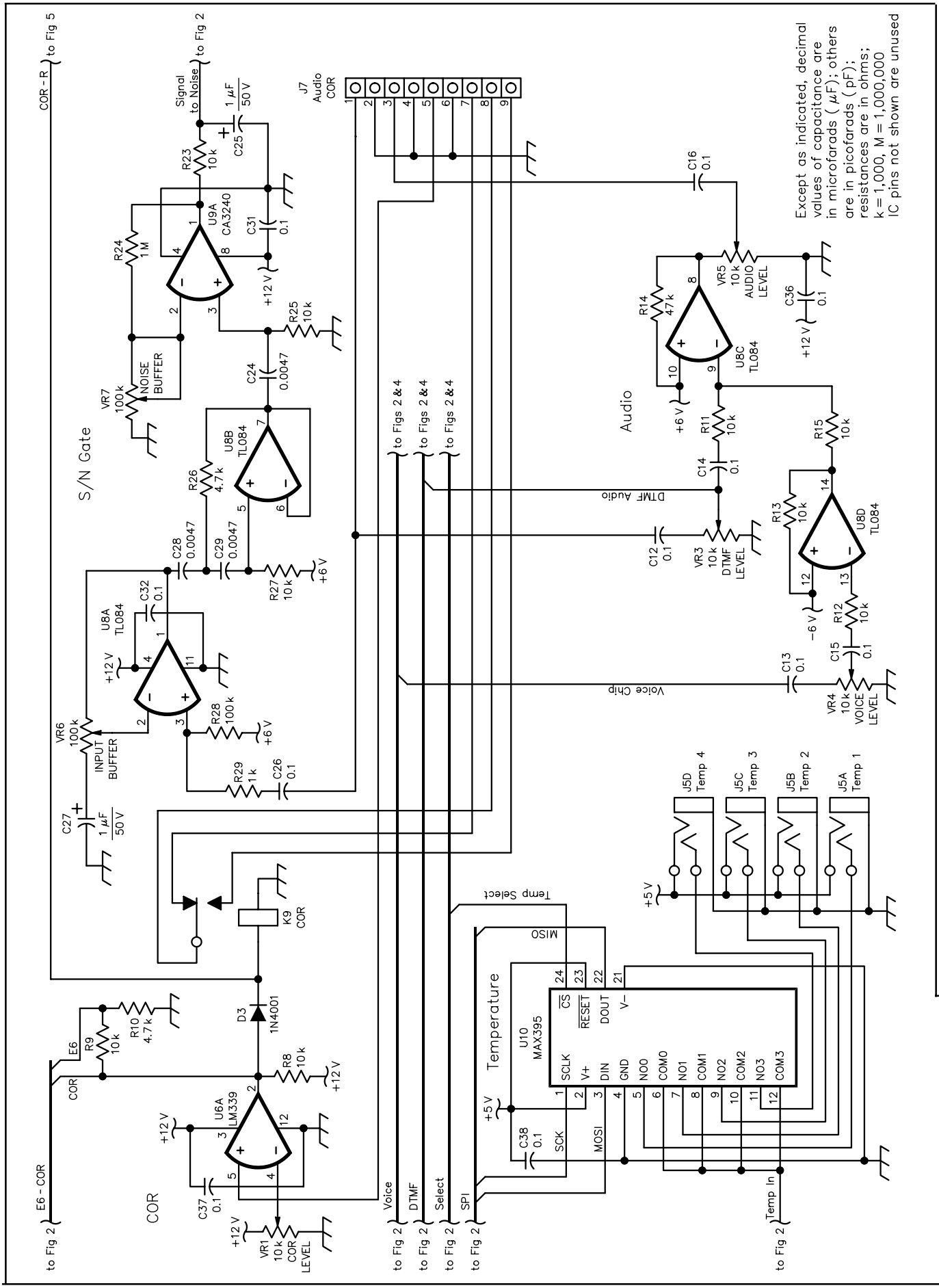
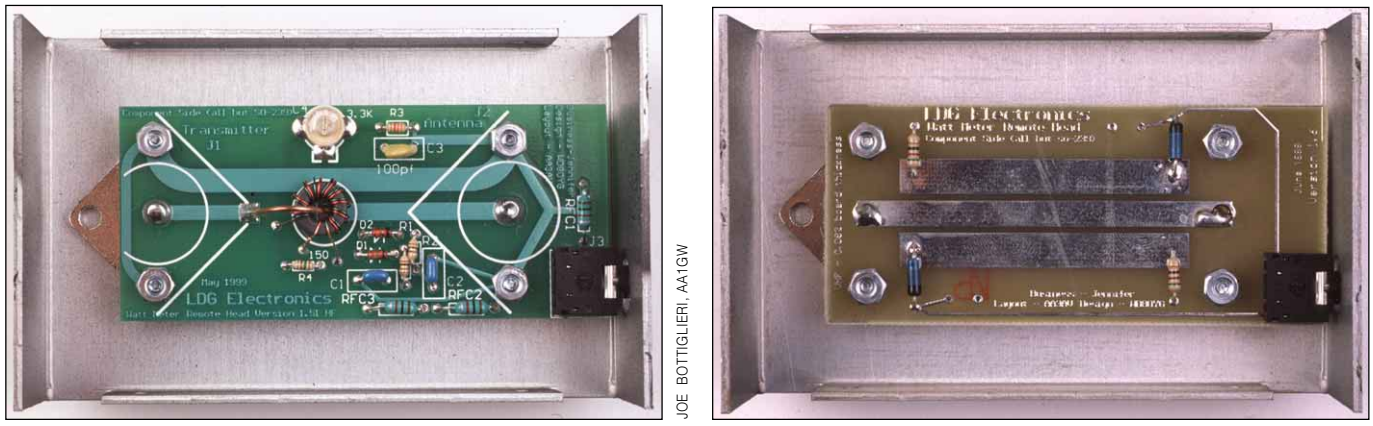

COR - R
to Fig 5
Signal to Noise
to Fig 2
1 µF 50 V
C25
R23 10 k
U9A CA3240
C31 0.1
+12 V
R24 1 M
R25 10 k
J7 Audio COR
C24 0.0047
VR7 100 k NOISE BUFFER
S/N Gate
U8B TL084
R26 4.7 k
C28 0.0047
C29 0.0047
R27 10 k
+6 V
C32 0.1
U8A TL084
VR6 100 k INPUT BUFFER
R28 100 k
R29 1 k
C26 0.1
C27 1 µF 50 V
to Figs 2 & 4
to Figs 2 & 4
to Figs 2 & 4
C16 0.1
VR5 10 k AUDIO LEVEL
C36 0.1
R14 47 k
U8C TL084
Audio
R11 10 k
C14 0.1
R15 10 k
DTMF Audio
C12 0.1
VR3 10 k DTMF LEVEL
R13 10 k
U8D TL084
R12 10 k
C15 0.1
C13 0.1
Voice Chip
VR4 10 k VOICE LEVEL
-6 V
J5D Temp 4
J5C Temp 3
J5B Temp 2
J5A Temp 1
+5 V
Except as indicated, decimal values of capacitance are in microfarads (µF); others are in picofarads (pF); resistances are in ohms; k = 1,000, M = 1,000,000
IC pins not shown are unused
Temp Select
MISO
K9 COR
D3 1N4001
R10 4.7 k
R9 10 k
E6
COR
R8 10 k
+12 V
U6A LM339
U10 MAX395
Temperature
SCLK
V+
DIN
GND
NO0
COM0
NO1
COM1
NO2
COM2
NO3
COM3
CS
RESET
DOUT
V-
C38 0.1
SCK
MOSI
+5 V
C37 0.1
VR1 10 k COR LEVEL
E6 - COR
to Fig 2
COR
Voice
DTMF
Select
SPI
Temp In
to Fig 2
to Fig 2
to Fig 2
to Fig 2
to Fig 2

Figure 3



JOE BOTTIGLIERI, AA1GW

An inside view of the HF and VHF/UHF remote SWR sensors

ADCs read the first two after they're filtered on the main board. U1's timer inputs read the temperature and wind-sensor outputs.

The RF SWR sensors include HF and VHF types that handle power levels up to 200 W. The HF sensor (used on 10 and 6 meters) is a common toroidal bridge.[4] The single-lead primary passes through the center of T1 providing RF current sampling to the secondary. D1 and D2 rectify the forward and reverse currents. Bypass capacitors and chokes filter out RF and provide a smoother dc signal. The potentiometers provide voltage-level reading adjustment and allow calibration.

For VHF (used on 144, 220 and 440 MHz), the RF sensor uses stripline sampling. Striplines above and below the main line provide the forward and reverse voltage sampling. D1 and D2 rectify the forward and reverse currents. Again, bypass capacitors, and chokes smooth the signal and potentiometers provide adjustable voltage levels to U1's ADCs.

The HF and VHF/UHF remote SWR sensors

Figure 3—Temperature section and level controls for audio, DTMF, COR and S/N gate.
C25, C27—1 μF, 50 V electrolytic
D3—1N4001
J5A-J5D—3-circuit phone jacks
J7—9-position screw-type PC-mount terminal block
K9—SPDT relay, 12-V, 30-mA coil, 10-A contacts (Aromat JS1-12V)
U6—LM339 quad comparator
U8—TL084 quad op amp
U9—CA3240 dual op amp
U10—MAX395CNG serially controlled, low-voltage, 8-channel SPST switch
VR1, VR3-VR5—10-kΩ PC-mount pot
VR6, VR7—100-kΩ PC-mount pot

The voltage sensor is set to read a range of 0 to 15 V dc. A simple resistive voltage divider lowers the input voltage to a level U1 can handle.

An external temperature sensor connects to the circuit via J5. The sensor is a unique device (an SMT-160-30 from Smartec) that provides a pulse-width modulated (PWM) signal proportional to temperature. U1's timer port reads these pulses and converts them to a digital number corresponding to the temperature. The temperature-sensor's range is –50° to +200° F.

The Peet Brothers wind sensor is a little more complicated. It provides a pulsed signal that represents the wind speed; another pulsed signal represents the wind direction. These pulses are filtered and sent to U1's timer port. There, an internal timer measures the pulses and the software correlates the measurements to wind speed and direction. The anemometer speed is directly proportional to the number of pulses per second received. Wind direction is found by comparing the relative timing between the anemometer and vane pulses.

Relay Driver

U7, the relay driver, is an Allegro '5810 IC. It is specially made to handle several relays and other high-current devices. The '5810 operates as a four-line serial device (there is one line each for the enable, clock, data and strobe signals) that gets its information from U1. The '5810 can drive a maximum of 10 relays. The RCA uses eight lines for the eight relay outputs and one line to drive the COR output.

DTMF Decoder

U5, the DTMF decoder, is an MT-8870 IC. The MT-8870 uses the Bell System standards for DTMF decoding. The chip has a 30-dB dynamic range that allows for wide audio-level variation. For the signal to be recognized by U5, it must have a 40-ms tone duration and a 40-ms pause between tones. The audio input is noise filtered before it is sent to the decoder. U5 then looks for an audio-signal input that has a valid DTMF signal. When a valid DTMF signal is received, the chip raises the valid bit and the data lines contain the proper signals corresponding to one of the 16 DTMF tones it can decode.

Voice Chip

An ISD33000 ChipCorder, U12, provides the voice for the RCA. This record/audio playback IC can store up to two minutes of audio data and retain it in nonvolatile memory for 100 years. The '33000 has an on-chip 3.4-kHz band-pass filter that provides a natural voice playback. Audio data is stored in 128 different segments, one for each word. (The RCA has only about 80 words in its vocabulary.) To play the selected word or words, U1 sends a read command to U12.

The RCA's vocabulary is recorded into U12 using an ISD programmer. A professional announcer in a sound studio recorded the words. The recordings were then transferred to a CD-ROM used as the master for the ISD programmer.

U12 communicates with U1 via a three-wire bus called a *serial peripheral interface* (SPI) bus. This high-speed (1 Mb/s) serial bus is controlled by U1. U1 also controls other devices on the SPI bus: voter input, temperature multiplexer and external EEPROM, U2.

Voter Input

The repeater's voter sends up to eight discrete inputs to the RCA to indicate which channel or site the voter selected as the best. The RCA monitors the COR line to determine when the COR becomes inactive and sends the command to U12 to announce the site number. If no voter is connected (or you

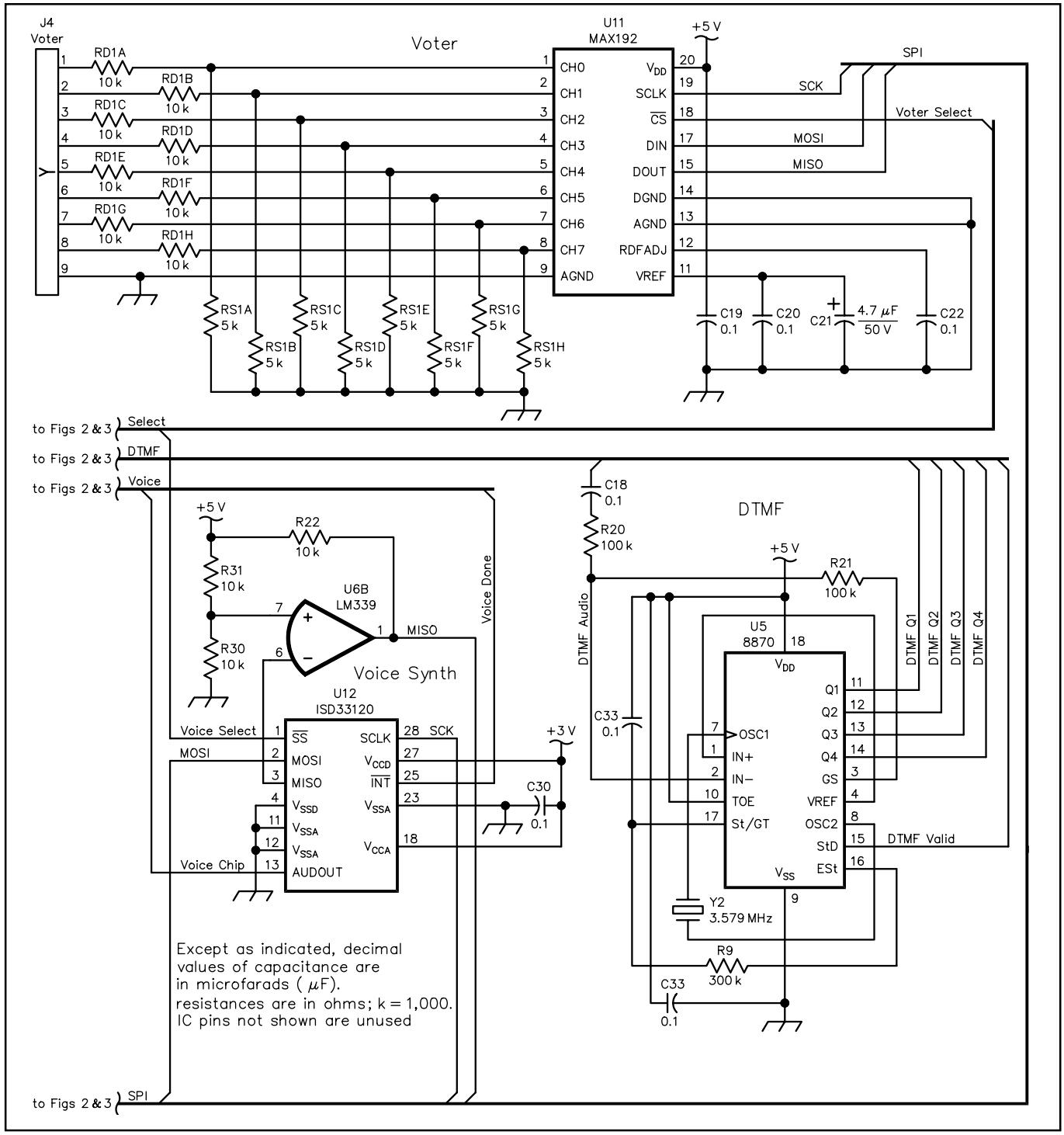


Figure 4—Voice synthesizer and DTMF receiver.

C21—4.7 µF, 50 V electrolytic
J4—2-row, 5-pin PC-mount header
RD1—10-kΩ DIP-16 resistor package
RS1—5-kΩ SIP-10 resistor package
U5—MT8870DE-1 DTMF receiver
U6—LM339 quad comparator (sections C and D unused).
U11—MAX192ACPP 8-channel, serial 10-bit ADC
U12—ISD33120 ChipCorder
Y2—3.579-MHz crystal, HC-33/U holder

find the announcement annoying) it can be deselected in the menu system.

User Interface

The user interface consists of an LCD (DS3, the main display), three pushbuttons (S1-S3), one toggle switch (S4) and two LEDs (DS1 and DS2). The LCD displays a series of menus. Each menu offers information about the setup and programming of the RCA.

There are two controller modes: setup and operate. During setup, you can scroll through the menu system to view or change the operating parameters. In operation, the RCA simply waits for a COR signal and DTMF tones, then performs the appropriate action.

Other Hardware

There are also a few miscellaneous hardware functions in the RCA. The COR input is buffered by U6, an LM339 compara-

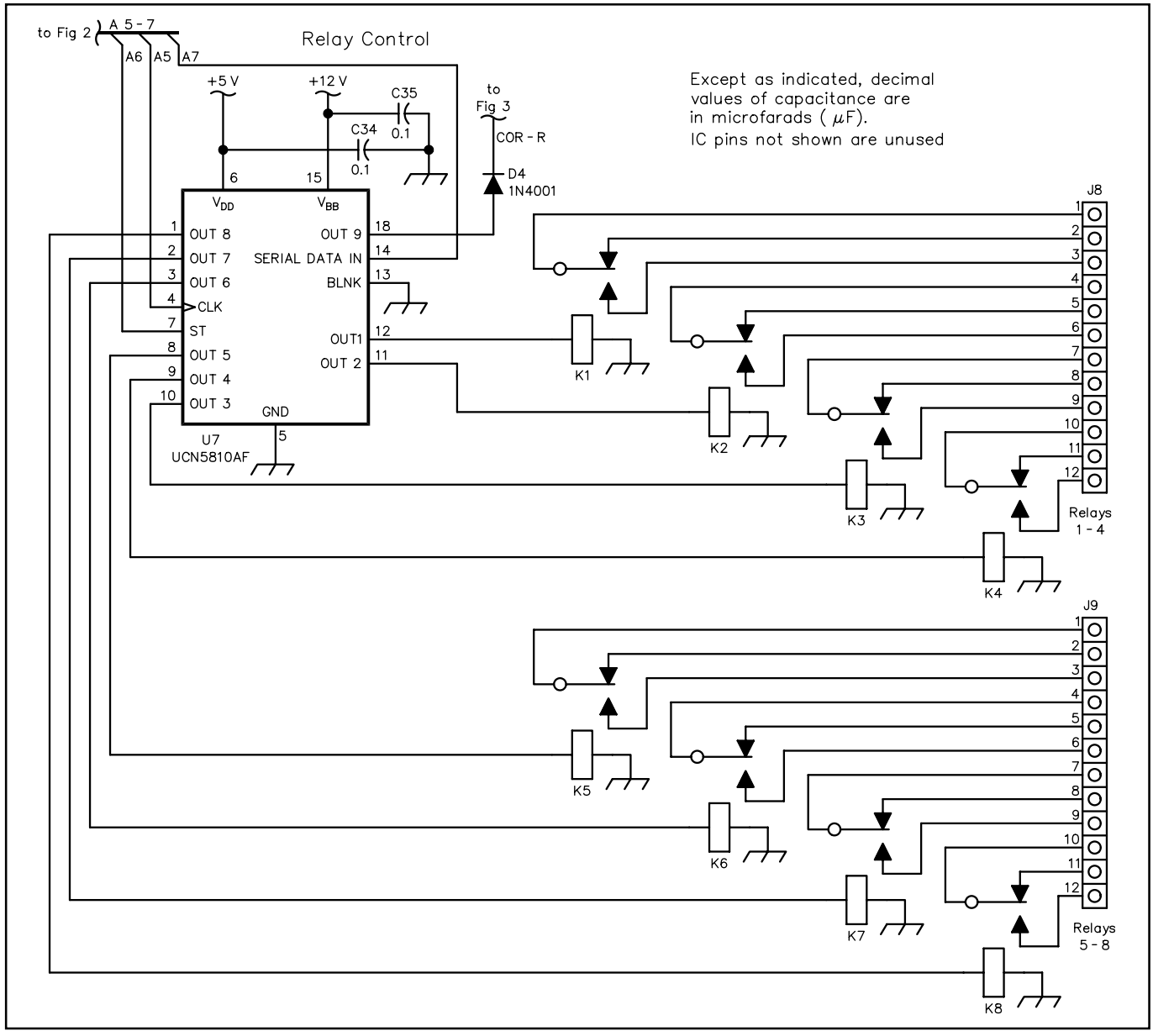


Figure 5—Relay control section

D4—1N4001 switching diode

J8, J9—12-position screw-type PC-mount terminal block

K1-K8—SPDT relay, 12-V, 30-mA coil, 10-A contacts (Aromat JS1-12V)

U7—UCN5810AF 10-bit serial-input latched-source drivers with active pull-downs

tor. Its variable COR level output can be set to match any COR input level between 1 and 11 V. The COR input is **OR**ed with U1's COR so that either can drive the COR output. This provides fast COR switching (about a 5-ms delay).

A pair of TL084 op-amp sections (U8A and U8B) buffer the audio input and output. They isolate the RCA from external devices and ensure the audio level is in the proper range for the DTMF decoder. These IC sections operate in their linear region by floating a voltage divider between the 12-V input and ground.

Processor

U1, an MC68HC11E9FN microcontroller, contains 12 kB of one-time programmable EPROM (for assembly language program space), 256 bytes of RAM for data storage, 512 bytes of EEPROM, an 8-bit output port, an 8-bit input port, an 8-channel, 8-bit ADC input port, an 8-bit timer port and a 6-bit communications port.

U1's eight ADC-input ports read the analog data; its 8-bit input port reads the DTMF and user interface and its 8-bit output port drives the main display, LCD module DS3. The wind sensor is read by U1's timer port; SPI-bus control is handled by U1's communication port. (Part of the communication port can be used for RS-232 communication, but that is not implemented here.)

U1 also uses external memory provided by U2, a 25LC640 serial EEPROM. This IC holds 8 kB of look-up tables used by U1 to convert the analog-input data to calibrated information used by the voice chip, U12. U1 also stores the user preferences.

U3, an on-board 7805 regulator equipped with a heat sink, delivers 5 V dc to the ICs. With no relays energized, the total current consumption is about 200 mA. Each relay draws an additional 30 mA, so depending on how many relays are used, the total current drawn can be as high as 500 mA.

Software

The RCA's program is written in 68HC11 assembly language.[5] The main routine monitors the COR and DTMF valid

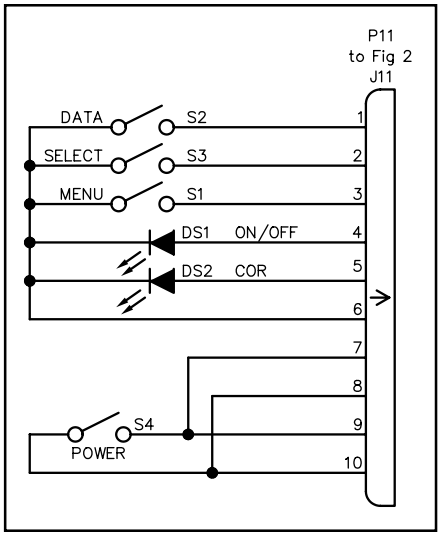


Figure 6—Front-panel switch and LED interconnect
DS1, DS2—LED
P11—2-row, 5-position header (mates with J11, Figure 2).
S1-S3—Normally open pushbutton
S4—SPST toggle

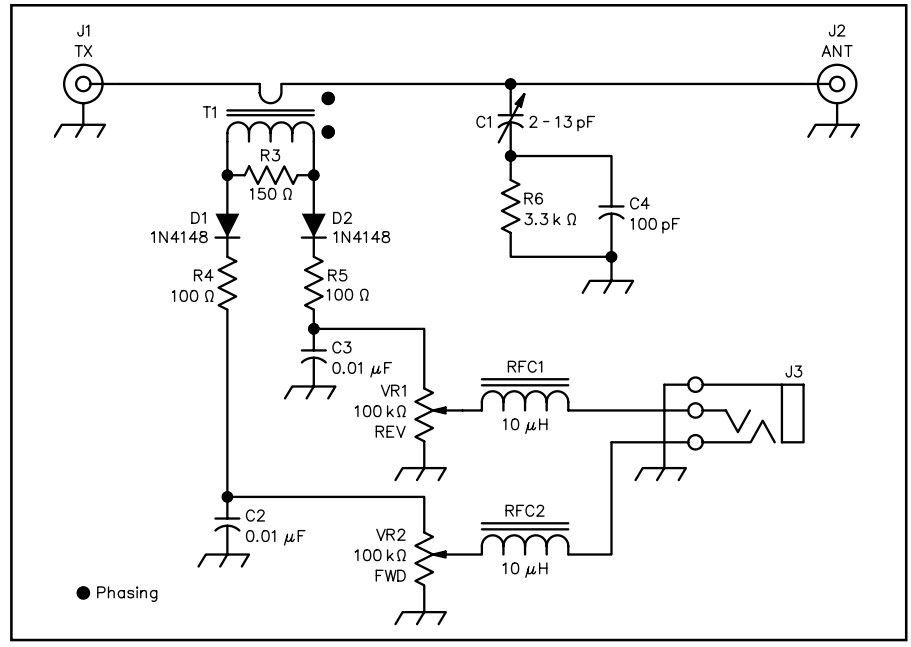


Figure 7—Schematic of the HF SWR sensor. Unless otherwise specified, resistors are 1/4-W, 5%-tolerance carbon-composition or film units. Equivalent parts can be substituted.
C1—2 to 13-pF air-variable trimmer
D1, D2—1N4148 silicon switching diode
J1, J2—SO-239 coax connector
J3—3-circuit 1/8-inch phone jack
RFC1, RFC2—10-μH RF choke
T1—14 bifilar turns #28 enameled wire on an FT-37-43 core.
VR1, VR2—100-kΩ PC-mount pot

lines to begin processing the DTMF tones. Once a valid tone is received, the software builds a string of DTMF tones. When the last tone is received— denoted by a two-second or longer pause—the string is compared to the command list. If a string matches a command, it is executed. If there is no command match, the software returns to monitoring tones.

When a command is executed, the related action takes place immediately. For example, if the command to read forward power is received, the forward power from the ADC input port is read. U1 then uses the look-up table in U2, the serial EEPROM, to convert the reading to watts. The watt number is formatted to a data string and sent via the SPI bus to be spoken by U12. When U12's message ends, the software returns to monitoring DTMF tones.

Menus

Eight menus control all of the RCA functions (see Table 1). You can scroll through the menus by pressing the **Menu** pushbutton. Under normal operating conditions, the **Status** menu is displayed. It shows when the COR is active and when valid DTMF tones are being received.

The second (**Command**) menu programs the codes for the commands. Pressing the **Select** button scrolls through the list of available commands. Pressing the **Data** button scrolls the cursor from one initial character to the next in the command-code sequence. Valid characters include: 0-9, A, B, C, D, *, and #. Pressing the **Select** button again cycles to the next command character. Pressing the **Menu** button enters the code in the display as the new command code. You can then use the **Select** button to scroll through the commands once more.

Table 1
Menu System

Menu	*Select*	*Data*
Status	-	-
Program	Command	Xxx
Program Call	Position	Xxxxxx
Band	10, 6, 2, 220, 440	-
COR Logic	hi, lo	-
Power Scale	1, 1/2, 1/4	-
Temp Report	F, C	-
Voter Report	ON, OFF	-
Signal Report	ON, OFF	-
Call	ON, OFF	-

The **Call Sign** menu works like the command-code menu. Valid characters include all letters and numbers and a blank. There are six character locations. The call sign can use any of the six as long as they are in sequence. Blanks do not equate to pauses.

The **Band** menu allows selection of 10, 6 and 2 meters and 440 MHz. This choice selects the proper look-up table to use for the forward and reverse SWR readings.

The **COR Logic** menu chooses between active-high and active-low COR logic. The input and output lines to the processor are matched to the COR logic.

Some repeater owners may not want to announce the repeater's transmitter power. The **Power Scale** menu keeps people other than the repeater owner from knowing the actual transmitted power. The scale can be selected to read back at full, half or one quarter of the real power. With the scaling, the repeater owner can easily convert the announced power reading to the real power reading.

The last two menus simply toggle the voter report and the call-sign status on or off. The call sign can be used if the RCA is connected to a radio that does not have a controller. This allows remotely monitoring weather conditions and reporting of other transmitters, such as remote packet radios. When activated, the call sign is voiced after the data is reported by the RCA.

Construction

Assembly is straightforward. Because there are so many ICs, it is best to use a ready-made PC board.[6] Use sockets for all ICs, as many repeater environments are prone to lightning strikes. When installing the ICs (especially U1), follow ESD safe-handling procedures and use a wrist strap to avoid damaging components. Once U1 is in its socket, it is well protected.

Place the RF sensor in a shielded enclosure to reduce the influence of RF fields. Ribbon cable connects the main board to the LCD and front-panel switches. Use a heat sink on U3, the 7805 regulator.

Adjustments

Because some repeater controllers do

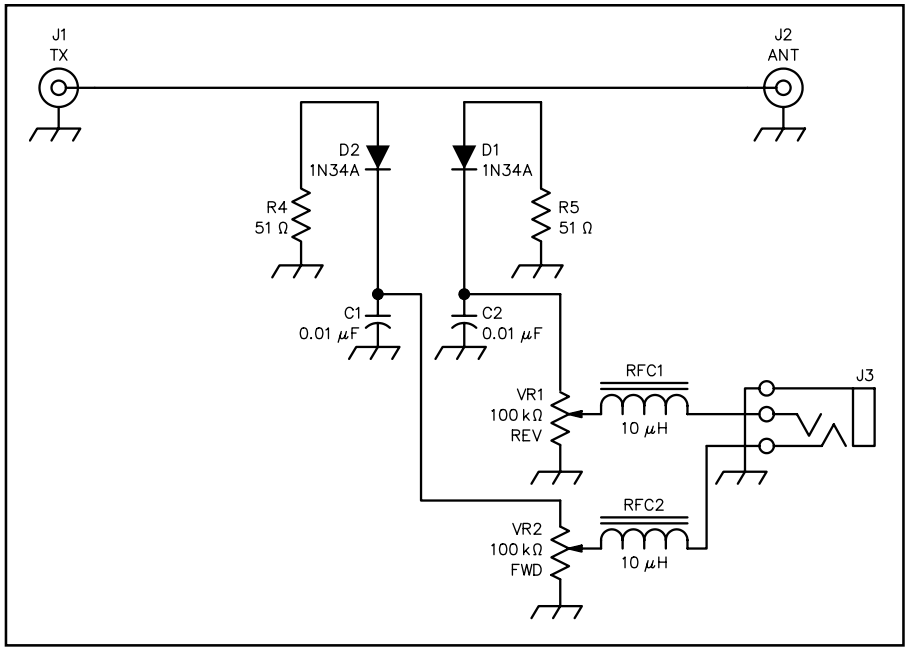


Figure 8—Schematic of the VHF/UHF SWR sensor. Unless otherwise specified, resistors are 1/4-W, 5%-tolerance carbon-composition or film units. Equivalent parts can be substituted. This sensor uses a stripline in lieu of the HF sensor's toroidal pickup.
D1, D2—1N34A germanium diode
J1, J2—SO-239 coax connector
J3—3-circuit, 1/8-inch phone jack
RFC1, RFC2—10-μH RF choke
VR1, VR2—100-kΩ PC-mount pot

not pass DTMF tones, it's probably best to install the RCA between the repeater's receiver and controller. The RCA's frequency response is 30 to 20,000 kHz, with a total distortion of less than 1%, so its presence does not affect the audio signals required by the repeater.

Few adjustments are needed. Start by adjusting VR1 so that your COR signal is read by U1. If you know your system's COR levels, you can monitor test point 1 (TP1) to set the COR level between the high- and low-voltage limits of your system. The COR LED (DS2) will light if the COR is being received.

VR3 adjusts the audio level fed to the DTMF decoder chip. While receiving a DTMF tone, watch the COR LED (DS2) to see if a tone is being received properly; it lights when the **DTMF Valid** signal is active. VR5 adjusts the voice level sent to the audio output. VR4 adjusts the overall audio-output level. Monitor your transmitter and another controller to ensure the voice is at an acceptable level. VR2 is the LCD's **CONTRAST** control.

The RF sensors have calibration adjustments. For the 10- and 6-meter sensor, first set VR1 and VR2 on the sensor PC board to midposition. Then, to calibrate the SWR-sensor reverse reading, connect the *transmitter* to the **ANTENNA** port and a *dummy antenna* to the **TRANSMITTER** port on the RF sensor. While transmitting at a level of 10 W, adjust C1 for a minimum voltage on the reverse line. A reading of 0.1 V or less is fine.

For all sensors: With the connections to the **ANTENNA** and **TRANSMITTER** ports still reversed, transmit a 10-W carrier and adjust the **REV** pot (on the RF board) for 1.2 V. Then, connect the transmitter and dummy antenna to their *proper ports*. Transmit a 10-W carrier and adjust the **FWD** pot on the RF board for a reading of 1.2 V. Once calibrated, the sensors offer an accuracy of 5% and a power resolution of 1 W over each band.

To adjust the signal-to-noise converter, transmit a 1-kHz tone with a 2.5-kHz deviation to your receiver. If you don't have a tone generator, a DTMF signal from your H-T will do. Adjust the **INPUT-BUFFER** pot (VR6) to read 0.5 V ac at the audio test point. Next, with the squelch open and no RF signal on the receiver, adjust the **NOISE-BUFFER** pot (VR7) to read 4.0 V dc at the noise test point.

The temperature and voltage sensors require no adjustment, neither does the wind sensor—it's calibrated at the factory.

Operation

After connecting the RCA to your repeater or remote base, you might want to program each code you intend to use rather than using the default values. Be sure that the codes you program don't conflict with codes used by your system controller. All codes are limited to three digits. The letters A, B, C and D, the pound key (#) and asterisk (*) may be used. This programming must be done from the front panel of the RCA, *not* over the air.

To operate the RCA, simply key your radio and use its DTMF pad to send the three-digit sequence corresponding to the function desired. (All remote-control operation must take place above 222.15 MHz.)The RCA will keep the repeater keyed; speak the words corresponding to that function, then unkey the repeater.

By being able to remotely monitor many sites, the RCA is certain to save repeater maintainers countless hours of valuable troubleshooting time. I've installed an RCA at each of our repeater's main sites and each remote site. I'm thankful for them every time I get a late-night phone call from someone with a repeater trouble report!

Acknowledgements

My thanks to the Calvert Amateur Radio Association for providing the testbed on their 146.985 repeater. Special thanks goes to Gene Tehansky, AA3AV, for his contributions with the assembly code and PC-board layout. As always, thanks to my wife, Jennifer, for her understanding and support of yet another project.

Notes

[1]Dwayne Kincaid, WD8OYG, "A Microprocessor-Controlled Repeater Voting System: the RVS-8," *QST*, Apr 1996, pp 38-43.

[2]Mark Kolber, WB2WHC "An Audio-Noise-Based Voting Circuit," *QST*, Oct 1992, pp 24-26.

[3]Peet Bros Company, 1308 Doris Ave, Ocean, NJ 07712; tel 732-531-4615; **http://www.peetbros.com**; wind sensor: $89.

[4]John Grebenkemper, KI6WX, "The Tandem Match—An Accurate Directional Wattmeter," *QST*, Jan 1987, pp 18-26. See also John Grebenkemper, KI6WX, "An Updated Tandem Match," Technical Correspondence, *QST*, Jul 1993, p 50.

[5]The software for all three programmable ICs, including the source code, is available for download from the ARRL Web site: **http://www.arrl.org/files/qst-binaries/**.

[6]A complete kit of parts including all PC boards and all *preprogrammed* ICs is available for $199, plus $10 shipping from LDG Electronics, 1445 Parran Rd, St Leonard, MD 20685; tel 410-586-2177; **http://www.ldgelectronics.com**. Please specify which band (10, 6, 2, or 440 MHz). Matching enclosures (rack unit and RF sensor) are available for $85, plus $12 shipping. All major credit cards accepted. Maryland residents must add 5% sales tax.

Dwayne Kincaid, WD8OYG, was licensed in 1977 at the age of 16. He holds a BS in electrical engineering from West Virginia Tech and works at the Naval Air Warfare Center, Aircraft Division, Patuxent River, Maryland. You can contact Dwayne at 1445 Parran Rd, St Leonard, MD 20685; **ldg@ldgelectronics.com**.

By George Edwards, K5VUU

A Tower in the Attic

No grounds for supporting your dream beam? This approach can make your dream become a reality!

I was first licensed as K5VUU in 1959. Since then, I've operated from many locations in the US and overseas. But for a number of reasons, I've never installed a tower and tribander. For several years, I wasn't very active pursuing DX or QSL cards. In 1998, however, I got the DX bug and started chasing QSL cards and awards. Then, to celebrate my 40th year as a ham, I not only qualified for DXCC, but got my WAS, WAC and WAZ certificates as well. I was getting serious.

I'd Like a Tower

For many years, I'd dreamed of retiring in a location that would provide the opportunity to erect "the ideal tower set-up," and an antenna "farm" with room for antennas covering 10 through 160 meters. Early in 1999, our family decided not to move again when I retire in a few years. We live in an older neighborhood in Spring, Texas, north of Houston where there are no deed restrictions relative to antennas. Our house and a three-car garage are at the back of a corner lot. This arrangement creates a small, enclosed backyard with no good location for a tower without removing some of the large trees surrounding the house. More significantly perhaps, the backyard garden is my wife's hobby, so we have a self-imposed "domestic deed restriction"!

Along with my decision to retire at our current location I was determined to install a "compromise ideal" tower setup within the constraints at hand. I wanted a lightweight triband beam with a small turning radius and a low profile. Several friends of mine are very pleased with their Force 12 beams, so I looked at them and selected the C-3SS. It meets all my requirements. This 27-pound antenna has a 12-foot boom, a turning radius of 13.5 feet and presents a wind load of 4.4 square feet. I particularly like the antenna's trapless design, especially for the lower visual profile that it provides. Recently, several other antennas have entered the market that would also suit my needs.

Figure 1—A top section of Rohn 25AG2 nestles comfortably in the attic. V-notched boards fastened to the roof rafters clamp the neck of the tower sleeve. A mating base plate secures the bottom end of the tower section to the ceiling joists below.

Deciding which antenna to buy was the easy part. The next questions were: How do I get it in the air, and how far up is "high enough"? Our story-and-a-half English Tudor house has steep gables surrounding a small upper roof section. Both ends of the house face large trees. The only location for the antenna was near the middle of the house at or near the peak of the roof, which is 25 feet above ground. I'd decided to mount the antenna at a height of 33 feet. That meant I needed a mast extending at least eight feet above the roof peak near the middle of the house. Initially I considered using a roof-mount tripod, but decided against it because it would almost double the amount of visible metal and require at least one leg to rest on the front side of the roof. Wanting to avoid that led to my tower-in-the-attic idea.

My Compromise

I elected to use one Rohn 25AG2 tower section—the top (see Figure 1). This sec-

Figure 2—Readily available roofing materials designed to seal vent pipes and other angled-roof protrusions are used to seal out the weather.

Figure 3—With the flexible rubber drain connector raised, portions of the mast and tower sleeve are visible. A piece of two-inch aluminum no-caulk vent-stack roof flashing with a neoprene seal placed over the tower sleeve prevents water from running down the outside of the tower sleeve and into the attic. Nearby, the coaxial cable feed line passes through an added vent pipe and elbow on its way from the attic to the antenna.

tion has a sleeve about 33 inches long, the inner diameter of which closely fits and helps support a two-inch-OD mast. The tower-section sleeve fits through a $2^1/_2$-inch-diameter hole in the roof and presents an easy way to seal out the weather as there are several ready-made roofing components designed to seal vent pipes and other angled-roof protrusions (see Figure 2).

Top to Bottom

Because there was a distance of only about six feet between the 2×8-inch second-floor ceiling joists and the 2×6-inch roof joists, I cut the bottom of the Rohn 25AG2 top section so that approximately eight inches of the tower sleeve protrudes above the outside roofline. Over the tower sleeve I placed a piece of two-inch aluminum "no-caulk" vent-stack roof flashing with a neoprene seal (see Figure 3); this prevents water from running down the outside of the tower sleeve and into the attic. A two-inch to three-inch rubber flexible drain connector keeps water from running down the two-inch-OD mast and between the mast and the tower sleeve (see Figure 4). This arrangement provides a secondary benefit not found in a "normal" tower installation: Because the water can't get between the mast and the tower sleeve, the mast is unlikely to lock up in freezing weather. I also installed a two-inch flexible pipe cap on top of the mast to prevent water from running down the inside of the mast. These two parts could be used to reduce or prevent freeze-up in outdoor tower installations. Of course, that wasn't my concern in South Texas! Because we get more than our share of wind and rain on the Texas Gulf Coast, I have had *many* opportunities to test this setup and have had virtually no leaks.

Although the house has a composition roof over a plywood deck, I figured it would be difficult to cut a hole in the roof and deck that provided a tight fit between the roof and the tower sleeve. That would also have made it very difficult to maneuver the tower section in place in the limited area available. So I decided to brace the top of the tower sleeve section on the underside of the roof. As you can see in Figure 1, I did this by placing two **V**-notched boards on two sides of, and tightly against, the tower sleeve, fastening the boards to the 2×6-inch roof rafters, which are further braced by the plywood decking overhead. I fastened the **V**-notched boards to the 2×6-inch rafters with a dozen three-inch-long wood screws (three screws on each end of both notched boards). This locks the top end of the tower sleeve in all directions providing structural support and preventing relative motion to the roof, seals, etc.

To route the feed line to the antenna, I used a section of $1^1/_2$-inch black schedule 40 PVC pipe and an elbow that's part of a $1^1/_2$-inch trap (see Figure 3). The pipe is clamped to a rafter with two pipe clamps and wood screws. I sealed the pipe/roof junction as I had the tower sleeve. (Stuff some fiberglass insulation into the elbow to discourage entry by unwanted critters.—*Ed.*) I ran the coax through the elbow before fastening the elbow to the pipe with black vinyl tape.

Securing the tower section at the bottom is similar to the procedure used in other installations. To provide a solid base, I installed a 30×50-inch section of $1^1/_4$-inch-thick plywood subflooring. Four-inch-long wood screws fasten this piece across three of the 2×8-inch second-floor-ceiling joists. I mounted a Rohn 15×15-inch base plate to the subflooring with three $1^1/_2$-inch-long $^3/_8$-inch zinc-plated lag screws (I had to drill $^3/_8$-inch-diameter holes in the base plate to pass the screws). This secures the attic tower at both ends.

Next, I installed a Rohn AS25G rotator base and a Yaesu G-450-A rotator. For the mast, I used a 12-foot-long piece of 2-inch OD, $^1/_4$-inch wall, 6061-T6 extruded-aluminum tubing. This mast length places the tribander 33 feet above ground and eight feet above the peak of the roofline. I later realized a secondary advantage to this installation: I can loosen the bolts holding the mast to the rotator, then remove the bolts holding the rotator to the rotator base plate. Then, I can push up the mast and remove the rotator, allowing me to lower the mast to the tower base plate. This lowers the top of the mast for installing and/or adjusting the beam. I reverse the process to return the beam to its operational height. All of this is accomplished while I'm in the attic, standing on the solid subflooring. I can also orient the antenna and service the rotator and connections with only a short trip up the pull-down staircase to the attic.

Figure 4—A two-inch to three-inch rubber flexible drain connector keeps water from running down the two-inch-OD mast and between the mast and the tower sleeve.

My new beam and attic tower have provided me with many hours of enjoyable and effective operation. If you're longing to install a rotatable antenna and are short on terrain, check your attic!

George Edwards, K5VUU, was first licensed in 1959 and currently holds an Advanced class license. He is active on HF, both fixed and mobile, enjoys chasing DX and is currently building an Elecraft K2 transceiver. George received a BA in speech from the University of Texas and attended the University of Arkansas for postgraduate work in communications. Enlisting in the Army in 1956, he was commissioned in 1964 and served in Asia from 1966 to 1968 in the Army Security Agency. George left the army in 1968 as a Captain, Military Intelligence. George is presently employed as a process improvement engineer at Compaq Computer Corporation in Houston, Texas. You can reach him at 17007 Hillview Lane, Spring, Texas 77379; **gedwards@onramp.net**.

Photos by the author. QST

By Jennifer Hagy, N1TDY

Announcing the Ninth Annual Philip J. McGan Memorial Silver Antenna Award

Throughout the year ARRL PICs, PIOs and other public relations volunteers strive to keep Amateur Radio visible in their communities by publicizing special events, writing press releases, and maintaining good relations with local media among many other valuable activities. Their efforts benefit us all. If you know someone who has achieved public relations success on behalf of Amateur Radio, nominating him or her for the McGan award is the perfect way to say "thank you."

The award's namesake, Journalist Philip J. McGan, WA2MBQ (SK), served as the first chairman of the ARRL's Public Relations Committee, which helped reinvigorate the League's commitment to public relations.

Phil never got to see the fruits of his labor of love. In honor of Phil, his friends in the New Hampshire Amateur Radio Association joined with the ARRL Board of Directors to pay a lasting tribute to the important contributions he made on behalf of Amateur Radio.

The 2000 McGan award will go to that ham who has demonstrated success in Amateur Radio public relations and best exemplifies the volunteer spirit of Phil McGan.

A committee of volunteers knowledgeable about Amateur Radio public relations will pick the winner, subject to approval by the ARRL Board of Directors.

Call For 2000 Nominations

(1) The award is given only to an individual (not a group), who must be a full ARRL member in good standing at the time of nomination. The nominee must not be compensated for any public relations work involving Amateur Radio (including payment for articles) and may not be a current officer, director, vice director or paid staff member, or a member of the current selection committee.

(2) The winner of the Philip J. McGan Memorial Silver Antenna Award will demonstrate volunteer public relations success on behalf of Amateur Radio at the local, state or national level, and will live up to the high standard of achievement exemplified by Philip J. McGan.

(3) Anyone may make a nomination. Nominations must be on an official entry form, available from ARRL Headquarters. The nomination will include a written summary whenever possible.

(4) Deadline: Nominations must be received at ARRL HQ in Newington by 5 PM May 26, 2000. Nominations arriving after the deadline or without an entry form cannot be considered.

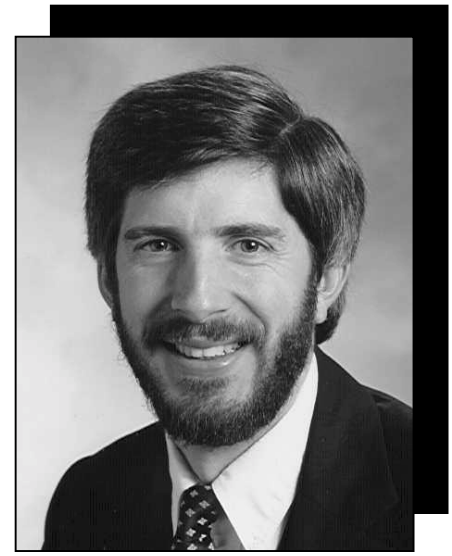
(5) Eligible nominations will be screened by a committee of Amateur Radio operators knowledgeable about public relations, which will forward its recommendation to the Volunteer Resources Committee of the ARRL Board of Directors. The Board will make a final determination at its July meeting and the winner will be notified shortly thereafter.

(6) To obtain an entry form, call ARRL HQ at 860-594-0328 or e-mail **jhagy@arrl.org**. Ask for an official Philip J. McGan Memorial Silver Antenna Award entry form.

(7) Return the completed entry form and supporting materials to: Philip J. McGan Memorial Silver Antenna Award, c/o Jennifer Hagy, N1TDY, ARRL, 225 Main St., Newington, CT 06111.

Public Relations vs. Public Service

In the past, there has been some confusion about the difference between "public relations" and "public service." Public Relations activities for which the McGan Award is given include efforts specifically directed at bringing Amateur Radio to the public's attention (and most often the media's) in a positive light. This may include traditional methods, like news releases; or non-traditional methods, such as hosting a radio show or being an active public speaker. Some candidates have been nominated for their public service activities, such as emergency communications, net leadership and other activities that, while helping maintain a positive impression of Amateur Radio among the public, don't fit the definition of "public relations." So, if you're considering nominating someone in your area for the 2000 award, please ask yourself if your candidate's work fits the *public relations* criteria. QST



Last year's McGan winner, Peter Coffee, AC6EN, of Torrance, California. Peter's efforts represented a broad range of PR activities, from placing stories in his local, regional and national press to introducing the magic of radio to area students.

STRAYS

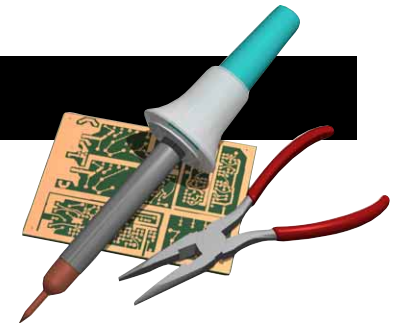
QST Congratulates KA3WVD

◊ Jenny Craigie, KA3WVD, age 21, from Paoli, Pennsylvania, has been named to *Who's Who in American Colleges and Universities*. Jenny is a senior majoring in psychology at Guilford College in Greensboro, North Carolina.

WANTED: TE201 KEYER SCHEMATIC

◊ I'm looking for a schematic diagram for a TRAC Electronics model TE201 memory keyer. Fred Holt, N5LMG, 240 Pine Knot Rd, Fairfield Bay, AR 72088.

Next Stray



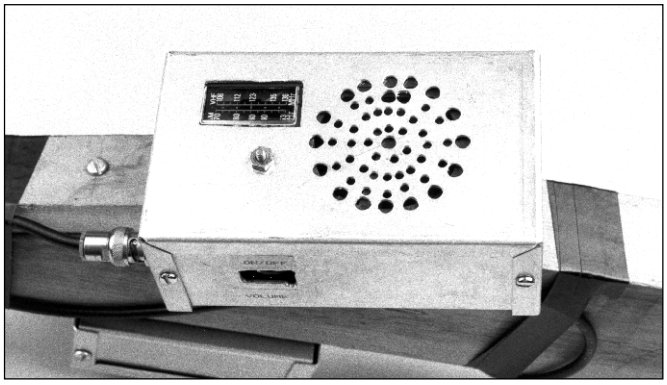
The Doctor is IN

Q Les, KL7J, asks, "Do you have any suggestions for an inexpensive AM receiver I could use to locate power line noise sources?"

A For close-in tracking (*DFing*) of a wideband noise source, you need a receiver that is fairly high in frequency. The AM aircraft band at 120 MHz works well and inexpensive receivers can be found that cover it. Many of the H-Ts on the market today also include AM reception in that frequency range, so if you know someone who has bought an H-T in the last couple of years, ask them if it has AM aircraft and if they would be willing to help you track down the problem.

Quite a few portable shortwave receivers also have AM airband reception. Another alternative is a couple of portable receivers from Radio Shack that feature AM aircraft reception. Model 12-456 retails at $35 and model 12-615 (handheld) sells for $25. Although these receivers do not have coax connections, you can still use them by connecting the center conductor of the coax from your DFing antenna to the existing antenna with a clip lead. Connect the shield of the coax to a case screw. The mismatch will give you some attenuation, but it will be a useful setup nonetheless.

You can find more information on hunting down power line RFI on the ARRL Web site at: **http://www.arrl.org/tis/info/rfi-elec.html**. Also, check out "A Line Noise 'Sniffer' That Works" by William Leavitt, W3AZ, in the September 1992 *QST*. If you don't have the issue you can get a photocopy of the article for $3 ($5 for nonmembers) by contacting the ARRL Technical Secretary at 860-594-0278; **reprints@arrl.org**.



W3AZ mounted an airband receiver in a shielded case as part of his line noise "sniffer."

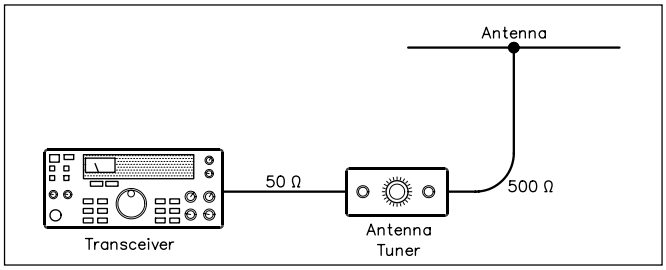


Figure 1—Think of an antenna tuner as an adjustable impedance transformer. Depending on the operational range of the tuner, it can match the antenna system impedance to 50 Ω for your transceiver.

Q Bill, W0LPQ, asks, "Is it true that an antenna tuner does not really 'tune' the antenna? And if an antenna is cut to resonance already, what good is a tuner?"

A Yes, it's true—an antenna tuner doesn't really tune your antenna in the strict sense of the word. It does not, for example, adjust the lengths of your antenna elements, their heights above ground and so on. What an antenna tuner *does* do, however, is transform the impedance at the feed line input to a value that your transceiver can handle (typically 50 Ω—see Figure 1). Think of an antenna tuner as an adjustable impedance transformer and you'll better understand its function.

If the antenna is cut to resonance and is designed to match the impedance of the transceiver and feed line, an antenna tuner is not required. The transceiver is presented with a 50-Ω impedance (or something close to it) into which it can deliver its full output. However, the SWR bandwidths of many antenna designs are usually limited to only 200 or 300 kHz. If you cut a dipole, for example, to be resonant and provide a 1:1 SWR at 7100 kHz, you might find that the SWR climbs well above 2:1 when you attempt to use this antenna at 7250 kHz. Most modern transceivers begin reducing output, or may shut down completely, at SWRs greater than 2:1. With an antenna tuner in the line you can transform the impedance to 50 Ω, reducing the SWR to 1:1. The transceiver delivers its full output once again and you'll be able to operate on 7250 kHz—minus some feed line attenuation between the tuner and the antenna. The attenuation is caused by the fact that the SWR on the feed line between the tuner and the antenna is not affected by the matching function of the tuner; it remains unchanged.

Q Ray, AH6LT, asks, "I have an antenna mounted on my apartment balcony with a counterpoise wire laying on the floor. The RF safety regulations don't say anything about counterpoises, but I presume that they radiate. What is the safe distance one should be from a counterpoise?"

A You are correct—a counterpoise is a radiating part of the antenna, especially if it is located significantly above ground. There are several ways you can evaluate it.

If you had accurate field-strength measurement equipment, you could measure the fields. This is, however, usually beyond the scope of most amateurs.

Most evaluations will be done by calculation. You can use the rather straightforward calculation methods outlined at the RF Safety Calculator Web page at the University of Texas at: **http://n5xu.ae.utexas.edu/rfsafety/**. The calculator will help you estimate the distance people need to be from any part of your antenna system (including the counterpoise). This is generally a conservative estimate; fields are usually less than the calculation would indicate. You could also use one of the antenna modeling software packages to get a more accurate estimate.

See **http://www.arrl.org/news/rfsafety** for ARRL info on the subject, plus links to the FCC.

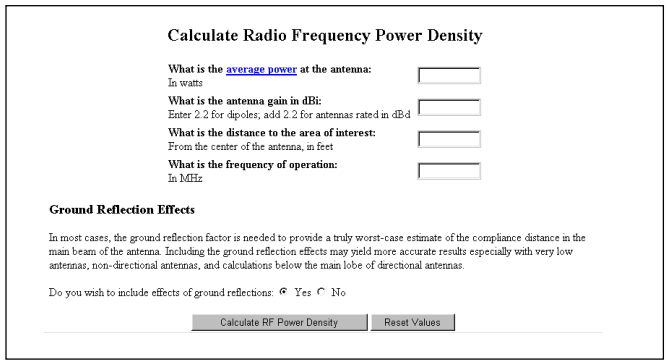


Figure 2—You can find an RF safety calculator on the Web at: http://n5xu.ae.utexas.edu/rfsafety/.

Q Bob, K4RFK, asks, "I live in Cape Coral, Florida. The local radio station, WINK-WNOG, transmitting on 1200 kHz AM, can be heard on my transceiver on several HF bands. I called the station and informed them of the situation and they said it was my problem. Can you help?"

A The type of interference you describe can come from several possible sources. The first could be the broadcast transmitter. Their transmitter could be transmitting some signals other than the one they are licensed to use. These signals are usually exact multiples (2.4 MHz, 3.6 MHz, etc.) of the transmitting frequency, but modern transmitters can also transmit other signals due to the internal mixing processes. These unwanted signals are collectively called *spurious emissions*, or simply *spurs*.

Much like the regulations that govern the Amateur Radio Service, there are stringent FCC regs governing the levels of broadcast spurs. Even if the spurs are below the FCC limits, however, the regulations require that radiated signals not cause harmful interference. The FCC, however, has stated that simple *reception* of a spurious emission does not constitute harmful interference. The signal is only considered "harmful" if it causes repeated disruptions of communication.

It is also possible that the problem is in your station receiver. A very strong signal can overload a receiver, resulting in spurious responses. These can range from image responses, to receiver responses, to various internal spurious signals in your receiver's local oscillator or phase-lock-loop circuitry. There are a few things you can try to diagnose whether this may be occurring. The easiest is to try an entirely different receiver. Its internal design will be different than the receiver on which you are hearing signals, so it will have a different set of spurious responses. It is best to use a receiver built by a different manufacturer for this test. If the interfering signals disappear, then you clearly have a problem.

If you are unable to use a different receiver, there are some tests you can try that may help diagnose the problem. Switch in your receiver's attenuator. If you select a 10-dB attenuator and the unwanted signal drops by significantly more than 10 dB, it is a clear indication that the signal is an unwanted receiver spurious response. Also, note how the receiver tunes in the unwanted signals when in the CW or SSB mode. If the tuning seems "fast," meaning that the beat note of the carrier seems to be changing in pitch at a faster rate than normal as you tune across it, this also is a clear indication that a receiver spurious response is the cause of the interfering signals.

Not all receiver responses will necessarily be found with the above tests. In that case, you may want to try a filter on the receiver to eliminate the broadcast spurs. You can use the search engine at **http://www.arrl.org/tis/tisfind.html** to search the database for companies that sell broadcast band filters.

Q Alan, KZ1Y, asks, "What is the difference between simplex and duplex?"

A *Simplex* is a mode of communication in which stations transmit and receive at separate times, either on the same frequency or separate frequencies. One station transmits while the other listens, then the roles are reversed. Most amateur communication is simplex in nature.

Duplex (or *full duplex*) occurs when stations transmit on one frequency and receive *simultaneously* on another. FM repeaters, for example, are duplex stations; they receive and transmit at the same time (although the repeater users are operating "half duplex"). Amateur satellite operators often use duplex, transmitting to the satellite on one frequency while listening simultaneously on another so that they can compensate for frequency drift caused by the Doppler effect.

Q Is it true that you can use a 40-meter dipole antenna on 15 meters as well?

A In many cases, yes. Dipoles have harmonic resonances at odd multiples of their fundamental resonant frequencies. Because 21 MHz is the third harmonic of 7 MHz, 7-MHz dipoles are harmonically resonant in at least a portion of 15 meters. This is attractive because it allows you to install a 40-meter dipole, feed it with coax, and use it without an antenna tuner on both 40 and 15 meters.

There is a catch, though. This idea works if you cut the 40-meter dipole for use in the CW portion of the band, say around 7010 kHz. Such a dipole should also be resonant in the CW portion of 15 meters at about 21030 kHz (7010 x 3 = 21030). But what if the 40-meter dipole is cut for phone work at 7250 kHz?

$7250 \times 3 = 21{,}750$

Oops! The 15-meter resonant frequency is out of the band.

The solution is to capacitively load the antenna. The simple loading wires known as *capacitive hats* shown in Figure 3 lower the antenna's resonant frequency on 15 meters without substantially affecting resonance on 40 meters.

To put this loading scheme to work, first measure, cut and adjust the 40-meter dipole to resonance at your desired frequency. Then, cut two 2-foot long pieces of stiff wire (such as #12 or #14 house wiring) and solder the ends of each piece together to form two loops. Now twist the loops in the middle to create two figure 8s. Solder the twisted centers of your figure 8s to each leg of your 40-meter antenna at a point about a third of the way out from the feed point (placement isn't critical). Adjust the loop shapes and take measurements on 15 meters until you reach an acceptable SWR on your chosen frequency. When you check the SWR on 40 meters you should only see a minor variation.

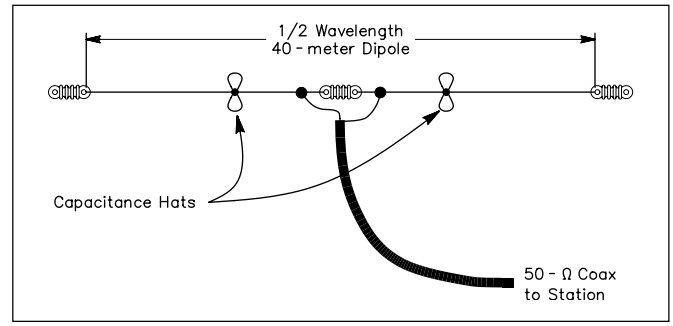


Figure 3—Figure-8-shaped capacitance hats made and placed as described in the text and make your 40-meter dipole antenna resonate anywhere in the 15-meter band.

Do you have a question or a problem? Ask the doctor! Send your questions (no telephone calls, please) to: "The Doctor," ARRL, 225 Main St, Newington, CT 06111; doctor@arrl.org. QST

By Herbert F. Slade, AA2BF

A Beginner's Guide to Scaling Natural Skyhooks

Trees and ham antennas have had a love/hate relationship since radio's earliest days. By learning how to safely climb your "antenna trees," you'll likely improve your antenna's performance and make life a little easier for your "natural skyhooks."

Remember the first wire antenna you planned? Some of us still exclusively use wires, and for good reason—they're relatively cheap and relatively effective. (I confirmed more than 250 countries in nine years using only a variety of dipoles and other low-gain wires and 100 W.) Getting the wire "up there," however, is the main challenge.

Some readers are blessed with convenient rooftop locations that leave everything easy to reach by window or ladder. But trees just seem to be ordained for use as wire antenna supports, so that's what I'll focus on here.

Conventional Wisdom

So, you have your 40-meter dipole assembled and ready to install between a couple of trees that are conveniently separated. What's next? Many short-term installations are launched with a slingshot or bow and arrow (and a fishing line leader for the wire to tie onto). That has one major disadvantage.

Let's assume that you use the fishing line to pull up a rope that supports the antenna. If you were a good shot, the support rope will go over a desirable branch and return to the ground, where you can tie it off. The same effort will get a support rope into the tree on the other end. But because wind storms have a nasty effect on wires drawn tightly between trees, you're probably going to leave enough slack (and sag) in the antenna to minimize its chances of getting snapped by the next stiff breeze.

Because of this extra sag, the effective height of your dipole will be a few feet lower than you could achieve if you dared to pull it tight. Additionally, there's no way to protect your trees from the inevitable sawing action as the ropes move across the branches. In time, this will wear through the rope or bark and probably kill off the branch.

If you could physically get to the apex of each tree, you could add a pulley and a counterweight. You could put more tension on the wire, resulting in less sag. You could protect the tree with a piece of garden hose where the antenna support rope or pulley is tied off. From this vantage point you may be able to use trees that have obstructions between them—trees that would be impractical to work with from ground level. Being able to climb trees can be a distinct advantage!

Skyhook Scaling 101

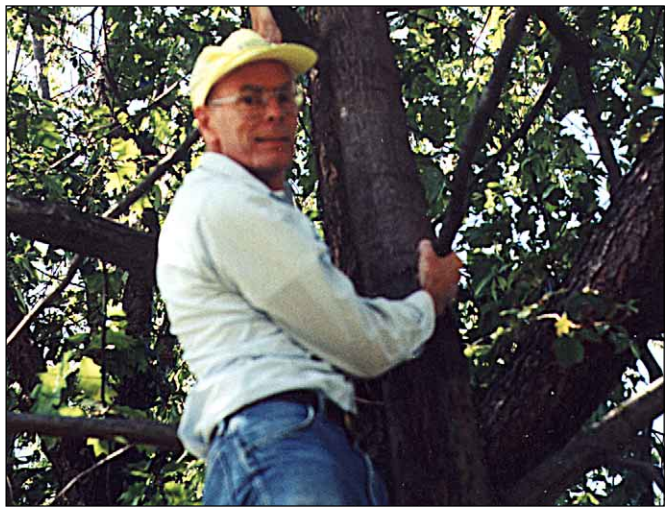
Before climbing anything there are several things to keep in mind. The first three are safety, safety and safety! A 40-foot fall is pretty unforgiving. But you can minimize its likelihood by taking practical steps to prepare.

The most obvious consideration is, "Do I have to?" Weigh an affirmative answer against, "Am I able to do this safely?" Not everyone can climb trees. I wouldn't be ashamed to answer "no" to both questions and look for a non-climbing solution to my antenna needs, if necessary.

You should certainly be in excellent physical condition. Being able to do at least several "chin-ups" is very desirable. Practice climbing a few times before trying to do any useful work aloft. You need to be limber for climbing, so get in the habit of doing stretching

The leg-wrap secure position. With one or both legs wrapped this way, both hands are free.

A handy climbing cleat. Drive 5-inch nails into the trunk through holes drilled in a 2 × 4.



Moving between branches. Maintain a solid hold with one hand while reaching with the other. Always hold with both hands whenever you move your feet.

A tool as fundamental as this rock and cord can be surprisingly useful.

exercises regularly, especially just before going up.

Next comes planning. Naturally, you'll need to measure distances and estimate clearances, both for the finished antenna and the installation process. At this point, abandon any thought of running part of the antenna or its support ropes over or under any power line. In fact, do not climb into any trees that are in contact with, or adjacent to, power lines or any other commercial cables. The risk simply isn't worth it.

Assuming that the designated tree is free of power cables, inspect the branches. Which branches look dead (check during foliage season)? Where are branches far enough apart to make climbing difficult? Where is the logical point for tying off the antenna? Will you have to cut away any branches to make a clear path? Also, learn to recognize poison ivy and poison oak, including the hairy but leafless vines that sometimes grow on tree trunks. Most of this can be done from the ground, but a practice climb or two in your "target" trees is a good idea, too. Timing is also important. Don't start a tree project at sundown, with a storm approaching or when dinner is about to be served. I know it's obvious, but I've made all these dumb mistakes!

Think about what you can accomplish with each climb. For safety's sake, and to reduce wear and tear on the tree bark, it's probably better to finish the job with a minimal number of ascents. I recently planned a rather complicated project and found it helpful to write an ordered list, with detailed tasks in one column and the tools and materials needed for each task in another.

If possible, work with a partner, even if he/she stays on the ground. You'll greatly appreciate having one the first time you're up a tree only to discover that you forgot a tool. (Let down a rope that you didn't forget and your helper can tie the tool on to be hauled up.) If your partner can also work in one tree while you're in another, so much the better.

What is high fashion for tree climbing? Well-fitting jeans, a work shirt with long sleeves and high-top sneakers are good for starters. Gloves are *not*, unless they fit very snugly and/or leave your fingertips exposed. Leave any necklaces or chains on the ground and eliminate protruding tool handles that could get snagged.

A utility pole-climbing belt is a good investment. There are ads for these in most ham magazines, including *QST*. Unfortunately, a climbing belt is hard to use while actually climbing most trees. Once you've arrived at your working position, however, secure yourself with the safety belt. I don't recommend belting in while climbing if you will have to detach and reattach your belt clip frequently while getting around branches. Manipulating the belt requires one or both hands that you need for gripping the tree. It's better to hold on and climb as described below and wear the belt clipped to itself until you reach your working height.

Beginning with your practice climbs, learn to look at each branch before committing your weight to it. Is it alive? Is it thick enough to support my full weight? Understand that certain trees are inherently weaker than others. For example, oak, hickory and maple trees are strong, but watch out for wild cherry, sassafras and dogwood varieties. Dead branches are dangerous. Avoid hanging from or standing on these, especially if you are not able to also hold onto a trustworthy branch at the same time!

Where suitable branches are too far apart, it may be necessary to add cleats to the trunk. These can be two-foot pieces of common two-by-four lumber, predrilled to accommodate five-inch spikes for nailing into place against the tree trunk. There should be two holes, no less than three inches apart, drilled either side of center and not along the same grain line. The nails must set deeply into the tree trunk. When climbing, hold onto or stand on these as close to the trunk as possible to prevent loosening the nails. I have no experience with utility pole climbing irons, but I will point out that they take training to use properly and they cause more damage to the tree than a few semi-permanent nails.

Up, Up and Away

Are you ready to climb? Put up a good extension ladder and secure it by leveling the feet against the ground. If the ladder must stand on an uneven or potentially slippery surface, take the time to put non-skid blocks under the feet to make it safe. Remember that the top will probably rest against a single point on the tree (the curve of the trunk), making that end inherently less secure. Having a partner to hold the ladder while you climb up or down is a smart idea.

If this is a working climb, check your list for required tools and parts. Put small tools and parts in easy-to-reach pockets. (I like to button them inside my work shirt so they're right in front.) Tie a lightweight rope to any larger tools and leave them at a convenient place on the ground where you can pull them up. Tie the other end of this rope loosely to your belt (behind you) and start up the tree. As you go, try to keep the rope ascending in a vertical direction toward your destination. This may require untying and retying it from your belt to pass it around branches. Do this only when you can belt yourself in or lock yourself in a secure position. When you get to your work location, belt yourself in and tie the lift rope to a branch where you can reach it when you need to pull up the tools.

If you don't think you'll need anything more than what you can carry in your pockets, carry a ball of lightweight cord and a small

The wire antenna and tie ropes can be kept under control with this simple homebrew device. The spool is a coffee can and the "drag" can be made from a piece of scrap wood and a bungee cord.

rock so that when (not if) you remember that "one more thing" you left on the ground, you can drop the cord down and your partner can tie it on for you. You'll also find this cord and rock handy when it's time to pull up the antenna (more about this later).

Back to the climb. Avoid poison ivy vines and leaves by climbing past them on your ladder or by moving around to the other side of the tree. Test each step, even when on the ladder. Move slowly and deliberately. Examine each branch and stump you come to, and consciously decide if it's trustworthy (and can bear your full weight). Place your feet and hands on branches as close to the trunk as possible, and always move only while holding on with at least one hand. Avoid stepping into tight crotches between branches and the trunk. They can trap you. Plan each move and avoid overreaching. It's better to prepare a cleat or two than to risk scrapes and injury. Stop and rest as necessary, belting in when you do. There is no rush. Enjoy the view.

With practice, your confidence will increase. You will find ways to use your hands, feet, knees and back to help you climb and to lock yourself into place. But be sufficiently fearful, even then. You need to respect what you're doing at all times and not allow yourself to be distracted. Branches sometimes break. That's why you need to have a secure hold on one while you reach for the next.

What can you do, once you're belted in and standing on a strong branch? Depending on your situation, it may be necessary to clear away one or more branches so your antenna can be stretched out without interference. A hand saw—or even a chain saw—can be pulled up from the ground. Obviously, great care is needed, especially if a branch to be cut is of considerable size. Again, it's wise to ask yourself the two questions: "Do I have to?" and "Am I able to do this safely?" If your answers aren't "Yes," *don't!*

If you need to make the cut and are able to proceed safely, start by planning. Where will the branch fall? Will it be more manageable if you cut it off in sections or with one cut near the trunk? Should you tie the branch to a higher point on the tree while cutting? What will you need to do at the moment the branch begins to break? Should you get a professional to do this? Remember, with limb cutting as with climbing, haste is your enemy. *Never* give in to it.

Raising the Antenna

Once the passage is clear, the antenna can be pulled up, one end at a time. Your antenna should be stretched out on the ground—without kinks—along its path between the support trees. From the tie point in either end tree, unroll enough cord from a ball of string (with a small rock tied to the end) to reach the ground. Next, carefully gather it in loops (to prevent tangling) in one hand and throw the rock out over the branches to the ground. Get your partner to tie the cord to the antenna tie rope (which is tied to the end insulator). From your vantage point in the tree, pull the cord, followed by the rope and the antenna, until the end insulator is where you want it to be. Then tie it off temporarily, while the other end is pulled up in the same manner. After final adjustments, the ends can be tied off permanently.

If there are obstructions between the endpoint trees (other trees, perhaps), you will need to go over or through them. If the obstruction is low enough it may be possible to throw your rock and cord over it to the other side. By the way, when you throw something from a treetop perch, both hands will be occupied. You *must* be belted in to do this safely. A slingshot or bow and arrow may work even better for this purpose.

The antenna may have to be strung through a space cleared for it in an intervening tree. This will require climbing this tree to cut away the obstructing branches. Then a rock and cord can be thrown out on either side of the opening in the third tree and tied onto the cord ends from the antenna end point trees. In this situation, the antenna must be rolled up on a large reel and carried to the top of one of the end trees, where it can be fed out without kinking as it's pulled across from the other end. When the cord has finally been stretched across or through all obstructions between the tie points, the end tie rope from the rolled up antenna can be tied onto one end of this cord. Then, rope and antenna are unrolled as they are pulled across from the other end tree. Could this be accomplished from the ground? I don't think so.

As I suggested earlier, tying off an antenna with a pulley and a counterweight provides a considerable advantage. In this configuration, the antenna is tied off to one of the end trees, while the counterweight is used to take up slack and maintain even tension from the opposite end. At the fixed end, after pulling up the antenna, run the end tie rope through a short piece of garden hose (length determined by the girth of the tree at the point of attachment). Cushion the tree from the rope by wrapping the hose around the trunk above a crotch and tie a bowline knot in the rope. (The bowline is chosen because it is not a slipknot. Leave enough space under the rope loop for easy movement and tree growth.)

At the opposite end, attach a suitable pulley to a length of insulated wire rope (the kind sold for clotheslines) and run this through another piece of hose. Wrap this around the trunk as at the fixed end and tie a bowline knot as before. The wire rope to the pulley should extend no more than two to three feet from the tree. When stretched out in the direction of the antenna, the pulley must end up over a vertical space where a counterweight can hang down a few feet without banging into the tree or its branches.

For a counterweight I use a section of a four- to six-inch log that's long enough to weigh about 30 pounds, which gets hauled up and tied off with the lifting rope. When the antenna has been pulled up, its end tie rope is threaded through the pulley and tied near one end of the counterweight. After loosening the lift rope and taking up the antenna slack, the counterweight hangs freely. Another piece of rope is then tied to the counterweight and to the tree above it, with a couple of feet of slack. This acts as a safety rope to prevent the counterweight from crashing to the ground if the antenna breaks.

Conclusion

Certainly, climbing trees to erect antennas deserves to be done with care. The advantages are a much more permanent antenna installation, better elevation and minimal distress to your trees!

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By Gerry Fasse, W8GF

A Keypad for the Yaesu FT-1000MP

Roll your own keypad quickly and easily, and save a bundle of money, too!

ALL PHOTOS BY THE AUTHOR

The Yaesu FT-1000MP transceiver is a favorite among radio amateurs worldwide. One of its features went unnoticed by me until recently. Looking through the transceiver's user manual one day, I noticed an entire section devoted to remote-control operation. The centerpiece of this feature is a 12-key pad that can be used to program and generate a number of special CW messages. These messages include a four-digit number generator useful in some contests.

My user manual states that the keypad is not available from Yaesu. However, a check of a few Yaesu distributors revealed that it *is* available—for about $100. After reviewing the circuit details in the manual, I decided to have some fun, save some money and roll my own keypad!

The Circuit

The circuit (see Figure 1) couldn't be simpler. Yaesu engineers deserve a pat on the back for the innovations realized here. To duplicate the keypad basics, all you need are 12 pushbutton switches and a like number of precision-value resistors. Incidental items include an enclosure, a short interconnecting cable, a chassis-mount jack and two phone plugs.

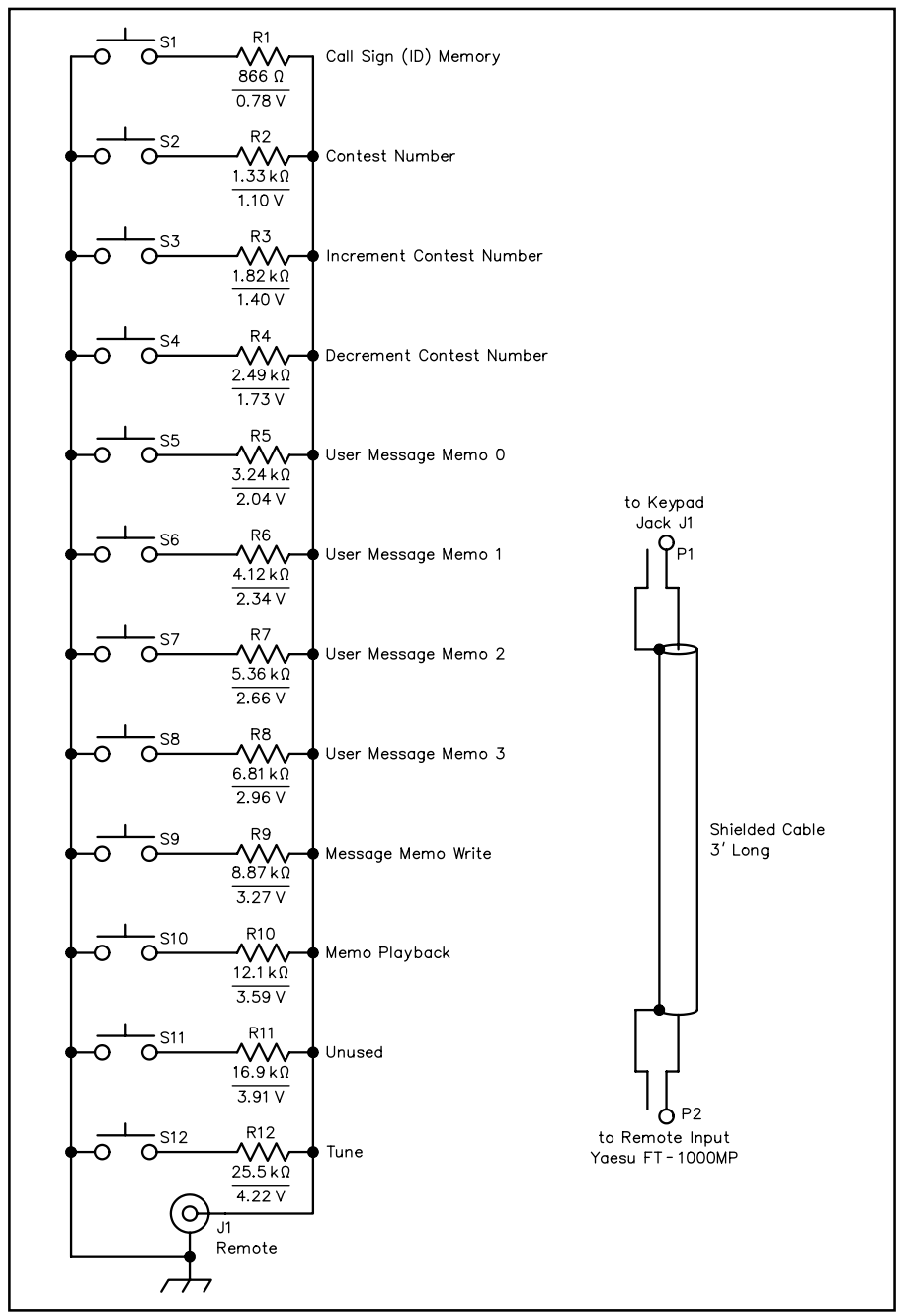
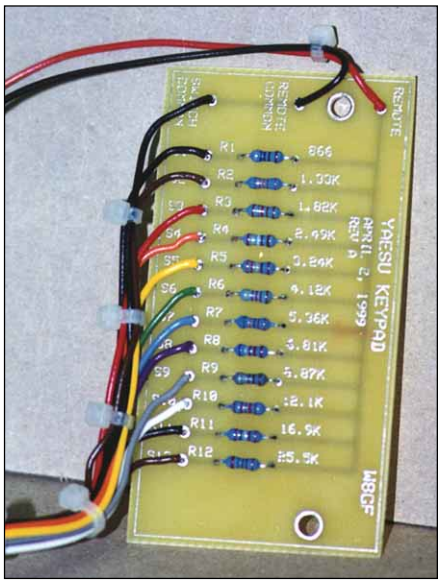
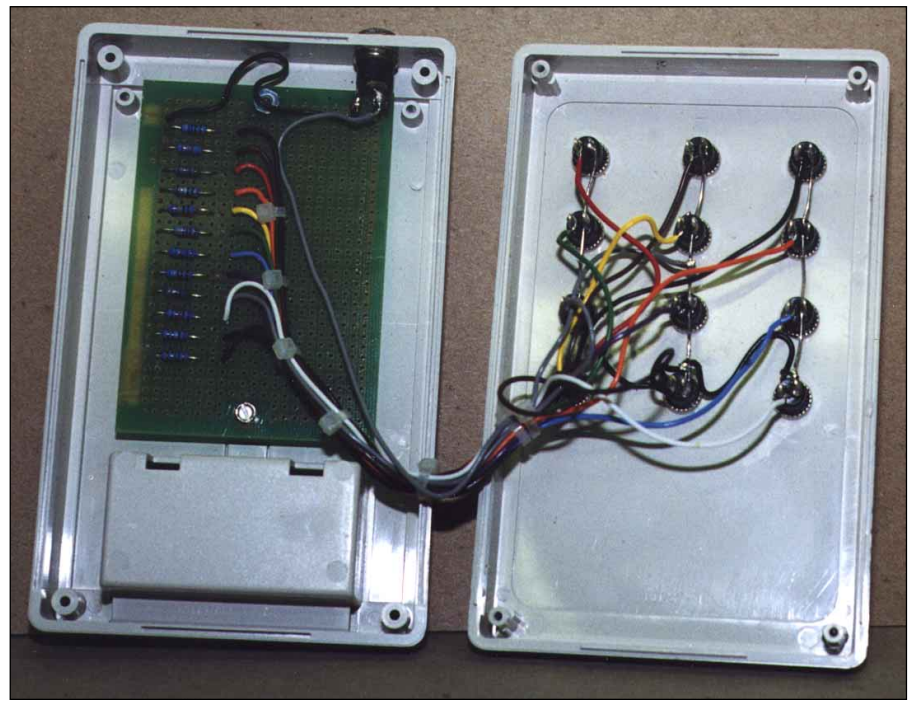


Figure 1—Schematic of the keypad circuit. Unless otherwise specified, resistors are 1/4-W, 0.5%-tolerance metal-film units (see text and Note 1). RS part numbers in parentheses are RadioShack. Equivalent parts can be substituted; n.c. indicates no connection.
J1—2.5-mm jack (RS 274-1583)
P1—2.5-mm plug (RS 274-1568)
P2—1/8-inch plug (RS 274-286)
R1-R12—Close-tolerance resistors; see text and Note 1.
S1-S12—Normally open pushbutton (RS 275-1547)
Misc: enclosure (RS 270-213); PC board (C&M; see Note 1); shielded cable (RS 278-512); hook-up wire (RS 278-1218); wire ties (RS 278-1632).



A ready-made PC-board and some cable ties make for a neat-looking assembly. (A short length of multi-conductor cable [such as rotator cable] can supply the required hook-up wire. —*Ed.*)



The PC board fits snugly into the recommended enclosure, with J1 at the top right of the bottom section. Twelve push-button switches arranged in three columns of four rows leave room to spare in the enclosure's mating top.

The theory of operation is simple enough. A precision reference voltage—approximately 5 V dc—is supplied to the keypad via the FT-1000MP's rear-panel **REMOTE** jack. Pressing a key (pushbutton) connects a resistor to common (ground), which changes the reference voltage level. The new level is sent to an analog-to-digital converter (ADC) in the transceiver that selects the desired message. Message programming and other operational aspects are detailed in the user manual and I won't repeat that here.

Construction

Assembling this keypad is easy! A look at the accompanying photographs and captions should be all you need for construction guidelines. The keypad housing, switches, plugs, jacks and cable are available from RadioShack. The resistance values specified in the manual have a tolerance of 0.5%. Such resistors can be difficult to find, but a resistor pack and PC board are available from C&M Enterprises.[1] Most of the called-for values I found in my personal resistor store, but as 1%-tolerance units. With the aid of a DMM, I was able to select the proper values.

The connecting cable should be well shielded. Suitable cable is available from RadioShack (see the caption of Figure 1). Using unshielded cable invites potentially damaging RF to enter your transceiver. Although RG-58 coaxial cable isn't as flexible (or small) as other shielded cables, it does a good job in a pinch. Equip the interconnecting cable with a two-circuit, 1/8-inch audio plug at one end. At the other cable end, the combination of a 2.5-mm plug and a mating jack on the keypad enclosure provides for quick connection and disconnection of the cable and keypad.

The keypad's **TUNE** key is handy when setting up an antenna tuner or adjusting an amplifier. For the fun of it, I built a single-resistor, single-pushbutton version of the keypad incorporating only the **TUNE** resistor value. I placed the parts in a small aluminum box. Later, I exchanged the pushbutton for a toggle switch. For tune-up purposes only, this works very well.

There you have it! You can duplicate the commercial Yaesu keypad for *much* less than $100—and you'll have fun building it, too!

Gerry Fasse, W8GF, was first licensed in 1954 as W8UCI. He is a DXCC Honor Roll member and is self-employed designing machine-tool control hardware and software. He attended the Electronics Institute of Technology and Wayne University in Detroit. You can contact Gerry at 11320 Darla Ct, Warren, MI 48089; **W8GF@aol.com.**

[1]A PC board and resistor pack for this project are available from C&M Enterprises, 280 Bell Branch Ln, Fruit Cove, FL 32259; tel 904-287-6448; **http://www.atlantic.net/~cment**. Price: $24 plus $3.25 for Priority Mail Service

STRAYS

WANTED: LCD DISPLAY

◊ I am trying to find a replacement LCD display for my Yaesu FT-470. The part is no longer manufactured and mine is failing. Phillip Gates, N5ZKF, 2802 Camelot Dr, Bryan, TX 77802-2807; **pgates@tca.net**.

NWS MARINE WEB PAGE

◊ Tim Rulon, WA2KQD, with the National Weather Service, has created an informative Web site with information concerning marine weather broadcast systems including NOAA Weather Radio, radiofax, SITOR and NAVTEX. You'll find it at: **http://www.nws.noaa.gov/om/marine/home.htm**.

VOLUNTEERS NEEDED

◊ Amateur Radio operators are needed to help provide communication for the American Lung Association's Big Ride Across America, a 3500-mile bicycle ride from Seattle to Washington, DC. The Ride takes place from June 19 to August 5, 2000. You can volunteer for the entire Ride, or choose from one or more parts of the country. Details are available on the Web at: **http://www.bigride.com**. To volunteer, or to obtain more information about volunteer responsibilities, contact Dick Anderson, KE7A, via e-mail at **ke7a@arrl.net**, or by telephone at: 877-752-3868.

Next Stray

Lakeview Company TM-1 License Plate Mount

I've discovered an elegant solution to my HF mobile antenna woes. For the last couple of years I've used a heavy-duty magnetic mount to secure my Hamstick antennas to the trunk lid of my Saturn SL-2. Although it worked very well, the magnetic mount was plug ugly. Worse yet, the mount scratched the finish of my precious Saturn no matter how carefully I removed it.

Enter the Lakeview TM-1

The TM-1 antenna mount attaches to your car in one of the places least likely to suffer visible damage—behind the license plate. The mounting plate is fashioned from stainless steel and it feels like a piece of tank armor. With strategically placed holes top, bottom and center, the main plate attaches snugly between the license tag and your bumper or trunk lid.

A 3-inch horizontal "tongue" protrudes from the bottom of the TM-1. The tongue has two sets of holes to accept the hardware for the extension piece. You can attach the extension to either hole set, which effectively gives you about an inch of "play" to compensate for recessed license plate holders.

The extension has a large hole to accommodate a standard $^3/_8$-inch × 24-threaded antenna connector. The connector includes an SO-239 jack on the opposite end. This allows you to attach or remove your coaxial cable quickly and easily. The TM-1 package also contains a ground strap, instructions and an assortment of nuts and bolts.

The main plate of the TM-1 is ready for installation. Note the ground strap in the upper corner.

Installation

I began the installation by threading my antenna coax and ground strap through a rubber grommet that was conveniently located just above my license tag. I attached the main plate and license tag using the original top corner screws, but it was quickly obvious that the flexing of the antenna would cause the heavy TM-1 to pivot on the screws like a hinge. Not good! Luckily, Lakeview had provided a long bolt and nut in the hardware set, so I drilled through one of the unused lower corner holes and secured the TM-1 at that point. (The new hole was invisible behind the TM-1.)

With the lower portion of the TM-1 in place, I reattached the ground strap along with the license tag using the two top corner screws. The ground strap secured to the interior of the trunk lid, which is at ground potential in my Saturn.

I thought I was home free, but another problem cropped up after I attached the PL-259 coaxial connector to the TM-1 and attempted to close the trunk: There wasn't enough clearance between the underside of the antenna connector and the Saturn's bumper. Flipping the TM-1 upside down wasn't an option; there wasn't enough clearance along the top. The solution entailed a quick trip to RadioShack for their $^3/_8$-inch × 24 mount that features solder lugs instead of an SO-239 (21-950).

Off went the PL-259 on the wire-cutter guillotine. Out came the portable soldering iron and within 10 minutes I was finished. That little bit of extra space below the antenna connector was exactly what I needed.

Passing the Spouse Test

With my 20-meter Hamstick antenna attached, I fired up my transceiver and checked the SWR. It was 1.2:1—exactly the same as my magnetic mount. After a couple of quick QSOs it seemed as though the antenna worked just as well in its new location.

For the most difficult test of all, I asked my wife to inspect the installation. She raised her eyebrows and nodded, "That looks *nice!*"

There is still a dent in our driveway where my jaw struck the asphalt.

How's this for a clean installation?

Bottom Line

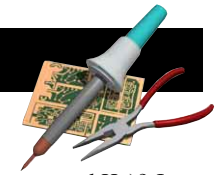
With hundreds of different vehicles on the road, it isn't practical for Lakeview to manufacture the TM-1 as a one-size-fits-all solution. You may find, as I did, that you need to do a little "tweaking" to achieve the best installation. Even so, the TM-1 has worked flawlessly—and you can't beat the aesthetic improvement. If you want to go mobile with a lightweight antenna, yet can't find an acceptable way to attach it to your car, the solution has finally arrived!

Manufacturer: Lakeview Company, 3620-9A Whitehall Rd, Anderson, SC 29626; tel 864-226-6990; **hamstick@hamstick.com**; **http://www.hamstick.com**. *Suggested retail price: $44.95.*

Next Short Take

Steve Ford, WB8IMY ♦ QST Managing Editor

THE HELP DESK



Q Signals

These Q signals most often need to be expressed with brevity and clarity in amateur work. (Q abbreviations take the form of questions only when each is sent followed by a question mark.)

QRA What is the name of your station? The name of your station is _____.

QRG Will you tell me my exact frequency (or that of _____)? Your exact frequency (or that of _____) is _____ kHz.

QRH Does my frequency vary? Your frequency varies.

QRI How is the tone of my transmission? The tone of your transmission is _____ (1. Good; 2. Variable; 3. Bad).

QRJ Are you receiving me badly? I cannot receive you. Your signals are too weak.

QRK What is the intelligibility of my signals (or those of _____)? The intelligibility of your signals (or those of _____) is _____ (1. Bad; 2. Poor; 3. Fair; 4. Good; 5. Excellent).

QRL Are you busy? I am busy (or I am busy with _____). Please do not interfere.

QRM Is my transmission being interfered with? Your transmission is being interfered with (1. Nil; 2. Slightly; 3. Moderately; 4. Severely; 5. Extremely.)

QRN Are you troubled by static? I am troubled by static _____ (1-5 as under QRM).

QRO Shall I increase power? Increase power.

QRP Shall I decrease power? Decrease power.

QRQ Shall I send faster? Send faster (_____ WPM).

QRS Shall I send more slowly? Send more slowly (_____ WPM).

QRT Shall I stop sending? Stop sending.

QRU Have you anything for me? I have nothing for you.

QRV Are you ready? I am ready.

QRW Shall I inform _____ that you are calling on _____ kHz? Please inform _____ that I am calling on _____ kHz.

QRX When will you call me again? I will call you again at _____ hours (on _____ kHz).

QRY What is my turn? Your turn is numbered _____

QRZ Who is calling me? You are being called by _____ (on _____ kHz).

QSA What is the strength of my signals (or those of ____)? The strength of your signals (or those of _____) is _____ (1. Scarcely perceptible; 2. Weak; 3. Fairly good; 4. Good; 5. Very good).

QSB Are my signals fading? Your signals are fading.

QSD Is my keying defective? Your keying is defective.

QSG Shall I send _____ messages at a time? Send _____ messages at a time.

QSK Can you hear me between your signals and if so can I break in on your transmission? I can hear you between my signals; break in on my transmission.

QSL Can you acknowledge receipt? I am acknowledging receipt.

QSM Shall I repeat the last message which I sent you, or some previous message? Repeat the last message which you sent me [or message(s) number(s) _____].

QSN Did you hear me (or _____) on _____ kHz? I did hear you (or _____) on _____ kHz.

QSO Can you communicate with _____ direct or by relay? I can communicate with _____ direct (or by relay through _____).

QSP Will you relay to _____? I will relay to _____

QST General call preceding a message addressed to all amateurs and ARRL members. This is in effect "CQ ARRL."

QSU Shall I send or reply on this frequency (or on _____ kHz)? Send or reply on this frequency (or _____ kHz).

QSV Shall I send a series of Vs on this frequency (or on _____ kHz)? Send a series of Vs on this frequency (or on _____ kHz).

QSW Will you send on this frequency (or on _____ kHz)? I am going to send on this frequency (or on ____ kHz).

QSX Will you listen to _____ on _____ kHz? I am listening to _____ on _____ kHz.

QSY Shall I change to transmission on another frequency? Change to transmission on another frequency (or on _____ kHz).

QSZ Shall I send each word or group more than once? Send each word or group twice (or _____ times).

QTA Shall I cancel message number _____? Cancel message number _____

QTB Do you agree with my counting of words? I do not agree with your counting of words. I will repeat the first letter or digit of each word or group.

QTC How many messages have you to send? I have _____ messages for you (or for _____).

QTH What is your location? My location is _____.

QTR What is the correct time? The correct time is _____.

QTV Shall I stand guard for you? Stand guard for me.

QTX Will you keep your station open for further communication with me? Keep your station open for me.

QUA Have you news of _____? I have news of _____.

ARRL QN Signals

QNA* Answer in prearranged order.

QNB Act as relay between _____ and _____.

QNC All net stations copy. I have a message for all net stations.

QND* Net is Directed (Controlled by net control station.)

QNE* Entire net stand by.

QNF Net is Free (not controlled).

QNG Take over as net control station

QNH Your net frequency is High.

QNI Net stations report in. I am reporting into the net. (Follow with a list of traffic or QRU.)

QNJ Can you copy me?

QNK* Transmit messages for _____ to _____.

QNL Your net frequency is Low.

QNM* You are QRMing the net. Stand by.

QNN Net control station is _____. What station has net control?

QNO Station is leaving the net.

QNP Unable to copy you. Unable to copy _____.

QNQ* Move frequency to _____ and wait for _____ to finish handling traffic. Then send him traffic for _____.

QNR* Answer _____ and Receive traffic.

QNS Following Stations are in the net.* (follow with list.) Request list of stations in the net.

QNT I request permission to leave the net for _____ minutes.

QNU* The net has traffic for *you*. Stand by.

QNV* Establish contact with _____ on this frequency. If successful, move to _____ and send him traffic for _____.

QNW How do I route messages for _____?

QNX You are excused from the net.*

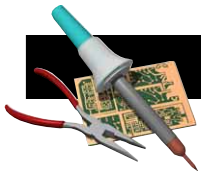
QNY* Shift to another frequency (or to _____ kHz) to clear traffic with _____.

QNZ Zero beat your signal with mine.

Notes:

*For use only by the Net Control Station.

Notes on Use of QN Signals: These QN signals are special ARRL signals for use in amateur CW nets *only*. They are not for use in casual amateur conversation. Other meanings that may be used in other services do not apply. Do not use QN signals on phone nets. *Say it with words*. QN signals need not be followed by a question mark, even though the meaning may be interrogatory.



By H. Ward Silver, N0AX

Test Your Knowledge!

The bigger they are...the more work they need. Slewing that aluminum around at the top of a tower takes know-how. Know how?

1. The part that connects the antenna to the supporting structure is called the…
a. boom-to-element clamp c. boom-to-mast clamp
b. boom truss d. lift sling

2. Use this to take the load off the rotor:
a. snatch block c. torque arm
b. thrust bearing d. turnbuckle

3. Galling is usually associated with fasteners using what material?
a. Cadmium-plating c. Stainless steel
b. Hot galvanized d. Brass

4. Copperweld antenna wire is used for its…
a. high surface area c. noncorrosive properties
b. strength d. low resistance

5. Use this at all mechanical antenna joints:
a. thread-lock compound c. graphite lubricant
b. penetrating oil d. anti-oxidation grease

6. Traps need to have these installed pointing down:
a. drain holes c. pressure seals
b. drip loops d. end caps

7. The device used to put tension on guy wires is called a…
a. counterweight c. come-along
b. riding lawn mower d. cable tray

8. A tilt-over tower places the most tension on the lift cable when nearly (up, down).

9. Which tool allows you to lift material *above* an existing structure?
a. block and tackle c. pole pig
b. gin pole d. cable grip

10. A wind-compensation plate minimizes...
a. twisting torque c. element vibration
b. antenna surface area d. boom length

11. The tubing in an open-sleeve driven element must be kept...
a. parallel c. perpendicular to the boom
b. equal-length d. insulated

12. What useful rigging technique allows raising and lowering antennas clear of guy wires?
a. boom sling c. tram line
b. pipe lashing d. screw anchor

Bonus: BIP and BOP are abbreviations for what?

Total Your Score!

There are a total of 12 possible answers in this quiz, not including the bonus question. Give yourself one point for each correct answer.

9—12 A "towering" score!
5—8 You need a little help, but a tower could be in your future.
1—4 You'd better remain safely on the ground.

Answers

1. c—This component holds the entire antenna weight.
2. b—This allows the rotor to rotate the antenna while the tower takes the weight.
3. c—Careful attention to the threads of stainless steel screws will prevent this annoying problem that can render a fastener frozen and useless.
4. b—Copperweld (copper-plated steel wire) offers the superior conductivity of copper and strength (and stretch resistance) of steel.
5. d—Anti-oxidation preparations keep joints corrosion-free and minimize resistive losses.
6. a—Otherwise, the traps will fill with water and be ruined.
7. c—This ratchet-driven winch is used to pull cables and ropes.
8. Down—With the tower nearly horizontal the forces on the cable can become enormous.
9. b—A gin-pole is essentially a pulley on a stick.
10. a—Balancing the wind load on each side of the mast minimizes twisting torque while slightly raising total surface area.
11. a—Asymmetry in these closely-spaced elements upsets their electrical properties, as well.
12. c—A tram line makes raising and lowering antennas a breeze—and safer, as well!
Bonus: Both-In-Phase and Both-Out-of-Phase refer to methods for feeding stacked arrays of antennas to control the vertical take-off angle.

22916 107th Ave SW
Vashon, WA 98070

QST

NEW PRODUCTS

FT-90R TRAVEL CASE AND POWER SUPPLY FROM CUTTING EDGE ENTERPRISES

◊ Cutting Edge Enterprises' PowerPort Trans-Porter is designed specifically for adapting your Yaesu FT-90R for stand alone portable operation in the field.

The package consists of a weather-resistant laminated black nylon carry case with $^1/_4$-inch foam padding and carry strap, a 9 Ah rechargeable power cell and a fully automatic charger. A cigarette lighter style dc input/output jack serves as the connection point for charging or for powering additional 12 V dc equipment. A standard T-type dc power connector on the power cell snaps directly to the dc connector on the FT-90R. Removable accessory pockets on either side of the case provide storage for your microphone, the charging unit and other accessories.

When you've reached your destination, simply slide the radio out of the bag (to allow for adequate ventilation), plug in your microphone, attach an antenna (not included), switch on the radio and you're on the air.

A roll-up solar cell recharging panel is available as an accessory.

For further information, contact Cutting Edge Enterprises, 1803 Mission Street, Suite 546, Santa Cruz, CA 95060; tel 800-206-0115, fax 831-426-0115; **cee@cruzio.com**. QST

Next New Product

BeaconSee

BeaconSee is shareware designed for *Windows 95/98* by Bev Ewen-Smith, CT1EGC. This innovative software allows any 486-66 or faster PC equipped with a 16-bit SoundBlaster-compatible sound card to function as an HF propagation analyzer as it monitors the global network of NCDXF/IARU CW beacons.

Installation is a snap. You simply connect a cable between the audio output of an HF receiver or transceiver and the audio input of your sound card. If you want *BeaconSee* to automatically switch your radio between the NCDXF/IARU beacon frequencies (14.100, 18.110, 21.150, 24.930 and 28.200 MHz), you'll need to connect a serial cable between the rig and one of your computer's COM ports (along with the appropriate level converter, if required). This full-automation setup is convenient, but not necessary.

When you run *BeaconSee* you're greeted with a segmented screen displaying the beacon call signs. Each narrow segment is actually a DSP *waterfall* display (think of it as an audio spectrum analyzer). As each segment becomes active (highlighted) *BeaconSee* quickly sweeps through the audio data provided by the sound card.

Signal information appears as bright dots or triangular shapes—the stronger the signals, the larger and brighter the images. After *BeaconSee* has made a few sweeps through the beacons, you are rewarded with a fascinating visual display of propagation conditions.

Getting in Sync

How does *BeaconSee* identify the individual beacons? It doesn't. Instead, the software depends on time synchronization. Each NCDXF/IARU beacon transmits for just 10 seconds in each three-minute cycle. *BeaconSee* "steps" through its display accordingly, highlighting the segments that *should* be active for the beacons in question.

For this synchronized dance to work properly, your PC clock must be set *very* accurately. While I was evaluating *BeaconSee* I set my PC clock manually using WWV. This worked well, although I quickly learned that there was about a two-second delay between the time I clicked on the **OK** button in the *Windows* Control Panel time-setting box, and the moment that the software clock was actually updated. Even that tiny lapse was sufficient to knock *BeaconSee's* synchronization out of step. I learned to "fudge" just a bit, clicking my mouse button about two seconds before the WWV start tone.

If you intend to do long-term monitoring with *BeaconSee* over several days, you may need to reset your clock repeatedly (some PCs keep more accurate time than others). If you happen to own a GPS receiver with a NMEA-0183 serial output, there is a free applet known as *GPSTime* (available for downloading on the *BeaconSee* home page) that will maintain a super-accurate PC clock at all times.

Other Goodies

BeaconSee is extremely flexible, allowing you to customize the program as necessary to fit your station. You can adjust the CW center frequencies, audio filter bandwidths display contrast and more.

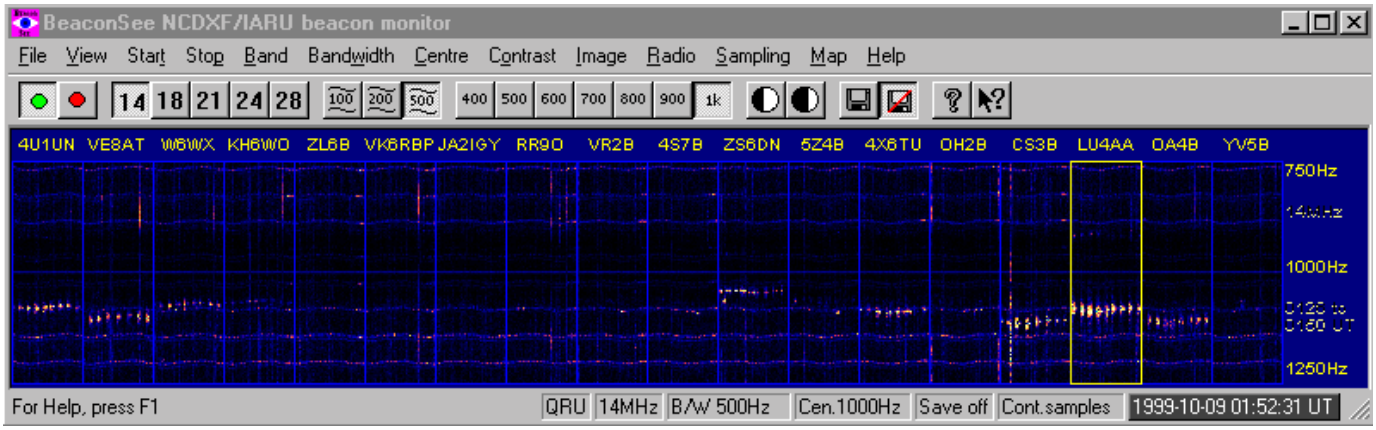
In addition, *BeaconSee* will display a Great-Circle map of the world centered on your location showing the positions of all NCDXF/IARU beacons relative to your position. The global map also displays the portions of the world that are in sunlight and darkness.

BeaconSee is a Bargain

The cost to register *BeaconSee* is US $29 and is handled online by a secure server in United States. When you register *BeaconSee* you receive the complete package that allows you to configure the software to sample beacon signals at periodic intervals so that you can see up to 24 hours of propagation history on a single screen. In the registered version you can even save the display automatically to a graphics file, at regular intervals, to build up a continuous record of band openings when you are away from your shack.

Twenty-nine dollars is a bargain for such a clever piece of software. Not only is *BeaconSee* a terrific addition to any HF station, it is a superb teaching tool. Imagine a classroom with a shortwave receiver, a PC and a copy of *BeaconSee*. Each day, students could view an active display of ionospheric propagation in real time. Or, they could conduct propagation studies over days or months.

Download *BeaconSee* at **http://sapp.telepac.pt/coaa/** and give this ingenious program a try. If you're impressed, cough up the $29 registration fee. Considering the value, it is a trivial expense!



Steve Ford, WB8IMY ♦ QST Managing Editor

NEW LIFE FOR THE YAESU FT-200

◊ Since my article about Yaesu FT-101s was published in May 1999, I have been inundated with letters asking for copies of my similar modification for the FT-200 that was published in *Radio ZS* (October 1995). The cost of sending photocopies to the many amateurs who have written is prohibitive, so here is the FT-200 article. (Thanks to *Radio ZS—Ed.*) It shows how to modify the Yaesu FT-200 / Sommerkamp FT-250 / Henry Tempo One, to replace the 6JS6Cs with 6146B output tubes.

Remove the old 6JS6C output tubes and disconnect all wires from the 12-pin tube bases (sockets) taking care not to damage any of the decoupling capacitors, which are used on the new bases. Remove the two 12-pin bases and using the same screws, install two octal tube bases as shown in Figure 1. Make sure that the locating keys are pointing in the position as shown. Cut short the orange wire that was used to supply the grid 2 (screen) voltage. This wire is no longer required.

Rewire the octal bases as shown. It may be easier to wire pins 1, 4 and 6 together before installing the bases. Make sure that each of these pins, which are the cathode and grid-3 (suppressor) connections, is decoupled to ground with a 0.01 µF ceramic capacitor, otherwise the output power will be low on 10 meters. Likewise, both screen grids, pin 3, on each socket must be decoupled as well as the heater pins.

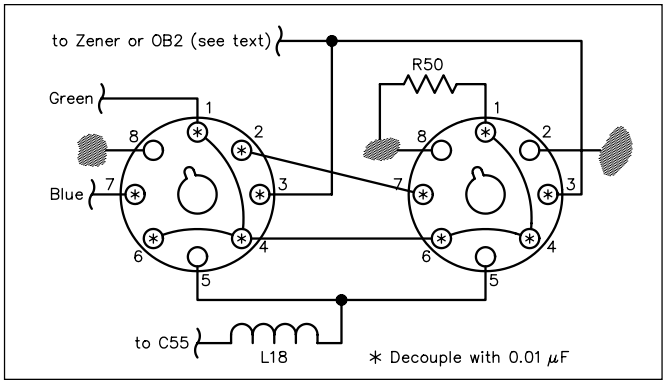


Figure 1—A pictorial diagram of the socket wiring for the 6146s.

The new screen-grid voltage is 250 V. Obtain this by wiring a 100 V, 5 W Zener diode in series with the 350 V line to the screen grids. (In the absence of a suitable Zener diode, use an OB2 neon regulator tube in series as shown in Figure 2.) We can take the 350 V from the dc supply to the choke feeding the cold end of the 12BY7A anode (plate) tuned circuits.

To change the neutralizing circuit for the lower interelectrode capacitance of the 6146Bs, connect an additional 200-pF 1-kV capacitor across the 200-pF capacitor shown as C40 on the original circuit diagram. C40 is the decoupling capacitor on the cold end of the 12BY7A plate tuned circuits.

In the early 1970s, I diagnosed an inherent fault with all FT-200s, FT-101s and FT-400/560 series: The 100-pF coupling capacitor from the plate of the 12BY7A to the grids of the finals becomes leaky or fails short. This places the full +350 V on the grids of the finals. Unfortunately, this normally occurs in receive mode when the meter is reading S-units and not PA current. This leaky capacitor immediately destroys the output tubes and—in some instances—the plate choke and power transformer. If this capacitor has not yet failed, it will. It is imperative that this capacitor be changed to one rated for at least 1 kV dc. In the absence of a replacement, install a 1000-pF 1-kV unit in series with the old 100 pF unit as a dc blocking safety measure.

The final modification is to the power supply. Open the Yaesu power supply to expose the PC board with the high-voltage rectifiers on it. Once you have removed the four silicon rectifiers and the parallel resistors, you will see that the PC board is marked and drilled to take eight diodes and resistors. Fit eight 1N4007 diodes with eight 470 kΩ, 1/4 W resistors and then move the tap on the transformer from the 460-V position to the 600-V tap. (Modern diodes are sufficiently consistent that equalizing resistors are no longer needed or recommended.—*Ed.*) This will give a high voltage of 850 V.

When you are ready to test and align the set, switch on the transceiver and set its mode to SSB, meter switch to plate current

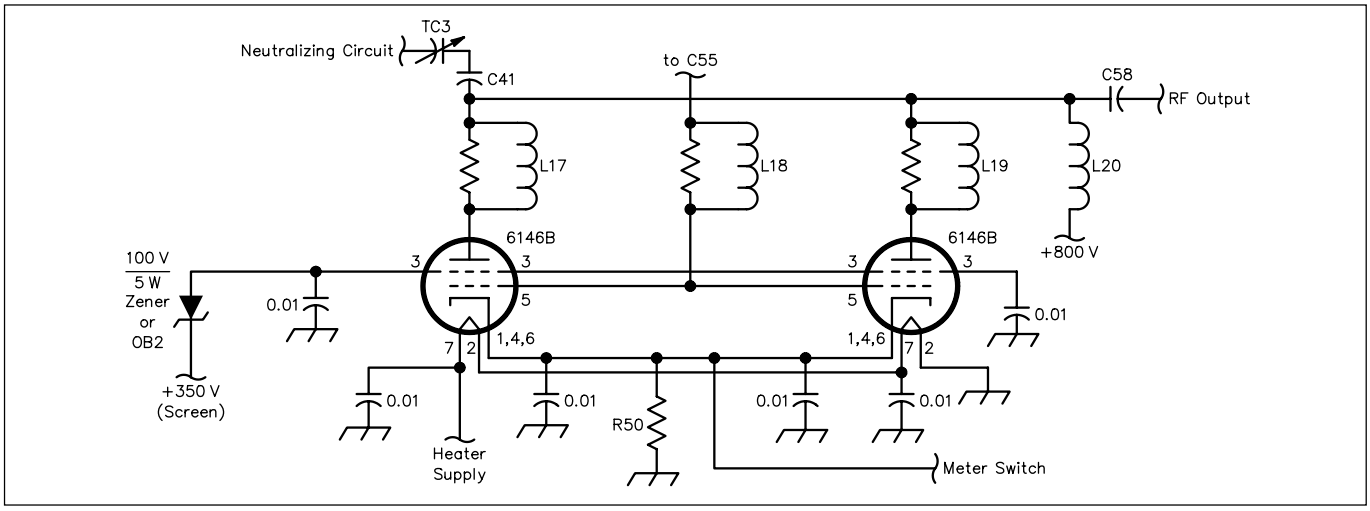


Figure 2—Schematic of two 6146 tubes in a Yaesu FT-200. Notice that the filaments must be series connected.

Bob Schetgen, KU7G ♦ Senior Assistant Technical Editor

and mike gain at zero. As soon as the rig is warmed up, key the microphone and quickly set the plate idle current to 50 mA using the bias control on the rear panel. Align the transceiver and neutralize the final amplifier stage in accordance with the original manual. RF output should exceed 100 W on all bands if modified and aligned correctly.

Should you attempt the modification with older 6146 tubes, you may find that the holes in the main upper chassis are too small to pass the tube bases. To make them fit, use a file to carefully remove the excess phenol from around the base of the 6146s until they pass through the holes. Older 6146 tubes work identically to those (6146Bs) with higher plate dissipation ratings in the FT-200. They yield a full 100-W output on all bands.

The modified set runs much cooler than with the original tubes, which were never designed for HF use.

Since publishing the original article, I have modified many FT-200s and have heard of many other amateurs who have undertaken the task with perfect results. This modification will give a new lease on life to the FT-200, which can still hold its own against many modern HF transceivers.—*Roger Davis, ZS1J, Whitewebbe Farm, PO Box 1660, Plettenberg Bay, 6600, South Africa*

SIMPLE EXTERNAL MIXER FOR THE HEWLETT PACKARD 8555A SPECTRUM ANALYZER

◊ Recently the HP-8555A spectrum-analyzer plug-in has become available as surplus at reasonable cost. It makes an excellent analyzer through 12 GHz and performs well. However, an external mixer is necessary to extend its range to 40 GHz. HP made a model-11517A external mixer that requires band-appropriate waveguide tapers to cover the 12-18, 18-26 and 26-40 GHz frequencies. The mixer is very sensitive to overloads and can be destroyed by power levels above 1 mW. Since the unit is sealed, it is very difficult to replace any internal components. Working mixers and tapers are very rare and dearly kept.

Briefly, in the external-mixer mode, the analyzer requires the normal input to be terminated with a 50-Ω load and a mixer connected to the "external mixer" connector. The first-LO signal, mixer dc bias and the returning IF signal are carried through coaxial cable to the mixer output. The input attenuator is out of the circuit.

In trying to find an alternate way to cover the 24-GHz ham band with the analyzer, it dawned on me that it would be possible to use other devices than the 11517A as mixers. I have found three techniques. The first unit I tested was a 24-GHz detector. It consists of a UG/595 flange and WR42 waveguide and a 1N26 diode mounted as a detector, with a coaxial output. With this detector connected to a very short piece of coax and the external-mixer bias adjusted for best signal, I was able to see signals from my Gunnplexer at 24 GHz at least 20 dB above the noise.

I also tried a Systron Donner mixer from an analyzer that used a similar arrangement. It also has a replaceable 1N26 mounted as a detector. It worked as well as the above unit.

A third method should work, but I have not tried it. It should be possible to use a waveguide-to-SMA adapter and put a coaxial detector in series between the adapter and the coax. The trouble with this arrangement is in finding components for this frequency range. Oddly, I have not found it difficult to obtain detectors.

The obvious advantages of these arrangements are that the 1N26 is relatively common, physically replaceable and cheaper than the HP part. The liability is that the arrangement is not very sensitive. However, there is enough sensitivity to do antenna alignment and signal analysis, which is its primary purpose.—*Doug Millar, K6JEY, 2791 Cedar Ave, Long Beach, CA 90806;* **dougnhelen@moonlink.net**

◊ Here are some hints from the ARRL Lab: Andrew Pawl of ATP had WR-42 to SMA adapters at the last Hosstraders hamfest for $50 each. This is not a bad price, considering the cost of SMA connectors that work at 24 GHz. It may make sense to build your own diode detector with an inexpensive SMA connector on the output. This way, you don't need expensive coaxial connectors that can handle 24 GHz. You can reach Andrew at **ATP@worldnet.att.net**. I also found 24-GHz detector diodes at **http://www.shfmicro.com/diode.htm**. Look at the bottom of the page.—*Zack Lau, W1VT, ARRL Lab Staff;* **zlau@arrl.org**

DON'T THROW AWAY THOSE OLD HEADSETS

◊ Headphones need not be scrapped just because metal-on-nylon cords are difficult to solder. Repair using readily available junkbox materials without soldering is simple. Clean off the insulation carefully leaving the metal-on-nylon conductor intact. Form a "crimpable" ferrule by removing the ring from a small (#18 AWG) crimp lug/termination. Slide some heat-shrink tubing over the headphone cord and move it well away from the joint area. Insert the clean conductor-on-nylon into the ferrule. If the joint is at the plug end of the cord, insert a short length of flexible bare stranded wire into the ferrule at the opposite end. Crimp the joint. (I prefer the type of crimping tool that dimples rather than squashes the ferrule.) Slide the heat-shrink tube over the ferrule and shrink it. You can now solder the bare stranded wire to a phone plug without fear of damaging the fragile nylon core. If the break is somewhere in the middle of the headphone cord, omit the bare flexible wire and slide the other broken end of the metal-on-nylon into the ferrule and crimp as before. Sometimes it helps to tightly fill the ferrule with short lengths of bare stranded wire. Either way you have a good electrical connector that will survive many years of use.

This same technique is excellent for installing ring terminations on telephone extension cords, a requirement for connecting many models of telephone patch equipment to the telephone service line.—*Bruce McCaffrey, N7OJ, PO Box 153, Poulsbo, WA 98370;* **bim@tscnet.com**

CLOTHESLINE ANTENNA SUPPORT CLARIFICATIONS

◊ Thanks for publishing my VA2ERY clothesline-antenna hints (*QST*, Dec 1999, pp 64-65). A few small errors in the figures need correction. All figures I mention here are in the original hint. Van R. Gibson, W4LLV, and I noticed that the upper wire in Figure 1 is misplaced. It should lie on top of the lower pulley, as the text says and Figure 2 shows. In addition, the upper wire is really the same gauge as the lower.

In the text for Figure 3, I suggested filing notches on alternate sides of the hanging dowel to make it fit the zigzag hole pattern of the flat-iron straps. That is not quite what appears in Figure 3, which shows the upper two notches on the same side in A and doesn't show the visible bolts in the foreground of those notches in B.—*Herb Slade, AA2BF, 22 Mallory Cir, Fishersville, VA 22939;* **hfslade@juno.com**

SALVAGE MONITOR TOROIDS

◊ Cut open the lumps in discarded computer monitor cables and you'll find great toroids for TVI suppression. They will slip over TV coax and act as a good shield choke to keep RF from coming down the lead-in.—*Rick Darwicki, N6PE, 17775 Elmhurst Cir, Yorba Linda, CA 92886;* **rickyd@deltanet.com**

Hints and Kinks items have not been tested by *QST* or the ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

QST invites you to share your hints with fellow hams. Send them to "Attn: Hints and Kinks" at ARRL Headquarters (see page 10), or via e-mail to **rschetgen@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing an item, please send the author(s) a copy of your comments. QST

NEW BOOKS

AM RADIO LOG—20TH EDITION

Copyright 1999 by the National Radio Club, Publications Center, PO Box 164, Dept W, Mannsville, NY 13661-0164. Loose leaf, unbound, 8½ × 11, 321 pages. $16.95 for National Radio Club members, $22.95 for nonmembers in the US and Canada. New York residents add appropriate sales tax. Check or money order only.

Reviewed by Steve Ford, WB8IMY
QST Managing Editor

Most modern HF ham rigs include general-coverage receivers, so it's tempting to give the VFO knob a spin and listen outside the amateur bands. In addition to sampling shortwave broadcasts, many of us dip below 1705 kHz to eavesdrop on the US AM broadcast band. It's fascinating to listen to the news and commentary that floats in on the nighttime airwaves. What are the hot topics in Peoria, Omaha, Saskatoon, Spokane, Atlanta, El Paso or San Diego? AM DXing puts you in touch with the width and breadth of North American culture.

One of the favorite pastimes of AM DXing is identifying the unknown "gem" that's whispering its distant signal into your speaker or headphones. Is it a large commercial operation or a tiny mom & pop broadcaster? Is the station in a major city or the hinterlands? How much output power?

Thanks to the *AM Radio Log* you can get the scoop on your latest DX "catch" quickly and easily. The National Radio Club has been publishing the *AM Radio Log* for more than three decades (it was called the *National Radio Club Domestic Log* when first published in 1968). It's considered the undisputed bible of AM DXing with comprehensive listings for stations in the United States and Canada. Each listing consists of the station location, frequency, call letters, format, network affiliation, station address, station "slogan" and day/night transmitter power levels. The bulk of the information in the *AM Radio Log* is arranged by transmitting frequency, but stations are also cross-referenced by cities and call letters. The *AM Radio Log* is delivered in unbound 3-hole-punched loose-leaf format so that you can place the pages in the binder of your choice, then replace them as updates become available.

So how comprehensive is the *AM Radio Log?* As a former DJ, I couldn't resist looking up one of my previous employers. Sure enough, there was KGVO in Missoula, Montana (1290 kHz, 5000 W day and night). It was interesting to note the highest and lowest frequency stations in current operation. CIAO in Brampton, Ontario nails down the low end of the dial at 530 kHz while the top position is held by WAFN in Miami Springs, Florida; KBGG in Des Moines, Iowa; KQXX in Brownsville, Texas and KTBK in Sherman, Texas—all broadcasting at 1700 kHz.

The *AM Radio Log* is an ideal companion for your AM broadcast explorations. You'll turn to it often to identify those "voices in the night." QST

Next New Book

NEW PRODUCTS

KLINGENFUSS 2000 FREQUENCY GUIDES

◊ Klingenfuss Publications has released print and CD-ROM versions of their 2000 frequency guides.

The *2000 Shortwave Frequency Guide* is a 556-page paper edition covering the latest schedules for clandestine, domestic and international broadcast stations worldwide. The guide features an extensive broadcast frequency list with 10,703 entries and an alphabetical listing as well. More than 11,000 utility station entries are also provided.

The *2000 Super Frequency List CD-ROM* features 38,700 listings with information on clandestine, domestic and international broadcasting and utility stations—and even includes entries for radio services such as the International Red Cross, the United Nations, maritime, military and police. You'll also find lists of 920 abbreviations and 16,999 formerly active frequencies—all on one CD for *Windows 3.1, 95* and *98*.

You can browse through the data quickly and use a search feature to locate specific frequencies, countries, stations, languages, call signs and times.

Klingenfuss Publications, Hagenloher Str 14, D-72070 Tuebingen, Germany; tel +49-7071-600849; fax +49-7071-62830; **klingenfuss@compuserve.com**; **http://ourworld.compuserve.com/homepages/Klingenfuss**.

These items are available through the ARRL. Price: *2000 Shortwave Frequency Guide* (ARRL order No. 7814), $32; *2000 Super Frequency List CD-ROM* (ARRL order No. 7822), $32. Shipping is additional. ARRL, 225 Main St, Newington, CT 06111; tel 860-594-0355; fax 860-594-0303; **pubsales@arrl.org**; **http://www.arrl.org**.

ELECTROSOFT CW SENDING PROGRAM

◊ Electrosoft's *WinCW* is a *Windows 3.1/95/98* program that allows you to use your PC to send CW.

Highlights include a 100-character type-ahead buffer, ten 100-character function key memories, message repeat, adjustable sending speed (5 to 99 WPM) and a "tune" setting.

The type-ahead buffer offers a visual display of the text that you have typed in. If you notice an error, you can backspace and correct mistyped characters prior to transmission. The message repeat feature can be programmed to automatically resend a message at an adjustable time interval—convenient for repeating unanswered CQs or for beacon applications. Press any key and the sequence will stop.

A wired RS232 interface cable—terminated in a ¼-inch phono plug—is included. The software allows you to select for operation on COM1 or COM2.

Price: $25. Satisfaction is guaranteed or Electrosoft will refund your money. For more information contact Stephen Stuntz, N0BF, Electrosoft, PO Box 1462, Loveland, CO 80539; **n0bf@juno.com**. QST

Next New Products

STRAYS

KOREAN WAR PROJECT

◊ June 2000 will mark the 50th anniversary of the beginning of the Korean War. The Korean War Project, founded by WD0HTG, is a nonprofit organization established for veterans. They would like to hear from Amateur Radio operators who participated in the war and will publish stories of their experiences. See **http://www.koreanwar.org/** on the Web, or write to: Korean War Project, PO Box 180190 Dallas, TX 75218-0190.

I would like to get in touch with...

◊...any member of the American Radio Institute (1123 Broadway, New York City) class of 1938. Jerry Mulberg, W2MJP, 609 Kappock St, 8E, Riverdale, NY 10463.

Next Stray

Ten-Tec Pegasus HF Transceiver

Reviewed by Paul Danzer, N1II
Technical Assistant

If I don't stop playing with this rig, I will never get this review written. The problem, I confess—is that this is one of the neatest rigs I have ever used. If fact, if I don't stop playing with it, this review will never be finished and I won't get to work either—and that's not a good idea! The trouble is—every time I try a new function, I make another contact—and there appears to be no end to the functions, bells and whistles on this rig.

I have also learned a few lessons: Never try a rig like this out on CW during the last few hours of the CW Sweepstakes! Forget doing "just one more test" when you are supposed to be getting dressed to go out to dinner—especially on your wife's birthday!

OBE—Out of Box Experience

This is a term usually applied to new personal computers—how easy, or even pleasant, is the setup procedure? Setting up the rig appeared to be fairly simple—all the jacks and plugs are well labeled. I just took the 3½-inch floppy disk, installed the software, plugged up the rig—one serial cable, mike, paddles for CW, antenna, power and ground connection—and turned it on. In less than five minutes, without reading the book, I had a rig that—just didn't work. I made one of the few possible mistakes—I plugged the rig into the second serial port (COM2) when the software default setting was COM1.

I still didn't want to read the manual, so I took a quick peek at the one-page *Troubleshooting Guide* section. The third suggestion on the page recommended looking at the serial port assignment. After one or two clicks I was tuning 40 meters.

Is It a Bird, a Plane or Superman?

Just what is this thing? Apparently this transceiver is derived from Ten-Tec's military/government radio line (see their Web site). The overall performance of this HF rig is on par with some of the other rigs in its price class, but instead of a fixed mechanical front panel, the Pegasus is software based. This allows a level of flexibility that far exceeds that of "similarly priced" rigs.

The Pegasus software installed easily and the hardware can be connected through either a serial or USB port. (USB connection however, does require a USB to serial port adapter.) But before you jump to the conclusion that you must lay out another $1000 on a new PC to use with this rig, this is not true. A very modest (for the year 2000—boy it still feels funny to type that year) 486 PC is up to the task (see sidebar). If you want to run the Pegasus and several other programs at once, a better PC will be required, but for one program at a time operation—a modest 486 running *Windows 3.1* will do just fine. No, I didn't just take Ten-Tec's word for it; I actually tried this system out on an old 33-MHz 486 running *Windows 3.1*.

Most of the time, I had the Pegasus connected to my 200-MHz Pentium—and yes, I am typing this review in *Microsoft Word* on one part of the screen, while the remaining portion of my monitor displays the working transceiver. In fact, that is part of the problem—I am listening on 15-phone, and the band is open—be back in a minute… (see Figure 4).

Installation Requirements

A stable 12 to 14 V dc at about 20 A is required. My shack dc power comes from an automotive battery that's located in my garage. A trickle charger has kept the battery alive for many years. I did have to disconnect the charger while operating CW to keep a trace of hum off the signal, but this was probably due to the connection point of the charger—the shack end of the power leads.

As is usual with the newer generation of solid state rigs, a really good ground is suggested. Most hams who run a PC in the shack for logging or for digital modes have already discovered the strange things that can happen when a little RF feeds back into the computer.

Most of the Pegasus's chassis connections are located on the front of the enclosure—mike, CW key or paddles, serial port, audio line out, remote control pod and **ACCESSORY**. It would seem more appropriate that one of these, the serial port connector, would be located on the back panel. It's really no big deal—as it's likely that many will choose to locate the radio chassis under the operating bench. The only control on the rig itself that you need ready access to is the power switch.

The dc power and antenna connectors and connections for a linear amplifier are on the back side of the chassis—along with that very important ground connection.

As any ham who currently uses a PC for logging will tell you, physically placing the typical transceiver, monitor, keyboard, mouse, key or paddle and mike all within easy reach can be challenging. The Pegasus makes this a little easier, since you just need to view the PC monitor screen—you won't

BOTTOM LINE

An economy-class HF radio that offers mid-level performance, the Ten-Tec Pegasus puts the novelty and flexibility of a PC-based transceiver within reach of the budget-conscious ham.

Joe Bottiglieri, AA1GW ♦ Assistant Technical Editor

Table 1

Ten-Tec Pegasus (Model 550), serial number 09A10199

Manufacturer's Claimed Specifications	***Measured in the ARRL Lab***
Frequency coverage: Receive, 0.1-30 MHz; transmit, 1.8-2, 3.5-4, 7-7.3, 10.1-10.15, 14-14.35, 18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7 MHz.	Receive and transmit, as specified
Power requirement: Receive, 1.0 A; transmit, 20 A.	Receive, 0.9 A; transmit, 18 A. Tested at 13.8 V.
Modes of operation: SSB, CW, FM, AFSK, AM (receive only).	As specified.
Receiver	*Receiver Dynamic Testing*
SSB/CW sensitivity, 3 kHz bandwidth, noise floor: –126 dBm (typical).	Noise floor (mds), 500 Hz bandwidth: 1.0 MHz, –123 dBm; 3.5 MHz, –133 dBm; 14 MHz, –132 dBm.
AM sensitivity: Not specified.	10 dB (S+N)/N, 1-kHz tone, 30% modulation: 1.0 MHz, 3.0 µV; 3.8 MHz, 0.7 µV.
FM sensitivity: Not specified.	For 12 dB SINAD: 29 MHz, 0.8 µV.
Blocking dynamic range: Not specified.	Blocking dynamic range, 500 Hz filter: 3.5 MHz, 113 dB*; 14 MHz, 110 dB*.
Two-tone, third-order IMD dynamic range: 90 dB at 50 kHz spacing.	Two-tone, third-order IMD dynamic range, 500 Hz filter: 3.5 MHz, 84 dB; 14 MHz, 77 dB.
Third-order intercept: +10 dBm at 50 kHz spacing.	3.5 MHz, +6.7 dBm; 14 MHz, +7.2 dBm.
Second-order intercept: Not specified.	+44.3 dBm.
FM adjacent channel rejection: Not specified.	20 kHz channel spacing: 29 MHz, 66 dB.
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing: 29 MHz, 66 dB*.
S-meter sensitivity: 50 µV at S9.	S9 signal at 14.2 MHz: 26 µV.
Squelch sensitivity: Not specified.	At threshold: SSB, 14 MHz, 0.16 µV; FM, 29 MHz, 0.55 µV.
Receiver audio output: 1.0 W into 4 Ω.	1.1 W at 3% THD into 4 Ω.
IF/audio response: Not specified.	Range at –6 dB points, (bandwidth): CW-N (525 Hz bandwidth): 222-1176 Hz (954 Hz); CW-W: 63-2000 Hz (1938 Hz); USB-W: 143-2857 Hz (2714 Hz); LSB-W: 143-2777 Hz (2634 Hz); AM: 69-3011 Hz (2942 Hz).
Spurious and image rejection: 60 dB.	First IF rejection, 122 dB; image rejection, 123 dB.
Transmitter	*Transmitter Dynamic Testing*
Power output: SSB, CW, FM, 100 W (high); 5 W (low).	Typically 103 W high, <1 W low.
Spurious-signal and harmonic suppression: ≥40 dB	53 dB. Meets FCC requirements for spectral purity.
SSB carrier suppression: >50 dB.	As specified. 52 dB.
Undesired sideband suppression: >60 dB.	As specified. 63 dB.
Third-order intermodulation distortion (IMD) products: 25 dB below two tone.	See Figure 1.
CW keyer speed range: Not specified.	1 to 50 WPM.
CW keying characteristics: Not specified.	See Figure 3.
Transmit-receive turn-around time (PTT release to 50% audio output): <20 ms.	S9 signal, 35 ms.
Receive-transmit turn-around time (tx delay): Not specified.	SSB, 22 ms; FM, 19 ms. Unit is suitable for use on AMTOR.
Composite transmitted noise: Not specified.	See Figure 2.
Size (hwd): 10.8×5.1×11.5 inches; weight, 9 pounds.	

Note: Unless otherwise noted, all dynamic range and intercept point measurements are taken at the ARRL Lab standard spacing of 20 kHz.
*Measurement was noise-limited at the value indicated.
Third-order intercept points were determined using S5 reference.
An expanded test result report is available on the ARRL's Members Only Web site.

need to position the transceiver chassis directly in front of you on the operating bench.

PC Controls

Normally, in a review of a new rig, a photograph of the front panel is included, and the controls are described as seen in the picture. However, there is no actual "control panel" on the front of the Pegasus enclosure.

The lead photograph in this article shows the Pegasus transceiver chassis to the left of a conventional computer monitor, keyboard and mouse. The optional hand microphone is shown to the left; the optional Remote Control Encoder pod is shown to the right. The PC being used to run the radio is positioned out of sight under the table. Figure 5 provides a more important view—a close-up of the *virtual* front panel.

If you find this rig interesting, why not take it for a test drive? It's easy, and you can do this right from the comfort of your shack. Go to the Ten-Tec Web site, **http://www.tentec.com**, download the software and install it on your PC. This will allow you to personally explore all the submenus and play with the controls. (No, you can't actually work anyone, but you will get to experience first hand how the various controls and menus are implemented.) You can even follow along as I further explain some of the finer points.

As is typical with *Windows*-based software, there are generally two or more ways to perform any given operation. Tuning the Pegasus is a good example. The virtual main tuning dial can be "rotated" with your mouse clockwise or counterclockwise, depending on the location of the cursor. Tuning steps are adjustable from 1 Hz to 100 kHz per step. As with any digital rig, this takes a bit of getting used to. If you set the tuning rate to 1 kHz steps for fast tuning, you must reduce it to 100 or even 50 Hz steps once you get near the target frequency. The frequency digits may also be entered directly on the computer keyboard. You can also control the frequency with the keyboard up and down arrow keys.

At first, I was a bit disconcerted—the

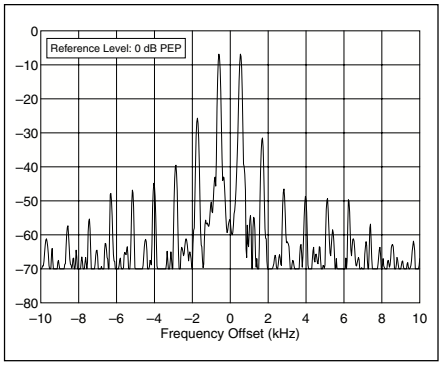


Figure 1—Worst-case spectral display of the Ten-Tec Pegasus transmitter during two-tone intermodulation distortion testing. The worst-case third-order product is approximately 27 dB below PEP output, and the worst-case fifth-order product is down approximately 41 dB. The transceiver was being operated at 100 W PEP at 28.350 MHz.

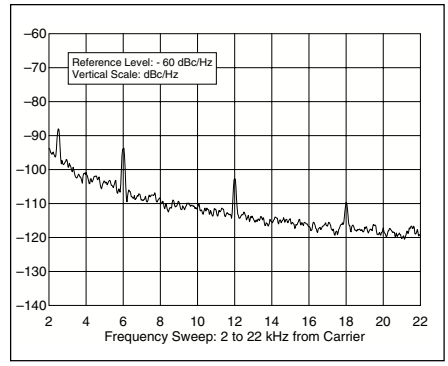


Figure 2—Worst-case spectral display of the Ten-Tec Pegasus transmitter output during composite-noise testing. Power output is 100 W at 14.020 MHz. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

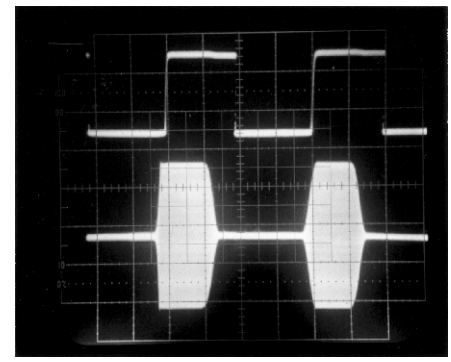


Figure 3—CW Keying waveform for the Ten-Tec Pegasus showing the first two dits in full-break-in (QSK) mode using external keying. Equivalent keying speed is approximately 60 wpm. The upper trace is the actual key closure; the lower trace is the RF envelope. Horizontal divisions are 10 ms. The transceiver is being operated at 100 W output at 14.2 MHz.

frequency scale is horizontal, and I visualized frequency as low on the left and high on the right—so the left and right arrows *should* change the frequency in those directions. However, you are really moving up and down in frequency, so I guess it's logical that Ten-Tec assigned tuning to the up and down arrow keys.

I was not able to really get the hang of controlling the frequency with a mouse or track ball and the virtual tuning dial. The need to change frequency steps and "mouseing around" made the process seem a bit awkward. However, using the up and down arrow keys on the computer keyboard solved this problem for me.

The optional Remote Control Encoder that we decided to purchase for this review has a very nice conventional tuning knob. The controller also includes a direct entry keypad and three additional user-programmable buttons. I would definitely recommend considering this accessory.

"Front Panel" Functions

The top tool bar item selections on the software's main screen—**File**, **View**, **Help**—each bring up their own submenus—just as you would expect with any *Windows* program. The **View** selection offers instantaneous recall of any selected WWV or CHU frequency, a very handy feature.

Primary rig control operations are accessed through a **Settings** menu in a second toolbar. If the apparent irrationality and strangeness of the menus used on many *Windows* programs bother you, you will be delighted with the menus on the Pegasus. For the most part, the functions are exactly where you might expect—Ten-Tec did a really nice human factors job. Too often the panels and menus on amateur equipment seem to be designed by either summer interns or non-hams; that is certainly not the case here.

Figure 6 shows the CW Settings menu. All the sidetone and keyer settings are available in this window. A built in CW keyer is enabled by checking the box in the lower right hand corner. Straight key operation is the default setting.

The SSB Settings window is shown in Figure 7. Several SSB transmit bandwidths between 900 Hz and 3.9 kHz can be selected. One word of warning—the bandwidth is determined by a DSP filter—virtually nothing is transmitted outside of the selected bandwidth. With analog filters, the slope of the cut-off is considerably more gentle, and as a result a wider range of frequencies sneaks through. To many ears, the sharp cut-offs will make the audio seem harsh, but the rig is just doing its job (and complying with FCC rules on bandwidth). In a contest, this sharply delineated audio may be just what you want for more

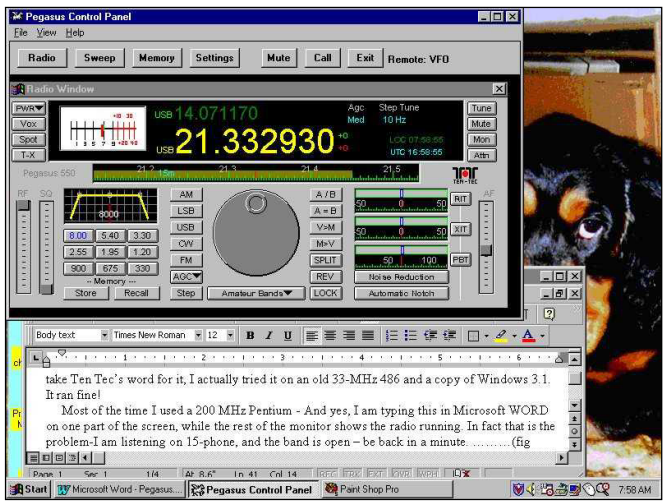


Figure 4—*Microsoft Word* on one portion of the screen, with the Pegasus transceiver program up and running simultaneously. That's wallpaper of my dog Candy peeking out from behind the active windows.

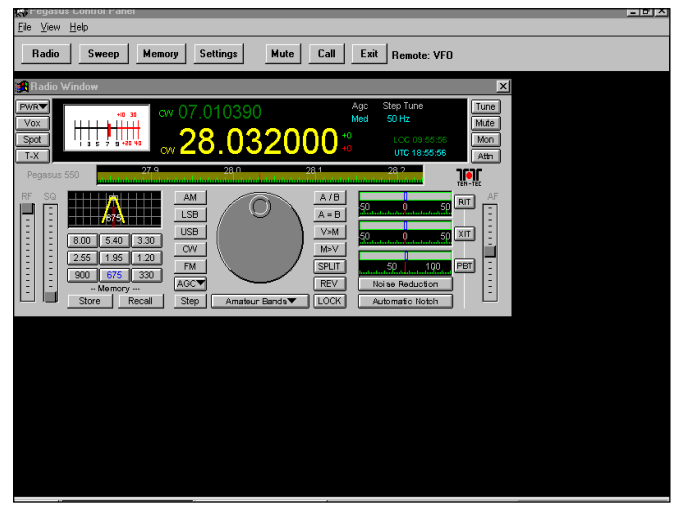


Figure 5—The virtual front panel of the Ten-Tec Pegasus HF transceiver. Your mouse cursor is used to "push" the buttons, "turn" the tuning knob and "slide" the control levelers.

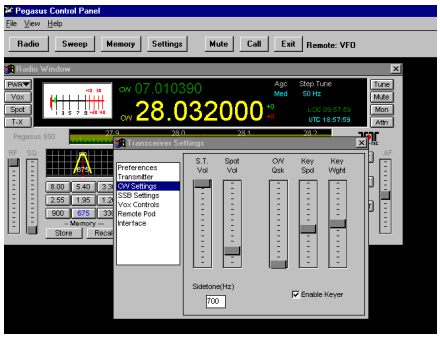


Figure 6—The CW Settings menu. Slide controls allow you to adjust the volume level of the sidetone and spotting tone, adjust the QSK delay, and set the speed and weighting of the built in CW keyer. The CW pitch can also be varied.

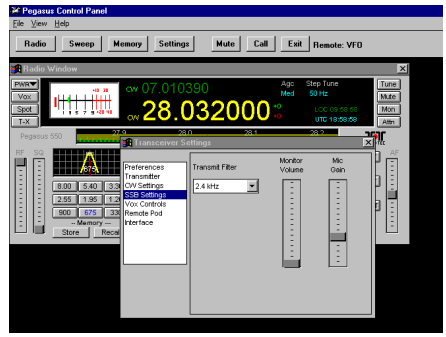


Figure 7—The SSB Settings menu. Settings on this menu allow you to select several different transmit filter bandwidths from 900 Hz to 3.9 kHz. Slide controls are also provided for adjusting the monitor volume and the microphone gain.

"punch," but to the locals used to hearing the full audio range of your voice on 146.52 FM simplex, you may not sound quite as pleasant!

Receiver—Performance, Bells and Whistles

The general coverage receiver performance of the Pegasus is comparable to many other receivers, with one exception—the ability to select a very precise frequency. Coverage is from 100 kHz to 30 MHz, and the AM sound was very acceptable on both strong and weak shortwave broadcast stations. The internal speaker is not exactly hi-fi, but it is good enough that I did not feel compelled to connect the audio from the Pegasus line output to my computer's sound card. Curiously, a jack for a conventional external speaker on the chassis of the unit is not provided.

Performance below the broadcast band was not remarkable. As is typical with most of the wide coverage receivers, if you are serious about VLF listening, an outboard tuned filter between the receiver and your antenna may be needed. However the DSP noise reduction and automatic notch filter were very handy capabilities, and were especially nice to have down below 500 kHz.

The full frequency memory capability of the Pegasus was not tested—I just did not have the time to try to store several thousand frequencies. The memory contents are stored in the PC, and for all intents and purposes are unlimited.

The mute button proved very convenient. There are many little things you won't notice missing from a PC controlled rig until you need them—a mute button is a good example.

The phone rings. Instead of being able to grab the conventional transceiver's AF gain control, twist the audio level down, and answer the phone—you now would have to move the mouse to the gain slide control, left click and hold, and slide the bug down. With this rig, you can just click on the mute button—a very handy control.

RIT, **XIT** and **PBT** are set up as slide controls. I had a considerable amount of difficulty controlling them, but no doubt more practice would make them easier to use. My current conventional transceiver has one offset control, which can be used to offset either transmit, receive or both. In a DX pileup, where the DX station is working split, I usually use the receive offset to find the last station the DX worked, push the button that makes my transmitter offset to this frequency, and release the receive offset. I am now tuned back to the DX station's transmitting frequency. On the Pegasus I ended up using the dual VFOs and the **A=B** and the **A/B** controls for this operation. **A=B** sets VFO **B** to the frequency of VFO **A**, and **A/B** sets receive to **A** and transmit to **B**.

Many recent (and not so recent) rigs provide dual VFOs and only offer an RIT tuning control. Therefore, most operators are used to having to manipulate the two VFOs to work "tail-ending" and offset simultaneously. The primary difference with the Pegasus is that VFO control is performed by "mouseing around" and left-clicking, rather than punching a button or two.

While the numbers measured in the ARRL Lab show medium range performance, I did not find the receiver performance anything to remark on, good or bad. As with most of the mid-priced solid state rigs in the past 10 years, a strong signal in the vicinity of the frequency you are tuned to will get in and either pump the AGC or otherwise affect the intelligibility of weak signals. In any case, while Sweepstakes and DX contests (at least for the first few hours) could be a problem, for general operating, most operators will be pleased with the overall performance level of this transceiver.

Software and Updates

Ten-Tec has been very busy since the in-

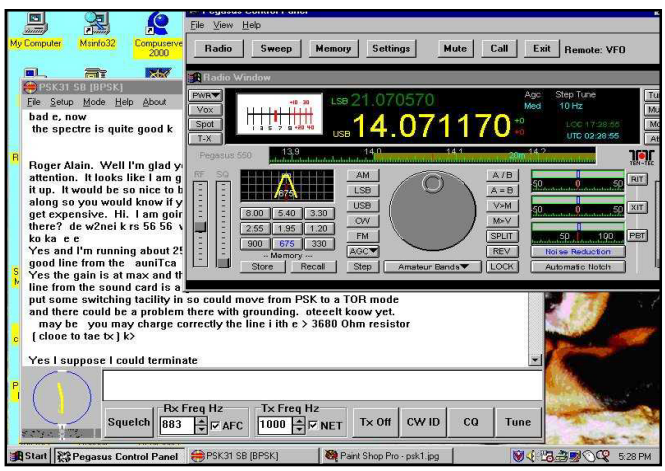


Figure 8—This screenshot shows one of the popular PSK31 programs—PSK31 SB—running in one window, with the Ten-Tec Pegasus, in a second window, serving as the HF transceiver.

Digital Modes

One of the first questions that pops up in many people's minds is "Can you run a digital mode on your PC while controlling the rig through the same PC?" The answer is a definite yes. Figure 8 shows the rig tuned to 14.071 (plus another 171 Hz for you perfectionists). Under the Pegasus control window is a second window with PSK31 SB running. The receiver was set to a bandwidth of 675 Hz.

Copy that day was not great—although PSK31 has earned a reputation as a mode that produces good copy even with very weak signals. The S-meter reading of the Pegasus indicates an S-6. In this case, the meter reading was primarily due to hash and QRM. The signals from W2NEI and the station he was working were at or below the level of the noise.

The audio gain and the RF gain were turned down to avoid overloading the sound card. If this was a permanent installation, I would have installed an attenuator in the audio line between the Pegasus and the PC sound card.

Since this version of PSK31 runs on the sound card, and the Pegasus uses the serial port, no problems were encountered. But as usual, if you are trying to use two I/O channels on your PC simultaneously, you have to make sure that the IRQ assignments are set up properly.

troduction of this radio tweaking and fine tuning the Pegasus software. Minor bugs that cropped up in the earlier versions of the software have been addressed, and each new version has also included some refinements and enhancements to the capabilities and controls.

Since the time that the initial transceivers—delivered with the first version of the software—hit the streets, subsequent software updates have included the addition of the CW sidetone volume, CW spot and keyer weighting controls. Earlier purchasers have been able to simply download the new versions of the software from the Ten-Tec Web site, install it in their computers and enjoy the new features. The software package is small—about 700k zipped—and installs easily.

Ten-Tec intends to continue to enhance and improve the software and release updated versions every few months.

The Pegasus relies on the computer processing power inside your PC to operate. Unlike the majority of the HF radios currently on the market, a conventional computer control interface connection point on the chassis of the radio is not provided. Controlling the Pegasus from within the presently available logging and contesting computer programs is not yet supported. Ten-Tec is communicating with the various software companies and has offered to provide technical assistance in adding this capability to their software packages.

IF DSPs

I have used several audio DSPs and evaluated them for the *ARRL Handbook* and for *QST*, but this was my first experience with an IF DSP. While you should rely on the lab numbers for actual quantitative results, I found some small but interesting differences between audio DSP and this built-in IF DSP. First, and most important, you don't have to worry about overload. With an outboard DSP, I always find myself riding the audio gain control. The better ones require less care, but the problem is always there. This is not much of a problem for general listening, unless you are in an environment with lots of varying signals, such as a DX pileup.

The narrowest filter on the Pegasus is 300 Hz. There have been times when a narrower filter has been very handy, although selection of bandwidths under 100 Hz have always proved to present a tuning problem for me, especially when I am listening to more than one station "on frequency."

I did notice an "apparent" increase in the receiver's background noise when using a narrow bandwidth on a very weak CW signal. Usually, as you narrow the bandwidth of any filter, the weak station is competing with less noise and tends to come up—a very dramatic effect with a good crystal filter. Here the signal did not pop-up, and to take best advantage of the narrow bandwidth the noise reduction had to be enabled.

Again, this is not much of a problem, since I tended to keep the noise reduction function on all the time—at least on CW. On phone, where the minimum bandwidth used was much wider, the effect did not seem to appear.

Sweep Function

The rig has a "sweep" function, which is actually a neat little panoramic band scope display. The bandwidth of the sweep can be varied from 3 kHz to 1.5 MHz. To really see what was going on, I found I had to bring the bandwidth down to either 75 or 30 kHz. You can use your mouse to position a set of crosshairs on a signal, left click, and the transceiver will tune to that frequency. Unfortunately, the station creating the blip is not always found in the middle of the blip—a little fine tuning may be required. You can set the vertical scale to log or linear divisions. For relatively quiet band monitoring purposes, this is a nifty toy.

Documentation

A very thin (22 pages, $8^1/_2 \times 11$) *Operators Manual* is supplied. But that is all, and it's probably more than you'll need. Ten-Tec did a nice job on this one—the included illustrations are clear and you can actually read the captions and labels without a magnifying glass. Most of the information is reference data and brief control listings and explanations. As with most software programs, the best way to get a feel for the controls used in the Pegasus software is to actually try each and every one of them.

The software includes a help section you can bring up from the tool bar. This relieves the need for a great deal of the printed information that's typically packed with a transceiver. One obvious advantage to the software help file is that changes, corrections and additions can be easily incorporated into the latest release.

You can download a copy of a *Programmers Reference Manual* from Ten-Tec's Web site. This will give you the information you need to roll your own software (I did not try it!) and can help you get a better idea of how this rig really works. The programmable basis for the rig, most probably inherited from the military/commercial Ten-Tec line, really shows.

The *Reference Manual* also contains the block diagram, a brief system overview and a start-up flow chart. The block diagram shows the five boards used in the Pegasus and their interactions.

Test Computer

For most of the testing, a *Quantex* 200-MHz Pentium was used. This is an older machine, and is running an original version of *Windows 95*. At no time did the computer speed seem to be an issue, even with several programs running at once. The display is a 17-inch unit.

A test with a 33-MHz 486 was successful, but no attempt was made with this second computer to run other programs at the same time. As this is being written, used 100+ MHz Pentium PCs are selling locally in a recondition shop for around a hundred bucks and new 15-inch displays are about $150. Older machines, such as 486s and under 100-MHz Pentiums are sometimes available for free (or for a small fee) from ham radio and computer clubs that have received these obsolete machines as donations.

Where Do You Put the Stuff?

Finding a spot for this transceiver in your shack shouldn't be a problem. As mentioned previously, as long as a good ground connection is available and the power leads are kept short (or large wire sizes used for the 20 A required), the chassis can be placed on the floor under the operating position.

However, you will still need to make room for the mouse or track-ball, the keyboard, mike and key or paddle—and the Remote Control Encoder, if purchased. I used a slide-out keyboard tray. I placed the paddles on an extension of the tray on the right that usually just holds a track ball. I positioned the remote on a second extension of the tray to the left of the keyboard. When I wasn't using it, I just left the mike on the floor—a situation I've become accustomed to after many years of mobile operation!

Of all of the contacts I made while using this modern, computer-controlled, digitally based rig, the one with Bob, KA3P, was perhaps the most memorable. He was using a good old fashioned hand key with his one-tube, 20 W rig. It's not clear who was having more fun, Bob or myself.

Thanks and Acknowledgements

As usual, I was able to enlist many members of the Greater Norwalk Amateur Radio Club for help with on the air testing. I also gathered reports from a large number of unsuspecting hams from across the country and overseas. I normally became quite evasive whenever they asked what rig I was using—not that I did not want to tell them, but if I let them in on my secret it typically extended the conversation by an hour or two. I can't spend my entire life on the air! Thanks also to Paul Clinton, WD4EBR, Ten-Tec's service manager, who cleared up several small mysteries for me.

Manufacturer: Ten-Tec, 1185 Dolly Parton Pkwy, Sevierville, TN 37862; 865-453-7172; fax 865-428-4483; **sales@tentec.com**; **http://www.tentec.com**. Price: Pegasus (Model 550), $895; Remote Encoder Keypad (Model 302), $139; hand-held microphone (Model 701), $24; desk microphone (Model 705), $79.95.

By Rick Lindquist, N1RL

Restructuring is Here:

Three License Classes, One Code Speed

The FCC drops the other shoe on amateur restructuring!

December 30, 1999, is a date that will go down in Amateur Radio history—to some as a day of infamy, to others as a day of victory. On that date, the FCC issued its long-awaited *Report and Order* in the 1998 Biennial Regulatory Review of Part 97—more commonly known as "license restructuring."

The FCC's action promises to change the complexion of Amateur Radio as it enters the new millennium: Starting April 15, 2000, there will be three license classes—Technician, General, and Amateur Extra—and a single Morse code requirement—5 WPM.

"We believe that an individual's ability to demonstrate increased Morse code proficiency is not necessarily indicative of that individual's ability to contribute to the advancement of the radio art," the FCC said. "We also find unconvincing the argument that telegraphy proficiency is one way to keep amateur radio operators ready to be of service in an emergency."

No Losers, No Auto-Upgrades

It's important to stress that no current licensee loses any privileges as a result of the FCC's action. All current license classes and privileges—including Novice and Advanced—remain the same, and all licensees will be able to renew their licenses indefinitely. The main difference is that the FCC will not issue new Novice and Advanced class licenses after April 15, 2000.

The FCC does not plan to automatically upgrade any existing license privileges, although an upgrade opportunity now exists for pre-1987 Technician licensees (see below). The ARRL had proposed a one-time across-the-board upgrading of current Novice and Tech Plus licensees to General class, but the FCC declined to adopt the idea. The FCC also said it would not upgrade to Amateur Extra the privileges of those who held Class A licenses prior to 1951.

The FCC's decision not to automatically upgrade Novice and Tech Plus licensees means the current Novice/Tech Plus HF subbands will remain and not be "refarmed" to higher class licensees as the ARRL had proposed. The FCC said it did not refarm these subbands because there was "no consensus" within the amateur community as to what to do with them.

The Commission left the door open to revisit this issue in the future, however, as new Amateur Radio technologies emerge and are established. The FCC said it wanted to allow time for the amateur community to "reach a consensus regarding implementation of new technologies before we undertake a comprehensive restructuring of the amateur service operating privileges and frequencies."

The FCC's action establishes the Technician license (with or without Morse code credit) as the sole entry-level ticket to Amateur Radio. After April 15, 2000, the FCC will lump Technician and Technician Plus licensees into a single Technician licensee database. When renewed, current Technician Plus licenses will be stamped simply "Technician."

Despite the name change, current Tech Plus licensees won't lose any privileges. Technicians who can document having passed the 5 WPM or higher Morse code examination will continue to enjoy Tech Plus HF privileges. "If documentation is needed to verify whether a licensee has passed a telegraphy examination, we may request the documentation from that licensee or the VECs," the FCC said. In other words, the burden of proof of having Element 1 credit will be on the licensee. It will not be obvious from the license class, however, raising a potential enforcement issue for the FCC.

"Old" Techs Gain

Starting April 15, 2000, holders of a pre-March 21, 1987, Technician class license (or a CSCE) may claim credit for a new General class license. This is because under the old system, the written examination for Technician and General class was identical; the only difference was that Technicians had to pass a 5 WPM Morse code test, while Generals had to pass a 13 WPM Morse code test. The upgrade is not automatic, however. You will have to apply through a Volunteer Examiner test session, complete Form 605, attach documentary proof of having completed the requirements for a Technician license prior to March 21, 1987, and pay a processing fee, if any, to the VEC involved. In turn, the VE Team will sign the application Form 605, and will complete, sign and issue a CSCE granting temporary operating authority at the new higher class earned.

An original or a copy of your Technician license issued anytime prior to March 21, 1987, would suffice as documentary proof. Other evidence might include an original CSCE for Element 3 issued prior to that date; an FCC verification letter of having held a Technician license prior to March 21, 1987; a document from the FCC's contractor, ITS Inc; or possibly a *Callbook* listing dated prior to March 21, 1987, indicating your license class as Technician.

To seek an FCC verification letter, write the FCC, Wireless Telecommunications Bureau, 1270 Fairfield Rd, Gettysburg, PA 17325. Provide the FCC with your name, address, and current call sign as well as all details of your licensing. The FCC may be able to verify in writing that you held a Technician license prior to March 21, 1987. Licensees also may contact ITS Inc (**http://www.itsdocs.com/**). For a fee, ITS will research prior FCC records and should be able to provide you with the necessary documentary proof.

Morse Code Reduction

The reduction in the Morse code requirement was not entirely unexpected. Several other countries already have lowered their Morse code examination requirements, and some observers believe that the Morse requirement will disappear altogether once it's eliminated in the international *Radio*

Regulations. The FCC said it opted for the "least burdensome requirement" as its sole Morse standard.

The Morse code issue will be on the agenda of a World Radiocommunication Conference later this decade. The FCC said it would not automatically "sunset" the Morse code requirement even if Morse code is eliminated from the international *Radio Regulations*.

Besides drastically streamlining the Amateur Radio licensing process, the FCC said its actions would "eliminate unnecessary requirements that may discourage or limit individuals from becoming trained operators, technicians, and electronic experts."

Written Test Changes

In addition to reducing the number of license classes from six to three and eliminating the 20 and 13 WPM code tests, the FCC also will reduce the number of written examination elements from five to three. The new licensing regime has four examination elements: Element 1, the 5 WPM Morse code exam; Element 2, a 35-question Technician exam; Element 3, a 35-question General exam, and Element 4, a 50-question Amateur Extra exam. It's anticipated that the new Amateur Extra exam will combine the important elements of the current Advanced and Amateur Extra examinations. Only minor changes are expected in the new General class examination. The new Technician examination is expected to incorporate some questions from the present Novice question pool.

In a significant move, the FCC left it in the hands of the National Conference of VECs Question Pool Committee to determine the specific mix and makeup of written examination questions. Current Amateur Radio study materials remain valid at least until the new rules become effective in April.

The FCC's new licensing scheme means someone will be able to become a Technician licensee by passing a single 35-question written examination. The plan also simplifies and shortens the upgrade path from the ground floor through Amateur Extra—especially since amateurs will only have to pass one Morse code test and there are fewer written examinations and total questions.

Elimination of the 13 and 20 WPM Morse requirements also means an end to physician certification exemption for applicants claiming an inability to pass the Morse code examination due to a severe handicap or disability. The FCC has never offered a waiver for the 5 WPM Morse code test. However, the FCC said that while the need to grant credit based on a *Physician's Certification of Disability* would be eliminated, it also agreed with Courage Handi-Ham System that reducing the emphasis on telegraphy proficiency may encourage some individuals with disabilities to participate in Amateur Radio and that "provisions must remain in place for accommodating individuals with severe disabilities." The FCC emphasized that its *Report and Order* does not "limit or eliminate such accommodations."

The New Amateur Radio License Structure—What it Means to You

You are a...	*To Become...*		
	Technician	*General*	*Amateur Extra*
Non-ham	Element 2[1]	Elements 1, 2, 3	Elements 1, 2, 3, 4
Novice	Element 2	Elements 2, 3	Elements 2, 3, 4
Technican	—	Elements 1, 3[2]	Elements 1, 3, 4
Tech Plus[3]	—	Element 3	Element 3, 4
General	—	—	Element 4
Advanced	—	—	Element 4[4]

Notes:
[1]Element 1 is the 5 WPM Morse code examination. Elements 2, 3, and 4 are the written examinations for Technician, General, and Amateur Extra respectively. Elements 2 and 3 are 35 questions each; Element 4 is 50 questions—all multiple choice.
[2]Starting April 15, 2000, individuals who qualified for the Technician class license prior to March 21, 1987, may upgrade to General class by providing documentary proof to a Volunteer Examiner team, paying an application fee, and completing FCC Form 605. This is *not* an automatic upgrade!
[3]The FCC has lumped Technician and Technician Plus licensees into a single category, all designated as "Technician" licensees. Those who can document having passed the 5 WPM Morse code examination will continue to have current Tech Plus HF privileges.
[4]Between now and April 15, current Advanced holders may take the *existing* Element 4B, a 40-question test, giving them credit for having passed the current Extra written examination. See text for details.

Upgrade Opportunity Windows

The effective date provides a window of upgrade opportunity for some current licensees. The FCC has told the League that current Tech Plus licensees holding a valid *Certificate of Successful Completion of Examination* (CSCE) for Element 3B may apply for a General class upgrade when the new rules become effective. The present Element 3B examination has 30 questions; the new Element 3 test will have 35, so the advantage to test before April 15, 2000, is slight.

Likewise, current Advanced licensees holding a valid CSCE for Element 4B may apply for an Amateur Extra class upgrade under the new system. The advantage here is that the current Advanced licensee will face a slightly shorter 40-question examination under the current licensing regime to get a CSCE for Element 4B. The new Extra class Element 4 will contain 50 questions, many taken from the current more-technical Advanced question pool.

To be valid on April 15, 2000, any CSCE will have to be dated on or after April 17, 1999. A CSCE is only good for 365 days. CSCE holders must attend a Volunteer Examiner session, complete Form 605, attach a valid CSCE, and pay any required application fee ($6.65 for the ARRL-VEC).

Prior to April 15, there's no particular advantage—and possibly a distinct disadvantage if you don't like to take tests—for any other upgrade path. See the table, "The New Amateur Radio License Structure—What it Means to You" for details on how to upgrade under the new system *on or after* April 15, 2000.

Other Changes

The FCC's action also authorized Advanced Class hams to prepare and administer General class examinations, and eliminate Radio Amateur Civil Emergency Service (RACES) station licenses. RACES will remain, however. "After review of the record, we conclude that we should eliminate RACES station licenses because RACES station licenses are unnecessary for amateur stations and amateur service licenses to provide emergency communications," the FCC said.

Additionally, the FCC said in its *Report and Order* that it would withhold any additional action on Amateur Radio enforcement because of the increased Amateur Radio compliance effort undertaken during the past year or so by FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth.

A copy of the entire *Report and Order* (FCC 99-412) is available at **http://www.arrl.org/announce/regulatory/wt98-143ro.pdf** or at **http://www.fcc.gov/Daily_Releases/Daily_Business/1999/db991230/fcc99412.txt**. Those wishing to comment on the FCC's *Report and Order* may contact their ARRL directors. Contact information for all ARRL directors appears on page 10 of any issue of *QST*.

TECHNICAL CORRESPONDENCE

SMT SOLDERING

By Avery Davis, WB4RTP, 969 N Miller Dr, Tucson, AZ 85710;
avery@mindspring.com

◊ I was delighted to see the series of hands-on articles by Sam Ulbing, N4UAU, on Surface Mount Technology in *QST*.[1] However, I would like to make some clarifications, comments and corrections on this mostly excellent series of articles.

First, in endnote 8, page 39, Sam comments, "I have touched parts often while soldering them and they have not sustained damage. Perhaps I have been lucky!" I would say, yes, Sam, you have been lucky. I have broken SMT components by touching the terminal ends directly with the iron before I learned better while taking special training in SMT rework techniques. The warning against touching an SMT part directly with the iron applies most importantly to ceramic chip capacitors, and is due to a phenomenon called *thermal shock*. The ceramic used in these capacitors is similar to ordinary glass (as opposed to Pyrex). Touching a cold ceramic capacitor with a hot soldering iron is like running cold water over an oven-hot Mason jar: It will crack or break. This sensitivity to thermal shock makes ceramic capacitors among the most difficult SMT components to install. Slow heating or cooling prevents thermal shock. Touching the component terminal with the soldering iron can also cause "leaching," which is a dissolution of the terminal metalization.

I have successfully used a reflow method similar to the one described by Sam on pages 34 and 35 for ceramic chip capacitors. First, I prefill one footprint/pad with solder. Then, I apply flux to that pad, hold the component in place with tweezers, and reflow the solder with the iron, touching the solder and pad only. The trick is to start with the iron at the edge of the pad and let the pad and solder heat up slowly, over about 5 or 6 seconds, before moving the iron towards the component terminal. Let the solder flow onto the terminal without touching the terminal with the iron. Then, flux and solder the opposite end again ensuring that the iron does not touch the component terminal. Finally, let it cool through conduction or convection for about 15 to 20 seconds before cleaning off the flux.

SMT soldering is really nothing magical. It is based on doing something that was absolutely forbidden in traditional soldering school: tack soldering. The way that SMT makes tack soldering reliable is by doing everything else just right. For example:

- Solder *must* be eutectic (SN63/PB37). SN60 is for tinning *only*!
- All solder joints must be made with fresh flux. Flux must be type RMA (Rosin, Mildly Activated). The flux-pen made by Kester (model no. 83-1000-1086) is my favorite as it has a "military-approved formula for add-on and rework," and it is readily available from several sources, such as RadioShack and Newark Electronics.[2]
- Contacts must be cleaned before soldering (you can't solder dirt!) and flux removed after soldering. I like to use Genesolv 2004 flux remover (available from Contact East) for cleaning and flux removal.
- PC-board pads for SMT components should be kept small to minimize thermal conduction away from the solder joint during soldering. Otherwise, soldering using a fine-tip iron may be difficult, and cold solder joints may result.
- Every solder joint must be inspected to see if it is cold, disturbed, uneven, "dewetted," "nonwetted," or has voids, cracks, blowholes or insufficient or excessive solder. Any crack will lead to an open circuit!
- Solder fillets of between 25% and 100% must be seen on all resistors and ceramic capacitors. Poor solder joints must be redone. I prefer to inspect solder joints with a 10× binocular microscope, but a 10× jeweler's loupe works just fine.

Attention to detail permits SMT to be used in high-performance electronic products for mission-critical or life-support systems that require the utmost reliability. An excellent reference for reliable soldering is *ANSI/J-STD-001, Requirements for Soldered Electrical and Electronic Assemblies*, published by the Electronic Industries Association (EIA) and the Institute for Interconnecting Packaging Electronic Circuits (IPC), and available from the IPC.[3]

[1]Sam Ulbing, N4UAU, "Surface-Mount Technology—You *Can* Work with It!—*Part 1*," *QST*, Apr 1999, pp 33-39.

[2]RadioShack, 200 Taylor St, Ste 600, Fort Worth, TX 76102; tel 800-843-7422, fax 817-415-2303; **http://www.radioshack.com**; Newark Electronics, 4801 N Ravenswood Ave, Chicago, IL 06040-4496; tel 800-463-9275, 312-784-5100, fax 312-907-5217; **http://www.newark.com**.

[3]The standard, *ANSI/J-STD-001*, has been superceded by *ANSI/J-STD-001B* (**http://www.ansi.org**) and was a joint development of IPC and EIA; Electronic Industries Alliance (EIA—formerly the Electronic Industries Association), 2001 Pennsylvania Avenue NW, Washington, DC 20006-1813; tel 703-907-7500, fax: 703-907-7501; **http://www.eia.org/**; Institute for Interconnecting and Packaging Electronic Circuits (IPC), 2215 Sanders Rd Ste 250, Northbrook, IL 60062-6135; tel 708-509-9700, fax 708-509-9798; **http://www.ipc.org/**. Here are some other interesting sites containing electronics standards information: **http://www.smtnet.com/wwwsites/smta_boston/standard_main.cfm** and **http://www.zdwebopedia.com/Standards/Electronic_Industries_Association.html**.

CTCSS TONE DECODE OPERATION IN SCAN MODE IS NOT ALWAYS THE SAME!

By Bob Witmer, W3RW, 146 Forest Trail Dr, Lansdale, PA 19446;
Witmerjr@aol.com

◊ I recently bought a two-meter mobile rig for a new vehicle. After doing some listening, I decided to add the CTCSS decode option so that I could selectively listen to certain repeaters (those with CTCSS-encoded transmitter output) on shared repeater channels. The dual-band H-T I've owned for many years has this capability, and it's a great "ear saver" in areas where several repeaters can be heard on one channel.

I almost made a mistake buying the decode module for the mobile thinking it would add tone-squelch capability in the scan mode the same way my H-T's decode worked. Not so! What saved me from buying an option that would *not* provide the desired operation was reading the manual!

The manual clearly states that when using tone decode in the memory-scan mode, the radio will stop on a busy channel, but the squelch will not open unless the encode tone from the repeater matches the decode tone that was programmed. In other words, the radio will operate as usual, but instead of skipping signals during scan with the *unselected* tone, the scan would stop—you just wouldn't be able to hear the audio! To me, this is unacceptable and not what I was anticipating based on my experience with the H-T.

Unfortunately, there is nothing in the advertising literature about this operating

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quirk. The only way to find out—without buying the radio with the decode option and actually checking its operation—is to read the manual, and this is something most operators don't do even after they've bought a radio!

To aid the investigation process for future buyers, I suggest that CTCSS decode operation characteristics in scan mode be verified in future *QST* equipment reviews. In the meantime—as always—buyer beware!

ANATOMY OF A REPAIR JOB

By Jay Craswell, W0VNE, 321 4th St W, Jordan, MN 55352; **aav5th@netzero.net**

◊ I was about ready to send my trusty TS-50S back to Kenwood for repair when the words of one of my own articles started to haunt me. Yes, that guy who keeps telling *you* that '90s technology is "homebrewable" was about to make an appliance-operator move and send his troubles to somebody else.

The Patient and the Disease

The TS-50S is one of Kenwood's new all-band, all-mode HF rigs. It is one of the smaller full-featured rigs sold today. After installing mine in my Jeep, I discovered a total lack of output on the 40-meter band. This was a disaster! Forty meters is my favorite mobile band! Instead of mailing my rig to Kenwood, I thought to consult the local brain trust. Bob, W0AUS, had just finished fixing his HF rig. He told me that he had to jump through hoops to obtain a schematic for his sick IC-706. "Have we really fallen that far that the manufacturers don't freely give us schematics?" I asked. (Me, the guy who was going to mail his problem to Kenwood's appliance repair center all of two minutes ago). Now I figured I had to at least *try* to fix my TS-50.

Calling 911!

No RF on one band? Clearly, the final amplifier was working or there would be no RF output on *any* band. I wondered if Kenwood had any applications notes that might help. Maybe no RF on 40 meters was a common problem. So I contacted Kenwood. Unfortunately, the technicians had no solution to my problem. My next step was to place a phone call to the store from which I had purchased the TS-50S. I reckoned they had plenty of experience with sick TS-50Ss—I had zilch! Hint: When asking for help from the service technician, remember that plenty of hams ask for free advice and then send the burnt remains to them to fix after they botch the repair job. Be polite and remember you are asking a favor! After salaaming my local tech, he gave me the straight poop, "Yeah," he opined, "either the bandpass filter or the relays that switch them in has gone kaflooie." Ahah!

Diagnosis

Relays, eh? Well, that sounded like something even *I* could handle! So I popped off the cover and squinted inside. Imagine my surprise when I saw that there were no top-secret circuits from Star Trek! Sure, the SMT stuff might be tough to handle without the proper tools, but that relay board was no sweat. With the radio open, I took a nostalgic trip back to the days when I worked in a radio repair shop (20 years ago!). I remembered my great shock when I discovered that *most* service problems can be solved without a need for fancy test gear and/or service manuals. Look for the obvious and try not to act surprised when you find that the problem is easy to fix! Smoked polarity-protection diodes and 30-A fuses in 5-A fuse sockets, scorched PC boards—you get the idea. So, revisiting my old technique, I visually inspected the radio and sniffed for burnt parts. Finding neither, I tried switching the radio through the different bands and listened for the relays to click.

Getting satisfactory clicks on each band, I then checked each band for power output and made notes of which relays operated on which bands. With this great amount of knowledge, I simply unsoldered and removed both of the 40-meter band-pass output-filter relays. After staring at them for a while, I got the bright idea to bench-test them. One relay worked fine, but the second one—dead!

Successful Surgery

After carefully checking the surrounding circuitry for related problems, I haywired another relay. Forty meters worked again! In addition to saving myself from a large repair bill, I proved to myself some of the rubbish I've been telling you readers. The only thing we have to fear from '90s technology is the fear of '90s technology. Sure, my problem was easy to solve, but as I said, *many* are! Making a few calls and doing the once-over may save you a bundle!

Letters for this column may be sent to Technical Correspondence, ARRL, 225 Main St, Newington, CT 06111, or via e-mail to **ppagel@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing a work, please send the author(s) a copy of your comments. The publishers of *QST* assume no responsibility for statements made herein by correspondents. QST

FEEDBACK

◊ Please refer to Mitchell Lee, KB6FPW, "Free Energy Concentrator," *QST*, Oct 1999, pp 66-67, Figure 1. C3 is incorrectly shown connected to the input side of L2; it should be shown connected to the output of L2 at the junction of L2 and C4.—*tnx Mitchell Lee, KB6FPW*

◊ In the January 2000 "Help Desk" (page 65) the 6-meter national FM simplex frequency is incorrect. It should be 52.525 MHz. QST

NEW PRODUCTS

"SUN VISOR" MOBILE MICROPHONE FROM PRYME

◊ The new MMC-100 Mobile "Sun Visor" microphone is a unidirectional electret mike element mounted in a flexible gooseneck that secures to the sun visor in your car. The PPT switch is located on an in-line box in the cord and can be mounted to the gearshift lever or armrest for easy access.

The MMC-100 is sold without a microphone cable—six different optional cables are available to allow easy connection to nearly any of the current VHF, UHF and HF mobile/base transceivers that use 8-pin or modular type microphone connectors.

Price: MMC-100, $79.95, microphone cable adapters, $14.95 each. For additional information visit your favorite Amateur Radio products dealer or contact Premier Communications Corp, 480 Apollo St, #E, Brea, CA 92821; tel 714-257-0300; fax 714-257-0600; **premier @adi-radio.com**; **http://www.adi-radio.com**.

HAMWHIP MOBILE ANTENNAS FROM LDG

◊ LDG Electronics Inc now offers a Hamwhip line of single-band mobile antennas.

Individual models covering each of the bands from 75 to 6 meters are available. These can be tuned to resonance at your desired frequency. Use with LDG's AT-11 line of automatic antenna tuners will allow multiple band operation from a single antenna.

The Hamwhips feature aluminum and fiberglass construction with chrome-plated brass fittings. They attach to standard $^3/_8$-24 threaded mounts.

The antennas are black in color, approximately 8 feet in length and are designed to handle 600 W (nominal).

Price: $22.95 each. For additional information contact LDG Electronics Inc, 1445 Parran Rd, St Leonard, MD 20685; tel (toll-free) 877-890-3003; fax 410-586-8475; **ldg@ldgelectronics.com**; **http://www.ldgelectronics.com**. QST

Next New Product

League to Press Request for Stronger Federal Preemption Policy

The ARRL will ask the FCC to partially reconsider its dismissal of RM-8763, the League's 1996 petition that sought to strengthen and clarify PRB-1. The League also has agreed to fund a Florida antenna case that has PRB-1 implications. PRB-1—spelled out by the FCC in 1985 and since incorporated into the laws of several states—calls on state and local governments to reasonably accommodate Amateur Radio and apply the least restrictive means to regulate amateur antennas and activity.

ARRL Executive Vice President David Sumner, K1ZZ, said the thrust of the League's petition was to get the FCC to deal with "things that frustrate the intent of PRB-1 or tend to run up the cost" for hams. Among other specifics, the League petition had called on the FCC to say that any state or local antenna restrictions limiting ham radio antennas to heights below 70 feet would be "presumed unreasonable" unless the state or local authority could show its restrictions were necessary for health, safety or aesthetic reasons.

In an *Order* released November 19, the FCC dismissed RM-8763 in its entirety and indicated it was unwilling to go beyond what is already spelled out in PRB-1.

"We continue to believe that the standards the Commission set, that is 'reasonable accommodation' and 'minimum practicable regulation', have worked relatively well," the FCC said in turning down RM-8763. But the dismissal *Order* did include some wording that could prove beneficial to amateurs.

In its denial, the FCC said it would not be "prudent" or "appropriate" to set a height standard for amateur antennas and supporting structures "because of varying circumstances that may occur" for differing antenna configurations.

The League will ask the FCC to reconsider two important aspects of the original petition. Meeting December 4 in Texas, the ARRL Executive Committee voted to seek reconsideration of the FCC *Order* regarding the application of PRB-1 to restrictive covenants and to excessive costs that localities might levy or require in order to install an antenna structure.

In its dismissal, the FCC pointed out that PRB-1 excludes restrictive covenants in private contracts as "outside the reach of our limited preemption." The Commission said, however, that it "strongly encourages" homeowners associations and private contracting parties to follow the principle of reasonable accommodation with respect to Amateur Radio.

In addressing zoning laws and application costs, the FCC dismissal *Order* asserted that the PRB-1 principles of "reasonable accommodation" and "minimum practicable regulation" already provide sufficient guidance to communities. Local zoning ordinances should be written to "not impinge on the needs of amateur operators to engage in amateur communications," the FCC said.

Hoping to take advantage of potentially favorable wording in the FCC dismissal *Order*, the Executive Committee agreed to have the League fund an appeal in a Florida Amateur Radio tower case. Lenard Persin, WB4HZQ, had applied to Seminole County for a special exception to a 35-foot tower height limit to build an 80-foot tower on his nearly one-acre lot. Initially granted, his application was later denied after a neighbor appealed. Persin appealed in federal court, and the ARRL filed a "friend of the court" brief in the case. On November 2, a US District Court in Florida ruled for the County, saying it had "properly balanced Mr. Persin's interests with the needs of the community."

In its November letter dismissing RM-8763, however, the FCC declared that, given the express language of PRB-1, "it is clear that a 'balancing of interests' approach is not appropriate."

ARRL President Rod Stafford, W6ROD, has appointed a committee to study how the ARRL provides support for antenna cases.

Elsewhere, the FCC late last year reaffirmed its Over-the-Air Reception

FCC Dismisses Five Other Amateur Radio-Related Petitions

The FCC has turned down five more Amateur Radio-related petitions, including three filed by the ARRL. The FCC consolidated the dismissals into a single *Order*, released November 29. Among the five was a petition filed last spring by the Central States VHF Society expressing concern about increasing encroachment into the so-called weak-signal portions of the bands above 50 MHz by wider-bandwidth modes, such as voice FM and packet. CSVHFS said voluntary band plans had not been successful in limiting the activity.

In turning down the petition, the FCC said that amateurs, including weak-signal adherents, already have been provided segments in the bands at issue that are off-limits to certain types of stations. The FCC reiterated language from another *Report and Order* that declared it was "unreasonable" to expect to operate in a totally interference-free environment. The Commission also expressed concern that "subdividing amateur service bands on the basis of operating interests would result in a loss of flexibility to accommodate changes in operating trends and emergence of new technologies." The FCC said it agreed with the ARRL's position on the CSVHFS petition that education and the application of existing rules should suffice to minimize interference among various modes.

The three ARRL petitions dismissed were RM-9259, asking for an FCC declaratory ruling to equate observance of voluntary band plans with "good amateur practice"; RM-9115, seeking to permit RACES participants and others to intercommunicate during emergencies, drills and tests and to expand the time allowed for RACES drills; and RM-9106, asking the FCC to permit stations in the Territory of American Samoa to transmit on 7.1 to 7.3 MHz as a domestic exception to the *International Table of Frequency Allocations*.

In dismissing RM-9259 as "unnecessary," the FCC suggested it was reluctant to expand its regulatory role beyond the existing limits on the emission types that may be transmitted in different subbands. The FCC said the requested changes "would have the effect of transforming voluntary band plans into *de facto* required mandates," something inconsistent with current FCC policy.

In denying the ARRL's petition for changes in the RACES rules, the FCC said the League failed to demonstrate a separate rulemaking was warranted. The FCC also noted that it's currently considering "the necessity of separate licenses for RACES stations" in another proceeding.

The FCC also dismissed as "unnecessary" a petition filed March 19, 1997, by James Cardillo-Lee, KE6VGV, asking that hams who also are emergency personnel engaged in disaster relief be permitted to use the amateur bands while on paid-duty status.

Rick Lindquist, N1RL ♦ Senior News Editor

Devices (OTARD) rule concerning governmental and nongovernmental restrictions on viewer's ability to receive video programming signals from direct broadcast satellites (DBS), TV stations and wireless cable video providers. The rule prohibits restrictions that impair the installation, maintenance or use of antennas used to receive video programming. The FCC says the OTARD rule "applies to restrictions in condominiums, cooperatives or rental buildings as long as the viewer installs the antenna in an area where the viewer has exclusive use, such as a balcony or patio."

ELSER-MATHES CUP AWAITS

The news late last fall about the presumed-lost Mars Polar Lander renewed interest in the Elser-Mathes Cup. Visitors to ARRL HQ may recall having seen the unusual trophy on display. It's intended to mark the occasion of the first two-way Amateur Radio contact between Earth and Mars. (The actual bowl of the cup is borne by images of beings that only coincidentally resemble the large-eyed hominids of alien abduction lore—although that was *not* the intention.—*Ed*)

JOE BOTTIGLIERI, AA1GW

The story of the Elser-Mathes cup appeared in the November 1969 issue of *QST*. In his article, "That Planet Mars QSO Cup," Col Fred Johnson Elser, W6FB, recalled meeting League founder Hiram Percy Maxim, W1AW, in the 1920s. He learned that Maxim had an interest in Mars and even owned a globe of "The Red Planet."

Later, back in The Philippines—in 1928 under US jurisdiction—Elser was inspired by a visit with Philippines SCM Lt Cmdr Stanley Mathes, K1CY, to offer "a unique trophy" for the first two-way communication with Maxim's "pet planet," Mars.

The actual trophy selected by Elser and Mathes during a trip to Baguio is an example of Igorot native woodcarving. "The base symbolizes Earth and the seated figures are its inhabitants," Elser explained in *QST*. "The bowl is Mars, and the standing men are the amateurs who bridge the gap of space." The plate fastened to the cup includes space for the names, call signs, and dates of those who will fulfill the cup's eventual destiny. (In the meantime, if you'd like to send your *name* to Mars, visit **http://spacekids.hq.nasa.gov/2001/**.)

Riley Hollingsworth to be Dayton Hamvention Keynoter

FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth, K4ZDH, will be the keynote speaker at the 2000 Dayton Hamvention banquet on Saturday, May 20. For the first time ever, the Dayton Hamvention will host the ARRL National Convention, and Hamvention 2000 promises to be the biggest and best ever.

Already well known to the amateur community, Hollingsworth's appearances at last year's Hamvention drew large and enthusiastic audiences. Hollingsworth said he was pleased to be invited back to Dayton and honored to be the banquet speaker for Hamvention 2000.

In the fall of 1998, Hollingsworth—who's headquartered at the FCC's Gettysburg, Pennsylvania, office—spearheaded an Amateur Radio enforcement initiative that reversed a long period of Commission inattention and apathy. Hams across the US have credited Hollingsworth with helping to reduce malicious interference and other problem behavior, both on and off the air. The result has been a marked upswing in morale within the amateur community.

RICK LINDQUIST, N1RL

As a warning to rulebreakers, Riley Hollingsworth wields the dreaded Wouff Hong and Rettysnitch during a visit to ARRL Headquarters.

Hollingsworth says his message is a simple one. "Our communications services in America, whether our telephone system or our computer networks, are the envy of the rest of the world," he said. "Our Amateur Radio Service should be, too. There's no reason why our Amateur Radio Service can't be the finest radio service in the world."

A native of South Carolina and a ham for 39 years, Hollingsworth holds an Advanced class ticket. He's a graduate of the University of South Carolina and Wake Forest University Law School.

Now an FCC veteran, Hollingsworth, 53, previously served in several prominent positions within the FCC's Wireless Telecommunications Bureau.

Hollingsworth joined the former Compliance and Information Bureau as Legal Advisor for Enforcement in 1998. As a result of the FCC reorganization last November, Hollingsworth became Special Counsel for Amateur Radio Enforcement within the FCC's new Enforcement Bureau.

In addition to his enforcement duties—which include the Land Mobile Service in addition to Amateur Service—Hollingsworth has been temporarily detailed to the new FCC Consumer Information Bureau to manage the Gettysburg Consumer Center.

A member of the ARRL, Hollingsworth also belongs to the Quarter Century Wireless Association and the Radio Club of America. He enjoys collecting vintage Amateur Radio equipment and has set up several older transmitter-receiver combinations at his home along with his modern gear.

Dayton Hamvention will take place May 19-21, 2000. Because it's also the League's national convention, Dayton Hamvention 2000 will include an expanded list of forums. Tentatively on the schedule are a space and educational forum conducted by ARRL Field and Educational Services Manager Rosalie White, WA1STO; a "2020 Vision" forum conducted by ARRL Executive Vice President David Sumner, K1ZZ; an ARRL technical forum; and a convocation for section managers hosted by White and Ohio Section Manager Joe Phillips, K8QOE. Other forums include public service and the traditional ARRL Forum conducted by League officers and directors.

Advanced registration now is available. Call 937-276-6930 or e-mail **tickets@hamvention.org**. For additional information, visit **http://www.hamvention.org** or e-mail **info@hamvention.org** or call 937-276-6930 weekdays 10 AM-5 PM.

Make plans now to be a part of Amateur Radio history!

FCC News

FCC INTERVENES IN POWER LINE NOISE COMPLAINTS

Taking a new direction in a power-line interference case, the FCC has contacted a West Coast power company to remind the utility of its obligation to fix equipment problems that cause harmful radio interference. The case involved longstanding complaints by several Northern California amateurs to Pacific Gas & Electric Company regarding severe power line noise on the ham bands.

On November 22, the FCC's Consumer Center wrote PG&E Senior VP James K. Randolph, requesting the company to correct the problem. "The FCC has the responsibility to require that utility companies rectify such problems within a reasonable time if the interference is caused by faulty power utility equipment," the Commission's letter said.

Special Counsel for Amateur Radio Enforcement Riley Hollingsworth explained that the situation involved "a long history of non-response" by PG&E and that the amateurs involved had "shown a lot of patience."

Under FCC Part 15, utilities and others that fall under its provisions are obliged to not cause harmful interference to licensed services and to cease operating a device that's causing harmful interference upon FCC notification. The FCC said it's confident that utilities can resolve such interference issues voluntarily, but its letter was intended as a reminder that the unresolved interference problem "may be a violation of FCC rules and could result in a monetary forfeiture for each occurrence."

The FCC said it encourages parties to resolve such problems "without FCC intervention" but says it will step in when necessary. In this particular case, Hollingsworth said, the amateurs "had worked diligently with the power company and with the League, and we thought it appropriate for us to send a letter reminding them of what the Commission's rules and policies are."

Hollingsworth and ARRL Lab Supervisor, Ed Hare, W1RFI—the League's point man for interference-related issues—advise that, before asking the FCC to intervene as it did with the PG&E situation, affected amateurs first should attempt to work patiently with the utility and contact the League for help.

The ARRL Technical Information Service has prepared a Web page, "RFI—Electrical and Power Line," at **http://www.arrl.org/tis/info/rfi-elec.html**. Amateurs suffering from interference believed to be emanating from power generation or transmission facilities also may contact Ed Hare, W1RFI, 860-594-0318; **rfi@arrl.org**.

VAST MAJORITY OF HAMS NOT ULS-READY

Even though registration has been available for more than two years, most Amateur Radio licensees have yet to register with the FCC's Universal Licensing

News in Brief:

• **FAR offers scholarships:** The nonprofit Foundation for Amateur Radio Inc—an ARRL-affiliated federation of more than 75 Amateur Radio clubs in the Washington, DC, area—plans to administer 73 scholarships for the 2000-2001 academic year to assist eligible radio amateurs with post-secondary education. The Foundation fully funds 10 of the scholarships with income from grants and from its annual hamfest. FAR administers the remaining 63 scholarships at no cost to the donors. Amateur Radio licensees are eligible to compete for these awards if they plan to pursue a full-time course of study beyond high school and are enrolled in or have been accepted at an accredited university, college, or technical school. Awards range from $500 to $2500. In some cases, preference goes to those pursuing certain courses of study or to residents of specific geographical areas. FAR encourages all clubs—especially those in Delaware, Florida, Maryland, Ohio, Pennsylvania, Texas, Virginia, and Wisconsin—to spread the word on the availability of these scholarships at meetings, in newsletters, during training classes, on their nets, and on their Web sites. Application forms and additional information are available by letter or QSL postmarked prior to April 30, 2000, from FAR Scholarships, PO Box 831, Riverdale, MD 20738. Contributions to FAR are tax-deductible.—*FAR*

• **ARRL insurance administrator changing name:** ARRL Ham Radio Equipment Insurance Program administrator A.H. Wohlers & Company is getting a new name, but the insurance program will remain the same. The company will become known as Seabury & Smith, but incorporation of the new name won't be completed until the middle of 2000. Personnel, management, location and telephone numbers will remain the same. For additional information, contact Seabury & Smith, 1440 N Northwest Hwy, Park Ridge, IL 60068; toll-free 800-323-2106; **http://www.wohlers.com/**; **cusv@ahw.com**. For information about the ARRL "All Risk" Ham Radio Equipment Insurance Plan, visit **http://www.arrl.org/field/regulations/insurance/equipment.html** —*Seabury & Smith news release*

• **New NCDXF/IARU beacon:** The 17th beacon in the NCDXF/IARU Beacon Network came on the air from Novosibirsk, Russia, November 26 at 0945 UTC. The call sign is RR9O. Beacon operator Yuri Zaruba, UA9OBA, reports that this was the first radio beacon to be placed on the air in Russia, and the occasion got local and national TV coverage. The NCDXF/IARU beacons provide world-wide coverage and transmit in turn every three minutes on five different amateur radio bands at 14.100, 18.110, 21.150, 24.930, and 28.200 MHz. These beacons help HF radio users assess current ionospheric conditions. The entire system is designed, built and operated by volunteers. The final beacon will be in Hong Kong, China, with the call sign VR2HK. For more information, visit **http://www.ncdxf.org**.—*Bob Fabry, N6EK*

• **New AMRAD LF Beacon activated:** A second experimental low-frequency beacon is on the air from Northern Virginia. The WA2XTF/12 beacon on 136.745 kHz is a part of the Amateur Radio Research and Development Corporation's experiments to gain LF experience in anticipation that the FCC may allocate an amateur band at 136 kHz. In October 1998, the ARRL petitioned the FCC to create two amateur LF allocations at 135.7-137.8 kHz and 160-190 kHz. AMRAD obtained its Part 5 experimental license for the project early last year. The new beacon at the QTH of Ted Seely, AA4GM, near Front Royal, Virginia—one of 12 WA2XTF sites—features a 175 W transmitter feeding a 1600-foot horizontal antenna. It transmits a continuous CW message at 5 WPM. Reception reports may be sent via e-mail to André Kesteloot, N4ICK, **n4ick@amrad.org**. Further more information, visit **http://www.amrad.org**.—*AMRAD*

• **KLM antennas out of business:** KLM Antennas of Monroe, Washington, reportedly closed its doors as of October 31. Industry sources say that Bruce Scott will continue to sell parts—at least for the time being—by e-mail orders only to **klm_antennas@msn.com**. No other information is available at this time.

• ***QST* Cover Plaque Award:** The winner of the *QST* Cover Plaque Award for November was Evhen Tupis, W2EV, for his article, "An Automated Meteor-Scatter Station." Congratulations, Ev!

NOTABLE SILENT KEYS

Charles J. "Chod" Harris, WB2CHO, SK

Former ARRL HQ staffer and *CQ* magazine DX columnist Charles J. "Chod" Harris, WB2CHO/VP2ML, of Santa Rosa, California, died December 8 of complications following a heart attack in early November. He was 50.

An ARRL Life Member, Harris was first licensed in the late 1960s. In 1976 Harris helped to establish the ARRL Club and Training Department, which he managed until 1978.

ARRL Executive Vice President David Sumner, K1ZZ, said Harris' tenure in Club and Training coincided with the League's response to the Citizens Band craze. "He faced the challenge of absorbing into our ranks the refugees of the CB boom," Sumner recalled. "He poured enormous energy and creativity into the task." ARRL Field and Educational Services Manager Rosalie White, WA1STO, remembered Harris as "a vibrant force, with a lot of new ideas for recruitment and education."

While on the ARRL staff, Harris also helped to author the beginner's classic *Tune in the World with Ham Radio*, among other publications. Harris met his wife, Jean, while working at ARRL HQ. Over the years, Harris wrote numerous articles for *QST* and other publications and once published several DX newsletters.

A record-holding contester and a consummate DXer and DXpeditioner, Harris had operated from several exotic locations around the world, including Senegal, Sierra Leone, the Galapagos Islands, Easter Island, and Christmas Island. He obtained his VP2ML call sign during his time spent on the island of Montserrat, where he lived in the late 1970s and early 1980s before moving to California.

Harris served as an International Amateur Radio Union Region 2 Conference delegate from Montserrat, most recently in 1995 at Niagara Falls, Canada, where he chaired the HF Committee.

Harris took over the reins as *CQ* DX Editor in July 1989. "All of us at CQ are going to miss Chod," said *CQ* Editor Rich Moseson, W2VU. "Chod devoted much of his life to ham radio, but it was a life that was all too short," Moseson said, adding that Harris' devotion to DX prompted him to name is dog "Dog X-ray."

Harris was the third member of the *CQ* family to die during 1998. *CQ* Editor Alan Dorhoffer, K2EEK, passed away July 19, and WAZ Award Manager Jim Dionne, K1MEM, died October 12.

A memorial service was held December 10 in Santa Rosa. The family invited memorial donations to the American Heart Association or to the Northern California DX Foundation, c/o Bruce Butler, W6OSP, 4220 Chardonnay Ct, Napa, CA 94558. Friends may write the Harris family at 3201 Franz Valley Rd, Santa Rosa, CA 95404.

VHF-UHF Pioneer Paul M. Wilson, W4HHK, SK

VHF-UHF pioneer Paul Wilson, W4HHK, of Collierville, Tennessee, died November 29. He was 75. Last summer, Wilson battled pneumonia then suffered a massive heart attack in late October. He succumbed as a result of a second heart attack.

A stalwart in the 144-MHz and Microwave Standings, Wilson remained active right up until his health deteriorated. In early July, he completed his VUCC on 10 GHz. He celebrated his 75th birthday last September by making his first contact on 24 GHz.

"Paul's life should inspire every amateur to strive to always try something new in Amateur Radio, regardless of age or health," said ARRL Vice President Joel Harrison, W5ZN—a friend of Wilson's. "He was a gentleman. He has definitely been an example for me. I will miss him."

"Paul's life should inspire every amateur to strive to always try something new in Amateur Radio, regardless of age or health," said ARRL Vice President Joel Harrison, W5ZN—a friend of Wilson's. "He has definitely been an example for me."

Noted VHF-UHFer Al Ward, W5LUA, called Wilson "a true VHF pioneer" and said he would be missed. Former AMSAT-NA President Bill Tynan, W3XO, called Wilson "a very good friend and a great VHFer," while Tom Clark, W3IWI, said he considered Wilson "a personal hero" and "truly a UHF pioneer."

Wilson got his ham ticket in 1941 at the age of 16. While still in high school, he began experimenting on the old $2^1/_2$ meter band (112 MHz). After World War II, he rekindled his interest in VHF and UHF, becoming a major figure on the then-new 2-meter band.

During the 1950s, he got involved in meteor scatter propagation. In 1954, W4HHK and Tommy Thomas, W2UK in New Jersey sent and received reports via 2-meter meteor scatter over a 950-mile (1520 km) path—a first! W4HHK and W2UK won the ARRL Technical Merit Award for 1955.

Wilson took on the challenge of Earth-Moon-Earth propagation as well, and in 1961 he began work on an 18-foot dish. He was among those making their first 70-cm EME contacts in July 1965. From that frontier, he moved on to attempt 2304 MHz moonbounce, and he won the ARRL Technical Merit Award for 1969 for his work on that band. In 1970, W4HHK and W3GKP claimed a new record—the first 2304-MHz EME contact.

In 1968, Wilson used his 18-foot dish to monitor the Apollo 10 command module on 2.2 GHz as the astronauts orbited the moon. He received a NASA confirmation of his reports in the form of a photograph signed by all the astronauts on the mission.

Wilson retired in 1980 after 30 years as an engineer for TV station WMC in Memphis. His wife "DB"—to whom he was married for 54 years—is W4UDQ. His son, Steven, is N4HHK.

A staunch League supporter and ARRL Technical Adviser, Wilson was frequently in the pages of *QST* over the years—both as an author and as a subject. In his December 1999 *QST* "It Seems to Us . . ." editorial, ARRL Executive Vice President David Sumner, K1ZZ, singled out Wilson as an Amateur Radio hero for his pioneering accomplishments.

The Central States VHF Society awarded Wilson its Chambers Award in 1986 for "his continuing technical contributions to UHF, especially EME on 13cm."

Services were December 2 in Collierville.

LESLIE SCHMARDER, WA2AEA, SK

Past Northern New York Section Manager Les Schmarder, WA2AEA, of Elizabethtown, New York, died December 4. He was 52. Not long before his death, Schmarder had stepped down as NNY SM due to ill health, and former SM Chuck Orem, KD2AJ, was named to complete his term.

Schmarder had succeeded Orem as SM in 1997 after Orem stepped down, and he was elected to the post in his own right a year ago. Schmarder was a volunteer examiner and treasurer of Digital Operators Emergency Radio Service and involved in emergency communication.

A memorial service was held December 8. Survivors include his wife, Mary Lou Morgan, and four sons. Friends may write the family at Route 1, Box 236, Elizabethtown, NY 12932.

System. The ULS Task Force reports that, as of mid-November, 682,212 amateurs still were not registered. This figure includes individuals whose licenses have lapsed but remain in the two-year grace period.

The FCC deployed the ULS for the Amateur Service last August 16. Amateurs must be registered in the ULS in order to file applications with the FCC—including renewals, modifications, and vanity call sign requests.

In mid-December the FCC began processing *some* of the backlog of new club station applications filed over the previous four months. The ULS processed some new applications from August, and the Task Force anticipated running applications from September and possibly October if no major problems occurred. The ULS was not yet processing club station modification applications via the Universal Licensing System. Applications for new or modified club station licenses still must be filed on FCC Form 610B. Prior to filing a new or modified club station application, applicants must obtain an Assigned Taxpayer Identification Number from FCC Technical Support, 202-414-1250.

The ULS Task Force also wants amateur applicants to know that if they apply too early for license renewal, their applications will be dismissed. A license renewal must be filed no sooner than within 90 days of expiration, even if coupled with a license modification. This is only an issue for those filing paper applications; the electronic filing system will not let applicants file prematurely.

To register for the ULS, visit **http://www.fcc.gov/wtb/uls** and click on "TIN/Call Sign Registration". Paper registration also is possible. For more information, call toll-free 888-CALL FCC (225-5322). Simple, step-by-step instructions on how to register for the FCC's Universal Licensing System are available at **http://www.arrl.org/fcc/uls101.html**.

Amateur Enforcement News

• **FCC investigates examination sessions:** Following up on allegations of irregularities, the FCC is auditing a July 14 W5YI-VEC Amateur Radio examination session in Clemson, South Carolina. FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth has queried several individuals said to have been involved with the session, including four W5YI-VEC Volunteer Examiners. Several individuals who took and passed examinations at the session also were designated for retesting. At the core of the issue is an examination "sub-session" arranged following a regularly scheduled test session the same day in Clemson. The W5YI-VEC, which has cooperated with the FCC in the investigation, says there's reason to believe that VEC paperwork may have been forged, some of the alleged volunteer examiners actually were imposters, and one examiner also was an examinee. In a prepared statement, Fred Maia, W5YI, says the FCC is especially interested in the circumstances of the upgrade of William J. Browning, AB4BB (ex-AF4PJ and KE4BWS), from General to Amateur Extra. Maia says Browning "upgraded his General class license at a second session held after he acted as team leader at his regular examination session held the same day at the same location." Maia says the second exam session appears to be "a concocted session to upgrade a specific licensee." Hollingsworth has written volunteer examiners Eugene D. Watring, AF4DB; "Dale" Martin, KT4NY; Grady P. Robinson, AK4N; and Mikel T. Blackwell, N4OPD, to ask if any of them signed the manifest or any Forms 610 or authorized anyone to sign on his behalf; if he was present for the exam session or any part of it, and, if so, the time and location; the nature of his involvement, if any, in the July 14 examination session, and, if he were not present, how he became aware that "your purported signature appeared" on the exam session documents. Following up on an audit of a May 2, 1999, examination session in Yonkers, New York, Hollingsworth posed similar questions to ARRL-VEC volunteer examiner James Bonnett, KA2ZSA. Hollingsworth also asked if Bonnett had applied any of the marks found on answer sheets from the session. Hollingsworth also wrote to session examinee Winston Tulloch, KC2ALN, who had attempted to upgrade from General to Advanced at the session. The FCC subsequently dismissed applications from Tulloch and others because of alleged irregularities and put a cloud over their future amateur applications. In his December 8 letter, Hollingsworth encouraged Tulloch to retake the examination and said his application "would be processed routinely." Alleged irregularities at the session, Hollingsworth told Tulloch, "were not your fault and in no way reflect adversely on your qualifications to be a licensee."

• **FCC letter includes operating reminders for nets:** FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth took advantage of an enforcement-related letter to issue some operating reminders for nets. On November 3, Hollingsworth wrote Alan E. Strauss, WA4JTK, of Carol City, Florida, to follow up on earlier complaints about the "14.247 DX Group," for which Strauss serves as net control. The FCC had contacted Strauss earlier regarding complaints that the 14.247 DX Group monopolized that frequency and interfered with ongoing amateur

Section Manager Election Notice

To all ARRL members in the Illinois, Indiana, Maine, Northern Florida, Oregon, Santa Clara Valley, Vermont, and Wisconsin sections. You are hereby solicited for nominating petitions pursuant to an election for section manager (SM). Incumbents are listed on page 12 of this issue.

To be valid, a petition must contain the signatures of five or more full ARRL members residing in the section concerned. Photocopied signatures are *not* acceptable. No petition is valid without at least five signatures, and it is advisable to have a few more than five signatures on each petition. Petition forms (FSD-129) are available on request from ARRL Headquarters but are not required. We suggest the following format:

(Place and Date)

Field & Educational Services Manager, ARRL
225 Main St
Newington, CT 06111

We, the undersigned full members of the _____ ARRL section of the _____ division, hereby nominate _____ as candidate for Section Manager for this section for the next two-year term of office.

(Signature__Call Sign___ City__ ZIP__)

Any candidate for the office of Section Manager must be a resident of the section, a licensed amateur of Technician class or higher and a full member of the League for a continuous term of at least two years immediately preceding receipt of a petition for nomination. Petitions must be received at Headquarters by 4 PM Eastern Time on March 10, 2000. Whenever more than one member is nominated in a single section, ballots will be mailed from Headquarters on or before April 1, 2000, to full members of record as of March 10, 2000, which is the closing date for nominations. Returns will be counted May 23, 2000. Section managers elected as a result of the above procedure will take office July 1, 2000.

If only one valid petition is received from a section, that nominee shall be declared elected without opposition for a two-year term beginning July 1, 2000. If *no* petitions are received from a section by the specified closing date, such section will be resolicited in the July 2000 *QST*. A section manager elected through the resolicitation will serve a term of 18 months. Vacancies in any section manager's office between elections are filled by the Field & Educational Services Manager. You are urged to take the initiative and file a nomination petition immediately.—*Rosalie White, WA1STO, Field & Educational Services Manager*

communications. The November 3 letter included a copy of correspondence the FCC received on August 4 that Hollingsworth said conflicts with Strauss's explanation of interference alleged to have occurred to the net in July. Hollingsworth said the case will remain open, and the FCC will continue to monitor net operations. Hollingsworth used the occasion of the Strauss letter to again point out that amateur frequencies are shared and no net has a greater right than any other ham to a given frequency and cannot take over a frequency unless voluntarily relinquished. If the frequency is not relinquished, Hollingsworth said, amateurs must exercise "good Amateur practice" in choosing another frequency that does not disrupt existing communications. "A net 'taking over' a frequency from existing legitimate communications or deliberately operating disruptively close to existing legitimate communications will be considered to be engaging in deliberate interference," he wrote. Hollingsworth also told Strauss that the practice of "identifying only by the last two letters of an Amateur call sign is a violation of Part 97" of the FCC rules and that such practice "must not be condoned by your group." Some amateurs had construed the statement as a tightening of FCC station identification enforcement policy. Hollingsworth told the ARRL that's not the case. "All we said was that if *only* the last two letters are given, it doesn't meet Part 97," he said. He pointed out that if a calling station using an abbreviated ID is never acknowledged and given a chance to give a complete call sign, a legal ID would be lacking for that communication. To be strictly legal, stations using a suffix-letter ID always must identify within the first 10 minutes of the communication (and each 10 minutes thereafter) with a complete call sign. Hollingsworth reminded net control stations not to encourage rule violations by requiring check-ins to use two-letter IDs without allowing a legal ID at some point within the time limits of the rules.

NEW BOOKS

JOE CARR'S LOOP ANTENNA HANDBOOK

By Joe Carr, K4IPV

Copyright 1999 by Universal Radio Research, 6830 Americana Pkwy, Reynoldsburg, OH 43068-4113; tel 800-431-3939; **http://www.universal-radio.com**. *Paperback, 8½× 11 inches, 133 pages, perfect bound. ISBN 1-882123-28-X. $19.95.*

Reviewed by Steve Ford, WB8IMY
QST *Managing Editor*

◊ Loop antennas seem to defy common sense. If you think of it strictly in terms of a dc circuit, a loop antenna is a dead short! The basic loop looks like nothing more than a length of wire bent or wound into a particular shape (often circular, square or triangular). The circuit path of the antenna begins and ends at the same place: your radio (or feed line). Who in their right mind would connect the output of a radio to a short circuit?

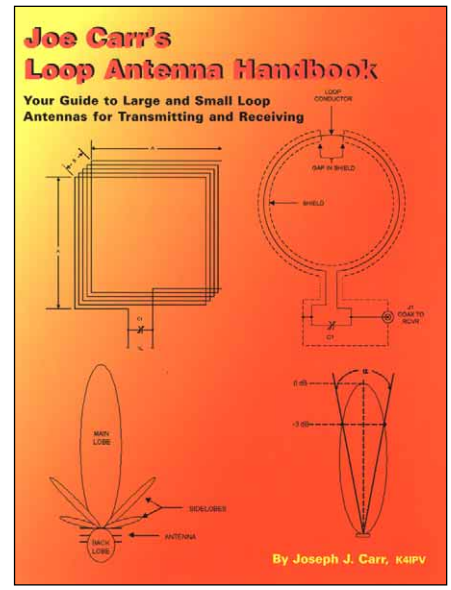
When it comes to RF, however, the loop is a very different circuit indeed. Depending on size, elevation and other factors, a loop presents a substantial load impedance at RF frequencies. A loop antenna is not only *not* a short circuit for RF, it radiates (and receives) quite well. Best of all, if offers good performance in a relatively small space.

Joe Carr, K4IPV, is a well-known author whose work spans more than 85 books and 650 articles over several decades. In *Joe Carr's Loop Antenna Handbook* this prolific author tackles the popular subject of loop antennas on a broad scale. Carr covers everything from small and large loop antenna theory to practical construction. Although the book is written primarily for shortwave listeners, Carr frequently reminds the reader that many of the same loops used for receiving can often be used for transmitting.

You'll find plenty of interesting large-loop construction projects, from a basic single-band loop that you can hang between a couple of trees, to an ambitious HF cubical quad beam. Two multiband triangular "delta" loops caught my eye. The 80-10 meter version hangs from two supports and is fed with 450-Ω ladder line. The top section (only 33 feet across) includes a quarter-wavelength stub. I may have to give it a try.

While discussing large loops, Carr correctly points out that you don't necessarily need trees or poles to support a loop antenna. For many years hams have successfully used loop antennas installed between attic rafters, and even along bedroom ceilings! (Yes, the author does stress the need to operate at low power levels with indoor loops.) Carr offers several indoor loop designs that would be valuable for apartment or condo dwellers.

When it comes to small loops, Carr concentrates on receiving applications almost exclusively. There are some intriguing designs for MW and VLF loopsticks (chapter 10), as well as a motorized rotatable loop. He also presents a neat method for remote tuning a receiving loop using a varactor installed at the antenna. A dc tuning voltage is applied through the feed line and adjusted with a potentiometer at the radio.



If you're looking for an effective wire antenna that you can squeeze onto a small lot, or into a small room, a loop design should be at the top of your list. *Joe Carr's Loop Antenna Handbook* will give you the fundamentals you need to understand and use these "mysterious" skyhooks. QST

Next New Book

STRAYS

SETI II: THE JOURNEY

◊ Science fiction author Frederick Fichman, WA6YVA, is pioneering an innovative method of book distribution. His latest work, *SETI II: The Journey*, is a novel available for purchase on the Web—not as a printed work, but as sets of chapters that you download and read on your monitor or print to paper (using Adobe *Acrobat* software, which is freely available on the Web). The book can be purchased in its entirety, or you can buy several chapters at a time. The story of *SETI II: The Journey* involves a young Amateur Radio operator who intercepts the first signals from an alien civilization. What follows is a fast-paced, suspenseful tale that weaves elements of "spy" fiction, science fiction and, of course, radios. You can check out the SciFiNetBooks site at: **http://www.scifinetbooks.com/**.

50 YEARS WITH THE ARRL

◊ ARRL Rhode Island Section Manager Armand Lambert, K1FLD (center), presents a special certificate to Gar Weymouth, N1NEZ (right), outgoing president of the Newport County Radio Club, to honor the club's 50th year of ARRL affiliation. Jack Garforth, K1IG, the incoming club president was also on hand for the presentation (standing immediately behind K1FLD), which took place December 13, 1999 at the NCRC Christmas party.

Next Stray

MOVED & SECONDED

MINUTES OF EXECUTIVE COMMITTEE
Number 461
Irving, Texas – December 4, 1999

Agenda

1. Approval of minutes of July 15, 1999, Executive Committee meeting
2. FCC matters
3. General legal matters
4. Antenna/RFI matters
5. Legislative matters
6. International matters
7. Organizational matters
8. Recognition of new Life Members
9. Affiliation of clubs
10. Approval of conventions
11. Date and place of next EC meeting
12. Other business

Pursuant to due notice, the Executive Committee of the American Radio Relay League, Inc., met at 8:30 AM Saturday, December 4, 1999, at the Dallas/Fort Worth Airport Marriott Hotel, Irving, Texas. Present were the following committee members: President Rodney Stafford, W6ROD, in the Chair; First Vice President Stephen A. Mendelsohn, W2ML; Executive Vice President David Sumner, K1ZZ; and Directors Kay Craigie, WT3P, Frank Fallon, N2FF, and Fried Heyn, WA6WZO. Member Tod Olson, K0TO, ws unable to attend owing to illness in his family. Also present were Vice President Joel Harrison, W5ZN, International Affairs Vice President Larry E. Price, W4RA, Directors Frank Butler, W4RH, and Jim Haynie, W5JBP, and General Counsel Christopher D. Imlay, W3KD.

1. On motion of Mr. Mendelsohn, the minutes of the July 15, 1999, Executive Committee meeting were approved in the form in which they had been distributed.

2. FCC matters

2.1. Mr. Imlay noted the release of an FCC Order signed by the Deputy Chief, Wireless Telecommunications Bureau, denying the 1996 ARRL petition, RM-8763, that had sought modification and clarification of the limited preemption policy governing Amateur Radio antennas. He has concluded that there are grounds for seeking reconsideration in two respects in which the FCC is treating the Amateur Radio Service differently from other, similarly situated radio services. On motion of Mr. Heyn, the General Counsel was instructed to seek reconsideration of the Order with regard to restrictive covenants as well as with regard to excessive costs levied or required by a local authority.

2.2. Mr. Imlay reported that on October 25, 1999 Clearwire Technologies, Inc., a manufacturer of Part 15 devices, filed a petition for partial reconsideration of the FCC's Report and Order in WT Docket No. 97-12. Clearwire seeks restrictions on amateur use of spread spectrum emissions in bands in which Part 15 operation is authorized. The petition has not yet been placed on public notice. On motion of Mr. Fallon, the General Counsel was instructed to file in opposition to the reconsideration petition at the appropriate time.

2.3. Mr. Imlay reported that comments are being drafted in response to a Notice of Proposed Rule Making in ET Docket No. 98-80, concerning conducted emissions limits below 30 MHz and measurement procedures for AC power lines. The draft is being prepared with assistance from the ARRL Technical Laboratory and the Washington Office, and will be available at the January Board Meeting. The comment deadline is January 31, 2000.

2.4. Mr. Imlay noted that in its Report and Order in ET Docket No. 98-95, the proceeding to allocate 5.85-5.925 GHz for dedicated short range communications systems operating in the Intelligent Transportation System, the FCC had not addressed the ARRL request for an upgrade to primary status of the amateur allocations at 5.65-5.725 and 5.825-5.85 GHz. This request was based on the diminished utility of the remainder of the band. After discussion, it was agreed that this particular proceeding did not offer a good vehicle for the further pursuit of this objective.

2.5. Mr. Imlay introduced an FCC policy statement released November 22, 1999 and entitled "Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium." The documents lists 216-220 MHz as one of several bands where the presence of existing services would appear to limit the opportunities for licensing new services, and therefore proposes no new allocations until the Office of Engineering and Technology, working with the National Telecommunications and Information Administration (NTIA), clarifies how it could be made available for new services in a manner that would be attractive to new licensees in a competitive bidding process. The document identifies 2300-2305, 2400-2402, and 2417-2450 MHz as a "new reserve" but notes current uses that restrict the availability of the bands for new services "given current sharing techniques." According to the FCC, the bands are to be reserved "until a future time, when new technology or other changes may increase the opportunities for new operations in these bands. Nevertheless, we will be receptive to petitions for reallocation of the reserve spectrum bands." Mr. Imlay noted that the ARRL is on record with a request for an upgrade of amateur allocation at 2300-2305 MHz from secondary to primary, in a Petition for Further Notice of Proposed Rule Making in ET Docket No. 94-32 filed on November 16, 1996. The FCC has not yet acted on this petition.

After discussion, on motion of Mr. Heyn, it was voted that the ARRL accept the FCC invitation extended in its policy statement to petition for an upgrade of the amateur allocation at 2400-2402 MHz from secondary to primary as the most appropriate use for this portion of the spectrum reserve.

2.6. Mr. Imlay reviewed the history of an application for an experimental license submitted on behalf of Los Angeles County for the band 2402-2448 MHz, ostensibly to study the potential of interference to incumbent users from airborne public safety video transmitters. The ARRL filed an informal objection, the proper procedural vehicle for an application of this type, on September 23. A similar application has now been filed by the City of Los Angeles, and an ARRL objection is being drafted.

2.7. Late-filed comments opposing RM-9404, the ARRL petition for a low frequency amateur allocation, were filed by HID Corporation of Irvine, CA. HID alleges potential interference to their products, which operate under FCC Part 15. Mr. Imlay will file an opposition in order to correct misstatements concerning the regulatory situation with regard to amateur LF operation in Europe.

2.8. Comments are due December 10 in response to an FCC Public Notice soliciting suggestions for the revision or deletion of certain sections of the FCC Rules, Parts 2, 15, and 18, that were adopted during the years 1986 to 1989. The objective is to reduce the economic impact of these rules on small business entities. Mr. Imlay noted that the present §15.17 does not provide adequate warning to small businesses that amateur HF bands cannot be used by Part 15 devices because of their high interference potential. As a result, businesses may make substantial investments in developing products that cannot be used. On motion of Mr. Mendelsohn, the ARRL Laboratory staff was thanked for its contribution to the analysis of this issue and the General Counsel was instructed to file comments recommending appropriate amendment of §15.17.

2.9. Mr. Imlay reported briefly on the status of WT Docket No. 98-143, the biennial review amateur license restructuring proceeding. Release of a Report and Order is believed to be imminent.

2.10. Mr. Imlay noted that some ARRL volunteer examiner teams are reluctant to handle FCC forms bearing applicants' Social Security numbers, for fear of being accused of making improper use of this information. After discussion it was agreed that VE teams should be advised that they have the option of requiring that applicants preregister on ULS before taking an examination, as long as adequate advance notice of the requirement is given. This information will be sent to VE teams in the next regular mailing.

2.11. A manufacturer has been marketing a system for remotely controlling an HF transceiver through a pair of dual-band VHF/UHF transceivers. The device cannot be operated legally in the United States because one of the bands used is 144 MHz, and auxiliary operation is limited to certain frequencies above 222.15 MHz. In the past the ARRL has opposed lowering this frequency limit. After discussion, Mr. Sumner was asked to prepare a paper explaining the rationale for the present rule to provide a basis for future discussion of whether the restriction is still needed.

2.12. Recent FCC correspondence concerning repeater coordination issues was discussed without formal action.

2.13. The recent FCC Order dismissing five petitions on Amateur Radio issues, including three submitted by the ARRL, was reviewed. No action was taken.

The committee was in recess for luncheon from 12:03 to 1:29 P.M.

3. General legal matters

3.1. Mr. Imlay reported briefly on the status of legal proceedings to which the ARRL is a party.

3.2. At Minute 53 of the 1999 Second Meeting of the Board, the Executive Committee was asked to consider whether elected ARRL officials who are members of the bar should be allowed to represent members in Amateur Radio tower cases on a pro bono basis, and to report its recommendation to the Board at the 2000 Annual Meeting. Mr. Imlay presented a report on how other non-profit organizations handle conflicts of interest. On motion of Mr. Heyn, it was agreed to recommend the following addition to Article 11 of the ARRL Articles of Association: "Nothing herein shall prevent an Officer, Director or Vice Director from assisting a member of the League, without compensation or remuneration, on a matter that is consistent with the stated interests and policies of the League."

3.3. Mr. Imlay advised that a request had been received from The Association of Public-Safety Communications Officials-International, Inc. (APCO) as to whether the ARRL would be willing to make its mediation services available for the resolution of public safety interference issues. It was agreed that it would be desirable to support APCO, with whom the ARRL has a memorandum of understanding, but that as a first step the ARRL volunteers in the mediation program should be asked whether they would be willing to serve in such cases. Mr. Imlay is to ask APCO for examples of the kinds of cases in which mediation might be sought, and will then write to the volunteers. It is hoped that a further report will be available by January 10, in time for consideration by the ARRL Board at the 2000 Annual Meeting.

4. The status of legal proceedings concerning amateur antennas and radio frequency interference were considered as follows:

4.1. *Persin v. Seminole County, Florida*. ARRL member Lenard J. Persin, WB4HZQ, applied to the Seminole County Board of Adjustment for a special exception to a 35-foot height limitation so he could erect an 80-foot tower on a 7/8-acre residential lot. Initially his request was granted, but a neighbor appealed and on appeal his application was denied. He then sought relief in the U.S. District Court for the Middle District of Florida. ARRL submitted a brief *amicus curiae*.

On November 2, 1999, the Court granted summary judgment in favor of the County "because the undisputed evidence shows that the County properly balanced Mr. Persin's interests with the needs of the community." Two weeks later, in its Order

denying RM-8763, the ARRL petition for clarification of PRB-1, the FCC said: "We do not believe a clarification is necessary because the *PRB-1* decision precisely stated the principle of 'reasonable accommodation.' In *PRB-1*, the Commission stated: 'Nevertheless, local regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and to represent the minimum practicable regulation to accomplish the local authority's legitimate purpose.' Given this express Commission language, it is clear that a 'balancing of interests' approach is not appropriate in this context."

After an extended discussion, on motion of Mr. Fallon, the Executive Committee authorized funding of an appeal of the Court's decision in the amount of $2,205.

President Stafford announced the appointment of a committee to study how the ARRL provides support for antenna cases consisting of Messrs. Imlay, Fallon, and Director-elect Jay Bellows, K0QB.

4.2. The status of other cases was reviewed briefly.

5. On behalf of Legislative and Public Affairs Manager Steve Mansfield, N1MZA, Mr. Sumner presented a report on legislative activities. There are 131 cosponsors for HR 783, The Amateur Radio Spectrum Protection Act introduced by Representative Bilirakis of Florida. It is hoped that a companion bill will be introduced in the Senate early in the second session of the 106th Congress.

6. International matters

6.1. Mr. Price reported on the IARU Region 1 Conference in Lillehammer, Norway, a meeting of ITU-R Study Group 8, and the Conference Preparatory Meeting for WRC-2000 that had just concluded in Geneva. He responded to questions about the status of Amateur Radio in several other countries.

6.2. Mr. Sumner reported that an improvement in the delivery of *QST* to foreign addresses is planned. He also reported that in January the Board will be asked to authorize a vote to be cast on behalf of the ARRL with regard to the admission to IARU membership of Association des Radio-Amateurs de Nouvelle-Caledonie (ARANC).

6.3. Mr. Price reported on plans to seek appropriate call signs for Amateur Radio operation from the International Space Station, impending Amateur Radio operation under UN auspices from East Timor, and European plans for a GPS system called Galileo that could pose a threat to amateur use of the 23-cm band.

7. Organizational matters

7.1. Mr. Mendelsohn announced his intention to circulate additional material relating to the review of ARRL bylaws before the next meeting of the committee.

7.2. On motion of Mrs. Craigie it was voted that, inasmuch as the requirements of the Standing Orders with regard to the nomination of Honorary Vice Presidents have been met, the Executive Committee endorses the nomination of Hugh Turnbull, W3ABC, for election as Honorary Vice President at the 2000 Annual Meeting of the Board.

7.3. Mr. Mendelsohn reported on the status of the work of the Technology Task Force. Digital communication, RF LANs/WANs, and "Ham Internet" are the topics most frequently mentioned by those submitting proposals.

8. On motion of Mr. Heyn, 63 newly elected life members were recognized and the Secretary was instructed to list their names in *QST*.

9. On motion of Mr. Mendelsohn, the following clubs were declared affiliated or their earlier affiliation by mail vote was ratified:

Category 1
Amplitude Modulation Society of Buffalo, East Amherst, NY
Chester Amateur Radio Emergency Service, Inc., Chester, SC
Gateway Amateur Radio Society, Winchester, KY
Lubbock Amateur Contest Club, Lubbock, TX
Lycoming County Emergency Management Agency, Montoursville, PA
Narraguagus Bay Amateur Radio Club, Milbridge, ME
Northern Tier Repeater System, Oscola, PA
Paulding Amateur Radio Club, Inc., Marietta, GA
Rainbow Canyons Amateur Radio Club, New Harmony, UT
Red Oak Victory Amateur Radio Club, Kensington, CA
Redwood Amateur Radio Club, Fortuna, CA
Southern Plains Amateur Radio Klub, Liberal, KS
South Puget Sound Emergency Medical Amateur Association, Tacoma, WA
U.S.S. Pampanito Amateur Radio Club, Fremont, CA

Category 2
New Mexico Hamvention, Inc., Albuquerque, NM

Category 3
St. Antoninus School Radio Club, Cincinnati, OH

The ARRL now has the following numbers of active affiliated clubs: Category 1, 1828; Category 2, 20; Category 3, 135; Category 4, 15; Total, 1998.

10. On motion of Mrs. Craigie, the holding of the following ARRL conventions was approved or their earlier approval by mail vote was ratified:

2000
Mississippi State, Feb. 4-5, Jackson, MS
Florida State, Feb. 11-13, Orlando, FL
Tennessee State, Feb. 12-13, Memphis, TN
Vermont State, Feb. 26, Milton, VT
Nebraska State, Mar. 10-11, Norfolk, NE
North Carolina Section, Mar. 11-12, Charlotte, NC
West Gulf Division, Mar. 24-25, Tulsa, OK
North Carolina State, Apr. 9, Raleigh, NC
International DX, Apr. 14-16, Visalia, CA
Delaware State, Apr. 30, New Castle, DE
Louisiana State, May 5-6, Baton Rouge, LA
Washington State, May 13-14, Yakima, WA
Wyoming State, May 27-28, Casper, WY
Texas State, June 9-10, Arlington, TX
Delta Division, June 11, Knoxville, TN
Utah State, July 7-9, Bryce Canyon, UT
Central Division, July 8, Indianapolis, IN
Georgia State, July 8, Gainesville, GA
Oklahoma State, July 29-30, Oklahoma City, OK
Kansas State, Aug. 27, Salina, KS
Kentucky State, Sept. 9, Louisville, KY
Hudson Division, Sept. 16, White Plains, NY
W9DXCC, Sept. 16, Rolling Meadows, IL
Roanoke Division, Sept. 23-24, Virginia Beach, VA
Microwave Update, Sept. 29-30, Trevose, PA
Connecticut State, Oct. 8, Wallingford, CT
Indiana State, Nov. 18-19, Fort Wayne, IN

2001
Central Division, July 7, Indianapolis, IN
Southwestern Division, Sept. 7-9, Riverside, CA
Indiana State, Nov. 17-18, Fort Wayne, IN

11. It was agreed that the next meeting of the Executive Committee will be held at noon Thursday, January 20, 2000 in Memphis, Tennessee.

12. Other business

12.1 Mr. Sumner was asked to provide a report to the Board, prior to the 2000 Annual Meeting, on plans for the National Convention 2000 in Dayton.

12.2. Mr. Sumner presented a report on the study of a Web-based survey capability that was requested by the Board at Minute 60 of its 1999 Second Meeting. He was asked to distribute the report to the Board for review and comment before the 2000 Annual Meeting.

There being no further business, the meeting was adjourned at 6:05 PM.

Respectfully submitted,

David Sumner, K1ZZ
Secretary

Life Members Elected December 4, 1999

William G. Aten, N4EGH; Richard E. Bardin, W2CCP; Mark B. Barettella, KA2ORK; R. Michael Barts, N4GU; R. Wesley Beavers, WD6CHW; Gary M. Blum, KR6BX; Albert J. Brunner, NU3S; Robert R. Bullard, WD3T; David W. Byerly, KB7FSD; Ian Capon, G0KRL; Andrew J. Catanzaro, W9NJY; Edward L. Chancy, N4CXE; Michael D. Check, K5UCQ; William A. Coby, KB0MWG; Neil J. Collesidis, AA1SB; Richard L. Dear, KB5QZA; Conrad A. Diric, K5CSK; Terry Dull, N9HUJ; Patrick C. Dullea, AI6E; Robert E. Falk, KE4QWN; Lloyd W. Frink, K2KJ; Harvey M. Good, W2HG; Gilbert J. Hart, K0BLU; Timothy F. Hayes, NH0H; Harvey M. Hoffman, WA1YCP; Richard D. Holland, WD0FJX; Steven L. Karty, N5SK; James R. Kenevan, N9KIM; Debra G. Kloda, KA3SIL; Randy M. Kruszka, WK9M; Cheryl C. La Frentz, KF6KXK; Paul T. Laing, VK2YIL; Petra R. Martin, DH8PM; Michael B. Martin, N0CID; James F. Miller, WS8L; Goutam Mukherjee, N7ZFG; Christopher P. Nelsen, WD9HIK; William R. Nixon, WD5INA; Joseph W. O'Daniel, KE4SOA; Michael A. Pastore, WA7SCH; Bart F. Presti, WB5P; David E. Preston, K5JOI; Govind Rao, KA3RTE; Melissa C. Rasmussen, K5MCR; Robert C. Rice, WB5PKN; Brian L. Roberts, AC7AF; Timothy J. Rose, WB9PMF; Robert S. Rosenthal, W4IH; Richard L. Rozsa, W7RLR; John H. Rushold, K7JHR; Richard A. Schleiffer, W9ZZX; James R. Schmidt, K6VB; Rodney L. Scribner, KA1RFD; David E. Shelton, W4DES; David R. Sherman, KF6JBD; Philip L. Smith, KG8AP; David E. Speltz, KB1PJ; William C. Stearman, KD5CJM; Richard Teyrowsky, OE8RT; Charles W. Thomason, KF4VX; Karl Verren, KN6CW; David W. Vrona, N9QNZ; John D. Waldron, KF4GSY. QST

VHF/UHF CENTURY CLUB AWARDS

Bill Moore, NC1L
Century Club Manager

The ARRL VUCC numbered certificate is awarded to amateurs who submit written confirmations for contacts with the minimum number of Maidenhead grid-square locators (indicated in *italics*) for each band listing. The numbers preceding the call signs indicate total grid squares claimed. The numbers following the call signs indicate the claimed endorsement levels. The totals shown are for credits given from October 1 to November 24, 1999.

The VUCC application form, field sheets and complete list of VHF Awards Managers can be found on the Web at **http://www.arrl.org/awards/vucc/**. Please send an SASE if you cannot download the forms online. If you have questions relating to VUCC, send an e-mail to **vucc@arrl.org**.

50 MHz
100
1039 K8BGZ
1040 KB9TLV
K2CS 225
K5LOW 200
SM7FJE 700
N6DHZ 175
WB2WIH 200
N3KFV 200
W4WTA 500

144 MHz
100
569 K2AN

222 MHz
50
103 WA8RJF
K2AN 60
WW8M 125

1296 MHz
25
130 WA8RJF
N0LL 50
WW8M 85

2.3 GHz
10
63 WA8RJF

3.4 GHz
5
58 K8TQK

10 GHz
5
102 WA1ECF

Satellite
100
VE6SWC 175

QST

Emergency Frequency Declarations: Too Much of a Good Thing?

By Rick Palm, K1CE

One issue that surfaced from the Hurricane Floyd floodwaters was the FCC's issuance of emergency frequency declarations. No storm in recent memory generated the demand for, and FCC's supply of, frequency set-asides that Floyd did. Not a surprise here: a roaring Hurricane Floyd ripped up assets along the entire eastern seaboard, involving many coastal (and inland) ARES, RACES and other amateur response entities. Without exception, these entities responded superbly. Also without exception, the FCC was impressively responsive to the needs of the local and regional amateur emergency networks in protecting specific frequencies for storm-related traffic. (The agency also monitored to enforce them.)

During the cycle of after-action debriefings that were held locally, regionally and within ARRL Headquarters, however, the declarations and the inevitable question of "How can we do better next time?" arose. In this question's context, other questions came up:

Declarations were issued by FCC field offices *but also by FCC Headquarters in Washington*. Some requests originating in the field went directly to local FCC offices while others were routed through ARRL Headquarters staff for coordination with FCC HQ. Did this dual track pose any problems?

Some frequencies protected by the FCC conflicted with the normal operating frequencies of other non-emergency, but potentially storm-related, relief-giving services, including the National Traffic System. (NTS nets were prepared to handle health-and-welfare traffic for the public.) Would better pre-request coordination have helped? Or is such coordination, given the circumstances of an immediate and major life-threatening event such as Floyd, even possible?

Were there too many declarations? Were they hard to keep track of? And more basically, were all requests and declarations truly needed?

From ARRL HQ's perspective, by and large, the frequency declarations served the amateur emergency providers and relief agents well during Hurricane Floyd. We can't recall one frivolous claim: Given the magnitude of the storm and the effect that normal communication services were indeed substantially diminished or taken out completely, no reasonable person could argue that communication emergencies did not exist. But there are a few things we can do to enhance efficiency and effectiveness of the frequency declaration protocols for the next time. (We all know there *will* be a next time.)

First, let's review the rules (always a good place to start). Section 97.401 (c) states:

"When a disaster disrupts normal communication systems in a particular area, the FCC may declare a temporary state of communication emergency. The declaration will set forth any special conditions and special rules to be observed by stations during the communication emergency. A request for a declaration of a temporary state of emergency should be directed to the EIC in the area concerned." (Note: EIC refers to the old FCC field office title of *Engineer-in-charge*. The EIC is now titled "District Director" or DD.)

Right off the bat, the rules solve one issue for us: Requests for frequency declarations should be submitted to the DD of the closest FCC field office. This couldn't be any less ambiguous. Hence, all ARES and RACES leadership should know how to contact their field office in an emergency, on a "24/7" basis. If your organization doesn't have this information, get it now.

It makes sense that the local field office's District Director should be contacted first: He is closest to the scene and consequently in the best position to determine the specifications of the local situation and need. National ARRL and FCC Headquarters are appropriately the courts of last resort.

Should the DD be free to decide what to do and can we assist the decision-making process? We'd venture to say yes, but consistent with a few overall criteria and guidelines to ensure reasonable uniformity of standards along these lines: (1) Does a communication emergency presently (as opposed to potentially) exist? (2) Is the request for protection of amateur communication supported by someone who is in a position to know how normal systems have been affected? (3) To avoid open-ended situations where the declaration remains in place long after the need has disappeared, can a reasonable period of time be established at the outset, with the possibility of extensions if the need still exists, instead of an "until further notice" declaration? (4) Is the requested frequency segment coordinated within the regional amateur community to head off conflicts like some we faced during Floyd?

On the first point, you can assist the DD in determining the status of the communication emergency by reporting on the condition of "normal" systems; e.g., telephone and cellular, PCS, public safety, emergency management, utility, Red Cross, and satellite. Are these systems down or significantly affected?

In the past, if we've read FCC in-house policy correctly, the FCC issues so-called "voluntary" declarations in cases where a *potential* communication emergency exists. Not until a true communication emergency is present does the agency issue a frequency set-aside *mandating* exclusion of stations not involved in the emergency. Your information will help the FCC make that determination.

On the second point, which dovetails with the first, it would be very helpful to the DD if your request already has the support of an involved emergency management official or someone else who is in a position to substantiate on an official level how normal systems have been affected. The DD will be more inclined to grant the relief requested if it is supported by officialdom. Ideally, you'll have that support prior to contacting the DD, or at least you'll want to have available the official's contact information to give to the DD in the event he wants to follow-up directly.

Thirdly, work with the DD to set an expiration date and time as best you can, so that the frequency can be returned to regular amateur use as soon as possible. The fact that you took the time to do this will foster a climate of good faith and a better case for observance of the frequency reservation by the rest of the amateur community that is standing by. Set a reasonable period of time for the duration of the declaration—an extension can always be considered at expiration time.

Fourth, and one of the more difficult issues, is the need to evaluate the request in terms of frequency usage and scheduling, which should include a check of the ARRL *Net Directory* for possible conflicts. If a conflict is detected, the frequency question should be resolved *to the extent prac-*

Rosalie White, WA1STO ♦ Field & Educational Services Manager

ticable before it is conveyed to the FCC for action. In the case of Hurricane Floyd, one request forwarded to ARRL HQ, which was relayed immediately to FCC Headquarters without such a check, resulted in a frequency conflict with the eastern area net of the National Traffic System, a major potential service provider. ARRL HQ staff (the former Field Services Manager, specifically) might have checked for possible conflicts prior to running the request to FCC.

However, there is a fundamental protocol, at least in our opinion, which needs to be recognized. When a request for a frequency declaration comes from a Section Manager, SEC, EC or RACES leadership official *in the affected area* who has the clear and present need for an exclusive band segment, his request should always be accommodated on a priority basis. If a conflict with another net or other amateur use is not detected for whatever reason or cannot be quickly resolved, then the question should be decided in favor of the requestor who is directly in the line of fire. In many cases, the requestor is asking for protection of a frequency that has long been recognized and planned for by his local ARES or RACES members as the frequency to go to in the event of an emergency—a traditional meeting place or rallying point. An effective ARES or RACES response depends on the number of members finding their leaders and fellow team members quickly for assignments and deployment. If it's your net or sked that gets excluded, give them a break and move your operation a few kHz away. The frequency will be returned to you and normal amateur use soon enough.

And finally, a note on the "boy who cried wolf" scenario. We have seen evidence of disagreement within the Commission's staff on the value and utility of the frequency declarations. Some FCC staff members feel as we do, that the declarations have served amateurs and response agencies well. And with education and improvements along the lines suggested above, the declaration facility should be even more useful in the future. Other FCC staff, however, feel that the declarations are superfluous; i.e., that amateurs already know that in any case, emergency communication takes precedence over routine communication—declarations are redundant with this basic hierarchy (and common sense) and are unnecessary. Some FCC staff may also feel that the facility of frequency set-asides is abused in some amateur emergency responses. They may feel that too many declarations are issued, without any hard evidence of a more effective emergency response resulting. So the message here is *do not request a declaration if you do not truly need one*. Don't be the boy who cried wolf once too often: We may end up losing the facility.

The following are some basic guidelines for declaration requests, bearing in mind that we need to avoid the pitfall of putting in too many guidelines or coordination steps that would cause the grant process to become overly deliberative or bureaucratic. If proceeding through all the coordination steps or meeting all the guidelines isn't possible, we should be prepared to give the requesting amateur emergency official the benefit of the doubt, especially if he is an ARES, RACES or NTS official.

Guidelines

1. Determine that a communication emergency presently (as opposed to potentially) exists. If normal communication assets are working, a communication emergency may not exist.

2. Get support for your request for protection of amateur communication by an emergency management official or someone who is in a position to know how normal systems have been affected, before contacting the FCC.

3. Submit your request to the District Director of your local FCC field office. If that fails, contact your Section Manager, SEC or ARRL HQ.

4. To avoid open-ended declarations that remain in place long after the need has disappeared, set a reasonable period of time at the outset, with the possibility of extensions if the need still exists.

5. Check *in advance* the requested frequency against other usage to head off significant conflicts to the extent practicable.

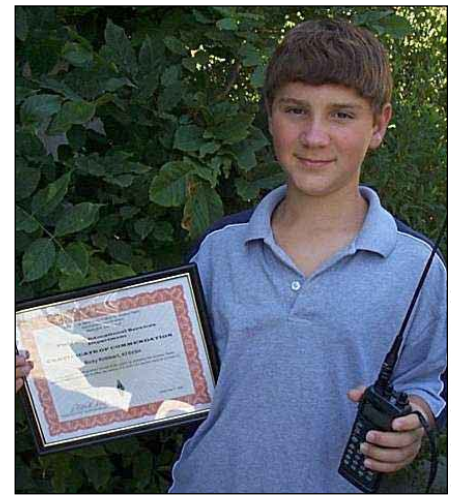
6. Avoid HF declarations for local or county events: 80 and 40-meter transmissions propagate nationally and internationally. Use repeater channel set-asides instead. The FCC granted a number of repeater protections during Hurricane Floyd.

Conclusion

Do you agree with our assessment? Have we missed anything? Have you had first-hand experience with frequency declarations—good or bad? Let's hear from you. Send your comments to **k1ce@arrl.net** for compilation and forwarding to ARRL HQ staff for consideration. FCC frequency declarations help us provide emergency communication and serve the public. They also tell us that the FCC considers the amateur emergency capability to be valuable to the public interest. With attention to some basic guidelines, we should be able to retain the facility of the FCC emergency frequency declarations for the future.

RICKY TO THE RESCUE!

A 10-year-old California ham recently used ham radio to help save the life of an injured fellow amateur. As a result, Ricky Rothbart, KF6VSH, of San Rafael, California—who only got his Technician ticket last April—received a Public Service commendation from the ARRL. He also gained a new appreciation of Amateur Radio's emergency service potential.



GEORGE ROTHBART, KF6VSG

Ricky Rothbart, KF6VSH, with his H-T and ARRL commendation.

On August 28, Ricky was in the family car heading home from a trip to LA. "Ricky was in the back seat absorbed in monitoring his favorite frequencies on his H-T," his dad, George Rothbart, KF6VSG, relates. "At about 6:10 PM, he suddenly said, 'Hey Dad, there's a guy on the radio who is bleeding all over the place and needs help!'"

It turned out the other ham had sliced his arm with plate glass and was bleeding profusely and asking on-the-air for medical help. The injured ham—Mike Lewis, KF6YDN—apparently was mobile in a remote area of Pittsburg, California, at the time and his cell phone was not working.

Ricky immediately replied, identifying himself and requesting the man's location and additional details. George Rothbart got on his cell phone, contacted a family member as Lewis had requested, then dialed 911. With Ricky working the emergency on his H-T—the Rothbarts were able to give the 911 dispatcher all the necessary information.

"By the time the emergency was over, three other hams had joined us on the frequency," George Rothbart said, "but it was Ricky that got the vital information to relay it to me in the front seat with the cell phone."

The Rothbarts never got to meet Lewis face-to-face. Attempts to contact Lewis by telephone were unsuccessful.

George Rothbart says that when he and his son were studying for their exams earlier this year, he'd told Ricky that someday he might be able to use his new skills to save property or life. While he hardly thought it possible then, he's now a firm believer. "I found that ham radio still works great, and through ham radio a 10-year old can make a difference," he said. Both George and Ricky Rothbart are ARRL members.

ALABAMA VOLUNTEER OF THE YEAR

When severe weather threatens Alabama's Baldwin County, amateur responders dig out the emergency operations plan recently crafted by a committee spearheaded by Eldon McDonald, KE4OCW. To recognize his ef-

fort, Eldon was recently honored as Alabama Volunteer of the Year by the Alabama Emergency Management Council. The emergency plan is an important document, considering that each year the county's 195 miles of shoreline are visited by one or more hurricanes.

Area ham, Katie Watterson-Aiken, N4UCV, says: "McDonald organized and chaired a committee made up of representatives of the North Baldwin and South Baldwin Amateur Radio Clubs, county ARRL officials and local RACES members to develop and write the plan, which defines the roles of hams as part of the county's Emergency Management Agency (EMA) operations." The committee visited all eight emergency shelters, and studied communication needs along with available emergency power equipment and other capabilities. The plan defines hams' responsibilities during emergencies for staffing the station at the county Emergency Operations Center (EOC), including setting up a 2-Meter VHF net, staffing communication centers at each of the shelters, providing personnel and communication equipment to support local law enforcement and military, and providing mobile operators for traffic, weather and river observation.

Eldon McDonald, KE4OCW (right), is congratulated by South Baldwin Amateur Radio Club president Pete Clinton, K2MUI, on being selected as Alabama Volunteer of the Year by the Alabama Emergency Management Council.

Just prior to finalizing a manual based on the plan, Hurricane Earl required an activation of the county EOC. McDonald's new plan was tested anyway, and he coordinated all staffing. The storm ended up bypassing the county, but McDonald organized a critique to identify and fix problems. A few weeks later, Hurricane Georges brushed by. Within hours, all shelters and the EOC were staffed, resulting in praise from the Red Cross, schools, law enforcement and the EMA. Afterwards, the EMA took action on one of McDonald's committee recommendations — to purchase identical radios for all shelters. Watterson-Aiken says, "McDonald and his son Rick, KU4PZ, programmed the radios and trained designated operators in using them. Having identical radios keeps operators from wasting time in learning how to use a radio they've never seen before."

McDonald has also coordinated SKYWARN classes that resulted in certifying 40 Baldwin County hams as weather spotters.—*Rosalie White, WA1STO, ARRL Field & Educational Services Manager*

Field Organization Reports

Public Service Honor Roll
November 1999

This listing is to recognize amateurs whose public service performance during the month indicated qualifies for 70 or more total points in the following 8 categories (as reported to their Section Managers). Please note the maximum points for each category: 1) Checking into a public service net, using any mode, 1 point each; maximum 60. 2) Performing as Net Control Station (NCS) for a public service net, using any mode, 3 points each; maximum 24. 3) Performing assigned liaison between public service nets, 3 points each; maximum 24. 4) Delivering a formal message to a third party, 1 point each; no limit. 5) Originating a formal message from a third party, 1 point each; no limit. 6) Serving as an ARRL field appointee or Section Manager, 10 points each appointment; maximum 30. 7) Participating in a communications network for a public service event, 10 points each event; no limit. 8) Providing and maintaining an automated digital system that handles ARRL radiogram-formatted messages; 30 points. Stations that qualify for PSHR 12 consecutive months, or 18 out of a 24-month period, will be awarded a certificate from HQ on written notification of qualifying months to the Public Service Branch at HQ

800
NM1K
429
N5JZ
425
KB8ZYY
366
W9RCW
365
K7BDU
305
KB5WEE
302
K4FQU
277
KK1A
267
KA2ZNZ
256
WB8SIW
232
W7AMM
224
WB5ZED
211
KF5A
210
W7TVA

205
WB5NKC
202
WA9VND
199
W6DOB
198
N5IKN N2LTC
196
KE4OAV
194
KB2LML
191
KE0K
189
W0GCB WB2UVB
185
N2OPJ
184
KK3F NN7H
182
K7VVC
181
AF4HE
180
WA4GQS

178
W0OYH
177
W6IVV
176
W4ZJY WX4H
174
WA5I
173
N8JGS
171
W4EAT KC2ALG N2YJZ
170
N2XOJ N2RPI K9FHI
168
KA2GJV N2JBA AD4DO
166
K4IWW
165
KF1L
163
N8FPN N5OUJ

KA5KLU
161
N7YSS
160
KB4WBY
159
N3WAV
158
W6QZ KC5OZT KA4UIV KB2VVB
157
WO0A
156
W2RJL
155
WX8Y KB5TCH
154
AC4CS K4SCL
153
WA1FNM
151
WN0Y WA1TBY
150
KB5W

149
WB4GM KC2AHS
148
W3YVQ
147
KD1LE
146
N2CCN AF4GF
145
N3WKE K5DPG WB2ZCM
144
N8FWA AA3SB W0LAW KD2AJ KB2RTZ KB2KLH N2GJ
143
WA2CUW NR2F
142
KT6A
141
WD4JJ K5IQZ

K2GTS
NY2V
W2MTA
W5GKH
140
NZ1D
139
N5JCG
W9YCV
W7ZIW
138
N1VXP
WA4QXT
AA3GV
WA6ODQ
N9BDL
KA4FZI
137
N5XGI
N2XJ
136
W5CDX
AB4XK
135
KJ3E
WB0ZNY
WA1JVV
N5NAV
134
KE4JHJ
W7NWP
133
KA1GWE
K2DN
W2EAG
132
NN2H
N1LKJ
130
KE1AI
KM5DT
N2AKZ
W2JHO
K9LGU
W9CBE
AF4PU
129
WA8EYQ
KC4TLG
KB2VVD
W7LG
WB2FGL
128
WD8MIO
WA0TFC
K6AGD
N2WFN

K5DMC
NY2CQ
WB2QIX
W2AKT
KC4ZHF
127
KA2CQX
AF4NS
126
W3VK
K2UL
125
NC4ML
KB0DTI
K0PY
KC6SKK
WB2GTG
N7AIK
124
AA8SN
AA2SV
W1ALE
123
K5WOD
KC4VNO
122
KF6UMU
N3WK
KA7AID
N2VQA
KB2VRO
WW4SC
121
KO6RZ
KD4HGU
120
KG2D
AC5Z
N9TVT
KF4NFP
119
K0PIZ
N7DRP
K9GBR
W1PEX
WA2UKX
WU4C
W7GHT
118
W4CKS
AF2K
KA2DBD
N2WDS
AG9G
W3OKN
K7MQF
KD4GR
KJ4N

117
AD6HR
K2VMC
116
W9ZY
N3RB
115
N3ZKP
KO4OL
114
KA8FCC
WD0GUF
WB4TVY
K5VV
W2FR
KU4WJ
113
KB2ETO
KC5QGI
112
N8DD
WB5NKD
KF6OIF
K5MC
K4AKC
WI2G
KC5VLW
W5MEN
111
W4DGH
KY1B
110
KA0DBK
KA4HHE
K4BEH
N9MN
109
W1JTH
N1JBD
W2MTO
KC2EOT
N9KHD
108
WA8SSI
K5MXQ
106
W2PII
105
KB2WII
K1FP
N5JUU
104
W9GGA
W1QU
KA2ZKM
AA2ED
KJ7SI

103
WA0KS
PY2CGB/
W5
W4RRX
WA4EIC
102
KA9KLZ
101
K2PB
100
AA4YW
AE4NW
WA2GUP
99
W1JX
KE6MIW
98
KA4LRM
97
KC0CEG
96
N9PF
95
WB2IJH
N5HK
94
KC8GMT
W4PIM
W5XX
WB7VYH
93
KA1VEC
W3CB
K8LEN
92
N2JRS
91
KD3JK
N9BNQ
90
K8IG
W7HH
KD6YJB
KC4PZA
AA4BN
89
KC3Y
W7VSE
W4ZBA
WB2IIV
88
WA4GLS
W4XI
KA1OTN
KD4DNO

86
KC8HTP
WA1QAA
K3CSX
W7EP
KA7TTY
85
WA8DHB
W2CC
KD5AHW
83
K1SEC
KC2DAA
KE4IFD
82
KB5YAM
WB9GIU
81
NR9K
WX2NJ
K4WKT
AD4IH
WB4PAM
80
N9KNJ
KG0IV
WA4CSQ
79
N0SU
KB2GEK
78
N3KB
77
AL7N
KA2BCE
76
KM5VA
AA8PI
AC4ZO
N1LAH
75
KO4A
74
N4MM
73
KL5T
K3UWO
W4CC
72
W4NTI
K5UCQ
AA4HT
70
KD5P
N1IST
W8SZU
KE4WBV

The following stations qualified for PSHR in previous months, but were not recorded in this column: (Oct) K8IG 97.

Section Traffic Manager Reports
November 1999

The following ARRL section traffic managers reported: AL, AZ, CO, CT, EMA, ENY, EWA, GA, IA, ID, IN, KS, KY, LA, MDC, ME, MI, MN, MO, MS, NC, ND, NFL, NH, NLI, NNJ, NTX, NV, OH, OK, OR, ORG, SBAR, SC, SD, SDG, SFL, SNJ, STX, TN, VA, WI, WMA, WNY, WPA, WWA, WY.

Section Emergency Coordinator Reports
November 1999

The following ARRL section emergency coordinators reported: AZ, CT, ENY, IN, KY, MDC, MN, MO, NLI, SD, SFL, TN, WMA, WV.

Brass Pounders League
November 1999

The BPL is open to all amateurs in the US, Canada and US possessions who report to their SMs a total of 500 points or a sum of 100 or more origination and delivery points for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL radiogram format.

Call	*Orig*	*Rcvd*	*Sent*	*Dlvd*	*Total*
NM1K	681	395	833	5	1914
WX4H	2	780	810	12	1604
K7BDU	146	463	513	51	1173
N2LTC	0	511	569	20	1100
KK3F	40	128	904	16	1088
KF5A	107	377	530	0	1014
W1PEX	0	116	822	5	943
K9JPS	0	513	39	333	885
KT6A	2	435	360	2	799
N5IKN	0	392	130	262	784
W9RCW	0	429	39	307	775
KA2ZNZ	30	309	242	99	680
W6DOB	0	287	320	51	658
WB5ZED	31	290	277	34	622
K7VVC	18	276	319	6	619
K4FQU	180	129	301	4	614
W7AMM	128	142	323	18	611
W9IHW	0	351	38	188	577
N5JZ	232	29	261	29	551
K9GU	0	313	28	203	544
W9YPY	0	253	285	0	538
KA1VEC	19	219	287	2	527
WA9VND	45	283	177	19	524
N0KJ	47	212	237	22	518
W5SEG	0	264	245	10	519

BPL for 100 or more originations plus deliveries: KK1A 149.

Conference Preparatory Meeting for WRC-2000

The next World Radiocommunication Conference (WRC) does not open until May 8 in Istanbul, but the first round already is history. For two weeks in November, nearly 1,000 delegates gathered in Geneva for a Conference Preparatory Meeting (CPM).

The purpose of such a CPM is to generate a comprehensive technical report addressing the WRC agenda items. The work actually began at a short CPM held in November 1997, right after the close of WRC-97. That meeting organized the outline of the CPM Report to WRC-2000 and assigned relevant chapters and studies to the ITU Radiocommunication Sector (ITU-R) study groups. A draft CPM Report was prepared over the intervening two years and submitted to the November 1999 CPM for review and adoption. More than 4,000 pages of contributions from participants seeking to support or modify the draft text were considered. There were 948 delegates in attendance from 78 Member States, 73 Sector Members, including the International Amateur Radio Union (IARU), and observers.

Amateur Radio was specifically represented by Wojciech Nietyksza, SP5FM, and Larry Price, W4RA, who attended on behalf of the IARU, and Paul Rinaldo, W4RI, and David Wardlaw, VK3ADW, who attended as members of their national delegations on behalf of their national Amateur Radio organizations (the ARRL and the Wireless Institute of Australia, respectively). Of course, numerous other radio amateurs were present, notably the following heads of delegation: Eberhard George, DL7IH (Germany), who is also the chair of Study Group 8; Krzystof Krassowski, SP4TKK (Poland); Barry Matson, VK1MB (Australia); G. Hugh Railton, ZL2MT (New Zealand); and Frank Williams, N4FK (USA).

The CPM Report deals with a number of issues of concern to the Amateur Services.

Draft **Section 1.1.1.3.3**, "Candidate bands for additional IMT-2000 terrestrial spectrum," was considered by the CPM. Unfortunately, the band 2300-2400 MHz remains in the report as a possible candidate extension band for IMT-2000 (the third generation of personal mobile telecommunications systems). The text makes note of the Amateur Service worldwide secondary allocation in this band.

Section 2.4 deals with a USA proposal to add a primary allocation for the radionavigation-satellite service (RNSS) (space-to-space) in the band 1215 - 1260 MHz. GPS has been used by satellites in other services for 17 years without harmful interference and adequate ITU-R studies have been completed. The proposed allocation is to ensure that any new users of the band protect RNSS (space-to-space) uses.

A European proposal introduced by Germany and France is to allocate additional spectrum, possibly as much as 60 MHz, to RNSS for a new GPS system called *Galileo*. One option presented is to extend the RNSS allocation of 1215 - 1260 MHz to a new upper limit of 1300 MHz. There is a possibility that WRC-2000 will make this allocation and will urge sharing studies by ITU-R. Such an allocation would impact the amateur services, especially the amateur-satellite service; we are secondary users and the proposed RNSS allocation is co-primary. The IARU delegation brought our concerns to the attention of the appropriate CPM sub-working group.

Section 4.1.3.1.4 reports on proposed realignment of allocations in the bands between 71 and 275 GHz. The specific realignment of the bands was not introduced. However, the affected parties are well aware of the draft table widely circulated by radio astronomers and earth exploration-satellite service (EESS) (passive) proponents. This table would make some shifts in amateur service bands around 80 GHz while retaining the same bandwidths for primary and secondary shared allocations.

There is some support in Canada for extensions of fixed and mobile service allocations that might be detrimental to the amateur service. Sharing with fixed and mobile services is more difficult for amateurs than is sharing with radiolocation and passive services.

Sections 7.1.2 and 7.1.4 explain an anomaly under which spurious emission limits for amateur earth stations would differ from amateur stations, even though the same equipment is used for satellite and terrestrial communications. This issue will be followed closely at WRC-2000 to ensure that additional constraints on the amateur services do not result.

Chapter 8, "Progress of studies for future conferences," was considered briefly. The CPM Report will include a recap of the preliminary WRC-2002/2003 agenda (which includes consideration of Article **S25** and Recommendation **718 (WARC-92)** concerning 7 MHz). In addition, the broadcasting item concerning more spectrum "from about 4 to 10 MHz" is listed. This is a troublesome item because it could be used to suggest expansion of HF broadcasting below 4 MHz.

Chapter 8 also lists the items formerly identified as agenda item 8 of WRC-99 including 8.7: "provision of up to 6 MHz of spectrum to EESS (active) in the band 420 - 470 MHz." It notes that ITU-R studies are underway including specific mention of a sharing study with the amateur-satellite service 430-440 MHz.

The IARU was able to attend, monitor, and where necessary, intervene in all relevant meetings of committees, sub-working groups and the Plenary. The final result is about as expected. CPM held few surprises and an overall evaluation is that it was merely the opening act of WRC-2000 with more of the same to come a few months later in Istanbul.—*Larry E. Price, W4RA, President, IARU*

● ***WA4IPI to lead third-generation wireless systems development:*** Stephen M. Blust, WA4IPI, has been selected to serve as chairman of the new ITU-R Working Party 8F, which is responsible for the overall system aspects of IMT-2000 and beyond with special emphasis on the terrestrial component. WP 8F takes up where ITU-R Task Group 8/1, which completed its activities in November 1999, left off. Blust, a licensed amateur since 1968, holds a B. Sc. Degree in Electrical Engineering from Tulane University and is Director - Technology Strategy and Standards of BellSouth Cellular Corp. He has authored several articles on software defined radio and is a co-holder of a patent covering wireless based trunking arrangements. Commenting recently on the continuing role of Amateur Radio in telecommunications development, he said: "When you look at two way higher speed mobile data service, mobile internet access, mobile video and the like in addition to voice, you see that these services are closely related to the communications modes and techniques we have been using as hams for years. It just takes a while to move these things to a consumer focussed service. So in our own way ham radio is still a harbinger of the communications future." QST

Ionospheric Forward Scatter Tests at 144 MHz

Ionospheric forward scatter is not one of your ordinary, day-to-day propagation modes. Signals are always very weak and easy to overlook. Random contacts are thus rare, because it is difficult to find such weak signals by chance. The best successes have come with some kind of prearrangements or schedules.

This propagation mode relies on incoherent scattering in the upper-D and lower-E ionospheric regions at about 90-km altitude. Signals tend to be stronger around noon local time and at times of high solar activity. It is easy enough to make contacts via forward scatter on 50 MHz with some patience, but only the best-equipped stations can expect consistent results. It is even more difficult on 144 MHz.

Incredible Contacts

Contacts at 144 MHz are rare, yet Jay Liebmann, K5JL (EM15), Don Stradley, WA1JOF (FN44), and others have been having some startling success. WA1JOF has been running with KB8RQ (EN80) around 1500 UTC in the mornings over the past year and a half. The pair has never failed to work over their 1050-km path. Signal strengths during evening runs were noticeably weaker, but they could still eke out contacts. Don has also made it with WA9KRT (EN61) with similar results. He notes that signals were usually detectable, but a surging effect appeared about every 30 seconds when the signals rose above the noise. Sometimes, several minutes may go by until the faint signal is heard again.

K5JL has made some even more impressive ionospheric forward-scatter contacts. On November 8, Jay worked VE1ALQ (FN65) at an incredible 2850 km. Well done! He noted that signals were just detectable in the noise most of the time. Necessary exchanges and "Rogers" were made during those periods when signals rose clearly out of the noise. No distance records have been claimed for ionospheric forward scatter so far, but 2850 km certainly must be one of the longest such contacts ever reported. Jay also completed with WA1JOF on November 11, around 1600, over another impressive distance of 2546 km.

K5JL has also had encouraging results with W1REZ (FN55) over 2600 km, another extraordinarily long path. Both stations have been able to detect each other during several one-minute sequences in their half-hour schedules. On November 23, Jay ran a half-hour schedule with W3EP (FN31), about 2300 km distant, but alas, no contact resulted. I did not hear anything from K5JL, but he caught bits and pieces of my CW. WA1JOF was listening behind me and had better luck, hearing Jay about 80% of the time.

Textbook Explanations

Textbook descriptions of ionospheric forward-scatter propagation (summarized in the September 1993 column) cannot account for all of these remarkable accomplishments. The standard explanation of this phenomenon suggests that weak forward scattering of radio signals in the VHF range is possible from the upper-D and lower-E reaches of the ionosphere around midday. This limits the maximum distance to about 2000 km.

These contacts are thus remarkable for several reasons. The relatively high frequency is unusual, although Europeans have been using this mode at 144 MHz for some years. The surprise is some of the distances exceeding 2500 km. Scatter over such long paths must be taking place considerably higher in the ionosphere than the lower E layer. This suggests some possible involvement of ionospheric irregularities much higher. Perhaps there is some link with solar activity, as it was very high when some of these longer contacts took place.

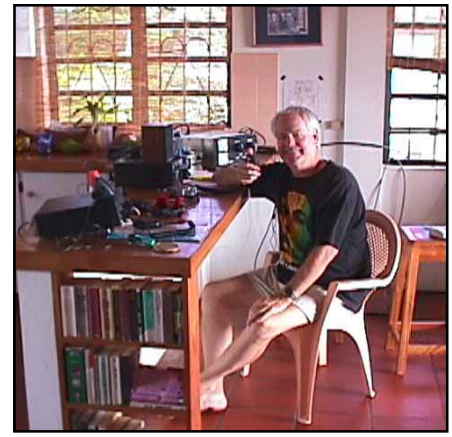
More Tests Needed

This is certainly something worth investigating further, but this mode is not for the casual operator. High power and big antennas are required. Indeed, most of the participants have EME-quality stations. CW and a good deal of patience are necessary. One-minute sequences, similar to EME procedures, seemed to work well. Routine distances are up to 1500 km, but as these reports have shown, much longer distances seem possible.

Many questions remain unanswered about these most recent accomplishments. Additional experience can help better understand the limits of forward scatter and provide additional insights into its causes. Please send me all the particulars of your ionospheric forward scatter tests.

This Month

February 20	Very good EME conditions



Dick Hanson, K5AND, at the operating position of J79AND at Oceanview Villa, Calibishie, Dominica. Dick and K4TW operated on 6 meters from October 26 to November 7 with an FT-650, FT-847, 8877 amplifier and an eight-element Yagi. The pair made 202 contacts in 32 countries, including 51 in Europe, 6 in Africa, 116 in South America and 10 in the Caribbean. VE1YX was their only QSO in all of North America!

ON THE BANDS

Worldwide 6-meter DX became more widespread in November and headlines the news this month. The Leonids meteors did not storm over North America, leaving many scatter fanatics disappointed. A few ducting, aurora, sporadic E and 2-meter TE openings round out November's offerings. As is the custom, dates and times are UTC.

Six Meter DX

Intercontinental six-meter activity has gotten off to a slow start during Cycle 23. November was yet another frustrating and disappointing month for many North American DXers, yet many interesting contacts were made around the world. There were a few openings from the eastern US and Canada to Europe, but not to the extent expected. Those in the western states had several scattered openings to Japan, Australia and other Pacific countries, yet they too dreamed of much more. The most interesting contacts for the month were probably made from Europe to Japan, Australia and the Far East.

Central and South America

Six meters opened on at least a dozen mornings during November to Central and South America, providing DX opportunities from every part of the US, even the beleaguered Pacific Northwest. The central part of the nation, from the Rocky Mountains to the Appalachians, seemed to have the best of it.

Emil Pocock, W3EP ♦ Box 100, Lebanon, CT 06249 (Home 860-642-4347, fax 860-594-0259) ♦ w3ep@arrl.org

Many fewer contacts were reported from the West Coast than other sections of the country. The most extensive openings took place on November 7, 8, 9, 11 and 14.

The number of countries and stations logged by US operators was impressive. Several South and Central American stations worked all US and a few Canadian call districts as well, so there can be little excuse if you have missed working some DX! In coming months and years, F-layer propagation to South America will be more common and routine—hardly newsworthy at all, save for the very rare countries.

So scan this list of calls logged in the US during November and check off which you worked and which you missed. There will be plenty of other opportunities. Caribbean: HI8ROX, J3EOC, J68CB, J6/K6MYC, J87AB, KG4AU, KP3A, KP4 (many) and V44KAI; Central America: HP2CWB, HP2XUG, TG9KV, TI2HL, TI5BX, TI5KD, TI7WAM, TI7WAT and YN3SW; South America: CE4AAJ, CE4MLN, CX (many), HC2FG, HK3YH, LU (many), PP5JD, PT7NK, PY0FF, YV4DDK, YV4DX and YV4YC. In addition, VP9ID made his first 6-meter contacts into the US in November.

Europe

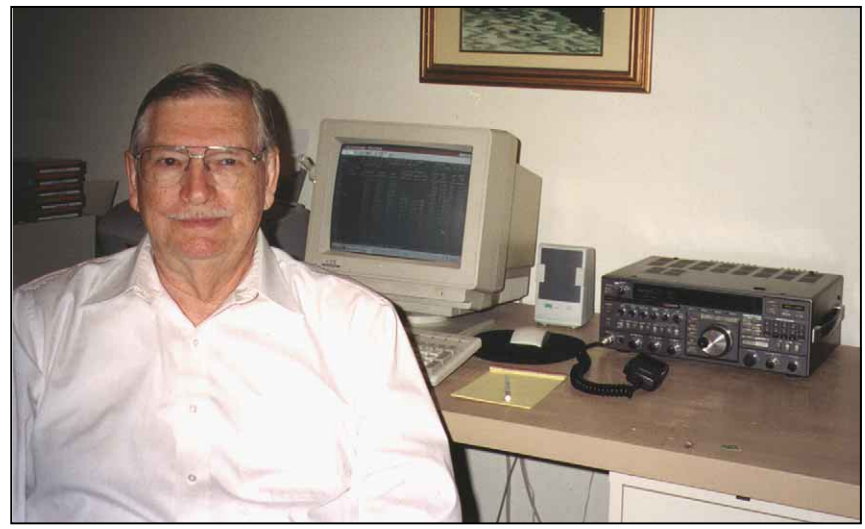
The East Coast crowd was impatient for the long promised openings to Europe, especially as there were so many countries yet to make their first 6-meter contacts with the US. Despite high solar activity for much of the month, November was a big disappointment. Although there were a dozen mornings during which someone in the US or Canada made at least one contact into Europe (however short or weak), only November 24 stood out as a memorable.

Six meters opened across the Atlantic for more than two hours that day, beginning around 1230 for those in New England and the Maritime Provinces. The opening started slowly, with only a few tentative contacts between the big guns of VE1 and W1 call areas with CT, EH, F and then G. By 1330, the opening had become more general, though limited primarily to the Northeast. Signals were strong enough at times that stations on both sides of the Atlantic were running SSB pile-ups in fine fashion. Activity spread out all the way up to 50.200 MHz.

Russ Miller, W1RMA (FN65), and Clint Walker, W1LP (FN41), did as well as any that day, working several dozen stations with CT, EH, F, G, GW, GI, GD, GM, EI, PA, ON and DL prefixes. N8II (FM19) in West Virginia was one of the most southerly and westerly stations to make multiple contacts into Europe, logging CT, F, GI and EI.

Openings on other days may not have been so strong or long lasting, but some extended well across the US. Jose Hierro, EH7KW, perhaps had the greatest success among the Europeans. Jose worked into the Midwest on several days and as far to the west as K5SW (EM25) in Oklahoma and N5JHV (DM62) in New Mexico on November 7. He worked W5EU, W5OZI and W6JKV/5—all in south Texas—on November 15.

Europeans worked a good deal of DX elsewhere in the world. In addition to many African and South American countries, which southern Europeans had worked in previous months, stations from all over Europe logged many JA, VK and ZL calls on several days in November. Among their more interesting catches in other areas of the world were J28FF (Djibouti) and DU1/GM4COK (Philippines).



Derwin King, W5LUU, a well-known EME operator from San Antonio, Texas. Derwin has provided the annual projections of EME conditions that appear as brief notices in the "This Month" box on the first page of each column for several years now.

Only those weekends with conditions rated *good* or *better* are listed. *Good* indicates a total 144-MHz path degradation of 1.5 to 2.5 dB over ideal conditions—Moon at perigee (closest point in its orbit to Earth) and in front of a low-noise portion of the sky. *Very good* indicates 1.0 to 1.5 dB degradation, and *excellent* indicates no worse than 1.0 dB over ideal conditions. There may be many weekdays when EME conditions are at least *good*, but as most moonbounce activity takes place on weekends, they are not included.

The year 2000 begins a three-year period during which conditions should be generally well above average. Derwin notes that there is at least one *excellent* day in every month for the next several years, but not necessarily on a weekend. During 2000, there are four weekends rated *excellent* and nine rated at least *good*. For newcomers and those with modest EME stations, these are probably the best dates to operate.

Africa

Africa provided glimmers of excitement for North American DXers. Many on the East Coast found CN8UN, CT3FT, EH8BDR, EH8BYR and EH8BPX mixed in among the Europeans, especially during the openings of November 7 and 11. A trio of Zimbabweans, Z21FO, Z22JE and Z23JOR, worked into the Northeast on November 11; Z21FO made contacts into the Midwest at least as far as W7XU (EN13) on the 20th.

Indeed, Midwesterners probably had the pick of the African DX. On November 7, 8, 11 and 12, 9J2BO (Zambia) worked widely throughout the W1, 2, 3, 4, 5, 8 and 9 call areas. N5TML (EM14) in Oklahoma logged him during the November 7 opening, perhaps the most westerly station to hook up with 9J2BO.

Jay Hainline, KA9CFD (EN40), made some remarkable African contacts from northwestern Illinois. In addition to working 9J2BO on the 11th, Jay made a notable contact with 3C5I (Equatorial Guinea) on November 17 at 1418, the first ever US 6-meter contact with that country. The next day, he and other W9 stations hooked up with TR8CA (Gabon) after 1500. The East Coast heard none of these goings on.

The most unusual DX contacts from the US were to Asia. During the November 7 opening, while much of the eastern half of the US was busy chasing after EH, 9J and Z2, some Florida stations had bigger catches on their lines. AE4RO (EL97) and K2RTH (EL95) worked JY9NX (Jordan) between 1615 and 1630. They were not hearing any Europeans at the time. Half an hour later, K2RTH and W4RCC (EL96) made contacts with VQ9QM (Chagos), in the Indian Ocean, for what must have been the prize catch of the month. This may be a US first for VQ9 on 6 meters.

Transcontinental

Contacts between the east and west coasts of North America are not real DX, but they are nonetheless welcome and provide indications of general F-layer conditions. A single F-layer hop just fits within the width of North America. Shorter contacts suggest the MUF has climbed higher than 50 MHz. K2RTH (EL95) and K7ICW (DN26) made a lone contact on November 8 around 1600, which may have been the first such transcontinental QSO this cycle.

The first general coast-to-coast opening took place on November 18 after 1700, when stations in the Northeast, from Nova Scotia to Maryland, worked from British Columbia to California and east to Nevada and Arizona. A similar opportunity opened on November 20 after 1650, when the same East Coast area worked primarily into the Pacific Northwest eastward to Idaho and western Montana. Notable contacts included VE6TA (DO33) to K2RTH and K4LQ, both in southern Florida. The transcontinental openings of November 21 and 22 were less extensive.

Alaska and Japan

During the latter 10 days of the month, as many as half a dozen KL7 stations worked throughout the Midwest as far east as Ohio and south from Texas to Nevada. NL7OW runs just 10 W and a dipole (some stations really are that modest), but was happily giving out contacts. Most of this activity took place between 2000 and 2300.

The Alaskans often serve as harbingers of

longer contacts into Japan, and US stations in the western half of the country were not disappointed. Hatsuo Hoshida, JA1VOK, reported many Japanese made contacts into the W6 and 7 call areas via direct paths nearly every day from November 13 to 26. KC7IJ (DN44) in Idaho, for example, was pleased to run off five JAs on November 19 between 0015 and 0050.

Several operators picked out the afternoon of November 16-17 for special mention. W7GJ found JA1RJU around 2200 for his first Japanese QSO of the new cycle. He also worked KH4/W4ZYV (Midway). K7ICW (DN26) in Nevada worked JE1BUY at 0039 for his first JA of the season. JA1VOK reported W7HAH and N7ML (both in western Montana) about the same time via a southerly skewed path, while he was beamed toward New Zealand.

The success of Japanese DXers elsewhere in the world continues to be phenomenal. JA1VOK reported that Japanese stations worked at least a dozen European countries, including Macedonia (Z32ZM), via a southerly skewed path on November 8, between 0820 and 1000. There were several other days with openings to Europe and the Mediterranean. JAs worked 5B4FL and 5B4AFB (Cyprus) on November 9. The westernmost contacts into Europe may have been completed on November 11, when JA5FFJ and G3FPK hooked up. JA6VU worked SV5BYR (Greece) on November 14 for a Japanese first to that country. On the 19th, JH0RNN worked JY9NX (Jordan).

That does not exhaust the Japanese accomplishments for November. JA1VOK made a contact with EY8MM (Tajikistan) on November 14 for another JA first. Other new and rare Asian and Pacific calls logged by the persistent JA DXers included 9V1JA (Singapore), BA7IA and BG7OH (China), BV2DP (Taiwan), FK1TK (New Caledonia), T30CW (Western Kiribati), V63AO and V63HJ (Micronesia), V85OO and V85HG (Brunei) and XU7AAV (Cambodia).

Other Asians active during the month included AP2WAP (Pakistan), P29KFS (Papua-New Guinea), S21YJ (Bangladesh) and several from West Malaysia (9M2), East Malaysia (9M6), Hong Kong (VR) and Indonesia (YB-YH). The real news will come when some of these calls begin appearing in US logs!

Australia, New Zealand and the Pacific

The western third of the US, at least as far to the east as Texas, had as many as 10 days with openings into the Pacific. Country prefixes that commonly appeared in US logs included KH4, KH6, V7 (Marshall Islands), VK and ZL. W5UWB (EL17), for example, logged several KH6 and ZL stations on November 11, 13 and 14. KH4/W4ZYV provided many happy W6 and 7 stations with Midway Island. V73AT was reported on November 14, 15 and 16, at least.

DX also looked good from the Pacific side. David Minchin, VK5KK, mentions the success of VK6JQ, who logged more than 20 European countries, plus JY and 5B, with just 10 W and a six-element Yagi. ZL3TIC worked FO5DRI (French Polynesia), EH7KW and several XEs among his many contacts with W6 and W7 during the month. KH6SX worked BV4SF on November 12. It cannot be too long before East Asian calls begin appearing in US logs.

Acknowledgements

The sheer volume of 6-meter DX contacts makes it impossible to mention the call signs of everyone who sent in reports in these brief summaries. This situation will only get worse as Cycle 23 continues to unfold, but the column thrives on information. Keep the news coming! My many thanks to those who sent reports during November. Those not otherwise acknowledged in the summaries include VE9MIO, NY1E, WB2AMU, W3VRD, WA4JQS, N4MM, WA5IYX, NJ7A, N7EIJ, N7DB, K7JA, W7ZT, N8LGP, K8MFO, WZ8D, WB8XX, K9KHW, N0VSB, HP2XUQ and G3FPK. Some news was culled from *Internet Six News* and the 50-MHz DX Web Cluster from Japan.

The Leonids

There was faint hope that the Leonids storm, predicted for about 0200 on November 18, might get delayed for a few hours so those in North America would have a chance to experience it. That hope was quickly dashed soon after 0700, when the Leonids radiant rose over the East Coast of North America. There were few Leonids meteors and certainly no signs of a storm. As far as American operators were concerned, the Leonids were quite normal, "very disappointing" for those who hoped for better and "a dud, flop, and failure" for those who had their hearts set on a great event.

Two observations were repeated in nearly all the reports—and there were many, despite the disappointment. First, it was difficult to make 2-meter contacts. Few stations made more than two or three QSOs during the entire November 18 morning, including those who had many schedules lined up. K1TEO in Connecticut, with his 10 random QSOs on 2 meters, was a notable exception. Several high-speed CW contacts were made, but the high-speed crowd did not seem to have any better success with the Leonids than those on SSB. WW2R (EM13) completed with NJ0M (EN34) via HSCW around 0920. Steve Harrison, K0XP, reported that KM0T (EN13) and K9KNW (EL95) were successful over a 2308 km path, perhaps a new DX record for HSCW, but the schedule took nearly an hour to complete around 1600.

Second, conditions on 6 meters were quite different. W7XU/0, K7ICW and others, primarily in the western states, reported almost continuous propagation between 1400 and 1700, allowing dozens of contacts to be made easily. Meteors seemed to be almost continuous at times, but for most, signals were not particularly strong.

Yes, the Europeans felt the full blast of the meteor storm, as predicted. Marc Gyssens of the International Meteor Organization estimated that the storm peaked about 0205, with an effective rate of 5000 meteors per hour. Observations across Europe indicate that the visual rate exceeded 200 meteors per hour between 0030 and 0400. Many Europeans reported making several dozen contacts on 2 meters during the most intense period.

Next year, North America will be in a much better position to intercept the peak of the Leonids meteor stream. Even though Comet Tempel-Tuttle, the source of the Leonids meteor debris, will have passed by Earth orbit nearly three years earlier, there is a fair chance that unusually high number of meteors will still be around. Even a rate of a few hundred per hour is significantly better than a good Perseids or Geminids shower. The next Leonids storm is not expected until 2031 or 2032, when Tempel-Tuttle again makes its periodic swing past Earth orbit.

Thanks also to W5UWB, K6AAW, K6PF, W7CI, N7DB, K7JA, K7XD, N0LQY, KD0PY and G8MBI for their contributions to the Leonids summary.

Six-Meter Sporadic E

Despite its rarity in the autumn, 6-meter operators reported sporadic E on November 4, 6, 10, 14, 29 and 30. As is typical for such out-of-season openings, they were primarily single-hop events that did not last long. Most affected the western two-thirds of the nation. The November 14 opening seemed to attract the most comment. Don Sipes, VE6NTT (DO31) was quite surprised, both because it was at an odd time of year and because he is at a relatively northerly location. Don worked into Wisconsin, Iowa and Illinois as late as 0310. Thanks to N4JQQ, WA7HQD, KC7IJ, K7KW, K9KHW, N0JK, K0MQS and N0VSB, for their reports.

Aurora

The geomagnetic field was at near storm levels for much of the month, yet few actual radio auroral events resulted. On several occasions, the K index was five or higher during the day or early morning, when aurora is unlikely and operators least expect it. Brief notes from N9USZ (EN57) and other northerly stations mention only November 11 and 13 with 6-meter auroral signals.

Two-Meter DX

Tropospheric ducts commonly form across the Gulf of Mexico in early spring, so it came as some surprise to find good conditions between south Texas and Florida on the evening of November 27-28. W5UWB (EL17) worked more than a dozen stations in EL86, 87, 88, 95, 96 and 97 between 0150 and 0330. He completed with Burch Akin, K4QXX (EL87), on all bands through 1296 MHz (save 902 MHz) and with several others on 432 MHz. K4WXL (EL96) made the jump across the gulf with just 25 W and a four-element indoor 2-meter Yagi. K4QXX also logged W5THT (EM50) and W5VAS (EM40).

Ed Rodriquez, WP4O (FK68), continued to make 2-meter contacts into Argentina and Uruguay via transequatorial field-aligned irregularities (TE). Ed logged CX9DX, LU5DJZ, LU9EVS and CX9AF with 57 to 59 signals between 2330 and 2340 on November 14. CX9AF, CX9DX, CX1DIO, LW9EVS, LU7DJZ, LU9EUE and LU9AS boomed into Puerto Rico as loud as 59 plus 10 dB on November 21. Five evenings later, Ed worked LU7DJZ at 2350 and heard other Argentines, but signals faded quickly. Much of the activity took place around 144.300 MHz.

VHF/UHF/MICROWAVE NEWS

The Southeastern VHF Society hosts its fourth annual conference April 14 and 15 at the Atlanta Marriott Northwest, in Marietta Georgia. The first call for presentations and papers is February 18. Contact program chair Bob Lear, K4SZ, at 706-864-6229 or e-mail **k4sz@arrl.net** for information. Further details can be found on the society Web site, **www.svhfs.org/svhfs/**. QST

Bhutan Revisited

By Jim Smith, VK9NS

This month we get an inside look at the possibility of Amateur Radio returning to the nation of Bhutan as Jim Smith, VK9NS, gives full details about his most recent trip. Jim has been there and done that before, and hopes to do it again—possibly this year! Last year Bhutan ended its ban on television and started its own network, the Bhutan Broadcasting Service. Can Amateur Radio be far behind?—W3UR

My 1999 visit to Bhutan was by invitation. Please accept my apologies for keeping everything low key. Very few were told of my intended visit to avoid raising hopes of activity during my stay.

I traveled to Bhutan via the "long path." First to Auckland, New Zealand, then London, and returning via Bangkok, up to Paro (Bhutan) and back to Bangkok via Calcutta, then to Sydney, on to Brisbane and finally home to Norfolk Island. I had an extended break in the UK with my family and also attended the GM Convention at Stirling, the IOTA Dinner (RSGB) and also part of the RSGB HF Convention.

I arrived at Paro (Bhutan) on a superb day of sunshine and the new terminal and airport facilities were stunning. After customs and entry formalities were completed, I was legally in Bhutan and was met by Dasho T. Yonten, better known to the DX world as Yonten, A51TY (ex AC5TY). The original plan was for me to be based in Paro and travel up to Thimphu (the capital) as required. We soon decided, however, that being based in Thimphu would be more convenient for me.

Many of the older DXers will remember Yonten; he was quite active over several years, first as AC5TY and later as A51TY. Yonten is now retired and has been keen to get back on the air. To that end, the Heard Island DX Association (HIDXA) donated a Kenwood TS-690S transceiver (with antenna tuner), a brand new state-of-the-art switching power supply, an HF6V Butternut antenna, coax cable, logbook, a 20-meter dipole antenna and more. During my stay the radio equipment and the 20-meter dipole were set up quite quickly in Yonten's house in Thimphu. Yonten and I assembled the HF6V in two separate parts and it will be a simple five minutes job to have the antenna complete. We were waiting for metal workers to roof-mount the vertical when I left.

While we monitored the bands I was able to guide Yonten in the ways of Amateur Radio as it exists today. (By the way, Yonten has not forgotten his CW.) We listened on many bands, but no transmissions were made.

There were some very good signals on that dipole! Even so, plans are also being made to get a beam for him (possibly a Cushcraft A4). During my visit we discussed a possible location for a tower and guy lines. All donated equipment is registered at the Ministry of Communications and Yonten has several other items available (such as a linear amplifier).

MOC Deputy Minister Leki Dorji kindly arranged an immediate first visit to his office. Although Leki was apologetic (I had

Amateur Radio in Bhutan could open at any time in 2000. Here is MOC Deputy Minister Leki Dorji and Dasho T. Yonten, A51TY (ex AC5TY).

Bhutan lies in the Himalayas between China and India.

Bernie McClenney, W3UR ♦ 3025 Hobbs Rd, Glenwood, MD 21738-9728 ♦ howsdx@dailydx.com

written earlier, requesting authorization) he felt strongly that with the introduction of the Amateur Radio Service so close to completion, there was nothing to gain by authorizing any operation under the guise of a "demonstration." We agreed that it was a sensible and honest decision.

Amateur Radio in Bhutan

One must consider that it is only in recent months that Bhutan's Telecommunications Act has become a reality. It is a fact that the level of work done by MOC in recent years has been outstanding. Today so many aspects of telecommunications have been brought under administration. The proof is in the fact that the Kingdom of Bhutan now has its own TV station in Thimphu. Bhutan also has a presence on the Internet and e-mail is flowing freely. The MOC has a Spectrum Management Agency Monitoring Unit in place as well.

I predict that we'll be hearing A5 call signs in the very near future. This activity will be supported on a solid legislative base, enabling the Amateur Radio portion of the Telecommunications Act to be administered fairly and professionally.

It is now 11 years since my first involvement with the Kingdom of Bhutan. Call it idealism if you like, but my view has always been the hope that Bhutan would join the world of Amateur Radio on an equal footing. The Kingdom of Bhutan is a sovereign nation and certainly the Ministry of Communications under Deputy Minister Leki Dorji, along with his small staff, has achieved a great deal to make this a reality.

I extend by sincere thanks to the many individuals in Bhutan who did so much to make my stay another wonderful experience—particularly Yonten, his family and all at the MOC. I was also able to renew several old friendships. I hope that Kirsti, VK9NL, and I will be back in Bhutan early this year.

ANOTHER LOOK AT AMATEUR RADIO IN CHINA

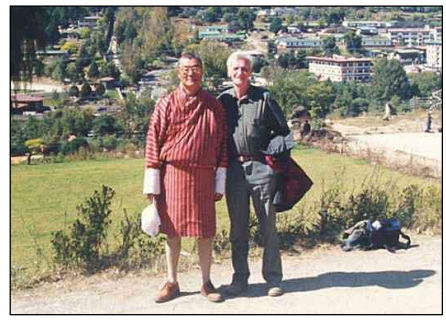
Alan Kung, BA1DU, in Beijing, read the September 1999 "How's DX?" and offers a clarification on Amateur Radio licenses and history in China.

The first Amateur Radio station from The People's Republic of China was BY1PK, the headquarters station of the Chinese Radio Sports Association, which was founded on November 3, 1958. BY8AA was the Sichuan Province Radio Sports Association headquarters station and was founded on July 22, 1963. BY1PJ was founded on October 15, 1963 and was the headquarters station of the Beijing Radio Sports Association.

Up until 1966 there were only six club stations in China and no individual stations were permitted. All club stations were controlled under the Chinese Government Departments and were only able to contact Amateur Radio stations from socialist countries. During this time the Soviet Union was China's Elmer to Amateur Radio, which promoted the hobby as a sport.

Table 1
Chinese Amateur Licensing

Class	*Output power*	*CW Testing*
1st Class	500 W (HF); 50 W (V/UHF)	12 WPM sending; 14 WPM receiving
2nd Class	100 W (HF); 25 W (V/UHF)	10 WPM sending and receiving
3rd Class/HF	10 W (HF); 3 W (V/UHF)	8 WPM sending and receiving
3rd Class/VHF	10 W (10 meters); 3 W (V/UHF)	No CW test



Once the Ministry of Communications gives the OK for Amateur Radio you can bet you will hear Yonten, A51TY (ex AC5TY), and Jim, VK9NS/A51JS, on the air shortly afterward.

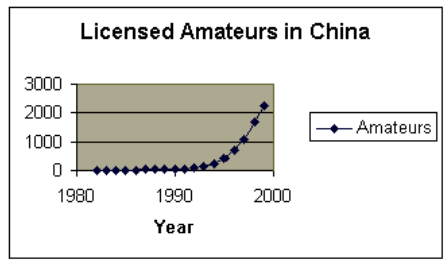


Figure 1—Charting the growth of Amateur Radio in China.

In the upheaval of the "Great Cultural Revolution" in 1966 all Amateur Radio stations in China were closed. Sixteen years passed before the Chinese government reopened Amateur Radio services in 1982. This time under new policies established by the Chinese government, Amateur Radio operators had an open window to contact the outside world (nonsocialist countries). By 1992 a milestone was met—Amateur Radio operators from China were now to assemble individual stations. This ruling caused substantial growth in the hobby over a short period of time (see Figure 1).

Most of the Amateur Radio organizations in China are run by the state. The first nonstate run group was the Beijing DX Club, BY1A, which was founded on May 16, 1998. This club is mostly active with the RSGB IOTA program.

In order to be licensed in China as an Amateur Radio operator you must be at least 18 years old. SWL licenses can be obtained at the age of 16. Whether you are an Amateur Radio operator or an SWL, you must take an examination. The exams are given about once a year in most of the main cities throughout China.

The Chinese license structure is listed in Table 1.

Chinese Amateur Radio call sign prefixes include:

B (1×1) Contest Calls
BA—First Class individual
BB/BC—Reserved prefix block for First Class individual
BD—Second Class individual
BE/BF—Reserved prefix block for Second Class individual
BG—Third Class individual
BGx-x-xxx—SWL stations (x = number)
BH—Originally this prefix block was for 10-meter experimental stations and is now reserved for Third Class individual
BI—Used for IOTA activities (but not for permanent stations)
BR—Repeaters
BT—Special event stations
BY—Club stations
BZ—Used to be allocated to members of club stations. None issued since August 1998
BS7H—Huang Yan Dao (Scarborough Reef)
VR2—Hong Kong
XX9—Macao

At press time no official word has come from the Chinese government as to the exact status of Macao, which was returned to China on December 20, 1999.

The prefixes BM, BN, BO, BP, BQ, BU, BV, BW and BX are allocated to Taiwan by oral agreement between the CRSA and CTARL during the IARU region III conference in Singapore in 1994. BV9P and BQ9P are for Pratas Island.

On July 1, 1999 the Chinese Radio Sports Association announced the beginning of the CRSA (0-9) Award, which is available to any Amateur Radio operator submitting proof of working at least one Amateur Radio station in each of the ten Chinese call areas. For complete details send a self-addressed envelope and 1 IRC to: CRSA, PO Box 6106, Beijing 100061, China.

MACQUARIE ISLAND – VK0LD

Alan, VK0LD, hit the airwaves in late November. Macquarie Island ranked number 12 on the ARRL's Most Wanted List in 1998. Many in the pileups have not been listening to Alan's requests as he calls for certain areas. Alan has a simple policy: If you call out of turn he won't work you. He may even go QRT. Alan is the boss and if you want to work him make sure you follow his instructions. Keep the faith and do as he says.

WRAP UP

Well that's all for this month. A special thanks to Jim, VK9NS, and Alan, BA1DU, for helping to put together this month's column. Don't forget the ARRL CW DX Contest on February 19th and 20th. You're likely to find contest DXpeditions running the bands a few days before and after the contest. Don't forget to keep those letters and pictures coming. Until next month, see you in the pileups!—*Bernie, W3UR*

Old Radio Profile: The Mystique Of The HRO-500—Only The Dial Remains The Same.

Contributed by Al Klase, N3FRQ

Many of us remember the introduction of National Radio Company's HRO-500 general-coverage communication receiver in late 1964. If we discount the consumer-oriented Heathkit GC-1A Mohican, the HRO-500 was probably the first full-featured all-solid-state communications receiver. This was a revolutionary step in a succession of National HRO receivers dating back to 1934.

By the early 1950s and the introduction of SSB operation, the nearly legendary HRO design was clearly obsolete by amateur standards. However, the double-conversion HRO-60 had soldiered on into the 1960's as a commercial "laboratory-reference" receiver due to its wide frequency range and stable performance.

While few amateurs actually got to use HRO-500s, everyone knew about them. Their $1500 price tag was intimidating. (In 1964 you could almost buy a complete Collins S-line station or a modest automobile for $1500!) Despite the price, the wide frequency coverage and solid performance of the HRO-500s carved a substantial niche in the commercial and military market. Over the years a fair number of these sets have made their way out of the laboratories, maritime installations, and military supply depots and into the hands of mere mortals. Through the vintage-radio collecting hobby we're finally able to own and appreciate treasures of this sort.

The HRO-500's frequency range extends from 30 MHz all the way down to 5 kHz with the optional LF-10 low-frequency preselector. The first conversion oscillator is controlled by a phase locked loop referenced to a single 500-kHz crystal, and provides a level of frequency accuracy and stability unparalleled in earlier HROs. The overall frequency range is divided into 60 500-kHz frequency bands tuned by the distinctive HRO knob, which controls the tunable IF. This control covers the 500 kHz range in five turns with 1-kHz accuracy. The center knob offers an additional 5:1 reduction ratio for easy SSB tuning.

While the 230-kHz LC filters in the final IF do not have the extremely steep skirts we've come to expect from crystal or mechanical filters, their 2.5:1 shape factor is adequate for all but the worst band conditions. Additionally, the LC design

The legendary HRO-500 receiver.

allows the passband of the 2.5 kHz and 500 Hz filters to be tuned continuously to either side of the crystal controlled BFO frequency. The 5 kHz and 8 kHz AM filters are fixed. A highly effective tunable notch filter is available in all modes.

While normally powered by an internal 115/230-V ac power supply, this receiver may be operated from a 12-V dc external source. A front panel switch turns off the dial lights, holding current consumption to a mere 200 mA (about enough to power the heater in one decent vacuum tube). A NiCd battery pack was available as an option.

On the air the HRO-500 gives a good account of itself even in the late twentieth century. Tuning is smooth and accurate. Selectivity is very good, and the passband tuning and notch filter let you dodge serious QRM. The set has a proper product detector and automatic gain control for good SSB performance. The 5- and 8-kHz AM filters provide the proper bandwidth for almost any occasion. The vintage solid-state circuitry is somewhat prone to overload on really strong signals, but the **AGC THRESHOLD** knob controls a highly effective front-end attenuator.

Tune-up does require some operating skill. The **BAND MC** switch selects one of five broad frequency bands. The appropriate 500-kHz band segment is selected by turning the **SYNTHESIZER TUNE** control until the desired frequency appears in the synthesizer-tune window and the red **PHASE LOCK** lamp stops flashing. Then the **PRESELECT TUNE** control is set to the approximate frequency and the station is selected with the main tuning knob. Finally, the preselector should be touched up using the S meter.

After all these years, it certainly is nice to lay a hand (and an ear) on one of these fine instruments. If the opportunity presents itself, take it!

For additional HRO-500 information on the Web, visit: **http://www.eht.com/oldradio/arrl/index.html**

SEE YOU AT RADIO XXXI!

I am planning to attend RADIO XXXI, a large vintage radio show at the Westford Regency Inn in Westford, Massachusetts (I-495 at Exit 32) on Sunday February 20, 2000. The show opens at 8 AM. It attracts sellers who display early home radios, microphones, Morse keys, crystal sets, books, magazines, and a few vintage Amateur Radio sets. It is a good place to collect. If you can attend, look for my call letters on my hat and say hello!—*K2TQN* QST

Collector Profile: Al Klase, N3FRQ

Al is a vintage radio collector, restorer and historian specializing in communication receivers. As Al tells it, "At the tender age of about three, I got a look inside my grand-father's 1930 McMillan radio—a gigantic wooden box filled with glowing vacuum tubes, and other mysterious objects. I've been in electronics ever since." General tinkering, engineering school, the US Army Signal Corps and many years as an electronics design engineer helped him further this early interest.

In a world where one can hide a quarter-billion transistors under a fingertip, Al finds working on vintage gear a welcome change from his work as a field applications engineer for a major semiconductor company. He has also done extensive investigations on the technical aspects of crystal radios, and feels the deceptive simplicity of crystal sets is an interesting counterpoint to the complexities of the high-end shortwave sets.

Al is presently program chairman for the New Jersey Antique Radio Club and newsletter editor for the Delaware Valley Historic Radio Club. Al has been licensed as N3FRQ since 1987.

John Dilks, K2TQN ♦ 125 Warf Road, Egg Harbor Township, NJ 08234-8501 ♦ k2tqn@arrl.org

Your QRP Elmer

If you're reading this, our second QRP column, it means two things. First, Y2K did not end the world as we know it! Secondly, you're a glutton for punishment, so welcome back! This month we are going to have a bit of fun with a mock operating session. Jay Greenberg, N3WWL, has graciously allowed me to use his call sign as part of this exercise to show you how easy and fun it is to try QRP.

By now I trust you have throttled back your high power HF transceiver and managed some QRP contacts.

What do you mean, "No"?

Okay, tell ya what I'm gonna do. I'll ride "shotgun" on your first attempt. I'll be at your elbow to talk you through it. You handle the rig and I'll provide some pointers and commentary, how's that?

Switch Your Rig to 40 Meters

Let's start out on my favorite QRP band, 40 meters. Set your VFO for 7040 kHz and tune around, listening for some QRP activity. Forty is a popular QRP gathering place and very often just by hanging around on "040" you can scare up a QSO with a fellow QRPer. Tune +/- 10 kHz and see if you can spot anything. Hmmm…now here is a signal. It's KA3WTF calling "CQ QRP". Get ready because we're gonna bag this dude!

Check the power output of your rig into your dummy load. Whoa! It's way too high…back it down. That's better. Key the transmitter and increase the RF drive until you get 5 W output on your wattmeter. Go back to your main antenna and let's check whether or not "WTF" is still calling CQ. Good, he has just started CQing again. QRPers are a patient lot. Set your keyer speed to around 18 to 20 WPM and get ready. When he signs, give him a 2 × 2 reply: KA3WTF KA3WTF DE N3WWL N3WWL KN. Okay, he's listening…hit it!

Contact!

Will wonders never cease? KA3WTF is coming back to you. I'm so proud! Kick back and have some fun. Fran's a great guy and one heck of a QRPer. Did I mention that he and Paul, AA4XX, hold the miles-per-watt record on 40 meters? Yeah, they did that twice, once in 1994 and again in 1995. The first time they used only 221 µW; the second time it was a measly 96 µW over a 421-mile path! You're in QSO with a real "hard core" QRPer.

Not bad, twenty minutes on the air using 5 W and you had a nice QSO with Fran, KA3WTF. Now that wasn't so hard, was it? Keep tuning around and see what else we can find. Slow down. You're tuning way too fast.

Hold it! What's that? Did you get solid copy on that call sign?

He's pretty weak. Listen carefully and cinch down your IF filter. Ah ha! It's Chuck Adams, K7QO, and he's just finishing up with another station. As soon as Chuck sends SK, get ready to jump on him. Call just like you did with Fran, using a 2 x 2 reply. There's his "SK" go ahead. You're on!

Wait…wait…*yes!* He's coming back to you! Remember, since Chuck's signal is so weak, you might want to keep this QSO to the bare minimum just in case band conditions drop off. He just gave you a 229 and he's about the same here, so we can assume the mediocre reports are the result of band conditions and not the fact that Chuck might be working in the milliwatt power range. It's a good idea to keep it short and to the point. Go ahead with his RST and your name and location.

Hey, not bad. In less than a half-hour you managed to work two very well-known QRPers. Is your confidence level coming up? I thought so. Let's take a quick look down at the bottom of the band and see if there might be some DX lurking around.

Busting a Pileup

Check that out! A 10-kHz wide pileup around 7015 kHz. Tune down a bit more…hold it! I thought so. It's CY9CWI, St. Paul Island. Let's see if we can get into his log using QRP.

First thing to do is to sit tight and listen. Notice how the St. Paul op isn't giving his call sign out at the end of each QSO. He's picking up two or sometimes three callers at a time and working them sequentially. Okay, he just gave his call: "CY9CWI U5 /10" which means he listening up between 5 and 10 kHz above his transmit signal for stations.

Park your receiver VFO right here and use your other VFO to move up about 5 kHz. The trick is to spot where he's listening. He's coming back to W8QRU. Quick—swap VFOs and see if you can find W8QRU. Oops, that was a little too quick! Don't worry, we'll get another shot in a second.

Jump back to CY9's frequency and listen for the next caller. He's calling W2QTR. Bring up the other VFO and search, quickly. There he is: "de W2QTR RR TU OM UR 599." Now we go back to the CY9's frequency once more and listen for the next station, then swap back to the other VFO to find out whether or not the CY9 is moving up or down from W2QTR's frequency.

"N4BP 599 K." Jump back to the other VFO we go and to spot BP's frequency. N4BP is Bob Patten, outstanding DXer and noted QRPer, so it will be interesting to see if Bob is working him using low power. All right! Bob just gave the St. Paul OP a "599 5 watts" and we heard him fine so the bands are in pretty good shape right now. BP's frequency was just above W2QTR's, so it looks like the CY9 operator is moving up in frequency from the last QSO.

Park your VFO about 400 Hz above where N4BP made contact, split your TX/RX frequencies (listening on the CY9s frequency and transmitting just above N4BP's frequency) and let's give this a try.

The CY9's calling "CQ" again, so drop your call-sign in twice just after he signs. Goose the keyer speed up to about 30 WPM. I know you can't copy at that speed, but what's to copy? You know the exchange: "599"

Go!

Listen….nope, he didn't hear you. Check your transmit frequency and spot the guy he's working now. Move your TX signal up about 300 Hz. We'll be ready next time.

Go back to split operation. The CY9 just called "QRZ." Hit it!

Listen…"N3 ?". That might be you! Shoot off your call sign one more time.

Listen again. "N3WWL 599 K"

That's for you! Send "599" and "5W" if you want.

"DE CY9CWI RR TU ES GUD QRP."

Congratulations! You just worked your first DX station using QRP *and* you busted a pileup to boot! Not a bad evening. Don't forget to get the CY9CWI QSO into your logbook. Now you have some bragging rights. Try not to rub it in at the next club meeting when some of the QRO locals asks you if you've worked St. Paul Island.

Easier than you Think

While the aforementioned session was obviously make believe, what we've illustrated *is* a common occurrence on the HF bands. Some of the calls I used in this illustration belong to real QRPers who are no strangers to QRP DXing and contesting. The point I'm trying to stress is that making contacts using QRP power levels is no big deal. Don't be afraid to jump right in and give QRP a try. QST

Rich Arland, K7SZ ♦ 25 Amherst Ave, Wilkes Barre, PA 18702 ♦ k7sz@arrl.org

New YLRL Officers for 2000

There are many women Amateur Radio operators who volunteer for various positions within the ARRL, local radio clubs and other organizations. One particularly demanding job is the administration of the Young Ladies Radio League (YLRL), the oldest international organization for women Amateur Radio operators, which is celebrating its 61st anniversary.

This year there are two new YLRL officers: president Carol Hall, WD8DQG and vice president Phyllis Shanks, W2GLB.

Carol has been a ham since 1975 and holds an Advanced license. She has been very active in YLRL and was president of TASYLS (The Auto State YL Society) and vice president of the Central Michigan Area Repeater Association.

Phyllis, W2GLB, is originally from the New York area and was instrumental in starting SAYLARC, the Second Area YL Amateur Radio Club, which still uses the butterfly logo inspired by her call sign (golden little butterfly). She has lived in Arizona for the past 17 years and is president of the YL club there (the Cactus Keys). Phyllis is very active in YLRL and was president of YLRL in 1979.

Carol Hall, WD8DQG, likes to travel. She has enjoyed attending YL conventions all over the globe. This photo was taken at the Svalbard Polar YL Convention in Norway.

CAROL HALL, WD8DQG

Phyllis Shanks, W2GLB, at the YLRL convention last year on the *Queen Mary* in Long Beach, California.

YLRL and the Future

In a recent interview, both Carol and Phyllis shared some of their thoughts on YLRL.

What are your goals for YLRL in the next two years?

Carol: "One of my goals is to encourage the YLRL district chairwomen to spread out their duties by mentoring other YLs. Some of the districts encompass more than one state and we need more representatives to be able to adequately cover those larger areas. It is important to prepare some of the younger gals so they will feel confident taking on increased responsibilities in YLRL. The district chairwomen gather information on what YLs are doing in their communities, upgrades, participation in Field Day, civic events, etc. They write a summary of their area activities for *Harmonics*, the YLRL informational newsletter, and notify members who are late on their dues. There any many YLs that don't realize that YLRL is out there. I would like to see more recognition of what our YLRL members are doing in the community."

Phyllis: "I'd like to see more participation in the YL nets and contests. It's important for YLs to keep in contact with each other and to share experiences. Two interesting nets are the 'Open House' on Wednesdays at 1800Z on 14.288 MHz run by Irma, K6KCI, and the 'Tangle Net' on Thursdays at 1800Z on 14.297 MHz with rotating net controls Marti, K0EPE, Marsha, K6DLL and others. Both nets are open to all licensed YLs—there is no affiliation necessary. They are both friendship nets to encourage YLs to make contact with one another and get experience operating HF."

Why should women join YLRL?

Carol: "YLRL is a wonderful organization and it offers women a chance to meet other women who are active on the air. We have gals who are PhDs and women who were radio operators on ships during the war. Some were hams before they ever met their husbands. YLRL gives every licensed woman the opportunity to increase their skills and share their experiences with other YLs."

What changes do you foresee in YLRL programs?

Carol: "I'd like to institute an SWL certificate for the YLRL contests. This would encourage YLs who don't have HF privileges to be involved and get a sense of participation. Many YLs get their license and only use it to find out when their OM is coming home for supper. There is so much more that you can do in Amateur Radio. I'd like to see YLRL help move more YLs into the mainstream of the hobby."

YLRL is open to all licensed women Amateur Radio operators. Visit their new Web site at **http://www.qsl.net/ylrl** where you will find information about YLRL contests, membership, officers, etc. If you would like to join, send a note to the receiving treasurer in your district. *Districts 1-4*: Jean Chittenden, WA2BGE, 292 Allen Rd, Mt Vision, NY 13810 (**jeandoe@juno.com**); *Districts 5-7*: Doris May, KJ7RF, PO Box 2807, Pahrump NV 89041-2807 (**kj7rf@isat.com**); *Districts 8-10* (KH6, KL7, VE): Carol Schmitkons, KB7VYB, 43530 Middle Ridge Rd, Lorain, Ohio 44053-3902 (**schmitkons@centuryinter.net**).

If you are a DX YL, or would like to sponsor a DX YL, contact Christina Ronshausen-Terrell, N5YCH, 17630 Point Comfort Lane, Webster, TX 77598-3223; **n5ych@juno.com**.

Upcoming YLRL contests include: YL-OM Contest (CW): 1400 UTC, February 5, 2000, to 0200 UTC, February 7; (SSB) 1400 UTC, February 12, 2000, to 0200 UTC,February 14, 2000 and the DX-YL-to-North-American YL Contest (CW): 1400 UTC, April 15, 2000, to 0200 UTC April 17, 2000; (SSB): 1400 UTC, April 22, 2000, to 0200 UTC, April 24, 2000.—*33, Diane K2DO*

Diane P. Ortiz, K2DO ♦ PO Box 296, Bellport, NY 11713 ♦ hamyl@aol.com

SILENT KEYS

It is with deep regret that we record the passing of these amateurs.

KC1CC, Chester S. Szydlowski, West Springfield, MA
KZ1I, David F. Metz, Gilford, NH
W1KVX, Harold S. Burns, East Falmouth, MA
W1MIV, Charles E. Tamm, Agawam, MA
K1NXB, Alvin F. Sproul, Chamberlain, ME
W1QQN, Gordon A. Watson, Colchester, VT
W1SDU, Theodore M. Berthiaume, Brooksville, FL
W1SJS, Anatole G. Courchene, Pittsburg, NH
K1TUR, Thomas M. Corbett, Dorchester, MA
W1VBX, Norman W. Littlefield, Pembroke, NH
N2AKW, Alfred P. Finkelstein, Chesnee, SC
K2ARK, Frank J. Ragger, New Hyde Park, NY
WA2AYR, Harry Dilts, Bradenton, FL
*WB2CHO/VP2ML, Charles Harris, Santa Rosa, CA
WA2CSJ, Julian J. Scavetta, Brooklyn, NY
WB2FTK, Sam Musikar, Palm Coast, FL
WB2HOX, Walter C. Urbanek, Cheektowaga, NY
K2HP, Walker H. Thomas, Boulder City, NV
WA2HRA, Leslie L. Crump, Apalachin, NY
W2JIX, Mike Ikonomou, Boca Raton, FL
N2JMW, Ruth T. Gutt, Bronxville, NY
KB2KVZ, Earl C. Tooley, Port Richey, FL
K2LZU, Raymond J. Rossiter, Whitesboro, NY
K2PR, Paul A. Roeder, Toms River, NJ
K2SQL, William H. Firth, Niagara Falls, NY
W2UMS, Agathon Albion, Lewiston, NY
K2UUJ, Ezra Markson, Boca Raton, FL
*W3EIV, William R. Long, Gaithersburg, MD
KA3JEI, Will Cridland, Carlisle, PA
K3KFP, Wayne F. Samuelson, Ellicott City, MD
W3KUN, Joseph C. Nester, Emporium, PA
W3SOK, Joseph H. Loraw, Elizabethtown, PA
W3TMB, Allan W. Anderson, Gaithersburg, MD
K3VIT, Thomas J. Jenkins, Wyndmoor, PA
WV3W, Robert D. Texter, Allentown, PA
W3ZAT, William A. Ingram, West Chester, PA
W4AEY, Robert H. Miller, Asheville, NC
W4DET, Ralph McKeral, Blairsville, GA
W4DEV, Helen McKeral, Blairsville, GA
W4FXE, William Tucker, Hallandale, FL
KQ4GV, Fred W. Mosley, Goodlettsville, TN
KE4GZ, Lester E. Bessemer, Sarasota, FL
WB4HPB, Lester W. Ulch, Birmingham, AL
KC4JOM, Kermit L. Coots, Lexington, KY
KB4KLX, Carri A. Smith, Mooresville, NC
K4MKX, Edward B. Beach, Arlington, VA
N4NYM, Willard D. DeJonge, Oldsmar, FL
WB4OCB, Grady Wyatt, Thomson, GA
N4OSE, Michael G. Zimmerman, Salem, OH
KC4PWV, Billy M. Bradbury, Augusta, KY
KF4SAS, Mary F. McCaustland, Largo, FL
W4SBQ, J. C. Seddon, Knoxville, TN
K4SP, Alex H. Hilliard, Orange Park, FL
K4SPS, Joseph E. Gillette, Franklin, VA
N4SST, Milton C. Blalock, Fuquay Varina, NC
KM4TH, John C. Powell, St Petersburg, FL
‡W4ZAN, John S. Sanderson, Clarkton, NC
WB4ZKE, Richard T. Carleton, Neptune Beach, FL
KB4ZX, Thomas E. Moseley, Puryear, TN
*WB5BEE, Gordon M. Goodfellow, Albuquerque, NM
W5BKU, James C. Eastwood, Richardson, TX
KB5EY, W. F. Brain, Amarillo, TX
AA5GH, Max Immerman, San Antonio, TX
K5KDR, Billy J. Oliver, Norman, OK
KK5LM, Wesley L. Reeves, Raymond, MS
W5NHH, Denson C. Bradshaw, Pascagoula, MS
K5OVF, Blenden Brandenburg, Bartlesville, OK
W5SQM, Warren B. Thwaites, El Paso, TX
WA5SXD, Samuel P. Landry, Norco, LA
W6ALO, Thomas W. Jentges, Orange, CA
N6AN, Harold C. Godfrey, San Carlos, CA
W6CRP, Lawrence A. Cullom, Santa Cruz, CA
K6EZ, Ernest W. Pappenfus, Temecula, CA
KA6FUA, Bill Hamm, Salinas, CA
*W6HNI, John F. Lyon, Carpinteria, CA
KC6HOM, Jack B. Phelps, Santa Maria, CA
*W6JRZ, Graeme P. Welch, Berkeley, CA
KH6JSE, John L. Steinfeld, Englewood, FL
*K6KFF, Bob Dobbins, Tahoe City, CA
W6KIJ, Frank H. Johnson, Yucaipa, CA
W6QOI, Rodney J. Olsen, Sedona, AZ
WB6RIW, Kent T. Warren, Alta Loma, CA
W6TAJ, Frank S. Dombek, San Diego, CA
KD6YCB, Steven L. Burleson, Modesto, CA
W6ZBY, Josiah J. Taylor, Interlachen, FL
N7BSG, Robert J. Mortell, Camano Island, WA
W7BUP, Sidney W. Storer, Lopez Island, WA
W7GIN, Alfred T. Vaughn, Seattle, WA
W7JTN, Edward M. Shunk, Tucson, AZ
K7JWB, Nathan B. Crane, Tempe, AZ
N7KMF, Stanton Warburton, Tacoma, WA
WN7L, Newton H. Grimes, Federal Way, WA
W7NH, Arthur F. Winslow, Phoenix, AZ
W7NJI, John D. Duncan, Bozeman, MT
W7OF, Vernon D. Phillips, Seattle, WA
K7PYS, William C. Biser, Eugene, OR
N7RHD, Donald G. Toman, Renton, WA
K7VC, George C. Downing, La Conner, WA
KB7YII, Alcuin P. Theisen, Safford, AZ
N7ZF, James E. Carlson, Mossyrock, WA
W8ABI, Walter L. Pritz, Cincinnati, OH
W8ABL, Robert E. Blair, Cleveland, OH
AA8BT, Troy C. Gilley, Springfield, OH
W8FMQ, Glenn E. Merriam, Cincinnati, OH
‡K8HDI, George J. Glondeniz, Detroit, MI
W8HRV, John M. Remish, New Waterford, OH
W8NAI, Lewis D. Evans, Worthington, OH
W8RSW, Frank M. Koval, Cincinnati, OH
W8UTB, Richard E. Marks, Dexter, MI
WB8VUZ, Thomas W. Miller, Euclid, OH
NN8W, James F. Mann, Russell Springs, KY
W8WYU, Arden R. Long, Dayton, OH
WB9CYI, Jeff P. Woodward, Algonquin, IL
K9DRD, Samuel M. Angel, Evansville, IN
N9HKY, Arthur Stamnes, Ellison Bay, WI
WD9IJY, Donald G. Rassbach, Eau Claire, WI
AA9KQ, Keith W. Phillips, Evansville, IN
WA9OYD, Harold A. Kramer, Chicago, IL
KA9QAR, William J. Brown, Savanna, IL
AJ9R, Jeff D. Watts, Naperville, IL
W9RBD, H. L. Kennicott, Highland Park, IL
N9TUS, Joseph A. Halasz, Portage, WI
N9TXT, Lorraine M. McCurdy, Princeton, WI
WA9UEF, Gerald R. Akers, Lafayette, IN
*WB9VCH, William Stidham, Zion, IL
W9YME, Ken A. Tyson, South Bend, IN
N9ZTT, Gregory D. Necessary, Ridgeville, IN
**W0AF, Charles G. Compton, Melbourne, FL
W0IZ, Dale E. Repp, Cedar Rapids, IA
W0KUM, Luther E. Hansford, Arvada, CO
K0MTO, Marquis R. Pasley, Shawnee Mission, KS
*K0RAX, Conrad L. Helber, Middle Brook, MO
*W0UZ, John H. Nelson, Cedar Rapids, IA
G0LRS, G. V. Allis, Surrey, Great Britain
ON6JI, Jacques Crombez, Brugge, Belgium
*VE3FOY, Michael J. Heslin, Kemble, ON, Canada

*Life Member, ARRL

**Charter Life Member, ARRL

‡Call sign has been re-issued through the vanity call sign program.

Note: Silent Key reports must confirm the death by one of the following means: a letter or note from a family member, a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address and call sign. Allow several months for the listing to appear in this column.

Many hams remember a Silent Key with a memorial contribution to the ARRL Foundation. If you wish to make a contribution in a friend or relative's memory, you can designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund, or the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation Inc, 225 Main St, Newington, CT 06111. QST

Kathy Capodicasa, N1GZO ♦ Silent Key Administrator

NEW PRODUCTS

AMPLIFIER INTERFACE UNITS FROM HARBACH

◊ Harbach Electronics is now offering a redesigned version of their popular *Soft Key* interface modules. Although they are primarily intended for use with the Heathkit SB-200 and SB-220 linear amplifiers, the new modules can be modified to work with many other linear amplifiers and will allow amplifier keying with any known exciter, even the ICOM IC-706 series transceivers.

The SK-200 Soft Key is designed for linear amplifiers—such as the SB-200—that use a negative voltage keying circuit. This unit presents +1 V to the exciter's keying circuit and draws approximately 1.5 mA when keyed.

The SK-220 Soft Key is designed for linear amplifiers—such as the SB-220—that use a positive voltage keying circuit.

Either of these units may require modifications for use with other similarly keyed amplifiers. These modifications can be provided for an additional $3.

Price: SK-200, $14; SK-220, $11. Shipping is included in the US and Canada.

For further information contact Harbach Electronics, 2318 S Country Club Rd, Melbourne, FL 32901; tel or fax 321-723-7145; **wa4dru@iu.net**; **http://www.harbach.com**.

ADD A REAL-TIME AMATEUR RADIO NEWS TICKER AND MORE TO YOUR COMPUTER DESKTOP

◊ QRZ and Jotter Technologies Inc have teamed up to create a software package that puts a real-time Amateur Radio news ticker and QRZ Callsign Database lookup toolbar in a "microportal" on your *Windows* desktop.

With the help of the Jotter microportal you can directly access QRZ.com without opening a Web browser. Data from QRZ is filtered for the individual and presented in a small window. Users can receive ham radio news and information including the latest DX hot spots, call sign updates and more. This toolbar also provides a direct connection to the on-line QRZ call sign lookup database.

The Jotter program is capable of providing a lot more than just Amateur Radio information—it can also remember your user name and password and any other personal information that you desire and will automatically fill out on line forms and questionnaires for you. It is highly customizable and offers a wealth of powerful features in a slim toolbar that you can place anywhere on your desktop screen.

You can download the Jotter software free of charge from the QRZ Web site: **http://www.qrz.com/**. QRZ.com, PMB 159, 8711 E Pinnacle Peak Rd, Scottsdale, AZ 85255. QST

Next New Product

75, 50 AND 25 YEARS AGO

February 1925

◊ Clyde Darr, 8ZZ, provides the cover illustration, which shows a ham with a very unpleasant look on his face as he holds a bakelite front panel that just broke into two pieces—just as he had finished drilling all the holes in it. The editorial discusses "The Hoover Bill," saying that "[Hoover] thinks that radio will ultimately require extensive legislation…," but that there is a lot yet to be "thrashed out before exhaustive legislation is attempted." Hoover therefore proposes a short bill in the interim, in the nature of "emergency legislation." Ham radio's continuing growing pains are evident.

Part I of "The McCaa Anti-Static Devices" tells the ham how he can minimize static and power-leak noise problems. "This Month's International DX" reports "New records all around…1KC works Asia and Africa…six new countries added to our list [of countries worked by US hams]." "A Novel Short-Wave Tuner" will enable hams to tune between 3 and 5 meters.

John Reinartz, 1XAM-1QP, in his article "That Wave Meter," tells how to equip the General Electric 247-W wavemeter with new coils to increase the upper end of its frequency coverage. League President Hiram Percy Maxim tells, in "Another Chance to Put One Over," that the Director of Naval Communications has asked for the League's help "in the organization of a topnotch A-Number-One Radio Naval Reserve," to which the League's Executive Committee replied, "'YOU BET YOUR LIFE', or words of like import." A short article, "International Intermediates Expanded," lists the intermediates (informal country prefixes) that are currently being used. In the article "Showing Up Missouri Troubles," E. C. Brownlee, 9BSF, describes how a group of Show-Me hams used portable receivers and receiving loops to find the source of loud spark-type interference caused by a defective bushing in a large ac power transformer.

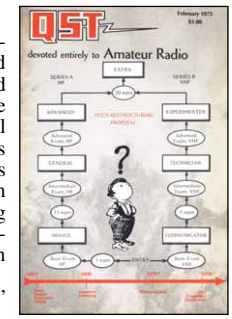
"Experimenters Section Report" tells that "20 meter tests put daylight signals across America," and reports that "The night tests can be described in one sentence—nothing was heard at any distance over 100 miles." A cartoon by Canadian c1DD shows two hams in a foxhole named "ARRL Policy," ducking overhead shell bursts of "commercial radio interests" and "B.C.L. interests," with the caption, "Well, if you knows of a better 'ole, go to it."

February 1950

◊ Gil's cover cartoon shows a freshened and invigorated VQ7AA getting ready for the ARRL International DX Contest. The editorial, "Docket 9295," begins, "Once again the [ARRL] regretfully finds itself obliged to take issue with certain aspects of changes in the amateur rules proposed by the [FCC]" in the matter of the proposed Amateur Extra Class license and its 20 wpm Morse requirement.'

"A Solution to the Keyed-VFO Problem," by Richard Smith, W1FTX, tells how to get clean oscillator keying for break-in CW operation. "A Simple Nondirectional Antenna for Ten Meters," by Stewart Backer, W7AYB, shows how easy it is to build a "J" antenna. George Grammer, W1DF, offers help to hams with TVI problems with "Eliminating TVI with Low-Pass Filters," Part I. Ed Tilton, W1HDQ, presents "Part I—The Receiver" of "A 2-Meter Station for the Novice." (The operating privileges of the Novice class license, soon to be available, will include a 2-meter phone segment.) In "The Land of the Morning Calm," Norris Maxwell, W5FOH and ex-J8AAG/HL1AG, tells the frustrating but hilarious story of getting on the air as rare DX from Korea, when stationed there with the military.

February 1975



◊ The cover shows a cartoon of the poor confused ham trying to understand the latest FCC license proposals. The editorial discusses those proposals and how difficult it has been to keep the ham community from reacting to all sorts of spurious rumors and misinformation on the subject.

"The Contester," by Michael Dodd, WA4HQW, tells about his semiautomatic contesting device that will send CW, keep and check dupe sheets, tell the time, count and number the QSOs, and fill out the log. Peter Bertini, K1ZJH, describes "A State-of-the-Art QRP Transceiver for 50 MHz." Part II of "Frequency Counter—A Modular Approach," is presented by Arlo EggenSperger, W2TJZ. Part II of "Practical Ideas for the ATV Enthusiast," by Thomas O'Hara, W6ORG, covers transmitters, modulators and cameras. In "Transmitting Variables—Who Needs 'Em," Doug DeMaw, W1CER, and Anthony Dorbuck, W1YNC, tell about an economy HF amplifier that uses four 807 tubes—but no variable tuning capacitor. Willi Richartz, HB9ADQ, describes "A Stacked Multiband Vertical for 80-10 Meters." In "Contesting—A Great Emotional Experience," Al Kahn, K4FW, tells about the various emotional states the typical contester goes through during a contest—it's well worth reading, and *so* true!—*Al Brogdon, W1AB* QST

W1AW SCHEDULE

Pacific	Mtn	Cent	East	Mon	Tue	Wed	Thu	Fri
6 AM	7 AM	8 AM	9 AM		Fast Code	Slow Code	Fast Code	Slow Code
7 AM-1 PM	8 AM-2 PM	9 AM-3 PM	10 AM-4 PM	Visiting Operator Time (12 PM - 1 PM closed for lunch)				
1 PM	2 PM	3 PM	4 PM	Fast Code	Slow Code	Fast Code	Slow Code	Fast Code
2 PM	3 PM	4 PM	5 PM	Code Bulletin				
3 PM	4 PM	5 PM	6 PM	Teleprinter Bulletin				
4 PM	5 PM	6 PM	7 PM	Slow Code	Fast Code	Slow Code	Fast Code	Slow Code
5 PM	6 PM	7 PM	8 PM	Code Bulletin				
6 PM	7 PM	8 PM	9 PM	Teleprinter Bulletin				
6^{45} PM	7^{45} PM	8^{45} PM	9^{45} PM	Voice Bulletin				
7 PM	8 PM	9 PM	10 PM	Fast Code	Slow Code	Fast Code	Slow Code	Fast Code
8 PM	9 PM	10 PM	11 PM	Code Bulletin				

W1AW's schedule is at the same local time throughout the year. The schedule according to your local time will change if your local time does not have seasonal adjustments that are made at the same time as North American time changes between standard time and daylight time. From the first Sunday in April to the last Sunday in October, UTC = Eastern Time + 4 hours. For the rest of the year, UTC = Eastern Time + 5 hours.

♦ Morse code transmissions:

Frequencies are 1.818, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675 and 147.555 MHz.

Slow Code = practice sent at 5, $7\frac{1}{2}$, 10, 13 and 15 wpm.

Fast Code = practice sent at 35, 30, 25, 20, 15, 13 and 10 wpm.

Code practice text is from the pages of *QST*. The source is given at the beginning of each practice session and alternate speeds within each session. For example, "Text is from July 1992 *QST*, pages 9 and 81," indicates that the plain text is from the article on page 9 and mixed number/letter groups are from page 81.

Code bulletins are sent at 18 wpm.

W1AW qualifying runs are sent on the same frequencies as the Morse code transmissions. West Coast qualifying runs are transmitted on approximately 3.590 MHz by W6OWP, with K6YR as an alternate. At the beginning of each code practice session, the schedule for the next qualifying run is presented. Underline one minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any) and complete mailing address. Send a 9×12-inch SASE for a certificate, or a business-size SASE for an endorsement.

♦ Teleprinter transmissions:

Frequencies are 3.625, 7.095, 14.095, 18.1025, 21.095, 28.095 and 147.555 MHz.

Bulletins are sent at 45.45-baud Baudot and 100-baud AMTOR, FEC Mode B. 110-baud ASCII will be sent only as time allows.

On Tuesdays and Fridays at 6:30 PM Eastern Time, Keplerian elements for many amateur satellites are sent on the regular teleprinter frequencies.

♦ Voice transmissions:

Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59 and 147.555 MHz.

♦ Miscellanea:

On Fridays, UTC, a DX bulletin replaces the regular bulletins.

W1AW is open to visitors from 10 AM until noon and from 1 PM until 3:45 PM on Monday through Friday. FCC licensed amateurs may operate the station during that time. Be sure to bring your current FCC amateur license or a photocopy.

In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

Headquarters and W1AW are closed on New Year's Day, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving and the following Friday, and Christmas Day.

COMING CONVENTIONS

TENNESSEE STATE CONVENTION

February 12-13, Memphis

The Tennessee State Convention (Dixiefest 2000), sponsored by the Delta ARC, Dixie ARC, FedEx ARC, Hickory Withe DX Club, Olive Branch ARC, and Tri-State Repeater Assn, will be held at the Mid-South Fairgrounds, Shelby County Building, Central and Parkway. Doors are open Saturday 9 AM to 5 PM, Sunday 9 AM to 2 PM. Features include huge flea market, major vendors, dealers, forums, auction, VE sessions, free parking. Talk-in on 146.82. Admission is $5, under 13 free. Flea market tables are $20 each and vendor tables are $50 each ($10 extra for power). Contact Ben Troughton, KU4AW, 3144 Ingleside Dr, Bartlett, TN 38134-3610, 901-372-8031, **bktrough@mem.net**; **http://www.dixiefest.org**.

VERMONT STATE CONVENTION

February 26, Milton

The Vermont State Convention, sponsored by the Radio Amateurs of Northern Vermont, will be held at Milton High School, Rte 7, 5 miles N of I-89, Exit 17. Doors are open 8 AM to 2 PM. Features include flea market, vendors (please call for setup information), auction, dealers, book sales, forums (ARRL, Contesting, VHF, RF), exhibits, VE sessions (9AM and 2 PM), commercial radio exams, refreshments. Talk-in on 145.15, bulletins on 146.67. Admission is $4, under 18 free. Tables are free while they last. Contact Mitch Stern, W1SJ, Box 99, Essex, VT 05451-8099, 802-879-6589, **w1sj@arrl.net**; **http://www.ranv.together.com**.

NEBRASKA STATE CONVENTION

March 10-11, Norfolk

The Nebraska State Convention, sponsored by the Elkhorn Valley ARC, will be held at Northeast Community College, 801 E Benjamin Ave; from US Hwy 81, turn E on Benjamin Ave, go approximately 1 1/2 miles. Doors are open Friday 5-9 PM, Saturday 9 AM to 5 PM. Features include flea market (Sue Askew, KD0JE, **saskew@conpoint.com**), VE sessions, special event station, banquet. Talk-in on 146.73. Admission is $5 in advance and $6 at the door. Tables are $12 (reserve in advance, space is limited). Contact Fred Wiebelhaus, N0VLX, 605 S 3rd St, Norfolk, NE 68701, 402-379-1929, **dfwiebel@sufia.net**; **http://www.qsl.net/evarc/**.

February 4-5
Mississippi State, Jackson*

February 5-6
Southeastern Division, Miami, FL*

February 11-13
Florida State, Orlando*

March 11-12
North Carolina Section, Charlotte

March 18-19
West Texas Section, Midland

March 24-25
Maine State, Lewiston
West Gulf Division, Tulsa, OK

March 25-26
Maryland State, Timonium

April 9
North Carolina State, Raleigh

*** See January *QST* for details.**

Attention Hamfest and Convention Sponsors:

ARRL HQ maintains a date register of scheduled events that may assist you in picking a suitable date for your event. You're encouraged to register your event with HQ as far in advance as your planning permits. Hamfest and convention approval procedures for ARRL sanction are separate and distinct from the date register. Registering dates with ARRL HQ doesn't constitute League sanction, nor does it guarantee there will not be a conflict with another established event in the same area.

We at ARRL HQ are not able to approve dates for sanctioned hamfests and conventions. For hamfests, this must be done by your division director. For conventions, approval must be made by your director and by the executive committee. Application forms can be obtained by writing to or calling the ARRL convention program manager, tel 860-594-0262.

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

HAMFEST CALENDAR

Attention: The deadline for receipt of items for this column is the **1st of the second month preceding publication date**. For example, your information must arrive at HQ by **February 1** to be listed in the **April** issue. Hamfest information is accurate as of our deadline; contact sponsor for possible late changes. For those who send in items for Hamfest Calendar and Coming Conventions: Postal regulations prohibit mention in *QST* of prizes or any kind of games of chance such as raffles or bingo.

(Abbreviations: *Spr* = Sponsor, *TI* = Talk-in frequency, *Adm* = Admission.)

Arizona (Phoenix)—Feb 7. Fred Jones, KC5AC, 623-214-7054. (Auction)

†**Arkansas (Russellville)—Feb 19,** 8 AM to 4 PM. *Spr:* Arkansas River Valley AR Foundation. Hughes Community Center; Hwy 7 to Parkway, go E on Parkway to junction of Parkway and Knoxville. Flea market, dealers, forums (ARRL, QRP). *TI:* 146.82. *Adm:* $5. Tables: advance $8, door $10 (flea market); $15 (dealers). Margaret Alexander, KC5MCS, 1511 N Jackson, Russellville, AR 72801, 501-968-7270, **ealexand@cswnet.com**; **http://www.cswnet.com/~arvarf/**.

British Columbia (New Westminster)—Mar 5. Jim McGill, VE7IED, 604-946-9801.

†**California (Monterey/Seaside)—Feb 19**, 8 AM to 2 PM. *Spr:* Naval Postgraduate School ARC. General Stilwell Community Center, 4260 Gigling Rd; at the corner of North South Rd and Gigling Rd. Flea market, ham radio and computer vendors, ARRL booth, forums, displays. *TI:* 146.97. *Adm:* Free. Tables: $20 (first), $15 (for each additional). Will Costello, WC6DX, 1052 Johnson St, Monterey, CA 93940, 831-375-8133, **wc6dx@arrl.net**; **http://www.k6ly.org/radiofest**.

†**Colorado (Brighton)—Feb 20,** 8 AM to 2 PM. *Spr:* Aurora Repeater Assn. Adams County Fairgrounds, 9755 Henderson Rd; US 85 to 124th Ave, W on 124th Ave which becomes Henderson Rd, continue W to Fairgrounds Complex on N side. Forums, VE sessions. *TI:* 147.15. *Adm:* $3. Tables: advance $12, door $15. Wayne Heinen, N0POH, Box 473411, Aurora, CO 80047-3411, 303-699-6335; **n0ara@qsl.net**; **http://www.qsl.net/n0ara**.

†**Florida (New Port Richey)—Mar 4-5;** set up Friday after 5 PM; public Saturday and Sunday 8 AM to 5 PM. *Spr:* Gulf Coast ARC. Fred K. Marchman Technical Educational Center, 7825 Campus Dr; I-75 (N or S) to US Hwy 52, turn W to Little Rd, turn S to Ridge Rd, turn W to Lemon Rd, turn S to hamfest. Amateur Radio and Computer Show, tailgating ($6), vendors, open speaker's forum, VE sessions. *TI:* 146.67. *Adm:* advance $5, door $6. Tables: $6. Rickie Brown, KF4GXS, 7121 Ingleside Dr, Port Richey, FL 34668, 727-863-1457 or 727-842-2127, **richar@gte.net**; **http://www.angelfire.com/fl3/gcarc/hamfest.html**.

†**Florida (Zephyrhills)—Feb 27,** 8 AM to 2 PM. *Spr:* Zephyrhills ARC. Zephyrhills Lions Den, 5827 Dean Dairy Rd; N of State Rte 54, between I-75 and US 301. "Phinney Fest", tailgating, VE sessions, refreshments. *TI:* 147.135. *Adm:* $4. Tables: $4. Ernie Vanselow, KD4VRV, 37536 Auric Terr, Zephyrhills, FL 33541, 813-783-8389; **kd4vrv@gte.net**.

†**Georgia (Dalton)—Feb 26,** 8 AM to 3 PM. *Spr:* Dalton ARC. N GA Fairgrounds, Legion Dr; Exit 137 off I-75. VE sessions. *TI:* 145.23. *Adm:* $5. Tables: $5. James Jordan, K4FLG, Box 143, Dalton, GA 30722-0143; 706-278-0630 (after 6 PM only).

†**Illinois (Sterling)—Mar 19;** set up Saturday 6-9 PM, Sunday 6 AM; public 7:30 AM. *Spr:* Sterling-Rock Falls ARS. Sterling High School Fieldhouse, 1608 4th Ave; Miller Rd, 1 block N of hospital, go E, use N entrances to Fieldhouse on Miller Rd. Indoor flea market, radio and electronic items, computers, self-contained campers and mobile trailers, free parking, refreshments. *TI:* 146.85. *Adm:* advance $3, door $4. Tables: $5 (without electricity), $6 (with electricity, bring your own cords). Send SASE by Mar 1 to Lloyd Sherman, KB9APW, Box 521, Sterling, IL 61081-0521, 815-336-2434; **lsherman@essexl.com**.

Indiana (La Porte)—Feb 26. Neil Straub, WZ9N, 219-324-7525.

†**Kentucky (Cave City)—Mar 4;** set up Friday 6 PM, Saturday 6 AM; public 8 AM. *Spr:* Mammoth Cave RC. Cave City Convention Center, Hwy 70; Exit 53 off I-65, left on Hwy 70. ARRL forum, 3.960 MHz net meeting, VE sessions (9 AM, walk-ins). *TI:* 146.94. *Adm:* $5, under 12 free. Tables: $7. Larry Brumett, KN4IV, 108 Withers Dr, Glasgow, KY 42141, 270-651-2363, **lbrumett@glasgow-ky.com**; **http://www.scrtc.blue.net/mcarc**.

†**Massachusetts (Marlborough)—Feb 19,** 8 AM to 1 PM. *Spr:* Algonquin ARC. Marlborough

Gail Iannone ♦ Convention Program Manager

Middle School, 25 Union St; Rte 495 to Exit 25A, Rte 85 S, go 2 miles to school on left. Flea market. *TI:* 146.61. *Adm:* $3. Tables: advance $12, door $15. Ann Weldon, KA1PON, 14A Emmett St, Marlborough, MA 01752; 508-481-4988.

†**Michigan (Farmington Hills)—Feb 20,** 8 AM to noon. *Spr:* Livonia ARC. William M. Costic Activities Center, 28600 W 11 Mile Rd, just E of Middlebelt Rd. Swap 'n Shop, SKYWARN, RACES. *TI:* 145.35, 146.52. *Adm:* $5. Tables: $16 (plus advanced $5 admission). Send 4x9 SASE to Neil Coffin, WA8GWL, Livonia ARC, Box 51532, Livonia, MI 48151-5532, 734-261-5486 or 734-427-3905, **swap@larc.mi.org**; **http://www.larc.mi.org**.

Michigan (Traverse City)—Feb 12. Joe Novak, W8TVT, 231-947-8555.

Nebraska (Norfolk)—Mar 10-11, Nebraska State Convention. See "Coming Conventions."

Nevada (Reno)—Feb 12. Gary Grant, K7VY, 775-784-6500 Ext. 276.

†**New Jersey (Parsippany)—Mar 4;** sellers 6:30 AM, buyers 8 AM. *Spr:* Splitrock ARA. PAL Building, 33 Baldwin Rd; I-80 or I-287 to US Rte 46, turn on Baldwin Rd at Burger King. Tailgating ($13, weather permitting), VE sessions, handicapped accessible. *TI:* 146.985, 146.52. *Adm:* $5. Tables: $16. Mark Turner, KB2VKO, 98 Stedwick Dr, Budd Lake, NJ 07828, 888-511-7272, **mlturner@bellatlantic.net**; **http://www.ham.hsix.com/sara**.

†**New York (Cheektowaga)—Feb 20,** 8 AM to 3 PM. *Spr:* Lancaster ARC. Leonard VFW Post, 2450 Walden Ave; 1 mile E of I-90. Greater Buffalo Winter Hamfest. *TI:* 147.255. *Adm:* $6. Tables: $6. Luke Calianno, N2GDU, 1105 Ransom Rd, Lancaster, NY 14086, 716-634-4667 or 716-683-8880, **lcalianno@freewwweb.com**; **http://hamgate1.sunyerie.edu/~larc**.

†**New York (Hicksville)—Feb 27;** set up 8 AM; public 9 AM to 2 PM. *Spr:* Long Island Mobile ARC. Levittown Hall, 201 Levittown Pkwy; located E of Wantagh Pkwy (Exit W2 E), 1/2 mile S of Old Country Rd. Indoor ham radio/computer flea market, AR equipment, computers, commercial dealers, vendors, ARRL information, VHF tune-up clinic, free parking, refreshments. *TI:* 146.85 (136.5 Hz). *Adm:* $6, under 12 free. Tables: $25 (6-ft, includes 1 admission; by reservation only). Eddie Muro, KC2AYC, Box 392, Levittown, NY 11756-0392, 516-520-9311 or 516-791-7630, **hamfest@limarc.org**; **http://www.limarc.org**.

New York (Horseheads)—Feb 19. Gary Sekella, N2OKU, 607-739-0134.

†**New York (Lindenhurst)—Mar 5;** set up 7 AM; public 9 AM to 2 PM. *Sprs:* Great South Bay ARC and Suffolk County RC. Knights of Columbus Hall, 400 S Broadway. Flea market, vendors, computers and accessories, software, electronic components, radio equipment, ARRL info, free tune-up clinic, VE sessions (Babylon Town Hall at noon), refreshments. *TI:* 146.685 (136.5 Hz). *Adm:* $6. Tables: advance $15, door $20. Lenore Dunlop, N2KYP, Box 1356, W Babylon, NY 11704, 516-785-0826, **info@gsbarc.org**; **http://www.gsbarc.org/hamfest.htm**.

†**North Carolina (Elkin)—Feb 20.** *Sprs:* Briarpatch ARC and Foothills ARC. National Guard Armory. VE sessions. *TI:* 145.37. *Adm:* $5. Glenn Diamond, N4VL, 8233 Carrollton Pike, Galax, VA 24333; 540-236-6514; **rgwaller@tcia.net**.

North Dakota (Bismarck)—Feb 26. Kurt Carufel, KB0KDG, 701-222-0938.

†**Ohio (Cuyahoga Falls)—Feb 27,** 8 AM to 2 PM. *Spr:* Cuyahoga Falls ARC. Emidio's Party Center, 48 E Bath Rd, at corner of State Rd. Hamfest and Electronics/Computer Show, vendors, VE sessions. *TI:* 147.27. *Adm:* advance $4, door $5. Tables: first table $14, additional $10. Carl Hervol, N8JLQ, 11192 Cottingham Cir, Uniontown, OH 44685, 330-497-7047, **hervol@pop.raex.com**; **http://www.cfarc.org**.

†**Ohio (Mansfield)—Feb 13.** *Sprs:* Intercity ARC and Mansfield Emergency Repeater Assn. Richland County Fairgrounds; from US 30 exit on Trimble Rd N, follow signs to far W side of Fairgrounds. *TI:* 146.94. *Adm:* advance $4, door $5. Pat Ackerman, N8YOB, 63 N Illinois Ave, Mansfield, OH 44905; 419-589-7133.

†**Oregon (Rickreall)—Feb 19,** 9 AM. *Sprs:* Salem Repeater Assn and Oregon Coast Emergency Repeater. Polk County Fairgrounds, 520 S Pacific Hwy W; W of Salem where Hwy 22 meets 99W. Salem Hamfair and Computer/Electronic Swapmeet, commercial dealers, vendors, country store (Mac McGowan, N7REO, 503-585-6307; **n7reo@arrl.net**), meetings (ARRL, ARES/RACES), self-contained RV camping ($10 per night), handicapped accessible, refreshments. *TI:* 146.86. *Adm:* advance $6, door $7, under 13 free. Tables: $13 (without power), $15 (with power), $40 (commercial vendors; for 2 tables). Evan Burroughs, N7IFJ, Box 784, Salem, OR 97308, 503-585-5924, **n7ifj@teleport.com**; **http://members.xoom.com/kb7cw/sra/index.html**.

†**Pennsylvania (Castle Shannon/Pittsburgh)—Feb 20;** set up 6-8 AM; public 8 AM to 3 PM. *Spr:* Wireless Assn of South Hills. Castle Shannon VFD, 3600 Library Rd (Rte 88); Rte 51 S to Rte 88 to Grove Rd, 1 1/4 miles to hamfest. Vendors, special-event station, handicapped accessible, acres of free paved parking. *TI:* 146.955. *Adm:* $4, under 10 free with adult. Tables: $15 (with power), $10 (without power). Steven Lane, W3SRL, 133 Sleepy Hollow Rd, Pittsburgh, PA 15216, 412-341-1043, **w3srl@arrl.net**; **http://www.hky.com/~sanfordb/index.htm**.

†**Pennsylvania (Oberlin)—Feb 19;** set up 6 AM; public 8 AM. *Spr:* Harrisburg RAC. Citizens Fire Company, 1201 Ober St; Exit 1 (PA 441) off I-283. Dealers, tailgating ($1 per space), VE sessions (9 AM), refreshments. *TI:* 146.76. *Adm:* $3 (nonham spouses and children free). Tables: $8. Richard Bordner, N3NJB, 2501 S 2nd St, Steelton, PA 17113, 717-939-4825, **n3njb@aol.com**; **http://hrac.tripod.com**.

Tennessee (Memphis)—Feb 12-13, Tennessee State Convention. See "Coming Conventions."

†**Texas (Canyon)—Feb 12,** 9 AM to 5 PM. *Spr:* Potter/Randall County ARES/RACES. Cole Community Center, 300 16th St; S on I-27 from Amarillo to Canyon, W on 3rd Ave to 16th St. APRS demo, SKYWARN training, 3933 kHz net meeting, ARES/RACES, EC meeting, VE sessions. *TI:* 145.35 (88.5 Hz) 444.2 (88.5 Hz) *Adm:* advance $5, door $7. Tables: advance $5, door $10. Ben Pollard, WS5R, 2000 Poplar St, Amarillo, TX 79107, 806-342-9930; **ws5r@arrl.net**.

Texas (Mesquite)—Feb 19. Bob Peters, K1JNN, 877-753-9577. (Auction)

†**Texas (Smithville)—Feb 19;** set up Friday 6-9 PM; public Saturday 7 AM. *Spr:* Bastrop County ARC. Riverbend Park, just off Hwy 71. Swapfest, tailgating (covered $5, not covered $3), RV hookups, plenty of parking. *TI:* 145.35, 443.75. *Adm:* Free. Tables: $10 (inside), $5 (outside). John Creamer, W5QXH, 112 Kukui Ct, Bastrop, TX 78602, 512-321-1145 or 512-321-1074, **jsc@smithsys.net**; **http://www.qsl.net/kb5yae**.

Vermont (Milton)—Feb 26, Vermont State Convention. See "Coming Conventions."

†**Virginia (Annandale)—Feb 27,** 8 AM to 1 PM. *Spr:* Vienna Wireless Society. Northern Virginia Community College; DC Beltway to VA Rte 236, go W 1 mile, college on left. Swap 'n Sell, computer odds and ends, tailgating ($10, includes admission; opens 6 AM), vendors, technical talks, VE sessions (8 AM sharp, walk-ins accepted), DXCC field checking, on-site parking. *TI:* 146.91, 146.685. *Adm:* $5, nonham spouses free. Tables: $15 (non-commercial), $20 (commercial). Mike Toia, K3MT, 723 Walker Rd, Great Falls, VA 22066, 703-757-7021, **k3mt@erols.com**; **http://www.erols.com/k3mt/vws**.

Attention All Hamfest Committees!

Get official ARRL sanction for your event and receive special benefits such as free prizes, handouts, and other support.

It's easy to become sanctioned. Contact the Convention and Hamfest Branch at ARRL Headquarters, 225 Main St, Newington, CT 06111. Or send e-mail to **giannone@arrl.org**.

NEW PRODUCTS

SWITCHING POWER SUPPLY FROM ALINCO

◊ Alinco USA has recently released a new communications grade switching power supply—the DM-330MV.

The new supply is very compact and lightweight—at approximately 2 1/2 × 7 × 7 inches and just under 5 pounds—yet still carries an impressive continuous duty rating of up to 30 A (32 A peak). Output voltage is variable between 5 and 15 V dc. A voltage setting "memory" can be programmed by the user to insure that the proper voltage is always provided to the connected equipment.

Additional highlights include a large backlit voltage/current meter; multiple dc output connection points (a set of high current binding posts, a 10 A cigarette lighter socket and two sets of 5 A snap in terminals) and a rear panel cooling fan. Triple protection—short circuit, over-temperature and current limiting—is provided.

A unique "Noise Offset Circuit" is also included. The power supply is designed with extensive filtering for quiet operation—but in the event that interference is encountered on a given frequency, the offset circuit will allow you to move it.

For additional information on the Alinco DM-330MV Switching Power Supply, visit your favorite Amateur Radio products dealer or contact USA Alinco Branch, 438 Amapola Ave, Suite 130, Torrance, CA 90501; 310-618-8616; fax 310-618 8758; **http://www.alinco.com**.

NCG'S "RF BUG"

◊ The RF Bug by NCG Co responds to strong nearby RF energy sources by activating a sequence of bright red LEDs.

It's primarily intended as a "silent" indicator of incoming calls on cell and PCS wireless phones. The device is useful in noisy environments or when the ringer has been shut off—helping you avoid the embarrassment of having the sound of your ringing wireless phone interrupt a business meeting or social gathering.

The RF Bug will also respond to the strong RF fields found close to nearly any RF generator—from Amateur Radio transmitters to leaky microwave ovens.

This is a short range detector—the manufacture claims activation within 12 inches of transmitting PCS phones and approximately 40 inches of transmitting cell phones. Have fun sniffing out hidden bugs or use it for testing garage door openers, automobile keyless entry systems—nearly any device that emits a sufficient level of radio energy.

The RF Bug is small—a little under 1 inch in diameter and 1/2-inch deep—and comes with a carry strap that can be used to attach it to a phone antenna, your wrist, your purse or case.

Price: $15.95. For additional information, contact your favorite Amateur Radio products dealer or NCG Co, 1275 N Grove St, Anaheim, CA 92806; tel 714-630-4541; fax 714-630-7024; **micks@rfbug.com**; **http://www.rfbug.com**.

CONTEST CORRAL

Feedback

In two photograph captions that appear on the first page of the **1999 ARRL UHF Contest Results**, the station operator should have been shown as **KF0UK**. The station trailer was provided by **N0QKG**. In addition, **WA8JFR** should have been listed with 7,020 points on 44 QSOs and 39 multipliers working bands CD9EFGH.

In the **1999 ARRL Field Day Results**, **AC4XO** was listed incorrectly in the 1B category. **W0BU's** score has been recalculated to 10,472 points in class 3A. This makes the **K9RN** operation the top score on the 3A category with an adjusted score of 15,396. **W3PGA** should be listed as 2A instead of 3A. **WD9DJD** should be listed as 1D instead of 1B. **N8KZG** should be listed as a 1B entry. **KQ6AR** should have been shown as the 415 Wireless Society in the SV section. **K8SWD** operated as 1 1B entry with no assistance.

In the **1999 June VHF QSO Party Results**, **VE2PIJ** should have been listed as QRP Portable. Also, due to a data processing problem, revised rover scores for this contest will be printed in next month's *QST*.

In the **1999 ARRL International DX CW Contest Results**, **K8PYD** operated portable from 3A with a final score of 48 QSOs, 28 mults, and 4,032 points as a single-op low-power entry.

W1AW Qualifying Runs are 7 PM EST Friday, February 4, and 4 PM EST Tuesday, February 15. The K6YR **West Coast Qualifying Run** will be at 9 PM PDT on Wednesday, February 2, with runs from 10 to 40 WPM. Check the W1AW schedule for details.

February

5-7

North American Sprint, phone, sponsored by the *National Contest Journal*, 0000-0400Z Feb 6 (local time, Feb 5); CW is 0000-0400Z Feb 13 (local time, Feb 12). Sprints are separate. 80, 40, 20 only. North American stations work everyone; others work NA stations only. Exchange other station's call, your call, serial number, name and state/province/DXCC country. Work stations once per band. QSY rule: Stations calling CQ, QRZ, etc, may only work one station in response to that call; they must then move at least 1 kHz before working another station or 5 kHz before soliciting another call. Once you are required to QSY, you may not make a new QSO on the previous frequency until you have made a contact at least 1 or 5 kHz (as required) away. Team competition. Awards. Electronic entries accepted. Send CW logs to Mark Obermann, AG9A, 6713 Forestview Ln, Niles, IL 60714; **cwsprint@contesting.com**. Phone logs go to Rick Niswander, Box 2701, Greenville, NC 27836; **niswanderf@mail.ecu.edu**. Send logs no later than 30 days after the end of the contest. See the Web site at **http://www.vramp.net/~ncj/**.

Minnesota QSO Party, sponsored by the Minnesota Wireless Association Contest Club, 1400-2359Z Feb 5. 160 80 40 20 15 10 6 2 meters. Single op low power (150 W or less); single op high power; single op Novice/Tech; multi op single transmitter. Single ops can may only operate 8 hours, multi-op and mobile stations can operate all 10 hours. Exchange serial number and QTH, Minnesota stations send serial number and county. Multipliers are Minnesota counties (87 max) all bands; for Minnesota stations multiplier is Minnesota counties plus states/provinces on all bands. Score one point for SSB, two points for CW. Final score is QSO points times total multipliers. Awards. Send logs by March 15th to Sean Warner, K0XQ, 3385 178th Avenue NW, Andover, MN 55304; or e-mail to **webmaster@rossiya.net**; **http://www.rossiya.net/mnqso.htm**.

Delaware QSO Party, 1700Z Feb 5 to 0500Z Feb 6, and 1300Z Feb 6 to 0100Z Feb 7. Exchange RS(T), and QTH (county for DE stations; state/province/DXCC country for others). CW 1.825 3.550 7.050 14.050 21.050 28.050; Phone 1.860 3.960 7.260 14.260 21.360 28.360. Novice & Technician frequencies: 25 kHz above the subband edge. Only one class for all stations. Count one point per phone QSO, two points per CW/RTTY/digital QSO. No multipliers. Awards. Send logs to Contest Chairman FSARC, PO Box 1050, Newark, DE 19715; **qsoparty@fsarc.org**; **http://www.fsarc.org/**

Vermont QSO Party, sponsored by the Central Vermont Amateur Radio Club, 0000Z Feb 5 to 2400Z Feb 6. 160 80 40 20 15 10 meters plus VHF/UHF. Single Op, multi-op club or rover. Vermont stations send RST and county; others send RST plus state/province/DXCC country. Frequencies: CW-40 kHz up from bottom of the band. 20 kHz up from the bottom of the Novice subbands. SSB in the first 25 kHz of the General portion of each band, entire Novice/Technician 10-meter phone band. VHF: 50.200, 144.200, 146.49, 146.69. VT stations count one point per phone contact, two for CW, RTTY or other digital modes. A station may be worked up to four times per band (different modes). Multiply by number of VT counties, states, provinces, countries, W1BD and Vermont club stations. Multipliers count only once regardless of the number of bands they might be worked. Other stations count one point per VT phone QSO, 2 per VT CW, RTTY, etc. Multiply by number of VT counties, W1BD and Vermont Club stations. W1BD is worth a 2000 point bonus. Awards. Send logs postmarked by March 1 to: Bob DeForge, K1HKI, QSO Party Coordinator, Vermont QSO Party, Central Vermont Amateur Radio Club, PO Box 674, Montpelier, VT 05601.

New Hampshire QSO Party, sponsored by the NHARA, 0000Z Feb 5 to 2400Z Feb 6. Operate any 24 hours. Off-times must be a minimum of 15 minutes. 160 80 40 20 15 10 meters plus VHF/UHF. Classes: Single transmitter QRP (less than 10 W), low power (150 W or less); high power (more than 150 W), and multi-transmitter (QRP, low or high power). New Hampshire stations send RST, county and state, Others send RST state/province/country. Use of repeaters is not allowed. Use of spotting nets, DX clusters, etc is prohibited. Stations may be worked once per band per mode. Count one point per phone QSO, two points per digital QSO, five points per phone QSO with an NH bonus station, 10 points per digital QSO with a NH bonus station. (Bonus stations: W1FGM, W1BKE, W1FZ, W1WQM, N1FD, K1NCR). Awards. Send logs by March 31 to Ed Deichler, 86 Wire Road, Merrimack, NH 03054-3323; **k2te@juno.com**; **http://www.nhara.nhradio.org**.

FYBO Winter QRP Field Day, sponsored by the Arizona ScQRPions, 1400Z Feb 5 to 0200Z Feb 6. QRP only. CW and phone. 160 80 40 20 15 10 meters , standard QRP calling frequencies. In the Novice/Technician portions of bands, try 3.710, 7.110, 21.110, 28.110 MHz. Work stations once per band. Exchange: RS (T), state/province/DXCC country, first name, power output, and temperature (Fahrenheit) at operator's position. Indoor stations must report indoor temperature. Example: "RST 579 AZ Joe 2W 58F." Novices sign with /N, Techs sign with /T. Categories: Single op, multi op (single transceiver), Novice/Tech. Send logs by Mar 5 to Roger Hightower, N7KT, 1265 W Kiowa Circle, Mesa, AZ 85202; **n7kt@earthlink.net**; **http://www.extremezone.com/~ki7mn/**.

Ten Ten International Net Winter Phone QSO Party, from 0000Z Feb 5 until 2400Z Feb 6. Contacts must be made on phone on 10 meters only. Exchange call/name/state and 10-10 number if member. Score one point per QSO with nonmembers, two points per QSO with members. Final score is total points. Send logs by Feb 21 to Portland 500 Chapter c/o Leon Hixon, W6NCK, 6936 N. Greenwich Ave, Portland OR, 97217-5416.

YL-OM Contest, CW, sponsored by YLRL, 1400Z Feb 5 to 0200Z Feb 7. (Phone: 1400Z, Feb 12 to 0200Z, Feb 14.) All licensed male and female operators throughout the world are invited to participate. Men call "CQ-YL" and women call "CQ-OM." Participants may work only 24 hours of the 36 hours in each contest. Operating breaks must be indicated in the log. Exchange call signs, QSO number, RS(T), ARRL section, VE province or country. Entries in log must also show time, band, and date. Scoring: phone and CW will be scored as separate contests. Submit separate logs for each contest. Score each band separately. One point is earned for each different station worked on each band; women count only men and men count only women. Add together the QSO points earned for each band and multiply the number of QSOs by the total number of different ARRL sections, VE provinces, and countries worked. Contestants using 100 W or less on CW and 200 W PEP or less on SSB at all times may multiply the results by 1.5 (the low power multiplier). The maximum power output that may be used at any time during the contest is 750 W on CW and 1500 W PEP on SSB. All logs must show your ARRL section, province, or country to qualify for awards. Logs must also state the power output used and the operating breaks taken. If you have 200 or more QSOs, submit a separate log for each band and submit a dupe sheet. Remember to file separate logs for each contest. Logs must show claimed score. Send logs to Cleo Bracket, K0JFO, 810 Towne Square Dr, Fremont, NE 68025; **cleob@mitec.net**; **http://www.qsl.net/~ylrl/ylcontst.html/**.

Spring Classic Radio Exchange, CW and phone, sponsored by *CX Newsletter*. 2000Z Feb 6 to 0500Z Feb 7. 80 40 20 15 10 meters. Exchange name, RST, QTH, receiver and transmitter type (homebrewers send final amplifier tube or transistor). Work stations once per band, mode and equipment combination. Nonparticipants may be worked for credit. CW: 3.545, 7.045, 14.045, 21.135, 28.180. Novice/Tech: 3.695, 7.120, 21.135, 28.180. Phone: 3.880, 7.290, 14.280, 21.380, 28.320. Score is total QSOs multiplied by the total number of different receivers plus transmitters plus QTHs worked on each band and mode. Multiply the total by the age, in years, of all receivers and transmitters used, three QSOs minimum per unit (transceiver ×2; homebrew ×25, unless older). Awards. Send logs to Allan Stephens, 106 Bobolink Dr, Richmond, KY 40475; **modsteph@acs.eku.edu**.

Mexico RTTY International Contest, sponsored by the Federacion Mexicana de Radioexperimentadores, AC. RTTY only. 1800Z Feb 5 to 2400Z Feb 6. 160 80 40 20 15 10 meters, single-op multi-band only. Exchange RST and QSO serial number (Mexican stations will send RST and State). Count 2 points for each QSO within your country; 3 points for each QSO outside your country; Contacts with Mexico count 4 points. Multipliers are each Mexican state and Distritio Federal (32) and each DXCC country on each band (do not count Mexico). Final score is QSO points × total multipliers. Send logs by Mar 7 to: Jose Levy, Direccion De Concursos FMRE, Clavel 333, Colima, Col. 28030 Mexico, e-mail to **xe1j@palmera.colimanet.com**; **http://www.fmre.org.mx/concursos/eng-rtty/rules.html**.

12-14

North American Sprint, CW. See Feb 5 listing.

YL-OM Contest, phone. See the Feb 5 listing.

Winter Fireside SSB Sprint, sponsored by QRP ARCI, 2000Z to 2400Z Feb 13, SSB, 160 80 40 20 15 10 meters. Entry categories: All band, high band

George Fremin III, K5TR ♦ 624 Lost Oak Trail, Johnson City, TX 78636 ♦ k5tr@arrl.org

(40, 20, 15, 10) or low band (160, 80, 40). Work stations once per band. Exchange signal report, state/province/country and ARCI number if member. Count 5 pts/QSO with ARCI members, 4 pts/QSO with nonmembers on a different continent, 2 pts/QSO with nonmember on the same continent. Final score is total QSO points (all bands) multiplied by total of states/provinces/countries (add the total from each band together) multiplied by the power multiplier (> 5 W out = 1; < 5 W out = 7; < 1 W out = 10; < 250 mW out = 15. SSB power is considered to be twice the dc output power. Include a description of equipment and antennas used. Mail entry within 30 days to: SSB Sprint, Randy Foltz, K7TQ, 809 Leith St, Moscow, ID 83843; **rfoltz@turbonet.com**.

WorldWide RTTY WPX Contest, sponsored by *CQ Magazine* and *The New RTTY Journal*, 0000Z Feb 12 to 2400Z Feb 13. Single op one signal, high/low (<150 W) power, all band; single op single band; multi-single (10 min rule); multi-multi. Single ops operate 30 hours max; multi operate full 48 hours. 80 40 20 15 10 meters. Use of spotting nets or PacketCluster is allowed for all classes. Exchange RST and serial number starting with 001. Score one point per QSO with your own country, two points per QSO with your own continent, and three points per QSO with different continents. QSOs on 3.5 and 7 MHz are worth double. Multipliers are prefixes; final score is QSO points x multipliers. Awards. Send logs postmarked within 30 days to Eddie Schneider, W6/G0AZT, 1826 Van Ness, San Pablo, CA 94806. Logs can be e-mailed to **edlyn@global.california.com**.

PACC Contest, sponsored by the Vereniging voor Experimenteel Radio-Onderzoek in the Netherlands, 1200Z Feb12 until 1200Z Feb 13. 160 80 40 20 15 10 meters, CW and SSB (no SSB QSOs on 160 meters). Single op or multi op. Send RS(T) and serial number, PA/PB/PI stations also send province. Score one point per QSO. Work PA/PB/PI stations only once per band regardless of mode. Final score is QSOs × provinces worked (max 12 per band). Awards. Send log by Mar 31 to Hans P. Timmerman, PA7BT, Nieuweweg 21, 4031 MN Ingen, Netherlands; **pa7bt@amsat.org**. You'll find complete PACC Contest rules on the Web at **http://home.wxs.nl/~pa3ebt/pacc/foreign.htm**.

12-13

Novice Round-Up, Sponsored by FISTS CW Club. CW only, 0000Z Feb 12 to 2400Z Feb 13. All contacts must be made in the Novice bands. Exchange call sign, name, RST, license class and QTH. Count 1 point for each phone contact and 2 points for each CW contact. Work stations once per band/mode. Multipliers count once overall regardless of band or mode. Multipliers are states (50) and Canadian provinces (13). Score is total QSO points × multipliers. Awards. Send logs by March 15th to: Novice Round-Up, c/o Dennis Franklin, K6DF, 4658 Capitan Dr, Fremont, CA, 94536-5448; **http://www.fists.org/~fists/novice.html**.

14-19

School Club Roundup. See page 47 in your January 2000 *QST*.

19-20

ARRL International DX Contest, CW. See page 99 in your December 1999 *QST*.

25-27

CQ WW 160-meter SSB Contest. See January *QST* page 100.

REF French Contest, phone. See January *QST* page 100.

UBA Contest, CW. See January *QST* page 100.

YL International QSO Party, phone. See January *QST* page 100.

RSGB 7 MHz Contest, sponsored by the RSGB, from 1500Z Feb 26 until 0900Z Feb 27. CW only. 7.000-7.030. Single operator and multiop-operator. Exchange RST and serial number. UK stations also exchange three-letter county code. Non UK stations work only UK stations and vice versa. North American stations score 15 points/QSO. Multipliers are UK counties. Final score is QSO points × multipliers. Awards. Send logs postmarked within 16 days after the end of the contest to: RSGB HF Contest Committee, c/o S V Knowles, G3UFY, 77 Bensham Manor Rd, Thornton Heath, Surrey, CR7 7AF, England.

CQC Winter QRP QSO Party, sponsored by the Colorado QRP Club, from 2200Z Feb 27 until 0359Z Feb 28. Single band, multiband, and homebrew. QRP, single operator only. Exchange RS(T), state/province/DXCC country, first name and CQC number or power output. CW 1.825 3.560 3.710 7.040 7.110 14.060 21.060 21.110 28.060 28.110; phone 1.910 3.985 7.285 14.285 21.385 28.385. Score 6pts per CW QSO with members, 4 pts per CW QSO with nonmembers. Score 3 pts per phone QSO with members, 2 pts per phone QSO with nonmembers. Final score is QSO pts × states /provinces/DXCC countries × number of first names worked. One thousand bonus points for working W0CQC. Awards. Send logs to Colorado QRP Club, PO Box 371883, Denver, CO 80237-1883; **contest@cqc.org**. See the Colorado QRP Club site on the Web at **http://www.mtechnologies.com/cqc/**.

North Carolina QSO Party, sponsored by the Alamance ARC, from 1200-2359 Feb 26 and 1200-2359 Feb 27. NC stations work everyone, others work NC stations only. Work stations once per band and mode. Work mobiles again as they change county lines. Exchange call sign, serial number, and NC county, state, province, or DXCC country. CW: 3.540, 3.740, 7.040, 7.140, 14.040, 21.040, 21.140, 28.040, 28.140; phone: 3.860, 7.260, 14.260, 21.360, 28.360; All VHF/UHF frequencies. No repeater or crossband/mode QSOs. Score one point per phone QSO, two points per CW QSO, three points per NC mobile QSO (either mode). NC stations multiply QSO points × NC counties, states, provinces and DXCC countries; others × NC counties worked (max 100). Add 100 bonus points for working both Cherokee and Dare counties, and 100 points for working K4EG, after all other score calculations. NC mobiles add 100 bonus points for each county from where at least 1 QSO was worked. Awards. Send logs (SASE for results) by April 1 to NC QSO Party, c/o K4EG, Box 3064, Burlington, NC 27215. E-mail logs to **k4eg@arrl.net**. See the Alamance Web site at **http://www.netpath.net/~n4mio/qsoparty .htm**.

STRAYS

RAILHAMS REFLECTOR

◊ There is a new e-mail reflector specifically for railroad employees and railfans with Amateur Radio licenses. The list is known as RailHams and you can join it at: **http://railhams.listbot.com**.

WANTED: NOVEX FC-5250B INFO

◊ I need the input specifications for a NOVEX Model FC-5250B frequency counter, especially the maximum input level. A complete manual or copy would be appreciated as well. Elwood Blose, W4EB, 7245 Chilton Ln, Riverdale, GA 30296; **woody.blose@worldnet.att.net**.

JARL 2000 AWARDS

◊ The Japan Amateur Radio League announces its new JARL 2000 awards.

The *Japan Domestic 2000 Award* is available for contacts with more than 2000 different amateur stations in Japan. You can count multiple contacts with the same station if each contact occurs on a different band.

If you make 2000 contacts with any DXCC entities during the year 2000, you are eligible for the *Global 2000 Award*. Once again, you can count multiple contacts with the same station if each contact occurs on a different band.

To earn the *Japan Domestic Award* you must accumulate at least 2000 "points" during the year by contacting amateur stations in Japan. Your point total is determined by taking the total number of Japanese cities, guns, and kus contacted on each band and multiplying it by the total number of Japanese prefectures contacted on each band. (Note: In Hokkaido, "shichos" are considered the same as as prefectures.)

The "points" version of the *Global Award* requires you to accumulate more than 2000 points by communicating with amateur stations throughout the world. Your point total is the number of DXCC entities contacted on each band multiplied by the total number of CQ zones contacted on each band.

To apply for any of the JARL 2000 awards you must submit:

1. A list of contacts showing the call signs of the stations worked, dates, bands and modes. Please do not send QSL cards.

2. Eight International Reply Coupons.

Only contacts made from between January 1 and December 31, 2000 are eligible. JARL will begin accepting applications on April 1, 2000. The application deadline is May 31, 2001.

Applications must be sent to:
Japan Amateur Radio League
Award Desk
1-14-5 Sugamo, Toshima
Tokyo 170-8073
Japan

FREE SATELLITE SOFTWARE

◊ *GrafTrak* by Richard Allen, W5SXD, is available for downloading on the Web at: **http://www.rcallen.com/**. Download *ssi-1.exe* to your hard drive, double click on the file using *Windows Explorer* to activate the "self extraction," then run *hd.bat* to start the program. *GrafTrak* is designed to run under DOS, particularly with older PCs, but can run in a "DOS window" under *Windows*.

W4RNL ANTENNA MODELS

◊ Noted antenna designer L.B. Cebik, W4RNL, has compiled a collection of more than 400 software antenna models including HF Yagis, HF quads, HF LPDAs, horizontal phased/parasitic arrays, HF horizontal wire antennas/arrays, HF vertical antennas/arrays, 10-meter antennas and VHF/UHF antennas. Each model is represented by a version in .EZ format for use with *EZNEC* and in .NEC format for use with *NEC-Win Plus* and other implementations of *NEC-2/NEC-4*. Almost every model can be scaled from the frequency of the design to the desired frequency. These models are not intended to translate directly into construction projects, but instead are designed to allow you to study various antenna types and their performance. You can purchase individual model sets (each set contains at least 52 different models) at $9.95 each, or the entire package at $59.95, from the Antennex Website at **http://www.antennex.com/Sshack/collect.htm**.

SPECIAL EVENTS

Centralia, IL: Centralia Wireless Association, W9CWA, 0001Z **Jan 29** to 2359Z **Feb 2**, for the 70th anniversary of the Centralia Wireless Association. 14.255 18.135 21.320 28.480. Certificate. Centralia Wireless Association, PO Box 1166, Centralia, IL 62801.

Jericho, VT: Jericho Historical Society, W1B, 1400Z **Feb 5** to 2300Z **Feb 6** for the 135th birthday of Wilson A. "Snowflake" Bentley. 3.870 14.250 21.350 28.415. Certificate. John R Fowler, N1PDV, 385 VT Rt 15, Jericho, VT 05465-2044.

Petoskey, MI: Straits Area ARC, W8GQN, 1300-2200Z **Feb 5**, celebrating 50 years of service to Northern Michigan. 7.270 14.270 21.370 28.370. Certificate. SAARC, Rick Jersey, 2768 Berger, Petoskey, MI 49770.

Decatur, IL: CENOIS Amateur Radio Club, K9HGX, 1400-2200Z **Feb 12**, commemorating Abe Lincoln's birthday. 7.245 28.485. Certificate. CENOIS ARC, PO Box 4595, Decatur, IL 62525.

South Dakota: QCWA Chapter 102, W0DAK, 1500Z **Feb 12** to 0300Z **Feb 13**, for the 23rd anniversary of QCWA Chapter 102. 3.550 7.250 14.285 28.500. Certificate. Frank Shaw, NU0F, 118 East van Buren St, Rapid City, SD 57701.

Saranac Lake, NY: Tri-Lakes Amateur Radio Club, W2TLR, 1500Z **Feb 12** to 2000Z **Feb 13**, during Saranac Lake's Winter Carnival. 3.920 7.250 14.257. Certificate. Albert Newman W2AFN, 63 Lake Simond Rd, Tupper Lake, NY 12986.

Prescott, AZ: Yavapai Amateur Radio Club, K7A, 1530-2230Z **Feb 14**, celebrating Arizona Admissions Day from Sharlot Hall Museum. 28.450 21.350 14.250 7.250. Certificate. Terry Pemberton, Granite Mountain Middle School, 1800 Wiliamson Valley Rd, Prescott, AZ 86305.

Marquette, MI: Hiawatha Amateur Radio Association, K8LOD, 2000Z **Feb 19** to 2000Z **Feb 20**, during the annual UP 200 Sled Dog Championship. 3.880 7.250 14.250 21.325. Certificate. Rich Schwenke, N8GBA, 21 Smith Ln, Marquette, MI 49855.

Mount Vernon, VA: Mount Vernon Amateur Radio Club, K4US, 1600Z **Feb 19** to 2100Z **Feb 20**, commemorating George Washington's birthday. 10.110 18.080 7.240 14.240. Certificate. Mount Vernon Amateur Radio Club, PO Box 7234, Alexandria, VA 22307.

Tucson, AZ: The Radio Society of Tucson, K7RST, 1600Z **Feb 19** to 2359Z **Feb 20**, honoring "Women in Flight" at the Pima Air and Space Museum. 14.250 28.450 147.140 446.000. Certificate. K7RST, 10056 E. Placita Del Timbre, Tucson, AZ 85747.

Pittsburgh, PA: Wireless Association of South Hills, W2K, 1300-1900Z **Feb 20**, *RTTY and PSK31 modes only*, celebrating the Year 2000. 7.085 10.140 146.955. QSL. Paul J. Lusardi, N0VLR, PO Box 79211, Pittsburgh, PA 15216.

Round Rock, TX: Cen-Tex Contest Group, WA5DTK, 0000Z **Feb 23** to 2400Z **Mar 6**, commemorating the siege of the Alamo from Feb 23-Mar 6, 1836. 7.240 14.250 21.300 14.040. QSL. Barry Brewer, 603 Broken Bow Dr, Round Rock, TX 78681.

Brainerd, MN: Brainerd Area Amateur Radio Club, W0UJ, 1400-2400Z **Feb 26**, during the Mid-Minnesota Sled Dog Race. 14.250 21.350 28.450 50.125. Certificate. BAARC, Box 801, Brainerd, MN 56401.

International Falls, MN: Northland Amateur Radio Association, K0NAR, 1900-2200Z **Feb 27**, as the "coolest station in the nation" celebrates the Rainy Lake Ice Fishing Derby. 28.430 21.330 14.255 7.235. Certificate. NARA c/o K0NAR, PO Box 564, International Falls, MN 56649.

Salem, OR: Marion County ARES, KK7HI, 2000Z **Feb 29** to 0400Z **Mar 1**, celebrating the Leap Year. 3.960 7.260 14.260 28.450. QSL. Raenell Dawn, 4405 Panther Ct NE, Keizer, OR 97303.

Certificates and QSL cards: To obtain a certificate from any of the special-event stations offering them, send your QSO information along with a 9×12 inch self-addressed, stamped envelope to address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, you must be an Amateur Radio club, and use the ARRL Special Events Listing Form. Copies of this form are available via Internet (**info@arrl.org**), or for a SASE (send to Special Requests, ARRL, 225 Main St, Newington, CT 06111, and write "Special Requests Form" in the lower left-hand corner. You can also submit your special event information on-line at **http://www.arrl.org/contests/spevform.html**. Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; ie, a special event listing for **Jan** *QST* would have to be received by **Nov 1**. Submissions may be mailed to George Fremin III, K5TR, at the address shown on this page; faxed to ARRL HQ at 860-594-0259; or e-mailed to **events@arrl.org**. QST

George Fremin III, K5TR ♦ 624 Lost Oak Trail, Johnson City, TX 78636 ♦ k5tr@arrl.org

NEW BOOKS

A PICTORIAL HISTORY OF COLLINS AMATEUR RADIO EQUIPMENT

By Jay H. Miller, KK5IM

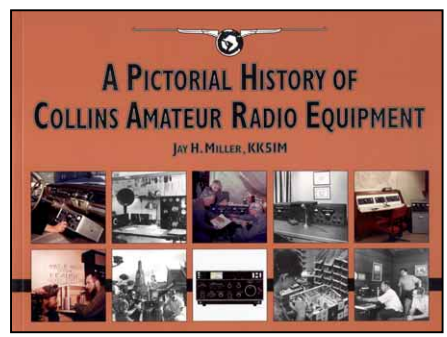
 5406 1/2 Morningside Ave, Dallas, TX 75206. Paperback, 11 × 8 1/2 inches, 176 pages, perfect bound. $39.95. Available from the ARRL, 225 Main St, Newington, CT 06111; tel 888-277-5289; **http://www.arrl.org/catalog/**.

Reviewed by Steve Ford, WB8IMY

QST *Managing Editor*

◊ If a book can be an object of visual art, *A Pictorial History of Collins Amateur Radio Equipment* certainly qualifies. Jay Miller, KK5IM, has created a work that appeals not only to Collins enthusiasts, but to anyone with even the mildest curiosity about the history of radio. As if to demonstrate the point, a nonham (and decidedly nontechnical) friend of mine stopped by on the evening I was writing this review. He spotted *A Pictorial History of Collins Amateur Radio Equipment* on my living room table and began aimlessly turning the pages. Within seconds he was engrossed. After several minutes he looked up and exclaimed, "This book is fascinating!"

As the title implies, *A Pictorial History of Collins Amateur Radio Equipment* is primarily a book of photographs. Thanks to the book's large format and excellent print quality, the photos are rich with detail. The majority are black and white, but there are a number of color images as well.



A Pictorial History of Collins Amateur Radio Equipment follows the entire history of the company and its founder, Art Collins, W0CXX (SK). There are images of Art Collins' earliest days in Amateur Radio prior to the formation of the company, including views of Art's station as it existed in 1926. You'll linger over photographs of Collins engineers, assembly lines, Art Collins' QSL cards, Collins advertising, and dozens upon dozens of photos of Collins gear—enough to keep you glued to this book well into the wee hours.

Of course, there is also text. Jay Miller has written a lively narrative sprinkled with anecdotes. The quality of the writing stands on its own and would be sufficient to pull you along even if the book was devoid of imagery. For example, Miller illustrates Collins' management style as he describes the day in 1961 when Art Collins gathered his lead engineers and declared that the era of the vacuum tube was passe and that it was time to begin incorporating solid-state devices and planar construction techniques ("…there were blank looks from the men in the room who were certainly among the best engineers in the country."). Miller also includes recollections from former Collins employees and others. The story of Collins' relationship with the US military, and general Curtis LeMay in particular, could probably become a book by itself.

A Pictorial History of Collins Amateur Radio Equipment would make an ideal gift (a belated Christmas present?), but I imagine many amateurs will purchase it for their own bookshelves. *A Pictorial History of Collins Amateur Radio Equipment* is a keepsake and a heavy cardboard sleeve is included to protect it. You'll probably be reluctant to hide this beautiful work from view, though. *A Pictorial History of Collins Amateur Radio Equipment* is what some refer to as a "coffee table book," one you'll want to keep in plain sight for all to enjoy. QST

SECTION NEWS

The ARRL Field Organization Forum

Field Organization Abbreviations

ACC	Affiliated Club Coordinator
ARES	Amateur Radio Emergency Service
ASM	Assistant Section Manager
BM	Bulletin Manager
BPL	Brass Pounders League
DEC	District Emergency Coordinator
DXFR	DX Field Representative
EC	Emergency Coordinator
LGL	Local Government Liaison
NCS	Net Control Station
NM	Net Manager
NTS	National Traffic System
OBS	Official Bulletin Station
OES	Official Emergency Station
ORS	Official Relay Station
OO	Official Observer
OOC	Official Observer Coordinator
PBBS	Packet Bulletin Board Station
PIC	Public Information Coordinator
PIO	Public Information Officer
PSHR	Public Service Honor Roll
SGL	State Government Liaison
SEC	Section Emergency Coordinator
SM	Section Manager
STM	Section Traffic Manager
TCC	Transcontinental Corps
TA	Technical Advisor
TC	Technical Coordinator
TS	Technical Specialist
VC	Volunteer Counsel
VCE	Volunteer Consulting Engineer
VE	Volunteer Examiner

ATLANTIC DIVISION

DELAWARE: SM, Randall Carlson, WB0JJX—Website: **gographics.com\Randall\secpage.htm**. Condolences to our friends in the NNY section on the passing of former SM, Les Schmarder, WA2AEA. Les will be missed and remembered. The Delaware State Convention will be April 30, 2000, in New Castle, DE. The program is just now being put together. Hope to see you there. Congratulations to the Central SKYWARN Association on their recent innovative fund raiser. Through the connection of a local ham, the club partnered with the Local VFW and helped out at a local roadside chicken stand one weekend day. The members helped cook and sell chicken at the popular roadside stand. For their services, the VFW made a donation to the club, who in turn donated the monies to the KCARC for maintaining the KCARC reporters used by the SKYWARN group. What I like about this is that the club not only raised money for Amateur Radio, but also helped out another organization like the VFW in return. This goes a long way in bringing Amateur Radio into the public view. Traffic (Dec) DTN QNI 165 QTC 17 in 22 sess, DEPN QNI 29 QTC 2 in 4 sess, KCARC NET QNI 32 QTC 1 in 4 sess. 73, Randall.

EASTERN PENNSYLVANIA: SM, Allen R. Breiner, W3TI—EC: Eric Olena, WB3FPL. ACC: Steve Maslin, N3ORG. OOC: Alan Maslin, N3EA. PIC: E. Max Peters, KI6NJ. STM: Harry Thomas, W3KOD. TC: Cully Phillips, N3HTZ. SGL: Allen Breiner, W3ZRQ. ASMs: WB2YGA, WY3K , K3TX, N3KYZ, WB3FQY. New officers for the Mobile Sixers Radio Club are N3AHP president, W3JG vice president, and KA3VTQ secretary. For the Penn-Wireless Association, president WR3B, vice president N3JZZ, secretary K3TX, treasurer K3JQH. The 145.13 repeater was moved to a new location through the efforts of volunteers WA3RIZ N3EA KB3CRY W3ZQN N3JIZ and K3KFD. Congratulations are in order for W3IM who has been licensed 60 years. If you're interested in operating QRP, contact N3AT who will get you started on the right track. Participating during JOTA exercise were Troop 607 of Morrisville with K3DS and KA3OUT at the Temple University ARC station K3TU. SPARK Lodge (Scouts Practicing Amateur Radio Knowledge) Jamboree on the Air were activated by KB3BSA N3NXZ K3JLK KB3CBO KB3EAZ KE3VQ WA3QGH N3LBY. Delaware-Lehigh Amateur Radio Club members assisting with the Emmas Halloween parade were N3QQ N3ULW N3ZSR WA3KIF W3TDF N2DH KB3CSR N3QZT N3UGH WA1LLD KB3DEC KA3MOU N3XRL N3YET KE3DZ WX3C KE3AW. At the time of this writing, the first snow fall of the season is in progress and we take time to reflect on 1999, a year that was quite interesting. The weather conditions in the central and southern portion of the country experienced severe flooding while over 80 percent of the Commonwealth was in a draught situation. It took Hurricane Floyd to raise the water table again. On the other hand, Floyd was not too kind leaving death, devastation, and destruction of property along the south coastal states. On the home front, Eastern Pennsylvania experienced exceptionally strong winds causing power outages everywhere. SKYWARN operators reported the only tornadic severe weather in the Williamsport area and west in Warren County. Where ever an emergency situation took place, the reports received indicated our EPA ARES/RACES teams were there ready to assist. The traffic handlers, net controls, members of the NTS were there to take up the slack handling the backlog of health and welfare messages. There will never be enough words available to express the thanks and gratitude to the volunteers who are involved in our Sections emergency field services. KUDOS. Tfc: W3KOD 471, W3IVS 131, W3IPX 126, N3YSI 104, W3HK 95, K3AEB 82, N3EFW 80, K3TX 68, N3AT 39, NR9K 36, WA3EHD 35, W3UAQ 18, KB3BBR 19, W3JKX 16, W3TWV 12, W3DP 11, N3DCG 10, KA3LVP 10, KB3CEZ 9, KA3KMH 9, W3TI 9, AD3X 9, W3BNR 8, KB3CKD 7, KA3ARR 6, N3KYZ 5, N3AS 4, N3IRN 3, W3NNL 3. Net reports EPA 167, EPAEP&TN 150, PTTN 77, HBSN 69, PFN 68, D3ARES 18, SEPTN 18, MARCTN 7, MCOES 6, LCARES 5, EPAS 2, D4ARES 1.

MARYLAND/DC: SM: Bill Howard, WB3V, **wb3v@arrl.org**. ASM /RACES: Al Nollmeyer, W3YVQ (**w3yvq@arrl.net**). BM: Al Brown, KZ3AB, 301-490-3188 (**kz3ab@arrl.net**). SEC: Mike Carr, WA1QAA, (**bamcc@erols.com**) 410-799-0403. STM: Bruce Fleming 301-863-6582 (**MEGASWOOP@aol.com**). MDC Section Web Homepage **users.erols.com/wb3v/mdc/. FRED** EC N8AAY reports 10 members, and 5 sessions of the Frederick County ARES Net on147.06. **HOWA** EC K3EF reports 22 members and 2 sessions of the Howard County ARES/RACES Net on 147.135 with liaison to MEPN and BTN. **MONT** EC K3XO reports 60 members and 5 net sessions on 146.955. Montgomery County ARES provided 13 operators out of the nearly 100 Amateurs who provided communications support for the Marine Corps Marathon on 24 October. The entire operation was done using simplex frequencies on 2-Meters and 440 MHz. The event was coordinated by the National Capitol ARES Council. **WASH** EC KD3JK reports 17 members and nine net sessions of the ARES/RACES Net and Four States Net held Tuesdays at 1900 hours on 146.94 and on Thursdays at 1900 hours on 147.09 repeaters. These nets have liaison with MEPN. One Public Service Event was supported this month. The J. F. K. 50 Mile Ultra Marathon. 21 Amateurs participated: K3ABH, W3YGC, WB3FTQ, W3NHR, N3MVR, KB3AOO, N3MZB, N3QFS, NF3X, WA4IBY, KB8ZQM, N8UKC, N3MPE, KD3JK, KB8WHW, K3CWC, N3VGS, N3LER, N3WSP, and N3KKW. **ANAR** EC N3QXW reports 37 members and 4 net sessions of the ANAR ARES Net on 147.805 with liaison to NCAC, MEPN, WVA, BTN, and MDD; 1 training session; 1 special meeting and one drill (COMMEX). **CARR** EC N3JIA reports 96 members, an increase of 76! Five CARET net sessions were held on 145.41 with liaison to MEPN, MDD, MSN, BTN, WVPN, DTN, MEPN, Central Net, and Western Nets. OES Reports received from WX3F, N3JIA, and N3SOK. WA4MTV and KF3AK continue their efforts with the Carroll County Office of Emergency Management and the Carroll County Amateur Radio Club, Y2K Committee. With the nets: Net/NM /QND/QTC/QNI: MSN/KC3Y/30/45/325, MEPN/N3WKE/30/72 /609, MDD/WJ3K/60/283/442, MDD Top Brass: KJ3E 259, AA3SB 122, AA3GV 128. BTN/AA3LN/30/51/373, SMN/KE3OX/ no report, Tfc: KK3F 1088, KJ3E 377, AA3GV 151, AA3SB 134, N3WKE 93, W3YVQ 65, K3CSX 56, N3WK 52, KC3Y 45, N3KGM 36, N3ZKP 35, W3CB 35, KO4A 23, N3EGF 18, WA1QAA 17, W3VK 12, WA3GYW 4, WA3WRT 4, KD3JK 3. PSHR: KK3F 184, W3YVQ 148, N3WKE 145, AA3SB 144, AA3GV 138, KJ3E 135, W3VK 126, N3WK 122, N3ZKP 115, W3CB 93, KD3JK 91, KC3Y 89, WA1QAA 86, K3CSX 86, KO4A 75.

NORTHERN NEW YORK: SM, Chuck Orem, KD2AJ—Web: **http://www.northnet.org/nnyham**. ASMs: WB2KLD, N2ZMS, WA2RLW. ACC: WZ2T. BM: KA2JXI.OOC: N2MX. PIC: N2SZK. SEC: KF2GC. STM: N2ZGN. TC: N2JKG. During the month of December we had two Silent Keys. WB2IRB, Bill Brennan, life member of the Society of the Wireless Pioneers passed away on Dec 1, 1999. On Dec 4, 1999, we lost the NNY Section Manager Leslie Schmarder, WA2AEA. The St Lawarence County RACES group has become active again, with Kerry, WA2NAN, the new Radio Officer, nice going. KB2LML, Al, has been upgraded to DEC of Clinton, Essex and Franklin Counties and KC2ALG Bernie to EC of Clinton County. NNYARA/NNY Cabinet meeting to be scheduled for sometime in May in Schoharie County. The 147.11 repeater on White Face Mtn has been moved to the top of the mountain, there is a WX net at 7:00 PM local time daily, let us know if you are getting in. I would like to start a section on the repeater. 73, KD2AJ. Traffic: KD2AJ 72, KB2LML 70, KC2ALG 30.

SOUTHERN NEW JERSEY: SM, Jean Priestley, KA2YKN (@K2AA) e-mail: **ka2ykn@arrl.org**—ASM: W2BE, K2WB, W2OB, N2OO. SEC: N2SRO. STM: WB2UVB. ACC: KB2ADL. SGL: W2CAM. OOC: K2PSC. PIC: N2YAJ. TC: W2EKB. TS: W2PAU. W2BE, WB2MNF, KD4HZW, WB3IJB, N2QNX, N2XFM, WA2NBL, AA2BN. On a visit to Old Barney, I was pleased to present W2VVN with his 50-yr-longevity award from ARRL and W2SQT with his 60 yr award. At my home club I presented 60 yr awards to N2EZ and W2SPV. Spring will be here soon and all the walks for charities such as March of Dimes and the MS Foundation. Just a few hours can give you such a good feeling. Try that new radio that Santa left under the tree. We will also have hamfest season starting soon. Buy things Santa didn't bring. News on the lighthouse activities: http://www.calendars.net:8194/LIGHTHSE It will be a lot of fun this year working the special events for the lighthouses. Traffic report for November New Jersey Morning QNI 199 New Jersey Net Early QNI 239 New Jersey Net Late QNI 211 New Jersey Slow Net QNI 179 South Jersey VHF Net QNI 241 Jersey Shores ARS QNI 399. Tfc: WB2UVB 202, WA2CUW 178, AA2SV 135, K2UL-4 90, W2AZ 40, KB2RTZ 38, N2VQA 34, N2WFN 31, KA2CQX 30, WX2NJ 12, WA2JSG 7, N2ZMI 3, KB2YJD, N2AYK 2, KB2YMB, KB2ETU, KB2VSR 1 each.

WESTERN NEW YORK: SM, William W. Thompson, W2MTA — Please send clubs' newsletters to new SM Scott, W2LC. CLUB OFFICERS/DIRECTORS: Rome K2YE KB2MAS K2UJ W4BNY; RVHFG NS9E K2OS N2OPW/K2DH KB2VGH N2ULL K2AXX; SCDXA KE2WY K2SY WB2KCI KB2G; STARS KB2YJ KD2QV WA2TVT KB2ESM N2TEZ/KB2VWC WB2KFL; WNYDXA WB2RAJ KB2NMV WB2YQH/KF2YP; XARC KC2DTT KG2NY K2AS W3MUD/N2SZS KE2MK. CONGRATS: WNYDXA for its great publicity job with K2L lighthouse special event - ASM K2ZR. Rochester VHF Group newsletter editor ponders whether personal computers' gender is feminine or masculine. Obviously, it's feminine, only the creator understands their internal logic, and the language is only comprehensible by other computers. That infamous suffix "AXX" has been seized by KA2RDO (Surely Clarkie will allow it). APPOINTMENTS: (ASM) N2ZWO Delaware-Herkimer-Otsego Cos.; (EC) N2BTX Wyoming; (LGL) KG2IC; (OES) K2GTS KC2TR N2BTX N2KPR; (ORS) K2GTS N2KPR. SILENT KEYS: NNY SM WA2AEA, admired for his strong influence in ham radio, will be sorely missed; Cayuga ARES and SKYWARN feel loss of EC K2ZOD; RARA notes passing of KJ2P and N2JSZ; RRRA misses NF2Z; RAGS remembers the Silent Key at WA2PEC. Our leader Clara, W2RUF, joined SKs twenty years ago. GB CR, NYS CW net has not been the same since you left us. (Nov.) BPL KA2ZNZ N2LTC. DATALINK: K2DN RX7/TX1, KA2GJV RX40/TX2, N2LTC RX204/TX157. Our thanks for his past service to ASM /ORS K2BCL as he relocates to the EPA.

Section Net/Manager	*QNI*	*QSP*	*QND*
EBN/WB2IJZ	507	000	22
NYSEMO/N2AGO	070	007	04
NYSCN/W2MTA	012	003	04
#NYS-M/KA2GJV	209	094	30
CHN/W2EAG	191	042	30
#WDN-M/KB2VVD	671	067	30
#NYPHONE/LTC	205	355	30
#NYPON/N2YJZ	301	151	30
ESS/W2WSS	400	089	30
NYSPTEN/KD2V	319	057	30
#OCTEN-E/KA2ZNZ	1559	229	30
#STAR/N2NCB	374	024	29

Section Net/Manager	*QNI*	*QSP*	*QND*
#WDN-E/N2JRS	567	122	30
#NYS-E/WB2QIX	384	193	30
OARCN/N2KPR	030	007	05
THIN/KB2VVD	tbd	000	01
TIGARDS/W2MTA	017	003	04
BRVSN/WB2OFU	268	006	30
STTHN/N2WDS	047	012	09
#CNYTN/WA2PUU	365	091	30
#OCTEN-L/ZNZ	634	238	30
#WDN-L/KB2UQZ	487	078	30
#NYS-L/W2YGW	284	259	30

#Denotes NTS Net. * Denote Public Service Honor Roll. Traffic (Oct.): N2LTC*1100, KA2ZNZ*680, KA2GJV*457, W2MTA*416, KF1L*380, NN2H*327, WB2IJH*326, W2PII*159, W2FR*149, WB2QIX*139, WI2G*134, NY2V*105, K2GTS*88, KG2D*74, AA2ED*65, NY2CQ*54, KA2DBD*51, KB2VVD*51, N2CCN*42, KB2WII*38, KC2EOT*37, AF2K*35, N2JRS*33, N2VDK 27, K2DN*23, WA2UKX*20, WA2GUP*13, W2RH 13, N2WDS*10, KA2BCE 5.NNY/WNY Field Results: 1A (222) W2BC #8, AA2AD #52, KD2A #87, W2ZJ#134. 2A(585) W2SEX #21m, W2LZ #56m, WF2V #113, NF2AR #155, WB2ELW #211, K2QR #252m, W2UB #335, W2UXC #401, WA2AEA #408, N2XV #457, WA2AAZ #478m, K2BWK # 497, NS9E #505, WA2RP #507, W2LCA #539, W2CM #571. 3A (368) W2RDX #4m, W2RA #8, W2XRX #96, K2BJ #198, K2IWR #297m, N2IED #342. 4A(152), W2PE #57m, K2BRK #63, KC2EOS #96, WA2ZWM #132, AA2YG #139, W2MO #142m. 7A (18) KV2W#13. 1B-1OP (106) KG2IP #65, KV2X #84, KB2YHZ #102. 1B-2OP (65) K2WNY #6, N2JGU #11. 1C(51) KB2PL #44, N2DLG #50. 1d (182) K3GHH #32, W2EZ #49, WA2BQI #51, N2LQQ #79, W2JPM #146, KC2BCQ #172. 1E (103), NT2W #11, K2ZR #46. (m indicates SM message). A message was also received from W2RCX, but they're not in *QST*, wonder how GRAM did? Happy Valentines Day es 73 to you all.

WESTERN PENNSYLVANIA: SM, Bill Edgar, N3LLR—ASM: N3MSE. ACC: open. ASM-ARES: WB3KGT. SEC: N3SRJ. ASM-Packet: KE3ED. ASM-Youth & Education: KE3EE. OOC: KB3A. PIC: W3CG. STM: N3WAV. TC: WR4W. DEC-SO: KD3OH. DEC-N1: N3QCR. DEC-N2: KA3UVC. DEC-S1: KA3HUK. DEC-S2: N3BZW. DEC-Rapid Response: N3HJY. I have had the pleasure of visiting with a number of ham clubs at their Christmas meetings. It is a widely known secret within the amateur community that we enjoy good food and good camaraderie. Field Day and Christmas dinners bring out the very best in food and camaraderie! "Hat's Off" to Jim Metzler, N3BZW. Jim is the new DEC for District South 2, and is doing a great job getting things together there! Also, "Hat's Off" to Ron Rieff, KF3DJ, for an excellent article he wrote on RF Safety appearing in the Corry club's newsletter. Interesting and pertinent articles are always welcome for club newsletters. A regularly issued club newsletter is one of the best ways to keep your club working together. Great way to recognize people for the work they've done, good way to publicize upcoming club events, and to give people a chance to learn new things. The more successful clubs have an active newsletter committee that solicits articles from the membership and supplements them with bulletins or articles from outside of the club. Don't forget to send a copy of your club's newsletter to the ARRL Division Director, ARRL Division Vice Director, Section Manager and the Assistant Section Manager. That gives us an idea of the things your club is involved with, and gives us an opportunity to provide some helpful feedback or ideas if we can. 73 and Another for 2000, Bill Edgar, N3LLR, WPA-SM.

CENTRAL DIVISION

ILLINOIS: SM, Bruce Boston, KD9UL—SEC: W9QBH. ACC: N9KP. STM: K9CNP. PIC: N9EWA. TC: N9RF. OOC: KB9FBI. DEC-Central: N9FNP. DEC-S/W KB9AIL. Tod West, KB9AIL, has been appointed the District Emergency Coordinator for western and southern Illinois. In this role, Tod will work with established ARES groups and build mutual aid support for gap areas. His district includes the Illinois counties served by the

Continued on page 106.

Steve Ewald, WV1X ♦ Assistant Field Services Manager

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(800) 854-6046
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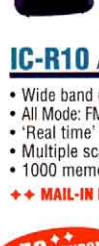

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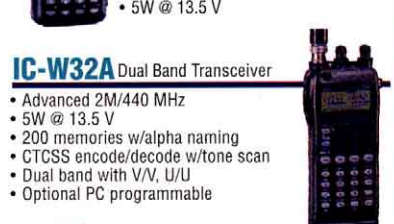
- 9600 BPS packet ready
- 45W VHF (2M), 35W UHF (440 MHz)
- CTCSS encode/decode
- 4 power settings per band



IC-W32A Dual Band Transceiver

- Advanced 2M/440 MHz
- 5W @ 13.5 V
- 200 memories w/alpha naming
- CTCSS encode/decode w/tone scan
- Dual band with V/V, U/U
- Optional PC programmable

$25 COUPON

IC-Q7A Dual Band Transceiver

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2M mobile

- 3 select. pwr. settings (5/10/60w)
- 80 memories plus a CALL channel
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- Wide receive cov. 130-171 MHz

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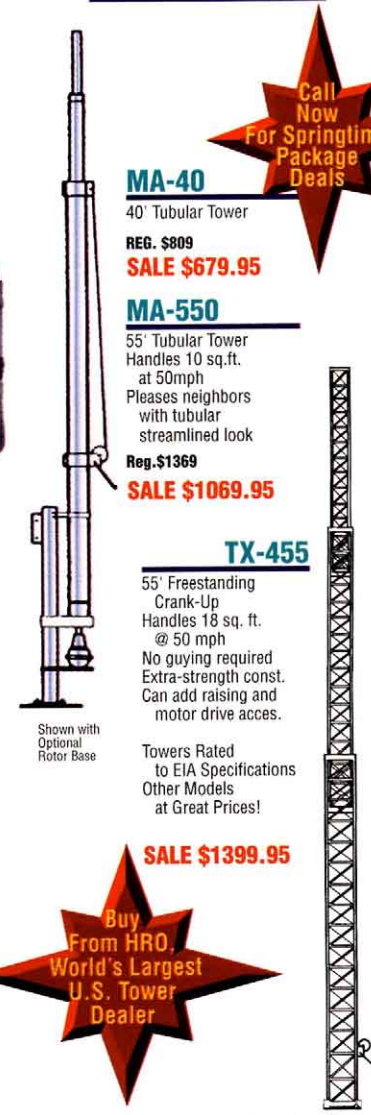

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- 50 Memory chanels
- RX Range 136-174mHz/420-470mHz
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- 100W SSB, CW, FM, 40w AM
- 100 memories • Dual VFO • Speech Processor
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- CW filter + keyer optional
- Hand mic included • 13.8V DC

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- 300 MW Tx output
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440 Tiny HT 2Mtr Tiny HT

- 340 mw
- 21 memories
- Uses 3 "AA" Batteries
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(DJ-S41T shown)

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- 100W 160-10 Mtrs • 100W 6M, Gencov. Rx
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- Dual VFO, 12VDC • 6.2 lbs.

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Dual band "Miracle Baby" style antenna, with a male SMA connector. Shown on the popular FT-50R by Yaesu. The antenna is only 1.75 inches tall, and exhibits surprising performance.

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40M-70cm Mobile Antenna

40/*20/*17/15/10/6/2M/70cm
* optional coils

A 6M/2M/70cm whip that accepts 1,2 or 3 HF coils for up to 6 band operation. Simply screw on any combination of HF coils you choose.

Standard PL-259 connector allows easy mounting. Convenient fold-over hinge for entering garages, parking structures, etc...

HF/VHF/UHF on a single antenna!! Contact any Ham Radio Outlet store for duplexer/ triplexer options.

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MSG Series

2M/70cm Mobile Antennas with spring-loaded whip to absorb impacts. Fold-over hinge included as well.

MSG-1000C
Length: 39 inches
Max Pwr: 150W
Conn: PL-259

MSG-1100C
Length: 43 inches
Max Pwr: 150w
Conn: PL-259

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NEW!

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6/2M/70cm HT Antenna w/SMA Connector
The first aftermarket gain antenna for the YAESU VX-5 and the ICOM T8A.

A dramatic improvement over the stock antenna, 20.75 inches of TRIBAND performance.

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Compatible w/all FM VHF/UHF • Transceivers + HF SSB Send/Rec Digital Images • (32 seconds) for download Store pictures in memory • 1.8" Color TFT LCD Display • Built-in speaker + mic • Download to PC • (with special software)

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- 6w 2m, 5.5w UHF @13.8 VDC
- Alphanumeric Display
- CTCSS Built It • Backlit Keypad

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5w High Power Also Avail.

TH-22AT

- Ultra Compact
- 2M HT, 5W optional
- 40 memories
- Encode Built-In

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- Computer Programmable • 9600 Baud Ready
- Cool-blue Reversible LCD • Backlit Mic

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TS-870S HF Transceiver

- DSP in I.F. Stage! • 100W, 12V DC
- Dual mode noise reduction
- Digital Filtering (no opt. filters req.)
- Built-in RS232,Windows software incl.

Great Low Price

TM-261A 2M Mobile

- 50W + Mid and Low • Mil-Spec
- 61 Mem. Chanels • Alpha Numeric Function
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- Sky Command II • Dx Packet Cluster
- Tone Scan • GPS/VC-H1/PC Ports

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- SSB, CW, AM, FM. • 12V Gen. Cov. RX,
- 6.4 lbs., 7.16 x 2.4 x 9.32" • 100W out
- 105 db dynamic range, 100 Mems.
- Opt. ext. ant. tuners available

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Optional 1.2GHz, 220 mHz, 6M Modules Available!

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- Up to 303 memories • 101 per band
- PL Encode Built in • Detachable front panel

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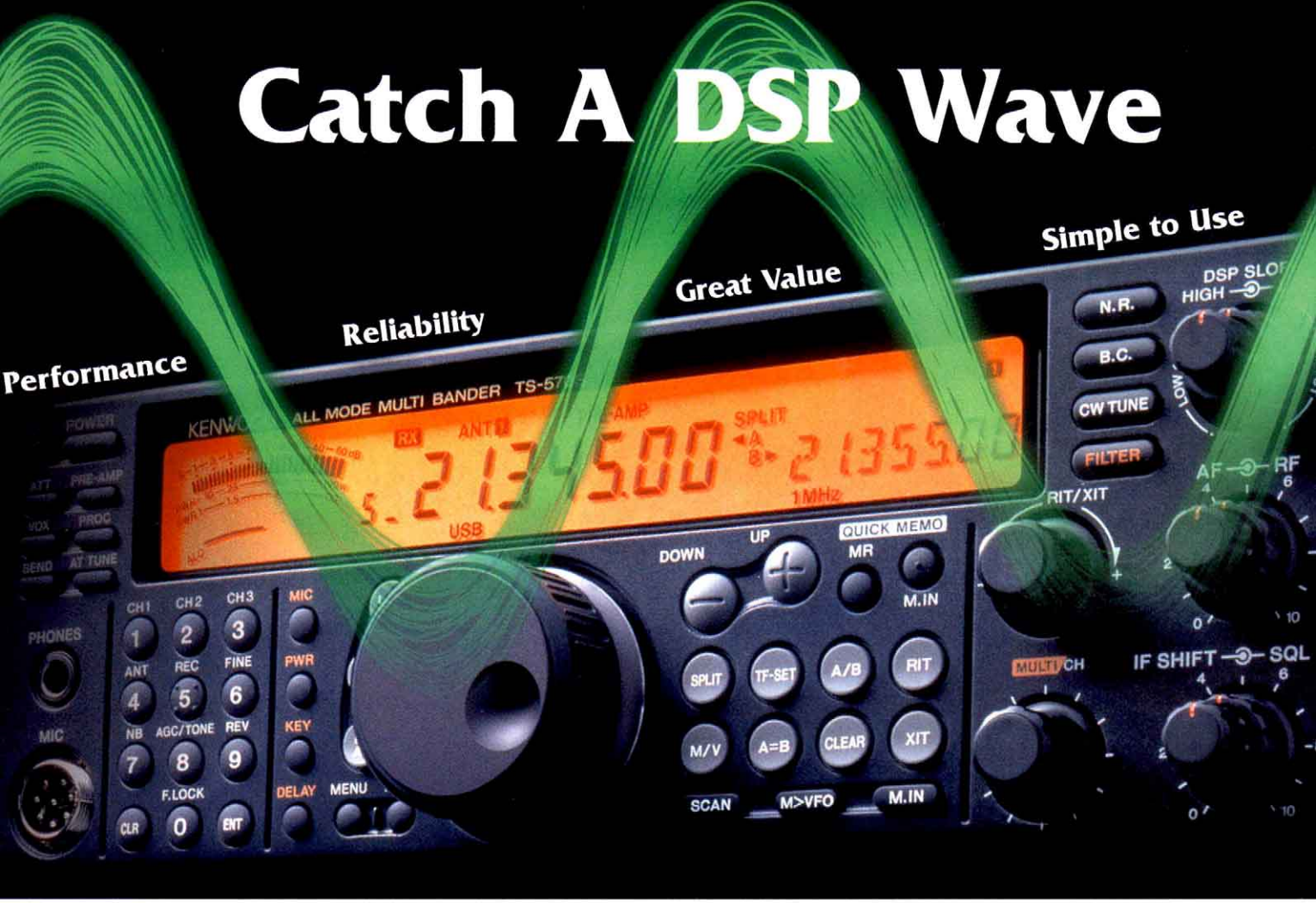

TS-570D(G) HF TRANSCEIVER/TS-570S(G) HF + 6M TRANSCEIVER

Kenwood has not been standing still since the introduction of the TS-570D/S HF Transceiver last year. Now you can command even more of Kenwood's advanced DSP technology with the G model.

The **DSP** filters and extracts signals with digital technology that is unmatchable with standard analog circuits. It provides **CD-class transmit and receive audio quality** that can be shaped to your needs, and two powerful noise reduction systems: **Line Enhancer Method** for SSB/AM modes, and **Speech Processing by Auto Correlation** (SPAC) for CW mode. DSP also enables the **CW-Auto Tune** feature that automatically zero-beats CW signals.

The **Extensive Memory Functions** provide a bank of 100 memory positions split into 90 standard channels for general operation and 10 for programmable VFO, programmable scan and long-term memory. Memory contents can be scrolled, copied or locked out. In addition there are **5 quick memories** for storing frequencies and modes on the fly, perfect for the busy DX contester.

The powerful **Menu System** incorporates **46 menu features** and an **on-line guide** for instant reference. The **large amber backlit LCD display** provides 4 light levels for clear readability under any lighting conditions.

The TS-570D/S has no shortcomings in the construction and performance area. The **continuous-duty 100 watt transmitter** incorporates a large heavy-duty heat sink with integrated cooling fan for non-stop operation even under extreme environmental conditions. The **wide-band receiver** is rock-stable from 500 kHz through 30 MHz with **dual pre-amps** and **dual bandpass filters** for exceptional selectivity and sensitivity.

With the features and performance of a high-end radio integrated into an affordable mobile-size package, the TS-570D/S is the perfect choice for the field or to build a full station around at home.

- ***FREE* operating manual via FTP site**
  ftp://ftp.kenwood.net
- Beat cancel
- 2 position antenna switch
- CW auto tune adjust (a world's first)
- Channel scan, program band scan, memory scan with channel lock-out and group channel scan, all with TO (time operated) or CO (carrier operated) resume modes
- Compact 10-5/8 inch by 3-3/4 inch front panel size for any travel or installation requirement
- Preset auto antenna tuner with 18 sub-bands
- Variable electronic keyer (0 and 100 wpm)
- Packet and FSK features
- RCP-2 software for PC-based display and memory configurations available via the Internet
- Full functionality on 6M (TS-570S) including DSP, 100 watts output and preset Auto Antenna Tuner

TS-570D/S (G) new features

■ TX sound quality monitor with 9-step monitor volume for absolute control over voice quality ■ NR1 (SSB) is operator controllable in 9-step increments, or automatically tracks input signal strength ■ New CW DSP Filters (80 Hz, 150 Hz and 500 Hz) give you a total of 11 user-selectable filters ■ NR1 and NR2 settings can now re-configure automatically when changing mode groups (SSB/AM/FM to CW/FSK) ■ Manual weight feature (with built-in electronic keyer) for adjusting the relative length of dots and dashes in 16 steps between 1:2.5 and 1:4.0 ■ Equalize receive signals, and use different settings for both TX and RX ■ "One-touch" DSP filter wide mode allows 'resurfacing' to check the band conditions when operating in narrow mode ■ Dual selectable Beat Cancel (BC) works against intermittent beat interference (except in CW mode) ■ CW auto tune mode links only with the RIT frequency without changing the transmit frequency.

Advance Technology Upgrade is available in new production models and for pre-existing TS-570D/S; contact you dealer for details.

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Paducah and St. Louis National Weather Service offices. Metro ARC president, W9MNF, is reportedly making good progress on the club's scrapbook. He is still seeking QSL cards from MAC members and additional pictures. Kane Co. EC WB9PPK reports he worked six stations during the NWS special event, and he began teaching a Novice class for Boy Scouts. Fox River Radio League reports that its members made at least 700 contacts during their club's 75th anniversary special event. ARES has received requests from utilities, hospitals and other organizations at the state and local level for communications backup in the event of Y2K problems. The Peoria Area ARC had its first organizational meeting for Superfest 2000. The Western Illinois ARC is also discussing plans for their Swapfest 2000 in Quincy. The Kishwaukee ARC provided communications for the annual pumpkin parade. The club is approaching its 50th anniversary and will celebrate in May with special event station W9K. Newly elected officers for KARC are Pres W9ICU, VP K9TIP, Sec KB9KDX, Trea W9ZS. Winnebago Co. EC N9OCW provided an extensive report on activities in the Rockford area. In part, he reports the ARES group is providing members with training opportunities. In October, they discussed the topic, "Short Communications... Saying a lot with a few words" and had a tour of the Winnebago County 911 Center in Rockford. In November, they hosted an American Red Cross "Introduction to Disaster Services" course. Those attending the training included ARES EC N9OCW, AEC KA9IMX, KB9TCW, KB9JRU, N9LHK (and xyl), and KB9NBD. They are planning to attend more Red Cross training. November traffic: W9HLX 80, K9CNP 58, WB9TVD 34, NC9T 20, KA9IMX 14, W9FIF 10, WA9RUM 7. ISN report de WB9TVD QNI-244, QTC-76, Sessions-30. Ninth region C4 report de W9FC traffic 239—sessions 60—time 365 min—average 3.98—rate .654—percent rep 92%—QNI—ILN K9CNP KF9ME NS9F. W9VEY Memorial Net de K9AXS 7 with 227 check-ins.

INDIANA: SM, Peggy Coulter, W9JUJ—SEC: K9ZBM. ASEC: WA9ZCE. STM: N9ZZD. OOC: KA9RNY. SGL: WA9VQO. TC: W9MWY. BM: KA9QWC. ACC: N9RG. No SK reported to me this month. The Wabash Valley ARA provided communications for the Duathlon held at Lincoln Trail State Park. Those helping were K9DUR, K9ERE, KB9HYH, KB9QWM, KG9GS, W9BBO, N5JJW, KB9TVF, KB9IXS, W9EEU, KB9RGR, N9ZRH, WB9QFE and N9YRX. Am wondering if Mike, N9MG, met anyone on his duties in the New London Cemetery. I bet he has some stories to tell. The Muncie ARC helped with communications for the Diabetes Walk thanks to KB9IVB, WA9OAO, N9GQA, KB9VGR, WD9AQA and WA9DOL. By now all clubs have new officers or ones doing it again. Congratulations to all. Please send me any and all interesting info activities of your club. Also many clubs have an Amateur of the Year award. Please send me their nominations for the IRCC Amateur of the Year Award. Do it now while you are thinking of it. The Elkhart RCARC participated in the annual Chapter Disaster Drill by N9DUZ, W9XD, KB9FMZ, AE9U, K9ZBM, WD9AWU, N1LL, KB9BBI and WA9RNT. Dearborn Co. ARES demonstrated slow scan TV between the County EOC and Mobile Command Post. The Group will participate in Y2K preventative efforts for the county. There were 16 EC's reporting to K9ZBM. If your EC isn't listed remind them that they need to send in a report to K9ZBM. Thanks to WB9NCE, KF9UP, WA9DOL, N9YNF, N9ADS, N9BLK, K9DIY, WD9BKA, KB9BBI, N9KQD, WB9UNL, KB9NZE, N9SFW, K9QPS, KB9OLZ and N9GDR. NMs ITN /W9ZY, QIN/N9PF, ICN/K8LEN, WN/AB9AA, VHF/N9ZZD.

Net	*Freq*	*Time/Daily/UTC*	*QNI*	*QTC*	*QTR*	*Sess*
ITN	3910	1330/2130/2300	2625	409	1379	90
QIN	3656	1430/0000	136	75	585	27
ICN	3705	2315	77	37	422	29
IWN	3910	1310	2175	–	300	30
IWN VHF Bloomington			478	–	450	30
IWN VHF Kokomo			705	–	150	30
IWN VHF Northeast			1063	–	600	30
Hoosier VHF nets(9 nets)			661	18	1043	44

No report from D9RN. 9RN QTC 239 in 60 sessions. IN represented by KO9D, K9PUI, AA9HN, N9PF, WB9UYU, and W9FC. Tfc: W9FC 275, KO9D 113, K9PUI 103, W9ZY 91, W9UEM 90, WB9QPA 81, N9ZZD 71, K9GBR 70, N9PF 56, AB9AA 54, W9JUJ 49, WA9QCF 41, KB9NPU 38, K8LEN 37, KA9EIV 32, KA9QWC 32, N9WNH 29, W9BRW 22, W9EHY 7, AA9HN 5, K9RPZ 4, K9DIY 2, WB9NCE 1, K9OUP 1.

WISCONSIN: SM, Don Michalski, W9IXG—BWN 3985 0600 W9RCW. BEN 3985 1200 KE9VU. WSBN 3985 1715 WB9WHQ. WNN 3723 1800 KB9OCZ . WSSN 3645 1830 N9BDL. WIN-E 3662 1900 WB9ICH. WIN-L 3662 2200 W9UW. It is with deep regret that I inform you of the passing of Dan Wiese, WA9UXM. I have a new Web address: **www.w9ixg.eboard.com**. Please check the current news at this site! Dave Karr, KA9FUR, is the new W.A.R. frequency coordinator. Pinery Road ARC elected W9EIL as president; KB9IRF as V.P.: KF9ZU as sec-tres; KB9QXZ & N9YVM as trustees. HVARC elected KB9SJC as president; KB9RYI as V.P.; KA9KLZ as secretary; KB9KVD as treasurer; KB9QBM & KF9TN as directors. Congratulations to all and thanks for stepping up to the officer's plate! The Badger Weather Net could use more pick-up stations with Windows 95/98 computers. Please contact Rick, W9RCW, for information— **w9rcwooc@newnorth.net**. Thanks to Stan Kaplan, SEC, for donating computer equipment to ECs and the BWN! 48 ECs and assistants attended the December 4th EC conference in Madison. It was well received and Stan is planning on future EC meetings and, maybe, more computers to ECs in need. Looking for new hams in your club? We need new amateurs and your help would be greatly appreciated! Consider contacting Big Brothers and Sisters. Become a mentor to a kid and bring him/her up into the hobby and, hopefully, to a related career. It is time to use YOUR talents and experience to set the tone for the future in ham radio. Amateur Radio has been good to you. Now is the time to pay it back by becoming actively involved. This ball is in YOUR court so don't look for someone else to pick it up!! 73, Don, W9IXG. Tfc: K9JPS 885, W9RCW 775, W9IHW 577, K9GU 544, W9YPY 538, N9TVT 468, W9CBE 252, K9LGU 101, N9BDL 96, W9UW 90, W9YCV 85, K9FHI 82, AG9G 70, N9CK 59, KE9VU 55, KB9QPM 38, KG9B 37, KB9ROB 37, AA9BB 34, K9HDF 33, KA9KLZ 32, W9BHL 32, WB9NRK 31, WB9ICH 29, WZ7V 28, N9JIY 19, W9ODV 19, KA9FVX 16, K9UTQ 4, W9PVD 3.

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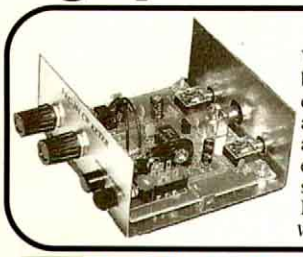

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VEC-201K shown in optional case (vinyl cover top not shown), VEC-201KC, $14.95

Aircraft Receiver Kit tunes entire voice aircraft band 118-136 MHz. Picks up air traffic 100 miles away. Track progress of incoming/outgoing traffic in your area, gain advanced weather information, and discover how the National Air Traffic System really works. Great way to learn about aviation. Use 9V battery. Drives external speaker/phones. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-131K, $29.95.**

20/30/40/80 Meter Receiver Kits give high performance! Covers entire band or tailor to cover desired portion. Copy CW/SSB/AM. NE602/ 612 mixer-oscillator, LM386 high gain audio amplifier. 1¾x4¾x5¼ in. *Moderate skill level.* Order **VEC-1120K** (20 Meters),**VEC-1130K**(30 Meters),**VEC-1140K** (40 Meters), **VEC-1180K** (80 Meters), **$29.95 ea.**

20/30/40/80 Meter QRP CW transmitter Kits have variable crystal oscillator tuning, front panel switch selects 1 of 2 crystals. 1 crystal included. Transmit and Receive switch. Connect receiver. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-1220K** (20 Meters), **VEC-1230K** (30 Meters), **VEC-1240K** (40 Meters), **VEC-1280K** (80 Meters), **$29.95 ea.**

Tunable SSB/CW Audio Filter Kit has sharp *four* pole peak and notch filters. Zero in with frequency control & adjust bandwidth for best response. Tune frequency from 300-3000 Hz. Notch is an outstanding 50 dB. 1 Watt amplifier. Speaker/Phone jacks. 12 VDC at 300 mA. 1¾x4¾x5¼ in. *Intermediate skill level.* Order **VEC-841K, $34.95.**

Vectronics Comprehensive Soldering Course **and Kit** is the best home study soldering course available! Includes theory, quizzes, PC board, tools, safety, techniques and materials. Get professional soldering skills and a fun blinking LED project. Gets you ready for "through-hole" PC board assembly and repair. *Simple skill level.* Order **VEC-1500K, $29.95.** *New!*

Super CW filter/amplifier Kit has powerful 1 watt audio amplifier to drive speaker. 8 poles active IC filtering uses cascaded low-Q stages. 3 bandwidths: 80,110, 180 Hz. Center frequency: 750 Hz. Up to 15 dB. Use 9-18VDC, 300 mA max. 1¾x4 x3½ in. *Simple skill level.* Order **VEC-821K, $29.95.**

Super SSB Audio Filter Kit improves readability with 8 poles, optimizes audio bandwidth, reduces SSB splatter, low, hi-pitched interference, hiss, static crashes, background noise. Use 9V battery. 1¾x4x 3½ in. *Simple skill level.* Order **VEC-830K, $19.95.**

144/220/440 MHz Low-Noise Preamp Kits soup up your antenna system. Helps pull in weak signals. Works wonders for scanner or ham-band receiver. Gives great low-noise performance and immunity from damaging electrostatic discharge. 1x1½ in. *Simple skill level.* Order **VEC-1402K** (144 MHz),**VEC-1422K** (220 MHz), **VEC-1444K** (440 MHz), **$17.95.**

CW Memory Keyer Kit stores 512 characters in four 128 character non-volatile EEPROM message memories. *Carry on entire QSOs by just pressing memory message buttons.* True sinewave sidetone with soft rise and fall time eliminates harsh keyclicks. Has all features of VEC-201K CW Keyer Kit. 1¾x 6¼x5¼ in. *Simple skill level.* Order **VEC-221K, $69.95.**

High-performance 2 Meter Preamp Kit pulls weak signals out of noise. Solves three reception problems -- boosts signals using a 1-dB noise figure microwave transistor, provides razor-sharp bandpass filtering, eliminates unwanted electrical noises with built-in balun. Uses 9-14 volts DC. Tiny 1½x3x1 in. fits in any size box. *Intermediate skill level.* Order **VEC-1402DK, $59.95.**

2/6/10 Meter FM Receiver Kits let you tune into the world of ham radio. Catch all the action! Each covers the entire FM sub-band and runs off your 9 volt battery. Plug in speaker or headphones for loud clear reception. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-1002K** (2 Meters), **VEC-1006K** (6 Meters), **VEC-1010K** (10 Meters), **$34.95 each.**

2 Meter Monitor Kit receives 144-148 MHz. Low noise, high gain RF preamp gives you excellent 0.1 uV sensitivity. Air variable tuning capacitor has 8:1 reduction. Dual conversion superhet provides selectivity and stability. Automatically eliminates squelch tails. Built-in speaker, squelch, tone, volume controls. 19¼ in. telescopic whip. 9V battery. 2x4¼ x4 in. *Intermediate skill level.* Order **VEC-104K, $79.95.**

5 Watt 2 Meter FM transmitter Kit lets you transmit voice and data -- AFSK data (up to 1200 baud) and FSK data (up to 9600 baud). Jumper select reactance or direct FM modulators. Reliable Motorola NBFM transmitter IC and PA transistor. Crystal controlled (x8 frequency multiplication). -60 dBc spurs and harmonics. Use 12-14 VDC, 1.5 amps. 5-pin DIN microphone jack. 1¾x4¾x5¼ in. *Difficult skill level.* Order **VEC-1202K, $99.95.**

Ni-Cad/Ni-MH Battery Charger Kit safely quick charges expensive batteries -- no overcharging -- many in less than an hour. HTs, cell phones, camcorders, lap top computers. Handles 1 to 12 cells. Charging status LEDs. Discharge before charge function reconditions batteries. Also removes memory effect. Runs on 12-15 VDC. 1¾x4¾x5¼ inches. *Moderate skill level.* Order **VEC-412K,$49.95.**

Shortwave Converter Kit converts AM or AM/FM radios to shortwave receivers at a push of a button. Choose two 1 MHz bands between 3 and 22 MHz. Popular 13, 16, 19, 25, 31, 41, 49 and 60 Meters international broadcast bands. On/off bypass, NE-602/612 mixer-oscillator IC and tuned input circuit. Use 9 V battery. 1¾x4x3½ in. *Intermediate skill level.* Order **VEC-101K, $27.95.**

Crystal radio set Kit lets you relive the experience of early radio pioneers. This baby really works! Wind your own inductor, wire up the earliest radio circuit without soldering a thing and listen to the magic of radio that needs no power. Put up an antenna, connect a ground. Stations come in amazingly loud and clear. Includes antenna wire, sensitive earphone. 1¾x5x6½ in. *Simple skill level.* Order **VEC-121K, $19.95.**

Shortwave Receiver Kit lets you listen to the world! Covers 75/80, 49, 40, 30, 31, 20, 25, 22, 19, 17, 16, 15 and 13 Meter bands. Explore AM, SSB, CW, WWV, RTTY and Packet signals. Vernier reduction drive, smooth regeneration control, RF stage. *Includes all metal cabinet.* 2 earphone jacks. Use 9V battery. 2½x7x6 in. *Intermediate skill level.* **VEC-102K, $59.95.**

QRP Transceiver Kits for 80/40/30/20 Meters

Great introduction to QRP, the hottest and fastest growing activities in ham radio. With this tiny *transceiver*, you'll discover what thousands of QRP enthusiasts already know -- you don't need a $1000 radio to get on the air and communicate worldwide. All it takes is some simple circuitry using less energy than a pen-light bulb! You get VXO frequency control, broad-banded transmitter circuitry, solid one Watt plus output, shaped keying, .3 uV sensitivity, direct conversion receiver. Includes crystal for popular QRP calling frequency. 1¾x4¾x5¼ in. *Intermediate skill level.* Order **VEC-1380K** (80 Meters), **VEC-1340K** (40 Meters), **VEC-1330K** (30 Meters), **VEC-1320K** (20 Meters) **$59.95 each.**

Super CW Audio Filter Kit gives you three bandwidths: 80, 110, 180 Hz. Eight poles gives super steep skirts with no ringing. Pull CW QSOs out of terrible QRM! Plugs into phone jack to drive phones. QRM down 60 dB one octave from center frequency (750 Hz) for 80 Hz bandwidth. Improves S/N ratio 15 dB. Use 9V battery. 1¾x4x 3½ in. *Simple skill level.* Order **VEC-820K, $19.95.**

AM Radio Transmitter Kit lets you set up your own AM station and broadcast crystal clear programming from your studio with *you* as the disc jockey or talk show host. Play music from CD player, tape deck or other source. Choose clear frequency from 530-1750 KHz. Standard line level or microphone input. Easy CD, tape deck or mike mixers connect. Audio level adjustment. 1¾x4x3½ inches. *Simple skill level.* Order **VEC-1290K, $29.95.**

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DAKOTA DIVISION

MINNESOTA: SM, Randy "Max" Wendel, N0FKU—I wish to thank all those who participated in the statewide Y2K operations. Operators were scattered all over, working on behalf of local governments manning their stations at home, EOCs, fire stations, hospitals, just to name a few. We had more than just ARES members involved and I'm happy to see the support given by all of you. Several ARES ECs worked particularly hard and coordinated operators at various places. Most of all, my hats off to Gary Peterson, N0ZOD, for his many many hours put into working with the State DEM, traveling across Minnesota for a week meeting with various ARES and club officials, and for his wife, Gladys, KB0TUT, who in addition to being an EC for Fillmore County, supports Gary in all his ongoing efforts! Thanks to our ARES District ECs...Gerald VanDervort, WD0GUF (Northern), Ed LaPlante, KC0ASX (Central), and Russ Marsolek, N0QKG (Southern). Thanks to all the operators at the HF hubs, and relay stations between the counties and other areas that helped bring everything together. THANK YOU ALL VERY MUCH for a task well done! For those of you with Internet, please stop by my Web site and check out the radio communications page. I'm trying to gather as many links to club Web sites in Minnesota in addition to other communication interests. Bookmark the Web site **http://www.pclink.com/rwendel**. With Y2K finally behind us (and the sky still in the sky), how about preparations for Y3K? Nah, let's put that off for awhile! 73 de N0FKU. Tfc: KB0AII, WA0TFC, W0LAW, W0GCB, WO0A, K0PIZ, W0HPD, KN9U, W7HH, K0WPK, W0WVO, K00PSH, KB0AIJ, KA0IZA, WD0GUF, K0OGI, N0JP.

NORTH DAKOTA: SM, Bill Kurtti, WC0M—Bismarck Hamfest March 11, 2000. Peace Garden Hamfest July 7-9. Sorry to report that KA0LXH is a Silent Key. Gus was active on ham radio & many other community affairs. WD0DAJ is resigning as Repeater Frequency Coordinator as of Jan 1, 2000. Thank you, Stan, for your hard work & the coordination system you have set up to in our state. KB0VSE is replacing Stan as Repeater Frequency Coordinator. We wish WA0HUD a speedy recovery from his recent surgery. The balloon launch at Grand Forks went well. The box was destroyed on landing but the electronics were not damaged & the pictures were a success. Another is planned for next spring. Many of our clubs plan to have personal at the EOC on New years for possible Y2K problems. Traffic: N0RDJ 2. Sess/QNI /QTC Mgr: Goose River, 1895 kc 8:30 AM Sun 4/64/0 KE0XT; DATA 3937 kc 6:30 PM Daily 28/657/19 KE0XT; WX Nets 3937 kc 8:30 AM, 12:30 PM 52/1014/43 KE0XT. Storm Net 3937 kc, continuous as needed during storms.

SOUTH DAKOTA: SM, R. L. Cory, W0YMB—Black Hills ARC at Rapid City has been approved by ARRL HQ as a Special Service Club. Our congratulations to them. The Garden City repeater tone freq has been changed to 146.2 Hz and the call sign is WD0FKC/R on the 146.67 repeater. At Lake Area Club test session at Watertown, 3 out of the 5 that tested obtained an Amateur Radio license. I regret to report the passing of the XYL of W0KUX at Eagle Butte. New ATV antenna is operating at Pierre with good signal reports. AA0CT, VE at Pierre, reports having a 10-year old pass the Novice test. Clubs that have anything they would like to have in the column may e-mail it to me at **w0ymb@cam-walnet.com**. Now that the hot weather has diminished, the SD nets have shown some improvements. However, more improvement is desired. The total number of traffic reported for November was 446.

DELTA DIVISION

ARKANSAS: SM, Roger Gray, N5QS, e-mail n5qs@arrl.org—As I write this, I have just finished catching up on old QSL requests some 6 or 7 months old. I never realized just how far behind you could get. Among those just sent out were some responses from School Club Roundup. These brought up an idea for this year from my XYL (N5QT). She suggested we design QSL cards and have the kids fill them out when they make the contacts to give them more of a feel for the hobby. It is time to make preparations for the School Club Roundup NOW. These students are the future of our hobby, please get out there this year and show some of them how much fun it can be. I want to express my sincere appreciation for Eldon Bryant, K7ZQR, for keeping me straight on all the traffic in the state since he took over. I would not have been able to keep it compiled without him. Arkansas section traffic and net reports for November, 1999: Tfc: K7ZQR 102, K5BOC 92, AB5ZU 12, N5SAN 9, KA5MGL 8, KK5QS 8, W9YCE 8, W5HDN 7, KC5UEW 7, AMN 28, APN 23, ARN 94.

LOUISIANA: SM, Lionel A "Al" Oubre, K5DPG, e-mail **k5dpg@arrl.org.** Web Page **www.aisp.net/k5dpg**. ASM: KB5CX, K5MC. ACC: KA5IJU. BM: K5ARH. TC: KE5FZ. SEC: N5MYH. OOC: WB5CXJ. PRC: KB5QVI. STM: KG5GE. NM LTN: WB5ZED. NM LCW: W4DLZ. The ham radio ARES blood bank account at Our Lady of the Lake Hospital is in need of additional donations. Go to any Blood Bank and donate blood. Then tell them to credit the donation to the ARES Blood Bank account at Our Lady of the Lake Hospital in Baton Rouge LA. The members of the Westside ARC provided communications for the commissioning of the LCVPPA-33-21 Higgins boat. Those participating were: KC5MGR, N5SC, WE5DWP, WE5DWO, W5PCM, KC5CTG, W5CTV, and WA5VWL. Upcoming AARA-Rayne March 11-12, Baton Rouge May 5-6. Go out and support our area hamfest events. By the time you read this you should have received the ballot for LA Section Manager. Please take the time to vote. Remember, the person you select will lead the section during the next two years. Louisiana Section Net Schedule: LTN 6:30 PM, local, 3910 kHz, nightly, WB5ZED Mgr; LCW 6:45 PM, local, 3673 kHz, nightly, W4DLZ Mgr. Reports for November LTN QNI 362 QTC 77 in 30 sessions. LA Rep 100 % by WB5ZED, K5IQZ, K5WOD, W5BKM, W5CDX, N0KWA, WA5LHL, K5DPG. PSHR: KG5GE 54, K5MC 112, K5WOD 123, W5CDX136, K5IQZ 141, K5DPG 145, WB5ZED 224. Tfc: K5WOD13, KG5GE 7, K5DPG24, K5MC 74, K5IQZ 144, W5CDX 167, WB5ZED 622 BPL 9th.

MISSISSIPPI: SM, Malcolm Keown, W5XX—DEC: K5IMT, N5XGI. EC: KK5BY, KD5CKP, W5DGK, W5DJW, K5DMC, KB5DZJ, KM5GT, N5HTQ, WD5IMP, WB5OCD, KC5SPR, WA5TEF, KC5TVI, KC5TYL, KB5WJJ, N5XGI, KB5ZEA, N5ZNT. Make your plans for the Capital City Hamfest and ARRL Section

MIRAGE ...160 Watts on 2 Meters!

Turn your mobile, base or handheld into 160 Watt powerhouses and talk further, longer, clearer . . . All modes: FM, SSB, CW . . . Superb GaAsFET preamp . . . Overdrive, high SWR, Over-temperature protection . . . Remote controllable . . .

B-5016-G
$299
Suggested Retail

Power Curve -- typical B-5016-G output power								
Watts Out	*130*	*135*	*140*	*145*	*150*	*155*	*160*	*165*
Watts In	*20*	*25*	*30*	*35*	*40*	*45*	*50*	*55*

The MIRAGE B-5016-G gives you 160 watts of brute power for 50 watts input on all modes -- FM, SSB or CW!

Ideal for 20 to 60 watt 2 Meter mobile or base. *Power Curve* chart shows typical output power.

Hear weak signals -- low noise GaAsFET preamp gives you excellent 0.6 dB noise figure. Select 15 or 20 dB gain.

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B-1016-G Great for ICOM IC-706!

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100 Watts for 2 Meter HTs

B-310-G
$199
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Power Curve -- typical B-310-G output power							
Watts Out	*25*	*50*	*75*	*95*	*100*	*100+*	*100+*
Watts In	*¼*	*½*	*1*	*2*	*4*	*6*	*8*

- ***100 Watts out with all handhelds up to 8 watts***
- ***All modes: FM, SSB, CW***
- ***Great for ICOM IC-706***
- ***15 dB low noise GaAsFET preamp***
- ***Reverse polarity protection/SWR Protection***
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***Boost** your 2 Meter handheld to 100 Watts!* Ultra-compact all mode B-310-G amp is perfect for *all* handhelds up to 8 watts and multimode SSB/CW /FM 2 Meter rigs. *Great for ICOM IC-706!*

35 Watts for 2 Meter HTs

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$89.95
Suggested Retail

Power Curve -- typical B-34-G output power								
Watts Out	*18*	*30*	*33*	*35+*	*35+*	*35+*	*35+*	*35+*
Watts In	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*

- ***35 Watts Output on 2 Meters***
- ***All modes: FM, SSB, CW***
- ***18 dB GaAsFET preamp***
- ***Reverse polarity protection***
- ***Includes mobile bracket***
- ***Auto RF sense T/R switch***
- ***Custom heatsink, runs cool***
- ***Works with handhelds up to 8 watts***
- ***One year MIRAGE warranty***

MIRAGE RUGGED!

35 watts, FM only . . . $69.95

B-34, $69.95. 35 watts out for 2 watts in. Like B-34-G, FM only, less preamp, mobile bracket. 3⅛x1¾x4¼ inches.

MIRAGE Dual Band 144/440 MHz Amp

BD-35
$159.95
Suggested Retail

Power Curve -- typical BD-35 output power							
Watts Out (2Meters)	*30*	*40*	*45*	*45+*	*45+*	*45+*	*45+*
Watts Out (440 MHz)	*16*	*26*	*32*	*35+*	*35+*	*35+*	*35+*
Watts In	*1*	*2*	*3*	*4*	*5*	*6*	*7*

- ***45 Watts on 2 Meters/35W on 440 MHz***
- ***Auto Band Selection*** • ***Auto T/R switch***
- ***Full Duplex Operation*** • ***5x1¾x5 inches***
- ***FREE mobile bracket*** • ***"On Air" LEDs***
- ***Single Connector for dual band radios and antennas***
- ***Reverse polarity protection***
- ***Works with all FM handhelds to 7 watts***
- ***One year MIRAGE warranty***

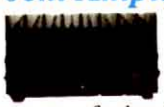
Add this Mirage *dual band* amp and boost your handheld to a *powerful* mobile or base -- 45 watts on 2 Meters or 35 watts on 440 MHz! **Mirage's** exclusive *FullDuplexAmp*™ lets you talk on one band and listen on the other band at the same time -- *just like a telephone conversation.* (Requires compatible HT).

6 Meter Amplifier

FCC Type Accepted

The A-1015-G, $389, is the *world's most popular* all mode FM/SSB/CW 6 Meter amplifier. 150 watts out for 10 in. For 1 to 15 watt transceivers.

70cm Amplifiers (420-450 MHz)



D-3010-N, $365, -- 100 W out/30 in. For 5 to 45 watt *mobile/base*. **D-1010-N, $395**, 100 W out/10 in. *Dual purpose* -- for handhelds or mobile/base. **D-26-N, $269**, 60 W out/2 in, for *handhelds*.

Amateur TV Amps

Industry standard ATV amps -- **D-1010-ATVN, $414**, 82 watts PEP out / 10 in. **D-100-ATVN, $414**, 82 watts PEP out/2 in. (without sync compression).

Remote Control Head for Amps

RC-1, $45, remote controls most MIRAGE amps. Power On/Off, preamp On/Off, switch for SSB/FM. 18 foot cable (longer available). 1¾x3¾x2½ inches.

Repeater Amps

11 models -- continuous duty all modeFM/SSB/CW repeater amps for 6, 2, 1 1/4 Meters, 70cm, 450 MHz ATV.

Low noise GaAsFET preamps

KP-1

KP-2

High gain *ultra low noise* GaAsFET preamps for receiving weak signals. Selectable gain prevents receiver intermod. 15 to 22 dB gain. Less than 0.8 dB noise figure. Automatic RF switching up to 160 Watts. **Choose** In-*Shack* model or *Mast-Mount* (includes remote control) model to reduce loss. Rugged die-cast enclosure.

Frequency (MHz)	*In Shack $139*	*Mast Mount $195*
28-30	KP-1/10M	KP-2/10M
50-54	KP-1/6M	KP-2/6M
144-148	KP-1/2M	KP-2/2M
220-225	KP-1/220	KP-2/220
430-450	KP-1/440	KP-2/440

1¼ Meter Amps (223-225 MHz)

Choose from 10 models -- 20 to 220 watts out for 2 to 50 watts in, $129 to $655.

Commercial Amps ($199 to $395)

FCC Type Accepted

Commercial amps for 150 - 174, 450-470 MHz and VHF marine bands, 70 -130 watts out.

Accurate SWR/Wattmeters

Read SWR directly andForward/ Reverse, Peak/Average power. Remote Coupler. 1.8-30, 50-200, 420-450, 1260-1300 MHz band models.

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2M Mobile
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FT-1000MP


FT-51R
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VX-5R
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FT-50R
Dual Band HT


Dual Band Mobile
TRUE DUAL BAND
FT-8100R


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Full Duplex Cross-band
DSP


ROTORS

BEST VALUE


FT-100
$100 Coupon thru 02/29
All Mode HF/6m/2m/440 MHz


FREE FM-1
FT-920
All Mode HF/6m, Free FM-1
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DSP, Auto-Notch 99 Memories
Built in DVR, CW Memory Keyer
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KENWOOD

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VC-H1


TH-79AAKSS

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Dual Band HT


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DATA COMMUNICATOR
FM Dual Bander


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with tone encode and tone decode

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Dual Band Transceiver

NEW PRICE

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5W @ 13.5V

NEW!

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All Mode 160M-2M
100W output for all bands
Built in Tuner

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IC-T7A/HP
Dual Band HT

Scanners/Receivers

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5W, 2M Handheld
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VHF/UHF air band receive

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Convention on February 4-5 at the Trade Mart in Jackson. Our special guest will be WV1X from ARRL Headquarters. W5OXA reports that the West Jackson Co ARC Hamfest went great thanks to the efforts of W9NZ (Chairman), AB5RS, KC5RRG, and N5XGI. The JARC again supported the Annual "Jamboree-on-the-Air" by setting up three stations on a farm near Gluckstadt during the local Boy Scout Fall Camporee." Participants were KD5EDV, KD5FUY, KD5HDZ, KD5HIH, KB5KKI, N5OH, W5PFR, KC5VTP, AB5WF, and KM5GE. OO Rpt: K5XQ. EC Rpt: KD5CKP, W5DGK, K5DMC, WB5OCD. Net Reports: sessions/QNI/QTC. MSPN 30/2828/89, MTN 30/201/80, MSN 30/1038/8, PBRA 30/1072/2, Jackson Co ARES 30/643/34, MSSN 22/130/5, Hancock Co ARES 13/133/16, MAEN 5/86/0, Lowndes Co 5/78/0, MCARES 5/41/0, LARCEN 5/60/0, MBHN 4/29/0, Stone Co ARES 4/43/0, MLEN 4/67/1. PSHR: KB5W 150, N5JCG 139, N5XGI 137, KM5DT 130, K5DMC 128, K5VV 114, W5XX 94, KD5P 70.Traffic: KB5W 412, KM5DT 109, K5DMC 94, N5XGI 70, N5JCG 64, KD5P 38, K5VV 26, W5XX 12.

TENNESSEE: SM, O.D. Keaton, WA4GLS—ACC: WA4GLS. ASM: WB4DYJ. PIC: W4TYU. SEC: WD4JJ. STM: WA4HKU. OOC: AD4LO. TC: KB4LJV. I thank you for your confidence in me by re-electing me as your Section Manager. As another year comes to an end, our programs look very good. WD4JJ, SEC, reports that ARES membership is 1255, 63 ECs, 9 DECs, 22 active nets, 119 net sessions and 14 with NTS liaison. WA4HKU, STM, and the net managers and net control stations have kept the nets handling the necessary traffic within the NTS. These phone nets operate on 3980 kHz at 6:40 AM, M-F; 6:45 AM, 8:00 AM S, S & H; the CW nets meet on 3635 kHz at 7:00 PM & the slow speed training net on 3682 kHz at 7:30 PM, M-S, all times listed are central time. AD4LO, OOC, has 17 OOs: W4TYU, PIC, has 12 PICs, KB4LJV, TC has 10 TSs. Thanks to all who have contributed to the success of these programs. KE4VMJ sends thanks to KF4BTO, KE4HID, KC4TRY, KD4LDL, ND4F, N4LFR, N4IJL, KG4ELT, AC4JS & KD4CKH for assisting in communications for the Mill House 15K Race for the Knoxville Track Club. JCARA has placed an ARRL Handbook in the Johnson City Public Library in memory of Russell Ingraham, W4UIO. The following NARC members contributed to the communications for the Lance Armstrong Cancer Foundation's Race the Trace: KF4WME, KE4CXU, KF4OAL, N4VHM, WB4ODQ, KE4ETY, KE4TQO, N4JUD, K4ANH, N4GWE, KF4OAH, WD4ICI, KF4VOW & KF4MCD. Thanks to all CARC members who assisted in communications in the county fair and the MS Bike Ride. Thanks to RCARS members KO4SY, KF4ZSX, KE4GSV, KT4IW, KV4BP, KV4BO, WA4PJP, KN4VY, KD4YJD, KT4LC and WA4UEU for their work during the tower party, these repairs should last for a long time. Thanks to the members of ORARC for their hospitality during my club meeting visit on Nov 8, 1999. Net Sess/QTC/QNI: TMPN 30/36/2245; TCWN 23/33/182; TEMPN 22/31/765; TEPN 25/70/2549; TSCWN 21/14/98. Tfc: N4PU 66, WB4DYJ 60, WA4HKU 45, W4SYE 15, KA4KDB 11, WD4JJ 9, KI4V 8, WA4GLS 5.

GREAT LAKES DIVISION

KENTUCKY: SM, Bill Uschan, K4MIS—ASM: Tom Lykins, K4LID. SEC: Ron Dodson, KA4MAP. STM: John Farler, K4AVX. SGL: Bill Burger, WB4KY. ACC: Todd Schrader, KF4WFZ. TC: Scotty Thompson, KI4AT. PIC: Steve McCallum, W2ZBY. BM: Ernie Pridemore, KF4IVG. It is with deep regret that we mention that Harry Wheeldon, KM4C, and John Steele, KD4DJC, became SKs in November. Now that I have the information, I would like to mention that the following were given certificates at the Louisville Hamfest by SEC Ron Dodson, KA4MAP: Pat Spencer, KD4PWL, was presented with a Certificate of Merit for the fine work he does as Section Webmaster. For his outstanding work in Marshall County as EC, Ron Ladd, KF4UBX, was presented with a Certificate of Merit. Randall, N4ID, was presented with a Certificate of Merit for his outstanding work in Christian County. Stu Kratz, KO4BI, was presented with a Certificate of Merit for his outstanding work with the NWS and SKYWARN Liaison to the NWS in Louisville, Ky. Mark Richardson, AF4NJ, was presented with a Certificate of Merit for his outstanding work with the ARES/SKYWARN Web pages. Ron Ritchie, KF4MOM, was presented with a certificate for his outstanding work with ARES and was named ARES operator of the year. Net QTC/QNI/Sess: KRN 966/22/22. MKPN 1194/37/30. KTN 1499/67/30. KYN 30/99/30. TSTMN 559/30/40. 4ARES 560/30/32. Tfc: KF4RBK 259, NF4G 172, AE4NW135, K4AVX 48, KO4OL 45, K4YKI 38, N4GD 14, KD0CEG 10, W4EET 6.

MICHIGAN: SM, Dick Mondro, W8FQT (**w8fqt@arrl.org**). ASM: Roger Edwards, WB8WJV (**wb8wjv@arrl.net**). ASM: John Freeman, N8ZE (**n8ze@arrl.net**). SEC: Deborah Kirkbride, KA8YKK (**ka8ykk@arrl.net**). STM: James Wades, WB8SIW (**wb8siw@arrl.net**). ACC: Sandra Mondro, KG8HM (**kg8hm@arrl.net**). OOC: Donald Sefcik, N8NJE (**n8nje@arrl.net**). PIC/SNE: David Colangelo, KB8RJI (**dcolangelo@ameritech.net**) SGL: Ed Hude, WA8QJE (**edhude@juno.com**). TC: Dave Smith (**DSmith@smithassoc.com**). Youth Activities: Carl Hillaker (**carln8zdw2@juno.com**). BM: Thomas Durfee, Jr. WI8W (**wi8w@arrl.net**). I am always happy to announce new folks accepting section appointments and this month I would like to welcome Thomas Durfee Jr., WI8W, back to the rolls as our Michigan Section Bulletin Manager. Thom, a member of the Big Rapids ARC, served in this capacity during the term of past Michigan SM George Race WB8BGY. If your club has a need for his help please contact him directly. We are very fortunate in the Section to have a Special Service Club that presents an award each year to the top Michigan Affiliated Club for their Field Day efforts. That club is the Motor City Radio Club of Southeastern Michigan and the award is the Ivory J. Olinghouse Memorial Award. Mr Olinghouse, W8ZBT, served as our Section Communications Manager (SCM) from 1970 to 1976. This award is based on the highest percentile ranking of Michigan Affiliated Clubs. For the second year in a row, the Oakland County Amateur Radio Society (OCARS) W8TNO, is the winner of this prestigious award. The following clubs placed in descending order: Motor City Radio Club, Cherryland ARC, Eastern Michigan ARC, Hazel Park ARC, and South Lyons ARC. Congratulations to all that worked so hard to earn this recognition and thanks to Stan Briggs, W8SB, for the information. Tfc (Nov): K8GA 217, KB8ZYY 211, W8RTN 130, N8FPN 112, WX8Y 100, WB8SIW 98, K8LJG 74, N8JGS 69, KA9EIZ 67, AA8PI 67, K8AE 56, AA8SN 56, W8RNQ 46, WI8K 32, K8UPE 29, K3UWO 26, K8ZJU 23, KC8GMT 22, KI8GR 18, W8YIQ 18, N8OSC 17, WR8F 16, K8AI 15, WA8DHB

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	100FT/UP	500FT	1000FT
"FLEXIBLE" 9913 STRD BC CNTR FOIL + 95% BRAID 2.7dB@ 400MHz NC/DB/UV JKT...	.58/FT	.56/FT	.54/FT
LMR 400 SOLID CCA CNTR FOIL + BRAID 2.7dB @ 450MHz WP/UV JKT	.59/FT	.57/FT	.55/FT
LMR 400 "ULTRA-FLEX" STRD BC CNTR FOIL + BRAID 3.1dB @ 450 MHz TPE JKT	.87/FT	.86/FT	.85/FT
LMR 600 (OD.590") SOLID CCA CNTR FOIL + BRAID 1.72dB @ 450 MHz WP/UV JKT	1.25/FT	1.22/FT	1.20/FT
LMR 600 "ULTRA-FLEX" STRD BC CNTR FOIL + BRAID 2.1dB @ 450MHz TPE JKT	1.95/FT	1.93/FT	1.90/FT

COAX (50 OHM "HF" GROUP)

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RG213/U STRD BC MIL-SPEC NC/DB/UV JACKET 1.2 dB/2500WATTS @ 30MHz	.36/FT	.34/FT	.32/FT
RG8/U STRD BC FOAM 95% BRAID UV RESISTANT JKT 0.9dB/1350WATTS @ 30MHz..	.34/FT	.32/FT	.30/FT
RG8 MINI(X)95% BRAID UV RESISTANT JACKET 2.0dB/875 WATTS @ 30MHz	.15/FT	.13/FT	.12/FT
RG58/U 95% BRAID UV RESISTANT JACKET 2.5dB/400 WATTS@ 30MHz	.15/FT	.13/FT	.11/FT
RG58A/U STRD CENTER 95% TC BRD UV RESISTANT JKT 2.6dB/350 WATTS @ 30MHz	.17/FT	.15/FT	.13/FT
RG214/U STRD SC 2 95% BRD NC/DB/UV JKT 1.2dB/1800WATTS @ 30MHz	.25FT/UP	1.75/FT.	
RG142/U SOLID SCCS 2-95% SILVER BRAIDS *Teflon®* JKT 8.2dB/1100WATTS @ 400MHz	.25FT/UP	1.25/FT.	

COAX (75 OHM GROUP)

	100FT/UP	500FT	1000FT
RG11A/U STRD BC (VP-66%) 95% BRAID NC/DB/UV JKT 1.3dB/1000WATTS	.44/FT	.42/FT	.40/FT
RG6/U CATV FOAM 18GA CW FOIL + 60% ALUM BRAID	.20/FT	.13/FT	.11/FT
RG6/U CATV FOAM 18GA CW FOIL *QUAD SHIELD*	.25/FT	.18/FT	.16/FT

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	100FT/UP	500FT	1000FT
"FLEXIBLE" 450 OHM 16GA COMPRESSED STRD CCS(PWR-FULL LEGAL LIMIT+)	.20/FT	.18/FT	.16/FT
"FLEXIBLE" 450 OHM 14GA COMPRESSED STRD CCS(PWR-FULL LEGAL LIMIT++)	.25/FT	.24/FT	.23/FT
300 OHM 20GA STRD (POWER: FULL LEGAL LIMIT)	.15/FT	.13/FT	.12/FT

ROTOR & CONTROL CABLES

	100FT/UP	500FT	1000FT
5971 8/COND (2/18 6/22) BLK UV RES JKT. Recommended up to 125ft	.20/FT	.18/FT	.16/FT
1618 8/COND (2/16 6/18) BLK UV RES JKT. Recommended up to 200ft	.35/FT	.34/FT	.32/FT
1418 8/COND (2/14 6/18) BLK UV RES JKT. Recommended up to 300ft	.47/FT	.45/FT	.43/FT
1806 18GA STRD 6/COND PVC JACKET Recommended for Yaesu Rotors	.23/FT	.21/FT	.19/FT

Quick disconnects: PS308 KIT (JONES 8/C M/F) $7.95/pr., PS309-KIT (JONES to AMP ROUND M/F)..$10.95/pr.
Or we can install either pair for $22.95, $25.95.

ANTENNA WIRE (UNINSULATED BARE COPPER)

	100FT/UP	500FT	1000FT
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14GA 7 STRD *"HARD DRAWN" (perfect for permanent Dipoles etc.)*	.10/FT	.08/FT	.06/FT
14GA SOLID *"COPPERWELD" (for long spans etc.)*	.10/FT	.08/FT	.06/FT
14GA SOLID *"SOFT DRAWN" (for ground radials etc.)*	.10/FT	.08/FT	.06/FT
ROPE: 3/16" DOUBLE BRAID *"POLYESTER"* 770# TEST WEATHERPROOF	.12/FT	.09/FT	.08/FT
ROPE: 5/16" DOUBLE BRAID *"POLYESTER"* 1790# TEST WEATHERPROOF	.17/FT	.14/FT	.13/FT

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8GA (rated:40 amps)	25FT $16.00	50FT $31.00	100FT $60.00
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12GA (rated:20 amps)	25FT $8.00	50FT $14.00	100FT $26.00
14GA (rated:15 amps)	25FT $6.00	50FT $10.00	100FT $18.00

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with USA made Silver/Teflon® Gold Pin PL259 connectors.

FLEXIBLE 9913 strd BC cntr foil+95% braid 2.7dB 400MHz NC/DB/UV JKT.
200' $129.95 175' $114.95 150' $99.95 125' $84.95 100' $69.95 75' $54.95
50' $39.95 25' $24.95 15' $21.95 10' $18.95 6' $12.95 3' $11.95 1' $10.95

RG213/U strd BC Mil-Spec NC/BD/UV JKT. 1.2dB 2500 watts @ 30MHz.
200' $89.95 175' $79.95 150' $69.95 125' $59.95 100' $49.95 75' $39.95
50' $29.95 25' $19.95 15' $17.95 10' $15.95 6' $11.95 3' $9.95 1' $8.95

RG8/U strd BC foam 95% braid UV resistant JKT. 0.9dB 1350 watts @ 30MHz.
150' $64.95 125' $54.95 100' $44.95 75' $34.95 50' $24.95 25' $14.95
10' $13.95 6' $11.95 3' $9.95 1' $8.95

RG8 MINI(X) strd BC foam 95% braid UV resistant JKT. 2.0dB/875watts@ 30 MHz
150' $34.95 125' $29.95 100' $24.95 75' $19.95 50' $15.95 25' $10.95
6' $4.95 3' $3.95 *(3ft & 6ft are China made)*

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25' $39.95 15' $32.95 10' $25.95 6' $16.95 3' $15.95 1' $14.95

With USA made Silver/Teflon®/Gold Pin PL259 to male "N"

FLEXIBLE 9913 strd BC cntr foil+95% braid 2.7dB 400MHz NC/DB/UV JKT.
150' $104.95 125' $89.95 100' $74.95 75' $59.95 50' $44.95 25' $29.95
15' $26.95 10' $23.95 6' $14.95 3' $13.95 1' $12.95

With USA made Silver/Teflon®/Gold Pin PL259 to male "BNC"

FLEXIBLE 9913 strd BC cntr foil+95% braid 2.7dB 400MHz NC/DB/UV JKT. 50' $45.95

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RG8 MINI (X) 6'	PL259-male BNC 6'	$9.95
RG58/U w/Right Angle Male BNC to SO239 3'		$14.95
RG58/U w/Right Angle Male BNC to PL259 3'		$14.95
RG142/U w/Female BNC to Male SMA 3'		$9.95

All connector terminations are soldered, Hi-Pot® tested @ 5kv for one minute, continuity checked, ultra violet resistant heat shrink tubing, and red protective caps. Which can also be used as a boot. CUSTOM CONNECTOR WORK TOO. Call for price and delivery.

CONNECTORS

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Cable	Size	Price/ft
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14, KB8EIW 11, N8TDE 5. (Reports by 5th of the month, please.) Please support the following Section Traffic Nets: November 1999 NTS Net Reports.

Net	QNI	QTC	Sess	Freq	Time	Day
QMN	616	229	60	3.663	6:30&10 PM	Daily
MACS	222	68	28	3.953	11 AM	Daily (1 PM Sun.)
MITN	436	181	30	3.952	7 PM	Daily
UPN	1115	35	34	3.921	5 PM	Daily (Noon Sun.)
GLETN	570	100	30	3.932	9 PM	Daily
SEMTN	447	78	31	146.640	10:15 PM	Daily
WSSBN	733	33	30	3.935	7 PM	Daily
ARAHH	27	0	4	145.130	8 PM	Wed
D8 ARES	22	0	4	3.932	7:30PM	Sunday
VHF Nets	552	5	41			Various

OHIO: SM, Joe Phillips, K8QOE, Fairfield, (to contact me, see page 12)—As this is written, Y2K hadn't yet occurred. If you're reading this in February, nothing substantial happened. Ohio welcomes its new Public Information Coordinator, Scott Yonally, KC8SS, Mansfield who has edited AIRWAVES newsletter since dirt was invented. Scott, a ham for 21 years, has completed with distinction several major ham radio posts - newsletter editor, District Emergency Coordinator, SKYWARN coordinator, club president - and will now serve the ARRL Ohio Section. Scott, of course, becomes contest manager for our Ohio Ham Radio Newsletter Contest which this year is in its 9th edition. He will be in contact with every Ohio Ham Radio Newsletter Editor we can find, to explain contest rules and regulations. By the way, these contest winners will be announced, along with many other activities, at the Ohio Section Conference, September 16, 2000, at the Ohio Emergency Management Agency in Columbus (Governor's War Room). That date and location are now confirmed - mark your calendars. OHIO SECTION CONGRATS (A) to Arkley Bruce, W8OUW, Newark, retiring after over a decade of serving as EC of Licking County; (B) to Rick Burdick, K8WWA, Blue Ash, who as Lieutenant of that city's police force, finally solved the City Hall rest room affair; (C) to new officers for Van Wert ARC, Joe Shelton, KB8JYW, pres; Jack Snyder, WD8MLV, veep; Bob Barnes, WD8LPY, sec; Steve Kouts, WA8WKF, Ralph Shields, WB8YIH, activities; and Louis Thomas, WD8LLO, publicity. (D) to new officers for Lake Erie ARA (Cleveland), Bob Winston, W2THU, pres; Marv Grossman, W8AZO, veep; Eric Jessen, N8AUC, veep; Jeff Garvas, N8YNR, sec; and David Foran, WA8APP, treas. and (E) to Brecksville ARF support of its city's 5K Marathon. Promoting amateur radio were W8HMU, KA8SZZ, KB8UXN, K8EE, KB8CQ, WB8KQJ, W8TAV, N8JR, KD8AK and KC8FAQ. The city's appreciation came when it purchased a 440 MHz repeater for the club. If your Ohio ham radio club isn't a Special Service Club of the ARRL, contact Joanne Solak, KJ3O, (**ljsolak@apk.net**) and see if your group qualifies and you wish to enjoy its special privileges. February hamfests, (13) Mansfield and (27) Cuyahoga Falls ARC. The Cincinnati ARRL Convention, normally at this time, has moved to March 26 at a new location de K8QOE. Now for the November traffic reports.

Net	QNI	QTC	QTR	Sess	Time	Freq	NM
BN (E)	132	58	262	29	1845	3.577	WD8KFN
BN (L)	170	96	362	30	2200	3.577	NY8V
BNR	2000	538	2422	90	1800	3.605	W8LDQ
OSN	166	53	707	30	1810	3.708	WB8KQJ
OSSBN	1930	540	2330	93	1030. 1615, 1845	3.9725	KF8DO
OH Section ARES Net					1700 Sun	3.875	WD8MPV

Tfc: KF8DO 193, KD8HB 186, W8STX 184, NS8C 148, WB8KFN 134, N8IXF 131, WA8EYQ 130, N8FWA 121, KA8FCC 86, WD8MIO 86, W8LDQ 80, WA8SSI 80, KA8VWE 76, W8PBX 66, N8TNV 61, W8BO 50, KI8GW 50, N8DD 49, K8WOQ 49, N8CW 48, KI8IM 48, WA8HED 43, N8ZBW 43, KC8DWM 41, KB8ESU 39, WD8KBW 37, WB8FSV 34, KD9K 34, K8OUA 33, NY8V 32, N8YWX 29, W8GAC 28, K8IG 28, KI8O 26, W9GGA 26, N8GOB 22, N8PAI 22, KB8SBK 20, KF8FD 19, KC8FWU 18, KB8SIA 18, WB8HHZ 17, N8ZBW 11, KC8KYP 9, WB8IOW 8, W8RG 8, KC8HFV 7, W8DYF 6, AA8SX 6, KB8TIA 6, W8RPS 5, KE8FK 5, N8RAK 5, KC8HTP 3, KE8FX 3, W8DYF 3, K8WC 2, N8LVA 2, KE8FK 1, KC9HFR 1, K8QIP 1. (Oct) N8RRB 124, W9GGA 24, WD8KBW 27, K8IG 21, KE8FK 8.

HUDSON DIVISION

EASTERN NEW YORK: SM, Rob Leiden, KR2L— STM: Pete Cecere, N2YJZ. SEC: Ken Akasofu, KL7JCQ. ACC: Shirley Dahlgren, WA2QCY. BM: Ed Rubin, N2JBA. OOC: Hal Post, AK2E. TC: Rudy Dehn, W2JVF. ASM: Tom Raffaelli, WB2NHC. ASM: Bob Chamberlain, N2KBC. ASM: Andrew Schmidt, N2FTR. ASM: Richard Sandell, WK6R. ASM: Phil Bradway, KB2HQ. Net Reports (November 1999) Check-ins (QNI)/Traffic handled (QTC+QSP): AES 44/10 CDN 301/151 CGESN 69/0 ESS 400 /178 HVN 565/311 NYPHONE 205/729 NYPON 301/307 NYS /E 384/392 NYS/M 209/213 NYS/L 285/524 SDN 350/117. All are invited to hear FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth, K4ZDH, speak at SARA on 4/3. By now, Y2K is in the past. Congrats to all RACES active hams for their work to get ready. PSHR: N2YJZ 171, N2JBA 168, WB2ZCM 145,W2JHO 130,W2AKT 128,WB2IIV 89, KC2DAA 83. Tfc: N2YJZ 401,N2TWN 77, N2JBA 73, W2JHO 73, WB2ZCM 73, WB2IIV 60, KC2DAA 41, W2AKT 36, W2CJO 19, KC2BUV 18, N2AWI 9, WA2BSS 4, KC2BUW 4, K2AVV 1.

NEW YORK CITY/LONG ISLAND: SM, George Tranos, N2GA—ASM: KA2D, N1XL, K2YEW, W2FX, KB2SCS. SGL: N2TX. SEC: KA2D. ACC: K2EJ. PIC-East: N2RBU. PIC-West: K2DO. TC: K2LJH. BM: W2IW. OOC: N1XL. STM: WA2YOW. Last minute update: Ham Radio University / Long Island is Sunday, Jan. 23, 2000, 9 to 3 PM at Babylon Town Hall Annex in North Babylon. VE Session there at 2:15 PM. Talk-in on 146.685 MHz. Thanks again to Marc Kaufman, WB2WDC, who retired as DEC in New York City. Charles Hargrove, N2NOV, has accepted this post effective December 1, 1999. Congratulations to new club officers: for GSBARC – Phil, N2MUN, President, Jay N2PIK VP, Tom, N2MIG, Treasurer, Pete N2GBM Recording Secretary, Lenore, N2KYP, Corresponding Secretary; for Order of Boiled Owls – Mel, KS2G, President, Jerry WM2V VP, Andy, K2LE, Treasurer, Bill NA2M, Secretary. Check the NLI Webpage at **www.arrlhudson.org/nli** for more information on upcoming events. NYC/LI VE exam list follows: Islip ARES, 1st Sat 9 AM, Slip Town Hall West 401 Main St. Slip, Len Battista, W2FX,516-277-0893. Bears VE: ABC Bldg Cafeteria, 125 West End Ave at 66th St. Call Hotline 212-456-

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5224 for exact dates & times, Jerry Cudmore, K2JRC. Grumman ARC (W5YI) 2nd Tues 5 PM. Northrop-Grumman Plant 5 S Oyster Bay Rd via, Hazel St Bethpage, NY. Bob Wexelbaum, W2ILP, 516-499-2214, LIMARC, 2nd Sat 9 AM NY Inst of Tech, 400 Bldg Rm 409, Northern Blvd. Old Westbury, Al Bender, W2QZ, 516-623-6449. East Village ARC, 2nd Friday 7 PM, Laguardia HS, Amsterdam Ave and West 65 Street, Manhattan. Robina Asti, KD2IZ, 212-838-5995. Great South Bay ARC, 4th Sun 12 PM, Babylon Town Hall, ARES/RACES Rm 200 E Sunrise Hwy N Lindenhurst, Michael Grant, N2OX, 516-736-9126. Hellenic ARA: 4th Tues 6:30 PM; Pontion Society, 31-25 23rd Ave, Astoria, NY, George Anastasiadis, KF2PG, 516-937-0775. Larkfield ARC, Huntington Town Hall, room 114, 2nd Saturday in Feb, May, Sep, Nov, Contact Stan Mehlman, N2YKT, 516-423-7132. Columbia U VE Team: 3rd Mon 6:30 PM, Watson Lab 6th.floor 612 W 115th St NY, Alan Crosswell, N2YGK, 212-854-3754 PARC: exams held every three months at Southold School Oaklawn Ave, Southold, NY, on next to last Friday of the month.6:30 PM all classes of licenses. For info contact Ralph Williams/N3BT 516-323-3646. Mid-Island ARC, Last Tue. 7 PM, Brookhaven Rec Ctr, 20 Wireless Rd, Centereach, NY. Mike Christopher, KG2M, 516-736-9126. Report all changes to N2GA before the 12th of the month. Tfc: WB2GTG 331, W2RJL 116, N2AKZ 115, KB2KLH 83, N2XOJ 63, WA2YOW 23, KB2GEK 13, K2GCE 5.

NORTHERN NEW JERSEY: SM, Jeff Friedman, K3JF—By the time this month's magazine gets published, hopefully we will all begin to relax and Y2K will have come and gone with minimum incident. I would, however, like to thank all those Hams in Northern New Jersey who volunteered to "Stand Watch" while others enjoyed the passing into the New Millennium. I would also like to thank our new SEC, Mike Hoeft, K2MPH, and his team of DECs for working hard in the development of the North Jersey Emergency Communication Plan. Speaking of ARES, Mike has resurrected the RAVEN Group, having its first meeting last November, as well as revitalizing the ARES Net in Northern New Jersey. Please be advised the ARES Net for NNJ will operate the 2nd Monday of every month at 8 PM on the Morris County Repeater 146.895 PL 151.4. It is through the good graces of the Morris County OEM, particularly Harvey Klein, WS2Q, Radio Officer, that we are able to hold this net. Everyone is invited to participate and check in. On Thursday, February 17th at 7:30 PM, Riley Hollingsworth will be addressing the Ham Community. The meeting will be held at the Morris County Police and Fire Academy in Morris Plains, New Jersey, talk-in 146.895 PL 151.4. All are invited. The presentation is co-sponsored by the ARRL Northern New Jersey Section in conjunction with the Splitrock Amateur Radio Association. Thanks to Len Davis, AB2BK, President and all the SARA members.

Net	*NM*	*Sess*	*QNI*	*QTC*	*QSP*	*QTR*
NJM	WA2OPY	30	199	101	85	313
NJPN	W2CC	34	210	57	44	182
NJSN	K2PB	28	179	11	9	380
NJN/E	AG2R	30	239	113	95	372
NJN/L	AG2R	30	211	40	34	272
CJTN	N3RB	30	302	63	49	257
NJVN/E	N2RPI	30	204	45	43	219
NJVN/L	N2OPJ	30	316	40	40	250

Tfc: N2XJ 157, KC2AHS 68, N2OPJ 59, N2GJ 41, N2RPI 38, W2MTO 38, N3RB 34, K2PB 23, KB2VRO 23, W2CC 18, N2QAE 12, N2TTT 8. WB2FTX 2RN Digital NTS Station: received 222, forwarded 218, total 440. WB2FTX-4 NTS/packet hub, 255 messages.

MIDWEST DIVISION

IOWA: SM, Jim Lasley, N0JL—ASM: N0LDD—SEC: NA0R. ACC: N0IJP @ KE0BX. BM: K0IIR @ W0CXX. SGL: K0KD. TC: W0DIA. Note that the Fort Dodge ARC, Megahertz Manor Maniace of DSM and the Tama ARS are 100% ARRL clubs! Congrats gang! Talk about late delivery! I received a newsletter addressed to me as SCM this month! OARC had a program on county hunting. Looks like the time of year for dinner meetings. SEITS says the linked system is back up using a spare repeater. What is PEST? Check NASA! Siouxland ARES is expecting to have a new repeater on 147.240 soon to facilitate comms to NWS in SD. Made a trip to MN the other day. Stopped for gas and met KF0NV! DMRAA reports on their activity for the MS150. They also report help from Iowa City and Knoxville. Many have noted that "informed sources" say we may have restructuring by the time you read this. Sorry to note the loss this month of WB0WCI, KF0UY, and W0DLJ. Congratulations to W0EJ, our new Midwest Division Director. I know that he and Bruce, K0BJ, will be assets to the division and the League. I find the TIDXC reporting SS results and comments from members. N0PSF is the new EC for Hamilton Co. Welcome! TSARC is still working on their van. Never ends, does it Ernie? That wraps it up for another month and, for me, another year. As I write it is early December 1999. As you read, I hope Y2K went well. 73. Newsletters were received from OARC, FMARC, SEITS, SARA, DMRAA, TIDXC, NIARC, TSARC, IIARC. Traffic: W0SS 102, KA0ADF 77, N0JL 30. Tfc: W0SS 102, KA0ADF 77, N0JL 30.

KANSAS: SM Orlan Cook, W0OYH—ASM/ACC/OCC: Robert Summers, K0BXF. SEC: Joseph Plankinton, WD0DMV. SGL: Marshall Reese, AA0GL. Don't forget the ARRL state convention Aug 27 at Salina. By the time you read this in *QST*, Y2K will have come and gone. I hope it will be all gone. I wish ARRL MW Director, Lew Gordon, K4VX, and xyl wonderful retirement. I have enjoyed working with him serving HR. SRI abt our "KAR" Web site being not updated. Will have the problem fixed by next writing. Herm, WV0R, got HR some nice PR with articles of his 12 license class graduates in two newspapers. Well done Herm and congrats to you new hams. I welcome all Kansas HR news items for this column in time of trouble, remember 3920/7253 kHz for the Kansas emergency frequencies. I hope you all had a very nice Christmas es HNY. Jesus is the reason for the season. Oct Kansas Nets: sessions/QNI/QTC, KSBN31/1141/110 25/368/38 KMWN31/619/513 KWN31/892/517 CSTN 26/1721 /26 QKS 57/271/61 QKS-SS 11/29/4 JCA3/8/0 SEC 35/373/26 QNS KB0AMY DMV K0BXF AA0HJ AA0IQ N0LJR N0LKK KF4LM KB0WEQ. TEN 224 msgs 62 sessions Ks 65% KB0DTI AA0FO KX0I K0OU K0PY NB0Z WB0ZNY W0SS mgr. DTRN 62/672 /302 AA0OM W0WWR N0KFS KF0WS W0FE KB0AMY N0KJ

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MFJ uses super heavy duty components to make the world's finest legal limit tuner

MFJ uses super heavy duty components -- roller inductor, variable capacitors, antenna switch and balun -- to build the worldí s most popular high power antenna tuner.

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MFJ's *AirCore*™ roller inductor, new *gear-driven* turns counter and weighted spinner knob gives you exact inductance control for absolute minimum SWR.

You can match dipoles, verticals, inverted vees, random wires, beams, mobile whips, shortwave -- nearly any antenna. Use coax, random wire or balanced lines.

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You get everything you've ever wanted in a high power, full featured antenna tuner -- widest matching range, lighted Cross-Needle SWR/Wattmeter, massive transmitting variable capacitors, ceramic antenna switch, built-in dummy load, *TrueCurrent*™ Balun, *scratch-proof* Lexan front panel -- all in a sleek compact cabinet (10¾Wx4½Hx15D in).

MFJ AirCore™ Roller Inductor gives high-Q, low loss, high efficiency and high power handling.

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MFJ will repair or replace your MFJ-989C (at our option) *no matter what* for one year.

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MFJ-986 Two knob Differential-T™

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Two knob tuning (differential capacitor and *AirCore*™ roller inductor) makes tuning foolproof and easier than ever. Gives minimum SWR at only one setting. Handles 3 KW PEP SSB amplifier input power (1.5 KW output). Gear-driven turns counter, lighted peak/average Cross-Needle SWR/Wattmeter, antenna switch, balun. 1.8 to 30 MHz. 10¾Wx4½Hx15 in.

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A few more dollars steps you up to a KW tuner for an amp later. Handles 1.5 KW PEP SSB amplifier input power (800W output). Ideal for Ameritroní s AL-811H! *AirCore*™ roller inductor, gear-driven turns counter, pk/avg lighted Cross-Needle SWR/Wattmeter, antenna switch, balun, Lexan front, 1.8-30MHz. 10¾x4½x10⅞ in.

MFJ-969 300W Roller Inductor Tuner

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MFJ-941E super value Tuner

MFJ-941E **$119.95**

The most for your money! Handles 300 Watts PEP, covers 1.8-30 MHz, *lighted* Cross-Needle SWR/Wattmeter, 8 position antenna switch, 4:1 balun, 1000 volt capacitors, Lexan front panel. Sleek 10½Wx2½Hx7D in.

MFJ-945E HF+6 Meter mobile Tuner

MFJ-945E **$109.95**

Extends your mobile antenna bandwidth so you doní t have to stop, go outside and adjust your antenna. Tiny 8x2x6 in. *Lighted* Cross-Needle SWR/Wattmeter. Lamp and bypass switches. Covers 1.8-30 MHz *and* 6 Meters. 300 Watts PEP. **MFJ-20, $4.95,** mobile mount.

MFJ-971 portable/QRP Tuner

MFJ-971 **$99.95**

Tunes coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle Meter. SWR, 30/300 or 6 Watt QRP ranges. Matches popular MFJ transceivers. Tiny 6x6½x2½ inches.

MFJ-901B smallest Versa Tuner

MFJ-901B **$79.95**

MFJí s smallest (5x2x6 in.) and most affordable wide range 200 Watt PEP Versa tuner. Covers 1.8 to 30 MHz. Great for matching solid state rigs to linear amps.

MFJ-16010 random wire Tuner

MFJ-16010 **$49.95**

Operate all bands anywhere with MFJí s reversible L-network. Turns random wire into powerful transmitting antenna. 1.8-30 MHz. 200 Watts PEP. Tiny 2x3x4 in.

MFJ-906/903 6 Meter Tuners

MFJ-906 **$79.95**

MFJ-906 has lighted Cross-Needle SWR/Wattmeter, bypass switch. Handles 100 W FM, 200W SSB. **MFJ-903,** $49.95, Like MFJ-906, less SWR/Wattmeter, bypass switch.

MFJ-921/924 VHF/UHFTuners

MFJ-921 or MFJ-924 **$69.95**

MFJ-921 covers 2 Meters/220 MHz. **MFJ-924** covers 440 MHz. SWR/Wattmeter. 8x2½x3 inches. Simple 2-knob tuning for mobile or base.

MFJ-922 144/440 MHz Tuner

MFJ-922 **$79.95**

Ultra tiny 4x2½x1¼ inch tuner covers VHF 136-175 MHz and UHF 420-460 MHz. SWR/Wattmeter reads 60/150 Watts.

MFJ-931 artificial RF Ground

MFJ-931 **$79.95**

Creates artificial RF ground. Also electrically places a far away RF ground directly at your rig by tuning out reactance of connecting wire. Eliminates RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding. **MFJ-934, $169.95,** Artificial ground/300 Watt Tuner/Cross-Needle SWR/Wattmeter.

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Mgr. BBS reports:W1AW Bul/ Per/NTS AA0HJ 4/553/4 N0OBM 45/218/0. Tfc: N0KJ 518, K0PY 75, WB0ZNY 85, WA0KS 68, W0OYH 47, NB0Z 34, K0RY 27, W0WWR 23, KB0DTI 22, KX0I 22, N0ZIZ 22, KB0NDT 9, K0BJ 4.

MISSOURI: SM, Dale Bagley, K0KY—Many of the clubs in the Missouri Section are planning to assist local hospitals, emergency services providers, and Civil Defense with back up communication on the Y2K event. Lee Smith, W0DLS, President of the Linn County ARC reports that their organization will be working with the Pershing Hospital in Brookfield and members of the CMRA in Columbia, MO, to provide back-up communication between the hospitals. The Macon County ARC will share this communications link for the Samaritan Hospital. Mike Bellinger, K0UAA, secretary for the Metropolitan Emergency Coordinating Council, reports that the Kansas City area group has been active in planning for the Y2K event. When more information becomes available, about the efforts in the MO Section, it will be included in the monthly report. Tom Housworth, KI0JO, Section Traffic Manager and Assistant Section Mana-ger resigned his appointments. Charlie Boyd, KE0K, from Louisiana, MO, has accepted the position of Section Traffic Manager. Charlie has a world of experience and will do a great job as STM. The following are recently appointed Emergency Coordinators; Thad Huff, KC0AQG, Shelby County, Mike Weiseman, N0VXD, Chariton County Montie Barcus, N0AUY, Randolph County, and Walter Gunn, KC0BFG, Webster County. I want to thank all those Amateur Operators that have, as section appointees, served the ARRL and the MO Section so well. If we continue our efforts, 2000 should be a very good year. Net sess/QNI/QTC: Rollabillboard Net 29/280/3, Paul Revere 4/368/0.Audrain ARC 4/30/3. WAARCI 4/128/0. MTN 30/637/155.Hambutchers 21/682/30, TEN for Nov 60 sess, 249 tfc, MO 87% with W2RRX, W9FE, W0OUD, K0PH, W0WFF, WO0X, W0SS. Tfc: KE0K 214, KG0IV 36. PSHR: KE0K 191, KG0IV 80.

NEBRASKA: SM, Bill McCollum, KE0XQ—ASMs: W0KVM, N0MT, WB0ULH, WY0F & WB0YWO. It is with deep regret to inform you that the following amateurs have become Silent Keys; W0QXR - Herb Curry, KB0BMG – Homer White and N0WJX – Merv Kirkpatrick. Herb and Homer were members of the AK-SAR-BEN ARC. Merv had been the NM for the W0IRZ Memorial Net. I am pleased to announce that Doug, N0UUZ has been appointed NM of the Midlands ARES Net effective January 1. He replaces Dave, WJ0Z, who held the position for 5 years. Thank you Dave for all your hard work! On Saturday Dec 11th, members of the AK-SAR-BEN took part in the "North Pole Net". This allows children at area hospitals to see and talk to Santa on amateur radio/ tv. A big thank you goes to Jim, KF0FO (Ho Ho Ho) for filling in for Santa at such a busy time of the year. With the change in club officers, don't forget to notify ARRL HQ. I would like to take this opportunity to thank K4VX for his years as our Director and I know he will be kept busy chasing DX! I am looking forward to working with our new Director, W0EJ. Net Reports; MID NE ARES: QNI 376, QTC 3 & 30 sessions. NESN: QNI 812, QTC 25 & 30 sessions. W0IRZ Mem Net: QNI 64, QTC 4 & 4 sessions. NECN: QNI 350, QTC14 & 26 sessions. ENE 2M ARES: QNI 422, QTC 2 & 30 sessions. NE 40: QNI 332, QTC 3 & 28 sessions. NMPN: QNI 328, QTC 6 & 30 sessions. Lincoln/Logan ARES: QNI 164, QTC 2 & 13 sessions. Tfc: K0PTK 100, W0AP 54, KE0XQ 36, K0OAL 32, W0RWA 10, WY0F 8, WD0BFO 6, KA0DBK 3, KB0MTT 2, W0EXK 2, W0UJI 2, K0AEM 2, KA0DOC 2. PSHR: KA0DBK 110, KB0YTM 13.

NEW ENGLAND DIVISION

CONNECTICUT: SM, Betsey Doane, K1EIC—BM: KD1YV. OOC: WA1TJT. PIC: W1FXQ. SEC: WA1D. SGL: K1AH. STM: K1HEJ. TC: W1FAI. Members of the Candlewood ARA were real busy in November supporting Amateur Radio in Danbury's pending tower legislation. Many members attended the hearing on November 23. Volunteer Attorney Dale, NA1L, was very helpful in this project which resulted in support from the City of Danbury and others. CARA's concerns will be addressed in follow-on modifications to the petition. Many thanks to all who participated and congratulations! Special thanks go to Jeff, WB3DLG, Club President, Dale NA1L, George, N1GS, Lou W1QJ, Seabury AA1MY and Bill N1NIQ. This is another example of a FB pro job by CT hams! The Meriden ARC always gives out certificates at their holiday party. Once again, Joel, N1JEO, received the Elmer of the Year Certificate and Bob, KB1CIW, received the Ham of the Year Award! Bob is an enthusiastic newer op who has really been working hard for the Club. Joel spends untold hours helping others in the hobby—he just finished teaching another class. Your SM was surprised and delighted to receive a certificate of thanks and appreciation at this gathering! Yes, for once in my life folks, I was speechless! THANKS! Why not try something different in the New Year. When your club has an activity, write a story about it and put it in the newspaper inviting those interested to your meeting. The work that PIC Al, W1FXQ, is doing for Newington ARL is incredible. Contact Al or me for examples of really informative PR. Sometimes it's hard to start writing the notice, but take a hint from Al and you won't have any trouble! Net Sess/QNI /QTC: ECTN 30/255/140; WESCON 30/279/125. NVTN 30/183 /62. CPN 30/267/97; CN 28/84/34. Bears of Manchester: 26 /341/413. Correction to Jan *QST*'s Bears of Manchester report: 28 sess, 310 QNI, 410 QTC. Tfc: NM1K 1914, KA1VEC 527, WA4QXT 238, KA1GWE 188, KE1AI 164, K1STM 93, N1VXP 68, KB1CTC 33.

EASTERN MASSACHUSETTS: The following was submitted by STM Bill Wornham, NZ1D.

Net	*Sess*	*QTC*	*QNI*	*QTRNM*	
EMRI	60	150	192	534	K1SEC
EMRIPN	30	131	195	549	WA1FNM
EM2MN	30	139	329	472	N1LKJ
HHTN	30	100	255	265	N1IST
CITN	30	77	319	513	N1SGL
WARPSN	4	11	53	NA	K1BZD
NEEPN	3	4	8	NA	WA1FNM
*CHN	30	42	191	438	W2EAG

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Power your HF transceiver, 2 meter/440 MHz mobile/base and accessories with these new 25 or 45 Amp MFJ MightyLite™ Switching Power Supplies!

No RF hash . . . Super lightweight . . . Super small . . . Volt/Amp Meters . . .

MFJís new adjustable voltage switching power supplies do it all! Power your HF or 2M/440 MHz radio and accessories.

MFJís *MightyLites*™ are so light and small you can carry them in the palm of your hand! Take them with you anywhere.

No more picking up and hauling around heavy, bulky supplies that can give you a painful backache, pulled muscle or hernia.

MFJís 25 Amp *MightyLite*™ weighs just 3.7 lbs. -- thatís *5 times lighter* than an equivalent conventional power supply. MFJís 45 Amp is even more dramatic -- *8 times lighter* and weighs just 5.5 pounds!

No RF hash!

These babies are clean . . . Your buddies wonít hear *any* RF hash on your signal! *None* in your receiver either!

Some competing switching power supplies generate objectionable RF hash in your transmitted and received signal.

These super clean MFJ *MightyLites*™ meet all FCC Class B regulations.

Low Ripple . . . Highly Regulated

Less than 35 mV peak-to-peak ripple under 25 or 45 amp full load. Load regulation is better than 1.5% under full load.

Fully Protected

You wonít burn up our power supplies!

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← MFJ-4225MV
25 Amp
$149.95
plus s&h

MFJ-4245MV →
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They are fully protected with Over Voltage and Over Current protection circuits.

Worldwide Versatility

MFJ *MightyLites*™ can be used anywhere in the world! They have switchable AC input voltage and work from 85 to 135 VAC or 170 to 260 VAC. Replaceable fuse.

MightyLites™ . . . Mighty Features

Front-panel control lets you vary output from 9 to 15 Volts DC.

Front-panel has easy access five-way binding posts for heavy duty use and cigarette lighter socket for mobile accessories. MFJ-4245MV has two sets of quick-connects on the rear for accessories.

Brightly illuminated 3 inch meters let you monitor load voltage and current.

A whisper quiet internal fan efficiently cools your power supply for long life.

Two models to choose from . . .

MFJ-4225MV, $149.95. 25 Amps maximum or 22 Amps continuous. Weighs 3.7 pounds. Measures 5¼Wx4½Hx6D in.

MFJ-4245MV, $199.95. 45 Amps maximum or 40 Amps continuous. Weighs 5.5 pounds. Measures 7½Wx4¾Hx9D in.

NEW! 25 Amp *MightyLite*™

Super light, super compact switching power supply delivers 25 Amps maximum/22 Amps continuous at 13.8 Volts DC. Low ripple, highly regulated. *No RF Hash!* Five-way binding posts for high current. Quick connects for accessories. Over voltage/current protection. 110 or 220 VAC operation. Meets FCC Class B regs. 3.5 lbs. 5½Wx2½Hx10¼D in.

MFJ-4125
25 Amp
$109.95
plus s&h

MFJ 35/30 Amp Adjustable Regulated DC Power Supply

Massive 19.2 pound transformer . . . No RF hash . . . Adjustable 1 to 14 VDC . . .

MFJ-4035MV
$149.95
plus s&h

MFJís heavy duty conventional power supply is excellent for powering HF or 2 Meter/440 MHz transceiver/accessories.

A massive 19.2 pound transformer makes this power supply super heavy duty! It delivers 35 amps maximum and 30 amps continuous without even flexing its muscles. Plugs into any 110 VAC wall outlet.

Itís highly regulated with load regulation better than 1%. Ripple voltage is less than 30 mV. *No RF hash* -- itís super clean!

Fully protected -- has over voltage protection, fold back short circuit protection and over-temperature protection.

You get front panel adjustable voltage from 1 to 14 VDC with a convenient detent set at 13.8 VDC. A pair of front-panel meters let you monitor voltage and current.

Three sets of output terminals include a pair of heavy duty five-way binding posts for HF/VHF radios, two pairs of quick-connects for accessories and a covered cigarette lighter socket for mobile accessories.

A front-panel fuse holder makes fuse replacement easy. Whisper quiet fan speed increases as load current increases -- keeps components cool. 9½Wx6Hx9¾D inches.

MFJ *High Current* Multiple DC Power Outlets

Power two HF/VHF transceivers and six or more accessories from your 12 VDC power supply

MFJ-1118
$74.95
plus s&h

MFJ-1116
$49.95
plus s&h

MFJ-1112
$34.95
plus s&h

New!
MFJ-1117
$44.95
plus s&h

MFJ-1118, $74.95. This is MFJís most versatile and highest current *Deluxe Multiple DC Power Outlet.* Lets you power two HF and/or VHF transceivers and six or more accessories from your transceiverís main 12 VDC supply.

Two pairs of super heavy duty 30 amp 5-way binding posts connect your transceivers. Each pair is fused and RF bypassed. Handles 35 Amps total.Six pairs of heavy duty, RF bypassed 5-way binding posts let you power your accessories. They handle 15 Amps total, are protected by a master fuse and have an ON/OFF switch with ìONî LED indicator.

Built-in 0-25 VDC voltmeter. Six feet super heavy duty eight gauge color-coded cable with ring tongue terminals. Binding posts are spaced for standard dual banana plugs. Heavy duty aluminum construction. 12½x2¾x2½ in.

MFJ-1116, $49.95. Similar to MFJ-1118. No 30 amp posts. Has ìONî LED and 0-25 VDC voltmeter. 15 amps total.

MFJ-1112, $34.95. Similar to MFJ-1116. No on/off switch, LED, meter, fuse.

NEW! MFJ-1117, $54.95. For powering four HF /VHF radios (two at 35 Amps each and two at 35 Amps combined) simultaneously. Tiny 8x2x3 inches.

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Tfc: NZ1D 303, W2EAG 252, WA1TBY 192, WA1FNM 118, N1LKJ 116, KD1LE 75, KY1B 70, N1LAH 65, K1SEC 58, KB1EB 49, K1BZD 46, N1IST 45, NG1A 43, N1AJJ 36, N1OBL 28, N1TDF 28, WA1LPM 27, N1TPU 26, N1BNG 21, K8SH 18, WA1VRB 10, W1ON 6, N1VUX 5, NK1L 4.

MAINE: SM, Bill Woodhead, N1KAT- ASMs: WA1YNZ, KA1TKS. STM: NX1A. BM: W1JTH. SGL: W1AO. ACC: KA1RFD. OOC: KA1WRC. PIC: KD1OW. SEC: N1KGS. Asst Dirs: W1KX, KA1TKS, K1NIT. Web Site: N1WFO. Y2K and the offshoot of interest in Amateur Radio has just been phenomenal. At the Dec meeting of the Narraguas Bay AARC, Congressman John Baldacci took the challenge to study for his ham radio license. Hopefully, he will be successful and will be able to replace the late Barry Goldwater as our voice on Capitol Hill. After a visit with W1QU and W1JX, Senator Susan Collins has offered her support in the Amateur Radio Spectrum Protection Act. To show your support for your radio frequencies, please send a QSL card to all four of our Washington representatives, asking them for their support. This would make an excellent club project to get members involved before the "For Sale" sign goes up on frequencies dear to you. The QSL card crusade worked very well on passing of LD1800, the ant structure bill. With almost 5,000 amateurs in the state, we can make a significant impression on our representatives in Washington. Tfc: W1KX 92, KA1RFD 70, W1QU 56, AF1L 52, W1JTH 47, W1JX 44, N1JBD 25, KA2ZKM 21.

NEW HAMPSHIRE: SM, Mike Graham, K7CTW—ASMs: WW1Y, W1NH, WB1ASL, N1KIM. TC: WA1HOG. STM: WA1JVV. PIC: KA1GOZ. OOC: W1GTA. SGL: K1KM. BM: KH6GR. ACC: AA1QD. SEC (acting): WW1Y. Hope everyone survived Y2K. It's time to move on, eh? New NARC Officers are Don Hornbeck, K1EER - President; Larry "Spi" Spinak, K1CWZ - VP; Dave Pyle, KW1DX - Sec'y; Mark Wagner, N1ZYZ - Treas.; Colleen Gaffey, N1HAJ - Activities; Neil Rosenberg, N1DMA - Programs; Dave Banks, N1SUE - Membership. Congrats all. Also hearty congrats to William Beal, W1PNR for 60 years continuous membership in the ARRL, and to Anthony Fiore, W1LKM on 50 years continuous membership. I regret to inform you that Alan Merrill, W1FYR, of Gilsum, long-time member of NTS and Associate Member of the ARRL NTS EAN Staff, is a Silent Key. I have also been informed that Dick Brooks, K1ZJY/AAA1NH, of Barrington is a Silent Key. Dick was Director of the NH Army MARS. Our condolences to the families of both of these fine amateurs. Don't forget the annual NH QSO Party coming up February 6 & 7. Contact Ed, K2TE (**k2te@juno.com**) for particulars, or check the NHARA Website at **http://www.nhara.nhradio.org/**. Good luck to all and see you in the contest. Best 73. Net sess/QNI/QTC: GSFM 30/230/34, GSPN 23/70/24, TSEN4/59/4, VTNH 30/173/152. Tfc: W1PEX 943, W1FYR (SK) 168, K1TQY 166, WA1JVV 110, N1NH 100, W1ALE 39, N1CPX 16, KA1OTN 6.

RHODE ISLAND: SM, Armand, K1FLD—Pride in amateur radio public service was clearly evident at the Rockets for Schools Program held Nov 18 at Ninigret State Park, RI. Unable to get all the names of those who participated. Thanks to KC1RI, N1JOY, WB1P, W1YUT, K1QVX, N2PGD, KB1CMD, N1JMA, KE1LI and WA1RI. Time off work was taken by many of the volunteers and a great thanks to those and all those who help with the event. Rockets of many sizes were fired by students as well as senior rockets, 6-8 ft, were launched by the more experienced hobbyist. All centered around the feature event a Viper rocket takeoff to recover comet dust particles. This rocket was fired by NASA officials. The lift off was spectacular but extremely short as it took off with determined attitude to it's mission. All was successful except the recovery which was hampered by S-Band receiver problems aboard the Coast Guard vessel Monomoy. The C.G. vessel was later called away to assist a fishing boat in distress just when they were needed most to find the payload from the rocket. To this date, recovery has not happened. If a small rocket appears at beach near you notify Patrick, K1VQX. Recent meetings with Warwick and Providence officials took place to exchange ideas benefiting support for emergency comms. Great job by Sec N1JMA, DEC KB1CMD and all who helped. New ground is constantly being gained in having amateur radio as a resource in emergency community needs. Field Day is closer than you think - now is the time to start your plans for a great fun-filled event. 73 fer now, Armand, K1FLD.

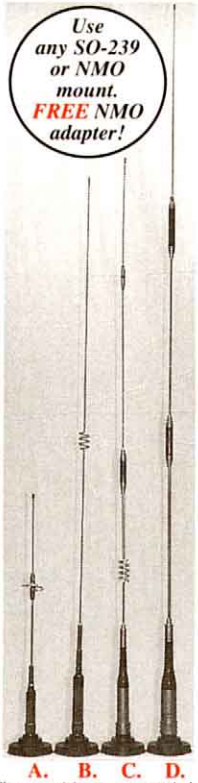
VERMONT: SM, Bob DeVarney, WE1U— February 26, 2000 - The Millennium Milton Hamfest and ARRL Vermont State Convention. The FIRST convention of the Millennium! All North Country hams should make their way to Milton for the celebration. We'll have the usual great flea market and auction, coupled with some great forums and demonstrations. DXers and contesters will again be treated to another YCCC meeting and forum at the hamfest. Vermont was well represented this past Field Day with 13 groups and 175 operators accounted for- a new record. Congratulations to RANV who took the top spot in 2A medium power nationwide! Hope to see you all on during the Vermont QSO Party, February 5-6. 73, Bob WE1U.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, W1UD, **w1ud@arrl.org**—ASM: N1LZC. ASM (digital) KD1SM. STM: W1SJV. SEC: K1VSG. WT1W. Santa delivered a Pegasus transceiver! After 50 years of staring at a box, it seems unusual to look at a monitor to see my rig. I hope Santa brought everyone exactly what they were hoping for. Reports were received concerning all section clubs Christmas party's. Everybody had an enjoyable evening and went away stuffed. All bands are in remarkable condition. Propagation on 10 meters is to all continents. Reminds me of the "58" solar cycle. Start in the cast at daybreak and follow the compass rose to Asia in the early evening. I worked CW SS, but not on a competitive level. Who said CW is dead? Forty meters was a layered mass of continuous signals from 7 to 7.1 kHz. I have never seen that happen even on Field Day. I want to compliment everyone that participated in the SET. We did better than last year! All clubs participated in the Y2K situation. Backup communication for municipalities was provided. A great job was done by all. Tfc: W1ZPB 103, KD1SM 8, N1ISB 16, W1SJV 13, W1UD 195.

NORTHWESTERN DIVISION

ALASKA: SM, Kent Petty, KL5T—OOC: KL7IKX. SEC: NL7DL.

MFJ *RuffRider*™ High Gain Mobile Antennas



A. B. C. D.
Shown on mini mag mounts, not included.

Each MFJ RuffRider™ mobile antenna comes with MFJ's unique 90 degree "fold-over" feature -- lets you pull into your garage without knocking your antenna over!

MFJ's heavy duty bases are extremely strong to handle super rugged rides and day-to-day highway abuse.

MFJ's *RuffRider*™ High Gain dual band 144/440 MHz mobile antenna series is for the serious mobile ham who demands the highest quality, premium products at reasonable prices.

They feature the finest quality construction using precision machined components. *RuffRiders*™ battle the elements, handle rugged rides and day-to-day highway abuse.

Stacked elements with high-Q phasing coils give you outstanding gain. Stay in solid contact!

Phased Radiators

Phased radiators flattens the radiation pattern and concentrates your power to give you *super gain.*

High-Q phasing coils are housed in weather proof high-tech plastic insulation. They're attached to stainless steel stacked radiators by solid metal end sections.

Heavy Duty Base

Rigid, heavy duty solid metal base reduces SWR flutter due to wind vibration. Two Allen set screws securely fastens radiator.

Specially treated center pin provides excellent electrical connection.

Quickly screws off -- helps prevents theft of your expensive rig.

Use SO-239 or NMO Mounts

RuffRiders™ have a PL-259 base mount for quick installation to your heavy duty SO-239 magnet, trunk/hatch, gutter or mirror mount.

A *free* NMO adapter is included for use with an NMO mount.

MFJ mounts are recommended.

All MFJ *RuffRiders*™ are dual band 144/440 MHz antennas and factory tuned for SWR less than 1.5:1 and have 50 Ohm impedance.

MFJ's *No Matter What*™ Warranty

All *RuffRider*™s are covered by MFJ's famous *No Matter What*™ one year limited warranty. MFJ will repair or replace (at our option) your antenna for one full year.

Choose from several different length and gain antennas . . .

A. ***RuffRider Junior***™**.** Premium, short 16½" antenna fits in any garage on any auto. ¼ Wave on 2 Meters, ½ Wave, gain on 440 MHz. 100 Watts. No fold-over.
MFJ-1402 **$34.95** add s/h

B. ***RuffRider High Power***™**.** Just 40" long handles full *200 Watts.* Great for high power mobile amp. ½ Wave, gain on 2 Meters, ⅝ Wave, gain on 440 MHz.
MFJ-1412 **$49.95** add s/h

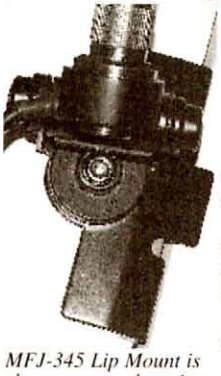
C. ***RuffRider High Gain***™**.** 41½" long antenna gives extra gain with little height increase. Handles 150 Watts. ½ Wave, gain on 2 Meters, ⅝ Wave, gain on 440 MHz.
MFJ-1422 **$49.95** add s/h

D. ***RuffRider Hyper Gain***™**.** 62½" brute gives a whopping gain on ⅞ Wave 2 Meters, ⅝ Wave, gain on 440 MHz. Our highest gain antenna. Handles 150 Watts.
MFJ-1432 **$69.95** add s/h

144/440 MHz Antenna Tuner with *built-in SWR/Wattmeter*
Covers 136 to 175 MHz. Handles 150 Watts. Compact 4x2⅛x1¼". *New!* MFJ-922 **$79.95**

MFJ *RuffRider*™ super heavy duty Antenna Mounts

Trunk/Hatchback *Lip* Mount



MFJ-345 Lip Mount is shown mounted vertically to a mini-van's angled hatchback lip. Note extra-wide mount with reinforcing tab at right -- safely secures heavy antennas. Swivel mount is adjusted so antenna is near vertical away from mini-van to clear luggage rack.

MFJ-345 **$34.95** add s/h

MFJ's *RuffRider*™ super heavy duty solid steel Trunk/Hatchback *Lip* Mount mounts to any lip on your vehicle.

Extra-wide *four* inch lip and large reinforcing tabs on each side safely distributes the load over your vehicle's lip.

Two large set screws on each end of the mounting lip locks your mount in place. A scratch-proof rubber guard protects your vehicle's finish.

Secures large VHF, UHF and medium size HF antennas even at highway speeds.

Mounts on lips at any angle. Two axis of rotation lets you position your antenna vertically, horizontally or at any desired angle. Serrated swivel joints locks securely in place with huge 3/8 inch set screw.

Has SO-239 base mount. Use adapter for NMO. Includes low loss coax with PL-259 connector, Allen wrenches and protection caps for SO-239 and locking screw, One year MFJ *No Matter What*™ limited warranty.

Mirror/Luggage *Pipe Clamp* Mount

MFJ-340 Pipe Clamp Mount is shown clamped solidly to vertical mirror support rod on a pickup truck. Antenna is slightly swiveled to the left and positioned about 30 degrees from vertical to clear cab of the pickup truck.

MFJ-340 **$34.95** add s/h

MFJ's *RuffRider*™ Mirror/Luggage *Pipe Clamp* Mount mounts on support rod of mirror, luggage rack or spare tire carrier of your truck, van, RV or SUV. Mounts on any horizontal, vertical or angled rod or pipe up to 5/8 inches in diameter.

Secures VHF, UHF and medium size HF antennas even at highway speeds.

Two axis of rotation lets you position your antenna to any desired angle. Serrated swivel joints locks securely in place with huge 3/8 inch set screw.

Convenient *Thumb and Finger* turn knob makes fold-over operation quick and easy. Locks in twelve positions.

Fold down your antenna at night when pulling into your garage and quickly put it back up to its operating position in the morning.

Has SO-239 base mount. Use adapter for NMO. Includes low loss coax with PL-259 connector, Allen wrenches and protection caps for SO-239 base mount and locking screw, MFJ's famous One year *No Matter What*™ limited warranty.

MFJ's *MaxStrength*™ Hi-Flux Antenna Magnet Mounts

MFJ's *MaxStrength*™ high-flux magnet mounts give you maximum pull strength -- your antenna stays on top of your vehicle at highway speeds.

MFJ-333 **$14.95** add s/h

MFJ-335 **$19.95** add s/h

Base is *Euro-style*, black poly or chrome finish with a Mylar protective undersheet.

MFJ magnet mounts come with 17 feet of tough RG-58 coax with a PL-259 connector. Easily reaches operating position.

Choose your favorite antenna to go with these fabulous low-profile mounts for outstanding mobile performance.

MFJ-333 BS/BM, $14.95. Light to medium duty magnet mount. Low profile 3.5 inch diameter black base weighs 1½ lbs. For small to medium size antennas.

MFJ-335 BS/BM, $19.95. Medium to heavy duty magnet mount. Super strong 5 inch diameter *chrome* base weighs a husky 2½ pounds. For medium to large size antennas. It's perfect for MFJ's *RuffRider*™ High Gain mobile antennas.

Order BS for SO-239 connector.
Order BM for NMO connector.

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• 1 Year *No Matter What*™ warranty • 30 day money back guarantee (less s/h) on orders from MFJ

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MFJ . . . the world leader in ham radio accessories!

DEC: KL7JBV, WL7GK. TC: AL7CE. TS: KL7CC, N1TX. ACC: KL0CY. Snipers Net 3920 Daily 1900 AST, Bust Net 7087 Daily 2000 AST, Motley Group 3933 Daily 2100 AST, and Alaska Pacific Net M-F 14.292 0830 AST. I want to thank Bennie, NL7XH, KL0CK, KE4TUU, WL7TY, NL7V, KL0MG, AL7BJ, WL7TP, WL7CIE, WL7UB, KL0CI for Two Rivers 200 Mile Dog Race communications. Yukon Quest and Iditarod races need hams. KL7EB was appointed as another Assistant Director to Greg Milnes, W7OZ. You are invited to join South Central ARES at 0930 Saturday, February 12, 2000. The contacts are Mike Borer, WL7CKB, 349-8191 or John Lynn, KL0CY, 337-1091. PSHR: AL7N 77, KL5T 73.

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP. (December report) The Spokane ARES joined about 60 other participating NWS stations in a nation-wide special event to recognize the contributions that Amateur Radio operators make to the NWS, as well as testing their capabilities as a back-up communications resource. The Spokane ARES SKYWARN core group operated for 24 hours in four-hour shifts and racked up hundreds of contacts with other stations, including being the center of a three-hour pile-up on 20 meters. Sorry to report that Bruce Kinzeback, W7BAO, of Wenatchee is a Silent Key. He had been an active ham for over 65 years. 10 out of 12 OO stations reported monitoring activity. Net Activity: WSN: QNI 890, tfc 320; Noontime Net: QNI 8157, tfc 303; WARTS: QNI 3549, tfc 137. Tfc: K7GXZ 360, W7GB 322, KA7EKL 83, K7BFL 65, KK7T 24, W7UVP 2. PSHR: W7GB 139, K7GXZ 119, W7UVP 56.

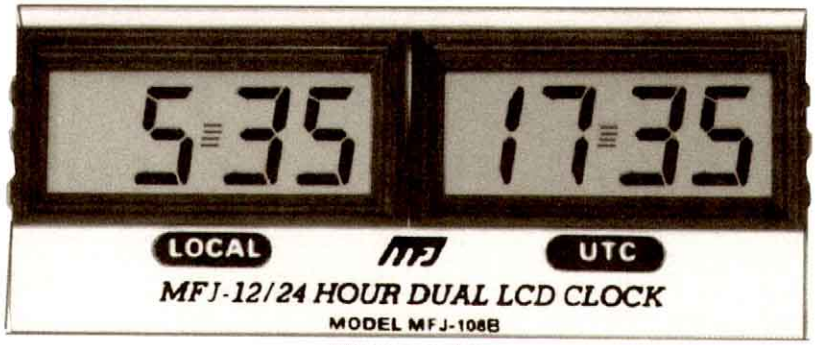
IDAHO: SM, M.P. Elliott, KF7ZQ — OOC: N7GHV. SEC: AA7VR. STM: W7GHT. 1999 ID Section Field Day winners are NA7ID and N7PI for the group/club category and Jerald Jensen, WC7F, for the individual station category. The Nampa and Pocatello groups tied with exactly the same score - 7880 points!!! NA7ID compiled their score with 9 operators, N7PI had 16 different operators. WC7F compiled 1795 points from his one-man operation. Congratulations!! A plaque commemorating the feat went to each winner. Have you thought about Field Day 2000? It will be coming up in June - a few short months away. I hear there will be more ID participants in 2000. Plan now! 73 — Mike, KF7ZQ. Tfc: W7GHT 407, KB7GZU 62, WB7VYH 54, and N7MPS 4. PSHR: W7GHT 119, WB7VYH 94, and N7MPS 31. Net (Sess/QNI/QTC/Mgr.): FARM - 30/2467/36/W7WJH; NWTN - 30/1266/88/KC7RNT; IDACD - 22/508/10/K7UBC; IMN - 30/433/381/N7MPS.

MONTANA: SM, Darrell Thomas N7KOR—The Yellowstone Amateur Radio Club in Billings MT and the Great Falls Area Amateur Radio Club in Great Falls MT both participated in the National Weather Service Special Event Stations by setting up and operating from the National Weather Service Offices in their respective cities. I do not have a total contact report for Billings but Great Falls reported 555 contacts. Both groups reported having a very enjoyable time working the event. The weather service in Montana has been very involved with hams and their work with the weather spotter program. Congratulations to the Gallatin Ham Radio Club at Bozeman MT upon obtaining 100% ARRL Membership among their club members. They are the second club in the Montana Section to achieve this goal. Congratulations again to a well-organized and active club. Net/QNI/QTC/NM MSN 110/1 W7OW; MTN 1952/43 N7AIK. PSHR: N7AIK 125.

OREGON: SM, Bill Sawders, K7ZM—ASM: KK7CW. ASM: KG7OK. SEC: WB7NML. STM: W7IZ. SGL: N7QQU. OOC: NB7J. STC: AB7HB. ACC: K7SQ. The ARES/RACES workshop in Portland was an excellent training opportunity for all those who attended. Speakers and instructors included Tami Burroughs, KB7HEK, Sharon Kennedy, KD7CWP, and John Beinhauer, W7BND, all from Oregon Emergency Management. Other ARES/RACES officials participated in the event, which made for an excellent one-day training session. More such programs are on tap, and all DECs, and ECs should try to attend. The Lincoln County Amateur Club has new 2000 officers. President is John Wilson, KL0ND, VP is Sean Hartley, KC7TYE, Secretary, Kyle, Matthews, KD7DEQ, and Treasurer, Sanie King, KC7PNK. The 2000 Hamfair season kicks off this month on Saturday, February 19th, as the Salem Repeater Association and Oregon Coast Emergency Repeater, Inc. proudly present the Year 2000 Salem Hamfair in Rickreall. Go west of Salem, on highway 22, then south on highway 99W to the Polk County fairgrounds. Doors open at 9 AM. See you there, and keep in touch! NTS traffic totals for November: KK1A 400, N7DRP 145, K6AGD 108, K7NLM 89, W7VSE 70, KA7AID 49, KC7SRL 43.

WESTERN WASHINGTON: SM, Harry Lewis, W7JWJ—When the World Trade Organization visited Seattle during the late fall of 1999, the ARES/ACS units were ready for possible communication interruptions to police and fire operations. During the four-day event over 500 hours were logged by Amateur volunteers assisting emergency management and city officials, not necessarily in amateur communications, but someone had to deliver those 2500 box lunches to the police on duty. ARES ears were tuned to various repeaters and communication frequencies to provide valuable input to those so requesting. In addition the Official Observers spent approximately 220 hours monitoring and finding it necessary to send just two advisory cards. In Clark County, ARES members brought with them their 72-hour emergency kits to a monthly planning meeting with certificates awarded to the top three. My kit consists of a five-gallon paint pail stuffed with food, water, yellow vest, ARES roster, hard hat and back-up handheld. It floats! DEC Monte Simpson, W7MLS reports history in the making when over 30 volunteers from Clallam, Cowitz, Grays Harbor, Jefferson, Kitsap, Lewis, Mason, Pacific, Pierce and Wahkiakum County's ARES & RACES groups participated in a Washington State Patrol alternative communications exercise by staffing EOCs in each county. This event required over 200 hours of planning and was coordinated by DEC W7MLS, Monte Simpson. Kudos to those that participated. Phoebe Witham Wahkiakum County DEM Director visited the residence of KB7UED as an observer. The Communications Academy for this spring will be May 6-7 jointly sponsored by Seattle ACS, Medical Services Teams, King County EOC Support Team, and County ARES. Possible site the old Sand Point Naval base. The new Microsoft Amateur Radio Club has requested ARRL affiliation and is off and running with over 30 members. The Pactor station at Camp Murray is operational with messages received during a Y2K exercise

MFJ 24/12 Hour Clocks



Shown actual size

Dual 24/12 hour LCD Clock

MFJ-108B
$19.95 plus s&h

MFJ-108B dual clock has separate 24 hour and 12 hour displays. Lets you read both UTC and local time simultaneously. Features huge high-contrast 5/8 inch LCD numerals that makes it easy to read across the room. Mounted in solid brushed aluminum frame with sloped face for easy viewing. Synchronizable to WWV for split-second timing. Quartz controlled for excellent accuracy. Long life battery included. 4½Wx1D x2H in. MFJís famous *No Matter What*™ one year limited warranty. *$6 s&h.*

DXerís Wall Clocks

MFJ-125, $29.95. 12 inch DXerís Quartz wall clock gives 24 hour time plus more. Has three smaller independently settable dials for 12 hour time, day of week and date. No more day/date confusion when logging DX! Highly visible, easy-to-read dials! Has Seconds hand.

MFJ-115, $24.95. Set this 24 hour clock to UTC/ GMT and you can determine the time in any time zone of the world at any time of the day. Premier world cities encircle its colorful world map face to indicate time zone. 12 inch face is easy to see across room. Has Seconds hand.

MFJ-105C, $19.95. *Worldís most popular ham radio wall clock!* True 24 hour Quartz movement. Huge 12 inch black face with large white numerals give excellent visibility across room. Attractive gold colored hour, minute and seconds hands.

MFJ-126, $24.95. 12 hour Quartz movement gives 12 hour time on inner dial (for XYL) and 1200 to 2400 hour time on its outer dial (for you). Attractive clean, white face is highly visible. Real glass cover! Handsome hunter green trim. Has seconds hand.

Hi-Contrast LCD Clocks

MFJ-119B, $49.95. Giant LCD Display 24/12 Hour Clock. Has *giant* see-across-the-shack 2¼ inch time digits. Digital calendar or clock modes. Displays inside temperature (F/C), relative humidity, month, date and day of week. Handsome hunter green and tan color. Wall mount. 8½x9 inches.

MFJ-118, $24.95. 24/12 hour clock has jumbo 1¼ inch LCD digits. Displays 24 or 12 hour time, year, month, date, and day of week. 100 year full calendar. Hang on wall or desk mount. 5¾Wx2½Hx½D in.

MFJ-107B, $9.95. 24 hour UTC Clock has large 5/8 inch LCD numerals. Synchronizable to WWV. Solid brushed aluminum frame lasts for years. Long life battery included. 2¼x1x2 in.

MFJ-112, $24.95. 24/12 Hour World Map LCD Clock displays time in *every time zone in the world.* Selected time zone flashes on LCD world map. Displays 24 or 12 hours, minutes, seconds, year, month, date, day, time zones, cities. Single button accesses pre-set second time zone. Alarms for two time zones. Adjusts for daylight savings time.

MFJ-152, $24.95. Read Indoor *and* Outdoor temperatures *and* 24/12 Hour time at-a-glance on huge 3/4 inch LCD digits! Choose F or C. Stores minimum and maximum temperature readings. Has backlight for in-the-dark viewing, outdoor temperature sensor with ten foot cable.

Bright LED Clocks

MFJ-114B, $59.95. Bright, GIANT 1.75 inch red LEDs are the biggest and brightest weíve ever seen! 24 or 12 hour time with *seconds* digits. Easily seen 50 feet away -- even in the dark! 110 VAC. Great on your desk or mounted on the wall! 12½Wx4½ in.

MFJ-116, $14.95. Big bright 5/8 inch LED digits. 24 or 12 hour, 9 min. ID timer, battery back up. Black. 110VAC.
MFJ-116DC, $19.95. 12 VDC, plugs in cigarette lighter. *Great for motorhomes and truckers!* 12 hour only.

Monster Display *Atomic Clock* with PinPointAccuracy™

MFJ-120, $69.95. 24/12 hour *Atomic Clock* automatically receives WWVB for millisecond accuracy. Monster 2 inch LCD characters. Reads relative humidity and temperature (F or C). Has alarm. Attractive metallic copper color. Use on desk or mount on wall. Giant 8x10½Wx¾D inch showpiece.

MFJ-388
$29.95
MFJ *CyberEAR*™
Tiny powerful MFJ *CyberEar*™ plugs in and loops over ear -- captures and amplifies sounds by 12 dB! Extends your hearing range, helps you hear every word at hamfests and club talks -- even if youíre on the back row! Great for eyeball QSOs. 30 day money back if not absolutely delighted. *Not a hearing aid.*

7 Band WeatherAlert

MFJ-8200
$29.95 plus s&h

Receive continuous weather info/ warnings on all 7 weather channels: 162.4/.425/.45/.475/.5/.525/.55 MHz from 380 U.S. locations 24 hours/day. Also includes AM/FM radio, spotlight, siren, flashing light for emergencies. Water resistant cabinet. Shoulder strap. Great for hamfests, DXpeditions, camping.

14-in-1 HamTool™

MFJ-7604
$19.95 plus s&h

Ham Radioís most versatile tool! This 14-in-1 tool pocket-size toolbox is all you need for putting up antennas or working on rigs. Includes needle-nose pliers with wire cutters and jaws for gripping. Has flathead and Phillips screw drivers, knife, ruler, file, punch, more! Stainless steel, belt carrying case.

HamGear™ Waistpak

MFJ-6200
$15.95 plus s&h

MFJís *HamGear™ WaistPak™* is the perfect hamfest, DXpedition or field day hands-free carry-all. Has amazing 9 spots to put your ham radio gear, tools, accessories and refreshments. Foam padded and comfortable. Made of heavy duty twill burlap for long life. Features tough webbed belting with solid plastic buckle.

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from Clark County. Digital stations were used at BPA, WADOT, Vancouver Operation Center, Red Cross, and District 11 Fire Station. Guemes Island somehow qualifies for DX status and now the only active Ham on the island Gail Nicolis, KD7FTB, is a member of ARES. Thanks to Chuck Lindenberg, W7BXH, for faithful EC service to his community. Visit the Washington State Net (WSN) Web site (**http//www.iea.com/~donf/wsn.html**). The WSN newsletter will be posted there. Reporting top traffic via STM W7ZIW is K7BDU with a traffic total of 1173. K7TVA attended a terrorism conference and reports introducing many emergency professionals to Amateur Radio and traffic handling. The Western Washington Repeater Association is looking for constructive comments on how better WWARA can serve the users of the repeater systems in Western Washington (**http://www.wwara.org/problems_comments.htm**). 73.

PACIFIC DIVISION

EAST BAY: SM, Bob Vallio, W6RGG—ASM: KF6RCO. SEC: KE6NVU. DECs: WA6TGF/Alameda County, KO6JR/Contra Costa County, WA7IND/Napa County, K6HEW/Solano County, N6UOW/Training, KE6HCI/Administration, W6CPO/Technical Services, KQ6TM/Section Plans and Administration. STM: K6APW. OOC: W6NKF. TS: KF6NY. Check out the EB WWW page at **http://www.pdarrl.org/ebsec/**. Webmaster is KB6MP. Twenty-one members of the Alameda County Sheriff's Communications Team (RACES) provided additional comms for the Sheriff's patrol units on Halloween eve. ORCA members provided comms for the Oakland Fire Dept. as part of their SET activities, and used packet to help score the Oakland Rowing Regatta. EBARC mourns the loss of Life Member K6ZR. VVRC's newsletter, THE VVRC Repeater, features monthly bios written by their members. LARK welcomes new member KE6CTA, and congratulates Justin and Bill Bonnar, who took and passed their tests at Pacificon. CCCC welcomed new members KF6WXC, K3ZJJ, & KE6HID. MDARC welcomes new members KD7HER, KE6YAW, KE6ZZG & KQ6QP. NALCO will be on-call for the Berkeley FD for Y2K. SARS mourns the loss of KC6AWA. The club just purchased a new dual-band antenna for their 147.180 and 440.050 repeaters. Nov tfc: W6DOB/658, WB6UZX/30. PSHR: W6DOB. BPL: W6DOB. Tfc nets: NCN1/3630/7PM; NCN2-SLOW SESSION/3705/9PM; NCN-VHF/145.21/7:30PM; RN6/3655/7:45 PM & 9:30 PM; PAN/3651/7052/8:30 PM. Your check-ins are always welcome.

NEVADA: SM, Bob Davis, K7IY—ASM: Jan Welsh, NK7N. SEC: N7JEH. TC: NW7O. ACC: N7FFP. STM/SGL: N7CPP. PIC: WW7E. OOC: N7ELV. Hope everyone in the Section has had a great Holiday Season. By now, most of the clubs have new board members and officers...please advise me of any changes in your clubs elected positions at the earliest convenience and please see that I continue to receive your newsletters, thank you. This may be a good time to request a copy of your clubs activity schedule for the year as soon as it is available. We may see an increase in club membership in the coming months, and as a reminder, this would be a great time to suggest membership in the League also. There has been some talk in the affiliated Clubs of attempting to promote increased communications between the clubs and to share more ideas of what works and what doesn't. Would appreciate any input regarding this idea. My Thanks again for a job well done by all the Nevada Section Appointee's in the past year. Look for new Section Appointments next month. Hi to Jim, KI7GH & Teresa, N7TSE. Thanks & 73, Bob, K7IY. Tfc: N7CPP 20.

PACIFIC: SM, Ron Phillips, AH6HN—ASMs: Harry Nishiyama, KH6FKG, Lee Wical, KH6BZF, Jim Reid, KH7M, George Heloca, Sr. KH6ANA;Mel Fukunaga KH6H. SEC: Dennis Carvalho, KH7H. TC: Chuck Cartwright, AH7Y. PIC: Russ Roberts, KH6JRM. ACC: Bob Schneider, AH6J. From all reports, the November issue of *QST* delivery to Hawaii was very poor. Please keep the reports coming, however. BIARC elected their new officers for year 2000. The BIARC meeting guest speaker was Harry Kim, Civil Defense Director. He spoke for 1.5 hours and passed out a very informative brochure on the Y2K issue. He reported that all systems for this island are covered. The SM passed out Public Service Commendation certificates for those hams involved in public support communications. Richard LaChance, WH6T, received the Certificate of Merit as recommended by Lee Wical. Congrats again, Richard. Please welcome aboard, Dan Spears, NL7UW, as a new OO from Oahu. Dan is looking forward to his new assignment. A committee was formed to evaluate the consideration of a Hawaii only Section. So far the response has been extremely favorable. Thanks to all for your participation. Aloha and 73,Ron, AH6HN, Pac Section Manager.

SACRAMENTO VALLEY: SM, Jettie Hill, W6RFF—New Emergency Coordinator for Butte County is Ken White, KC6RSS. Thanks to Betty, KF6BOI, for her past help in Butte. Other ECs appointed by SEC, K6BZ are WA6EHE and KN6NG for Sacramento area, KF6KDD Tehama, KA5BTR West El Dorado county. Congratulations to Bob Vallio, W6RGG, on his election as Pacific Division Vice Director. I have known Bob for many years, and we are still friends, even though he got more votes than me! As I write this in December, most club newsletters contain the following; Election of Officers, cues and Christmas parties. Several invitations to parties are in hand, and I would like to be able to attend all, but time does not allow that. As the New Year has not as yet arrived, we can only guess at any Y2K problems. Some of the cities are setting up Amateur Radio patrols, just in case there are problems. With the new year, I hope that you all volunteer to help out your local clubs and repeaters. The club officers need your participation. I received a newsletter from the "Rural Amateur Radio Association," The loneliest Ham Club in America (Nevada). Mother Lode DXCC members have been busy in the fall contests. Ken, K6DB, went all out for the CQWW CW contest. MLDXCC looking for new members - DXers and/or contesters. Sacramento ARC members have been building "Pixie 2" QRP CW Transceiver kits. This is a type of project most clubs could do, and the cost is low. Thanks to appointees for their help during the year. 73, Jettie.

SAN FRANCISCO: SM, Len Gwinn, WA6KLK—ASM: N6KM. SEC: WB6TMS. TC: N1AL. I hope to be able to visit all clubs after the first of the year. Humbolt hams suggest, with permission, leaving radio magazines, with local contact numbers, in doctor and dentist offices, as well as the barber shop. Great

MFJ Contest Voice Keyer

Brand New design . . . Microprocessor controlled

Transformer-coupled -- No RFI, hum or feedback . . . 75 seconds total, 5-messages . . . Can be computer-controlled by CT, NA, etc . . . Records received audio . . .

Let this *new* microprocessor controlled MFJ *Contest Voice Keyer*™ call CQ, send your call and do contest exchanges for you in your own voice!

Store frequently used phrases like "CQ Contest this is AA5MT", "You're 59" . . . "Qth is Mississippi" and more! Contest by pressing a few buttons and save your voice.

You can record and play back five natural sounding messages in a total of 75 seconds. EEPROM technology keeps messages stored for up to 100 years -- no battery backup needed.

Repeat messages continuously and vary the repeat delay from 3 to 500 seconds. Makes calling CQ so easy and it's also a great voice beacon.

A receive audio jack lets you record and play back off-the-air signals -- great help if you didn't get it right the first time! No more "*Please repeat*".

A playing message can be halted by pressing the *Stop Button*, your PTT mic button or by your VOX PTT line. A closure to ground via remote control or computer can also halt messages.

MFJ-434
$179.95
plus s&h

Has jack for remote or computer control (using CT, NA or other program and its interface). Lets you select, play and cancel messages.

The MFJ-434 is transparent to your microphone -- your mic's audio characteristics do not change when your MFJ-434 is installed. Dual controls make it easy to tailor audio level to match your voice.

All audio lines are RF filtered to eliminate RFI, audio feedback and distortion. An audio isolation transformer totally eliminates hum and distortion caused by ground loops.

It's easy to use -- just plug in your 8 pin microphone cable and plug the MFJ-434 shielded cable into your transceiver's mic connector. Internal jumpers let you customize it to Kenwood, Icom, Yaesu, Alinco or Radio Shack rigs. Use your station or built-in microphone for recording.

Built-in speaker-amplifier lets you monitor stored messages. 3.5 mm speaker/headphone jack. SMT technology. Use 9 Volt battery, 9-15 VDC or 110 VAC with optional MFJ-1312B, $14.95. 6½Wx2½Hx6½D inches.

MFJ-73, $29.95. Remote Control Head with cable for MFJ-434.

MFJ *Professional grade* Boom Mic Headphones

For marathon contesting, DXing, traffic nets, ragchewing . . . These lightweight, fully padded Boom Mic Headphones make operating superbly comfortable! Flexible gooseneck microphone boom and speech frequency tailored microphone cuts through noise and QRM!

This *professional grade* MFJ Boom-Mic Headphones set is designed for contesting, DXing and traffic nets. Features *total comfort* design with leatherette padding for operating long hours.

Superb 3/4 inch thick padding on each ear and headband lets you wear your headset all day long! So super lightweight, you won't even know they're there! Headband adjusts for a perfect fit to keep out external noise.

The headphones' frequency response is enhnanced for communications to bring out speech fidelity that you never knew existed. Signals never sounded so crystal clear.

The flexible microphone boom lets you position the mic comfortably at an optimum distance to minimize silibant sounds.

MFJ's frequency tailored microphone element lets you bust through noise and QRM!

Extra-long 9⅔ feet of cable lets you move about your ham shack!

Has standard 1/4 inch jack for headphones and 3.5 mm jack for microphone. Build your own adaptor or use MFJ's pre-wired adaptors to match your transceiver. **Order** MFJ-5396 Y/K/I (YAESU, KENWOOD, ICOM respectively). $15.95 each.

Even casual operators will appreciate the advantages of MFJ's superbly crafted Boom-Mic headphones for *hands-free* operating at an incredibly low price.

MFJ-392, $19.95. Communication Headphones only. Great for ham radio, shortwave listening -- all modes, SSB/FM/AM/ Data/CW.

Each phone has individual volume and speech enhancement control. Superb leatherette padding.

Both MFJ-392 and MFJ-396 have MFJ *No Matter What*™ one year limited warranty.

MFJ Communications Speaker

MFJ-281
$12.95
Ship Code A

SSB, FM, AM, and CW never sounded so crystal clear! Plug in this MFJ-281 *ClearTone*™ speaker and bring out communication speech fidelity that you never knew existed. Restores the smooth sinewave sound that CW naturally generates and makes copying easier. It was carefully designed to improve intelligibility of speech in the frequency range of 600 to 4000 Hz while reducing undesirable noise, static and hum. A top grade 3" Mylar cone speaker is mounted in a well designed baffle. Its fine mesh metal grille allows sound to radiate without muffling. 8 Watts, 8 Ohms. Six foot cord. 3.5 mm mono plug. 3¾x3x2¼ inches.

MFJ 12/24 Hour *DXers Watch*

MFJ-181
$39.95
plus $6 s&h

This *MFJ DXers Watch* lets you quickly check 12 hour local time and 24 hour time in time zones around the world. By noting day and night areas around its rotatable bezel, you can estimate which bands are open each hour to different parts of the world. You can even estimate best times of gray line propagation. It features a highly accurate *Japanese* quartz movement. Turn out the lights . . . *NiteGlo*™ hour, minute and second hands show up in the dark! Has date display. Well-known world cities encircle it's attractive world map face to indicate time zones. A durable stainless steel band adjusts to fit. Attractive giftbox has felt padding. A great gift!!!

MFJ 12/24 Hour LCD Clock

MFJ-108B
$19.95
plus $6 s&h

Dual Clock with separate 24 hour UTC and 12 hour local time displays. Large 5/8 inch LCD numerals, heavy brushed aluminum frame, sloped face, battery included. Synchronizable to WWV. 4½x1x2 in.

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Tech Help: (662) 323-0549

idea! Guaula hams working on a comm van. All counties participated in Y2K. Thanks everyone. Please send your area and club information, happenings, to WA6KLK, and participate and support nets and club meetings. OO, EC and traffic handlers please send in your reports. Sad to report WA6L, Ukiah, is a SK.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN—So, here we are in a new century moving forward in Amateur Radio. The new century will bring new technologies and new amended rules for the Amateur Radio service. The one constant is that Amateur Radio provides many opportunities for public service in emergency communications. I would urge all who would be interested in joining ARES and/or RACES groups to contact the Section Emergency Coordinator, Kent LeBarts, K6IN, for information. Kent can be reached via the Internet at: **k6in@elite.net** or by phone: 209-723-2020. I hope all had a wonderful holiday season and good luck and gud DX in the year 2000.

SANTA CLARA VALLEY: SM, Glenn Thomas, WB6W—SEC: KM6GE. BM: WB6MRQ. TC: WA6PWW. OOC: KB6FPW. The Naval Postgraduate School ARC will be holding their annual "Radiofest 2000" at the Stillwell Hall POM Annex, 4260 Gigling Rd in former Ft Ord on Saturday, Feb 19. Admission is free. Congrats to Andy Korsak on his new call, KR6DD. Still, I'll miss the double-takes of people who heard Andy's old call on VHF. There are not a lot of VE3s on VHF hereabouts! An informal group has started having lunch together every Wednesday at noon at Harry's Hofbrau on Saratoga Ave. Swing by and visit if you're in the area! The Los Cumbres ARC had their Christmas Dinner party. They normally meet on the third Thursday at 7:30 PM in Hewlett-Packard bldg 48 (Cupertino) in the Oak Room. Talk-in on K6FB/R 145.45- pl 100. The Santa Clara County Amateur Radio assc had their annual Christmas Lunch. They usually meet on second Mondays at 7:30 PM at HP Oak Room, contact Clark, KE6KXO, at 408-262-9334 for more info. The Saratoga ARA net meets every Tuesday at 7:30 PM on 28.4 MHz (SSB) and 146.655- (114.8pl). The Garlic Valley ARC also had a Christmas dinner. They usually meet at 8 AM on the LAST Saturday of each month, at the Gavilan Restaurant in Gilroy on Monterey Avenue. Palo Alto Amateur Radio Association heard from Dick Kors, KM6EP, on "Mini-Satellites." PAARA meets the first Friday at 7:30 PM in the Menlo Park Recreation Center, 700 Alma Street, Menlo Park. For general information on clubs and other activities in the section, take a look at the SCV section Webpage at **http://www.pdarrl.org/scvsec/index.html**. If you'd like your club mentioned in these pages, send me a copy of your club newsletter to me at home or via e-mail (**wb6w@arrl.org**). I can't report it if you don't. See you next month! 73 de Glenn WB6W. Nov tfc: W6PRI 13.

ROANOKE DIVISION

NORTH CAROLINA: SM, W. Reed Whitten, AB4W—SEC: KE4JHJ. STM: K4IWW. TC: K4ITL. SGL: KI4AN. OOC: W4ZRA. PIC: KN4AQ. ACC: W4CC. BM: KD4YTU. Two years ago I announced that I would not seek election to a seventh term as Section Manager. I did this to encourage others to consider serving. ARRL has already mailed you the 300 word candidates' statements and the ballot, which is due back at HQ before Feb 18. It is important that all ARRL members submit a considered and informed vote. In order to assist you in your decision, the Section Web site **http://www.ncarrl.org** will have links to additional information from both candidates. This will also let the candidates avoid the burden and expense of additional mailings. *I am doing this because of my previously expressed my concerns about the intensity of the last election. I have questioned whether a highly charged and expensive approach to campaigning for an election was appropriate in a volunteer service organization.* The Section Manager is responsible for the operation of ARRL Field Organization. The SM's duties are to facilitate and promote many Amateur Radio activities within North Carolina. Emergency communications (ARES), traffic handling (NTS), interaction with state and local government, and publicizing the Amateur Radio Service are principal responsibilities. Resolving technical and interference problems, coordinating some club activities, and occasionally helping resolve minor disputes are also part of the job description. Your SM is sometimes required to act as a spokesman for North Carolina Amateurs. You, the voting members, will decide who will have the opportunity and privilege of serving as your SM. Look at what the candidates consider important, what they have done for Amateur Radio, AND don't forget to mail in your ballot. Then ... please continue to support Amateur Radio and the Field Organization through your participation in ARES (including SKYWARN), NTS, public service, and other activities. Elkin Hamfest Feb 20, Charlotte Hamfest Mar 11-12. Nov Tfc: W4EAT 620 (BPL), K4IWW 155, NC4ML 108, AA4YW 69, W4IRE 68, KE4JHJ 60, W4CC 54, AC4DV 45, AB4W 38 , KE4AHC 34, AD4XV 24, WD4MRD 19, W3HL 17, AC4ZO 15, KB8VCZ 14, WA4SRD 14, KR4ZJ 11, NT4K 11, KF4OZF 10, N0SU 6, KF4YHG 5, KT4CD 5, N2JLE 5, KR4OE 4.

SOUTH CAROLINA: SM, Les Shattuck, K4NK—Well we are on our way into a new year. As you know, I have to write this column several months early, and it makes getting up to date info in this column almost impossible. Hope Santa was good to you. Why not write or e-mail me and tell me what new rig or ham goodie you got. As for me, I think my XYL Joyce, N2PTW, went to the ARRL bookstore for my Christmas gifts. I have both towers up now and a new tribander on one. Thanks to K4NNP, ND4N and KE4VIS for their help. Probably still need to have another antenna party here. We have plenty of skilled antenna people here in the Greenville area, and if you need some help with your antenna or rig problems why not call me or send an e-mail. My address is **K4NK@aol.com** or **K4NK@arrl.org**. Tfc (Nov): Congrats to this month's PSHR winners: KA4UIV 158, WW4SC 122, KA4LRM 98. SAR tfc passed: WW4SC 335 (great job Ken), KA4UIV 105, KA4LRM 69, W4DRF 57, WA4UDG 42, WD4BUH 18, K4NK 16, W4CQB 9. Also, congratulations to the Blue Ridge 2-mtr net for the high score this month: 1402, K4SUG net manager.

VIRGINIA: SM, Lynn Gahagan, AF4CD—ASM: W4TLM. SEC: K4EC. ASM/DSEC: KR4UQ. SGL: KK4IY. TC: W4IN. PIC: W2MG. OOC: KR4UQ. STM/ ACC: AF4CD. Our SEC Frank Mackey reports that Tony Amato, KR4UQ, will be the new Deputy

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State RACES Officer. Tony, who has been serving under Frank as ASEC for Area "A" will now step up a position. The Deputy RACES Officer position has been vacant for some time with Tony filling in. The VDES has endorsed Tony for this position. In addition to working the many statewide issues, the Deputy works closely with VDES. Since there is not an ARRL appointment for the ARES Deputy SEC position, I have appointed KR4UQ ASM/DSEC. Tony will work directly under the SEC. Earl Evans, KE4NBX, the DEC 7 has been appointed by the SEC to replace Tony as ASEC Area "A". Earl has demonstrated that he is very capable of taking on the new position and did an outstanding job during the Floyd activation. Earl will also retain the DEC 7 position for the present time. Mike Lussier, K4MQF, has been tapped as the new EC for the City of Fredericksburg. Tom Harmon, KO4OX, has taken up the job as DEC 4. W2PVY, Joseph Glovanelli, now retains the title of OES for Fluvanna Co. Brian Squibb, W4PAJ, also has been appointed OES for Giles Co. Thanks to all the above for taking on these important responsibilities. Rosalie White, WA1STO, ARRL Field & Educational Services Manager has brought to my attention that the Va Digital Emergency Net ARC has once again achieved ARRL 100% Club status. This is at least the second year in a row that this club has retained this status and is the only club in the Va Section to have all members ARRL members. Congratulations to VDEN ARC! The club will be receiving a nice certificate from HQ. Virginia is rapidly becoming one of the most dynamic and exciting sections in the ARRL organization. Your present leadership officials in Virginia have worked very hard with me and together we have made many positive changes. As your Section Manager, I have had to deal with some very difficult and challenging decisions. It's not always an easy task but working as a team we have made tremendous progress over the past two years. Very 73 de AF4CD. Tfc: K4MTX 283, W3BBQ 192, KR4MU 152, WD4MIS 143, WA4DOX 126, K0IBS 78, N4ABM 57, W4CAC 37, KE4PAP 52, WB4ZNB 32, AF4CD 29, WB4UHC 26, W4UQ 13, K4JM 8, W4HDW 7, W4JLS 5, KB4CAU 6, WB2KQG 6, N4FNT 6, W4MWC 2, W4IN 2.

ROCKY MOUNTAIN DIVISION

COLORADO: SM, Tim Armagost, WB0TUB— ASM: Jeff Ryan, N0WPA. SEC: Mike Morgan, N5LPZ. STM: Mike Stansberry, K0TER. ACC: Ron Deutsch, NK0P. PIC: Erik Dyce, W0ERX. OOC: Karen Schultz, KA0CDN & Glenn Schultz, W0IJR. SGL: Mark Baker, KG0PA. TC: Bob Armstrong, AE0B. BM: Jerry Cassidy, N0MYY. As I write this in mid-December, we're just over two weeks away from Y2K, but by the time you read this, it hopefully passed without much more notice than any other New Year. The Colorado Council of Amateur Radio Clubs (CCARC) is looking for a few good hams. At their next meeting, a new director and frequency coordinator will be elected. Our longtime coordinator, Whit Brown, WB0CJX, is stepping down after many years of service. There was a very lively ARRL forum at the RMRL Swapfest in Golden. These forums are a great opportunity to find out what's up with ARRL, and to make your voice heard by section and division representatives. Next time you're at a swapfest, and you hear an ARRL forum announced, drop in! The Mountain Amateur Radio Club (Woodland Park) has started a regularly scheduled VE Session held the first Saturday of the odd numbered months (except January) at 10:00 AM. Contact Dean Buckhouse, KB0VVA, for more info. If you have items for this column, e-mail them to me at **n0wpa@arrl.net.** 73, de N0WPA. NTS traffic: AD0A 115, K0TER 103, N0UOD 27. CAWN totals: W0WPD 976, AA0ZR 598, N0NMP 528, W0GGP 481, N0JUS 389, K0HBZ 354, N0DKK 330, WB0VET 322, N0FCR 245, W0LVI 224, KB0QBF 179, KI0ND 160.

NEW MEXICO: SM, Joe T. Knight, W5PDY—ASM: K5BIS & N5ART. SEC: K6YEJ. STM: N7OIM. NMs: WA5UNO & W5UWY. TC: W8GY. ACC: N5ART. New Mexico Roadrunner Net handled 114 msgs with 1103 checkins. New Mexico Breakfast Club handled 225 msgs with 940 checkins. Yucca Net handled 26 msgs with 790 checkins. Caravan Club Net handled 3 msgs with 59 checkins. SCAT Net handled 14 msgs with 553 checkins. Four Corners Net handled 26 msgs with 324 checkins. GARS Net handled 4 msgs with 35 checkins. Rusty's Net handled 87 msgs with 674 checkins. Valencia Co Net handled 8 msgs with 37 checkins. The Socorro Hamfest was certainly a success. It was so good to have Riley Hollingsworth, K4ZDH, Walt Stenson, W0CP, and so many other fine speakers present. The tour of the VLA was outstanding and the weather was perfect. Parking was a minor problem, but you certainly got your exercise. Our thanks to the Socorro/NM Tech clubs for a fine hamfest. Understand that the Pecos Valley ARC is planning a hamfest, their first in many years. We all wish them great success. So many good newsletters this month. Can't start to recognize them all, but the efforts of the editors and their staff are always appreciated! Our VA Hospital Amateur Radio station, N5VA, had a fine Special Events Station during Veterans Day, and special thanks to KK5GX & KB5HA and all who manned the station for that event. Congratulations to W5IH on his 91st birthday on December 3. Vy sorry to report the passing of K5PES and W5OUJ. They will both certainly be missed. Best 73, W5PDY.

UTAH: SM, Mel Parkes, N5UVP—Don't forget to attend the Utah VHF Society Swap meet on 26 Feb at the National Guard Armory on Sunnyside Avenue in Salt Lake City 8:00 AM. There will be lot of interesting good stuff for sale come see what your ham shack may need. If your club or group is conducting an event you would like me to attend, please let me know. I would enjoy meeting with the hams in your area. Check out the Utah Hamfest 2000 web page at **http:\\www.utahhamfest.org** and register early. 73, Mel, N5UVP.

WYOMING: SM, Bob Williams, N7LKH—The Wyoming Section enthusiastically supported the NWS Special Event Station operation on 27 November at both the Cheyenne and the Riverton NWS stations. At Riverton, an HF station was set up by Larry Hudson, KD7BN, with help from several to operate on a single frequency at a time. Bob Johnston, WB7AHL, and Art Edmonds, KK7BZ, among others operated the station and served as control operators for Weather Service operators. They made about 25 contacts with other NWS stations and around 100 contacts overall. At Cheyenne, two HF stations and a VHF station were set up by the Shy-Wy ARC. With 18 operators they made 22 NWS contacts and 484 contacts overall including aero mobile,

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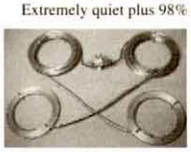

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marine mobile and even with the North Pole. Both the amateur operators and the NWS operators universally enjoyed the experience and most say they would like to do it again. It was an excellent example of the Amateur Radio and NWS communities working together, the same as when there is a weather emergency to be handled. Tfc: NN7H 399. PSHR: NN7H 185.

SOUTHEASTERN DIVISION

ALABAMA: SM Bill Cleveland KR4TZ—ASMs: W4XI, KT4XA, KD4PDQ. SEC: AF4HE. STM: WB4GM. BM: KA4ZXL. OOC: WB4GM. SGL: KU4PY. ACC: K4LI. TC: W4OZK. PIC: KA4MGE. I would like to congratulate and thank Shane Jackson (K4JSJ) for becoming the new Section Traffic Manager. Please send your net reports, PSHR, and station activity reports to him. Shane's e-mail address is jack728@mindspring.com. Its not too early to plan for the "Jamboree On The Air" (JOTA) in October. One of my goals this year is to have activities section wide. Please encourage your local Boy Scouts and Girl Scouts Troops to participate in this annual event. My plan is to introduce the Alabama Section to the area scout councils, and encourage the local Amateur Radio clubs to follow up with the local troops. Norris Landry (KB4KOY) will coordinate JOTA activities this year. You can call Norris at 256-236-4588. Support your traffic nets! 73, Bill KR4TZ. PSHR (Nov 99): AF4HE 181, WA4GQS 180, W4ZJY 176, AC4CS 54, WB4GM 149, KC4TLG 129, KC4VNO 123, W4CKS 118, WB4TVY 114, K4AKC 112, W4DGH 111, W4PIM 94, KC4PZA 90, W4ZBA 89, W4XI 88, W4NTI 72. SAR (Nov 99): WB4GM 195, W4ZJY 165, W4PIM 127, W4CKS 126, WA4GQS 88, AF4HE 55, KC4VNO 53, W4ZBA 34, K4AKC 28, AC4CS 19, W4DGH 17, W4XI 11, W4NTI 7.

GEORGIA: SM: Sandy Donahue, W4RU—ASM/So Ga: Marshall Thigpen, W4IS. ASM/Legal: Jim Altman, W4UCK. SEC: Tom Rogers, KR4OL. STM: Jim Hanna, AF4NS. SGL: Charles Griffin, WB4UVW. BM: Eddie Kosobucki, K4JNL. ACC: Bob Lear, K4SZ. OOC: Mike Swiderski, K4HBI. TC: Fred Runkle, K4KAZ. A joyous February to you all. I hope you are keeping warm this winter. I am delighted to announce that Mike Swiderski, K4HBI, is the new Official Observer Coordinator (OOC). Riley Hollingsworth said at the hamfest in November that the Amateur Auxiliary will become increasingly important in the regulation of our hobby. Mike has been licensed since forever and is active and experienced in a wide variety of ham activities. He should be very good at helping Riley clean-up our frequencies. Kennehoochee ARC new officers Chairman: Robert Harris, KF4OEG, Vice-chair: K4TYJ, Sec: W4CPU, Tres: N4TZM. Don't forget the 1st hamfest of the year at Dalton, Feb 26. Confederate Signal Corp elected new officers; Pres KE4BNG, Vice pres WA4OGE, Rec Sec W4BJT, Member Sec, W4DPZ. As you know, I like to eat, and the Christmas season saw me eat my way through the Christmas parties of the Alford, Gwinnett, West Ga, and Conyers clubs. Hope I never see another cooked carrot again. Speaking of Conyers, they have new officers; Pres KC4CGY, Vice pres KF4ASC, Sec KD4SLT, Tres KC4ELV. 73, Sandy. Tfc (Oct): AF4NS 97, WU4C 87, K4BEH 85, KA4HHE 82, AF4PX 66, K1FP 58, K4WKT 23, KU4WJ 23.

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—ASM-E Central District: AC4PF. ASM-W Panhandle District: KO4TT. ASM-APRS: WY8O. ACC: WA4B. BM: N4GMU. OOC: AF4EW. PIC: KF4HFC. SEC: WA4NDA. SGL: KC4N. STM: WX4H. TC: KO4TT. Packet: N4GMU. The month of November was preparing for Y2K. There has been a lot of planning, discussions, coordination, and cooperation among the various disaster organizations for Y2K. The ARRL Board of Directors approved the West Central Florida Section to be operational the middle of January, 2000, and, apparently, the newly-appointed officers got a head start. The newly-appointed WCF section manager has proposed that their SKYWARN program encompass a 15-county area that includes additional counties not in their section (1 in Southern Florida, and 5 in Northern Florida). We have four other NWS stations in NFL, and at no time has there been a problem. I will not agree for the new section to assume any responsibility of the Northern Florida Section. The Northern Florida Section has had outstanding coordination and cooperation with 3 other nearby sections: Georgia, Alabama, and Southern Florida. I have always worked for the improvement and enhancement of Amateur Radio. Things have been accomplished since I became Section Manager. For example, PRB-1 was made a State Law (first in the nation), getting the National MOU revised with the National Red Cross Office and to stop the recruiting of ARES personnel, the establishment of VOAD in Florida, and the State to recognize the Amateur community after hurricane Andrew. Before Andrew, the State would not accept emergency traffic from Amateurs, and now they highly respect Amateur Radio and need our assistance. 73 de Rudy. Tfc: NR2F 366, AF4PU 233, KE4OAV 226, N0ZO 200, KE4DNO 128, KE4PRB 88, KF4NFP 81, AD4DO 80, AF4GF 58, W5MEN 56, N9MN 50, K1JPG 45, KB4DCR 41, KF4TM 36, K4JTD 32, WB2FGL 32, WB8NER 24, W4KIX 23, KC4FL 22, KM4WC 21, N4EC 20, W8IM 19, WB2IMO 15, WA4EYU 12, WX4J 8, WB9GIU 8, AB4PG 7, N4ORZ 6.

SOUTHERN FLORIDA: SM, Phyllisan West, KA4FZI—With the new WCF Section beginning Jan 15 comes the challenge of replacing 48 excellent SFL appointees. They were presented ARRL Certificates of Merit by K4SCL (oldest living SFL SM) and by me at the Tampa hamfest in November. I appreciate their efforts serving ARRL in the SFL Section. I have been lining up new SFL cabinet people to replace them. Three replacement appointees coming on board are Sherri Brower, W4STB, as PIC, Jeff Beals, WA4AW, as ACC, and KC4ZHF as BM. Sherri, an advanced class licensee, was first licensed in 1989. She is an OES, PIO, LGL, and VE. She served on the FL Youth ARC Advisory Council, held several offices in the Viro Beach ARC, is active in ARES/RACES/EARS, FL State DCAT, YLRL, Vero Disaster Assistance Volunteers, St Lucie Repeater Assoc., and writes articles for various amateur publications. She will be contacting all PIO stations. Background Info on the other new appointees will be an up-coming attraction. An updated list of all SFL appointees will soon be available on the SFL Web page created by WB2WPA. Some traffic nets currently post info on NR4DR's Web page: **http://www.pcola.gulf.net/~drjr/qfn.htm** and any manager can have him post their net info by sending an email to him. W4SS, WB2WPA, and KD4GR are updating the SFL Emergency Plan; KI4T is investigating

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new training opportunities; and WA4AW is attempting to compile a complete club listing. Please contact Jeff if your club has not heard from him yet. Every member of the cabinet is available to help you or receive your suggestions. All are available via e-mail as their **callsign@arrl.net** except AA4BN (DEC). Plans for our section-level workshop at the Miami Hamboree are moving along. I look forward to see as many as possible there. Traffic by KJ4N: K4FQU 614, W7AMM 611, WA9VND 524, KB4WBY 285, K4SCL 275, KA4FZI 255, AB4XK 229, KC4ZHF 216, KD4HGU 165, KD4GR 159, KJ4N 156, K2VMC 150, WA4EIC 129, AA4BN 128, KE4IFD 122, AD4IH, 114, WB4PAM 112, WA4CSQ 112, AA4HT 70, W8SZU 62, KB4WBI 49, KT4XK 48, K4RBR 39, KG4DUF 28, KE4UOF 28, KE4VBA 26, W6VIF, 25, KG4CHW 25, K4LKL 21, KT4PM 13, W4WYR 11, W4AUN 11, AF4NR 8, KT4TD 6, KE4KSN 6, KD4QDD 6, AA4WJ 6, W3JI 4, KF4UTH 1. 73, de KA4FZI.

VIRGIN ISLANDS: SM, John Ellis, NP2B—St Croix, ASM: Drew, NP2E, St Thomas. ASM: Mal, NP2L, St John. SEC: Vic, WP2P, St Croix. PIC: Lou, KV4JC, St Croix. ACC: Debbie, NP2DJ, St Thomas. NM: Bob, VP2VI/W0DX Tortola. Well, just about the time that we thought it was all over, "wrong way Hurricane Lenny" visited us in mid November. Fortunately it stayed 20 miles south of St. Croix, but it still took out power, most of the phones, cable and generally made a mess of things. St Thomas and St John, being north of St Croix were spared most of it. At one time or another, all the repeaters were down but the 63 machine on St John, the 81 machine on St Thomas and the 25 machine on St Croix are all up and running fine now and most everything is put back together. Team RTTY gathered at NP2W's QTH in St Thomas, and gave out 970 plus Q's to an appreciative audience. A great time was had by all. Lead by that venerable contester KP2N, team RTTY members NP2W and NP2E were joined by NP2DJ, NP2M and KP2CM. St Croix ARC party was canceled because of the storm; will be rescheduled in January. That's it for this month. Hope everyone had a happy holiday season, 73, John, NP2B.

WEST CENTRAL FLORIDA: SM, Dave Armbrust, AE4MR **ae4mr@arrl.org** Section Web Page at: **http://www.wcfarrl.org**. ASM: K2SEC. ASM-Web: KR4YL. SEC: KE4MPQ. TC: KT4WX. BM: KE4WU. OOC: W3BL. Join me in welcoming the following new cabinet members: STM: Chet Carruth, AB4XK. PIC: Alan Gauzen, WA4ATF. SGL: John Hills, KC4N, and Assistant ACC: Fred Hendershot, N3BUL. I would like to thank those that have applied for station appointments. More Official Bulletin Stations are needed. In many cases, the reading of bulletins may be the only information on items relating directly to ham radio that some get. You can make a difference and help to build the WCF Section. Visit the section Web page, or contact me, for more information about OBS and other appointments. I enjoyed meeting many of you at the Suncoast Convention in Tampa 11/20-21, at the TBAR Annual Spaghetti Dinner on 11/20 and at club meetings and events. Special Event Station at the Ruskin NWS Office reports a total of 334 contacts on 11/27. On 11/29, radio amateurs from the Highlands County ARC and ARES activated for the Avon Park Christmas Parade. On 12/4 Pinellas County amateurs provided coms for the Ride With the Stars bike event. **Hamfests** - Pinellas Park Boys Club Hamfest on 1/23 and DeSoto Amateur Radio Club Hamfest 1/29 in Arcadia 73, Dave AE4MR.

SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford Hauser, KD6XH—This last month was a busy one for work and home. Amateur radio had to take a back seat. I received 2 more QSL cards to get my country count up to 91. Congratulations to the Northern Arizona DX Association. It is the only amateur radio club here in Arizona that has 100% ARRL membership. Way to go. The Superstition Hamfest was a very active event. It was "COLD" (coat, hat, and gloves weather) in the early morning hours but after 0930, the sun warmed up the temperature and the day turned out very reasonable. I saw a lot of equipment changing hands and everyone was pleased with the event. Special thanks to Mark Kesauer for his help in doing the leg work and putting on this event. The latest ARRL letter stated that Riley Hollingsworth, K4ZDH, will be the guest speaker at the 2000 Dayton Hamfest. The dates for this event are May 19-21 and you can make advanced reservations by calling 937-276-6930 or by e-mail, **tickets@hamvention.org**. The Dayton hamvention Website is **http://www.hamvention.org**. The "Tucson Tour De Tucson" was covered by the use of over 60 amateur radio operators and used APRS on several key vehicles. Ted Willis, AA7HX, did a great job of coordinating this event. The ARCA frequency coordination body has a new 440 coordinator. Robert Dahl, KA6LSL, has been appointed to this position and is in the process of trying to fill all outstanding requests and delete all ghost repeaters. Please give him your cooperation. As you read this article, if all went as planned, I am in Myanmar (old Burma) on a DX-expedition. Hope you have had good fortune to contact this rare country, XZ0A. Start planning for the spring Hamfest in March at Scottsdale Community College. The year 2000 Southwest Division Convention will be held at the Ramada Inn in Scottsdale on 6-8 October. I will be gone from 16 January 2000 to 08 February 2000. Look for me on the HF bands from Myanmar (Burma). If you need any help contact Bernie Sasek (520-297-5885), Jim Swafford (520-298-7793), or Gary Capek (602-237-4314). 73's Clifford Hauser, KD6XH. Net: ATEN 1011 QNI, 75 QTC, 30 sess. Tfc: K7VVC 619. W7EP 63.

LOS ANGELES: SM, Phineas J. Icenbice, Jr.,W6BF – A nice e-mail note was received from Doug Smith, KF6DX, Editor of QEX, the technical publication of ARRL. As a result, I agreed to do some work for QEX. Doug is also a part of the League's Technology Task Force (TTF). Yes, ARRL is doing some thinking about FUTURE TECHNOLOGY. This is very worth while even though I like CW. Even CW, has changed and challenged the operator with new "squeeze keys", keyboards and automated computer code readers. Now, we also have voice-to-print, programs. Soon we can look forward to voice-to-code, then code-to-voice. This will reduce the bandwidth required by about twenty-to-one or so for "ssb". This reduction in bandwidth would even be a much greater improvement for FM. Since the transmissions would be sent in Morse code (CW) or (digital data stream), this system could work in the CW section of the

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band. – Barry, AD6HR, reports the following for SCN, (stats) for 11/ 1999. (21 Sessions QTC=25 / QTR=181 & QNI=83) – NCS & present RN61/RN62 operators are: W6QZ, K6YR & AA6HR. Barry, could use more help and more messages. – Charlie, W6KK, from Edison Amateur Radio Network (EARN) sent out their latest bulletin listing of the very extensive Repeater Network of 13 voice repeaters and three EARN Packet Systems. Two of the digipeaters are operational for APRS, with the call signs of W6SCE-10 & W6SCE-11. Jim Walls, K6CCC, is the Newsletter editor. – Great memories were re-established and still exist from the ARRL Convention on the Queen Mary. One person came up to me and introduced himself. This was Joe Welch, WB6ACU, he was wearing a Collins Radio Co "T" shirt and he wanted to know if I was an ex Collins Radio Co, engineer. I knew that Joe was quite an outstanding musical personality with the "Eagles," so it was good to see Joe on major network TV, twice in past month. Joe and Bob Heil, W9EID, have worked the big time music-circuits, for many years. Joe lives in the San Fernando Valley. Vy 73, de W6BF, Phineas.

ORANGE: SM, Joe Brown, W6UBQ—The season for the installation of new WARA board members! Congratulations on selecting a great team to carry WARA into the new millennium. Fred Austin, KF6MGJ, Feedback. Club renewals for IEARC, Bob KD6PCC, Mike KF6THQ, Donnie N6ZOL, Lil K6LIL, Robert WB6EQB, Steve K6AOR, Charles, KB6POY, Gordon W6LKI, Richard KM6SP, Patricia KF6SMW, Lonnie KD6PFN, Chuck N6RQK, Jody, KD6AXH, Ted KF6NYV, Dave KE6OPS, "Push to Talk" IEARC, Mike Unfried WB9MJQ. STM report for Nov: Traffic: KO6RZ 284, KC6SKK 136, W6QZ 76, N6GIW 35, AD6HR 34. PSHR: W6QZ 158, KC6SKK 125, KO6RZ 121, AD6HR 117. Digital Traffic: W6QZ NTS BBS 384, N6GIW mailbox 155. SCN /V Net Mgr KO6RZ reports: 30 sessions, QNI 172, QTC 83.

SAN DIEGO: SM, Tuck Miller, K6ZEC, 619-475-7333—Carl Brummund, Sr. KE6JQL, a close personal friend, became a Silent Key on November 20, 1999. Carl was the embodiment of ham radio. Whenever there was a public service event, drill, or any other type of activity, you could count on Carl to be there with his "go kit". Carl held many positions for various clubs. He was secretary of SANDRA, and was the awards chairman for the Amateur Radio Club of El Cajon at his passing. He was just awarded El Cajon's Ham of the Year, posthumously, and the award given to his wife Carrie. I know Carl is in heaven, organizing communication needs. We will miss you Carl. I would like to make the year 2000, the year of public service. What better way to start off a new century than with service to the community. Listen to all ARES nets, to learn how you can serve the great folks of our towns. Throughout the year we have events, such as beach cleanups, special olympics, the Del Mar fair, 50-mile runs, the list goes on, and on. Remember, one of the tenets of ham radio is emergency communications, and public service. Be a part, give back to the hobby and to the service. At the time of this writing, we are still awaiting word on the FCC's Amateur Radio license restructuring. What will it be? Have you been upgraded? It is never too late to make plans for upcoming conventions. Let's see, we have the International DX convention in Visalia in April, and the SWD convention in Scottsdale, AZ next October. I know elections were held in SOBARS, and ARCEC, and the results have been sent to me. Please be sure to send me all the new officers for your club. If you have a new president, have them contact me. Send e-mail to **k6zec@arrl.org.** Tfc: KT6A 799, KD6YJB 285, WA6ODQ 210 W6FFF 154, KO6BU 39, WA6IIK 1 BPL: KT6A 799. PSHR: KT6A 142 WA6ODQ 138 KD6YJB 90. Until next month... Remember, Helping Others...Always Worthwhile!! 73, Tuck, K6ZEC.

SANTA BARBARA: SM & STM, Rob Griffin, K6YR—805-543-3346 & **k6yr@arrl.org.** SEC: Jack Hunter, KD6HHG (**kd6hhg @arrl.net**). ACC: Michael Atmore, KE6DKU (**jatmore @telis.org**). OOC: Howard Coleman, W6HQA (**w6hqa @pacbell.net**). PIC: Jeff Reinhardt, AA6JR (**jreinh@ix.netcom .com**). TC: Warren Glenn, KM6RZ (**wglennrz@ix, netcom .com**). ASM-Ventura: Don Milbury, W6YN, Dave Lamb, WA6BRW (**dlamb@silcom.com**). SLO-Bill Peirce, KE6FKS (**ke6fks@arrl.net**) & Ventura-Dave Gilmore, AA6VH (**aa6vh @arrl.net**). Congrats to 2000 Paso Robles ARC Officers: Tom Schiller, N6BT - Prexy; Mike Kelly - N6VNE, VP; Bill Palmerston - K6BWJ - Tres; & Bill McFarlan, WA5VGI, Secy. The Santa Barbara ARC is putting out an outstanding newsletter, Key-Klix, under the combo of Editor, Terri Mekker, KF6DZK; Mack Stanton, KD6NBZ & Lorin McRae, WA6ISS. These folks know how to help keep the SBARC leaders and members tied together. Congratulations! SB Sec Web: **wwww.qsl.net/arrlsb**. Join in our Section traffic nets: SCN slow speed NTS Net, M-F, at 1915 local on 3598 kHz & SCN/SB at 2100 local on 147.000+ (131.8), 224.90- (131.8) & 448.875- (100). PSHR/Tfc: K6YR -/ 141, KF6OIF 112/74, KE6MIW 99/39 & KF6UMU 122/-. Thats 30 in memory of Reg Dawe, W6HUT & Ralph Kelly, N6HUO. Rob K6YR.

WEST GULF DIVISION

NORTH TEXAS: SM: Don Mathis, KB5YAM—SEC: K5UPN. STM: KC5OZT. SGL: N5GAR. OOC: WB5UDA. AAC: WN5PFI. ASMs: KX5K, K5RE, W5FB, KK5QA, KK5NA, N5JZ, KB5LWZ, KD5HIS, AD5X, W5GPO. Visit the section Web page at (**http: //www.lsic.net/net/ntexas.html**) for the most current information. If you would like to be on the Section Newsletter mailing, send me an e-mail: **dmathis@lsic.net**. If you are reading this, then you must have survived Y2K. Congratulations. As I write this article, we are in the final midst of Y2K planning. At this point, I am making the assumption that everything will turn out all right with only minor glitches. Also at this time, we are starting the planning process as to what we want to accomplish in the coming year. Any or all of these activities could be in cooperation with a club or other group. Some of the projects that are currently in the thinking process for the upcoming year: 1. HamCom at Arlington. We hope to have a significant section presence at this year's HamCom with several section activities. Please let us know if you would like to help us plan or implement this activity. 2. A presence at the State Fair. We have had a section activity at the State Fair in previous years that were a lot of fun. We are doing some preliminary checking to see if there would be interest in doing this again this year. 3. Attendance at the other section hamfests. We will try to make a presence at as many of the other hamfests in the section as we can

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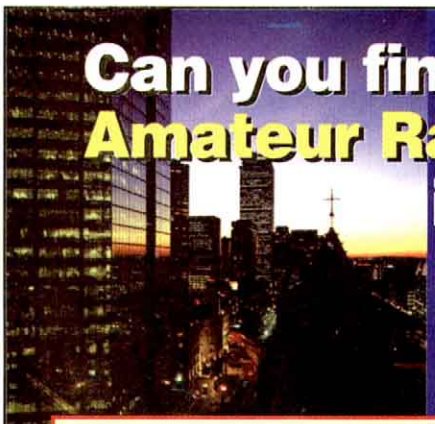

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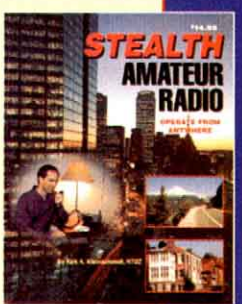

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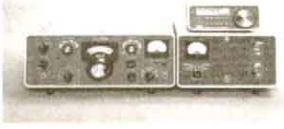

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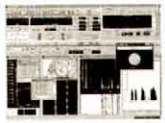

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possibly do. Please let us know as early as possible if you are planning a hamfest so that we can coordinate some efforts with you. It is our goal to use the hamfests to meet with as many interested people as possible. 4. Club meetings and other activities. We will try to attend as many other gatherings as possible. Because of the large number of clubs in the section, that will be a major undertaking, but we will do what we can. Let us know what we can do to help support you. If you have any 'interesting' activities planned this year, let us know that you would like for us to help spread the work and we will do what we can. Remember the *QST* article needs 2 months lead time. Nov SAR Report: N5JZ 551, KB5WEE 269, KC5OZT 236, KC5VLW146, K5AO 118, N9BNQ 90, WA5I 86, KB5TCH 85, PY2CGB/W5 51, KC5QGI 30, AC5Z 14, KB5YAM 6, AC5PO 4, KC5SMC 4, KD5AHW 2, N8QVT 1. N5JZ has qualified for BPL with a total of 551 points. 73, Don, KB5YAM.

OKLAHOMA: SM, Charlie Calhoun, K5TTT—ASMs: N6CL, W6CL. SEC: W5ZTN. ACC: KB5BOB. PIC: WA9AFM. OOC: K5WG. SGL: W5NZS. STM: K5KXL. Congratulations to Tom Johnston, N5IKN, and William James Herbert, KF5A, on receiving their ARRL traffic medallions. Great work guys. Special thanks to Ron Lancaster, KB5VDB, and Jay Davis, KE5RW, for their assistance in putting together a Y2K plan that covered the city of Tulsa and all of it's hospitals. SCARS has a nice new Web site you should check out. **http://www.telepath.com/n5dkr**. It looks like my tower project has turned into a winter project. I didn't want that! I did get the two meter antenna up and operated the Leonids and Geminids and was pleased with the performance. Frank, AB5J, reports that the Texoma hamfest was a good one. Grant, Tom, N5LWT, said that the Enid hamfest was a good one with increased attendance as well. It won't be long until hamfest season is upon us. The Tulsa Greencountry hamfest is next month, and it will be held at a new location. **http://www.greencountryhamfest.org** for details. Ada ARC elected new officers. They are Pres Steve Wilson, KD5DKZ, VP Charles Etier, KC5TGA, Sec Darla Coffey, KC5RGU, Treas Marie Wilson, KD5EXM and Trustee, Mason Smith, WT5X. The Edmond ARS VE team licensed 15 new hams in November, way to go! The Enid ARC also elected new officers. Congratulations to Pres John, KA7GLA, VP. Sam, KD5EUS, Sec Dave, KC5GUD, and Treas Dwayne, KC5QVS. That's it for this month. 73, Charlie. Tfc: KF5A 1014, N5IKN 784, WB5NKC 410, K5GBN 183, K5KXL 149, KM5VA 99, KK5GY 99, KE5JE 98, KI5LQ 92, WB5NKD 71. WA5OUV 68, AB5RV 37, W5REC 31, N5FM 2.

SOUTH TEXAS: SM, Ray Taylor, N5NAV—ASMs: NR5ED, N5WSW, W5GKH, K5DG, N5LYG, WA5UZB, KK5CA, WA5TUM, KB5AWM, WA5JYK, K5PFE, K5PNV, and K5SBU. STM: W5GKH. SEC: K5DG. ACC:N5WSW. PIC: KA5WSS. TC: KJ5YN. BM:W5KLV, OOC:W5JAM, SGL: K5PNV. Here it is February in the New Millennium. I hope all of our systems are still working. Since I'm writing this before December 31st, I am unable to foresee any of the problems that might have occurred for Y2K. Strange, that all at once, all agencies find the necessity to depend on Amateur Radio as the only means of true back-up communications. We have always been here. I did notice after attending a drill at the new EOC in New Braunfels, all agencies were mentioned in the local newspaper except the Amateur Radio group that attended. We were told we might be the only means of communications to the outside world, but they left that out of the media. My question is, when are they going to give credit where credit is more than due. Everyone mentioned in that drill was on someone's payroll. They seem to have no regard for volunteers. I do hope there was enough Amateurs that took enough interest to help. The main concern is far greater than Y2K, the Sun eruptions that are to take place from the 2nd week in January through the end of May. This poses a great danger to our satellites. The scientists working on this project call the erupted particles SPIKES. The average is about the size of your fist. They are very radio active with a strong magnetic field. If they don't hit our satellites but only come close, the intense radioactive and magnetic fields could destroy the CPUs in our satellites. This could cause problems with our APRS, banking, power company systems, and the list goes on. Again they are asking the amateurs to be ready to provide back-up communications. I want to thank Roy, W5MRY, for the newspaper clippings, and W5MRY and Jeff, N5ECP, for getting me connected to their Web sites. I will update you on the Texas Traffic Net, 7 PM, M, T, T and F, on 3873 when time permits. We had 2 more SKs, December 4th K8EJB, and December 11th W5YQZ. They will not be forgotten because of their dedication to Amateur Radio. We're losing our old timers. This has got to stop! It was my privilege to present the Kingsland Radio Club the certificate of affiliation with the League on December 11th. My wife and I had the pleasure of seeing our long-time friends Jim and Lil Whiting, W5MWK, at the meeting. The future plans of the club include a VE program to attract the youth of the area into the hobby. I hope to travel more in the next few months and see first hand what some of the rest of our clubs are doing. One final word, I hope all of you will do something for your community this year. God Bless and 73. Tfc: W5SEG 519, KA5KLU 230, W5KLV 128, W4RRX 102, NR5ED 94, N5OUJ 84 W5GKH 80, N5NAV 45, W5OYY 18, N5JUU 14, N5HK 1, N5LF 2.

WEST TEXAS: SM, Charlie Royall, WB5T, 915-944-0469, **WB5T@arrl.org**—ASMs-Cley, K5TRW, Ron, KB5HGM. Jerome, K5IS. Fred, W6VPI. Sandy, W5MVJ. SEC-Alex, N5LRH. OOC: John, KO5D. OBM Frank, N5WT. Resignation: DEC/EC Dist 3, Raymond Bethel, N5RMO, due to declining health. New Appointments: DEC, Dist 3, John Dyer, AE5B; EC, Coleman Co., Erich Straach, W5AKS. Sun City ARC new officers: Pres, Mike Olson, KB6JYF; VP, Larry Springsteen, WB8LBZ; Secy, Albert Ortiz, KB5GZZ; Treas, Martin Raue, WB5LJO. Odessa ARC new officers: Pres, Joe Detiveaux, WA5VYK; VP, Gary Peek, N5XXF; Secy, Craig Martindale, W5BU; Treas, John Clement, KF5NI. Panhandle ARC now has a Web page. Check it out at **www.qsl.net/w5wx**. Total membership as of 31 Oct 99 for West Texas is 793 hams-down 55 from this same time last year. Talk to your folks at the meetings-let's build up those renewals as well as add new members. Coming up 17-19 Feb 2000-bike races at Lajitas, TX, hosted by the Alpine and San Angelo ARCs. Come out and help them provide communications for this grueling cross-country annual event. 73 de Charlie, WB5T.

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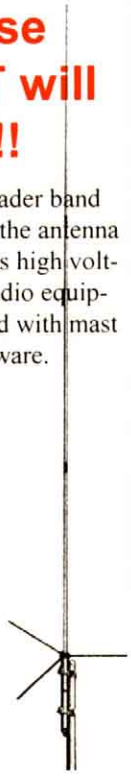

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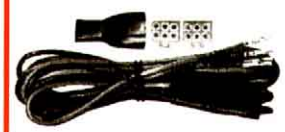

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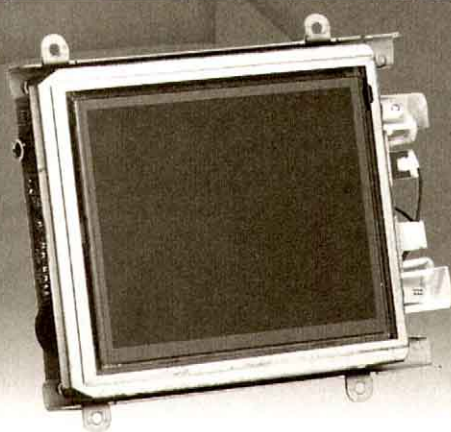

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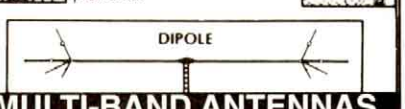

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50 MHz						
0503G	1-5	10-50	6	15/0.7	LPA	204
0508G	1	170	28	15/0.7	Standard	359
0510G	10	170	25	15/0.7	Standard	314
0550G	5-10	375	59	15/0.7	HPA	503
0552G	25-40	375	54	15/0.7	HPA	463
144 MHz						
1403G	1-5	10-50	6	15/0.7	LPA	160
1405G	1-2	100	14	15/0.7	Standard	291
1410G	5-10	160-200	28	15/0.7	Standard	323
1412G	25-45	160-200	22	15/0.7	Standard	283
1450G	5-10	350+	56	15/0.7	HPA	563
1452G	10-25	350+	50	15/0.7	HPA	516
220 MHz						
2203G	1-5	8-35	5	14/0.8	LPA	166
2210G	5-10	130	20	14/0.8	Standard	341
2212G	25-45	130	16	14/0.8	Standard	313
2250G	5-10	225	40	14/0.8	HPA	574
2252G	10-25	225	36	14/0.8	HPA	531
2254	75	225	32		HPA	489
440MHz						
4405G	1-5	15-50	9	12/1.2	LPA	305
4410G	10	100	19	12/1.2	Standard	362
4412G	15-30	100	19	12/1.2	Standard	352
4448G	1-5	75-100	25	12/1.2	HPA	423
4450G	5-10	185	35	12/1.2	HPA	579
4452G	25	185	30	12/1.2	HPA	539

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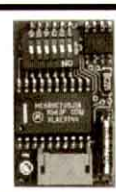

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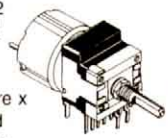

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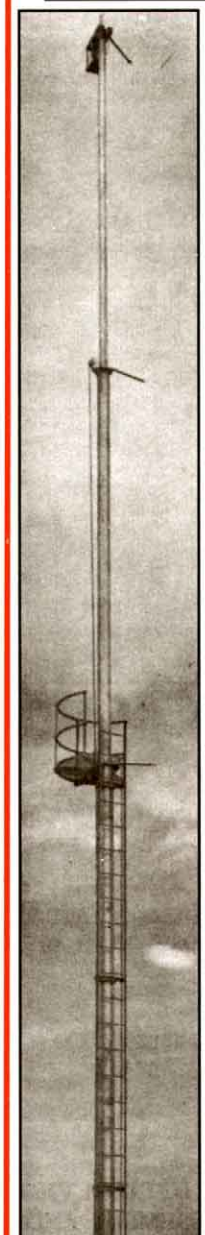

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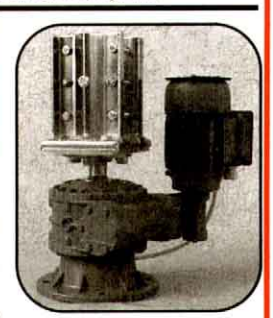

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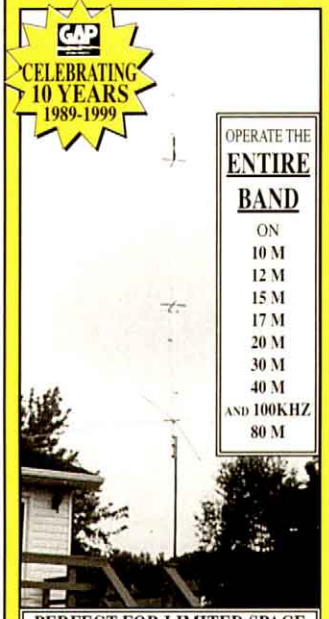

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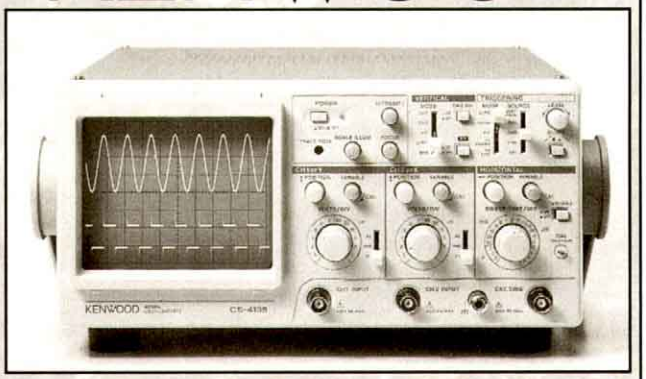

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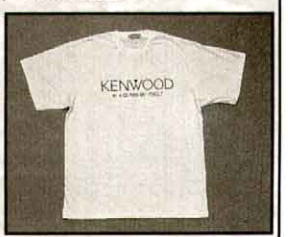

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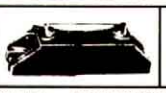

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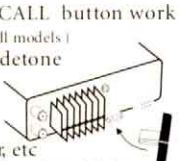

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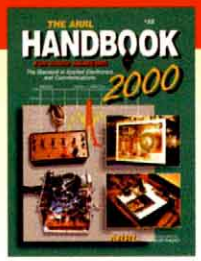

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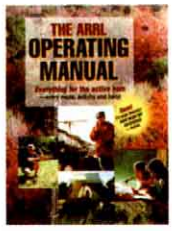

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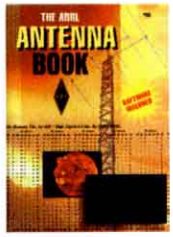

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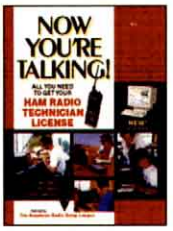

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IC-T2A ..... Amazing Low Price!

IC-207H ..... New Lower Price!

The Icom IC-207H is a 2m/70cm dual band mobile transceiver featuring CTCSS tone encode/decode, 182 memory channels, removable front control panel, and more. Supplied with a back-lit DTMF hand mic, mounting bracket, and a DC power cord.

IC-2100H ..... Great Low Price!

The Icom IC-2100H is a rugged 2m mobile transceiver featuring CTCSS tone encode/decode/scan, DTMF paging/squelch, 113 memory channels, switchable display color, multiple scan modes and more. Supplied with a back-lit DTMF hand mic, mounting bracket, and a DC power cord.

G-2800SDX $1069

Heavy duty antenna rotator handles 34 square feet of antenna load, and features 450° rotation, preset and variable speed.

G-1000SDX $479
G-800S/SDX $319/399
G-450A $239
G-5500 ..... $499
G-550 ..... $289

VX-5R ..... Now In Stock!

Tiny 6m/2m/70cm triband HT, with CTCSS tone encode/decode/scan, high capacity Lithium-Ion battery pack, and more.

FT-50RD ..... New Lower Price!
FT-51RH ..... Yaesu Special!
VX-1R ..... Yaesu Special!

WEEKDAY HOURS:
9AM–5PM CST

SATURDAY HOURS:
9AM–1PM CST

CREDIT CARDS:
M/C, VISA, DISCOVER

TEXAS TOWERS

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FT-1000MP
The radio of choice for world-class contest operators, the FT-1000MP provides 100 Watts of power, Enhanced DSP,™ Dual In-band Receive, Cascaded IF filters, General Coverage RX, and 160-10 M TX. (DC-only version also available.)

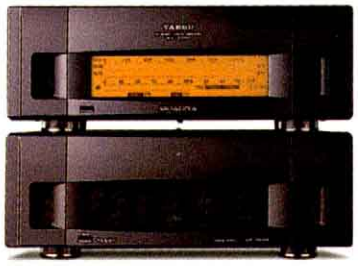
FT-920
The FT-920 HF/6M Transceiver is designed for today's active Ham. It features high-speed DSP in all modes, 127 memory channels, AFSK or FSK Digital operation, new-technology MOSFET PA finals, high-speed Automatic Antenna Tuner, and high-resolution LCD display.

FT-1000D
Truly an elite-class HF masterpiece, the 200 Watt FT-1000D provides Dual Receive (in-band or cross-band), Cascaded IF Filters, extraordinary Dynamic Range, DDS, high-speed Automatic Antenna Tuner, and 100 memory channels.

FT-100
This ultra-compact HF/VHF/UHF 100 Watt Transceiver provides SSB, CW, AM, FM and AFSK coverage of the HF, 6M, 2M and 70 CM bands. Features include 300 memory channels, built-in Electronic Memory Keyer, DSP, IF Shift, IF Noise Blanker, and CTCSS/DCS.

FT-840
Affordable yet feature filled, the FT-840 is an ideal traveling companion. It offers 160-10M TX with general coverage RX, 100 memory channels, DDS, CTCSS, Twin Band Stacking VFOs, and excellent receiver dynamic range.

FT-600
This compact 100 Watt HF Transceiver offers the utmost in operating simplicity. The MIL-STD rated FT-600 covers the 160-10M Amateur bands with General Coverage Receive, 100 memory channels, Direct Keypad Frequency Entry, and a front-mounted speaker.



VL-1000/VP-1000
The VL-1000 Quadra System is a Solid-State Linear Amplifier featuring four twin-MOSFET PA modules to produce 1000 Watts of clean power output on 160-15 Meters (500 Watts on 6M, modifiable for 12/10 meters). Included are an Automatic Antenna tuner, 2 Input and 4 Output Antenna Jacks, and extensive status displays on the multi-function LCD.

FT-847
The introduction of the FT-847 completely redefines base station operation by offering three radios in one—HF, VHF/UHF and Satellite. A full power multi-mode transceiver, the appropriately named Earth Station covers the HF, 50 MHz, 144 MHz and 430 MHz bands, and it includes crossband Full Duplex operating capability for satellite work. Its exceptional receiver performance is ready for all aspects of DX work thanks to the DSP filtering. And for local FM work both CTCSS and DCS encode/decode are built in. The FT-847 is an engineering breakthrough offering you the earth, the sky, and the moon in one compact package.

THE TASK MASTERS.

They're out there. Those elusive DX signals that can't poke through the QRM regardless of the late-night hours you put in trying to find them. But when a Yaesu HF enters the picture, weak signals suddenly jump into your headphones. Yaesu's High Frequency transceiver technology uniquely combines years of RF and AF design know-how with cutting edge advancements in IF filtering, noise reduction, and dynamic range. Whether you're on high bands or low, at home or away, the high frequency technology of Yaesu's task masters quickly fills up your log with contacts. Learn more about Yaesu products on the web at www.yaesu.com

YAESU **Choice of the world's top DX'ers.**

An APRS® transceiver built for tomorrow's communication needs with advanced features available today.

TM-D700A DATA COMMUNICATOR 144/440MHz FM Dual Bander

Conspicuous with its extra-large amber & black display, Kenwood's new TM-D700A is fully equipped to make the most of the exciting opportunities offered by SSTV, GPS and APRS® (the Automatic Packet/Position Reporting System that is rapidly gaining popularity worldwide), and other innovative features. This mobile transceiver with built-in TNC offers a wide range of data communications options, including simple packet operation using the AX.25 protocol. You can also send and receive SSTV images using Kenwood's VC-H1. Ham radio is truly entering a new era.

APRS® (Automatic Packet/Position Reporting System)

- **Position/directional data**
  With an NMEA-0183 compatible GPS receiver you can transmit position data for automatic calculation of distance, current speed and heading. Last 4 digits can be masked for position ambiguity. Manual input of latitude/longitude is also possible.
- **Versatile messaging**
  Transmission of position data can be accompanied by a choice of programmable status text (up to 28 characters), position comments (15 settings), icons and bulletins. For added messaging flexibility, individual alpha messages (up to 64 characters) can also be sent.
- **Station list**
  Store received APRS® data in up to 40 station reports.
- **Grid square locator**
  Position data is displayed on the grid square locator for visible reference.
- **BCON TX interval (0.2/0.5/1/2/3/5/10/20/30 min.)**
- **Packet path selection for Digipeat**
- **Weather station & PHG data reception**
- **Digipeat station and DIGI function capability**
- **Auto Message Reply**
- **Audible APRS® message receive (call sign) notification (requires VS-3)**
- **Waypoint position data output**

FEATURES

◗ Full Dual-band operation: VHF x VHF/VHF x UHF/UHF x UHF ◗ Wide-band receive: 118–524, 800–1300 MHz (excluding cellular blocked + frequencies) ◗ Detached panel (extension cable and panel holder supplied) with extra-large (188 x 54 dots) backlit LCD and multifunction key display (reversible) ◗ Improved key operation announcement with optional VS-3 voice synthesizer ◗ Built-in 1200/9600bps TNC compliant with AX.25 protocol and KISS mode ◗ Simplified packet monitoring ◗ SSTV functions with Fast FM for transmission of images in just 14 secs (approx.) and dual receive for voice and image transmissions (two frequencies simultaneously) ◗ 200 memory channels with 8-character memory name input ◗ Up to 10 programmable memory scan banks ◗ Easy-to-use menu system similar to the TH-D7A ◗ Built-in DCS (Digital Code Squelch) and CTCSS encode and decode ◗ CTCSS tone frequency scan ◗ DCS code scan ◗ 9600bps PC-based packet communications for chat, BBS ◗ DX packet cluster monitoring ◗ Cross-band repeater ◗ Wireless remote controller ◗ 1750Hz tone burst ◗ D-sub 9 pin terminal (for PCs) ◗ GPS input terminal (NMEA-0183) ◗ Visual band scope ◗ Mute function ◗ Memory control program available via Internet access ◗ New backlit microphone with alphanumeric message input.

NOTICE:
The TM-D700A has not been approved by the F.C.C. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the F.C.C. has been obtained. Pending approval in December, 1999.

Example A: with GPS receiver & laptop

Example B: with VC-H1

ISO 9001
JQA-1205
Communications Equipment Division
Kenwood Corporation
ISO9001 Certification

KENWOOD
Amateur Radio Products Group

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