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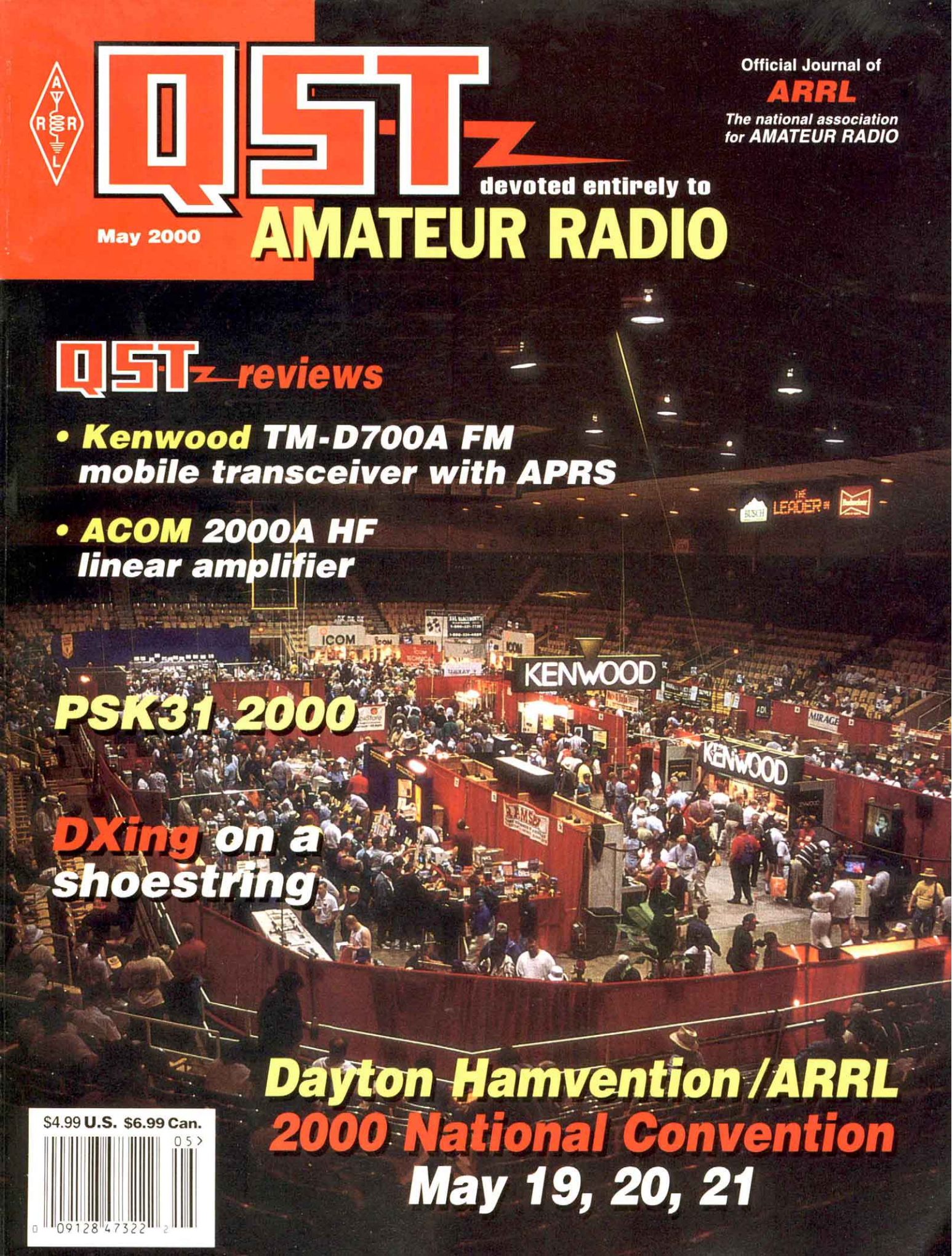
QST

devoted entirely to
AMATEUR RADIO

May 2000

QST reviews

- **Kenwood TM-D700A FM mobile transceiver with APRS**
- **ACOM 2000A HF linear amplifier**



PSK31 2000

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Dayton Hamvention /ARRL 2000 National Convention
May 19, 20, 21

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Simulated picture

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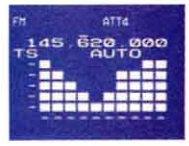

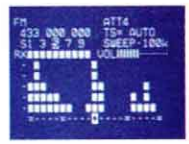

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†Cellular blocked: unblocked version available to FCC authorized users only.

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See page 10 for detailed contact information.

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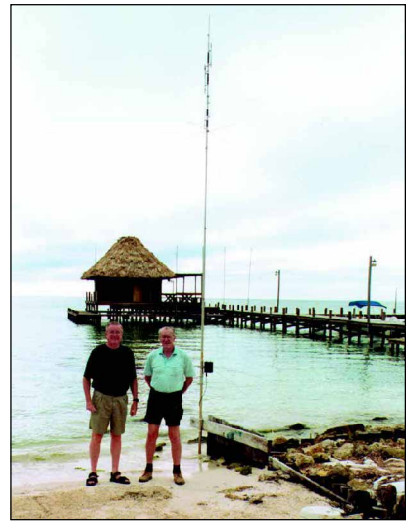

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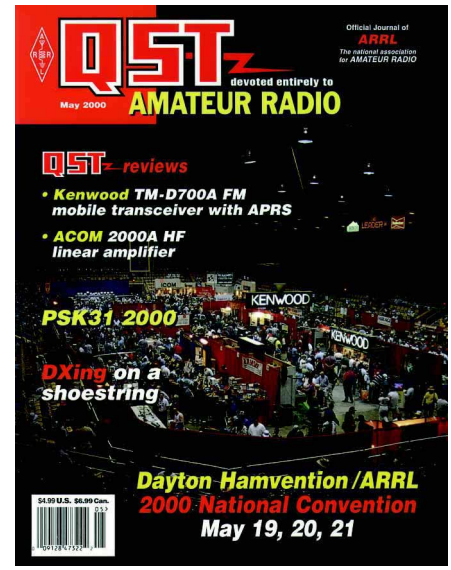

Our Cover

QST Senior News Editor Rick Lindquist, N1RL, captured this bustling scene in Hara Arena during 1999 Dayton Hamvention. Believe it or not, the floor of Hara Arena contains only a *fraction* of the Hamvention exhibits. The rest are scattered throughout the convention complex. There is still time to make your plans to attend the historic 2000 Dayton Hamvention and ARRL National Convention. Hamvention General Chairman Jim Graver, KB8PSO, tells you why you should, on page 32.

Membership in the ARRL, including a subscription to *QST*, is available to individuals at the following rates: $34 per year in the US and possessions, $47 Canada, $54 elsewhere, payable in US funds. Age 65 and over, with proof of age, $28 (US only). Licensed radio amateurs age 21 and under may qualify for special rates; write for application. Life membership is also available. Membership and *QST* cannot be separated. Fifty percent of dues is allocated to *QST*, the balance for membership. Subscription rate for libraries and institutions: $34 per year postpaid in the US and possessions, $47 Canada, $54 elsewhere. Single copies $5 in the US.

Membership without *QST* is available to the immediate family of a member living at the same address, and to anyone who is legally blind, for $5 per year.

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FCC License Required: Operation on the General Mobile Radio Service requires an FCC issued GMRS license. Information on obtaining a license is included with your transceiver. The FCC license fee is $80 for five years, which breaks down to a little more than $1.00 per month. One license covers you and everyone in your immediate family, including your children and parents. Your amateur radio license does NOT confer any privileges on the General Mobile Radio Service.

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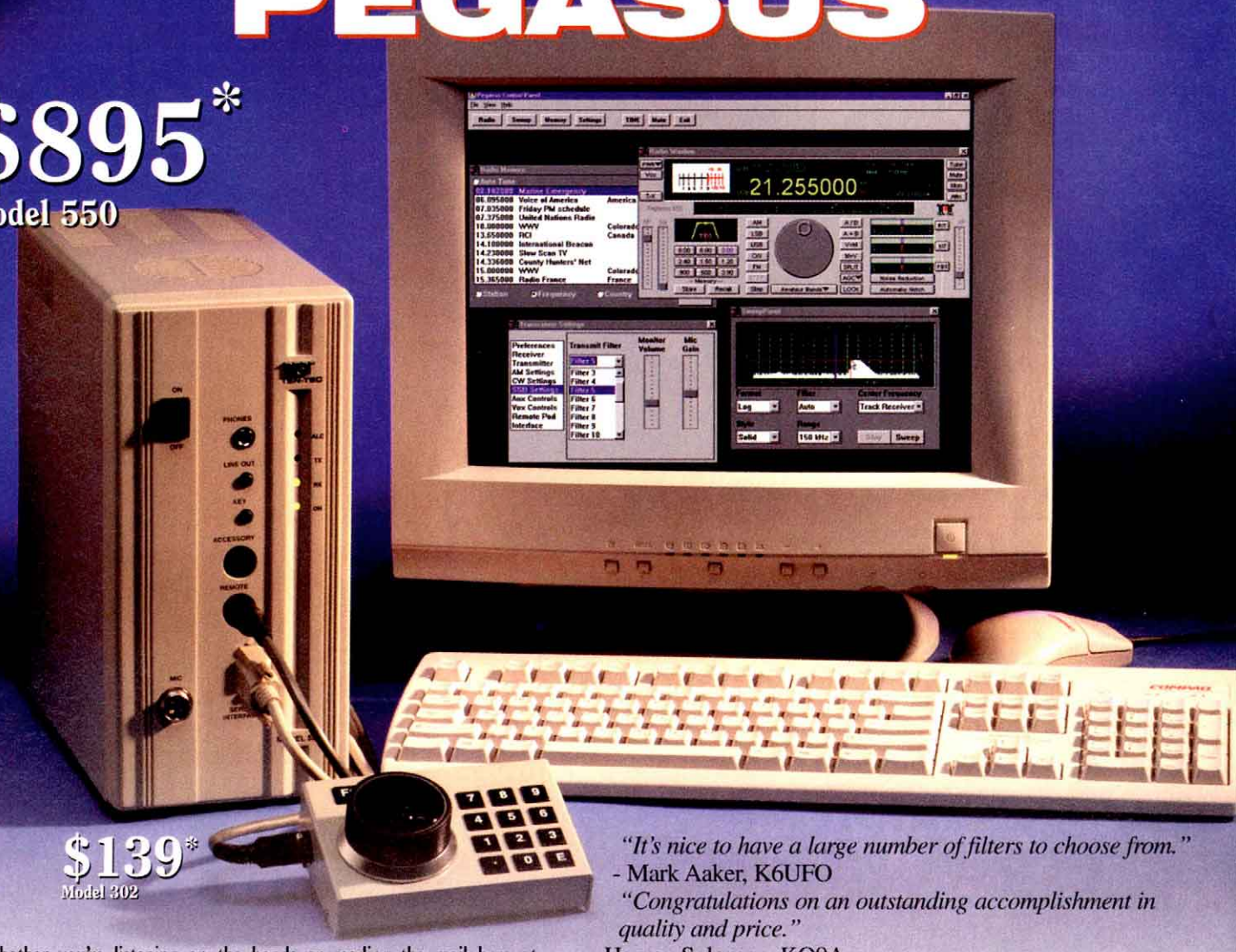

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"IT SEEMS TO US..."

Real Hams

We all know how one becomes an Amateur Radio licensee. You study, you pass a test, and you get a piece of paper from the FCC. Do that, and you're a ham.

Being a "real ham" is different. It isn't just about being licensed. It's more than that—it's how you feel about radio, and how you act on those feelings.

Getting the license is not the end of the road. For a real ham, it's just the beginning of the adventure.

Being a real ham means having a love for radio and for what can be accomplished with radio to benefit others. It means being able to appreciate the magic of a crystal set and the wonder of cutting-edge technology, equally and at the same time. It means working with others who share your love of radio to perform a service or to achieve a goal.

If they didn't feel that way about radio, why would anyone bother to get an amateur license today? In the not-too-distant past some people became licensed simply to use Amateur Radio as a personal communications service. It's easy to forget that cellular phones are a relatively recent phenomenon, and that at one time repeater auto-patches provided service that was both cheaper and better than what was commercially available. It wasn't too many years ago that "CQ with phone patch traffic" was often heard on the HF bands because international telephone calls were expensive and difficult to arrange. Now, that has pretty much gone by the boards except from extremely isolated locations or during emergencies. Pre-restructuring statistics may have shown a decline in licensing activity, but how much of the decline can be attributed to people having access to better and more appropriate personal communications services and no longer having a need to use Amateur Radio in this way? Perhaps the number of real hams entering our ranks hasn't declined at all. Anyone working an amateur license today is potentially a real ham, or is at least deserving of the benefit of the doubt.

Sometimes, to be a real ham a license isn't even necessary. Isn't someone who lovingly restores a vintage receiver a real ham, licensed or not? Shouldn't we claim as one of our own anyone who would get up at sunrise just to hear tropical broadcasting signals pop through for a few minutes from halfway around the world? We're interested in obtaining a low-frequency allocation for amateur experimentation, but shouldn't we value and honor the work that is already being done, unlicensed, within Part 15 of the FCC Rules? If a volunteer provides valuable radiocommunication in an emergency, does it really matter what frequency the radio happens to operate on or in what service it happens to be licensed?

In short, it isn't the license that makes you a real ham. It's what you do with it.

And there's so much to do! Most of us are able only to explore a small sample of the worlds that are open to an amateur licensee. The fortunate among us have experienced guides—Elmers—who are willing to take the time to help us begin our explorations. Perhaps the Elmers themselves are even more fortunate, for they have discovered the joy that comes from sharing their passion with others.

Heading the list of things we can—and should—do are emergency and public service communications. Regular participation may not be for everyone, but every ham should know the basics and should be able to get on the air when normal communications are disrupted. Isn't this the least we can offer in exchange for the array of privileges we enjoy?

Beyond that there is such a range of opportunities to explore, it isn't possible to list them all. There are new satellites to try, with the crown jewel of the amateur satellite fleet, Phase 3D, standing by for an early ride into orbit. The solar cycle finally began to live up to its promise this spring, with worldwide openings on 10 meters coming just in time to spice up the quest for contacts with two brand-new DXCC entities.

At the risk of being accused of touting a commercial product, the Elecraft K2 transceiver kit is one of the most positive developments in Amateur Radio in recent years. The K2 responds to our nostalgia for the Heathkit era while offering good performance at a reasonable price along with a sense of personal accomplishment and a community of fellow constructors.

As you will read in Steve Ford's article this month, PSK31 continues to push HF digital communications in new and exciting directions. New microwave records are being set, only to be broken. APRS innovators are finding new and intriguing applications for their tool of choice.

It doesn't take a forest of antennas to explore any of these paths; new radio worlds are in reach of nearly everyone.

If you're a real ham, what are you waiting for?—*David Sumner, K1ZZ*

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You can send e-mail to any ARRL Headquarters employee if you know his or her name or call sign. The second half of every Headquarters e-mail address is **@arrl.org**. To create the first half, simply use the person's call sign. If you don't know their call sign, use the first letter of their first name, followed by their complete last name. For example, to send a message to John Hennessee, N1KB, Regulatory Information Specialist, you could address it to jhennessee@arrl.org or N1KB@arrl.org.

If all else fails, send e-mail to hq@arrl.org and it will be routed to the right people or departments.

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If you have Internet e-mail capability, you can tap into the ARRL Technical Information Server, otherwise known as the *Info Server*. To have user instructions and a handy index sent to you automatically, simply address an e-mail message to: info@arrl.org
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In the body of your message enter:

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ARRL on the World Wide Web

You'll also find the ARRL on the World Wide Web at:

http://www.arrl.org/

At the ARRL Web page you'll find the latest W1AW bulletins, a hamfest calendar, exam schedules, an on-line ARRL Publications Catalog and much more. We're always adding new features to our Web page, so check it often!

Members-Only Web Site

As an ARRL member you enjoy exclusive access to our Members-Only Web site. Just point your browser to http://www.arrl.org/members/ and you'll open the door to benefits that you won't find anywhere else.

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- *QST* Product Review Archive. Get copies of *QST* product reviews from 1980 to the present.
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Stopping by for a visit?

We offer tours of Headquarters and W1AW at 9, 10 and 11 AM, and at 1, 2 and 3 PM, Monday to Friday (except holidays). Special tour times may be arranged in advance. Bring your license and you can operate W1AW anytime between 10 AM and noon, and 1 to 3:45 PM!

Would you like to write for QST?

We're always looking for new material of interest to hams. Send a self-addressed, stamped envelope (55¢ postage) and ask for a copy of the *Author's Guide*. (It's also available via the ARRL Info Server, and via the World Wide Web at http://www.arrl.org/qst/aguide/.)

Press Releases and New Products/Books

Send your press releases and new book announcements to the attention of the ***QST* Editor** (e-mail qst@arrl.org). New product announcements should be sent to the Product Review Editor (e-mail reviews@arrl.org).

Strays and Up Front

Send your Strays and Up Front materials to the *QST* Features Editor (e-mail upfront@arrl.org). Be sure to include your name, address and daytime telephone number.

ARRL Audio News

The best way to keep up with fast-moving events in the ham community is to listen to the ARRL Audio News. It's as close as your telephone at 860-594-0384, or on the Web at http://www.arrl.org/arrlletter/audio/

Interested in Becoming a Ham?

Just pick up the telephone and call toll free 1-800-326-3942, or send e-mail to newham@arrl.org. We'll provide helpful advice on obtaining your Amateur Radio license, and we'll be happy to send you our informative Prospective Ham Package.

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The 15 divisions of the League are arranged into 71 administrative *sections*, each headed by an elected *section manager* (SM). Your section manager is the person to contact when you have news about your activities, or those of your club. These news items could find their way into the pages of *QST*! If you need assistance with a local problem, your section manager is your first point of contact. He or she can put you in touch with various ARRL volunteers who can help (such as technical specialists).Your section manager is also the person to see if you'd like to become a section volunteer. Whatever your license class, your SM has an appointment available. If your ARRL section has a Web site, the address can be found at **http://www.arrl.org/field/org/smlist.html**.

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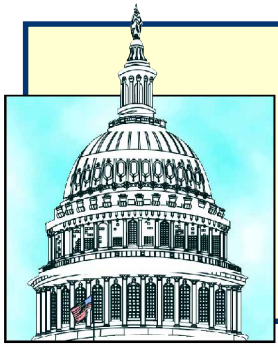

DC Currents

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.

Amateur Radio Spectrum Bill Introduced in Senate

Amateur Radio now has supporting legislation in the United States Senate with the introduction of new legislation by Idaho Senator Michael Crapo that mirrors HR.783, The Amateur Radio Spectrum Protection Act, in the House.

"In introducing this bill, we want to do something for Amateur Radio in return for all the good it has done the people of Idaho and elsewhere in the US by providing a reliable means of backup communication in times of emergency," said Senator Crapo. "We'll work hard to push this bill in the Senate."

Crapo is a first term Republican who has also served in the United States House of Representatives and the Idaho legislature.

The new Senate legislation, S.2183, was introduced with bipartisan co-sponsorship from Senators Daniel Akaka (D-HI), Susan Collins (R-ME), Blanche Lambert Lincoln (D-AR), Bob Smith (R-NH) and Olympia Snowe (R-ME). The bill's introduction comes on the heels of a visit to The Hill by the newly elected ARRL President Jim Haynie, W5JBP and First Vice President Joel Harrison, W5ZN.

Just like the House version, the Senate bill, if enacted, would require the Federal Communications Commission to provide equivalent replacement spectrum should it ever be necessary to reallocate Amateur Radio frequencies for some other purpose. So far, the House bill has drawn bipartisan support, with 142 cosponsors to date, and has met with no opposition. However, Congress, and the all-important House and Senate Commerce committees, have been preoccupied with non-telecommunications matters and the Amateur Spectrum Protection Act has not yet moved out of committee. The new Senate bill provides additional motivation for the Congress to consider the legislation.

ARRL President Jim Haynie, W5JBP (left) thanks Idaho Senator Michael Crapo for his help in introducing S.2183 in the Senate.

ARRL ELECTED OFFICIALS VISIT CAPITOL HILL, FEDERAL COMMUNICATIONS COMMISSION TO DISCUSS HAM ISSUES

● The ARRL flew the Amateur Radio flag in Washington in March. Jim Haynie, W5JBP, and Joel Harrison, W5ZN, met with members of the Senate and the House, as well as with FCC Commissioners and staff as part of a two day planning session and "get acquainted" tour for the new association leadership.

The group's discussions focused on key Amateur Radio contributions such as emergency communication and education to help convince the lawmakers and regulators to work with the ARRL on a variety of issues. Among these are spectrum protection legislation, expanding PRB-1 into private-sector agreements as well as more technical issues such as the possibility of lifetime credit for the 5 WPM Morse code element in the wake of the FCC's restructuring of Amateur Radio licensing.

"We had an opportunity to tell the story of Amateur Radio and the important functions it serves to some key public officials," Haynie said. The League president said he was pleased by the willingness of both members of Congress and the FCC "to acknowledge Amateur Radio as an important part of American society."

During his Capitol Hill meetings, the ARRL President told Senators, Congressmen and Congressional staff that Amateur Radio provides "millions of dollars worth of emergency communications vehicles and equipment that's made available to the

Texas Congressman Pete Sessions (white shirt, beneath flag) regales his ARRL visitors with his encounter with the FCC on Amateur Radio restructuring. Seated at the far left is Sessions' Chief of Staff, Jeff Koch, NU5Z.

The ARRL contingent meets with FCC Commission Susan Ness at the Commission's new DC offices to discuss a variety of Amateur Radio issues. (Ness is seated far right.)

The ARRL and the FCC's Private Wireless Bureau staff meet to discuss the topic of expanding PRB-1 to include covenants and restrictions.

public at no cost to any governmental agency." Haynie said the lawmakers seemed to be impressed with the fact that Amateur Radio is a valuable resource that doesn't cost the taxpayers a dime and is poised for action in the event of a disaster.

Accompanying Haynie to Washington were First Vice President Joel Harrison, W5ZN, Executive Vice President David Sumner, K1ZZ, Legislative and Public Affairs Manager Steve Mansfield, N1MZA, and General Counsel Chris Imlay, W3KD.

The group met first with Congressman Pete Sessions (R-TX-5th) and his Chief of Staff Jeff Koch, NU5Z. High on the agenda for that meeting was thanking the Congressman for his active and energetic efforts to encourage the FCC to release the commission's final report and order on Amateur Radio licensing restructuring. Also on the House side, the group met briefly with Congressman Vic Snyder (D-AR-2nd) to thank him for his willingness to sponsor HR.783. Snyder graciously agreed to duck out of an Armed Services Committee hearing to talk with the group. In addition, the group met with a legislative assistant to House Majority Leader Dick Armey (R-TX-26th) to try to convince him that Mr. Armey should sign onto HR.783 as a cosponsor (House leadership seldom cosponsors legislation).

On the Senate side, the group met with Senator Michael Crapo to thank him for his sponsorship of S.2183, the Amateur Radio Spectrum Protection Act, and to discuss possible ways to move the bill forward in an increasingly difficult legislative environment. In addition, they met with Senator Blanche Lambert Lincoln (D-AR) and her staff to thank the Senator for her early cosponsorship of S.2183 and to discuss Amateur Radio's educational potential for schools in Arkansas.

At the FCC, the League officials met with Commissioners Susan Ness and Michael Powell, and sat down for more than an hour with Public Safety and Private Wireless Division Chief D'Wana Terry, Bill Cross, W3TN, and other WTB staffers. One of the prime topics at the FCC gathering was the League's recent petition for reconsideration that includes expansion of PRB-1 to include covenants and restrictions—what Haynie called a "hot button issue" within the Amateur Radio community. The ARRL in late December filed a petition calling on the FCC to apply PRB-1 to hams falling under private-sector restrictions just as it does to those regulated solely by local zoning laws. Haynie and Harrison later met with Wireless Telecommunications Bureau Chief Thomas J. Sugrue to discuss the same topics.

"We feel that it's only fair that we be given the same 'reasonable accommodation' in that area as we have been with municipalities," Haynie said.

Haynie and the ARRL contingent told FCC officials and staff that the League sees "a positive and exciting future" for Amateur Radio in the wake of restructuring. He said League and FCC officials also talked about the possibility of lifetime credit for the 5-WPM Morse code element. "They're very much willing to listen to us," he said.

ARRL members are urged to write to their Senators and members of Congress in support of S.2183 and HR.783. More information can be found on the ARRL Web at: http://www.arrl.org/govrelations/hr783.html.

Senator Blanche Lambert Lincoln (D-AR) listens while Jim Haynie discusses Amateur Radio's contributions to education. In the background facing the camera are Michael Watson and Kelly Rucker, who brought S.2183 to Senator Lambert's attention.

Jim Haynie thanks FCC Commissioner Michael Powell for his interest and attention following a meeting in Powell's office. Looking on is Joel Harrison, W5ZN (right).

Low cost, low loss flexible LMR® cable!

for HF through Satellite Bands

	Diameter in Inches	Jacket Material	Shielding (dB)	*Attenuation (dB/100') 30 MHz	146MHz	440 MHz	2.4GHz
LMR® 900	**.870**	**Black PE**	**90**	**.29**	**.65**	**1.2**	**2.9**
LMR® 600	**.590**	**Black PE**	**90**	**.42**	**.95**	**1.7**	**4.3**
LMR® 400	**.405**	**Black PE**	**90**	**0.7**	**1.5**	**2.7**	**6.6**
Air Dielectric 9913	.405	PVC	90	0.8	1.5	2.8	7.5
9914	.403	PVC	90	1.0	2.1	3.8	8.7
RG-214	.425	PVC-IIA	60	1.2	2.8	5.1	13.7
RG-213	.405	PVC-IIA	40	1.2	2.8	5.1	13.7
LMR® 240	**.240**	**Black PE**	**90**	**1.3**	**3.0**	**5.2**	**12.7**
RG-8/X	.242	PVC	40	2.0	4.5	8.1	21.6
LMR® 200	**.195**	**Black PE**	**90**	**1.8**	**3.9**	**6.9**	**16.5**
LMR® 195	**.195**	**Black PE**	**90**	**2.0**	**4.4**	**7.7**	**18.6**
RG-58	.195	PVC-IIA	40	2.5	6.1	10.4	35.0
LMR® 100A	**.105**	**Black PVC**	**90**	**3.9**	**8.8**	**15.6**	**38.9**
RG-174	.110	PVC-IIA	40	5.5	13.0	25.0	75.0

LMR features: Watertight foam polyethylene dielectric • Non-kinking • EZ install connectors

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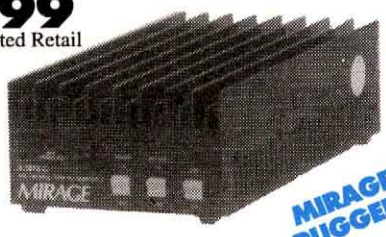
Turn your mobile, base or handheld into 160 Watt powerhouses and talk further, longer, clearer . . . All modes: FM, SSB, CW . . . Superb GaAsFET preamp . . . Overdrive, high SWR, Over-temperature protection . . . Remote controllable . . .

B-5016-G
$299
Suggested Retail



MIRAGE RUGGED!

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.

B-5016-G has legendary ruggedness. *We know of one that has been in constant use since 1979!*

Heavy-duty heatsink spans entire length of cabinet -- prevents overheating. Power transistors protected by MIRAGE's *Therm-O-Guard*™.

Fully protected from high SWR and excessive input power. Has warning LED.

Has smooth adjustable Transmit/Receive switching with remote external keying.

RC-1B, $45, Remote Control. On/Off, preamp On/Off, selects SSB/FM. With 18-ft cable.

Draws 17-22 amps at 13.8 VDC. 12x3x5½ in.

More 160 Watt, 2 Meter Amplifiers . . .

B-2516-G, $299. For 10 to 35 watt mobile or base stations. 160 watts out for 25 watts in.

B-1016-G, $379. MIRAGE's most popular *dual purpose* HT *or* mobile/base amplifier. 160 watts out/10 W in. For 0.2-15 watt transceivers.

B-1016-G Great for ICOM IC-706!

B-215-G, $379. MIRAGE's most popular *handheld* amp. 150 watts out/2 watts in; 160 watts out/3½ W in. For 0.25 to 5 watt handhelds.

100 Watts for 2 Meter HTs

B-310-G
$199
Suggested Retail

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***
- ***FREE mobile bracket*** • ***Auto T/R switch***
- ***FREE handheld BNC to B-310-G cable***
- ***Ultra-compact 4³/₄x1³/₄x7³/₄ inches, 2½ pounds***
- ***One year MIRAGE warranty***

***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

B-34-G
$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. 3¹/₈x1³/₄x4¹/₄ inches.

MIRAGE Dual Band 144/440 MHz Amp

BD-35
$159.95
Suggested Retail

MIRAGE RUGGED!

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*** • ***5x1³/₄x5 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). 1³/₄x3³/₄x2½ 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.

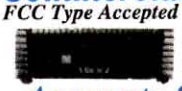
Frequency (MHz)	*In Shack $139*	*Mast Mount $195*
28-30	KP-1/10M	KP-2/10M
50-54	KP-1/6M	KP-2/6M
144-148	KP-1/2M	KP-2/2M
220-225	KP-1/220	KP-2/220
430-450	KP-1/440	KP-2/440

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.

One Year Mirage Warranty

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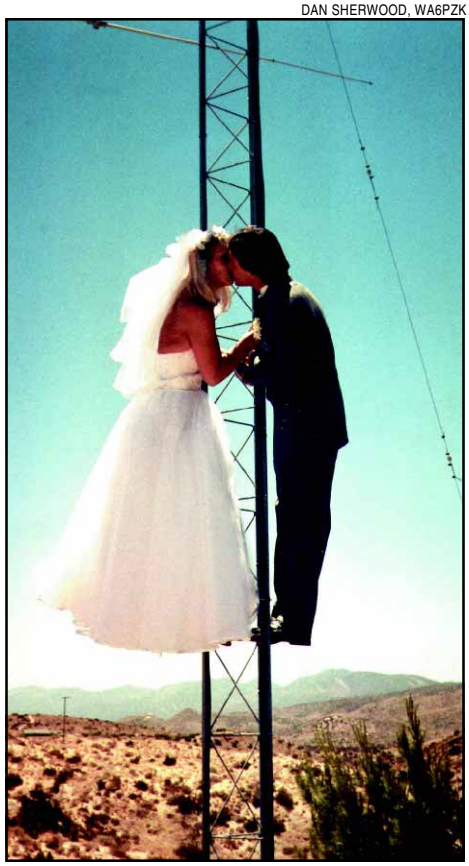
MIRAGE . . . the world's most rugged VHF/UHF amplifiers

Relief in Florida after a successful Y2K transition. Florida governor Jeb Bush (left) thanks Florida Capital District Emergency Coordinator Kent Hutchinson, KC4TOC, who established and maintained a direct link to the governor's office from the Florida State Emergency Operations Center on New Year's Eve. Hams operated a statewide net from the center using the call sign K4TLH from 7 PM until 2 AM.

DAN SHERWOOD, WA6PZK



You may kiss the coax, er, *bride*. Last June Randy, KF6UQI and Bonnie, KF6UZL, were married at the home of Keith, K6GXO, near Palmdale, California. After the ceremony they took their romance to new heights—about seven feet up K6GXO's tower.

It's been more than 30 years since Burma Shave signs have graced American highways but Jerry, K9AF, has rejuvenated this bit of advertising history. As a youth Jerry traveled extensively by car and still carries fond memories of the all-too-familiar Burma Shave jingles. When he erected a quarter-wavelength vertical antenna for 160 meters, Jerry celebrated the new skyhook with his own backyard Burma Shave creation!

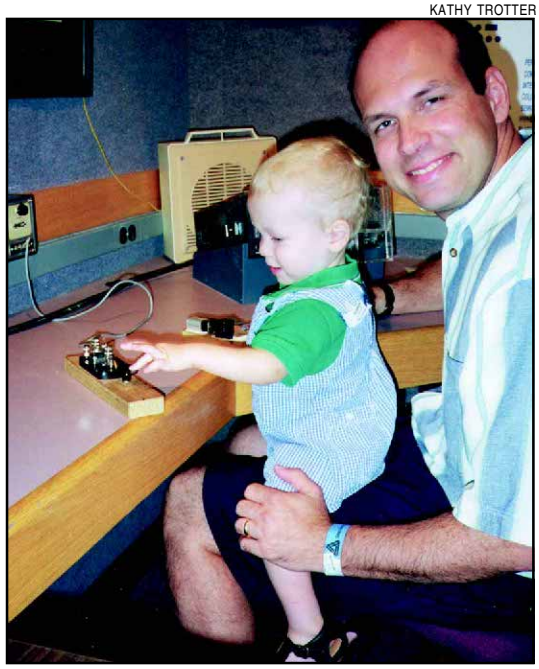
The postman always keys twice.

According to Hardy, DL1VDL, the postman usually signs SOS to indicate that mail has arrived (good news or bad!). Ham visitors prefer to send their call signs with the old Russian key. Hardy received this unusual doorbell in 1999 as a gift from his friend Rico, DF2CK. He says the neighbors still can't resist giving him a "buzz."

Scenic station locations don't get much better than this. Mel, KC7IJ, in Ashton, Idaho has the pleasure of waking up to this spectacular view of the Grand Teton mountains. Mel is active on 50 and 144 MHz and especially enjoys VHF contesting and 6-meter DX hunting. His tower supports a 6-element 6-meter Yagi, an 18-element 2-meter Yagi and an HF triband beam.

"Air Johnson", WB6KOE, is in the air and on the air. Harry enjoys operating 2-meter FM simplex from his Piper Tri-Pacer.

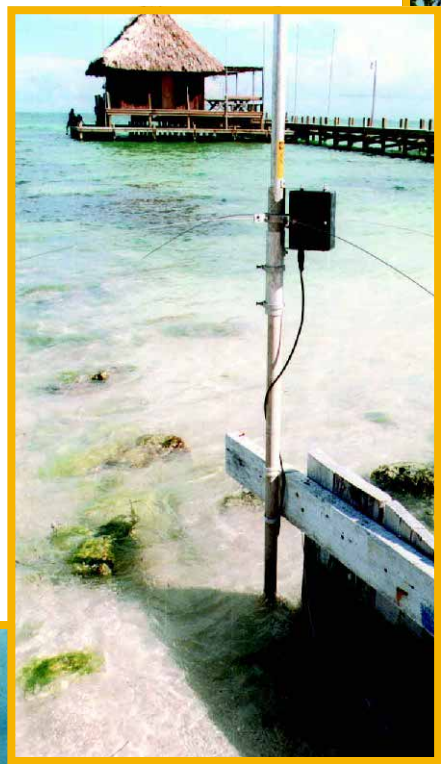
KATHY TROTTER



Start 'em young! Mark Trotter, age 17 months, tentatively taps the key while sitting in the lap of his father Paul, AA4ZZ, at W4BFB, the Amateur Radio station at the Discovery Place science museum in Charlotte, North Carolina.

Amateur Radio is hot in Sweden—even in the dead of winter. Teemu, SM0WKA, clawed his way to the rooftop of the Botkyrka Radio Amateurs Club station, SK0HB, to knock off some of the ice that was encrusting their HyGain TH3 antenna.

All the hits, all the time! Has *QST* expanded to broadcast media? Not yet. Bob, W1YRC/5 grabbed this shot outside the WQST studios in Forest, Mississippi.



A spectacular view from a hotel balcony, a picturesque village and a vertical antenna in salt water. Is this paradise? No, it's Belize, a DX destination many hams can afford. See "DXing on a Shoestring" by Roger Sullivan, WA0ETE, and Hugh Tinley, K0GHK, in this issue.

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.)

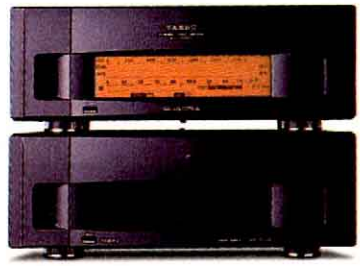
FT-920
The FT-920 HF/6M Transceiver is designed for today's active Ham. It features high-speed DSP in all modes, 127 memory channels, AFSK or FSK Digital operation, new-technology MOSFET PA finals, high-speed Automatic Antenna Tuner, and high-resolution LCD display.

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.**

VX-150
Compact yet incredibly rugged 2-meter handheld is designed to perform under the most difficult operating conditions. And it's packed with the leading-edge features you've come to expect from a Yaesu product. Five Watt power-output, 209 memories, DCS/CTCSS, 7 digit alphanumeric display, automatic repeater shift and much more.

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.

FT23RMKII/FT33R
These ultra-compact, 5 Watt VHF FM Handhelds feature rugged die-cast aluminum cases, 10 memory channels, optional CTCSS, and multiple scan modes. The FT23RMKII (2M) and the FT-33R (222 MHz) are easy to operate, and give outstanding performance.

VX-110
This incredibly rugged 5 Watt VHF handheld features 209 memories, Smart Search,™ DCS/CTCSS, simple 8 key operation and Omni Glow™ display illumination for night time operation.

FT411MKII
The affordable FT411MKII 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.

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

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

YAESU ...leading the way.

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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.

NO LIDS, NO KIDS, NO SPACE CADETS

♦ I was looking through an Internet forum the other day when I spotted a discussion about one of the more unusual ham "celebrities" to grace our ranks in days gone by: Mike, W2OY (SK). Boy, did the exchanges bring back memories!

Originally licensed as WA8IMY in Morgantown, West Virginia in 1963, I operated 75-meter AM for several years. It seemed as though Mike was everywhere I went. At 15 years of age I always felt that he was a force to be accepted and tried my best to stay clear of him.

I recall that his CQs always included the phrase, "No lids, no kids, no space cadets; Class A1 operators only." His transmissions came across the airways as strong and as clear as if he was sitting in my ham shack (which also served as my bedroom, study room and, above all else, my inner sanctum). As I type this message, I hear still that voice reverberating in my brain.

My one attempt to contact Mike resulted in one of the biggest embarrassments possible to a young ham radio operator. His reply was a terse dismissal—something to the effect that my signal was unreadable and unworthy. I'm sure that the filaments in his BC610 consumed far more power than the input power of my Knight Kit T150 transmitter, but I thought that with my powerful external modulator borrowed from my Elmer, W8GUL, I could be heard for hundreds of miles. Or, maybe that was hundreds of kilocycles!

Some day I hope to understand what motivated Mike to behave the way he did. As much as his antics were demeaning to many of us during those tender teenage years, Mike was one voice among many and I now look back on those times with wonderful feelings.

Having just passed the half century mark, the big question for me now is am I doing enough to share this love of radio and this love for adventure with my children (ages 14 and 11) and with other children? Intrigued by the Internet, my son Christopher, age 11, will spend hour after hour hunting and searching for things unknown on the vast World Wide Web. My daughter Kathleen, age 14, uses the Internet to talk with her friends both here and around the US, and to find those special nuggets of information for her school projects that make the difference between a B and an A.

But I wonder if they are getting the full range of experiences and challenges that we all enjoyed so much as youngsters? The music of a weak, but strong-fisted CW signal just below the noise level. The smell of the dust burning off the 6146s and 807s, and for the most fortunate, the 811As. The emotional connection of hearing the voice of a close ham buddy. And, the sense of community and belonging that comes from seeing everyone at the state hamfests and discussing at length the benefits of grounded grid over push-pull as if, at age 15, we had even a smidgen of knowledge about the theory and practice of tube amplifiers.

I would not give up what ham radio has done for me, both as a youngster and over the past 35 years. Organizing ham club events gave me the confidence to approach uncertain business situations with confidence. Building and troubleshooting my own equipment taught me the basics of complex technical systems. Working DX and contests gave me the understanding that a strong voice with clear thoughts will gather far more support in a large group setting than a timid, hesitant or uncertain voice. Contact after contact gave me the friendship of many, many hams that I still enjoy to this very day. And, operating late at night, after everyone else in the house was sound asleep, Amateur Radio was a place to go when my troubles seemed insurmountable.

Mike, you had a big impact on me. Maybe not in the way that you thought back in the early 60s, but in a deeper, more rewarding way. "No lids, no kids, no space cadets," was personal challenge to become the best I could be. Thank you so much. I hope that God has treated you kindly. Maybe some day, beyond this life, I'll be there to listen to your CQ and reply once again. All I ask is that you give me an honest signal report this time.—*Dave Mitchell, K8DM, Montgomery Village, Maryland*

HIGHWAY INFORMATION FREQUENCY?

♦ I would like to comment the letter from Bob Harvey, K2PI, in the December 1999 *QST*, in which he lamented the lack of activity for travelers on 146.52 MHz.

I share Bob's sentiments. I recently traveled from Texas to California, listening to 146.52 MHz during the entire journey, and never heard a soul. Even the repeater systems were mostly inactive.

So how did I obtain information about traffic conditions, or the best possible routes to take? I got it all from my CB transceiver (particularly on channel 19). I would like to throw my CB away, now that I went through all the trouble to get my Advanced ticket, but that simple CB rig still provides me with the necessary information I need. In contrast, most ham transceivers are too cumbersome for easy mobile operating—especially when you find that you need to program a new PL tone to reach a repeater. But even if the ergonomic issues were solved, the ham community is simply not organized for making 2-meter FM a useful mode for travelers.

I know there are many hams that like things just like they are, and I'm sure some think I should just go back to Citizens Band where I belong. However, I think that the FM portion of 2 meters could become truly useful to travelers and commuters. Start with something as simple as calling 146.52 MHz the "Highway Information Frequency" rather than the "National Simplex Calling Frequency." This would let everyone know that the frequency is for use when traveling on the road, no matter where you are. CBers use a common highway channel and the practice works very well for them. The marine community uses a common channel, too. It is a matter of changing habits and mindsets.

Let's begin by monitoring 146.52 MHz whenever we are in our cars. We should try to keep an ear to the frequency at home also. In time we will all come to regard 146.52 MHz as the "Highway Information Frequency" and it will serve a far more useful purpose than it does today.—*William J. Andress Sr, KC5HVV, Orange, Texas*

ULS AND PRIVACY

♦ I have read recently that the FCC is concerned about the low rate of ULS registration in the ham ranks. I am counted among that substantial number of nonregistrants. I'm not at all keen on using my Social Security number as a personal ID. When Social Security was first envisioned, the act of giving each citizen a number didn't sit well with the populace. It was only with the assurances of Congress that the system as we know it was adopted.

In the intervening years the assurances of limited use have deteriorated. We commonly see our Social Security numbers used for income tax purposes and other financial dealings. The Social Security number is well on its way to being the ubiquitous Orwellian identifier for each and every citizen. It has even reached the point where any child over the age of 2 has to have one in order for a parent to claim the dependent deduction on their income taxes, thanks to Ted Kennedy's amendment to the 1986 tax reform bill.

I don't use my Social Security number on my driver's license and I decline to give it when asked by various clerks and tellers. Call it my small effort to stop further intrusion on our right to privacy.

I suspect this is the same reason a lot of hams have chosen to defer on the honor of giving it out one more time to another government entity. Perhaps the rest are too busy taking advantage of the current sunspot cycle to participate in ULS registration.

Ostensibly, the reason for requiring Social Security numbers in all dealings with government entities pertaining to licenses and permits is to catch student loan deadbeats and parents who are delinquent on child support payments. My feeling is that to require 100% of the citizenry to do this in order to catch a minority of miscreants is invasive. I plan on putting ULS registration off as long as possible; and maybe trying to stall a little beyond that.

I have come to the conclusion that I've reached the point of being a contrary old coot at a much younger age than I should have needed to.—*Rick Reneau, KB9NDF, Indianapolis, Indiana*

A NEW TECHNOLOGICAL BREAKTHROUGH?

♦ I try to keep up with the latest equipment and software by reading the amateur magazines and surfing the Web. However, I am becoming aware of a new and exciting device that I have not seen or heard about anywhere—the CW DX Operating Robot.

I suspected I had heard several of them during a recent DX contest, but now I am convinced they exist. Apparently these devices are programmed to lock onto DX stations and send their owner's call signs continuously, occasionally pausing for 1-3 seconds. Furthermore, these clever devices are programmed to tune their transmitters to the frequencies of any stations the DX has answered and continue their work. They call on top of the station asked for by the DX, so that all the DX hears is a loud squeal. I also detect some evidence that they are not too good at copying the owner's call in QRM.

You might ask why I say these are obviously robots? Well, consider this: A human would not be so rude as to call on top of the station the DX was trying to work. Further, a human would realize that such thoughtless activity would actually decrease the chances of anybody, including himself (itself?), working the DX station. When the DX station sends "WT8 ONLY" and ZZ4ZZ starts calling, it must be a robot!

I think these devices have a lot of promise. If anyone has access to the source code, I would love to receive a copy. I would try to program my version to be more effective at working DX. I would program it to pause when the DX station sent "?" and have the robot scan its memory to see if the station had sent a fragment that overlapped with the owner's call. If it did, then call. If not, keep quiet until the QSO is over.

Who says that amateurs are not still at the cutting edge of communication technology?—*Val Edwards, W8KIC, Chesterland, Ohio*

A COMMENDATION FOR N3FJP

♦ N3FJP is one of the unsung heroes of the Amateur Radio community. I very much appreciate the excellent work he has done with his *International DX Contest Logging Program*, *Ten Meter Contest Logging Program*, *November Sweepstakes Contest Logging Program*, *Field Day Contest Logging Program*, and (most of all) *Amateur Contact Log*. Scott does it all in the name of good amateur practice and the fraternal spirit that has made Amateur Radio what it has always been. He doesn't accept a penny in compensation. On the contrary, he offers his programs free to hams at his Web site at **http://members.aol.com/snkdavis/page1.html**.

His enhancements to the various logging programs have been timely and keyed to the needs of the amateur community, and I (for one) deeply appreciate the time and talent he has put into this. In my opinion his freeware is superior to many commercial products.

I hope you will accept my gratitude for a job well done, Scott. If any ham deserves to be Ham of the Year, it's you!—*Royce P. Bell, KX7Q, San Bernardino, California.*

MARCH WAS A WINNER!

♦ I want to offer my praise and encouragement for the outstanding work done on the March 2000 issue of *QST*. The *QST* production staff and editors really outdid themselves with this QRP issue and deserve our thanks. I hope we see more of the same in the months and years to come. Being a ham for more than 38 years, I can tell you that QRP provides the kind of excitement we need to keep the thrill alive. I also see great success Elmering younger people with QRP kits.—*Dave Heintzleman, K8BBM, North Platte, Nebraska*

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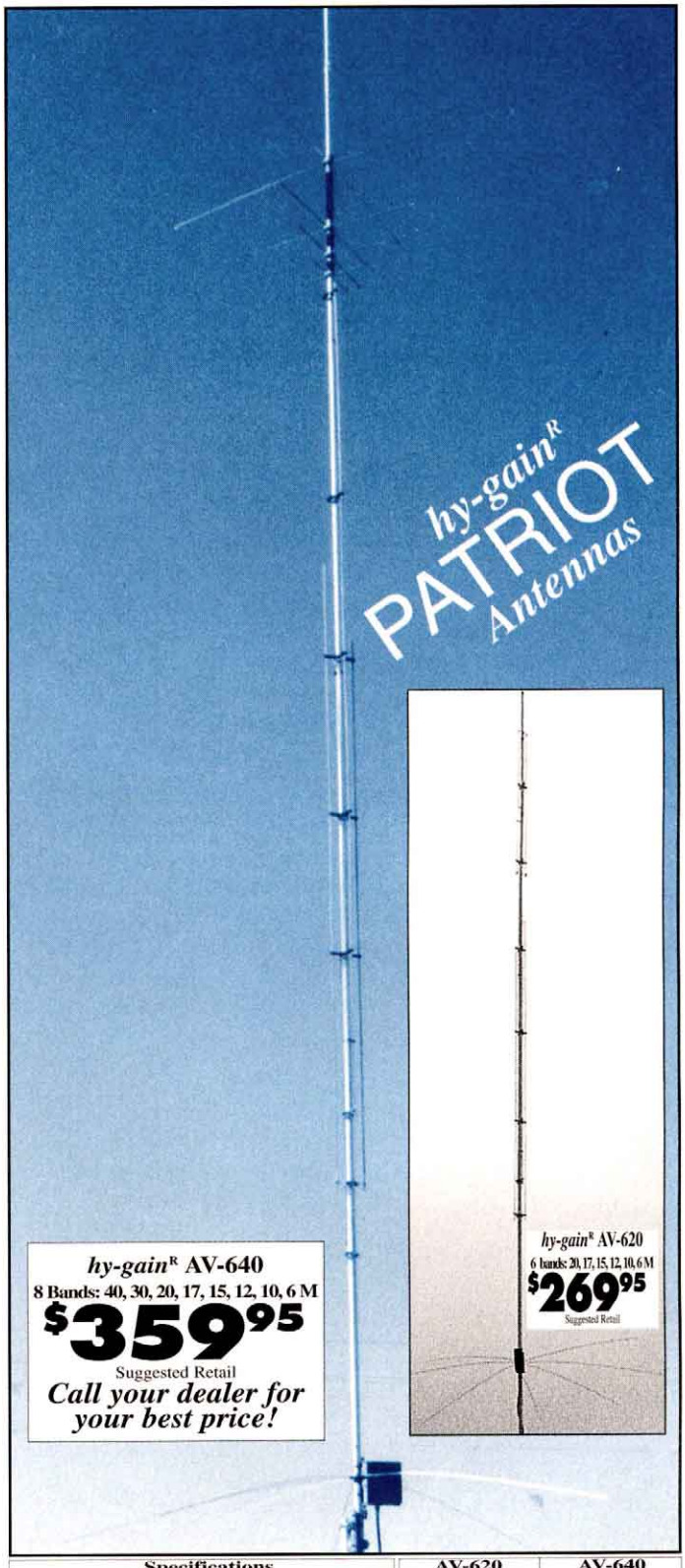
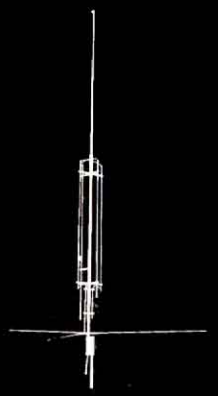


Specifications	AV-620	AV-640
Bands covered (meters)	6,10,12, 15,17,20	6,10,12,15, 17,20,30,40
2:1 VSWR Bandwidth (KHz)		
40M	N/A	150
30M	N/A	175
20M	500	500
17M	500	500
15M	500	500
12M	500	500
10M	1500	1500
6M	2000	1500
VSWR at resonance (typical)	1.5:1	1.5:1
Power handling (watts output) key down 2 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

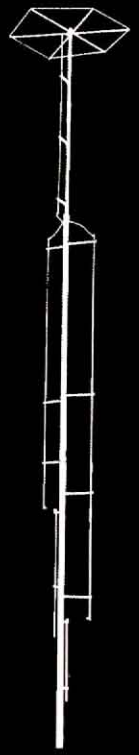
GAP: THE PERFECT ANTENNA

We at GAP realize there isn't a perfect antenna. No singular antenna will scream DX on 80 and be the best for local nets on 10. If anyone tells you there is, beware! The perfect antenna does not exist, but the right one for you may. If you want something to bust the pile on the low bands, then consider the Voyager. Just starting out in ham radio and need a great general coverage antenna, the Challenger is easy to assemble and for little effort will yield superior performance, especially on DX. Maybe you knowingly or unknowingly moved into one of those "restricted areas" where the Eagle's limited visibility, but unlimited ability is desired.



Eagle DX

Challenger DX



Voyager DX

This chart helps you select the right GAP antenna. When comparing GAPs, bandwidth is not a concern. With few exceptions, a GAP yields continuous coverage under 2:1 for the **ENTIRE BAND**.

All antennas utilize a GAP elevated asymmetric feed. A major benefit is the virtual elimination of the earth loss, so more RF radiates into the air instead of the ground. This feed is why a GAP requires **NO RADIALS**. Just as elevating a GAP offers no significant improvement to its performance, adding radials won't either, making set up a breeze.

A GAP antenna has no traps, coils or transformers. This is important. The greatest sources of failure in multiband antennas are these devices. Perhaps you heard someone discuss a trap that had melted, arced or became full of water. Improvements to these inherent problems are the focus of the antenna manufacturer, while the basic design of the antenna remains unchanged. **GAP improved the trap by eliminating it!** Removing these devices means they don't have to be tuned and, more importantly, won't be detuned by the first ice or rain. The absence of these devices improves antenna reliability, stability and increases bandwidth.

Another major advantage to a GAP antenna is its NO tune feature. Screws are simply inserted into predrilled holes with a supplied nutdriver.

The secret is out and people in the know say:

CQ–"The GAP consistently outperformed base-fed antennas. ..and was quieter."

73–"This is a real DX antenna, much quieter than other verticals."

RF–"To say this antenna is effective would be a real understatement. Switching back and forth on 40m between another multiband HF vertical and the GAP, there was no comparison. Signals were always stronger on the GAP, sometimes by S units, not just DB's."

Worldradio – "These guys have solved the problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound. A half-wave vertical does need radials if it is end fed (at the bottom). But the same half-wave vertical does not (as much, hardly at all) if is fed in the center."

IEEE–"Near field and power density analyses show another advantage of this antenna (asymmetric vertical dipole): it decreases the power density close to the ground, and so avoids power dissipation in the soil below it. The input impedance is very stable and almost independent of ground conductivity. This antenna can operate with high radiation efficiency in the MF AM standard broadcast band, without the classical buried ground plane, so as to yield easier installation and maintenance."

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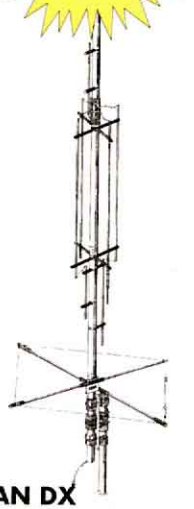

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This all purpose antenna is designed to operate 10m-80m, WARC bands included. It sits on a 1-1/4" pipe and can be mounted close to the ground or up on a roof. Its bandwidth and no tune feature make it an ideal antenna for the limited space environment as well as a terrific addition to the antenna farm.

MODEL	BANDS OF OPERATION											HT	WT	MOUNT	COUNTER-POISE	COST
	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m					
Challenger DX	■	■	■	■	■		■		■	■		31.5'	21 lbs	Drop In Ground Mount	3 Wires @ 25'	$279
Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	$289
Titan DX			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	$319
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	$399

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By Ian Poole, G3YWX

Operating in the UK: A Primer for US Hams

Now that US hams can easily operate in many foreign countries thanks to CEPT participation, it's easier than ever to pack a mini rig or two and make ham radio part of your travels. The UK—a popular destination for many US hams—is a good place to start. Here's a "leg up" on operating in Britain.

Each year Britain receives several million visitors from abroad. Many will have an interesting time visiting tourist spots such as Stonehenge, Buckingham Palace, the Houses of Parliament at Westminster or some of the many castles and monuments around the country. For hams, however, a trip to the UK can also be an opportunity to pack some radio gear and try operating from the other side of the "pond."

"Hamcationing" can be particularly useful for solo business travelers who'd like to talk to hams from Britain, possibly on the VHF or UHF bands. For those with access to HF equipment, a "G-trip" can make it possible to work DX from a new country or talk to friends and family back home.

Table 1
UK HF Band Allocations in MHz

1.81 - 2.00
3.5 - 3.80
7.00 - 7.10
10.10 - 10.15
14.0 - 14.35
18.068 - 18.168
21.0 - 21.45
24.89 - 24.99
28.00 - 29.70

Table 2
UK VHF/UHF Allocations in MHz

50.00 - 52.00
70.00 - 70.50
144.00 - 146.00
430.00 - 440.00
1240.00 - 1325.00
2310.00 - 2450.00

Formalities

With the increasing "globalization" of Amateur Radio it's becoming much easier to operate in other countries with a minimum of formalities. Many countries—now including the US—have signed on to CEPT Recommendation T/R 61-01, a "universal" reciprocal operating agreement among participating countries that permit Amateur Radio. US hams can now operate within "CEPT countries" by simply bringing their *original* US licenses and proof of US citizenship (a passport is the obvious choice for this) along with the multilinqual text that's included in the FCC's CEPT Public Notice, which can be printed from the ARRL Web site at **http://www.arrl.org/field/regulations/io/cept-ral.pdf**.

There are two CEPT license designators—Class 1 and Class 2. The Class 1 license requires proficiency in Morse code (to a given level) and qualifies holders for all operating privileges, including operation on the bands below 30 MHz. US General, Advanced, Technician Plus and Amateur Extra licensees qualify for CEPT Class 1 tickets.

Qualifying for a Class 2 license does not require knowledge of Morse code and gives users all operating privileges on frequencies above 30 MHz. It's the equivalent to the Technician-class license in the US. There is no CEPT equivalent for Novice licensees.

When operating in a CEPT country, operators sign their home call signs preceded by the ITU prefix assigned to the country they're operating from. Being temporary, CEPT stations are classified as portable or mobile. In other words, a US ham operating from England would sign M/WZ0ZZZ/P (or /M as appropriate), MW/WZ0ZZZ/P for

Table 3
2-Meter Channel Designations

Repeater Input Channels	Simplex Channels	Repeater Output Channels
145.000 RV48 (R0)	145.200 V16 (S8)	145.600 RV48 (R0)
145.025 RV50 (R1)	145.225 V18 (S9)	145.625 RV50 (R1)
145.050 RV52 (R2)	145.250 V20 (S10)	145.650 RV52 (R2)
145.075 RV54 (R3)	145.275 V22 (S11)	145.675 RV54 (R3)
145.100 RV56 (R4)	145.300 V24 (S12)	145.700 RV56 (R4)
145.125 RV58 (R5)	145.325 V26 (S13)	145.725 RV58 (R5)
145.150 RV60 (R6)	145.350 V28 (S14)	145.750 RV60 (R6)
145.175 RV62 (R7)	145.375 V30 (S15)	145.775 RV62 (R7)
	145.400 V32 (S16)	
	145.425 V34 (S17)	
	145.450 V36 (S18)	
	145.475 V38 (S19)	
	145.500 V40 (S20) —calling channel	
	145.525 V42 (S21)	
	145.550 V44 (S22)	
	145.575 V46 (S23)	

Table 4
70-Centimeter Channel Designations

Repeater Output Channels	Simplex Channels	Repeater Input Channels
433.000 RU240 (RB0)	433.400 U272 (SU16)	434.600 RU240 (RB0)
433.025 RU242 (RB1)	433.425 U274 (SU17)	434.625 RU242 (RB1)
433.050 RU244 (RB2)	433.450 U276 (SU18)	434.650 RU244 (RB2)
433.075 RU246 (RB3)	433.475 U278 (SU19)	434.675 RU246 (RB3)
433.100 RU248 (RB4)	433.500 U280 (SU20)	434.700 RU248 (RB4)
433.125 RU250 (RB5)	—calling channel	434.725 RU250 (RB5)
433.150 RU252 (RB6)	433.525 U282 (SU21)	434.750 RU252 (RB6)
433.175 RU254 (RB7)	433.550 U284 (SU22)	434.775 RU254 (RB7)
433.200 RU256 (RB8)	433.575 U286 (SU23)	434.800 RU256 (RB8)
433.225 RU258 (RB9)	433.600 U288 (SU24)	434.825 RU258 (RB9)
433.250 RU260 (RB10)		434.850 RU260 (RB10)
433.275 RU262 (RB11)		434.875 RU262 (RB11)
433.300 RU264 (RB12)		434.900 RU264 (RB12)
433.325 RU266 (RB13)		434.925 RU266 (RB13)
433.350 RU268 (RB14)		434.950 RU268 (RB14)
433.375 RU270 (RB15)		434.975 RU270 (RB15)

Wales, etc. Effectively, an operation is portable when it's staged from a "temporary" location and mobile when it's from a vehicle (or even when walking). No maritime or aeronautical mobile operation is permitted.

M Call Signs

If you'd like to stay a little longer in the UK, consider applying for an "M" license. An application should be made to the Radio Licensing Centre, POCM, PO Box 885, Bristol, BS99 5LG, UK. Use the appropriate form and enclose £15 Sterling, your original US license and your UK station address (which can be a hotel). It's possible to quote a US mailing address if you want to renew your license (done annually).

Bands

Most traveling hams will probably use the VHF/UHF bands because it's so easy to pack a small hand-held radio. Diehard HFers, however, will want to look over the UK band allocations in Table 1. In general, power output is limited to 26 dBW (400 W). Between 1.850 and 2.000 MHz the limit is only 15 dBW.

At VHF and UHF, a slightly greater knowledge of band plans, channel allocations and operating conventions comes in handy. Because 2 m and 70 cm are the most popular, details for those bands are shown in Table 2.

The bands have channels allocated for repeater and simplex operation. These have letter designations so they can be easily identified. Repeater channels start with the letter R; simplex channels with a V on 2 m and a U on 70 cm. Although 2 meters supports 12.5-kHz channel spacing, this will not be fully implemented until June 30, 2000. The introduction of this tighter channel spacing has mainly been driven by the need for more repeater channels (to reduce repeater channel re-use and interference).

It's also worth noting that operation is not permitted on frequencies between 431 and 432 MHz within a 100-km radius of Charing Cross in the center of London. Fortunately, there is little activity on these frequencies anyway, and neither simplex nor repeater channels are affected by this restriction. See Tables 3 and 4 for 2-meter and 70-centimeter channel designators.

What to Expect

HF operation from the UK isn't too different from that in the US, but the background interference *is* different, and stations from around Europe are quite strong.

If you're an experienced US VHF/UHF operator you won't have any difficulty operating in the UK, although things may have a slightly different "feel" to them. Activity is sparse compared to many areas of the US, although when people are traveling to and from work the bands perk up. It may be surprising, but even around London during weekdays there are not many stations to be heard during the day. At times like these the best way to prompt a contact is to make a call through a repeater—an American accent is sure to generate some interest!

Final Thoughts

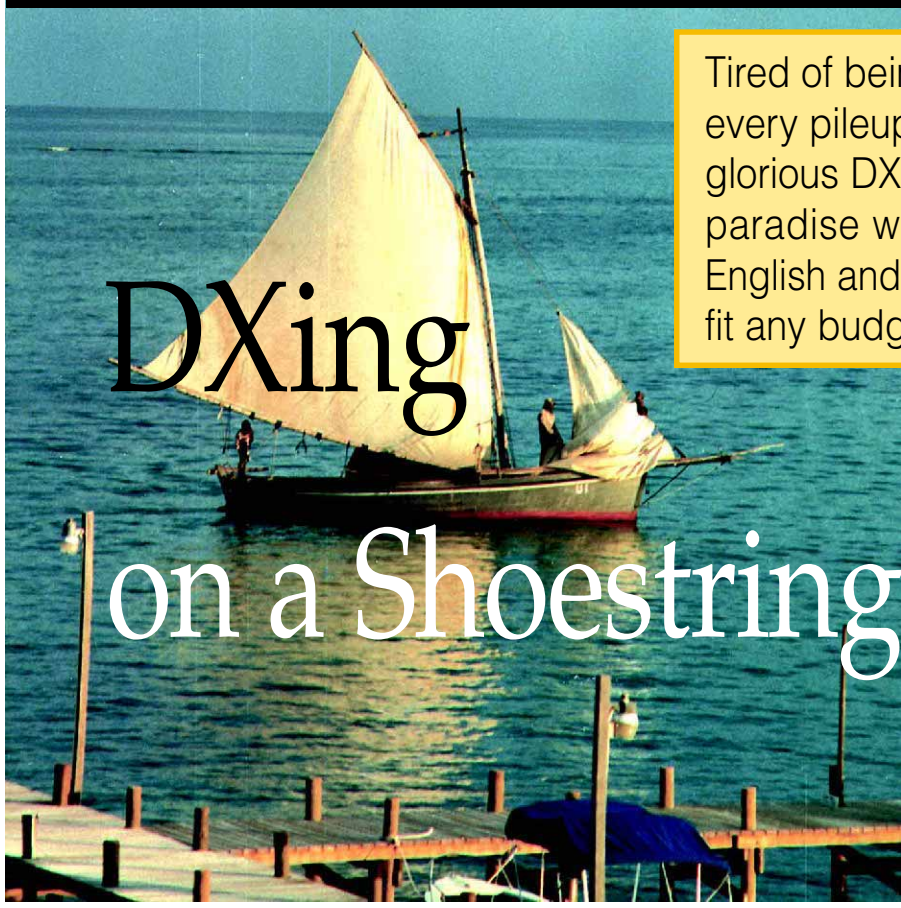
One point you'll have to remember is that the ac mains in the UK put out 230 volts and require connectors that are different than those used in the US. This is even important for powering hand-helds, because unless you're using disposable cells, the batteries will need charging sooner or later. The plug size problem can be overcome by using a "shaver adapter," available from most electrical retailers for a small sum. It's still necessary to make sure that the voltage can be accommodated. Most US RadioShack stores sell a plug and voltage converter kit suitable for most low-power devices.

When packing your equipment remember that hand-held radios should be carried as hand luggage and not packed away in a suitcase. After the Lockerbie disaster, airline security workers are leery of radios packed in suitcases.

Guide to VHF/UHF Amateur Radio by Ian Poole is due to be published at press time by the RSGB. It gives details of operating in the UK as well as information valuable to anyone using the VHF and UHF bands. You can contact the author at 5 Meadway, Staines, Middlesex, TW18 2PW, United Kingdom; **ian-poole@lineone.net**. QST

By Roger Sullivan, WA0ETE, and Hugh Tinley, K0GHK

DXing on a Shoestring



Tired of being on the wrong end of every pileup? Want to embark on a glorious DXpedition to a tropical paradise where everyone speaks English and food and lodging options fit any budget? Here's how!

For radio amateurs, there are two indisputable facts. First, a buttered piece of bread, if dropped, will always land butter-side down. Second, the best DX is *always* found on the other side of the world.

Although belief in the buttered bread phenomenon is still firm, an increasing number of hams will tell you that the most interesting DX *is* worked when they get on the air from nearby countries that rare DX stations *themselves* are looking for, such as the small, out of the way countries in Central America and some Caribbean islands.

Amazingly, the average American ham can get to these places easily and cheaply (and on a plane in just half a day). And the average ham with a spouse, two kids and a mortgage—but with enough green stuff in the bank to take a ski vacation—can fly there and draw pileups fierce enough to compete with those experienced by the ops on any well-appointed million-dollar DXpedition.

Actually, hundreds of hams are doing just that. You hear them on the air having a ball with a dipole and 90 W, working rare DX stations that are scattered throughout their pileups. What could be better—especially on a budget?

One of the best places for a family DXpedition is Belize, where hams sign call signs that start with V31. Although nine people out of 10 have never heard of Belize, when a V31 station shows up on the ham bands it really smokes out the DX and creates humongous pileups.

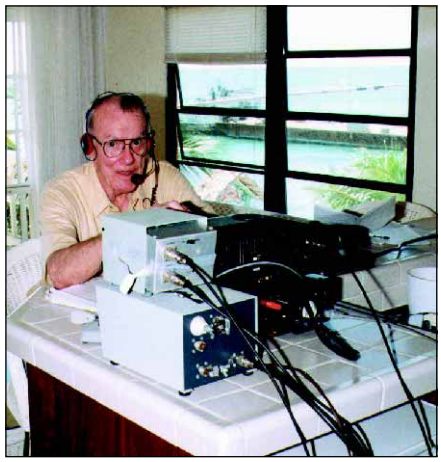
Before I retired, my work often took me out of the country and gave me the opportunity to operate from some interesting locations. Belize was near the top of my list. The pileups I stirred up from Belize were mind-boggling.

Roger Sullivan, WA0ETE, and I, K0GHK, were in Belize for a week last October and, with the call V31KQ, worked the world using an R5 vertical and 90 W from a Yaesu FT-757 transceiver. Roger, smart guy that he is, stuck the R5 on a post a few feet offshore and a few feet above the water—and the thing really performed. We attributed our popularity to the V31 prefix, but I doubt we could have gotten more attention if we'd used a big beam and an amplifier. We were in high cotton.

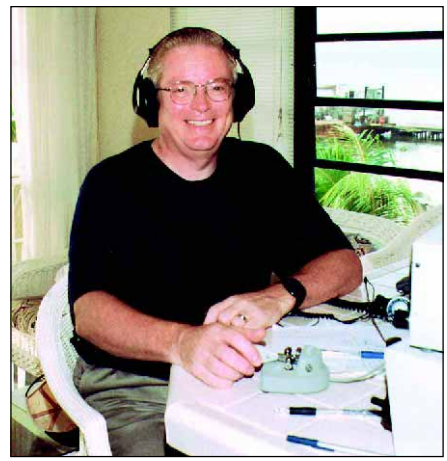
Being out of the States and in a "wanted" location like Belize gives you the opportunity to work some super QRP DX—all the way down to 1 W—even with modest antennas. Most of this is done on 10 or 12 meters, but you can go to the other end of the bands, hook up a big wire antenna, crank the rig up to 90 W and shake up 160 meters.

There is a romance about Amateur Radio and the art of communicating with people in faraway places with strange-sounding names. Hams call it DXing and,

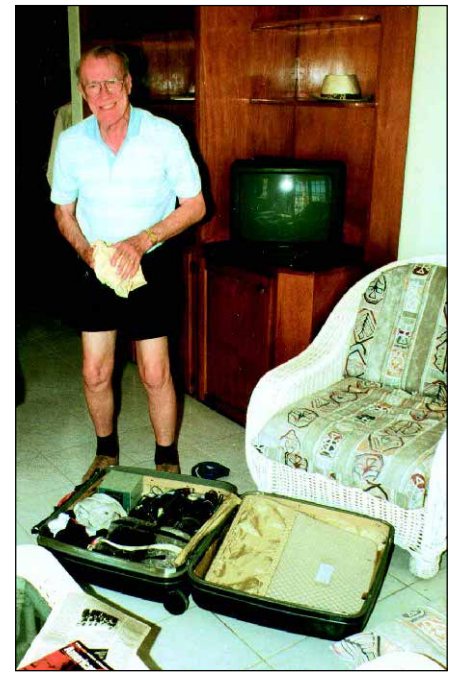
Our "DX Central"—the Mayan Princess Hotel on Ambergris Cay, about 40 miles off the coast of Belize.



K0GHK in the kitchen operating position.



Roger, WA0ETE, takes a turn at the radio.



Hugh, K0GHK, unpacks after our arrival.

at least once in a lifetime, every amateur should have the opportunity of doing this from a foreign country with *hundreds* of DX stations calling. Being at the *bottom* of such a pileup is a magical place where all of your fanciful Amateur Radio dreams come true.

Meet Me in Belize

Besides being a great place to operate, Belize has some other interesting features.

It's close to the United States, which makes it an easy and inexpensive destination. It's right below Mexico and can be reached in half a day from practically any place in the States.

Belize has a reciprocal operating agreement with the US and licensing is no problem. A Belize license costs $20 and is good for a year. For an application, write to the Office of Telecommunication, PO Box 310, Belize City, Belize, Central America.

Belize has a stable, democratic government and is the only country in Central or South America where English is the primary language. Getting on the air in a foreign country is a whale of a lot easier when people in that country speak English (assuming that English is your primary language!).

The Belize currency is tied to the American dollar, and our dollar is worth two Belize dollars. Unfortunately, American dollars don't go twice as far in Belize, but things are more affordable there and are far less expensive than most of the more popular Caribbean tourist hotspots.

If ham radio isn't enough to hold your attention, Belize has world-class ocean fishing, snorkeling and scuba diving, plus intriguing opportunities to explore little-known Mayan ruins.

Although Belize is off the beaten path, accommodations and food range from good to excellent and both are reasonably priced.

Here are some tips:

✔The summers in Belize are hot and the country is in "Hurricane Alley" through October. The most comfortable and safest time to be there is November to May. Winter rates are somewhat higher, so if you plan to go, try to arrive before winter rates start or after they end.

✔As more and more hams are traveling to Belize, be sure you don't end up in a hotel when other hams are there or everyone will probably have interference problems.

✔Before you go, find out all you can about the place where you plan to stay. The New Orleans ARC is a good source of information.

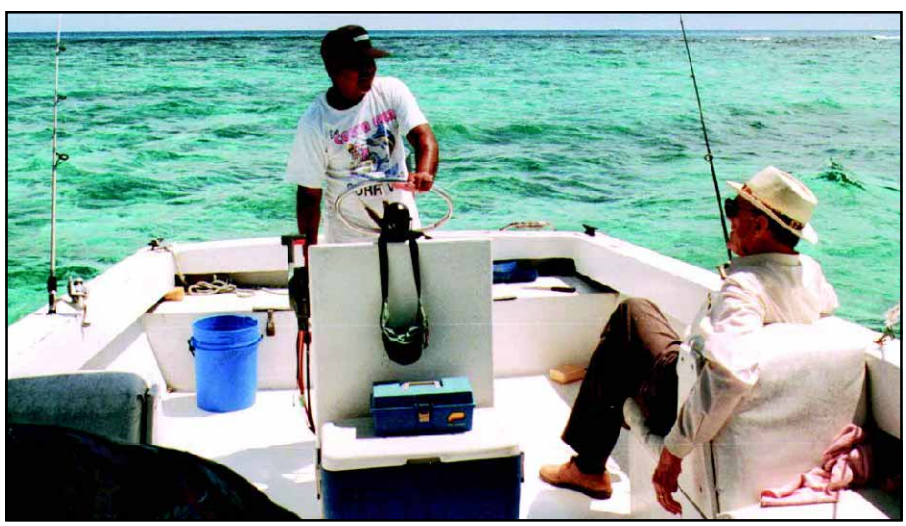
Remember that there won't be a ham store or a RadioShack around every corner. If you blow a fuse and don't have a spare, your "hamcation" may suffer.

✔Before you go, ask a local ham, preferably one with a phone patch, if he or she will be your "babysitter." (Third-party traffic is okay from Belize.) Leave phone numbers and work out a sked with your sitter when you can get together on the air. Lorraine Bogle, AA0BS, was our sitter. I don't know what we would have done without her!

✔Don't stay on the air day and night. It may sound like heresy, but there *is* more to life than Amateur Radio. Work the interesting DX and tackle your pileups, but don't wear yourself out just to tell your friends at home that you made 4000 contacts in three days.

If you've always wanted to be on the business end of a major pileup, consider taking your own "close in" DXpedition. We did—and the DX was there!

You can contact Roger Sullivan, WA0ETE, at 14930 Hawthorne Ave, Omaha, NE 68154-1973. You can reach Hugh Tinley, K0GHK, at 17475 Frances St, Apt 2010, Omaha, NE 68130.



Don't spend all of your time in front of a radio!

By Jim Graver, KB8PSO

Dayton Hamvention 2000

A Once-in-a-Lifetime Gathering

MEL BERMAN & ASSOCIATES

"Did you go to *Dayton?*"

That question has been a staple among amateurs for almost 50 years. Notice that no one asks, "Did you go to the Dayton Hamvention in Dayton, Ohio?" That would be unnecessary. When you say "Dayton," everyone understands that you mean the *Dayton Hamvention*.

Every Hamvention is a memorable event, but this one will be historic. At Hamvention 2000 we'll celebrate the coming millenium and the second century of Amateur Radio. And for the first time in Hamvention history, we will host the ARRL 2000 National Convention. If you've never made the pilgrimage to Dayton before, this is the year to do it.

You and 29,999 Friends

The Dayton Hamvention is the largest Amateur Radio gathering on the face of the Earth, attracting nearly 30,000 active hams. For three days the Hara Arena Conference and Exhibition Center is converted into a bustling miniature city. Five hundred indoor exhibits give new meaning to the phrase, "Shop 'til you drop." The outdoor fleamarket—the largest ham fleamarket in the world—is legendary. If you can't find what you want at Dayton, it probably doesn't exist.

Hamvention is the best place to find old friends, or meet people that you've only communicated with by radio. The custom is for everyone to wear their call signs on their hats, badges, jackets or whatever. As the "pilgrims" pass each other in the aisles, eyes dart to call signs. Sudden recognition often causes spontaneous human traffic jams. ("Hey! I worked you 10 years ago when you were in Brazil!")

Of course, Hamvention is about more than shopping, eating and reminiscing. There are forums Friday, Saturday and Sunday with a broad range of topics including QRP, satellites, SSTV, contesting, VHF and microwave, fox hunting, kit building and more.

Getting There

Several major carriers including Delta, American, US Airways, TWA and Continental serve Dayton International Airport, located north of the city.

Rail travelers can take Amtrak to either Cincinnati (to the south) or Toledo (to the north). If you prefer to drive, you'll find that the Hamvention is conveniently located just a few miles from the junction of Interstates 70 and 75.

At this late date it may be difficult to find motel and hotel rooms in the Dayton area, but not impossible. Call the Dayton and Montgomery County Convention and Visitors Bureau at 937-226-8211 for information on available rooms. The alternative is to seek lodging outside of Dayton in surrounding communities such as Franklin, Springboro, Hamilton, Springfield, Middletown and elsewhere. If you're willing to do some driving between your hotel and Hamvention, there is a room available for you.

Tickets

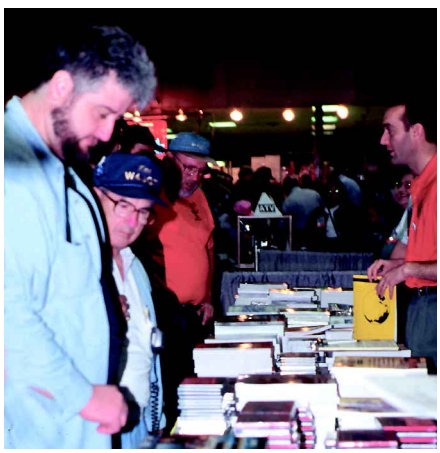
Pre-show priced admission tickets are available at HARA Arena box office through 5 PM, May 18. Banquet tickets must be ordered by May 10 (no sales after that date). Advanced sales tickets are available by mail (enclose a self-addressed, stamped envelope) at: Dayton Hamvention, Ticket Sales, PO Box 1446, Dayton, OH 45401-1446. They are also available via fax at 937-454-5655 (ticket ordering form can be found on our Web site or in our preshow mailer). Please provide charge card information with your order.

Tickets ordered by mail or fax after May 1 (USA) or April 20 (Canada) will be held at the Hara Arena Box Office for pick up beginning May 17 at 9 AM. No fax or mail orders will be processed after Wednesday May 10, 2000.

Advance Admission Ticket
(valid all 3 days): $16
Admission Ticket (at door)
valid all 3 days: $22
Banquet Ticket
(must be bought by May 10th, no sales after): $45
Don't forget to bring the kids.
All children 12 years of age and under are admitted *free*.
Check the Web for more information at
http://www.hamvention.org.

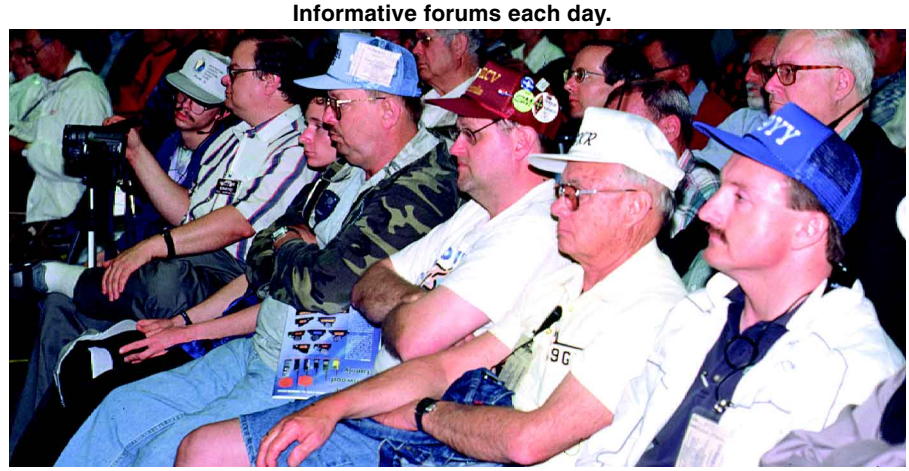
Jim Graver, KB8PSO, is Hamvention 2000 General Chairman. QST

500 indoor exhibits.



RICK LINDQUIST, N1RL

Informative forums each day.



RICK LINDQUIST, N1RL

By Paul Hewitt, WD7S

Automatic Amplifier Selection for the ICOM IC-746, -736 and -706MKII Transceivers

This simple and neat add-on makes multiple-amplifier selection a breeze!

ICOM's new multiband radios have simplified many a radio amateur's station. Unfortunately, the simplification doesn't extend to interfacing multiple non-ICOM linear amplifiers to that new radio. The ICOM IC-746 and IC-736 have only one buffered key line, and the delay its switching relay introduces creates problems for those who operate full-break-in CW.[1] The IC-706 series transceivers don't have any buffered key lines for interfacing amplifiers. If you use separate amplifiers for HF, 6 and 2 meters, band changing involves manipulating the operate/standby switches of the individual amplifiers each time you change bands—not something I want to have to remember after 18 hours of VHF contesting!

Automated Switching

The simple interface described here resolves the aforementioned difficulties by providing automatic key and ALC-line selection for HF, 6 and 2-meter amplifiers. It also bypasses the slow internal reed relay in the IC-746 and IC-736 transceivers by providing electronically buffered key lines for all three ICOM transceiver models. All of this is accomplished without the need for another power supply or any internal transceiver modification thanks to the **ACC(2)** jack on the rear panel of each transceiver. Provisions are also made to control an external coaxial relay giving the IC-706MKII-series transceivers three programmable antenna ports for HF, 6 and 2 meters, eliminating the need for a manually operated coax switch when using three separate amplifiers or antennas.

[1]Notes appear on page 36.

Circuit Details

Figure 1A is the schematic of the interface and the two key-line buffers. Some of you might recognize the circuit as an adaptation of Nigel (KG7SG) Thompson's automatic antenna switch.[2, 3] The IC-746 **ACC(2)** pin-out (Figure 2) shows that in addition to the two unbuffered key lines (**vsend** and **hsend**), band logic is also provided and is used to bandswitch ICOM's solid-state linear amplifiers. The band logic is in the form of specific dc-voltage levels between 0 and 8 V, corresponding to the various bands as shown in Table 1. The **ACC(2)** jack also provides an 8-V dc regulated reference source and a 13.8-V, 1-A supply (transceiver supply voltage for the IC-706MKII series). With the exception of **vsend** on the IC-736, all of these outputs are available on the IC-736 and IC-706MKII series radio's **ACC(2)** jacks. The original IC-706 does not have a separate **vsend** line and requires manual key-line switching of any 6- and 2-meter amplifiers. This interface also works with the IC-756.

Band Selection

Because the 2-meter-band position has its own key line, we can pass it to its own buffer and then out to a 2-meter amplifier. This means we need decode only the voltage differences between the HF bands and 6 meters. If we divide the 8-V reference voltage into voltage levels corresponding to the bands of interest, simple voltage-window comparators can decode the band logic. Comparator U1A determines if the band-logic voltage is above 2 V (HF). If it is, its open-collector output turns off, allowing Q1 to turn on via R1, lighting DS1 and energizing K1. K1's contacts connect the ALC line and the buffered **hsend** key line to rear-panel **HF KEY** and **HF ALC** phono jacks for routing to an HF amplifier. U1B detects if the band-logic voltage is below 2 V, while U1C detects if the band-logic voltage is above 1 V. When the band-logic voltage is in this window (between 1 and 2 V [6M]), both comparators are off. This allows Q2 to turn on via R2, lighting DS2 and energizing K2, connecting the ALC and buffered **hsend** key lines to rear-panel phono jacks for a 6-meter amplifier.

Thirty meter (10-MHz) amplifier operation is not supported by the interface shown here as the band-logic voltage level is 0 V. If you want to control a 10-MHz 200-W amplifier, use another comparator section (U1D) to control another relay driver (Q7) and relay (K3) for band-logic voltage levels below 1 V as shown in Figure 1B.

Table 1
ICOM Transceiver Band Voltages

Frequency (MHz)	*Output Voltage (V)*
1.8	7.0-8.0
3.5	6.0-6.8
7	5.0-5.8
14	4.0-4.8
18, 21	3.0-3.8
24, 28	2.0-2.8
50, 144	1.0-1.9
10	0-0.9

ALC-Line Selection

ALC-line selection between HF and 6 and 2 meters is included to make use of keying sequencers that apply a negative

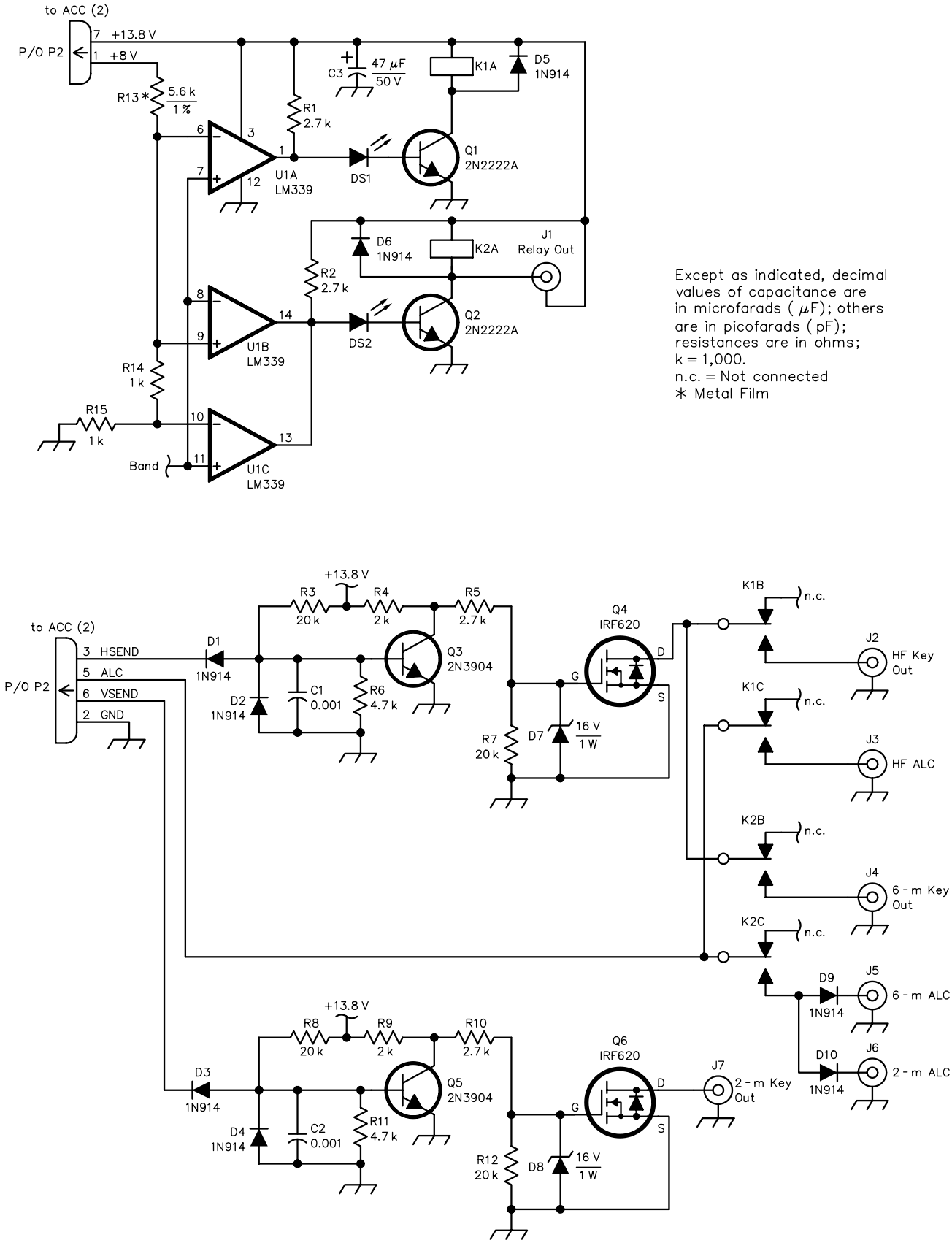
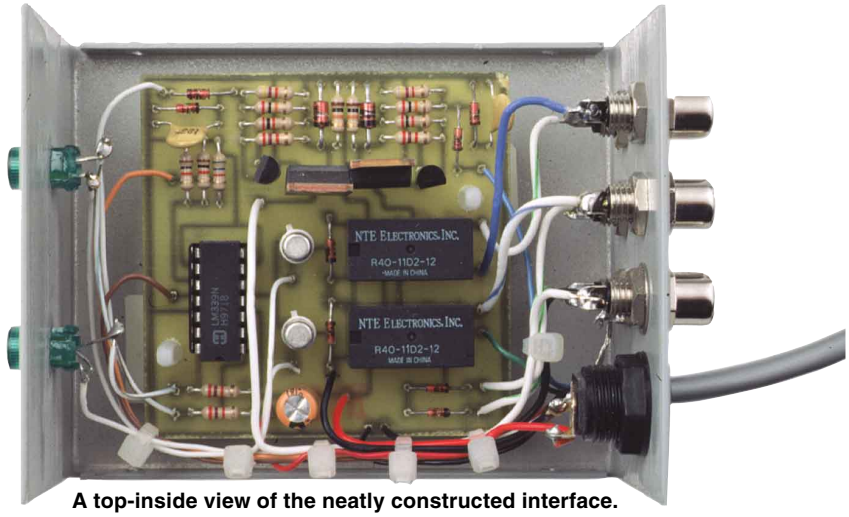


Figure 1A—Schematic of the interface. Unless otherwise specified, resistors are 1/4-W, 5%-tolerance carbon-composition or metal-film units. Equivalent parts may be substituted; n.c. indicates no connection. At the right, modification for 30-meter (10-MHz) amplifier control.

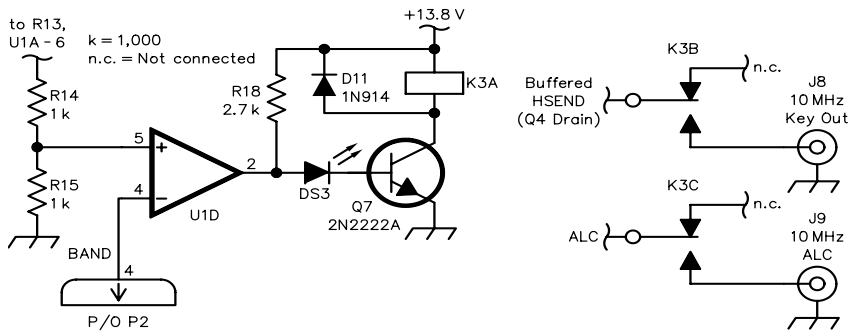
voltage on the ALC line for transmit inhibit. This type of sequencer allows you to use the desk mike's PTT switch and not have to tap into a key line or use a foot switch to key the sequencer. The 6- and 2-meter ALC lines are combined with an **OR** gate made from two 1N914 diodes. Because my 6- and 2-meter sequencer radio-control ports are tied together, I needed only one ALC line for both bands. All three ALC lines could be combined with a three-input **OR** gate if you don't plan on using sequencers using ALC control. Many amplifier manufacturers no longer recommend the use of ALC to control amplifier output power when a continuously variable power control is available on the exciter, so all three ALC connections could be eliminated.



A top-inside view of the neatly constructed interface.

ACC(2)	PIN NO.	NAME	DESCRIPTION	SPECIFICATIONS
 Rear panel view	1	8 V	Regulated 8 V output.	Output voltage : 8 V ±0.3 V Output current : Less than 10 mA
	2	GND	Same as ACC(1) pin 2.	
	3	HSEND	Same as ACC(1) pin 3.	
	4	BAND	Band voltage output. (Varies with amateur band)	Output voltage : 0 to 8.0 V
	5	ALC	Same as ACC(1) pin 8.	
	6	VSEND	Input/output pin (144 MHz only) Goes to ground when transmitting. When grounded, transmits.	Ground level : –0.5 V to 0.8 V Output current : Less than 20 mA
	7	13.8 V	Same as ACC(1) pin 7.	

Figure 2—ACC(2) jack pin-outs for the ICOM IC-746 series transceivers.



C1, C2—0.001 µF, 100 V ceramic disc
C3—47 µF, 50 V electrolytic
D1-D6, D9-D11—1N914, 1N4148, etc
D7, D8—16-V, 1-W Zener diode (1N4745A)
DS1-DS3—T-1-3/4 LED
J1—2.5-mm dc power jack, plastic housing (Mouser 163-4303; Mouser Electronics, 958 N Main St, Mansfield, TX 76063-4827; tel 800-346-6873, 817-483-4422, fax 817-483-0931; sales@mouser.com; http://www.mouser.com)
J2-J9—Chassis-mount phono jack
K1-K3—DPDT DIP relay, 12-V dc, 960-Ω coil, 0.5-A, 125 V ac contacts (Mouser #526-R40-1102-12); K3 is optional, see text.
Q1, Q2, Q7—2N2222A
Q3, Q5—2N3904
Q4, Q6—IRF620 (TO-220 case)
U1—LM339 quad comparator; see text.

Key-Line Buffers

The key line buffers use NPN transistors to control the gate voltage of power MOSFETs. Q3 and Q5 are biased on during receive, holding the gates of Q4 and Q6 low. If either key line goes low, Q3 or Q5 is turned off, allowing voltage to appear at its associated MOSFET's gate, turning it on. Each MOSFET keys the amplifier connected to it via relay contacts—K1B for HF or K2B for 6 meters (or directly for 2 meters). My original design used NPN transistors in place of the MOSFETs, but their voltage rating was insufficient for the key lines of older Heath amplifiers and other published full-break-in amplifier-keying designs. The IRF620 used here has a maximum voltage rating of 200 V, a maximum current rating of 5 A and a maximum power dissipation rating of 40 W. My key-line requirements were low enough (less than 1 W) that I didn't use heat sinks on the MOSFETs; this should be the case for most modern amplifiers. If you use an old amplifier, make sure the relays you use can handle the voltage and current requirements of the key lines. The relays used here are rated to switch 0.5 A at 125 V. Because these relays change state only during band changing, they need only *carry* the intended load, not *switch* it—unless you are too excited to let go of the PTT switch when you go for that multiplier! Each MOSFET gate is protected by a 16-V Zener and a 20-kΩ pull-down resistor. The resistor was added to lower the gate impedance, hopefully eliminating possible false keying by stray RF.

When using the IC-706 series radios, the HF/6-meter antenna port can be automatically switched between two amplifiers (or two antennas) with the addition of an SPDT 12-V coaxial relay powered by the **RELAY OUT** jack on the decoder as illustrated in Figure 3. This 2.5-mm insulated power jack supplies 12-13 V at 500 mA during 6-meter band selection. Because this relay switches when no RF power is applied, it can be very small; a BNC- or F-connector relay should suffice. Whichever relay you use, make sure it is rated for *continuous* duty as many coaxial relays are not, and get very hot when energized for long periods.

Construction Details

Check your individual radio's band voltage to ensure they agree with ICOM's data. It's good practice to confirm the values of resistors used in the voltage dividers (R13-R15) as well. The interface uses a single-sided PC board.[4] The simplicity of the circuit makes perfboard an attractive alternative; ground plane ("dead bug") construction may also be used. The PC board is 2.3 inches square and is held above the enclosure floor by 0.75-inch Nylon peel-and-stick stand-offs. U1, the LM339

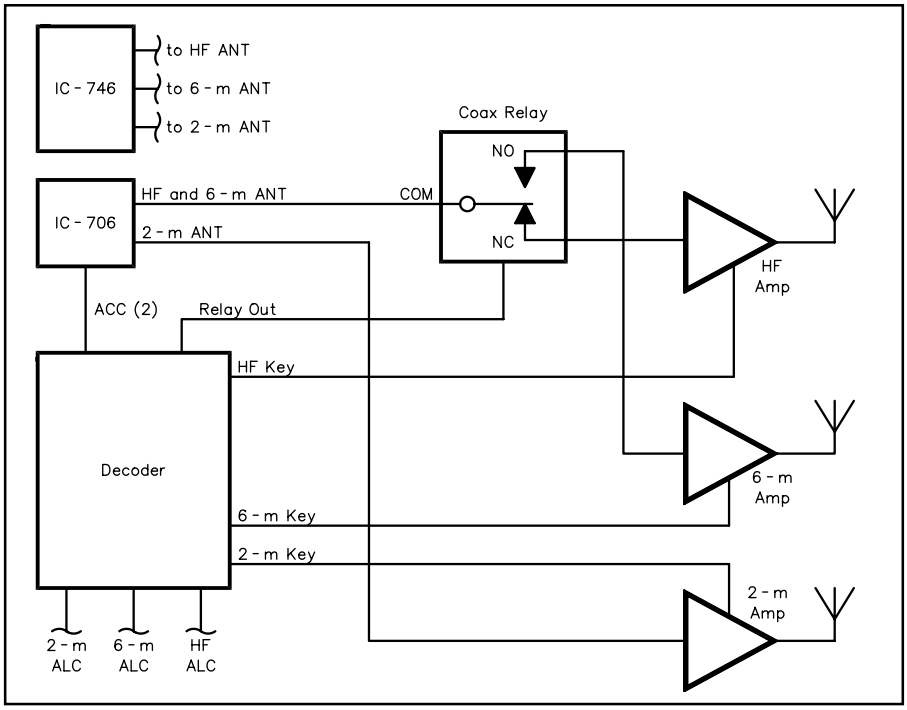


Figure 3—Typical configurations for multiple non-ICOM linear amplifiers using the interface. The RELAY OUT jack can add an extra programmable antenna jack to any of the radios.

All input/output connections are made via the rear panel.

comparator, is mounted in a DIP socket for ease of replacement (just in case!). A 2.125×3.0×3.75-inch (HWD) painted LMB enclosure is available from suppliers who advertise in *QST*. All amplifier connections are made via rear-panel-mounted phono jacks. To ensure good ground contact, remove any paint on the inside of the enclosure where the jacks are mounted. The two LEDs are mounted on the front panel in colored Fresnel lenses that I like for their wide-angle viewability. Jacks are identified using Brother P-Touch labels. All connections to the transceiver are made with a matching 7-pin DIN connector via 7-conductor shielded wire. (A 15-pin DIN connector is required for the IC-706 transceivers.) Figure 3 illustrates some common interconnection schemes. For 6- and 2-meter high-power operation, band changing requires but a single keystroke (and drive-level touch-up), while HF operation requires a keystroke and band selection on the amplifier.

Summary

The IC-706MKIIG 70-cm capability is not supported by this interface, so switching between 2-meter and 70-cm amplifiers requires external switching of some sort. I hope ICOM will address these interface problems for non-ICOM amplifiers in future designs, perhaps by bringing three- or four-bit binary band data to the rear of the radio where we could decode it for automatic amplifier and antenna selection for all bands.

Notes

[1]Tony Brock-Fisher, K1KP, "Cure for the 'Missing First Dot' Problem with ICOM MF/HF Rigs Driving Linear Amplifiers," Hints and Kinks, *QST*, Nov, 1995, p 84.

[2]Nigel Thompson, KG7SG, "A Remotely Controlled Antenna Switch," *QST*, Apr 1993, pp 32-35.

[3]Nigel Thompson, KG7SG, "A Remotely Controlled Antenna Switch," *The ARRL Handbook For Radio Amateurs*, 76th Edition, 1999, pp 22.43 to 22.45.

[4]PC boards for this project are available from FAR Circuits, 18N640 Field Ct, Dundee, IL 60118-9269; tel 847-836-9148 (voice and fax). Price: $4 plus $1.50 shipping for up to four boards. Visa and MasterCard accepted with a $3 service charge.

Paul Hewitt, WD7S, has enjoyed being an electronics experimenter since age 8. He wasn't licensed until 12 years ago when time finally allowed it. Paul currently owns and operates a construction company that specializes in building custom, beach-front homes. You can contact Paul at PO Box 1735, Bandon, OR 97411; **WD7S@arrl.net**.

Photos by Joe Bottiglieri, AA1GW. QST

NEW PRODUCTS

COMPACT MULTIBAND ANTENNA FROM GIOVANNINI

◊ Giovannini Elettromeccanica of Florence, Italy is proud to announce the US introduction of their D2T antenna for 160 through 2 meters.

The D2T is primarily intended for apartment dwellers and others in very restricted antenna situations. The antenna is relatively small—it consists of two 19 1/2-foot elements on a 6 1/2-foot boom. The total weight is under 20 lbs.

The manufacturer claims that the antenna exhibits some level of gain and directivity on 20 through 2 meters and, considering its compact size, acceptable performance on the lower bands. While clearly billed as a "compromise" antenna, the D2T offers multiband frequency coverage that may otherwise be difficult to attain in space restricted applications.

The US sales director for the D2T is Murray Neece, K5MDM, 2636 Kermit Highway, Odessa, TX 79763; tel/fax 915-580-9051; **radioranch@qth.com**; **http://www.qth.com/k5mdm/**.

Manufacturer: Giovannini Elettromeccanica, Via E Mattei II 9,50039 Vicchio (FI), Italy; tel + 39-055-844124; fax + 39-055-8448797; **giovannini@antenna.it**; **http://www.antenna.it/**.

NEW HIGH VOLTAGE CONSTANT CURRENT REGULATORS

◊ IXYS Corporation is expanding its family of 450-V rated constant current regulators for both dc and ac applications.

The dc current regulators are two-terminal devices with output current settings of 2, 10, 30, 50, 60 or 100 mA. The regulated current bias tolerance depends on the current level, and ranges within +/-5% at 100 mA and +/- 20% at 2 mA. The regulator's current shift with temperature is typically less than +/- 50 ppm/K. The dynamic resistance varies from 900 kΩ at 2 mA down to 9 kΩ at 10 mA.

The components are available in either two-leaded, through hole TO-220AB outline packages or surface mountable TO-252 outline packages.

A similar family of ac current regulators is also available, with current ratings ranging between 2 and 50 mA. Lower-cost 350 V versions are also available.

IXYS Corporations offers a wide range of power semiconductors, including power MOSFETS, IGBTs, ultra-fast reverse recovery diodes, thyristors, rectifiers, multichip modules, DCB ceramic substrates and power interface integrated circuits.

For further information, contact your local authorized IXYS distributor or IXYS Corporation, 3540 Bassett St, Santa Clara, CA 95054; tel 408-982-0700; fax 408-496-0607; **sales@ixyscorp.com**; **http://www.ixys.com/** QST

Next New Product

By Frank Ingle, KG4CQK

Build a Flagpole Antenna Booster

This 10-minute project can help you elevate the status of a simple VHF ground-plane antenna. It's perfect for public service.

Not long ago, the Duval County, Florida, ARES team was conducting a drill with the local fire department. One of our operators who had been on duty at an outlying station had been unable to raise the repeater with his H-T. During a critique he commented, "Next time I'll bring a 'spider' antenna and hoist it up the flagpole!" That was the seed for an idea that blossomed into a solution for a common problem facing emergency-service operators all over the country: getting an antenna as high as possible above surrounding objects and doing it simply.

Post-Storm Operations

After a hurricane or other disaster, phone lines are knocked down and the need for emergency communications is immediate. In all probability, however, the same storm that took down the phone lines likely took down most "permanent" antenna installations as well, rendering many point-to-point radio links inoperative. If repeaters are also out of commission because of power failures and damage to fixed antennas, all that's left is simplex operation. For an ARES operator, the need to quickly erect a simple but *tall* antenna is one of our most pressing challenges.

In Duval County, many of our served agencies have flagpoles. Red Cross shelters located in public schools, fire stations, neighborhood police headquarters and the weather bureau are a few such locations. Most of these flagpoles are taller than any surrounding buildings, so if there were an effective way to use a flagpole to support a temporary antenna, it would be an ideal solution to the antenna-height problem.

A Fly in the Ointment

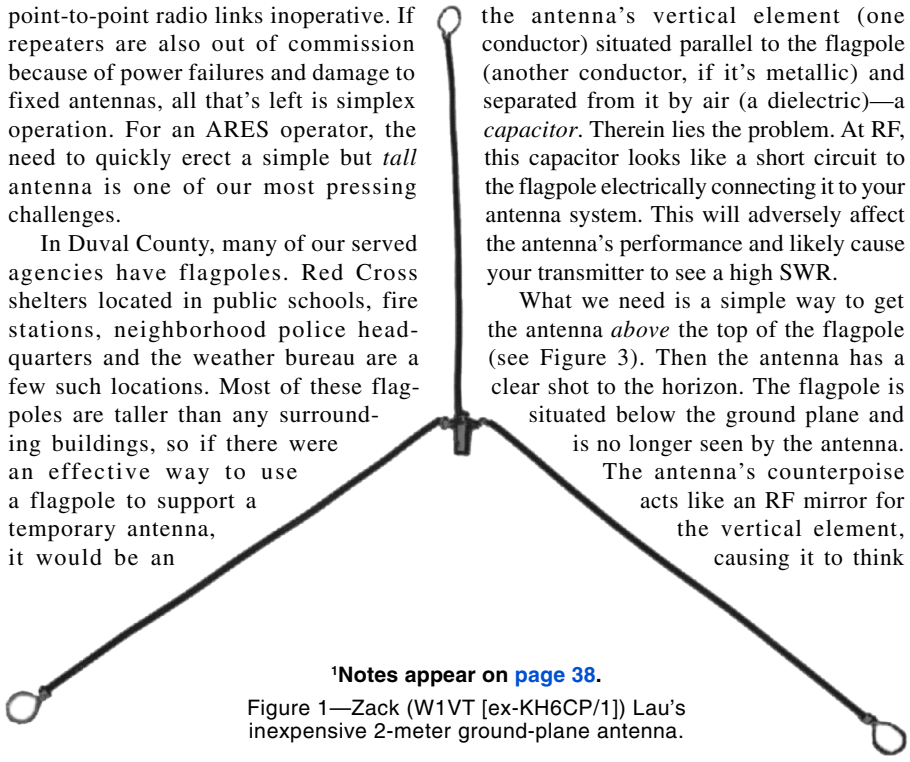
The "spider antenna" referred to earlier is a nickname for the well-known ground-plane antenna that consists of a $^1/_4$-λ vertical element and two or more counterpoise elements (also known as radials or the ground plane). My favorite example of this antenna is Zack (W1VT) Lau's "homebrew" antenna shown in Figure 1.[1] It's incredibly simple and costs little, if anything, to make.

At first glance, you might think that getting the antenna to the top of the flagpole is a simple matter of attaching the top of the antenna to the flagpole's halyard and hoisting the antenna up to the pulley. But this approach is deceiving. As you can see in Figure 2, when the antenna is raised to pulley level, the halyard snap link keeps the top of the antenna lower than the top of the flagpole. That means that the vertical element is adjacent to the flagpole and parallel with it. Hence we have the antenna's vertical element (one conductor) situated parallel to the flagpole (another conductor, if it's metallic) and separated from it by air (a dielectric)—a *capacitor*. Therein lies the problem. At RF, this capacitor looks like a short circuit to the flagpole electrically connecting it to your antenna system. This will adversely affect the antenna's performance and likely cause your transmitter to see a high SWR.

What we need is a simple way to get the antenna *above* the top of the flagpole (see Figure 3). Then the antenna has a clear shot to the horizon. The flagpole is situated below the ground plane and is no longer seen by the antenna. The antenna's counterpoise acts like an RF mirror for the vertical element, causing it to think it's the top half of a vertically oriented half-wave dipole. Because the flagpole lies on the other side of the mirror, it is now invisible to the antenna, just as the feed line is.

Build a Flagpole Antenna Booster in 10 Minutes

This simple gadget, easily used with virtually any flagpole, can be built for about $3. See the Bill of Materials.



[1]Notes appear on page 38.

Figure 1—Zack (W1VT [ex-KH6CP/1]) Lau's inexpensive 2-meter ground-plane antenna.

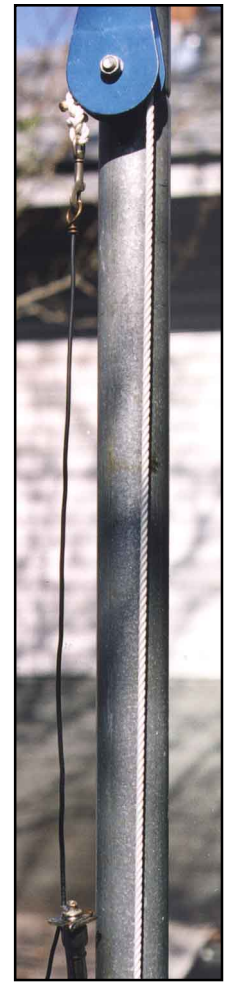


Figure 2—In this position, your antenna becomes part of a capacitor, causing your transmitter to see high SWR.

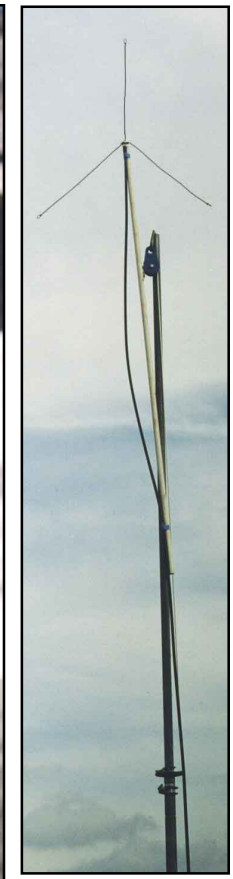


Figure 3—The flagpole antenna booster in action.

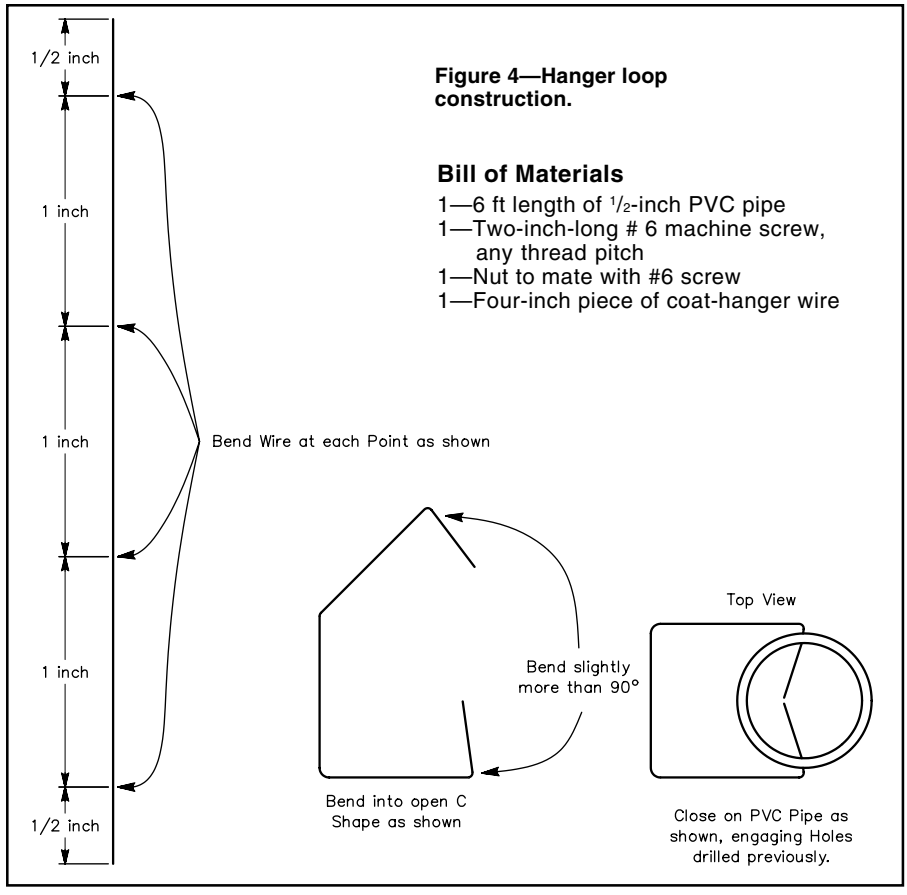


Figure 4—Hanger loop construction.

Bill of Materials

1—6 ft length of 1/2-inch PVC pipe
1—Two-inch-long # 6 machine screw, any thread pitch
1—Nut to mate with #6 screw
1—Four-inch piece of coat-hanger wire

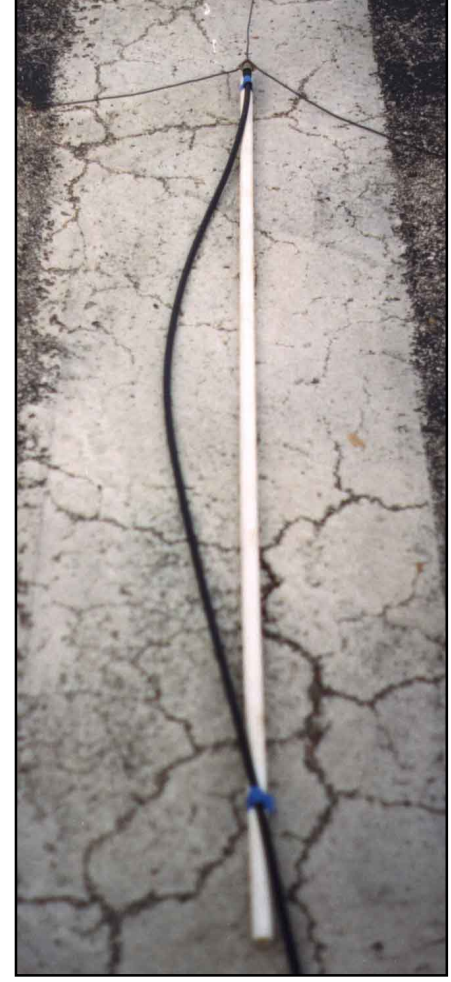


Figure 6—Antenna attached to the flagpole antenna booster, ready to be hoisted. Note the slack intentionally left between the top and bottom tape points.

Assembly is straightforward: Cut the 1/2-inch PVC pipe to a length of six feet. Pick a point two feet from one end of the pipe and drill a 7/64-inch hole through the pipe. (The end of the pipe nearest the hole is the top of the booster.) Liberate a coat hanger from your closet and cut off a four-inch piece of wire. Bend the wire into a **C** shape as shown in Figure 4. Insert the **C**-shaped wire into the hole you drilled. Use pliers to tighten the wire so it won't pull out of the pipe.[2] Insert a #6 machine screw into one of the mounting holes (enlarge as needed) in the antenna's SO-239 connector (see Figure 5). Secure the screw in place with the nut and your booster is finished.

When you're ready to hoist your antenna, attach the antenna to the feed line (RG-8 or RG-8X recommended for 2 meters). Insert the downward-facing #6 screw into the open end at the top of the pipe (it should fit tightly). This places the feed line alongside the PVC pipe's outer surface. As shown in Figure 6, secure the feed line to the top and bottom of the PVC pipe with 3/4-inch-wide electrical or masking tape. (Masking tape is easier to remove). Leave an inch or so of slack in the feed line between the two taped points. This ensures that the PVC pipe, not the PL-259 connector, carries the feed-line weight. The force helps keep the pipe vertical when raised on the flagpole.

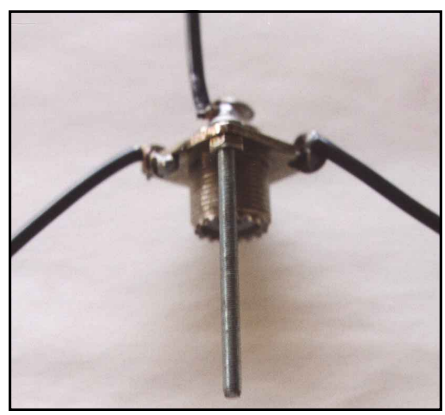


Figure 5—This two-inch screw slips inside the PVC pipe and helps secure the antenna to the flagpole antenna booster.

Next, connect the coat-hanger wire to the top snap link on the flagpole's halyard. Raise the assembly to the top of the flagpole. Have an assistant pay out the feed line, ensuring that no kinks develop on the way up. (An antenna raising ceremony is optional…) The antenna should now extend above the top of the flagpole. It may lean slightly to one side of vertical, but that's okay. This slight tilt won't measurably affect the antenna's performance. Finally, secure the halyard to the flagpole's cleat.

Allow the feed line to fall to the ground and run it loosely around the flagpole base several turns before routing to your H-T or portable rig. These turns at the base of the flagpole offer a small degree of extra lightning protection to your rig, but aren't a substitute for a real lightning arrester.

There you have it! A ready-made antenna installation, right where you need it for a cost of about $3 (not counting the feed line, of course!) When not is use, your new flagpole antenna booster can find a home under the back seat of your car or in your trunk. That way it is sure to be handy in an emergency.

Notes

[1]Zack Lau, W1VT (ex-KH6CP/1), "Build a Portable Groundplane Antenna," *QST*, Jul 1991, pp 33-34.

[2]There are likely a number of ways to ensure that the wire hanger doesn't slip out of the pipe. Consider making a complete wire loop with the ends joined. Number 14 or 12 antenna wire could be used in lieu of coat-hanger wire.—*Ed.*

Frank Ingle, KG4CQK, has been a ham for one year although he has held various FCC radiotelephone licenses for 30 years. Frank holds a master's degree in electrical engineering and owns a consulting firm specializing in computers and communications. You can contact Frank at 2580 Park St, Jacksonville, FL 32204; **command@usa.net**.

Photos by the author.

By Jim Kocsis, WA9PYH

Improving the Hamtronics R139 VHF Weather-Satellite Receiver Interface

Tired of adjusting the volume control to maintain picture quality? This add-on delivers a fixed-level output.

The Hamtronics R139 is a good, sensitive VHF receiver.[1] It's much better than my 15-year-old Hamtronics R137, as the circuit has been completely redesigned. After I'd listened to a few satellite passes with my new receiver, I decided to connect it to my PC and grab some geostationary and polar-orbiting weatherfax pictures.

When I checked the schematic looking at the audio circuit, I was disappointed to discover that the receiver doesn't provide a fixed-level output that's independent of the **VOLUME** control setting. The single audio-output connection consists of two sets of pins on the rear connector. One pin pair you route to a speaker, the other to a demodulator. Hamtronics suggests using a switch to turn off the speaker if you don't want to listen to the incoming audio. But if you do that, you must later reset the **VOLUME** control to exactly the same position as before, otherwise the picture brightness varies, resulting in a dark (audio level too low) or washed out (audio level too high) picture. I wanted to be able to adjust the **VOLUME** control without affecting the picture brightness.

I searched for a way to make a modification, but found I couldn't do it at the rear-panel DB9 connector because the connector leads go directly to the underside of the PC board. Because the enclosure lid and bottom fit very tightly, I couldn't even sneak small-diameter wires between the two. So I settled on another approach:

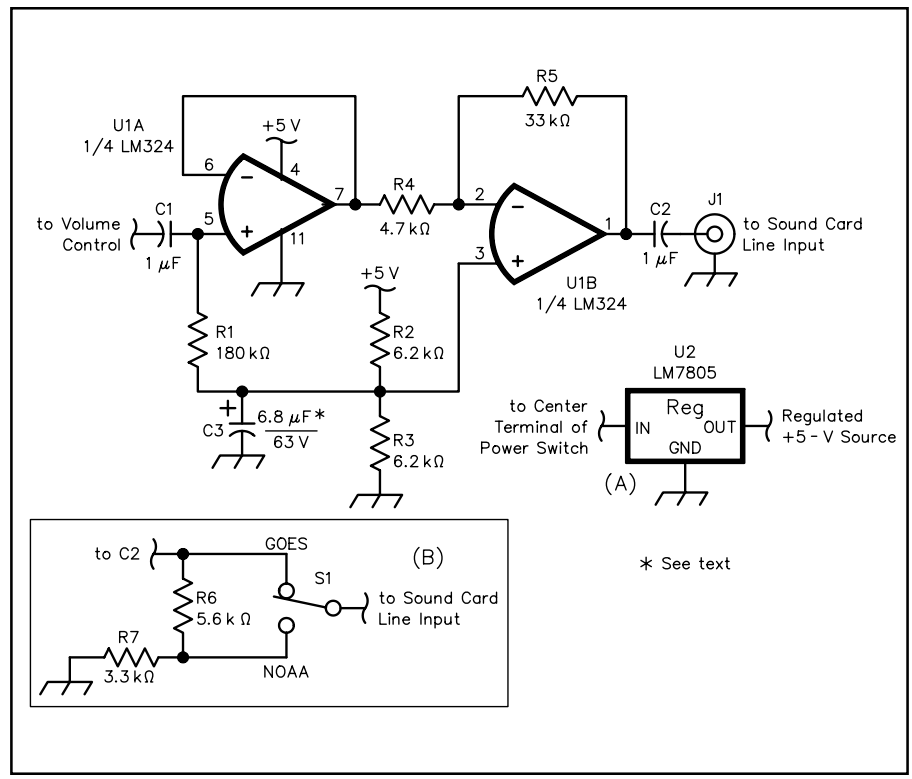


Figure 1—Schematic of the add-on audio-amplifier/isolation circuit. The inset shows a simple attenuator (see text). Unless otherwise specified, resistors are 1/4-W, 5%-tolerance carbon-composition or metal-film units. JC part numbers in parentheses are from Jameco Electronics, 1355 Shoreway Rd, Belmont, CA 94002; tel 650-592-8097, domestic fax, 800-237-6948, international fax, 650-592-2503; info@jameco.com; http://www.jameco.com. Equivalent parts can be substituted; n.c. indicates no connection.

C1, C2—1 µF, 30-V nonpolarized (JC 81509); see text.
C3—6.8 µF, 63-V electrolytic (JC33873); see text.
J1—Phono jack (JC 159484)
S1—SPDT toggle (JC 21936)
U1—LM324 quad op amp (JC 23683)
U2—LM7805 5-V 1-A positive voltage regulator (JC 51262)
Misc: perfboard (JC 43140), T421 terminals (JC 34147), or PC board (see Note 3), hardware

[1]Notes appear on page 41.

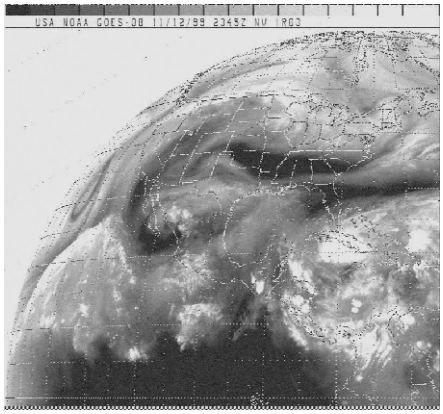


Figure 2—A GOES-8 picture captured using my homebrewed 1691-GHz downconverter feeding the modified R139.

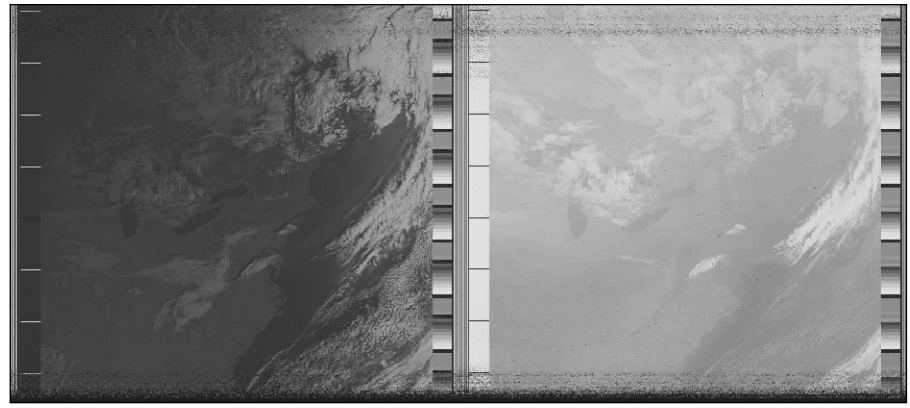
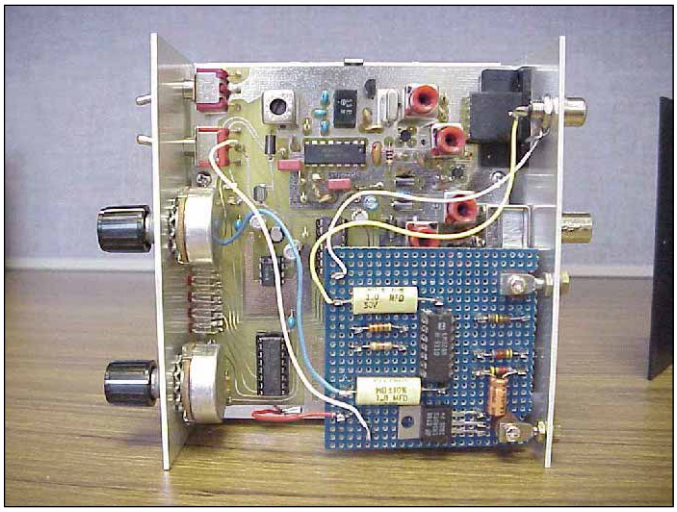
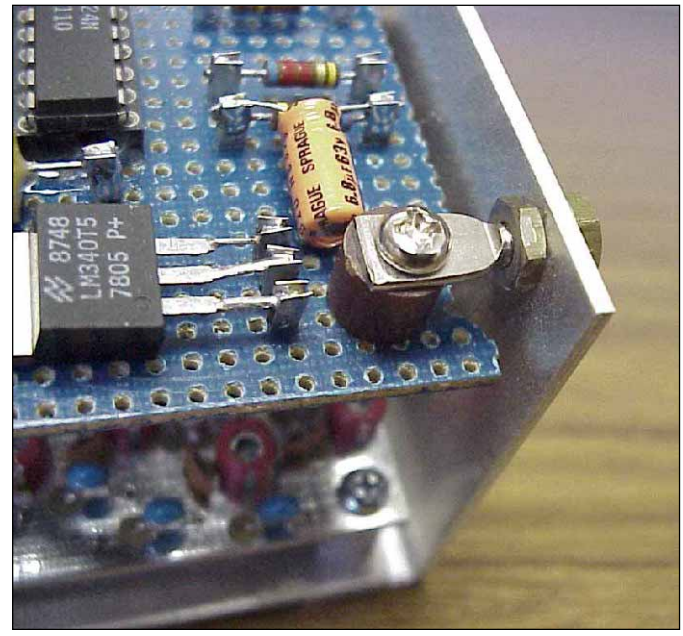


Figure 3—This is a sample of a NOAA-15 pass (see text).



Rear panel of the modified receiver showing the added phono jack above the DB9 connector and the two circuit-board mounting nuts.



adding a constant-level buffer/amplifier. The parts cost is low—around $5 if all parts are purchased new, much less if you have a well stocked junk box or shop at hamfests.[2]

Circuit Description

Refer to Figure 1. U1A provides a gain of one and isolates the relatively high impedance of the detector from the rest of the added circuit. Biasing network R2 and R3 provides a virtual ground for the op amps. This eliminates the need for a negative voltage source. C3 provides a low-impedance ac reference for the op amp. Together R2, R3 and C3 allow the output voltage from U1B to vary either side of the bias point. U1B provides the gain necessary to drive a PC sound-card's ADC to full scale so the ADC's complete range can be used. I use an LM324 because it can operate with power supplies as low as ±1.5 V dc, is inexpensive and widely available. Because the input to U1A is driven with a capacitor, adding R1 keeps the input from floating high or low.

The circuit output connects to an attenuator (see Figure 2) then to the **LINE INPUT** of my PC's sound card. If needed, you can raise or lower the circuit gain by adjusting the values of R4 and R5. With the values shown, the gain is 7 (gain = R5/R4).

Construction

I built the circuit using perfboard and push-in pins, but a PC board is available.[3] Most component values are not critical except for those of R2 and R3: They must be equal in value. C3 is shown as a 63 V rating (that is what I had on hand); a 10-V unit is adequate. C1 and C2 can also be 10-V units. R1 should have a value of 100 kΩ to 200 kΩ. Wiring placement is not critical because only audio frequencies are involved.

Remove the rear panel from the receiver and drill the holes for the phono connector and board-mounting screws. To remove the rear panel, remove the nut securing the BNC connector and remove the two screws at the bottom rear of the receiver. To mount the board, use threaded standoffs and some $^1/_4$-inch high spacers (you can use metal tubing cut to $^1/_4$-inch lengths). The accompanying photographs shows my installation method.

The +12 V supply is derived from the center pin of the **ON/OFF** switch; the demodulator output is taken from the high side of the **VOLUME** control (the terminal nearest the five LEDs) and circuit ground is picked up from a location directly beneath the board. To prevent shorting any points to ground, make sure the board is mounted well below the top of the rear panel so that no components can touch the underside of the

lid. As an added precaution, I put a piece of duct tape on the underside of the lid above the prototype board.

Although the added board blocks access to some of the receiver's coils, this isn't a problem because you shouldn't need to adjust them often. Merely make the leads from the board to the receiver long enough so that if you do have to adjust some of the coils, you can simply remove the board and fold it out of the way without unsoldering any wires.

Operation

How does the receiver and PC work with the new board? See the GOES (geostationary) and NOAA (polar orbiting) pictures in Figures 2 and 3, respectively. I use a "homebrew" 1691-GHz downconverter for GOES reception.[4]

I use *WXSAT* written by Christian Bock to digitize the pictures.[5] The software works nicely, but you still need to adjust the line input audio level on your sound card for best picture quality. The audio from the NOAA satellites is much louder (because of the higher deviation) than the audio from the GOES, so you have to adjust the audio level fed to your sound card when switching between the two satellite types. I adjusted the gain of this circuit so that the ADC in the sound card reaches full scale when tuning in GOES signals and I use an attenuator (a two-resistor voltage divider) when tuning in NOAA signals (see Figure 2). The level of the GOES signals is about 60% of those obtained from the NOAA satellites. The attenuator resistors and a toggle switch can be mounted inside the R139. I placed my attenuator outside the receiver because I intend to interface my HF receiver to the sound card for PSK31 operation.

The NOAA-15 satellite picture in Figure 2 was received while using a quadrifilar helix antenna described earlier in *QST*.[6] At the time, the antenna was mounted *inside* our house on the first floor with 20 feet of RG-58 coax between the antenna and receiver—a testimony to the receiver's sensitivity. The small amount of noise visible in the picture wouldn't be there if the antenna were mounted outdoors. I hope that Hamtronics adds this circuit or one similar to it in future versions of this otherwise great receiver.

Adding this circuit makes an excellent receiver a little easier to interface. If you try it, I'd like to hear from you. I want to thank my wife, Yvonne, for proofreading this article.

Notes

[1]Steve Ford, WB8IMY, "Hamtronics R139 Weather Satellite Receiver," *QST*, Jun 1999, pp 72-74.

[2]Modifications to the receiver may void its warranty. Contact the manufacturer if this is a concern to you.

[3]FAR Circuits, 18N640 Field Ct, Dundee, IL 60118-9269; tel 847-836-9148 (voice and fax); **http://ww.cl.ais.net/farcir/**. Price: $4 plus $1.50 shipping for up to four boards. Visa and MasterCard accepted with a $3 service charge.

[4]Jim Kocsis, WA9PYH, "A Synthesized Down Converter for 1691-MHz WEFAX," *QEX*, Mar/Apr 2000, pp 48-55.

[5]Available at **http://ourworld/HFFax/toc20.htm**.

[6]Eugene F. Ruperto, W3KH, "The W3KH Quadrifilar Helix antenna," *QST*, Aug 1996, pp 30-34; see also Feedback, *QST* Jun 1999, p 78.

Jim Kocsis, WA9PYH, was first licensed in 1964 as WN9LDB and in 1965, upgraded to WA9PYH (General class). He now holds an Extra class license. Jim has a degree in Physics from Indiana University (1976). He is a test engineer at Honeywell International Aerospace (formerly AlliedSignal Aerospace). Other than weather-satellite imagery, Jim's interests include casual HF DXing, DX contests, Field Day, "ragchewing" on HF, antennas and "homebrewing" anything. Jim has been interested in weather-satellite imagery since 1985 and has decoded images from NOAA satellites, HF FAX and GOES satellites. He also enjoys reading, music, some cooking/baking and bicycling. You can contact Jim at 53180 Flicker Ln, South Bend, IN 46637; **Jimpyh@worldnet.att.net**.

Photos by the author.

NEW BOOKS

THE VOICE OF THE CRYSTAL

By H. Peter Friedrichs

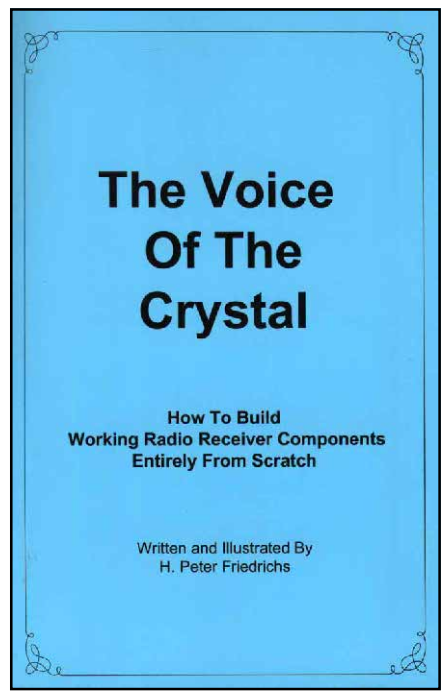
First edition. Copyright 1999 by The Xtal Set Society, PO Box 3026, St Louis, MO 63130; tel 800-927-1771; ***http://www.midnightscience.com/****. Softcover, 5½ × 8½ inches, 186 pages. $14.95 plus $3.50 shipping and handling.*

Reviewed by Steve Ford, WB8IMY
QST *Managing Editor*

◊ The introduction to *The Voice of the Crystal* ends on page 5 with an understatement: "You have never read a book like this before."

The author, H. Peter Friedrichs, can make such a declaration with confidence because it is highly unlikely that you'll encounter another book like this. There are plenty of books about crystal radio receivers (or *roots radio*, as I call the genre), but this latest offering from The Xtal Set Society takes the concept of elementary radio to an entirely new level. *The Voice of the Crystal* is essentially a guidebook to the art of building radio receivers from scratch. "Scratch" doesn't mean components purchased at RadioShack, or lifted from abandoned gear. This is "scratch" in its most elemental sense—discarded glass, scrap metal, you name it.

The first four chapters give a short introduction followed by a summary of the theory behind crystal-detector receivers. With chapter five *The Voice of the Crystal* launches into a discussion of headphone building that spans the next four chapters. Friedrichs shows you



how to create working headphones from such flotsam as shoe polish tins and soup cans using unusual components such as transformer laminations and plastic cigarette lighters.

Chapter nine introduces you to the detector and chapters 10 and 11 offer some astonishing detector construction ideas. Sure, you could use a simple diode or find at bit of galena somewhere, but that would be too sophisticated for *The Voice of the Crystal*. Instead, the author discusses making detectors out of safety pins and razor blades, among other things. One of my favorites is a detector created by suspending two electrodes in a gas flame!

Capacitors are more straightforward (metal foils, plates and insulators). You can make variable capacitors any number of ways. The most unusual design described in the book, however, involves a 2-liter plastic soda bottle filled with salt water and equipped with two external plates. You place the bottle in a wood cradle and turn it slowly to vary the amount of water between one plate and another.

The Voice of the Crystal ends with brief discussions of coil and antenna designs. As Friedrichs is quick to point out, a good ground and a long antenna are crucial to the success of any crystal radio.

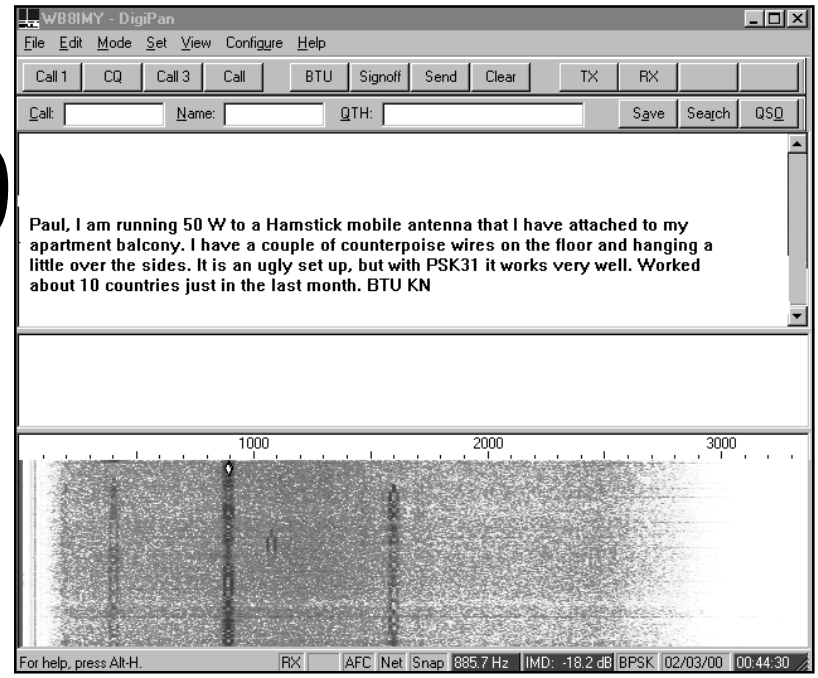
This book would make an excellent addition to any science classroom. Imagine how impressive it would be for students to listen to signals received with radios made from "trash." *The Voice of the Crystal* is well written with a style that educates without sedation. The hand drawings could benefit from the talents of a professional graphic artist, but that would probably violate the back-to-basics spirit of the book.

The Voice of the Crystal is worthwhile for anyone who still harbors a spark of curiosity. Following Friedrichs' instructions you can put together a radio that will take you back to the days of Fessenden, Marconi, Tesla and the other pioneers. Best of all, you'll rediscover the thrill of grabbing signals out of the air with your bare hands.

By Steve Ford, WB8IMY

PSK31 2000

In early 1999 hams throughout the world discovered a new way to communicate using a digital scheme known as PSK31. Where do we stand today?



***DigiPan* in action on 20 meters. All three signals (represented by the three vertical lines) are copyable, yet none of them even budged my S meter!**

Early last year I was lucky enough to stumble across some curious Internet traffic. It was a message posted to a newsgroup and it stated that Peter Martinez, G3PLX, had developed some software that would allow anyone to send and receive phase-shift keying transmissions using little more than an SSB transceiver and a PC equipped with a 16-bit sound card. According to the message, this new digital mode, known as *PSK31*, was not only easy to use, it allowed hams to swap text information at very low power levels and in poor signal conditions. I was intrigued!

I downloaded the software, cobbled together the necessary cables, fired up my computer and...*PSK31 absolutely knocked my socks off!* My first conversation was in the BPSK mode with a station whose signal I could barely hear. Despite the fading and crashes of static, his text flowed across my monitor with only a few errors. Switching to the QPSK mode, the text was 100%. I had never seen such weak-signal performance in a digital mode that didn't rely on "handshaking" (PACTOR, Clover, etc). And it was all accomplished with just software and a sound card.

The news was too hot to hold. I contacted Peter and we worked together to rush an article into the May 1999 *QST* ("PSK31—Has RTTY's Replacement Arrived?").

The response was overwhelming. PSK31 was suddenly thrust into the spotlight and it gathered a devoted following with astonishing speed. What began as an "experimental" mode a year ago is now firmly planted in the Amateur Radio mainstream. A lot has happened in a year…and there is more to come!

Software Developments

By the middle of 1999 Peter had made refinements to his original software, adding features and fixing a couple of minor bugs. The current version is 1.08 and is available for downloading at the "official" PSK31 Web site at **http://aintel.bi.ehu.es/psk31.html**, or in the Amateur Radio section of my Web site at **http://home.att.net/~wb8imy/home.htm**.

Peter's software worked well and could run on a computer as "primitive" as a 486-100. Hams are never satisfied with the status quo, though. We *must* modify and tinker—it's hardwired into our genetic code.

Among the first modifications was a *front-end* program created by Al Williams, WD5GNR. This handy piece of software added a number of functions to Peter's program including a much requested type-ahead transmit buffer. (So you can enter comments on what the other guy is saying and have the text ready to go when it's your turn to transmit.) You can download the latest version at **http://www.al-williams.com/wd5gnr/pskgnr.htm**. Note that this software will only work with *Windows 95*, *98* or *NT*.

One of the first full-featured stand-alone PSK31 packages to appear was *Logger* by Bob Furzer, K4CY. This program is still a big favorite for the plethora of features it offers. You can download the full version at **http://www.mv.com/ipusers/innermedia/logger/LoggerFullRelease7.02.exe**.

At nearly the same time *Logger* was making its debut, Nick Fedoseev, UT2UZ, rolled out *MixW32* to an enthusiastic reception. Like *Logger*, *MixW32* is a full-featured package that does much more than just send and receive PSK31. You can download a demo version at **http://users.nais.com/~jaffejim/mixwpage.htm**.

With the appearance of the first PSK31 contests, it was inevitable that someone would add PSK31 capability to a digital-contesting package. That honor fell to Wayne Wright, W5XD, and his popular *WriteLog* software. *WriteLog* was one of the first contesting programs to support RTTY transmit/receive using a sound card. At the time of this writing, *WriteLog* was the only digital contesting software that included PSK31 as well. See the *WriteLog* site on the Web at **http://www.contesting.com/writelog/**.

During the past several months more PSK31 software has been popping up on the Web. In addition to the programs I've already mentioned, you'll also find:

- *WinPSK* at **http://www.mindspring.com/~ae4jy/**
- *RCKRtty* at **http://home.t-online.de/home/dl4rck/**
- *LogPSK* at **http://www.megaone.com/yo3fff/**
- *TruTTY* at **http://www.dxsoft.com/mitrtty.htm**
- *PSK31 for Linux* at **http://wwwcip.informatik.uni-erlangen.de/~hsreiser/hamradio/#psk**
- *Multimode (PSK31 for Macintosh)* at **http://www.blackcatsystems.com/software/multimode.html**

…and no doubt more will show up by the time you read this article. PSK31 has also found a home in at least one hardware multimode data processor: the PTC-IIe by SCS (see the review in last month's *QST*).

My Personal Favorite: *DigiPan*

All of the PSK31 programs are good; there isn't a bad apple in the bunch. But when I was introduced to *DigiPan* a couple of months ago, it was love at first sight.

One of the early bugaboos with PSK31 had to do with tuning. Most PSK31 programs required you to tune your radio carefully, preferably in 1-Hz increments. In the case of the original G3PLX software, for example, the narrow PSK31 signal would appear as a white trace on a thin *waterfall* display. Your goal was to bring the white trace directly into the center of the display, then tweak a bit more until the phase indicator in the circle above the waterfall was more-or-less vertical (or in the shape of a flashing cross if you were tuning a QPSK signal). Regardless of

Dirty Signal Syndrome

If you've done any PSK31 operating, I'm sure you've seen and heard them—the dirty signals. You'll see them in your tuning display as a picket-fence pattern of lines to the right and left of the primary signal (see Figure A). Worse yet, you'll hear the dirty signals from a mile away (so to speak). It's all caused by an obnoxious phenomenon better known as *splatter.* PSK31 splatter is usually the result of an overdriven sound card or transceiver. The good news is that Dirty Signal Syndrome is easy to cure.

When you're setting up your transmit audio level (using the sound card mixer in *Windows*, for instance), increase the sound card output until you see the ALC meter on your radio beginning to indicate that limiting is taking place. Then, reduce the output until the meter does not indicate ALC activity. (The ALC meter or LED display should read zero.)

Now get on the air and ask for signal reports. In particular, ask other operators to study their displays for telltale signs of harmonics.

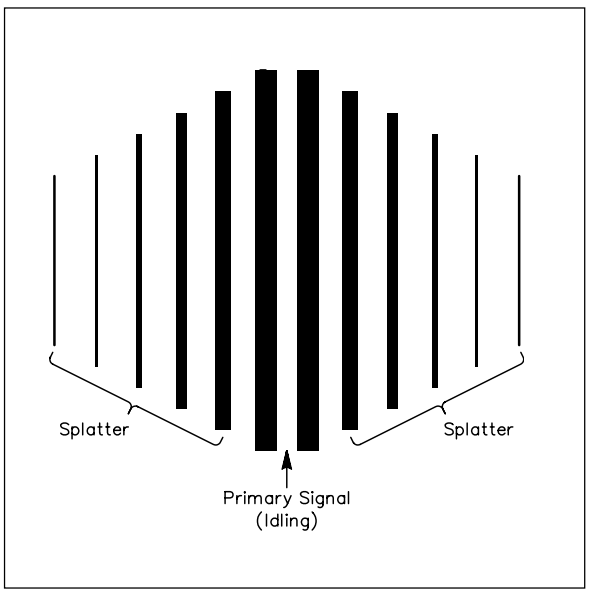
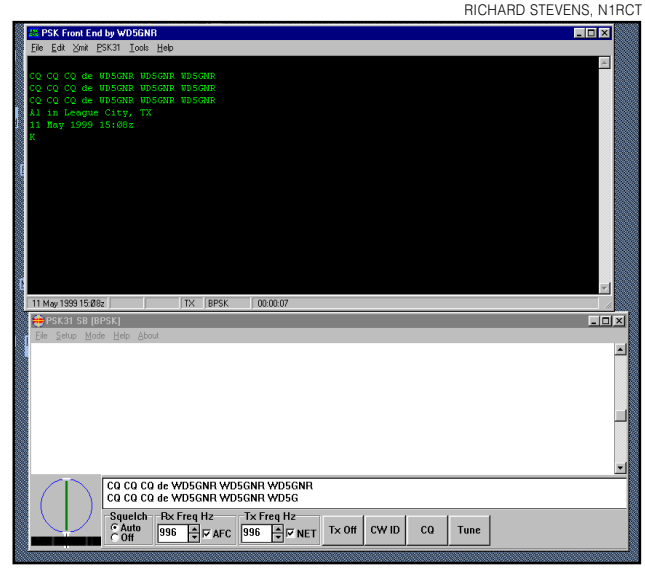


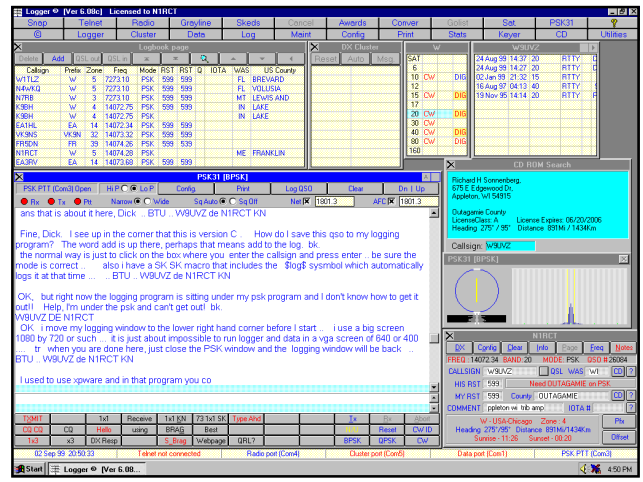
Figure A—Dirty Signal Syndrome. The fading lines to the right and left of the primary signal represent intermod products (splatter).

If your ALC isn't budging and you're still receiving dirty signal reports, the problem may be in your sound card. Some sound cards will generate fairly clean audio regardless of how high you crank the output. Others become prodigious harmonic generators when they slide past 50% output. Open your sound card control software and reduce the master audio output level. Keep reducing the output until your signal is clean. In the end you may wind up with an audio setting that provides a clean signal—but at the cost of substantially reduced RF output. Don't worry. The reduced output will make no difference whatsoever to PSK31!—*WB8IMY*

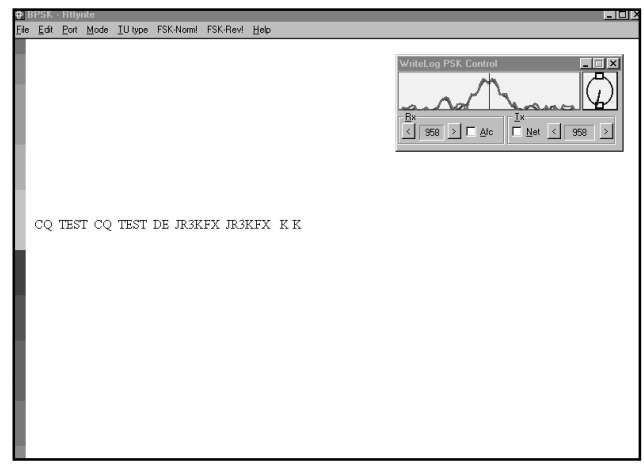
RICHARD STEVENS, N1RCT



WD5GNR developed this software to add features to the original G3PLX PSK31 program.



The popular *Logger* by K4CY.



***WriteLog* contesting software in the PSK31 mode.**

the software, PSK31 tuning required practice. You had to learn to recognize the sight and sound of your target signal. With the weak warbling of PSK31, that wasn't always easy to do. And if your radio didn't tune in 1-Hz increments, the receiving task became even more difficult.

Nick Fedoseev, UT2UZ, and Skip Teller, KH6TY, designed a solution and called it *DigiPan*. The "pan" in *DigiPan* stands for "panoramic"—a complete departure from the way most PSK31 programs work. With *DigiPan* the idea is to eliminate tedious tuning by detecting and displaying not just one signal, but entire *groups* of signals.

If you are operating your transceiver in SSB without using narrow IF or audio-frequency filtering, the bandwidth of the receive audio that you're dumping to your sound card is about 2000 to 3000 Hz. With a bandwidth of only about 31 Hz, a lot of PSK31 signals can squeeze into that spectrum. *DigiPan* acts like an audio spectrum analyzer, sweeping through the received audio from 100 to 3000 Hz and showing you the results in a large waterfall display that continuously scrolls from top to bottom. What you see on your monitor are vertical lines of various colors that indicate every signal that *DigiPan* can detect. Bright yellow lines represent strong signals while blue lines indicate weaker signals.

The beauty of *DigiPan* is that you do not have to tune your radio to monitor any of the signals you see in the waterfall. You simply move your mouse cursor to the signal of your choice and click. A black diamond appears on the trace and *DigiPan* begins displaying text. You can hop from one signal to another in a heartbeat merely by clicking your mouse! If you discover someone calling CQ and you want to answer, click on the transmit button and away you go—no radio adjustments necessary. (And like the original PSK31 software, *DigiPan* automatically corrects for frequency drift.)

Even I can Master DigiPan

Most of the PSK31 signals on 20 meters are clustered around 14.070 MHz, so I just park my rig in the vicinity and boot up *DigiPan*. I can opt to display the audio frequencies on the *DigiPan* waterfall, or I can enter the frequency displayed on my radio's VFO and *DigiPan* will indicate corresponding RF frequencies.

One remarkable aspect of *DigiPan* is that it allows you to see (and often copy) PSK31 signals that you cannot otherwise hear. It is not at all uncommon to see several strong signals (the audible ones) interspersed with wispy blue ghosts of very weak "silent" signals. I've clicked on a few of these ghosts and have been rewarded with text (not error free, but good enough to understand what is being discussed).

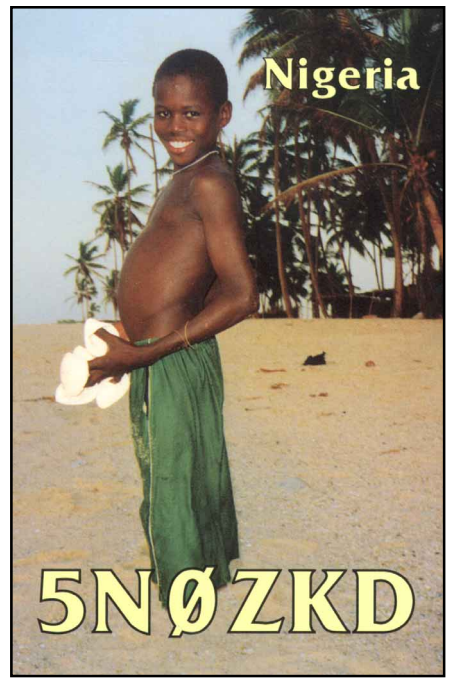
Using *DigiPan* reminds me of the sonar operators in the movie *The Hunt for Red October*. There is an eerie excitement in finding one of those ghostly traces and muttering to yourself, "Hmmm...what do we have here? An enemy submarine rigged for silent running? A distant pod of killer whales? Or Charlie in Sacramento running 5 W to his attic dipole?"

DigiPan is, in my opinion, one of the most important developments in the brief history of PSK31. It makes this exciting mode more "user friendly" and accessible to a larger audience and a larger assortment of radios (the ability to tune in 1-Hz steps isn't a requirement for *DigiPan*). And I haven't even mentioned *DigiPan's* other features such as a type-head buffer, logging functions, macros and much more. You can download *DigiPan* on the Web at **http://members.home.com/hteller/digipan/**. Note that you need a 486-100 PC or faster running *Windows 95 or 98*.

PSK31 on the Air

As I've already mentioned, 14.070 MHz (+/– 2 kHz) seems to be the hot hangout for PSK31. Activity is gradually spreading to other bands, too. When 10 meters is open listen for warbles around 28.120 MHz. PSK31 operators also haunt 10.140 MHz on occasion. Last winter I heard some PSK31 action clustered around 3.580 and 3.610 MHz.

It's fair to say that PSK31 signals now outnumber Baudot RTTY for casual QSOs, but RTTY is still the king of contests. Even so, the PSK31 contests sponsored by the Troy Amateur Radio Association (TARA) and the Chautauqua County Contest Club (CCCC) have attracted a surprising amount of activity. Look for more of these to pop up in "Contest Corral."



There is plenty of DX on PSK31! 5N0ZKD has been active on several bands.

RTTY is still dominant in the digital DX world, but that picture is changing rapidly. A number of DXpeditions have used PSK31 and more have announced their intention to be "warbling" from exotic locations this year.

Has anyone worked 100 DXCC countries on PSK31? I've heard of a few alleged claims passed along the grapevine, but nothing verified—yet. The PSK31 DX *is* out there. Even with my half-hearted attempts at chasing DX I've managed to net about 30 countries. Some of my catches have included 5N0ZKD, TF3VS and 4Z5AO.

PSK31 activities have not been confined to the HF bands. Andy Bachler, N9AB, has tried PSK31 moonbounce experiments with limited success. (Unfortunately the phase distortion wreaks havoc with the PSK31 signal.) Others have established experimental PSK31 beacons on 6 meters, 2 meters and 70 cm. Some hams are even using PSK31 on 2-meter FM as a kind of educational tool to inspire their local brethren to expand their horizons.

The Future

I don't think it is a coincidence that many new PSK31 users are running low power, often with indoor antennas. Since PSK31 has such excellent weak-signal performance, hams who've been off the air because of antenna restrictions or RFI problems (or both!) are now finding a new way to enjoy the hobby once again. It's common to read: "Running 20 W to an indoor dipole…"

Amateurs who enjoy low-power QRP operating for the sake of QRP itself are also finding excitement in PSK31. Although it is certainly feasible to operate QRP phone, the tradition has been to use CW for greatest efficiency. Now PSK31 offers a new QRP mode that rivals CW's performance. Hams are buying used Pentium laptops (with sound capability) and taking them to the great outdoors to run PSK31 with QRP SSB rigs. My guess is that you'll hear more than a few PSK31 signals next month during Field Day.

PSK31 was in the right place at the right time. Amateur Radio was in need of a jumpstart in 1999, something to bring people back on the air and help restore the long-lost sense of wonder. Because the majority of amateurs already owned computers with sound cards, their "risk" and investment in PSK31 was essentially zero. All they had to do was download the software and fashion a couple of cables. If they tried PSK31 and didn't like it, little was lost.

"My PSK31 Doesn't Work!"

We've had a year to accumulate the various trouble reports and cures. Here are several of the most common problems and solutions.

Problem: I know I'm getting receive audio from my radio to my sound card. I can even hear my radio's audio in my computer speakers. The PSK31 software, however, is dead as a doornail. There is nothing whatsoever in the tuning display.

Solution: Your receive audio is indeed reaching your computer, but it is not reaching the PSK31 software. This is a common glitch in *Windows 95* and *98* and it involves misadjustment of the sound card mixer. Follow these steps:

1. Double click on the little loudspeaker in the lower right corner of your *Windows* screen.
2. The **Volume Control** panel should appear. Click on **Options**, then **Properties**.
3. In the "**Adjust volume for...**" section, click on the circle labeled **Recording**, then click **OK**.
4. The mixer panel you see now is the **Recording Control**. Click on the little box to select **Line-In**, then move the slider all the way up.

Note that some programs may disable this setting. Don't be surprised if you have to repeat these steps after running certain types of software.

Problem: People keep telling me that they are hearing strange noises on my PSK31 signal.

Solution: This is another common woe—and it is easy to fix. The strange noises are the cute little boops and beeps that you've asked *Windows* to play when you open a program, close a window and so on. The straightforward cure is to avoid opening windows or taking other actions that generate cute sounds while you are transmitting. You can also turn the offending sounds off by going to **Settings**, **Control Panel** and clicking on the **Sounds** icon. This will allow you to scroll through the list of sounds you've chosen. By changing the selection to "**None**" for a particular sound, you are effectively turning it off.

Problem: I'm told that people can hear my voice and other noises in the room when I am transmitting.

Solution: Unplug your microphone. You're feeding your PSK31 signal to the accessory jack on your transceiver and probably keying it that way as well. The problem is that your radio is still accepting audio from your microphone jack, too. When you key the radio to transmit PSK31, your microphone is live!

Problem: Stations report that my PSK31 signal looks fuzzy on their waterfall displays.

Solution: When your PSK31 station is idling (not sending data), stations should see your signal as two distinct lines, possibly with a bit of fuzziness between. When you start typing, the lines should look as though they are segmented or twisted together. A PSK31 signal that looks like a solid fuzzy line often indicates the presence of distortion. RF may be getting into your sound card, the sound card may be overdriven, or you could be picking up hum induced by ground loops. Try reducing output and see if that cures the problem. If not, consider using a couple of isolation transformers in the cables between the sound card and your radio.

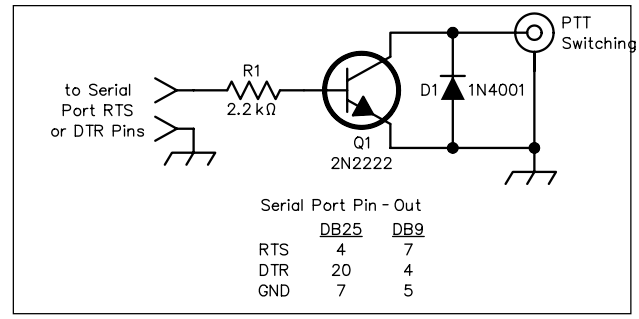


Figure B—A simple circuit for keying transceivers from computer COM ports.

Figure C—The new RIGblaster sound card interface.

Problem: The PSK31 software doesn't key my radio to transmit.

Solution: Most hams are using some variation of the circuit shown in Figure B to key their radios from their computer COM ports. If this applies to you, don't forget that some PSK31 programs activate the COM port DTR or RTS pins—but not both. (The original G3PLX software sends logic "highs" to both pins.) If you have your keying interface tied to the DTR (or RTS) pin, try switching it to the other pin. A more elegant solution to sound-card interfacing and keying is now available in the form of the RIGblaster from West Mountain Radio, 18 Sheehan Ave, Norwalk, CT 06854; tel 203-853-8080; **K1UHF@westmountainradio.com**; **http://www.westmountainradio.com**. This neat little box (see Figure C) takes care of transceiver keying, microphone switching, audio level matching and so on.—*WB8IMY*

If the increasing number of signals is any indication, hams are trying PSK31 and sticking with it. They are also discovering that with different sound-card software they can use their PSK31 hookups to run Slow-Scan Television, RTTY and more. There is a small revolution going on and it's refreshing to witness. Anything that invigorates Amateur Radio is nourishment for our future. To quote Inspector Kemp in the movie *Young Frankenstein*, "A riot is an ugly thing ...and it's about time we had one!"

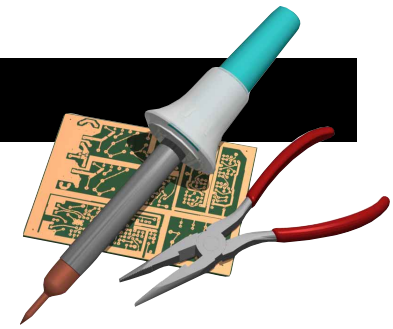
You can contact the author at 225 Main St, Newington, CT 06111; **sford@arrl.org**. QST

FEEDBACK

◊ Please refer to Dwayne Kincaid, WD8OYG, "A Repeater Controller Accessory: The RCA," *QST*, Feb 2000, p 44, Figure 7. Add a center tap connection to the secondary (bifilar) winding of T1, connecting the other end of the center tap to the junction of C1, R6 and C4. To the descriptor of T1 add the words "center tap."—*tnx GJ3RAX and W1VT*

◊ Please refer to Wayne J. Stanley, W4RDG, "A Simple Meter Tester," *QST*, Mar 2000, pp 41-42. Author Stanley offers another approach to avoiding battery drain as identified in endnote 3. Relocate the momentary push-button **TEST** switch between the 9-V battery and regulator (U1) input pin, then connect the regulator output pin directly to the junction of R12 and R9. Also, the push-button **TEST** switch should be labeled S1, not S2.—*tnx Wayne J. Stanley, W4RDG*

◊ The Web address of Twenty First Century Books shown in our review of *Nikola Tesla; Guided Weapons and Computer Technology* (March 2000 *QST*, page 112) is incorrect. The correct address is: **http://www.tfcbooks.com/**. QST



The Doctor is IN

Q George, KD4KYM, asks, "I'm uncertain about how I should attach a 450-Ω ladder transmission line to my radio. I have SO-239 coax connectors on my Kenwood TS-520 transceiver. Can I assume that it is simply a matter of soldering one side of the ladder line to the center conductor of a PL-259 and the other to the outer conductor? I want to use the ladder line to feed a multiband 80-10 meter dipole antenna."

A Your TS-520 was designed for 50-Ω *unbalanced* coaxial cable. Your ladder line is 450-Ω *balanced*, so there is more to deal with than just the physical differences. If you were going to use the ladder line on just a couple of bands, you might be able to get away with feeding the ladder line to a *balun* (a balanced-to-unbalance feed line transformer) with an appropriate impedance ratio (4:1, for instance), then using coax between the balun and your radio. But since you're aiming for broad, multiband coverage, I'd recommend an antenna tuner.

Most antenna tuners are designed with built-in baluns to handle the impedance transformation. There are usually three posts in the back of a tuner—two for ladder-line and one for random wire antennas. There may be a jumper between the random wire post and one of the ladder-line posts. Make sure the jumper is removed—it is only used for a single random-length wire.

If your tuner does not have provisions for ladder-line, you can connect it as you say, by soldering the ladder line to a PL-259. It may work, but not as well as using a balun. Of course, you could always install an external balun in the line between the ladder-line and the antenna tuner (see Figure 1), although we don't recommend that you run high power with such a setup.

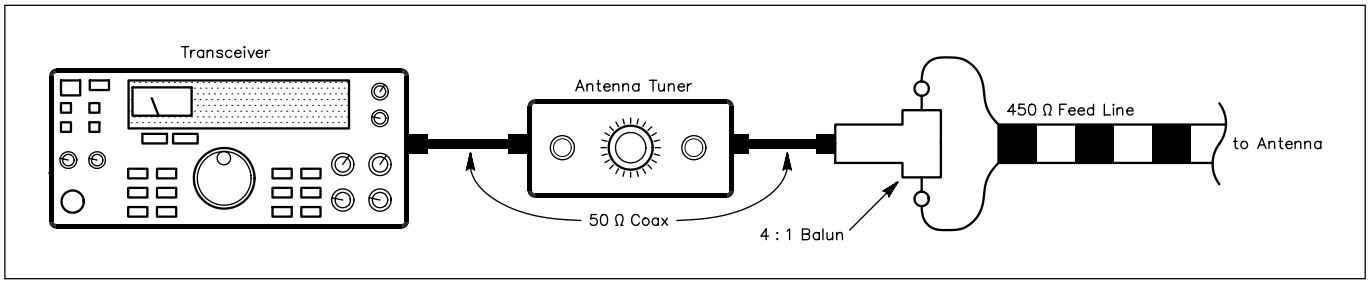


Figure 1—If you own an antenna tuner that does not include an internal balun, you can use an external balun. Just keep the coaxial connection between the balun and the tuner as short as possible.

Q Gary, KD4SRX, asks, "I read the product reviews in *QST*, talk with other hams and radio dealers, and I'm still very much confused about handhelds (H-Ts). I'm not sure what model would suit my needs. To be more specific, I like working various ham events, as well as taking my handheld on Amtrak train trips along the Northeast Corridor. With all these various models to choose from, which features are the most important?"

A I'd suggest that you look for an H-T with a large battery pack (you may have to purchase this separately). Choose a pack that has enough capacity to last through a daylong hamfest or public-service event. I would suggest looking for one that has at least 600-m/Ah capacity.

Also, although 5W output is not a must, having at least 2½ to 3 W helps when trying to work someone (via simplex) who is on the other side of the hamfest grounds (for an outdoor hamfest). Higher output power will also be helpful when attempting to work stations from a moving train. Most modern handhelds will receive the 160-161 MHz Amtrak frequencies in the Northeast Corridor, but check the specs to be sure.

Concerning battery life, consult the *QST* Product Reviews and refer to the power requirements section. This will tell you the maximum receive and transmit current drawn for each handheld under consideration.

Ease of programming is another thing to consider, but there is a mitigating factor. If your H-T has a lot of features that you won't use, it doesn't matter if you can't remember (or figure out) how to program them. I prefer H-Ts with the most frequently used functions marked on the buttons (like switching between memory and VFO mode, setting PL tones, etc.). Failing that, you can make up a small (2-inch square) "cheat sheet" with the most important functions written on it.

Unless you plan on carrying the manual with you everywhere, direct keypad frequency entry is practically a must. Also convenient is automatic repeater offset, although that is more of a luxury than a necessity (if "-" doesn't bring up the repeater, just switch to "+" —assuming you don't need to consult the manual to remember how).

Don't forget audio quality. You want to be able to understand what is being said, even when you are in a noisy area. If a particular radio's audio is poor, the Product Review will mention it.

Most H-Ts are pretty rugged. You don't have to treat them as you would an expensive camera, but reasonable care is required (a 3-foot drop onto a hard surface is survivable if it only happens once in a great while).

Q Bill, N3SNU, asks, "The display malfunction on my ADI-146 is definitely temperature-dependent. During summer, and to a lesser extent during spring and fall, all the segments of the LCD display activate so it is impossible to tell what frequency the radio is on, or any other displayed parameters. The radio apparently still works fine. Transmitting, especially on high power, causes heat to build up faster and the display to go haywire sooner, but in hot weather just having the radio on receive during a long drive will eventually bring

on the problem. This is a mobile radio, installed in the family car, and taking it out whenever the car is parked is not a practical solution. If I had to resort to that I might as well go back to carrying a handheld and plugging it into an external antenna. Any troubleshooting suggestions?"

A This problem crops up in many LCDs in conditions of extreme heat. Typical problem conditions include the obvious (when the car has been sitting in the sun on a 90° day with the windows closed) and the not so obvious (on a moderately warm day with the radio mounted on top of the dash in direct sunlight, or mounted in the dash without ventilation space around it). The ideal mounting position is under the dash where the rig would get some shade, but adding a small 12V fan helps in installations that are less than ideal.

If the display is failing under more normal conditions, then the LCD itself or the display driver circuit is very likely defective. If the radio was purchased recently, I would suggest asking the dealer for an exchange. If the dealer can no longer exchange it, then having ADI repair it may be your only option. This is not a problem that can be easily tackled on the typical workbench.

Q Kaehu, WH6WW, asks, "I want to use one coax run for my VHF and UHF station, but I also want to have a vertical and a beam. I think a coax relay would provide the solution. Is this something I could fabricate from RadioShack components or should I buy one commercially?"

A When switching multiple feed lines, the impedance of the switching network is a prime consideration. The impedance of a feed line is a function of the conductor surface areas and the spacing between them. When you insert a standard type of relay in the line, you will have a point with a different impedance, with a resultant change in SWR. At HF, the SWR difference is not likely to be significant, but at VHF and UHF this is not the case. This doesn't make homebrewing impossible, but it does add a major complicating factor.

Remote coax relays are available for VHF and UHF, but they are costly (it may be cheaper to run multiple lengths of coax). If the cost is not a consideration, you can purchase a remote coax relay from these folks:

Electronic Switch Co
8491 Hospital Drive
Suite 328
Douglasville, GA 30134
tel: 770-920-1024
k4mzw@akorn.net

Q Don, W9DEW, asks, "I have owned an ICOM IC-720A and a Kenwood TS-450S for several years and have never really understood when to use the attenuator as opposed to simply turning the RF Gain control down. I think I understand the difference, but the result seems to be the same. Is there any real difference?"

A In a practical sense, there is no difference. However, at high levels of attenuation the RF gain control may be hard to set, so the fixed attenuator is easier to use. Under some circumstances you might even need both. When band noise and signals are both over S 9 with the RF gain up all the way, the attenuator will bring them down to where the RF gain can be used for "fine tuning" the level.

Q Steve, N8UBR, asks, "I put up a 10-meter quarter-wavelength ground plane antenna on my property in my subdivision. When doing an RF safety evaluation for this system, is the distance measured from the main vertical radiator or the ground plane radials? (I plan to use 100 W.) The radials are currently above the ground, but will be buried in the spring when the ground thaws."

A If I were doing your evaluation, I would consider radials that were within a few inches of the ground to be grounded and would do my calculations from the main antenna itself. If I had a ground-plane antenna with elevated radials, I would, to be conservative, consider them as an active part of the antenna system. The simple evaluation methods, such as the one found on the University of Texas Web page (see "The Doctor is IN," February 2000), works very well for ground-mounted verticals. You can assume about 1 dBi of antenna gain and do use the ground-reflection factor.

Start with your 100 W output and adjust it for the operating mode and typical duty cycles.

100 W CW = 40 W

100 W SSB = 20 to 40 W, depending on speech processing, use 30 W for average speech processing

100 W FM, RTTY, other digital = 100 W

Then, adjust it by the amount of time you *might* be transmitting continuously during the averaging time of 6 minutes for controlled exposure or 30 minutes of uncontrolled exposure. For "conversational" operating, you can use 100% for controlled exposure and about 67% for uncontrolled. If you wish, you can also make further adjustments for feed-line loss, but I will refer you to *RF Exposure and You* for more info on that.

For a 1-dBi-gain antenna on 28 MHz, this typically works out to:

Mode	*Controlled Distance (feet)*	*Uncontrolled Distance (feet)*
SSB	2.7	4.9
CW	3.1	5.8
FM	4.9	9.0

This all assumes 100 W, 1 dBi, 28 MHz, 10 minutes on, 10 minutes off, 10 minutes on and moderate speech processing for SSB. If you and your family are greater than 4.9 feet from the antenna and your neighbors are greater than 9 feet from the antenna, you can run 100W continuous duty (carrier) for an indefinite period.

The required distances are from your antenna to any point where people could actually be exposed. Most hams choose to control exposure in their backyard by instructing their families not to linger closer than the controlled distance to their antennas when they are on the air. You should also take some steps to ensure that no one can accidentally contact your antenna. Hams generally use their property line as the criterion for the uncontrolled distance because they have no way of knowing whether their neighbor might be spending time near the property line. With the above assumptions, if you operate SSB on 10 meters with 100 W and your antenna is located 4.9 feet from the property line, you are in compliance.

Q John, KF6EOJ, asks, "I just recently completed a modification of a RadioShack FM antenna for 2 meter use, but I am a little confused about the issue of vertical vs. horizontal polarization. Two members of my local club say that for FM use I should use the antenna vertically polarized, which means modifying the antenna mounting holes, which I have already done. Is this true? I only have a FM H-T and I intend on using the antenna to increase my range."

A When amateur 2-meter FM repeaters came along in the 70s they were used primarily for mobile communication. Horizontal mobile antennas proved cumbersome (remember the Halo?) and so vertical whips were the favored. Repeaters followed suit, using vertically polarized antennas as well. The penalty for a polarization mismatch (using horizontal polarization when the other station is using vertical, or vice versa) is a substantial signal loss.

So, the established custom among FM operators is to use vertically polarized antennas. If you want to communicate with other FM stations, choose vertical polarization.

On the other hand, you should know that 2-meter SSB and CW operators use horizontal polarization—if you ever decide to give 2-meter DXing a try.

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; http://www.arrl.org/tis/. QST

By Martin A. Minow, K6MAM

Practice Morse Code with a *Java* Applet

If your computer has a sound card and can run *Java* applets or applications, you can use the *MorsePractice* applet to lean Morse code or improve your code skills. If you can program in *Java*, you can take *MorsePractice* apart and put it to use in your own shack.

When I read the July 1999 issue of *QST* and found that 10-year old Zane Wurble, W2YL, had passed the 13-WPM code test—and then sailed through her 20-WPM Amateur Extra test a few weeks later—I decided to do something about my terrible code skills. The "restructured" 5-WPM test is easy enough, but many of us want to master Morse at a much faster clip so that we can actually use it on the air.

My real skills are in computer programming, so I took the obvious, if impractical, approach: I wrote my own training application. (Another reason for this decision is that I use a Macintosh and write in the *Java* language, putting me outside the *Windows*-centric mainstream of the ham community.)

The program I wrote, *MorsePractice*, runs on sound-card-equipped Macintosh and *Windows* computers, should work on Linux (I haven't tested this), and can be used as a stand-alone application or an applet on any *Java*-enabled system that supports the "sun.audio" sound generation library. I'm also distributing the source so you can adapt *MorsePractice* to your own needs, or pick out interesting pieces for some other purpose (just don't sell my code). You can also read the code to make sure I'm not trying to sneak a virus into your system!

MorsePractice provides two kinds of training: random symbols and random QSOs. The random symbol training emphasizes the *Koch Method* that teaches Morse Code symbols in a particular sequence. The random QSO trial generates a unique amateur contact vaguely based on the ARRL code proficiency test.

Learning Morse Code

While I am hardly an expert on Morse code, the Koch Method appears to be a better approach than listening to code tapes. It was developed in the 1930s by Ludwig Koch, a psychologist at Die Technische Hochschule in Braunschweig, Germany. The book by William G. Pierpoint, N0HFF, *The Art and Skill of Radio Telegraphy* has more information, including references to Professor Koch's research. The *MorsePractice* Web page has links to an online copy of N0HFF's book.

The Koch Method uses high-speed random code at all times. That way, the student learns the code patterns directly and doesn't fall into the trap of trying to listening for a symbol's individual "dits" and "dahs". You will notice that *MorsePractice* never displays a visual (dot-dash) representation of the characters. Training should never be slower than around 13 words per minute to avoid learning the code by picking apart each character. After all, when you read English, you don't distinguish between "b" and "d" by isolating the vertical line and circle; you read the letter as a unit and, as you become proficient, read the words instead of the letters.

To train using the Koch Method with *MorsePractice*, select "Random Symbols", click on the checkboxes or the Koch training sequence to select the characters you want to learn, then select the number of minutes to train (the Koch method recommends 5 minutes). I've been starting off with 1 minute sessions for the first few letters, but will increase this as the number of letters in the training set increases. To begin, click the "Start Trial" button. Write down what you hear. When the test completes, type what you heard into the text box and click the "Check" button. When you can copy one sequence with 90% accuracy, add another character.

MorsePractice has a clickable palette showing the characters in Koch training order, making it easy to gauge your proficiency and know what you need to do next.

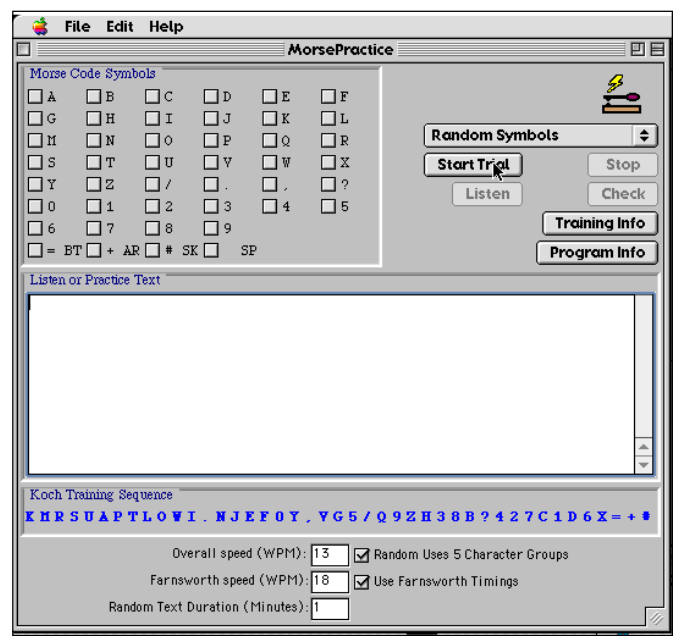


Figure 1—The MorsePractice window.

Using MorsePractice

When you start *MorsePractice*, you'll see its main window, as shown in Figure 1. Here, I've set the program to use a Koch training sequence, with the overall code speed set to 13 WPM, but with each Morse symbol sent at 18 WPM. The trial will run for one minute.

After the trial, you need only type the symbols you hear into the text area and click on the "Check" button. The program compares what it sent to what you typed and displays a "confusion matrix" that shows you how well you did. In the trial shown in Figure 2, I managed 92% correct. The top line shows that *MorsePractice* sent an "S" that I heard as an "A" and that I'm clearly having trouble with the "L" symbol.

If you select the "Random QSO" option, *MorsePractice* will send a QSO that vaguely follows the format used in the code proficiency exam. The message is fairly long and will give your ears a workout. Since you will probably be listening for content, the "Check" option, while usable, isn't really useful. When the trial completes, the program displays the entire text it sent so you can check your results by hand.

If you run the application version, you can also generate messages from text files and write an audio file (in the *Sun .au* format) with the generated code.

Installing *Java*

While you can use *MorsePractice* as an applet at my Web site at **http://homepage.mac.comK6mam/**, there are advantages to installing it as an application: you can save your current training parameters, listen to text files and save Morse code in sound files. If you don't have *Java* on your personal computer, follow the instructions below to install it. (Macintosh users are lucky: if you have a recent system, everything you need, except Netscape *Java* support, should already be on your system.)

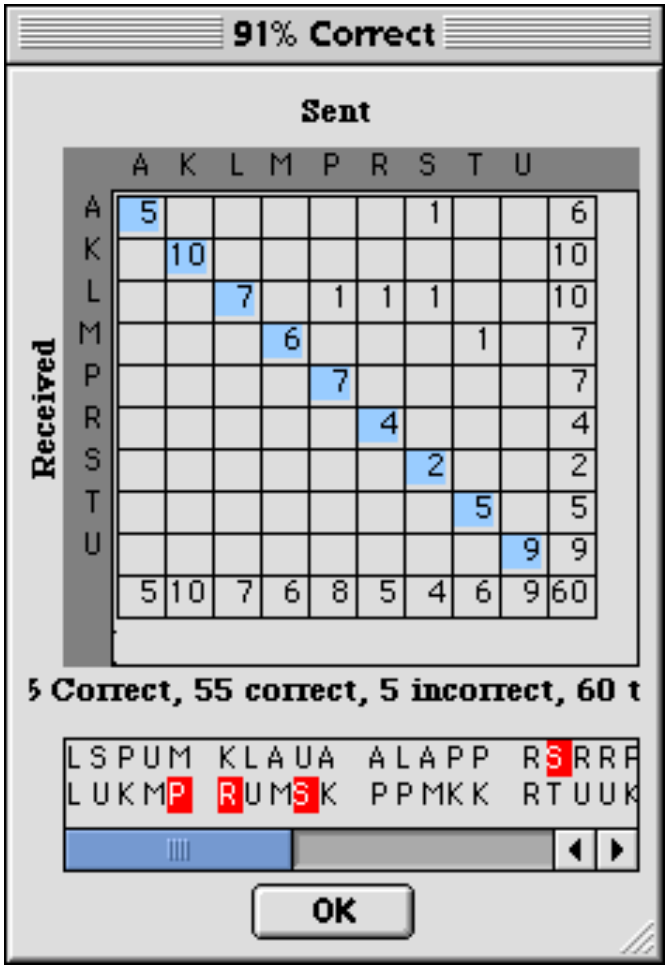


Figure 2—My training trial result.

Notes on *Java*

The *Java* programming language is reasonably simple to learn with fewer "gotchas" than *C* or *C++* (and let's not talk about assembler!). *MorsePractice* runs both as a normal application and as an *applet*: a downloadable code module that can run in most Web browsers.

While applications act like any computer program, applets run in a security "sandbox:" they can't read or write files on your system, for example. Since you can read the *MorsePractice* source code, you can check that there are no viruses or "hidden features" in the program. Also, *Java* has a number of built-in programming safeguards that prevent many coding errors that are common to assembler or *C* programs, such as scribbling over random bits of memory.

While most recent personal computers can run *Java* applets, *Windows* and *Windows/NT* users may need to install a *Java Runtime Environment* to use *MorsePractice* as an application. I've provided instructions in the article.

Installing on Macs

On the Macintosh, you need MRJ 2.1.4 or later. It was distributed with System 8.6 or later and will be installed when you do a normal system installation. If you have an earlier system or want to update to the latest public distribution, you can install MRJ from Apple Computer's *Java* support area. You may also install the software development kit if you want to modify the sources. I've tested MorsePractice on MacOS System 8.6 and MRJ 2.1.4 and 2.2. The *MorsePractice* file is a self-contained double-clickable application; it's all you need. You can download *MorsePractice.hqx* from **http://homepage.mac.com/K6mam/MorsePractice/MorsePractice.html**.When run as an applet, *MorsePractice* should work on the *iCab* and *Internet Explorer* browsers. Unfortunately, *Netscape* version 4 does not support the current *Java* release on the Macintosh and will not run *MorsePractice*.

Installing on Windows, Windows/NT

Before trying to run *MorsePractice* as an application, first make sure that you have a suitable *Java* environment. You can get a *Windows* or *Solaris* distribution from Sun Microsystems and a *Linux* distribution from Blackdown.org. You can use the Java Runtime Environment (JRE) or the Java Development Kit (JDK). The latter lets you modify *MorsePractice*. *MorsePractice* requires *Java* 1.1.8 or later. On *Windows/NT*, I found that JRE 1.2.2 works, but JRE 1.2.1 had display problems. Here are step-by-step instructions for installing JRE on *Windows*.

1.Point your browser at **http://java.sun.com**.

2. At the bottom of the screen, click on the "Products & APIs" link.

3. Click on the "Java 2 Platform, Standard Edition" link then, on the next page, click on the "Java 2 Runtime Environment, Standard Edition" link. This brings you to the **http://java.sun.com/products/jdk/1.2/jre** page.

4. Select the "Java 2 Runtime Environment v 1.2.2-001 Windows 95/98/NT Production Release" link. This is the minimal release, and doesn't let you write Java programs. Look at other releases or purchase a third-party development kit if you want to modify the program.

5. Choose a download method, agree with the license, and save

the download to a suitable location on your local hard disk. This is a 6 Mbyte download, so it may take a while.

6. Leave your browser and navigate to the directory containing the *Java* release you just downloaded. Double-click on the download and do a normal install, accepting all defaults. You may have to restart your *Windows* system after installing *Java*.

7. You're (almost) done: go to the *DOS* prompt (it is in your Start menu). Change directories until you find yourself in C:/program files/javasoft/jre/1.2/bin and enter:

```
java
```

you should see a "Usage" message if everything went well.

8. On some *Windows* releases, the installer will have configured your system so it can launch *Java* applications stored on your hard drive. If not, you may have to set the path variables yourself. Here is a script I used to test *MorsePractice* on a *Windows/95* system:

```
set PATH=%PATH%;C:\PROGRA~1\JAVASOFT\JRE\1.2\BIN

set CLASSPATH=%CLASSPATH%;C:\PROGRA~1\JAVASOFT\J
RE\1.2\BIN
echo %PATH%
echo %CLASSPATH%
```

The first "set PATH=" commands tells *Windows* where your applications are stored. The second command tells *Java* where to search for the library classes. The two "echo" commands let you see the current PATH and CLASSPATH settings. Be very careful when you type these commands; make sure they are exactly as shown. If you understand *Windows*, you should be able to add the PATH and CLASSPATH to your standard configuration.

CLASSPATH is specific to Java, and it might not be defined on your system, so you may need to define it by typing:

```
set CLASSPATH=C:\PROGRA~1\JAVASOFT\JRE\1.2\BIN
```

As you probably know, the Internet changes quickly, so you should expect that the steps may have changed since I wrote this article.

Installing *MorsePractice* on *Windows* or *Linux*

After you installed *Java*, you need to dowload *MorsePractice.jar* from the ARRL Web site at **http://www.arrl.org/files/**. Save it to a convenient folder on your hard drive (you may want to save it to the same directory as the *Java.exe* file [probably c:/program files/javasoft/jre/1.2/bin] unless you set up the path statements described below). To run it, go to the *DOS* prompt (or *Linux* terminal window), set your working directory to the directory that holds *MorsePractice*, and enter

```
java -cp MorsePractice.jar Main
```

That's all: MorsePractice should run in a new window.

Windows/95 objects to the long filename. so you will have to use an abbreviated form:

```
java -cp MORSEP~1.jar Main
```

Here's a complete startup sequence for *Windows/95*. It assumes that you installed Java in the standard location and stored *MorsePractice.jar* in the "Download" folder on your "C:" hard drive. You can edit all of the following into a tiny batch file and run it all with a single command.

```
set PATH=%PATH%;C:\PROGRA~1\JAVASOFT\JRE\1.2\BIN
set CLASSPATH = % CLASSPATH %; C:\ PROGRA~1\
JAVASOFT\JRE\1.2\BIN
cd C:\Download
java -cp MORSEP~1.jar Main
```

Morse Code Links On The Web

If you're interested in Morse code, you may find these links useful…

- The ARRL Web Morse page at: **http://www.arrl.org/ead/learncw/**
- The Art and Skill of Radio Telegraphy by William G. Pierpoint, N0HFF: **http://www.joates.demon.co.uk/megs/N0HFF/index.htm**
- MEGS is a group of radio amateurs and shortwave listeners interested in Morse code: **http://www.joates.demon.co.uk/megs/**
- *So You Want to Learn Morse Code* by David G. Finley has information on Morse code training, including links to his book, *Morse Code, Breaking the Barrier* and information on using the Koch Method with the *SuperMorse* software package:
  http://griffy.nmt.edu/sara/sara/finley.morse.html
  http://www.sdc.org/%7Efinley/
  http://griffy.nmt.edu/sara/sara/finley.sm404.html
- *The Victorian Internet* is an interesting book on the development of telegraphy in the 1800s. Also, the article on the telegraph in the 11th edition of the *Encyclopedia Brittanica* is well worth reading.

[The author upgraded to General on March 18, 2000. He gives much of the credit to *Morsepractice*!—*Ed*]

332 Molimo Dr
San Francisco, CA 94127-1620
k6mam@arrl.net

NEW PRODUCTS

HF BAND-PASS FILTERS FROM ARRAY SOLUTIONS

◊ The WX0B BPF-1 is an integrated set of 6 HF band-pass filters housed in a single enclosure. This new filter system is designed to reduce the harmonic energy and wideband phase noise generated by transmitters and to limit the receiver desensing that is common when multiple HF stations are operated in proximity.

Possible applications include the reduction of cross band interference in single operator two radio, multi-single and multi-multi (ie Field Day) contest operations; for multi transmitter DXpeditions; and for monitoring facilities that may have the need to transmit on one band of frequencies while listening on another.

The BPF-1 contains 6 filters for 10, 15, 20, 40, 80 and 160 meters. Custom-built units are available for alternative frequency ranges. The desired band filter can be selected automatically using external band data information, or manually using an optional remote manual selector switch box. A bypass mode is included and will engage automatically if dc power is disconnected.

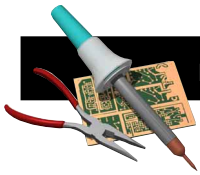
The enclosure dimensions are 7 × 14.25 × 3 inches, SO-239 type connectors are used for the input and output and a 7-section terminal strip mounted on an internal PC board provides a connection point for the external switching source.

Claimed specifications include 200 W CW/RTTY/SSB power handling capability (at an SWR <2.0:1), a pass band SWR of <1.2:1 and a typical insertion loss of <0.3 dB. The attenuation of the second harmonic is specified at 50 to 75 dB (depending on the particular band). An external 12 V dc, 50 mA power source is required.

The design of the individual filter elements is based on those described by Ed Weatherhold, W3NQN, in his article series that appeared in the May and June 1998 issues of *QST*.

For additional information contact Array Solutions, 350 Gloria Rd, Sunnyvale, TX 75182; tel 972-203 2008; fax 972-203-8811; **wx0b@arraysolutions.com**; **http://www.arraysolutions.com**.

Next New Product



By H. Ward Silver, N0AX

Test Your Knowledge!

No pain, no gain. Still more dreaded word problems…

As Mark Twain once said, "Supposing is good, but finding out is better." Let's find out, shall we?

1. An output driver package with eight 12-V outputs has the capability to handle a total of 150 mA. It's connected to the following loads:

- a relay coil that consumes 600 mW
- four LEDs that require 10 mA apiece
- a display backlight that draws 200 mW

Can you add an audio annunciator that needs 30 mA of drive without overloading the chip?

2. During emergency service a handheld rig could be used at a 10% duty cycle of transmitting vs. total on-time. The rig draws 50 mA while receiving and 1 A while transmitting. Each 8-V NiCd pack has a capacity of 2.5 A/h. How long will each pack last if 80% of its capacity can be used? How many fully-charged battery packs are needed for 24 hours of operation?

3. A base-fed 160-meter inverted-**L** antenna has an impedance of 35 + *j*40 Ω. Find the value of a series capacitor attached to the feed point that will cancel the inductive component of the feed point impedance at 1.830 MHz. Then, using an L-network with an inductor in series with the feedpoint, transform the remaining 35 Ω resistive impedance to 50 Ω and calculate the values of L and C. (See the *ARRL Antenna Book* for L-network design equations.)

4. A transmitter requires 10.5 V or greater at its input terminals. At full load it draws 25 A. The power supply has an internal impedance of 0.02 Ω and the cable and connectors have a total resistance of 0.05 Ω. Will the rig have sufficient input voltage when the power supply output is set to 13.5 V? How much power is dissipated by the cable and connectors? Can an additional splicing connector with a resistance of 0.06 Ω be added to the cable and still allow sufficient voltage at the rig under full load?

5. Seeking to improve weak signal performance, you're weighing the choice of replacing your existing coax with hardline, or adding a preamp at the antenna. The coax has a total length of 275 feet and a loss of 3 dB per 100 feet. A preamp has a gain of 6 dB. Assuming that the hardline has a loss of 0.5 dB per 100 feet, which choice —hardline or preamp—will result in better signal strength at the receiver input?

Total Your Score!

There are a total of nine possible answers. Give yourself one point for each correct answer.

7-9	Hardly a tickle
4-6	That didn't hurt too much, did it?
1-3	Ouch!

Answers

1. First, compute all current draws. The relay coil draws 600 mW / 12 V = 50 mA. The LEDs consume a total of 40 mA. The backlight draws 200 mW / 12 V = 16.7 mA. The total current already being handled is 50 + 40 + 16.7 = 106.7 mA. An additional 30 mA brings the total to 136.7 mA, which is within the rated capacity of the driver.

2. If 80% of a pack's energy (expressed in amp-hours (Ah), which assumes constant voltage) is available for use, that's 2 Ah. The usage profile given is an average current drain consisting of 10% at 1 A plus 90% at 0.05 A = 145 mA. The total time this load can be supported is 2 / 0.145 = 13.8 hours. For 24 hours of operation you'll need 2 packs.

3. At 1.830 MHz, a capacitive reactance of 40 Ω requires 1/(6.28 × 1.830 MHz × 40) = 2180 pF. This leaves an impedance of 35 Ω to be transformed to the desired impedance of 50 Ω. From the L-network design equations, Q is calculated to 0.66; X_L = 0.66 × 35 = 23 Ω; X_C = 50 / 0.66 = 75 Ω; L = 23 / (1.83 MHz × 6.28) = 2 μH; C = 1 / (1.83 MHz × 6.28 × 75) = 1133 pF. Note that the feedpoint capacitor and matching network inductor are in series, partially cancelling and leaving a net reactance of -40 + 23 = -17 Ω of reactance. This is equivalent to a single capacitor of 5120 pF. Thus, the matching network reduces to a 5120 pF capacitor in series with the antenna feedpoint and a 1133 pF capacitor connected across the feed line output.

4. The voltage at the rig under full load is 13.5 V – 25 A × (0.02 + 0.05 Ω) = 11.8 V; enough for proper operation. The cables and connector dissipate $25^2 \times 0.05 = 31.3$ W. Note that a loose connector can get mighty hot under loads like this! If an additional 0.06 Ω is added to the 0.07 Ω series resistance, full load voltage at the rig drops to 13.5 – 25 (0.13) = 10.3V—not enough! Note also that this single connector would dissipate 37.5 W all by itself.

5. The existing cable is causing 275 × 3/100 = 8.25 dB loss. Hardline of the same length will result in 275 × 0.5/100 = 1.38 dB. Cable replacement results in 8.25 – 1.38 = 6.88 dB of improvement, slightly better than the preamp. Not considered in this problem, but still pertinent, is the fact that adding a preamp at the antenna would probably reduce the system noise figure and improvement performance more than a mere signal gain computation would indicate.

STRAYS

ARRL FORUM ON-LINE

◊ An on-line member-to-member ARRL e-mail discussion forum (not sponsored by the ARRL) has been established. You can elect to have the daily messages summarized and sent to you in digest form once a day, or have all messages sent directly to your e-mail address as they arrive. Please note that this is not a rant-and-rave anti-League forum. Uncivil discourse will be terminated and the offenders dropped. Constructive comments and civil arguments are, of course, welcome. You can sign up for the forum on the Web at: **http://www.onelist.com**.—*Jay Craswell, W0VNE*

LOOKING FOR AN EXAM?

◊ If you want to take an Amateur Radio exam, but don't know where to go, you can find out on the ARRLWeb at **http://www.arrl.org/arrlvec/examsearch.phtml**. At this handy site you can search for exam dates and times by state, ZIP code and even country (for US Amateur Radio exams offered overseas).

Next Stray

Heil Sound Goldline Studio Microphone

By Dan Henderson, N1ND
Contest Branch Manager

Everyone has their own idea of the type of look they want for their personal station. Some go for the high tech style while others strive to achieve a nostalgic feel to the shack. While the engineering adage of "form follows function" certainly is a must, there is no reason why an equipment's "form" has to be unappealing, if it can still provide the "function" for which it was intended.

For those that say any microphone will do so long as it gets the job done, I would offer that at least in the case of the Heil Sound Goldline Studio Microphone, you have a product that gets results *and* is an attractive addition to your station appearance.

Rarely does any piece of radio equipment receive a more thorough workout than during a contest. The Heil Goldline was put through its paces recently at ARRL Headquarters station W1AW during the ARRL International DX Phone Contest. In preparation the microphone was set to the factory suggested settings for the Yaesu FT-1000 transceiver that was used during the event. The set-up procedure varies from radio to radio and can be a bit complicated, but was accomplished without much difficulty.

The model used for the test was the Goldline GM-5, which can be switched between the full range studio element and a Heil HC-5 element. I used the full range element for operation during the contest. Two other models are available. The GM-4 includes the full range studio element and HC-4 "DX Dream Machine" element while the Goldline Vintage includes a special low to high-impedance matching transformer designed for use with "vintage" gear to accompany the full range dynamic element.

Being accustomed to using a headset with microphone attached, it took a little time to get used to working with a boom microphone during the contest. But in short order it was easy to position the boom out of the line-of-site to the computer monitor and radio controls. After overdriving the microphone a couple of times, and with a bit of testing, it was also easy to find a position where the normal speaking voice was easily picked up and transmitted without distortion.

Using the boom type set-up produced a pleasant surprise. The mike on a tight fitting headset is often sensitive to normal twists and turns by the operator. This in turn can trigger the VOX circuitry. The easiest solution is to use a foot pedal. This contest was run entirely with VOX using the Heil Goldline and boom configuration. Setting the microphone to the side, and speaking in normal conversational tones allowed easy, reliable VOX operation.

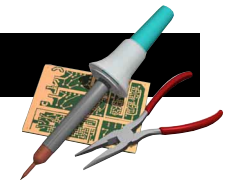
After all is said and done, the real test is simple: how did I sound? I find two good ways to measure this. First, many QSOs included comments on the "good audio." Knowing how my southern drawl often affects how others hear me, I would chalk up "good audio" comments as a real plus. After all, if my audio was good enough to provoke comments, it must have been very good indeed.

The second simple test involved conversations with friends who know how I sound "in real life." Before the contest, and in several conversations with friends during and after the contest, it was common to hear "you sound like yourself" when asked about the quality of the audio. One old friend tuned across the conversation and dropped in to chat for a while, saying "I heard that voice and knew right away who it was."

Your choice of station accessories can be as important as the choice of transceivers and radio equipment. This is especially true of microphones. Don't let its sleek style and attractive appearance lull you into believing that the Heil Sound Goldline Studio Microphone is there just for show. With its 60 Hz-16 kHz response, including a +4 dB peak at 2 kHz, the Goldline offers excellent voice articulation. On phone your goal is to be *understood*—and the Goldline gives you a definite edge.

The Heil Sound Goldline and accessories including a boom with a shock mount, a foot switch and a microphone-to-transceiver cable.

Manufacturer: Heil Sound Ltd, 5800 North Illinois Ave, Fairview Heights, IL 62208; tel 618-257-3000; fax 618-257-3001; **http://www.heilsound.com/**. *Goldline GM-4 (full-range and DX Dream Machine HC-4) $139.99; Goldline GM-5 (full-range and HC-5), $139.99; Vintage Goldline, high impedance only for Collins, Drake, etc, $159.99; CC-1 connecting cable, $29.99; LX-1 balanced studio microphone boom, $94.99; SM-1 shock mount assembly, $50; FS-1 foot switch, $29.99.* QST



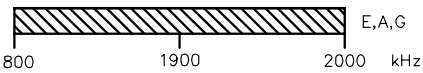
US Amateur Bands

April 15, 2000

Novice, Advanced and Technician Plus Allocations

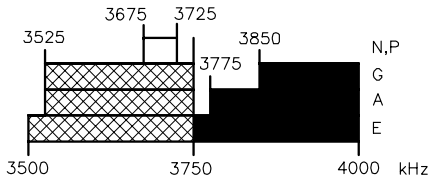
Novice, Advanced and Technician Plus licenses will not be issued after April 15, 2000. However, the FCC has allowed the frequency allocations for these license classes to remain in effect.

160 METERS



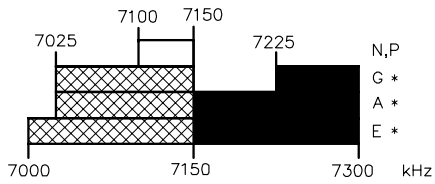
Amateur stations operating at 1900–2000 kHz must not cause harmful interference to the radiolocation service and are afforded no protection from radiolocation operations.

80 METERS



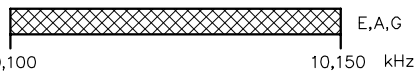
5167.5 kHz (SSB only): Alaska emergency use only.

40 METERS



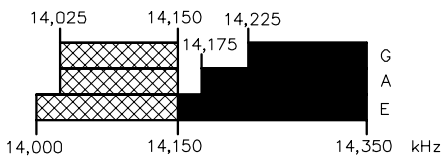
* Phone and Image modes are permitted between 7075 and 7100 kHz for FCC licensed stations in ITU Regions 1 and 3 and by FCC licensed stations in ITU Region 2 West of 130 degrees West longitude or South of 20 degrees North latitude. See Sections 97.305(c) and 97.307(f)(11). Novice and Technician Plus licensees outside ITU Region 2 may use CW only between 7050 and 7075 kHz. See Section 97.301(e). These exemptions do not apply to stations in the continental US.

30 METERS



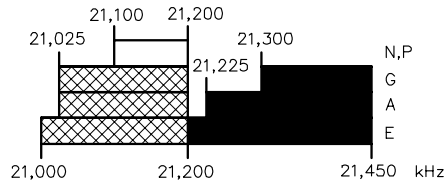
Maximum power on 30 meters is 200 watts PEP output. Amateurs must avoid interference to the fixed service outside the US.

20 METERS

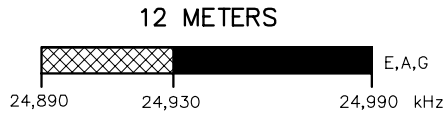


17 METERS

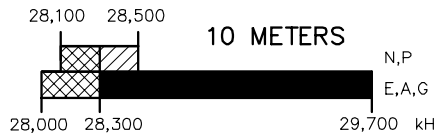
15 METERS



12 METERS

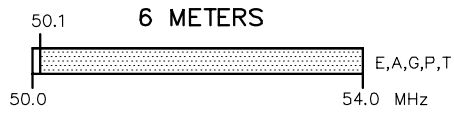


10 METERS



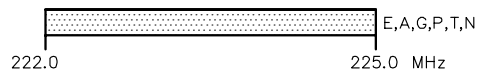
Novices and Technician Plus Licensees are limited to 200 watts PEP output on 10 meters.

6 METERS



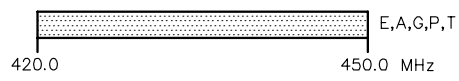
2 METERS

1.25 METERS



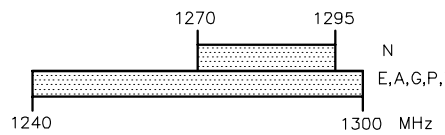
Novices are limited to 25 watts PEP output from 222 to 225 MHz.

70 CENTIMETERS**



33 CENTIMETERS**

23 CENTIMETERS**



Novices are limited to 5 watts PEP output from 1270 to 1295 MHz.

US AMATEUR POWER LIMITS

At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in watts PEP output. Unless otherwise stated, the maximum power output is 1500 W. Power for all license classes is limited to 200 W in the 10,100–10,150 kHz band and in all Novice subbands below 28,100 kHz. Novices and Technicians are restricted to 200 W in the 28,100–28,500 kHz subbands. In addition, Novices are restricted to 25 W in the 222–225 MHz band and 5 W in the 1270–1295 MHz subband.

Operators with Technician class licenses and above may operate on all bands above 50 MHz. For more detailed information see *The FCC Rule Book*.

KEY

- = CW, RTTY and data
- = CW, RTTY, data, MCW, test, phone and image
- = CW, phone and image
- = CW and SSB phone
- = CW, RTTY, data, phone, and image
- = CW only

E =EXTRA CLASS
A =ADVANCED
G =GENERAL
P =TECHNICIAN PLUS
T =TECHNICIAN
N =NOVICE

** Geographical and power restrictions apply to these bands. See *The FCC Rule Book* for more information about your area.

Above 23 Centimeters:

All licensees except Novices are authorized all modes on the following frequencies:

2300–2310 MHz
2390–2450 MHz
3300–3500 MHz
5650–5925 MHz
10.0–10.5 GHz
24.0–24.25 GHz
47.0–47.2 GHz
75.5–81.0 GHz
119.98–120.02 GHz
142–149 GHz
241–250 GHz
All above 300 GHz

For band plans and sharing arrangements, see *The ARRL Operating Manual* or *The FCC Rule Book*.

By Zack Lau, W1VT

A No-Tune 2-Meter Bandpass Filter

A homebrew solution to annoying intermod.

Here is a solution to a common problem—strong pager signals interfering with 2-meter signals. Wideband receivers rarely have enough filtering to reject pagers signals just above the 2-meter amateur band, resulting in strong intermodulation products, or *intermod*.

My solution is a sharp bandpass filter in the form of tuned circuit made entirely of coaxial cable. This is similar to microwave printed circuits, where the frequency is too high to effectively use ordinary capacitors and inductors. Inductors and capacitors work quite well—if you have the test gear to tune them. I found that semi-rigid cable could be cut accurately enough to eliminate the need for tuning.

The design shown in Figure 1 uses sections of UT-141A semi-rigid coax cable for the circuit elements. This Teflon cable has a solid copper jacket that can be cut accurately to length with a sharp hobby knife and a steel rule. It can also be bent around $^3/_4$-inch PVC pipe to form compact coils, which reduces the size of 28-inch resonators. Coax cable is also self-shielding—you don't need to buy an expensive box to shield the filter from RF. These days, a good box could cost more than the electronics inside it!

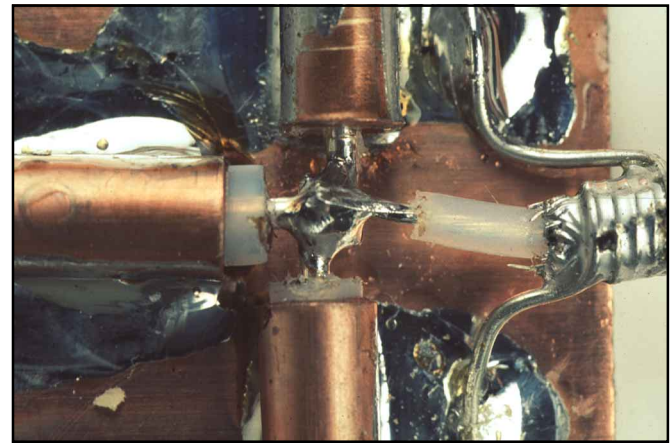
The principle of operation is rather simple—a half wavelength of coax shorted at each end forms a resonant circuit. By tapping into the resonator, energy can be introduced and extracted. Tapping closer to ground reduces the coupling, while tapping closer to the center point increases the coupling.

Thus, the bandwidth of the filter can be adjusted by changing the distance of the tap points from the grounded ends of the resonator. Filters using a pair of resonators have a good compromise between performance and complexity. "The Double-Tuned Circuit: An Experiment's Tutorial," in the December 1991 *QST*, by Wes Hayward, W7ZOI, is an excellent reference for understanding filters with two resonators.

To optimize the rejection of signals just above 148 MHz, I used the same tap points for both the input and output of each resonator. This maximizes the attenuation on the high side of the passband—perfect for rejecting unwanted pager signals around 153 MHz. As a bonus, fewer tap points simplify construction. A more symmetrical passband can be obtained by tapping into the half wave resonator at one end and coupling through the other end. You might want to do this with a 70-cm filter used in a transverter, despite the greater complexity. This would result in greater attenuation of the unwanted low-side local oscillator and image.

With tap points set for the desired bandwidth, I adjusted the passband response by varying the length of the coupling cable. This is tedious to do on the bench, but rather easy with a computer simulation. I used *ARRL Radio Designer* to design the filter—tweaking the element lengths until I achieved a design that looked good. *Radio Designer* is also good for looking at other design possibilities. I explored the idea of making a notch filter out of UT-141A, but none of the designs were worth building.

A significant disadvantage of transmission line filters is



A close up of the T-junction connected to 50-Ω Teflon coax.

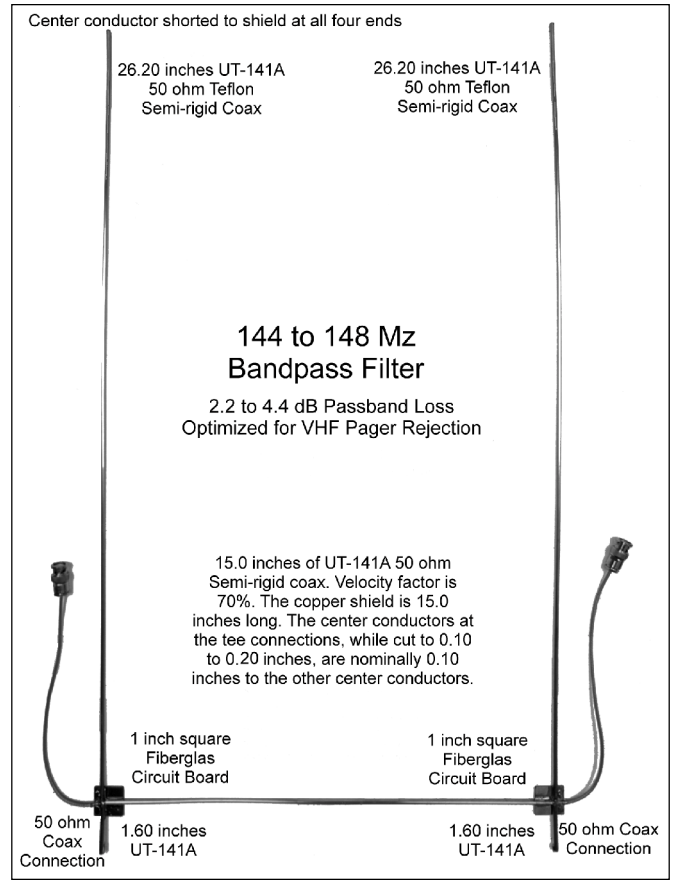
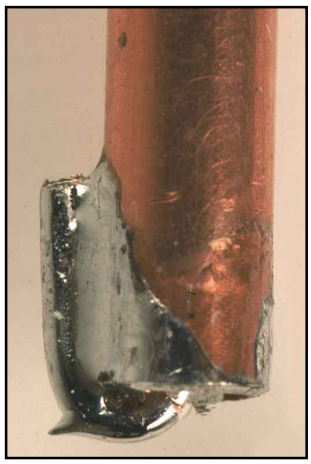


Figure 1—A view of the 2-meter no-tune bandpass filter showing the dimensions and wiring.



Here you can see how the center conductor is grounded to the shield.

harmonic responses. A half-wavelength filter is also resonant on its harmonics. This means that harmonic rejection is quite poor. A more conventional filter is suggested if you need good rejection above 170 MHz. Alternately, a low pass filter could be used in conjunction.

Construction

The semi-rigid cable is available from Down East Microwave and RF Connection.[1] I'd buy at least a couple extra feet for practice and errors. To work well, the cable shields should be cut with an accuracy of 1/16 inch. However, the 15-inch cable isn't as critical—the performance is still good with a 1-inch error. With practice, this can be done by placing the cable on a large flat surface and rolling straight lengths of cable under a sharp knife. I used an X-Acto knife with a new blade. You don't have to cut the cable all the way through—copper will break along a score line. A good steel rule will help insure accuracy. I strongly recommend some sort of eye protection when working with very sharp knives.

The dimensions shown in Figure 1 (26.20, 15.00 and 1.60 inches) are the lengths of the copper shields. The cable is most easily cut when there are a few inches on either side, but as little as 1/2 inch of extra cable will work. A pair of pliers is useful for grasping short lengths of cable. As you cut through the dielectric avoid nicking the center conductor—it will weaken the cable and make it much harder to bend without breaking. If you do nick the conductor, use it on the side that isn't bent.

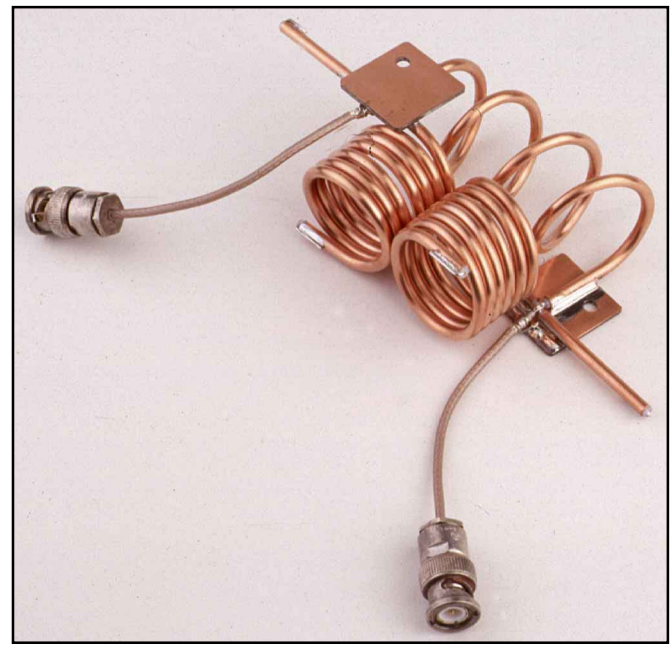
I also looked into ways of cutting the cable that required less skill. I made two cutting guides. They were both sections of brass rod with #27 (0.144) inch holes drilled down the center. The first was made out of 3/8-inch rod—thick enough to tap with set screws to firmly hold the cable. The second was made out of 1/4 inch rod—I just taped it to the coax. I wouldn't go through all this trouble just to make one filter, but making some tools might be a good idea if you plan a lot of microwave construction. UT-141A is a popular cable for connecting microwave subassemblies.

It doesn't hurt to measure twice, even after you have cut the cable shield. If you discover that you've made a mistake, and if you haven't cut the dielectric yet, you might be able to solder the cable back together. Tin the shield, wrap some copper foil over it, and solder the copper foil to the cable. Not as pretty, but still useable. Just 1/2 inch of center conductor is plenty for the shorted ends.

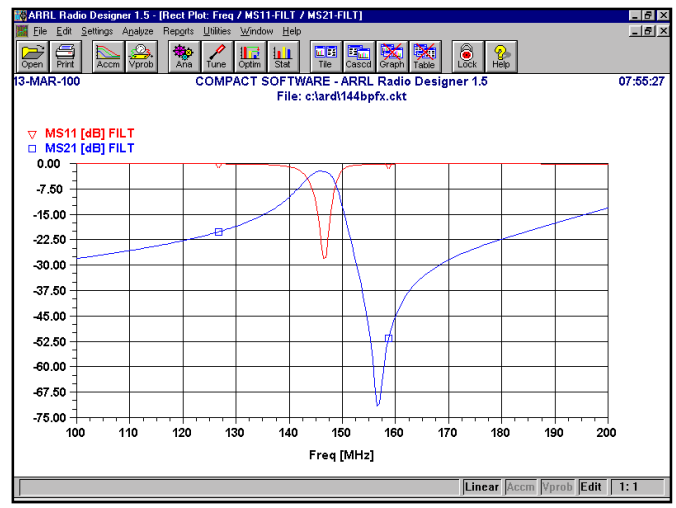
I used an unetched copper and Fiberglas circuit board to solder the three coax connectors together in a **T**-junction. It is a poor heat conductor compared to solid metal—you can solder additional pieces of coax to it without the first melting off. The Teflon may swell up. If this happens you can cut it back with a sharp knife. If you wish, you could use copper foil to cover the **T**-junctions and coax cable ends. However, the exposed "antennas" are so small that I doubt there will be much to be gained by shielding the connections.

I used RG-316/U Teflon coax to connect to the filter **T**-junctions. More common RG-174/U or RG-58/U can also be used, but Teflon coax is less likely to melt and short out.

[1]http://www.therfc.com/coax.htm; http://www.downeastmicrowave.com.



A view of the filter with the resonators coiled up to save space.



Insertion and return loss plots of the bandpass filter generated by *ARRL Radio Designer*. MS21 is the insertion loss and MS11 is the return loss.

Using the Filter

The loss of this filter is a bit high to leave in during transmit—3 dB loss is half your transmit power. Also the SWR, while acceptable from 146 to 147 MHz, isn't too good at the band edges. A common solution is to use a relay to bypass the filter. The 2-meter brick amplifier in the *2000 ARRL Handbook* can be easily adapted to use this filter. Just cut "coax A" in Figure 13.57 on page 13.47 and insert the filter. The amplifier circuit can be adapted to merely bypass the filter, without adding an amplifier.

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A FOLD-DOWN MOBILE-ANTENNA MOUNT

◊ Here is a description and photos of a unique mobile antenna mounting system. The system uses a three-position boat-trailer jack that has been modified to provide a three-position locking swivel mount for an antenna. The antenna shown is a heavy screwdriver style, the BB-3 manufactured by the T J Antenna company.[1]

After removing the crank and screw from the jack, you are left with a very strong pipe collar and mounting plate with a swivel connection between them and a heavy-duty locking pin. Let's call this assembly the jack swivel. I welded a 3/8×2×4-inch steel plate across the top of the collar (see Figure 1) to accept the antenna bolt. Drill a 3/8-inch hole in the plate adjacent to the collar to receive the antenna stud.

A heavy (3/8-inch) welded steel **T** secures the jack swivel to the pickup bed. Size and drill the cap of the **T** to fit the mounting plate and bolt pattern of your jack swivel. Figure 2 shows the **T**, with its leg bolted to the pickup bed rear post.

Figure 3 shows the installed jack swivel with the antenna in place. The assembly is locked in the forward-down position. I

[1]T J Antennas is part of nott ltd, 4001 La Plata Hwy, Farmington, NM 87401; tel 505-327-5646, orders only 1-800-443-0966, fax 505-325-1142; k5ynr@tjantenna.com; http://www.tjantenna.com/

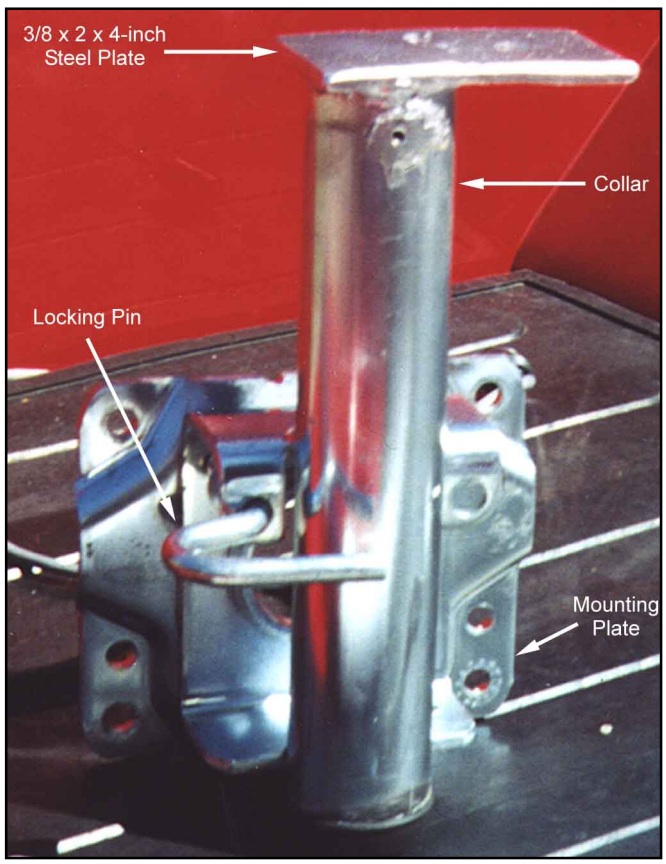

Figure 1—A modified boat-trailer swivel jack with its crank and wheel-elevating screw removed. A 3/8×2×4-inch steel plate is welded to the top of the jack, with a 3/8-inch hole to mount the antenna. The braided strap is used to ground the antenna and mount to the vehicle.

Figure 2—To use the mount in my pickup truck, I secured a 3/8-inch-thick plate to the pickup bed rear post. The swivel jack bolts to the plate.

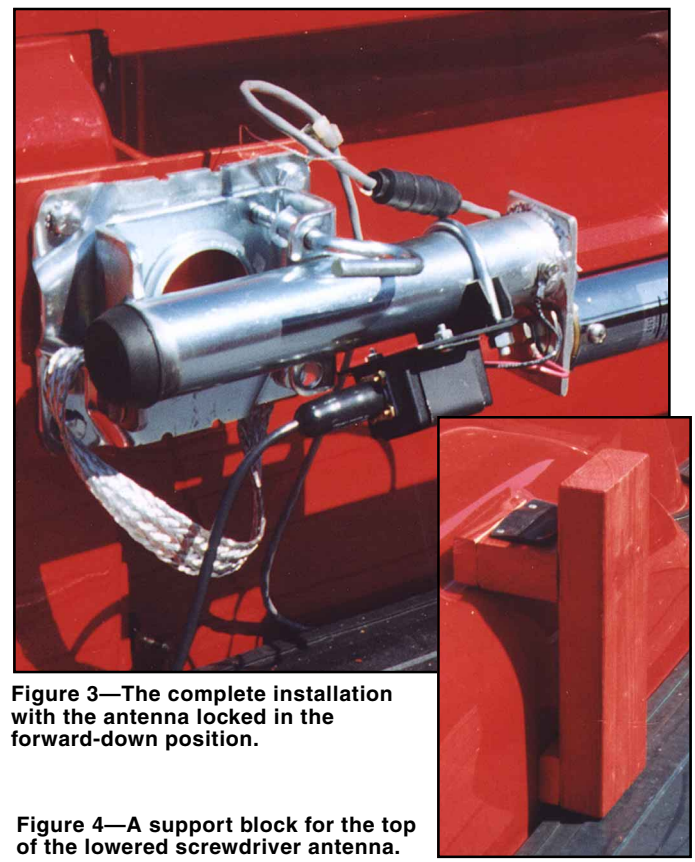

Figure 3—The complete installation with the antenna locked in the forward-down position.

Figure 4—A support block for the top of the lowered screwdriver antenna.

Bob Schetgen, KU7G ♦ Senior Assistant Technical Editor

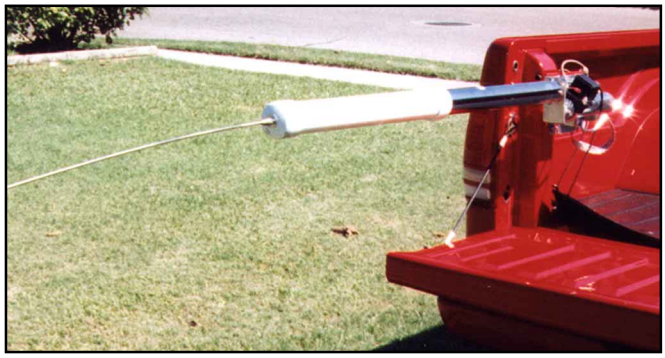

Figure 5—The antenna in the rear-down position with the whip installed.

stow the antenna in this position when it's not in use. With the whip removed, the antenna lies within the pickup bed. My screwdriver antenna is very heavy, so I fashioned a wooden support post for its upper end. The post is secured to the fender well with adhesive-backed Velcro (see Figure 4).

To prepare for operation, I swivel the antenna to the rear-down position and lock it in place to install the 60-inch whip (see Figure 5). The whip is stored beneath the pickup bed mat when not in use.

With the whip in place, I lock the antenna in the vertical position for use. The total height with the antenna extended for 75 meters is 13 feet 6 inches. The mount is very sturdy, easily supporting the large screwdriver antenna at 70 mph.—*Joe W. Williamson, KB5YA, 1509 Conder St, Killeen, TX 76541;* **kb5ya@juno.com**

STAINLESS-STEEL FASTENER SOURCE

◊ Every Amateur Radio operator who installs outdoor antennas or towers, needs stainless-steel fasteners at one time or another. While some larger hardware stores carry a limited supply of stainless-steel bolts, nuts and washers, most don't or they're priced beyond what might seem reasonable to most of us. Boating and marine-supply stores are another potential source for stainless steel fasteners, but they may not be located anywhere near the vicinity for those hams who are land-locked.

One interesting source for such items recently came to my attention in the form of a catalog from Champion Trailers.[2] They supply finished boat and utility trailers along with a wide variety of trailer parts, including a nice selection of stainless steel **U** bolts, hex-head bolts, threaded rods, sheet-metal screws, wood screws, carriage bolts, lag screws, machine screws, washers and self-locking (nylon insert) nuts. Their prices seem reasonable (a bag of 10 #8-32×1/2-inch machine screws for $0.99) and their mail-order catalog is free for the asking. They're just the ticket for Amateur Radio antenna buffs.

Remember, although stainless-steel fasteners aren't supposed to rust, they can seize under certain environmental conditions, so use an anti-seize thread lubricant such as Bostik's Never Seez[3] on all fittings that will be exposed to the elements.—*Dave Miller, NZ9E, 7462 Lawler Ave, Niles, IL 60714*

A SOLID-STATE FLASHLIGHT

◊ I wanted to experiment with the new white LEDs[5] and see if they would work in a flashlight application. Lo and behold, they do. I found an old beat up mini-Maglight flashlight for the purpose. I determined that two AA cells driving the LED do not need a dropping resistor because 3 V only drives the LED to 6 mA. So, I just clipped off the leads of the LED to match the lengths of the old Maglight bulb leads.

Then, I drilled out the back of the plastic reflector to match the larger diameter of the LED. Drilling the reflector can be tricky. I used several drill bits of different sizes so that each cut only a little from the reflector. I was very careful and took my time.

Finally, I plugged the LED into the Maglight—observing the polarity—and Voilá! A Maglight flash light that will probably last forever. It's not as bright as with the stock lamp, but it's useable nonetheless and a good experiment.—*Jeff Montgomery, WB4WXD, 104 Rosewood, Palestine, TX 75801;* **jmonty@flash.net**

MORE ON TS-570 BATTERY PROBLEMS

◊ I noticed a piece on battery replacement for the TS-570 in the November 1999 Hints and Kinks. The piece is accurate regarding mechanics, however, Kenwood has a known problem with many of these radios discharging their batteries in about six months—well in advance of the expected life.

If you press them, Kenwood will install a diode in the line that prevents the battery from discharging through the ac power supply when the supply is turned off.

Read all about it at my Web site: **http://www.al-williams.com/wd5gnr/kbatt.htm**—*Al Williams, WD5GNR, 310 Ivy Glen Ct, League City, TX 77573;* **alw@al-williams.com**

PC BOARD VIEWS

◊ When troubleshooting electronic equipment, we are fortunate to have the service manual. These manuals often have pictorial layouts of the circuit boards, complete with component designations and the printed wiring pattern. Usually, these images are the view from the component side.

Sometimes, only the opposite side is accessible. While probing the circuit board, one must form a mental mirror image of the component side to find the appropriate points. Recently, while troubleshooting a transceiver under these conditions, I decided to use my computer to ease the task. I scanned the service manual picture, then flipped the image electronically and printed it. Presto! The resulting image matched the pattern on the solder connection side. Probing was now much easier. Of course the component designations were now backwards, but that was a small price to pay.—*Gene Pentecost, W4IMT, 2017 Cedarmont Dr, Franklin, TN 37067-4019;* **gene.pentecost@ieee.org**

STEALTH ANTENNA SUPPORTS

◊ My stealth 80-meter full-wave horizontal loop is supported by those gold painted masts from RadioShack. After receiving glares from my neighbors and noticing several curious people drive by, I came up with an idea: camouflage. I painted the bottom of the poles to match the buildings and trees nearby. The top portion is painted flat black. For the most part, the poles are difficult to see unless you are looking for them.—*Lawrence E. Mergen, K0WVL, 209 S Morrison Rd, Raymore, MO 64083.*

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

[2]Champion Trailer Parts Supply, 56705 I-10 Service Rd, Slidell, LA 70458; tel 800-229-6690, fax 504-781-7701; **http://www.championtrailers.com**.

[3]Bostik, 211 Boston St, Middleton, MA 01949-2128; tel 978-777-0100, fax 978-750-7293; **http://www.bostik.com**. Check out their Never Seez selector sheet at **http://www.bostik.com/pdf/distribution/N23p1.pdf**.

By James Kates, N9GBB

Confessions of a DXing Dad

Contrary to conventional wisdom, being an active ham and an involved parent are not mutually exclusive!

Shortly before 6 o'clock on a March morning in 1996, my daughter Margaret came screaming into the world, the sweet payoff of 36 hours of labor and a hastily arranged Caesarian section. My wife, Sherry, and I were exhausted but thrilled. Three days later, Maggie came home with us, bundled warmly against the spring chill.

Hurrying inside, we were brought up short by a UPS box on the back porch. I recognized the return address. Inside the box, I knew, were a thousand freshly printed QSL cards bearing my call sign.

A Thousand Cards. A Thousand QSOs

I had been a ham for 25 years. Suddenly, I was a father as well. Were the two compatible? Or was life on the air about to end? Maybe I'd have to place one of those pathetic ads you occasionally find in the "Ham Ads" section of *QST*: "Entire shack for sale. All gear must go. Quitting ham radio."

Four years have passed; another daughter, Lucy, has joined the family. Have I quit Amateur Radio? Of course not. I've just learned to do things a bit differently—to be more adaptable, to put off my hobby once in a while for the sake of my kids. I'm still on the air. No, those thousand QSL cards aren't gone yet, but I recently qualified for ham radio's most prestigious award: membership in the DX Century Club, better known simply as DXCC.

You old-timers may be scratching your heads over this. Where's the conflict, you may be thinking, between the role of dad and that of DXer? Back in Ozzie and Harriet's day, a man worked at a job (or two or three of them, like my own father did) and his wife tended the house and kids. That's not to say things were easy, but everyone pretty much knew his (or her) place. Fathers brought home the bacon; moms fried it up. Ozzie was a swell dad, all right, but he didn't change any diapers.

Times have changed. More moms have joined the paid work force. More dads are pitching in at home. If they've got young families, they find that caring for small children can be all consuming. (You YLs out there have known this all along!)

A recent newspaper article quoted Florida officials as saying they were hard-pressed to find enough hams to handle emergency operations during the hurricane season. The reporter speculated (rightly, I think) that in the brave new world of co-parenting, hams with young children simply had trouble leaving the house. But if a dad's place is in the nursery, does that necessarily bar him from the shack?

I'm here to say no.

For 20 years I have worked alternately as a newspaperman and as a college journalism instructor. My wife is a lobbyist. If anything, we are blessed with more opportunities in life than we can reasonably take advantage of, at least all at once. Since Maggie was born we have had a shared parenting arrangement, with one or the other of us being at home with the kids most of the time. What this means, in practical terms, is that any hobbies or interests we pursue are probably going to be pursued with children in tow. Think it's impossible to enjoy an intelligible QSO when two small kids are in the shack? Trust me: Spend five minutes watching daytime TV and you'll find a way to make it work.

Think of it this way: Hams have an easier time with parenthood than do parachutists, drag racers or rock climbers. The hobby is usually no farther away than the basement, after all. It can be pursued in fits and starts, put away for a while and then taken out again. And it can be enjoyed 15 or 30 minutes at a time, something that cannot be said of golf or wilderness kayaking. A ham with young kids may not spend hours stalking twisters with a SKYWARN unit, but that doesn't mean his gear has to go into mothballs.

So take heart, ham dads. If you chase kids, you can still chase DX. Here's how I made the adjustment, and how you can too.

Managing the Transition

I was licensed as a Novice in Nebraska as a 12-year-old. That was the era of straight keys, crystal control and secondhand tube rigs, bought with paper-route money. Short on cash for crystals, I was rockbound on one measly frequency. QSOs were slow and few, and DX meant waking at 1 AM to work a Californian on 40 meters.

Through high school and college in Michigan, I was on the air sporadically, still with modest gear. In 1984 I moved to Milwaukee, where I plunged seriously into the newspaper business and met the young copy-runner who would become my wife. In 1989 we moved east, eventually settling in a tenant farmer's house on 80 acres in Bucks County, near Philadelphia.

Life was good. Then I hung a 15-meter dipole in the attic, and suddenly it became even better.

Before work one morning, I tapped out a CQ. I was answered by a ham in Venice—not California, but Italy! On successive mornings I worked a steady stream of foreign stations: Colombia, Israel, Spain, Finland. The sunspot cycle was peaking. With 50 W and 22 feet of wire, I suddenly felt like a "big gun."

This was an awakening. Perhaps the bug had been there all along, but it had lain

dormant until that time. In any case, I started hunting DX in earnest. By the time we moved back to Wisconsin in 1992, I had worked perhaps 80 countries and confirmed about 70 of them.

Graduate school intervened. I went to work as both a student and a teacher, and the shack became an office. As sunspots declined, so did my ham activity. Often the rig was buried in paper, and I was too frantic over impending exams and a looming dissertation to do anything but study. Then, somewhere around the first day of spring 1996, my life changed forever when I became the father of a baby girl.

My last contact as a nonparent, on March 16, 1996, was with C56CW, a DXpedition to Gambia. On April 13, I returned to the shack and chatted for all of eight minutes with a fellow in Connecticut. It was an ordinary QSO in every respect but one: On the log page in the remark field I wrote: "Maggie, guest op." She was three weeks old. Strapped into a plastic rocking seat atop the operating desk, she spent about half an hour that day listening to the rhythms of CW pulsing from a big gray Hammarlund speaker.

I was more than happy. I was exultant. I was elated. This ham/dad thing was going to work.

And so it has. Maggie was an early and prolific talker, and she knew the meaning of the word "shack" before she turned one. "Shack," she knew, was Daddy's world—a place where she could sit on the desk while Dad twiddled the knobs and tapped out the code. Dad's rig—an ICOM 751A transceiver—was quickly understood to be off-limits, but Maggie had her own radio: a hulking Hammarlund HQ-180 receiver, the electronic equivalent of a Sherman tank, so solid and immovable that she couldn't possibly break it. Occasionally I'd even turn it on, so she could watch the dials glow.

Lucy arrived in March 1998, and the phrase "Go shack" was among her first. The DX, meanwhile, didn't exactly pour in. It sort of dribbled. Sunspots, which had disappeared in the mid-1990s, took their sweet time coming back. I found myself plateauing at perhaps 90 countries, wondering where the other 200-plus were hanging out. (Gosh, I thought more than once, there sure are a lot of hams in France and Germany!) But the rapid-fire format of DX QSOs was well-suited to my lifestyle. Even while propping a baby and a bottle (as happened more than once), I could still spin a dial and reach for the paddles to tap out "599 TNX 73 DE N9GBB." A few semi-rare ones—Guantanamo, Tunisia, Galapagos, Rwanda—carried me toward the magic century mark. Finally, I mailed my cards off to the ARRL, and in August of 1999 the treasured certificate arrived on my doorstep in a heavy cardboard mailing tube. I framed the award above my operating position. Not to be outdone, Maggie turned the mailing tube into a pirate's telescope.

The Right Tools for the Job

Here's how to find the DX on your own horizon, even with average gear and a herd of kids:

Use contests. Some newer hams are intimidated by contests. They shouldn't be. It's actually a lot easier to work DX in a contest, because the DX stations are looking for points just as you are. Even the rare ones will run out of people to talk to after a while. When else would a station in, say, West Africa be thrilled to hear from you? The ARRL International DX Contest, the CQ WW contests, and the IARU tourney in the summer are the major ones. You needn't operate the whole time period or shoot for a big score. An hour or two on a Saturday afternoon can net dozens of quick QSOs. (I bagged 50 stations in the ARRL's 10-Meter Contest in 1998, many of them while 9-month-old Lucy snoozed on my shoulder.) Check the contest schedules in *QST* or online for the smaller contests, too. If a Latvian ham club is sponsoring a contest and you need Latvia, it's a sure way to find it.

Use the Internet. Cyberspace is full of incredible ham resources. Use it to check DX calendars and DX bulletins. You'll probably find a portal to use as your ham home page. (I like the one run by Scott, KA9FOX; it's at **http://www.qth.com/ka9fox**; or try **http://www.dxer.com**.) Online "DX clusters," similar to the ones on packet radio, serve as spotting aids to tell you which DX stations can be found on the air at a given time. Once you work the rare ones, check the QSL routes on the Internet, too. Unless you're willing to wait for a year or more, don't QSL a rare station via the bureau. Spend a buck or two and go direct or through a manager. If you've got the information—and the Internet is filled with free ham info that used to cost money—you might as well use it.

Monitor favorite frequencies. In my case, it's 14.025 MHz. That's where the DXpeditions pop up most often on 20-meter CW. My shack still doubles as an office; often I'll have the rig on to listen while doing other things (usually running after kids!). If you've got one of those nifty general-coverage receivers that fit in your pocket, tote the thing around the house. Remember that DX is much like fishing (my other favorite hobby); much of your success lies in simply being there when the big ones swim by. And if you're among the first to hear them, you can jump in before a pile-up occurs.

Use CW. It may seem old-fashioned in this post-Restructuring world, but the plain fact is that Morse code is an astoundingly efficient medium for a ham on a budget. With phone, you're pretty much toast in the pile-ups unless you're running 100 W or more to directional antenna. On CW, 50 W (or even 5!) and a hank of copper wire can bring you the world. Sure, I've snared some rare ones on phone now and then, mostly through pure luck. But CW is the real meat-and-potatoes for the ham with a simple station. Don't forget RTTY, PSK31 and other digital modes either; these days it seems more and more DXpeditions are dedicating themselves to these methods.

Upgrade your license. I'm guilty on this count. I loped along with a General ticket for two full decades before realizing there was an awful lot of juicy DX to be had in the bottom 25 kHz of the 20-meter band. I upgraded to Amateur Extra in two quick steps at the beginning of 1999. And I'm pleased to report that code practice is entirely compatible with child care: I copied code in my head every afternoon with W1AW, all while playing blocks with Lucy on the shack floor as Maggie napped upstairs. Now that the licensing structure has changed, the Amateur Extra exam no longer carries that intimidating 20 WPM code requirement. (Those of us who conquered that barrier, of course, now become "old-timers" who get to rant about having done it the hard way.)

Make your shack kid-safe and kid-friendly. The rest of your house had to be "kid-proofed"; so will your shack if small children are to spend any time there. Much of this will consist of things you should be doing anyway: securing any loose or exposed wiring; making sure your gear is properly grounded; and generally getting rid of any hazardous clutter. Consider outfitting the operating desk with a "special" radio just for the kids (those flea-market "boat anchors" are perfect for this purpose). And don't forget to sprinkle a few toys around. It may seem silly, but if that's the price of working a ZD8, it will be worth it.

So do kids raised in ham shacks grow up to be hams? We'll have to wait and see. In the meantime, a generation of dads and moms will be able to enjoy their children while continuing to enjoy their hobby. Ozzie and Harriet would be dumbfounded, but I bet they'd be proud of us.

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Kenwood TM-D700A Dual-Band FM Mobile Transceiver

Reviewed by Stan Horzepa, WA1LOU
QST *Contributing Editor*

The TM-D700A—it's not your father's TH-D7A!

Last year, I reviewed Kenwood's TH-D7A dual-band FM hand-held transceiver (see *Product Review*, August 1999)—the first hand-held amateur transceiver to include a built in TNC. I was very impressed with what it had to offer, particularly to APRS users. When I first heard about the TM-D700A, my initial reaction was that it was probably just a TH-D7A in a mobile package. Well, it's marveling time again—Kenwood's TM-D700A dual-band mobile transceiver packs in even more features than its ground-breaking predecessor.

It's Two, Two—Two Radios in One

The TM-D700A includes all of the features that we've come to expect in a high-end dual-band FM mobile transceiver—and more. Highlights include 200 memory channels with 8-character alphanumeric memory naming capability; CTCSS and DCS encode, decode and tone scan; 10 nameable autodial memories; DTMF wireless remote control; extended receive frequency coverage; a spectrum display; extensive control from the microphone and cross band repeat—just to name a few. FM SSTV operation is even possible by connecting a single optional cable between the transceiver and Kenwood's VC-H1 Interactive Visual Communicator (see *Product Review*, December 1998).

Perhaps the most notable features however, are the built in 1200/9600-baud TNC and GPS receiver interconnect jack for APRS applications.

Having a TM-D700A is practically like owning two transceivers in a single enclosure. Both radios, "A" and "B," can transmit and receive on the 2-meter or 70-cm bands. In fact, both radios can transmit and receive on the *same* band, providing that one is in the voice mode and the other is in a data mode. (Voice transmission will however, interrupt or delay data transmission when operating in this configuration.)

Cross band data communications is also possible—very handy for digital satellite work. In this case, the transmitter of one radio is set up for data operation on the satellite uplink frequency and the receiver of the other radio is also set up for data operation on the satellite downlink frequency.

Two Boxes for the Price of One

The TM-D700A transceiver actually consists of two distinct components: a front panel and a main unit. The faceplate is not "detachable"—it is a completely separate part.

The 5.25×1.5×7.75-inch main unit contains the majority of the circuitry. It supports a single chassis mounted SO-239 antenna connector and two RJ style jacks—one for the microphone and another for the front panel's umbilical cord. A male DB-9 connector for computer connection, a female 6-pin mini DIN connector for an external TNC and a 2.5 mm jack for your GPS receiver are also provided. A pair of 3.5 mm jacks are available for connecting external speakers (you can use a single external speaker, independent speakers for radios A and B or combinations of the internal and external speakers by changing a menu setting). The built-in speaker, mounted inside the main unit, provides more than adequate audio even in the noisiest environments.

A short pair of power leads with a fuse on the positive side and terminated with a conventional T-type Molex power connector exits the back apron of the main unit. (This connector mates with one on a longer power cable that has fuses in both the positive and negative leads near the power source end.) The cooling fan is very quiet.

The front panel contains the radio controls and a large 3.75×1.25-inch dot-matrix LCD display. The default display setting shows black segments on an amber background, but a "reverse" mode is also available from a menu. Additional menu settings allow you to change the display intensity and contrast. An adjustable front panel bracket and a chassis-mounting bracket are provided. The display is easy to read over a wide range of lighting conditions and viewing angles.

The front panel's umbilical cord is over 9 feet long, providing considerable leeway for installation of the front panel and main unit in convenient locations in the car or shack. That leeway is somewhat limited—the main unit needs to be positioned within mike cord's length and ears' shot of the operator—the microphone connector and internal speaker are in the main unit. Trunk mount applications will require extension cables and an external speaker (or speakers).

Kenwood offers a solution. Their optional PG-4X extension cable kit contains 13-foot extensions for the microphone

Bottom Line

The TM-D700A is more than just a TH-D7A in a larger package. Kenwood's combination of top-of-the-line dual-band FM mobile transceiver features and enhanced digital, APRS and SSTV capabilities offer new dimensions in fixed and mobile amateur communications.

Joe Bottiglieri, AA1GW ♦ Assistant Technical Editor

Table 1

Kenwood TM-D700A, serial number 10800015

Manufacturer's Claimed Specifications	*Measured in the ARRL Lab*
Frequency coverage: Receive and transmit, 144-148 MHz, 438-450 MHz.[1]	Receive, 118-524, 800-1300 MHz[2]; transmit, 144-148 MHz, 430-450 MHz.
Power requirement: Receive, 1 A; transmit, 11.5 A (high power).	Receive, 0.8 A; transmit, 8.1 A. Tested at 13.8 V.
Modes of operation: FM, FSK.	FM, FSK, AM (AM receive only).
Receiver	*Receiver Dynamic Testing*
FM sensitivity, 12 dB SINAD: <0.16 μV; sub-band (in VHF/VHF or UHF/UHF mode), <0.25 μV.	For 12 dB SINAD, VHF, 0.13 μV; UHF, 0.15 μV.
AM sensitivity: Not specified.	10 dB (S+N)/N, 1-kHz tone, 30% modulation: 0.9 μV.
FM adjacent channel rejection: Not specified.	20 kHz channel spacing, preamp on: VHF, 72 dB; UHF, 73 dB.
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing, preamp on: VHF, 72 dB*; UHF, 73 dB*; 10 MHz channel spacing, preamp on: VHF MHz, 81 dB; UHF, 84 dB.
S-meter sensitivity: Not specified.	S9 signal: VHF, 3.4 μV; UHF, 4.7 μV.
Squelch sensitivity: <0.1 μV.	At threshold: VHF, 0.07 μV; UHF, 0.12 μV.
Receiver audio output: 2.0 W at 5% THD into 8 Ω.	2.5 W at 4% THD into 8 Ω.
Spurious and image rejection: Not specified.	First IF rejection, VHF, 102 dB; UHF, >130 dB; image rejection, VHF, 75 dB; UHF, 51 dB.
Transmitter	*Transmitter Dynamic Testing*
Power output (H/M//L): VHF, 50 / 10 / 5 W; UHF, 35 / 10 / 5 W.	VHF, 47 / 10 / 4.0 W; UHF, 35 W / 13 W / 5.3 W.
Spurious-signal and harmonic suppression: ≥60 dB.	VHF, 72 dB; UHF, 70 dB. Meets FCC requirements for spectral purity.
Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.	S9 signal, VHF, 104 ms; UHF, 90 ms.
Receive-transmit turn-around time (tx delay): Not specified.	VHF, 58 ms; UHF, 55 ms.
Bit-error rate (BER), 9600-baud: Not specified.	146 MHz: Receiver: BER at 12-dB SINAD, 8.3×10^{-4}; BER at 16 dB SINAD, 2.4×10^{-5}; BER at –50 dBm, $<1.0\times10^{-5}$; transmitter: BER at 12-dB SINAD, 1.2×10^{-3}; BER at 12-dB SINAD + 30 dB, $<1.0\times10^{-5}$. 440 MHz: Receiver: BER at 12-dB SINAD, 6.5×10^{-4}; BER at 16 dB SINAD, 3.0×10^{-5}; BER at –50 dBm, $<1.0\times10^{-5}$; transmitter: BER at 12-dB SINAD, 8.6×10^{-4}; BER at 12-dB SINAD + 30 dB, $<1.0\times10^{-5}$.

Size (hwd): main unit, 2.4×5.5×7.7 inches; front panel, 2.4×5.5×1.3 inches; weight, main unit, 2.6 lb, front panel, 0.4 lbs.

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value shown.

[1]Band A receive range is approximately 136-200, 118-136 MHz (sub), 200-300 MHz (sub), 300-400 MHz (sub), 400-470 MHz (sub). Band B receive range is approximately 400-524 MHz, 136-175 MHz (sub), 300-400 MHz (sub), 800-1300 MHz (sub, see note 2).

[2]Receive range excludes 824-849, 869-894, 914-934 and 1213-1229 MHz. Sensitivity at 222 MHz was measured at 0.18 μV. Poor sensitivity (3-25 μV) was measured between 250-350 and 510-524 MHz. Reduced sensitivity (approximately 1 μV) was measured above 800 MHz.

An expanded test result report for this transceiver is available on the ARRL Members-Only Web site. Printed copies are also available for those without Web access.

cable and the front panel's umbilical cord. The kit also includes a third dual 13-foot cable for connecting up to two external speakers and a 19.5-foot dc power cable. A second PG-4X cabling kit can be connected in series to provide an even more remote installation. While these multi-wire extension cable kits allow for lots of flexibility for installing the various radio components, add your GPS receiver cable to the fray and the potential for a rat's nest escalates!

Controls, Buttons and Menus

The front panel sports five multi-function rotary controls and twelve multi-function buttons.

The largest control is the main tuning knob. It selects the operating frequencies in the "VFO" mode, the memory channels in the "memory recall" mode, or the menu selections in the "menu" mode. Pressing this knob toggles between 1 MHz and normal tuning steps and user-selectable incremental tuning steps when in the VFO mode.

Radios A and B each have separate concentric squelch and volume controls. Pressing a particular volume control causes that radio to be "selected." Adjustments or features you access with the other controls or buttons then effect only the "selected" radio.

With the exception of the **PWR** button, all the buttons surrounding the front panel have multiple functions. "Soft" labels for these appear in the LCD display above or beside each button. The assignments change depending on which mode is currently selected or whether the **F**unction button had been pressed. There are menu options that allow a considerable amount of flexibility for tailoring the available buttons to your particular operating preferences.

Along with all the primary multi-function controls and buttons, there is a menu hierarchy that allows you to control additional operating parameters. Pressing the **MNU** button accesses the main menu. Navigation through the various selections and choices

is accomplished by using **OK**, **BACK** and arrow buttons and/or the main tuning knob.

The menu contains 88 selections controlling an incredible variety of operations. For example, if you wish to monitor AM activity in the 118 MHz band, you would press the **MNU** button, then press the arrow button to display the "RADIO (1)" menu. Press the **OK** button; then press the arrow buttons to display the "TX/RX (3)" submenu. Press the **OK** button; then press the arrow buttons to bring up the "FM/AM MODE" sub-sub-menu. Press the **OK** button; then press the arrow buttons to select the desired mode (FM or AM). Press the **OK** button to select "AM," then press the **MNU** button to exit the menu mode. While this may seem a bit complicated, once you get a feel for the general arrangement, it really becomes quite easy.

Some of the menu items—memory naming for example—require that you input alphanumeric data into the radio. There are two ways of performing this task: via the 16-key microphone keypad or via the front panel tuning control.

The ten number keys (**0** through **9**) on the microphone keypad are also labeled with two or three letters. You can use these keys to enter the number or one of the letters in lower or upper case. For example, each time you press the key labeled **4GHI**, you are offered the following selections in sequential order: g, h, i, 4, G, H and I. When you bring up the desired character, you press the microphone's **D** key to enter it. A variety of punctuation signs and symbols are available by pressing the **#** key.

Alternatively, you can also use the front panel tuning control to scroll through all the choices. When you locate the character or symbol you want, you press the **OK** button to select it and the right arrow button to move on to the next character. Once you are finished inputting the desired information you save it by pressing the **OK** button once again.

In my opinion, using the main tuning knob for alphanumeric entry is much easier than using the microphone keypad. The knob allows you to scroll through all the choices very quickly. Once you get a feel for programming characters with that control, you will probably prefer it to the microphone keys as a means of entering alphanumerics.

Good News for Scanner Buffs

Radio A and radio B each have expanded receive frequency coverage. The specific ranges covered by each are different. The overall receive range is approximately 118 to 524 MHz and 800 to 1300 MHz. See Table 1 for details.

There's a bevy of scanning modes—and these complement this wide receive frequency coverage nicely. Scanner enthusiasts will be very pleased.

"VFO scan" checks all the frequencies on a selected band. "Memory scan" examines every programmed memory channel. "Group scan" looks at a group of 20 memory channels—memory channels 21 to 40 for example.

"Program scan" peruses a specified range of frequencies between preset limits—144.910 to 145.090 MHz for example. "MHz scan" looks at the 1-MHz segment of the band where the radio is currently tuned. "Call/VFO scan" monitors the calling channel of the selected band and the current VFO frequency on that band. "Call/memory scan" monitors the call channel on the selected band and a selected memory channel.

"Visual scan" provides a graphic representation of the activity on the frequencies surrounding the current operating frequency. You can select 31, 61, 91 or 181 frequency channels to visually scan. For example, if you select 61 channels, 30 channels above and below your current operating frequency as well as your current operating frequency are scanned. Vertical bars whose height is dependent on signal strength indicate the active channels. The main tuning knob can be used to move the visual scan cursor on the horizontal axis of the graph to investigate active frequencies. The operating frequency that the cursor represents is displayed in the visual scan window. A **SET** button allows you to reset the current cursor position as the center frequency of the visual scan.

Visual scan is a great tool, but I ran into difficulty when using it initially. Visual scan will *not* work when the radio is in the TNC packet or TNC APRS modes, but this important bit of information is not in the manual. And as Murphy would have it, I tried using visual scan for the first time when the radio was in the TNC APRS mode. After a frustrating 20 minutes, I finally guessed the source of my problem and switched out of the TNC mode. The visual scan then worked as advertised.

On to the Main Attraction—APRS!

As with the TH-D7A, the big selling feature for this radio is its built-in TNC and APRS capabilities. With that combination, the TM-D700A is a self-contained APRS station with practically all the necessities. The only significant item you'll probably want to add is a GPS receiver. While for fixed station operation, the GPS receiver isn't necessary, for most mobile APRS applications I consider a GPS receiver to be a necessity.

Unlike the TH-D7A, the TM-D700A can serve as an APRS digipeater. It can take on as many as four "aliases" (alternative tactical station identifications that are used in place of a station call sign). The instruction manual briefly mentions the *four*-alias capability, then goes on to explains how to program *one* alias—leaving you in the dark as to how to program the other three!

After some head scratching and experimentation, I figured out how to get all four programmed into the radio. Once in the menu, work your way down to the "UIDIGI" command (menu item 3-L), then enter each alias separated by a comma with no spaces (example: "alias1,alias2,alias3,alias4"). The total number of characters in each alias must not exceed 9. Note that aliases like WIDE and RELAY will work, but the TM-D700A cannot be programmed to function as a TRACE N-N or WIDE N-N APRS digipeater. The TM-D700A can be programmed to use TRACE N-N and WIDE N-N digipeaters in the path that it uses for relaying its packets.

Another enhanced feature is the ability to store *five* positions and *five* status texts (the TH-D7A only allows you to store one of each). The five-position status text capability is especially useful if you do not have a GPS receiver and want to report your changes in position. This would allow you to program a position for your home and another for work, then switch between the two as required. The five status texts are also useful for conveniently switching between status messages such as "Parked in my driveway," "En route to work," and "Parked in my company parking lot." Each status message can be up to 28 characters long (versus 20 with the TH-D7A).

A related new feature is the ability to control how often your status text is transmitted. You can program status to be transmitted with every transmitted APRS packet or you can limit it to a ratio between 1:2 and 1:8 (one status text transmission per X number of APRS packet transmissions). For example, if you select 1:4 your status is sent once in every four transmitted APRS packets. You could also set this parameter to 0, thereby disabling status text transmissions entirely.

Position ambiguity is another settings option with the TM-D700A. Rather than transmitting your "exact" latitude and longitude, you can make your reported position less specific by programming the TM-D700A to lop off the last 1 to 4 digits of your position. Thus, 41 degrees 37.80 minutes N and 72 degrees 56.71 minutes W in my backyard becomes a less precise 41 degrees N, 72 degrees W when the unit is set for "maximum ambiguity."

A new internal clock allows you to set the date and time that is displayed in the detailed received APRS data window and this will record precisely when an APRS packet was received.

You can view the actual raw packet data

received by switching to the packet monitor mode. A **HOLD/RESUME** button allows you to freeze this display in order to study its contents and then resume displaying the scrolling lines of packets. The arrow buttons allow scrolling up and down through as many as ten pages of received packets that the radio is capable of storing.

The messaging functions have some new capabilities, too. For starters, messages and bulletins can now be 69 characters in length (versus 45 in the TH-D7A). A 64-character automatic answer message can be stored in the TM-D700A to automatically respond to any received messages. This function is very useful for times when you cannot respond manually (tooling down the Interstate during rush hour for example).

You can also program the TM-D700A for message and bulletin "groups." This filters received messages and/or bulletins and displays only those messages or bulletins from the groups you specify. The TM-D700A stores the last 16 messages or bulletins received.

Position limit settings of from 10 to 2500 miles (or kilometers) allow you to filter packets from APRS stations beyond a selected limit. For example, if you set the limit to 50, all packets originating from beyond 50 miles will be ignored by the TM-D700A. (A menu setting allows you to display measurements in miles or kilometers and degrees Fahrenheit or Centigrade.)

The TM-D700A can be programmed to transmit APRS packets via the "manual" mode (after pressing the **F** button, then the **BCON** button on the front panel), via the "PTT" mode (on a press and release of the microphone PTT button) or via an "auto" mode. In the auto mode the radio transmits APRS packets automatically according to the setting of the transmit beacon rate parameter.

Kenwood added a 0.2-minute transmit beacon rate to the selectable rates provided in the TH-D7A (0.5, 1, 2, 3, 5, 10, 20 and 30 minutes). The 0.2-minute setting is handy for fast-moving APRS sources such as a Ferrari at Le Mans. The 30-minute rate is more appropriate for sedentary sources like my classic Oldsmobile—in *Le Driveway*.

Like the TH-D7A, any APRS icons can be used to identify your station, but the radio is only capable of displaying 15 of these. Since the TM-D700A can function as a digipeater, a displayable digipeater star icon has replaced the triangle icon found on the 'D7A. And, since the TM-D700A is more likely to be installed in a vehicle than carried by a jogger, a tractor-trailer icon replaces the jogger icon found on the H-T.

The TM-D700A stores information received from the last 40 APRS stations (just as with the TH-D7A). However, the TM-D700A can store and display more extensive information on each station.

When the TM-D700A receives a new APRS packet, it momentarily replaces the band operating frequency on the display with the call sign, SSID and a short string of data. This data varies depending on the type of APRS station that is being received.

For a mobile station, it typically displays its course and speed. A mobile station using the compressed APRS data format also provides its altitude. A mobile APRS station employing a TM-D700A, TH-D7A or a MIC-E also gives a position comment. A fixed APRS station typically displays its transmitting power, height above average terrain (HAAT), antenna gain and antenna directivity (or "OMNI" if it's using an omni-directional antenna). A fixed station using the compressed APRS data format can also display its transmit range and altitude. An APRS weather station might display its wind direction, wind speed, temperature and the recent rainfall amount. An APRS object displays its course, speed and the call sign of the station that placed the object in the APRS network.

While this information is shown, you can press the **DETAIL** button to bring up additional details on the received station. The detailed received APRS data window displays the station's call sign, its SSID, the time the packet was received, the station type, the station icon, the latitude, the distance, the longitude, the grid square, a compass pointing to the station's approximate relative location, an exact compass direction and a longer string of data that varies depending on the station type. Pressing the **DATE** button changes the time the packet was received to the date the packet was received. Pressing the **MSG** button opens the message input window with the received station's call sign and SSID already inserted in the "Message To:" field. Arrow buttons allow you to scroll through the details of the 40 most recently received stations.

You can toggle the TM-D700A's GPS interface to use position data generated by a GPS receiver that is connected to the TM-D700A or you can manually input position information directly. The TM-D700A is compatible with GPS receivers that use the NMEA 0183 2.0 protocol. The Garmin GPS-II+ GPS receiver that I normally use with my 'D7A attached to the TM-D700A using the same cable and connector. (This cable and radio connector is included with the TM-D700A. You must provide the connector for the GPS receiver end of the cable.)

If your current GPS receiver supports $GPWPL sentence data input, it will accept position data from the TM-D700A and that data will be added to the GPS receiver's waypoint list. The waypoint is identified by the last six characters of the received station's call sign and SSID (WA1LOU-15 would become LOU-15 in the GPS receiver's list.) This data will also be displayed on the GPS receiver's map window if it supports that capability.

The TM-D700A has 15 preprogrammed MIC-E compatible messages or "position comments"—the TH-D7A only provides 8.

The internal TNC uses a command set that is very similar to those in most current standalone TNCs. It includes some additional commands, like KISS and DIGIPEAT, that were not available in the TH-D7A's command set.

On the Air and On the Road

To road test the TM-D700A, I decided to install it in my land barge (the Oldsmobile). I ran it in the APRS mode back and forth to work and hither and yon everyday for weeks. To monitor my daily treks, I ran *MacAPRS* on my computer at the home station.

The local WIDE APRS digipeater (WA1LOU-15) is in my backyard near the top of a 1000-foot mountain (which, incidentally, is pretty darn high for this part of the country!). On my trip to work, I drive down the mountain to about 200 feet above sea level and then proceed through a valley to my final destination at the "salt mine." When using my TH-D7A for mobile APRS, my tracks inevitably disappeared near the base of the mountain. The mountain creates an RF shadow that the 5 W output of my TH-D7A just could not overcome. When using that radio, I would have to clear the shadow of the hill before my tracks reappeared on my home station's APRS map. While road-testing the TM-D700A—with its hefty 50 W 2-meter transmitter—there was never a drop-out. My tracks were solid for the entire 19-mile trek to and from work.

I also ran the TM-D700A extensively from my home station in the following configurations:

Voice on 2 meters and 70 cm.

Plain vanilla packet with a dumb terminal program running on my computer using the TM-D700A's built-in TNC.

APRS with *MacAPRS* running on my computer interfaced to the TM-D700A's TNC.

DX Packet Cluster operation using the DX mode of the TM-D700A.

APRS using the APRS mode of the TM-D700A.

General monitoring of our local police frequency—453.150 MHz.

All of these applications ran smoothly without any gotcha's or other unwanted surprises. However, the last application resulted in an interesting surprise.

Monitoring 453.150 MHz proved to be a good test of the radio's UHF receiver capabilities. Besides hearing the local *gendarme* on that frequency, I also heard an-

other radio operation. The chatter from the mystery radio station indicated that it was coming from some kind of government housing authority. I assumed it had to be out of state—I doubted that another in-state radio service would be assigned the same frequency as our local police force.

The nearest state is Massachusetts and the nearest populated area in Massachusetts that would likely have a housing authority is the Springfield area. I started keeping track of the street names that were mentioned by the users. At one point, the intersection of X and Y streets was mentioned, so I ran Delorme *Street Atlas* on my computer, searched for that street intersection and, voilá, Springfield was indeed the source of the mystery radio transmissions.

Nice detective work, but more importantly it gave some indication of the radio's UHF sensitivity. Springfield is approximately 40 miles away from my radio shack as the RF flies and the signals emanating from the housing authority were S-9. But, there's more! Pushing the envelope, I started monitoring the Springfield housing authority while mobile and I was shocked how well I was able to hear that operation while traversing the hills and dales around town. This was very impressive!

For a weekend, I replaced the WA1LOU-15 APRS digipeater radio equipment with the TM-D700A using its built-in APRS software. None of the users noticed any difference in the digipeater's operation. (At least, no one complained and, as they say, "*No news is good news.*")

The TM-D700A may lack some state-of-the-art APRS digipeater protocol features like TRACE N-N and WIDE N-N, but it can still serve as a suitable APRS digipeater in a pinch.

The Ultimate Test

My wife has never been interested in any of my ham radio toys. When she saw the TM-D700A installed in my Oldsmobile, she thought it was actually "neat!" I believe that earning that response from her qualifies this radio as a major milestone in Amateur Radio equipment design!

I am the administrator of the HTAPRS Special Interest Group (*SIG*), which is an e-mail list devoted to the discussion of technology topics related to APRS—including the TM-D700A. The SIG is sponsored by TAPR. If you have questions concerning the operation of this transceiver, this list can provide a good source of information. You'll also discover how other owners are using the radio. You can subscribe to the HTAPRS SIG by visiting **http://www.tapr.org/tapr/html/sigf.html**. Select the "Join APRS HT" link.

Manufacturer: Kenwood Communications Corp, 2201 E Dominguez St, Long Beach, CA 90801; 310-639-5300; fax 310-537-8235; **http://www.kenwood.net**.

Manufacturer's suggested retail price, $780. Typical current street price, $660. PG-4X Extension Cable Kit, $70; VS-3 Voice Synthesizer Unit, $40.

ACOM 2000A HF Linear Amplifier

Reviewed by David Sumner, K1ZZ
Executive Vice President

It would be very easy to get used to having an ACOM 2000A in your shack. In fact, you might get so used to having it that you might forget it's there! Operation is almost that transparent.

The ACOM 2000A amplifier consists of a large, heavy, black box and a small, separate remote control unit (RCU) that's about half the size of an $8^1/_2 \times 11$ sheet of paper and about a half-inch thick. The main unit can be stowed in any out-of-the-way corner where there is adequate ventilation. In normal operation you never have to touch it or even see it, although the manufacturer recommends using the master power switch (the black box's only control) to turn the power off between operating sessions. What little operator interface is required is provided by the remote control unit, which can be as much as 10 feet away using the supplied cable.

The amplifier is shipped in two cartons—the transformer is boxed separately. The tubes come installed, but special supports are included to keep them from shifting during shipping. These, of course, must be removed prior to use. Two small screws through the back panel also temporarily secure the blower assembly and are likewise removed. The control head comes packed in a box nestled within the amplifier in the location where the transformer is installed.

The desired ac line voltage must be set before the transformer is installed. Rather than a terminal strip, the 2000A uses a PC-board with 9 metal posts arranged in a grid. Three movable shorting bars are positioned to allow a wide variety of supply line voltages from 100 to 240 volts. As with most HF amplifiers, the user must supply the appropriate plug for the power receptacle.

The complete assembly process takes less than an hour. As the finished main unit is quite heavy (79 lbs), it's a good idea to put the amp together in a location close to its final operating position.

Hooking up the amplifier is straightforward. For full-power operation, a source of approximately 240 V ac at 20 A is required. On the rear panel there's a grounding stud, one SO-239 coaxial connector for the input from the transceiver, and another for the output to the antenna or antenna switch. Three RCA phono jacks provide connections for **KEY IN**, **KEY OUT** and **ALC**. **KEY IN** is the usual "ground on transmit" control line that puts the amplifier into the line when your transceiver switches to transmit. **KEY OUT** allows you to inhibit the operation of the amplifier at times when you might want to, such as when you're switching antennas and you want to avoid inadvertently "hot switching." The manufacturer recommends against using the **ALC** connection—it's better to adjust the drive to the amplifier with the "RF power" control that is almost universally available on the front panel of HF transceivers these days—but it's there if your particular installation requires it. Finally, there are two DB-9 connectors, one for the cable to the RCU and the other for an RS-232 interface. The most common use for the RS-232 interface is to control the accessory ACOM

Bottom Line

The operation of the ACOM 2000A is so transparent that you might forget it's there. After initial set up and programming with it connected to your particular antenna system, the amplifier will sense your transmitting frequency and automatically tune itself for the band segment of interest.

Figure 2—The optional weatherproof 2000SW 10-position remote antenna switch and the corresponding 2000S automatic antenna selector control.

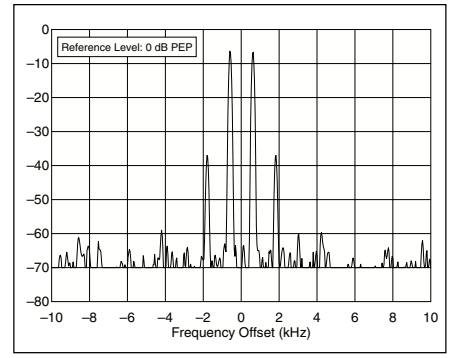


Figure 1—The spectral display of the ACOM 2000A during two-tone intermodulation distortion (IMD) testing on 14 MHz at 1500 W PEP output. The third-order product is approximately 37 dB below PEP output, and the fifth-order product is down approximately 60 dB.

Table 2
ACOM 2000A, serial number 990346

Manufacturer's Claimed Specifications	*Measured in ARRL Lab*
Frequency Range (US units): All amateur frequencies, 1.8 to 29.7 MHz.[1]	As specified.
Power output: 1500 W PEP, all modes and continuous or modulated carrier.[2]	As specified for SSB and CW.
Driving power required: 50 to 60 W.	As specified.
Input SWR: less than 1.3:1	As specified.
Output matching: up to 3:1 SWR (2:1 for 160 meters).	As specified.
Spurious signal and harmonic suppression: 50 dB below rated output or greater.	50 dB, worst case (3.5 MHz).
Intermodulation distortion (IMD): –35 dB.	See Figure 1.

Primary power requirements: 90-132, 180-264 V ac (five user settable taps).

Size (hwd): 7.1×17.3×19.7 inches; weight, 79 lb.

An expanded test result report for this amplifier is available on the ARRL Members-Only Web site. Printed copies are also available for those without Web access.

[1]1.8-21.7 MHz. Frequencies above 21.7 MHz can be unblocked with proof of proper licensing.
[2]Optional auxiliary cooling fan recommended for extended high-duty-cycle operation.

2000S automatic antenna selector and 2000SW remote antenna switch; we'll have more to say about these accessories later.

When you turn the amplifier on (using the rocker switch on the front panel and the distinctive red **POWER ON/OFF** pushbutton on the RCU) the LCD display on the RCU comes to life and it beeps a cheery "TEST" in Morse code. The fan also turns on, although if you have a desktop PC running in the shack you may not notice it; it's quieter than many PCs. It takes 2½ minutes for the pair of 4CX800A tubes to warm up, during which time a countdown clock on the RCU tells you how many seconds you have to wait. A Morse "R" tells you when the amplifier is ready. Push **OPR/STB** to switch from Standby and you're ready to go. In addition to the LCD display the RCU has peak-reading LED bar displays showing forward and reflected power and individual LEDs to show when power is on and whether the amplifier is operational or in standby, and to warn of abnormal operation.

The first time you use the amplifier with a particular antenna or on a particular band segment (the amateur HF bands are divided into 40 different band segments ranging in width from 25 kHz in the 160-meter band to 300 kHz in the 10-meter band) you will have to run through a simple autotune procedure. Push **ENT** twice and the LCD display will tell you to apply 10-20 W of drive. The display will show you when the drive is within these limits. As soon as it is, the autotune circuitry will take over and a second or so later the message "AUTOTUNE COMPLETED PLEASE REMOVE DRIVE" will appear on the LCD. That's all there is to it! From that point on, the amplifier will automatically sense (from the first few milliseconds of drive you apply to the input) the operating frequency and will tune itself up for that band segment. Manual tuning is also possible, but it's unlikely you would ever need to resort to it in normal operating. The amplifier requires about 60 W of drive to deliver the full legal-limit output of 1500 W.

The amplifier can handle VSWRs of up to 3:1 on all bands except 160 meters, where the limit is 2:1. Should the characteristics of your antenna change drastically, either through failure of the antenna or feedline or because of temporary weather conditions such as icing, the amplifier will sense the change and will put itself in standby, displaying an appropriate error message. The same thing will happen if you apply too much drive or commit some other "cockpit error." While any high-power transmitter is worthy of the utmost care and respect, it would be very difficult to damage this amplifier through inadvertence.

The LCD display normally shows the temperature of the exhaust air, whether the amplifier is in Standby or Operate, the band segment and antenna (if the automatic antenna selector is installed) that are in use, and whether the amplifier is tuned to factory default or user-defined settings. There are 20 other operating parameters that can be measured and displayed, two at a time, by digital readout. You can check your power line voltage, plate voltage and current, antenna VSWR, drive power, and a host of others—even the power gain of the amplifier! Monitoring some of these parameters during CW or SSB operation isn't possible because they change too quickly, but a brief key-down test (into a dummy load, please!) will tell you what you need to know.

ACOM encourages amateurs who buy the 2000A also to pick up the 2000S automatic antenna selector and 2000SW 10-position remote antenna switch (see Figure 2). Once you have used them together it's easy to see why. The amplifier will automatically select the last antenna that was used in the band segment of operation. Changing bands becomes a matter of choosing your operating frequency on your transceiver, tapping your key or your microphone, and waiting for the second or so that it takes for the amplifier to sense the new operating frequency, tune itself to that frequency, and select the right antenna. Alternatively, you can use the computer interface to the 2000S and the switch will follow commands from the computer rather than from the amplifier. If you have more than one antenna per band you can select them (up to a maximum of 10) using the 2000S control box or your own switching system. If the antennas tune differently, don't worry—the amplifier will remember separate settings for up to 10 antennas per band segment!

It's difficult to describe the 2000A in

operation because there's so little involved. It's like having a 1.5-kW no-tune transceiver. I thought my manual switching system for selecting various monobanders was pretty good, but having the switching done automatically was a revelation. There's nothing more involved in changing from, say, 160 to 10 meters than there is in going from one frequency to another within the same band. The benefits for contesting and DXing are obvious, but even if your operating is more casual (and especially if it's intermittent and you have to remind yourself how things work every time you sit down to operate) it's a great convenience and will add to your operating enjoyment. My wife Linda, KA1ZD, often tells me that our station is configured differently every time she sits down to operate, which discourages her from doing so when I'm not around. If the ACOM 2000A/S/SW were permanent residents of our shack she wouldn't have to worry.

The remote antenna switch can be located practically any distance from the shack and is designed to be weatherproof, so if you want to you can eliminate as many as nine coaxial cables coming into the shack. Depending on your own installation, the cost of the switch could easily be less than the cost of the cables it would replace.

Special thanks to Tod Olson, K0TO, for the loan of his brand new ACOM equipment. Tod let us use the gear for several months before he even had the opportunity to lay eyes on it!

Manufacturer: ACOM OOD, ul.3011-9, complex Lyulin, 1324 Sofia, Bulgaria; +359-2-251-164; fax +359-2-276-190; **acom@aster.net**. Manufacturer's US/Asia/Pacific sales and service division: ACOM International, Inc, 157 Horse Pond Rd, Sudbury, MA 01776; 978-440-7555; fax 978-440-9008; **info@acom-intl.com**; **http://www.hfpower.com/**.

Retail price: ACOM 2000A Amplifier, $5500; 2000SW Antenna Switch with 2000S Controller, $595.

Armed Forces Day 2000 Stations and Frequencies

Operation is May 13-14, 2000. For more information, see "Happenings" in this issue pp 71-72. All frequencies in kHz. Operation is cross-band. Listen on the listed frequencies for information on where in the amateur bands to transmit.

SSB

AAZ: 1300Z 5/13 to 1300Z 5/14—4038.0 6913.0 7424.0 13910.5 13993.0 21824.0 27788.5. **Address:** HQ USASC, ATTN: AFSC-OPE-MA (MARS), Ft. Huachuca, AZ 85613-5000

AAC2KYA: 1300Z to 2300Z 5/13—5760.0 7314.0 10163.5 14402.0 18211.0. **Address:** HQs 1st BN 623d FA (MLRS), BN Signal Support NCO, 410 Cavalry Drive, Glasgow, KY 42141-1045

AIR: 1200Z to 2400Z 5/13—4026.5 6894.5 7316.5 13985.0 13996.0 **Address:** USAF MARS Station, 789TH Comm SQ/SCS-3, Andrews AFB, Washington, DC 20672

AIR-2: 1500Z 5/13 to 0300Z 5/14—4488.5 6994.5 13983.5 14387.5 27983.5. **Address:** USAF MARS Station, PO Box 394, Edwards AFB, CA 93523

WAR: 1200Z 5/13 to 1200Z 5/14—4020.0 6910.0 7363.0 13512.5 14928.5 20518.5. **Address:** Commander, 1110th Signal Battalion, 1671 Nelson St, ATTN: MARS Station, Bldg 1678, Ft Detrick, MD 21702

WDE: 1200Z to 2300Z 5/13—4438.5 6989.5 10150.0 14438.5 14512.5 **Address:** DEARNG STARC HQ, 1st Regiment Rd, Wilmington, DE 19808-2191

WUG-231: 1300Z 5/13 to 0600Z 5/14—4032.0 6826.0 14484.0 14663.5 20973.5. **Address:** USACE Memphis District Office, ATTN: Jim Pogue, Public Affairs Office, Room B-202, 167 N Main St, Memphis, TN 38103-1894

RTTY and SSB

(1200Z 5/13 to 0400Z 5/14)

NAV: 4010.0 7348.0 14478.5 20994.0 **Address:** HQ NAVMARCORMARS Radio Station, Nebraska Avenue Complex, 4234 Seminary Dr NW—Suite 19239, Washington, DC 20394-5461

NAV-2: 4016.5 7366.5 14470.0 20678.5 **Address:** NAVMARCORMARS Radio Station, 1050 Remount Rd—Bldg 3231, Charleston, SC 29406-3542

NAV-3: 4014.0 7394.5 13974.0 20997.0 **Address:** NAVMARCORMARS Radio Station, 9035 Ocean Drive Suite 3A, Corpus Christi, TX 78419-5234

NAV-4: 4011.5 7376.5 14467.0 21758.5 **Address:** NAVMARCORMARS Radio Station, 615 Preble Ave, Camp Barry Bldg 153, Great Lakes, IL 60088-2850

NBL: 4041.5 7371.5 14391.5 20623.5 **Address:** NAVMARCORMARS Radio Station, PO Box 161 Naval Submarine Base, Groton, CT 06349-5161

NMH: 4006.5 7386.5 14383.5 20373.5 **Address:** USCG Telecommunication and Information Systems Command, 7323 Telegraph Rd, Alexandria, VA 22315-3940

NPL: 4003.0 7351.5 14463.5 20936.0 **Address:** NAVMARCORMARS Radio Station, 937 North Harbor Dr, San Diego, CA 92132-5100

NUW: 4044.0 7381.5 13528.5 20952.5 **Address:** NAVMARCORMARS Radio Station, 260 W Pioneer FSC Bldg, NAS Whidbey Island, WA 98277

Secretary Of Defense Message Test Via Digital Modes

Frequency (kHz)	*Mode*	*Broadcast Date/ Time*
AAZ		
6988.0	RTTY	14 May/0230Z
	PACTOR FEC	14 May/0310Z
	CLOVER	14 May/0340Z
21825.5	RTTY	14 May/0230Z
	PACTOR FEC	14 May/0310Z
	CLOVER	14 May/0340Z
NAV		
7346.5	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
14480.0	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
NAV-2		
7365.0	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
14471.5	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
NAV-3		
7393.0	RTTY	14 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
13975.5	RTTY	14 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
NAV-4		
7375.0	RTTY	14 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
14468.5	RTTY	14 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
NBL		
7370.0	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
14393.0	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
NMH		
7385.0	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
14385.0	RTTY	13 May/2340Z
	PACTOR FEC	14 May/0010Z
	AMTOR FEC	14 May/0040Z
NPL		
7350.0	RTTY	14 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
14465.0	RTTY	13 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
NUW		
7380.0	RTTY	14 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
13530.0	RTTY	13 May/0240Z
	PACTOR FEC	14 May/0310Z
	AMTOR FEC	14 May/0340Z
WAR		
13514.0	AMTOR FEC	13 May/2340Z
	GTOR	14 May/0010Z
	CLOVER	14 May/0040Z
14440.0	AMTOR FEC	13 May/2340Z
	GTOR	14 May/0010Z
	CLOVER	14 May/0040Z

Stations copying AAZ or WAR send entries to: Armed Forces Day Celebration; Chief, Army MARS; HQ, USASC; ATTN: AFSC-OPE-MA (MARS); Fort Huachuca, AZ 85613-5000

Stations copying NAV, NAV-2, NAV-3, NAV-4, NBL, NMH, NPL or NUW send entries to: Armed Forces Day Celebration; Chief, Navy-Marine Corps MARS; Nebraska Avenue Complex; 4234 Seminary Dr NW—Suite 19239; Washington, DC 20394-5461

Phase 3D Could Launch in July!

The Phase 3D next-generation Amateur Radio satellite has been tentatively scheduled to launch in late July. The information was included in the "Provisional Ariane Launch Manifest" for February through July that appeared in the February edition of the Arianespace newsletter. If that schedule holds, Phase 3D would go aloft on Ariane 507, flight V132. A specific launch date was not available.

AMSAT-NA President Keith Baker, KB1SF, was reported to be "delighted" with the news. "To finally see it listed on a launch manifest is a major milestone," he told AMSAT News Service.

Baker's predecessor as AMSAT-NA president, Bill Tynan, W3XO, echoed those sentiments. "As the President of AMSAT-NA during much of the time the spacecraft was being constructed at our Orlando facility, I am especially pleased that the hard work of so many, for so long, is now coming to fruition," he said.

A launch contract accepting Phase 3D as a payload for the first suitable Ariane 5 launch vehicle was signed last October. The Phase 3D satellite now is at the European Spaceport in Kourou, French Guiana. Phase-3D is in its packing case in a climate-controlled clean room, awaiting the start of the launch campaign. All systems have been shut down and the batteries left uncharged.

ANS said the AMSAT-UK Phase 3D Fund underwrote the bulk of the cost of transporting the Phase 3D satellite to its launch site.

The ARRL Technical Information Service has assembled a Phase 3D resource page at **http://www.arrl.org/tis/info/p3d.html**. The site includes links to the latest Phase 3D news, the AMSAT-NA site, the official transponder frequency list, and other information including past *QST* articles dealing with P3D topics.

The Arianespace manifest identifies the other possible payloads aboard Ariane 507 as the PAS-1R or Europe*Star packages and the STRV-1C/1D package.—*AMSAT News Service*

LEAGUE FILES PARTIAL RECONSIDERATION PETITION

As promised, the ARRL has formally asked the FCC to reconsider and modify two aspects of its December 30, 1999, *Report and Order* that restructured the Amateur Radio rules. The League wants the FCC to continue to maintain records that indicate whether a Technician licensee has Morse code element credit. It also seeks permanent Morse element credit for any Amateur Radio applicant who has ever passed an FCC-recognized Morse exam of at least 5 WPM.

The League suggested that it would be less of an administrative burden for the FCC to maintain the Technician database as it has been doing. The database now identifies Technician and Tech Plus licensees by encoding the records with a "T" or a "P" respectively. The ARRL also said the inability to identify those Technicians that have HF privileges and those who do not could hamper voluntary enforcement efforts. It further suggested it would be wrong to put the burden of proof of having passed the Morse examination on the affected licensees.

The League cited the demands of fairness in asking the FCC to afford Morse element credit to all applicants who have ever passed an FCC-recognized 5 WPM code exam. The rules already grant Element 1 credit to those holding an expired or unexpired FCC-issued Novice license or an expired or unexpired Technician Class operator license document granted before February 14, 1991. It also grants Element 1 credit to applicants possessing an FCC-issued commercial radiotelegraph operator license or permit that's valid or expired less than five years.

The League has asked the FCC to "conform the rules" to give similar credit to those who once held General, Advanced or Amateur Extra class licenses.

The League's *Petition for Partial Re-*

Bill Kennamer, K5NX, Retires from League HQ

ARRL Membership Services Manager Bill Kennamer, K5NX (ex-K5FUV), retired March 28. Kennamer said he planned to return to Fayetteville, Arkansas, to be closer to the rest of his family.

"Bill has made great contributions to the ARRL and particularly to the DXCC program since he joined the staff in 1992, and he will be greatly missed," said ARRL Executive Vice President David Sumner, K1ZZ, in announcing Kennamer's departure.

Soon after getting his ticket at age 15, Kennamer gravitated first to contesting, then to DXing. A 1968 graduate of the University of Arkansas, Kennamer joined the HQ staff in June 1992 as a DXCC Specialist after a career in the insurance and securities industries and as manager of AGL Electronics in Dallas. He became editor of the "How's DX" column in *QST* in September 1993. He later became ARRL DXCC Manager.

In addition to editing the DX column, Kennamer penned numerous DX-related articles for *QST* and an occasional product review. He replaced Chuck Hutchinson, K8CH, as Membership Services Manager in April 1998.

In 1995, Kennamer was among the international group that reopened Myanmar (Burma) to Amateur Radio as part of the XZ1A operation (see "DXing from the Golden Land," *QST*, Mar 1996).

In addition to his expertise in the DX realm, Kennamer has extensive contesting and QSL Bureau experience. He's been a regular presence—and presenter—at Amateur Radio gatherings around the US and elsewhere in the world, and he enjoys an international reputation as a DXer and contester.

Kennamer said he obtained his newly minted call sign, K5NX, in part to mark the move back to his native Arkansas. His wife, Sandy, is N5LEK. Kennamer said he hopes his wife can obtain his former call sign in the future.

A replacement for Kennamer as Membership Services Manager had not been announced by press time.

Rick Lindquist, N1RL ♦ Senior News Editor

consideration in the WT Docket 98-143 proceeding was filed March 13.

ARRL, NFCC FIRM UP RELATIONSHIP AT HQ MEETING

A February 15 visit to League Headquarters by three Board members of the National Frequency Coordinators' Council has helped to solidify the relationship between the League and the NFCC. The NFCC had requested the meeting earlier this year.

"The main purpose of the meeting was simply to touch base," said Executive Vice President David Sumner, K1ZZ. Participants on both sides described the face-to-face session as constructive and positive.

On hand from the NFCC were President Owen Wormser, K6LEW, Secretary Dick Isely, W9GIG, and board member Nels Harvey, WA9JOB. Representing the League in addition to Sumner were Field and Educational Services Manager Rosalie White, WA1STO, and National Frequency Coordinators' Officer Tom Hogerty, KC1J.

Participants discussed a potential shift in philosophy by the NFCC away from seeking mandatory coordination and toward serving as an educational organization, a repository for a master database, and a point of contact with the FCC on coordination matters. The NFCC also sees a role for itself as a "centrist" or neutral organization to mediate and arbitrate disputes that cannot be resolved at the local or regional level.

Wormser emphasized, however, that any change in NFCC strategy would require a

FCC News

US APPEALS COURT UPHOLDS RF EXPOSURE REGS

The US Court of Appeals for the Second Circuit has upheld the FCC's 1996 RF exposure guidelines. The court also turned away a challenge to the FCC's exclusive ability to regulate relevant radio facility operations. The wide-ranging challenge was brought by the Cellular Phone Taskforce joined by other petitioners including the Communications Workers of America.

In an opinion released February 18, the three-judge panel upheld the FCC against the challenges on all points.

The Court disagreed on all facets of the petitioners' claims. The petitioners, in part, had claimed the FCC failed to account for non-thermal effects of RF radiation, didn't evaluate new evidence, failed to get expert testimony, and failed to account for "scientific uncertainty" about RF exposure in deciding to not lower the maximum permissible exposure levels below the maximum permitted thermal levels. The petitioners also faulted the FCC for adopting a two-tiered MPE level system that allows for higher exposure in "occupational/controlled" situations than in "general population/uncontrolled" situations.

Additionally, the Appeals Court:

• said the FCC was not irrational, arbitrary or capricious in its decision and that it did not ignore "substantial comments" from experts.

• noted that licensees are still responsible for compliance "and an interested person can petition the FCC for review of a site believed to violate the MPE levels."

• disagreed that an environmental impact statement was required from the FCC.

• rejected the petitioners' arguments that by not considering RF interference with medical devices, the FCC failed to take a hard look at the environmental consequences of its actions.

• rejected arguments that—under the Telecommunications Act of 1996—the FCC did not enjoy broad preemption authority over state or local government to regulate wireless service facilities.

ARRL RF Safety Committee Chairman Greg Lapin, N9GL, credits the FCC with being comprehensive in developing its RF safety regulations and thinks the Appeals Court did the right thing. "The FCC is not a health and safety organization, and the Commission never intended the rules to serve as a standard," Lapin said.

Lapin pointed out that the FCC's rules are based on accepted ANSI/IEEE and National Council on Radiation Protection and Measurements standards and based on "mountains of research and the opinions of lots of experts."

"The appeals court recognized this in its decision," Lapin said.

COURT DENIES KV4FZ APPEAL

In what could mark the end of the legal road for Herbert L. Schoenbohm, KV4FZ, the US Court of Appeals has turned down his appeal of an FCC decision to not renew his Amateur Radio license. The FCC in 1994 refused to renew Schoenbohm's Amateur Radio license citing his 1992 felony fraud conviction and character issues. Subsequently, the FCC said that Schoenbohm had improperly solicited *ex parte* contacts with the FCC on his behalf.

Schoenbohm had filed FCC administrative appeals at every step along the way. That avenue came to a dead end in 1998 when the FCC reaffirmed the denial of his renewal application. The agency said that Schoenbohm's fraud conviction, "in combination with" his misrepresentations and lack of candor during the renewal proceedings, justified nonrenewal. The FCC also refused to look into allegations newly raised by Schoenbohm that some of his detractors may have had improper *ex parte* contact with the Administrative Law Judge in the case.

Schoenbohm appealed the decision to the US Circuit Court for the District of Columbia, contending that the denials of both his renewal application and his petition for reconsideration were arbitrary and capricious agency actions. Describing his experience as "pure Kafka," Schoenbohm told the ARRL that he has continued the fight to renew his license "because what the FCC did to me they can do to any of us."

On February 29, the Court ruled in favor of the FCC. "We affirm the FCC's refusal to renew Schoenbohm's radio licenses and conclude that we are without jurisdiction to review the rejection of his petition for reconsideration," the ruling said. "There is nothing unreasonable about the FCC's conclusion that Schoenbohm's felony conviction was relevant to his license renewal." The Court asserted that a fraud conviction "plainly calls into question a licensee's ability to act in a manner consonant with FCC regulations."

The Court also agreed with the FCC that Schoenbohm "demonstrated an absence of rehabilitation by making deliberate misrepresentations and displaying a lack of candor during the renewal proceedings." The Court said the misrepresentations provided "a rationale for nonrenewal" that went beyond his felony conviction.

Schoenbohm would not say if he intends to attempt an appeal to the US Supreme Court. His call sign no longer is in the FCC database, but he's been allowed to continue operating until all appeals are exhausted.

POWER COMPANY ACTS ON AMATEUR COMPLAINTS

After prodding by the FCC, Pacific Gas & Electric Company says it's making headway in mitigating long-standing power-line noise complaints from several Northern California amateurs. As of March, not all complaints had been resolved, however, and several new ones have sprung up in the interim.

The hams involved in the initial complaints had been unsuccessful getting the utility to investigate their reports of severe noise, so they turned to the ARRL and the FCC for help. In late November, the FCC wrote PG&E to remind the utility of its obligation to rectify equipment problems that cause harmful radio interference. The FCC requested that the company correct the problems "within a reasonable time" and report back.

discussion and vote of the NFCC membership. Sumner suggested that the ARRL Board of Directors might be open to the change, given the directors' cool reception to the NFCC's draft *Petition for Rulemaking* last year that would have called on the FCC to codify mandatory coordination.

A letter last fall on repeater coordination issues from FCC Private Wireless Division Chief D'Wana Terry also came up for discussion. The letter—in response to two amateurs' complaints about coordination in Southern California—reiterated the FCC policy of voluntary repeater coordination. Both sides agreed that while the letter simply restated past FCC policy, it might inadvertently have resurrected some regional coordination issues.

NFCC representatives said that, in light of the Terry letter, they felt the time was right to meet with Terry and the WTB staff to educate them about the NFCC. Sumner encouraged them to do so. "Many FCC field offices know and work with the coordinators in their areas, but WTB hasn't had much recent contact with the coordination community," he said.

Repeater Directory policy also came in for considerable discussion. Sumner said the League plans to continue to accept data only from coordinators in areas that have functioning coordinators. For areas lacking a functioning coordinator, NFCC representatives expressed no objections to the League's accepting information from other sources, as long as there's no implication that the systems are coordinated.

The complainants were four hams in the Los Gatos/San Jose area and another in Berkeley. ARRL Lab Supervisor Ed Hare, W1RFI—the League's point man for RF interference issues—says the League has since received reports from additional hams in PG&E's service area. Those complaints were forwarded to PG&E for resolution.

In a letter to the FCC, PG&E Manager for Operations and Construction Robert Lipscomb summarized progress in clearing up the initial complaints. The work included replacing poles, guy wires, insulators, and transformers as well as installing radio/television interference "clips" at one site and re-routing a service drop at another. Lipscomb conceded, however, that the utility still has additional work to do. PG&E personnel continue to work with Hare in resolving remaining complaints.

Some interference has been cleared up, however. Lipscomb told that in at least one of the five original cases, "the customer has been contacted and he is satisfied."

Amateur Enforcement News

• FCC affirms $20,000 fine; unlicensed operation continues: The FCC has affirmed a $20,000 fine levied on a Florida man last summer for unlicensed operation, willful and malicious interference with Amateur Radio communications, and failure to let the FCC inspect his radio equipment. The FCC's January 28 *Forfeiture Order* gave William Flippo of Jupiter 30 days to pay up or the matter will be referred to the US Attorney. Following an FCC *Warning Notice*, Flippo first was notified of the fine last July. Hams in Florida say Flippo has thumbed his nose at the FCC and has continued to flout the law by interfering with local HF and repeater nets. FCC personnel from the FCC's Tampa District Office have followed up on complaints from amateurs that Flippo—known by his CB handle of "Rabbit Ears"—has regularly interfered with hams on 10 meters, 2 meters and elsewhere. One Jupiter-area ham who has aided the FCC investigation says Flippo has been causing problems for the amateur community since late 1997. "I want to see the guy in jail—plain and simple—and his equipment confiscated," said the amateur, who did not want to be identified by name fearing retaliation. "The problem is, we're all playing by the rules here, and this guy goes out and buys a radio and he gets on there and does whatever he wants and brags about it."

• FCC fines two Texas amateurs for malicious interference: The FCC has fined two Texas hams $8000 apiece for allegedly interfering with a local repeater and failing to identify. Paul E. Holcombe, K4TOF, and Robert L. Myers, N5WLY, both of Houston, were notified in January by the FCC's Houston office. The fines come in the aftermath of an FCC investigation last year that involved the use of direction-finding equipment. On separate occasions in February and May 1999, FCC personnel from the Houston field office used direction-finding gear to track transmissions interfering with the Memorial Emergency Repeater Association's 145.47 repeater to Holcombe's and Meyers' vehicles. As a result, Holcombe and Meyers each received a *Notice of Violation* from the FCC last June. Since being cited, both men have denied the allegations in statements to the FCC. In both cases, the FCC determined otherwise and ordered Holcombe and Meyers to pay the fines within 30 days or show why the forfeitures should be reduced or canceled.

• FCC levies hefty fine on former amateur: The FCC has told a former Houston, Texas, amateur that he's liable for a $17,000 fine for unlicensed operation and for failing to allow the FCC to inspect his radio equipment. *A Notice of Apparent Liability for Forfeiture* was sent March 3 to Leonard D. Martin, formerly KC5WHN, by the FCC's Houston Office. Martin has bumped heads with the FCC on several occasions. The FCC said it received a written complaint in May 1998 alleging that a station identifying as KC5WHN was operating on frequencies not authorized by his Technician ticket. FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth sent Martin a *Warning Notice* in November 1998. The Commission said Martin "generally denied the unauthorized operation." After tracking transmissions on various 27 MHz frequencies to Martin's residence on at least two occasions in early 1999, an FCC agent twice was rebuffed in efforts to inspect Martin's radio equipment. The FCC's Houston Office issued Martin an *Official Notice of Violation* last April. Martin acknowledged the complaint and promised that "no further action by the Commission" would be necessary. In July, he turned in his Amateur Radio license for cancellation. Martin's troubles didn't end there, however. Last October, following up on complaints of RF interference to a telephone in Martin's neighborhood, the FCC again tracked 27 MHz transmissions to Martin's residence. Martin reportedly again refused to let the FCC inspect his equipment. Martin was given 30 days to pay or to request reduction or cancellation of the proposed fine.

• FCC threatens Michigan ham with revocation: The FCC has told a Michigan ham he could face a revocation hearing if it gets any more reports alleging malicious interference. A *Warning Notice* went out February 23 to Tech Plus licensee Allen J. Stap Sr, N8OKU, of Bangor, Michigan. FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth advised Stap that the FCC has received "numerous complaints regarding malicious interference and jamming" to a 2-meter repeater that apparently originated with Stap's station. Hollingsworth said some of the interference to the Kalamazoo Amateur Radio Club's repeater consisted of "sound effects, unidentified transmissions and keying over ongoing communications." The FCC said further evidence suggests that the licensee had been harassing repeater users. Hollingsworth warned Stap that if "legitimate complaints or our monitoring reveal additional instances of this behavior," the FCC intends to designate his station license for a revocation hearing and his operator license for suspension for the remainder of its term.

News in Brief:

• **League members now can vote on *QST* Cover Plaque Award:** The winner of the *QST* Cover Plaque award—given to the best article in each issue—now is determined by a vote of ARRL members. Voting takes place on the ARRL Members Only Web site at **http://www.arrl.org/members-only/qstvote.html**. Previously, the award was determined by a vote of the ARRL Directors. The winner of the February *QST* Cover Plaque Award was Dwayne Kincaid, WD8OYG, for his article "A Repeater Controller Accessory: The RCA." The March *QST* Cover Plaque Award was the first to be awarded on the basis of an on-line vote by more than 500 members. The winner was Lew Smith, N7KSB, for his article "A Simple 10-Meter QRP Transmitter." Congratulations, Dwayne and Lew!

• **Amateur crowned Miss Topeka 2000:** Heather Hollenbeck, KB0MDX, recently was crowned Miss Topeka 2000 and will compete in the Miss Kansas 2000 pageant in June. Heather comes from a ham radio family. Proud mama is Missy Hollenbeck, AA0OF, her dad, Fred, is N0WSA, her brother, Jacob, is KB0RMK, and her granddad, Gary Hoffsommer, W0TI, introduced her to Amateur Radio.—*Missy Hollenbeck, AA0OF*

• **ARISS crews get initial ham gear training:** The first International Space Station expedition crew and its backup crew have received some initial training on the use of the initial US-provided Amateur Radio gear to be installed as part of the Amateur Radio on the International Space Station, or ARISS, effort. The session was conducted at Russia's Gagarin Cosmonauts Training Centre. As part of the ARISS training effort, NASA's Matt Bordelon, KC5BTL, was preparing a consolidated schedule for training in the US and in Russia that will include familiarization with equipment, packet theory and hands-on training, using a hardware mockup, and simulation. Training will focus on general principles of ham radio as well as preparations to use ham radio, equipment types and operating modes, and general packet module information and software. Bordelon has held an initial training session with astronauts and cosmonauts that provided exposure to the actual hardware. Other training has included the information required to obtain an US Amateur Radio license. The first ISS crew includes US astronaut Bill Shepherd, KD5GSL, and Russian Cosmonauts Sergei Krikalev, U5MIR, and the recently licensed Yuri Gaidzenko.—*Carolynn Conley, NASA*

• **ARRL says "thank you" to exemplary Special Service clubs:** Every two weeks, a Special Service Club will be featured in the *ARRL Special Service Club Spotlight* at **http://www.arrl.org/field/club/sscspot/**. If you'd like to suggest your SSC for the *ARRL Special Service Club Spotlight*, send your information, including e-mail and Web site addresses, to Dan Miller, K3UFG, at **dmiller@arrl.org**. Photographs, particularly those that highlight club activities, are especially welcome.

• **Enhanced DXCC card checking is here:** DXCC members may have their cards checked by local card checkers without having to mail cards to ARRL Headquarters. Under the new program, DXCC card checkers will be able to check all awards *except* 160 meter DXCC, as well as all QSLs from any current DXCC entity. This will apply to both new awards and endorsements. QSOs made up to 10 years prior to the current year will be eligible for field checking, while older cards and those from deleted entities still may be sent to ARRL HQ. Reappointment of DXCC Card Checkers under new criteria will be necessary. For more information, contact Bill Moore, NC1L, **dxcc@arrl.org**; 860-594-0234.—*DXCC*

• **League announces Club 2000 Achievement Awards:** The ARRL Volunteer Resources Committee has established the Club 2000 Achievement Awards to reward the achievements of ARRL-affiliated clubs. The new incentives program is aimed at recognizing growing, thriving clubs that are having a positive public impact through their activities. Throughout 2000, ARRL Field and Educational Services staff will review the activities of participating clubs. The Volunteer Resources Committee will pick four exemplary clubs—one in each eligible category. Selections will be announced at the ARRL Board meeting next January. Eligible club categories include clubs with more than 100 members; clubs with fewer than 100 members, but more than 25; clubs with 25 or fewer members, and school clubs. Clubs earn points for such activities as ARRL recruitment nights, regular monthly meetings that are open to the public; instructional workshops; ARES and National Traffic System group activities; and special event stations. Clubs with highest point values at midnight December 31, 2000 will be considered finalists. A $1000 check from The ARRL Foundation will be awarded to the club in each category with the highest number of achievement points. Details on how clubs can accumulate points are available on the ARRL Web site at **http://www.arrl.org/field/club/club-awards/**. For more information, contact Dan Miller, K3UFG, **dmiller@arrl.org**; 860-594-0340.

Plans are being made for an in-person meeting of coordinators later this year, with invitations also to be extended to FCC and ARRL officials.

ARRL SUPPORTS SWITCH TO CISPR STANDARDS

The ARRL says it supports an FCC proposal to adopt the slightly stricter International Special Committee on Radio Interference—or CISPR—standards for conducted emission limits for Part 15 and Part 18 devices. In comments filed in an FCC Notice of Proposed Rulemaking (ET Docket 98-80), the League said the proposed FCC standards will reduce both the potential for interference to Amateur Radio HF operation and manufacturers' costs for Part 15 and 18 devices.

Last fall, the FCC proposed to amend Parts 15 and 18 of its rules to revise the limits to which unlicensed Part 15 electronic devices and Part 18 Industrial, Scientific and Medical devices are permitted to conduct RF onto the ac power lines below 30 MHz. In comments filed January 31, the League called conducted RF energy into the power lines "a particularly significant concern in the high-frequency range" and called on the FCC to adopt the tighter standards.

In general, the current conducted emission limit for Part 15 devices between 450 kHz and 30 MHz is 250 µV. Part 18 limits are device-specific. The League pointed out to the FCC that the CISPR standards "are slightly more stringent than the current Part 15 and 18 regulations, offering at least a few dB of additional protection for HF over the existing Part 15 standard."

ARRL Executive Vice President David Sumner, K1ZZ, says it's "no accident" that the CISPR standards are as tight as they are. The International Amateur Radio Union is a member of CISPR and has participated actively in its meetings since the late 1980s, he explained. Sumner credited two hams in particular—Tom Sprenger, PA3AVV, and Christian Verholt, OZ8CY—who have represented IARU at CISPR meetings—with being instrumental in making sure that CISPR standards take sensitive HF receivers into account.

The ARRL also said it could not accept any liberalization of broadband emission limits that may result from the use of Part 18 fluorescent lighting devices or RF light bulbs. The League said the present limits for such devices already are "extremely liberal."

THREE MORE STATES JOIN PRB-1 BANDWAGON

California, New York, and Rhode Island are the latest states to consider enacting PRB-1 legislation.

ARRL Southwestern Director Fried Heyn, WA6WZO, said Senate Bill 1714

was introduced February 23 in the California Senate. Similar to a PRB-1 measure passed last year by Virginia's General Assembly, the California bill would require localities to accommodate Amateur Radio antennas of up to 200 feet, according to local population density.

Echoing the language of the PRB-1 limited federal preemption, the measure says that local ordinances regulating antenna placement, screening or height "shall reasonably accommodate amateur radio antennas and shall impose the minimum regulation necessary to accomplish the legitimate purpose of the city or county." The bill would not preclude localities from regulating amateur antennas with respect to the use of screening, setback and placement, and health and safety requirements.

Heyn credited Michael Mitchell, W6RW, with helping to get the bill introduced, and he asked California amateurs and clubs to contact their state lawmakers to support the measure.

On March 7, a bill was introduced in the New York State Assembly to codify PRB-1 into New York State law. Assembly bill A. 9947 would require localities to "reasonably accommodate" Amateur Radio antennas and would prevent localities from restricting antenna structures to less than 95 feet above ground level or from restricting the number of support structures.

The bill was sent to the Committee on Local Governments, which must vote on the measure before it goes to the full Assembly. Assuming the measure makes it past both chambers, it would go to Gov George Pataki—a former amateur—for his signature.

ARRL Hudson Division Director Frank Fallon, N2FF, said the bill represents two years of work by his Hudson Division PRB-1 Task Force, which spearheaded the bill's development as well as a strategy to get it enacted. The Task Force used other successful state PRB-1 bills as models and had assistance from ARRL Headquarters.

A bill, 2000-S 2304—introduced in late March in Rhode Island's General Assembly at the request of Hank Grilk, WA2CCN—also would put PRB-1 into the Ocean State's law books. It would prevent localities from enacting or attempting to enforce zoning restrictions or prohibitions against the installation or use of towers "and/or antennas" by Amateur Radio licensees that would make effective radio communication "difficult or impossible." The Rhode Island bill specifies a minimum 50-foot tower height. Grilk, a former ARRL Headquarters staff member, has solicited assistance from the ARRL in seeing the bill over the legislative hurdles that lie ahead.

So far, ten states have PRB-1 laws in place.

ARMED FORCES DAY EVENT AVOIDS HAMVENTION CONFLICT

To avoid a conflict with Dayton Hamvention, the Army, Air Force, Navy, Marine Corps, and Coast Guard are cosponsoring the annual Amateur Radio

NOTABLE SILENT KEYS

• SKYWARN pioneer Sherman C. Carr, W9NGT, SK: The man credited with being the father of SKYWARN—Sherman Carr, W9NGT, of Hartford, Wisconsin—died March 15. He was 83 and had been ARRL member for nearly 40 years. As Wisconsin Section Emergency Coordinator in the late 1960s, Carr established the first Amateur Radio weather-spotting network, the Weather Amateur Radio Network—WARN. He had assistance from Dave Theophilus—now W0NRW but then W9KWQ and a National Weather Service meteorologist in Milwaukee. In those largely pre-repeater days, the network operated on 75 meters. Carr's idea worked so well that other states adopted its basic structure, which eventually was implemented as SKYWARN. Last June, the NWS honored Carr for his role by presenting him with its Central Region Special Service Award. Wisconsin's current SEC Stan Kaplan, WB9RQR, called Carr "as much a pioneer as the first astronaut." Another accolade came from Rusty Kapela of the National Weather Service in Sullivan, Wisconsin. "Every time we issue a severe weather warning we are doing so with the help of Sherm's pioneering efforts," he said. Kapela called Carr "a giant of a man in the Amateur Radio world and in severe weather communications." Said Wisconsin ARRL Public Information Officer Jim Romelfanger, K9ZZ, "Carr leaves a legacy of creativity, incredible dedication and innovation in emergency communications, in technical excellence, and thousands of friends who will remember his chuckle and his grin."—*Jim Romelfanger, K9ZZ*

• Nevada Section Manager Bob Davis, K7IY, SK: Nevada Section Manager Robert J. "Bob" Davis, K7IY, of Reno died February 24 after reportedly suffering a heart attack. He was 51. Davis had served as Nevada's SM since July 1997. Prior to that, he served for two years as an Assistant SM. First licensed in his late teens in Illinois, Davis joined the US Air Force following high school and worked on the radio equipment aboard the SR-71 Black bird. Following the service, he worked as an IBM service tech, then started up his own remodeling, landscaping and general maintenance business in the Reno area. "Bob has been a valuable asset to the ham radio community," said Neil Dresbach, WA7KCD, a friend. "He did an outstanding job as SM." Dresbach said Davis was always open to various viewpoints and tried to avoid letting politics get in the way. Survivors include Marina Brenes, KI7DK. ARRL Field and Educational Services Manager Rosalie White, WA1STO, has appointed Janet "Jan" Welsh, NK7N, of Henderson to be the new Nevada SM. Welsh had served as an Assistant Section Manager during Davis's tenure and formerly served as an ARES Emergency Coordinator. She'll fill the remainder of Davis's term, which ends July 1, 2001.—*thanks to Dick Flanagan, W6OLD, Neil Dresbach, WA7KCD, and others*

• Dawn M. Cummings, K1TQY, SK: Women Radio Operators of New England President Dawn Cummings, K1TQY, of Keene, New Hampshire died February 2, as a result of heart failure. She was 52. A ham since age 15 and an ARRL member, Cummings was an avid traffic handler. She served as manager of the First Region Net, Cycle 2, of the ARRL National Traffic System and as an Official Relay Station. Cummings' call sign also graced the "Keene Machine"—a local repeater on 146.805 MHz that she managed. Cummings was active in SKYWARN and served as an official weather observer for the *Keene Sentinel* and other outlets and participated in a regional weather net. After her repeater-related role in the rescue of students stranded on Mt Monadnock, Cummings was cited by New Hampshire Gov Jeanne Shaheen as "an enduring model of volunteerism." She also was an active ARES member and belonged to the Quarter Century Wireless Association. "Dawn was always cheerful and polite, on and off the air," said Scott Porter, N1SP. "All of us who knew Dawn are saddened at the loss. She tirelessly worked for our hobby, and never sought the limelight." In addition to her ham radio activities, Cummings was a Red Cross volunteer. She owned and operated a consignment craft store in Keene. Her father, Lem Cummings, K1IOJ, and her mother, Vivian, are among her survivors. The family invited memorial contributions to the Keene Machine, in care of Joseph Armstrong, KA1YLN, 21 Clark St, Apt 1, Brattleboro, VT 05901-6437; or The American Red Cross, 83 Court St, Keene, NH 03431. —*thanks to Joe Armstrong, KA1YLN, and Scott Porter, N1SP*

communications tests in celebration of the 50th Anniversary of Armed Forces Day May13-14 (Armed Forces Day this year will be celebrated May 20).

The annual on-the-air event features the traditional military-to-amateur crossband communications and message receiving tests. These tests give Amateur Radio operators and shortwave listeners an opportunity to demonstrate their individual technical skills and receive recognition from the Secretary of Defense or the appropriate military radio station for their proven expertise.

QSL cards are available to those making contact with military stations. Special commemorative certificates are awarded to those who receive and accurately copy the digital Armed Forces Day message from the Secretary of Defense.

Military-to-amateur crossband contacts will include SSB and digital modes (RTTY, PACTOR, AMTOR, GTOR, and CLOVER). Some military stations may not operate the entire period. Participating military stations will transmit on selected military MARS frequencies and listen for Amateur Radio stations in certain Amateur bands. Military station operators will announce specific amateur frequencies being monitored. Contact should be limited to three minutes.

Transcripts of the RTTY, PACTOR, AMTOR, GTOR or CLOVER receiving test should be submitted *as received*. No attempt should be made to correct possible transmission errors. Provide time, frequency and call sign of the military station copied, and include the name, call sign, and address (including ZIP code) of the individual submitting the entry. This information should appear on the sheet containing the test message.

Stations copying AAZ or WAR send entries to Armed Forces Day Celebration, Chief, Army MARS, HQ, USASC, ATTN: AFSC-OPE-MA (MARS), Fort Huachuca, AZ 85613-5000. Stations copying NAV, NAV-2, NAV-3, NAV-4, NBL, NMH, NPL or NUW send entries to Armed Forces Day Celebration, Chief, Navy-Marine Corps MARS Nebraska Avenue Complex, 4234 Seminary Dr NW—Suite 19239, Washington, DC 20394-5461.

For details on times, stations, frequencies, modes, QSL addresses and other information, see page 66 of this issue or visit the ARRL Web site, **http://www.arrl.org/contests/months/may.html**.

DAYTON HAMVENTION ANNOUNCES AWARD WINNERS FOR 2000

DX luminary Martti Laine, OH2BH, has been named Hamvention's Amateur of the Year for 2000. "Martti is well known in the international Amateur Radio community as our number one Ambassador of Good Will," said a statement from Cathi Hoskins, N8ZCQ, who chairs Hamvention's Awards and Banquet Committee. "Martti has been responsible for promoting the activation of new DXCC countries—traveling under difficult and often dangerous conditions to promote the hobby worldwide."

Laine is the only person to have been inducted into the *CQ* DX Hall of Fame as well as the *CQ* Contest Hall of Fame. He's also a *QST* author as well as the subject of many other articles dealing with the DX world.

Among other highly visible DXpeditions, OH2BH pioneered the P51BH operation from North Korea in April 1999. He also was among the operators at the Gaza E44DX operation in February 1999 and the FW8ZZ Wallis Island DXpedition later that year.

Hamvention will present its Technical Excellence Award to H. Paul Shuch, N6TX. Shuch is being honored for his pioneering work in the 1970s in VHF, UHF and microwave receiver design and for his recent design of Amateur Radio astronomy equipment for the 21-cm hydrogen line region.

Shuch, who's executive director of the SETI League, was the ARRL Atlantic Division's 1999 Technical Award winner. A prolific writer, Shuch is the author of more than 200 articles, about half of them in Amateur Radio publications. He's an ARRL Life Member and was the 1996 Dayton Hamvention banquet speaker.

Hamvention will present its Special Achievement Award to former FCC official A. Prose Walker, W4BW, an FCC veteran who headed the FCC's Amateur and Citizens Division from 1971 until 1975. Walker is being honored for his early involvement in obtaining new Amateur Radio allocations. He made an initial proposal for new bands at 10, 18, 24 MHz before an International Amateur Radio Club meeting in Geneva in 1972, and he was one of four members of the US committee that took the initial steps to turn the idea into reality. The Hamvention announcement described Walker as "the guiding force behind the development of the Advisory Committee of Amateur Radio" and its first chairman. He also chaired the Amateur Radio Working Group in preparation for the 1979 World Administrative Radio Conference, at which US amateurs obtained the new HF bands. An ARRL Life Member, Walker retired from the FCC in 1975 and now lives in New York.

Hamvention this year will host the 2000 ARRL National Convention. The international gathering is May 19-21. The annual awards will be presented during the annual Hamvention Saturday evening banquet on May 20.

Section Manager Election Notice

To all ARRL members in the Connecticut, Idaho, Minnesota, North Dakota, Ohio, Oklahoma, Southern Florida, Western New York, Puerto Rico, and Virgin Islands 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.

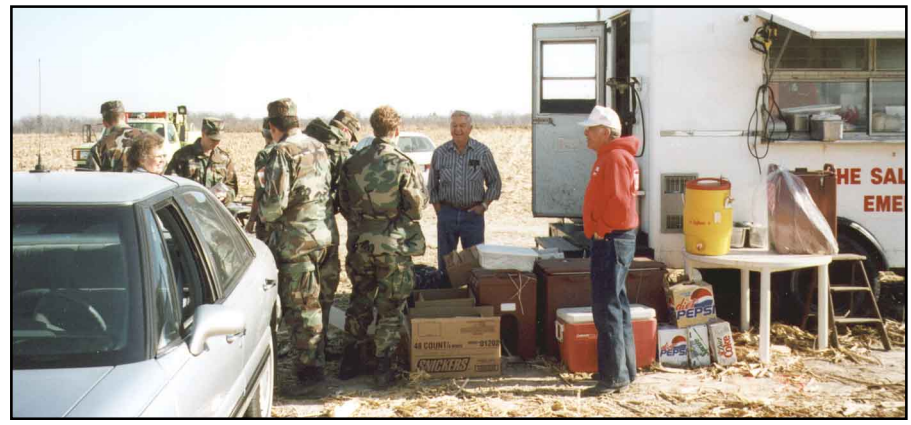
(Signature ___ Call Sign ___ City __ ZIP __)

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 June 9, 2000. Whenever more than one member is nominated in a single section, ballots will be mailed from Headquarters on or before July 1, 2000, to full members of record as of June 9, 2000, which is the closing date for nominations. Returns will be counted August 22, 2000. Section managers elected as a result of the above procedure will take office October 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 October 1, 2000. If *no* petitions are received from a section by the specified closing date, such section will be resolicited in the October 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* QST

Hams Give Aid when Two F-16s Collide

KEVIN WALTER, KB9EBJ.



Near the F-16 crash site in McDonough County, Illinois, are Air Force, Air National Guard and Salvation Army personnel, and Tony Coniglio, KB9NAB (far right).

Late last year, two Air Force F-16 fighter jets of the 182nd Air Wing, accidentally made mid-air contact near Vermont, Illinois. One pilot ejected to safety before his plane crashed, while the other jet limped back to base in Springfield. Amateur Radio operators from the Lamoine Emergency Amateur Radio Club worked with the Salvation Army as first respondents in the recovery operation, along with Illinois State Police, McDonough and Fulton County sheriffs and police, plus the local fire departments. According to Jay Hainline, KA9CFD, ARRL Official Bulletin Station, and Bruce Boston, KD9UL, ARRL Illinois Section Manager, the hams continued to assist for the next six days.

PUBLIC SERVICE—ACCENT ON SERVICE

By Sumner Weisman, W1VIV

Like many ham radio clubs, the Framingham Amateur Radio Association in Massachusetts takes pride in offering dual paths of public service—to our community and to our members. We serve our community providing communications at parades, road races, and other special events. Of course, we remain ready to serve in any emergency. For members we provide a repeater, packet cluster, license exams, club station, college scholarships and a newsletter.

Many clubs do all of that. Our club is a little unique, though, because of the additional service we provide. Our efforts, and the tenacity and dedication of some of our individual members, have led to some unusual stories in recent years.

"License-In-A-Weekend" Story

In the past few years, about 100 people have attended our License-in-a-Weekend classes conducted by Ed Weiss, W1NXC. For minimal cost, we teach, feed and test them in one highly intensive weekend. It starts when they see our notice in the newspaper, and before they realize it, they are licensed radio amateurs! The look of pride on their faces is something to behold! Hearing them on the air is payment for our service.

We've had many family success stories with various combinations of husbands, wives, mothers, fathers, sons and daughters earning licenses. One was Karen Brothers, K1KEB, wife of Dennis, KE6DPL. She took the weekend course, later attended the upgrade class, and has served as instructor at every licensing session since!

Extra TVI Assistance

Janet Rugo saw our class notice in the newspaper. She called Ed, W1NXC, to relate a tale of frustration. For three years, she experienced terrible intermittent TVI. She called everyone—cable and electric companies, the local radio station (after reading about their power increase) and town hall. Someone suggested it might be a ham or CBer, which initiated her call to Ed. In spite of general wisdom that hams should avoid getting involved with TVI problems if their rigs are clean, a dedicated group of club members made trips to her home and determined that it was *not* a ham radio problem. Normally, at that point, they would have politely said "Goodbye and good luck," as everybody before them did. Instead, they did extra service, tenaciously conducting an investigation, isolating the noise to the wiring on the furnace burner, and making the TVI go away forever.

Janet sent the club $50 for our scholarship fund. We began mailing her our club newsletter. To our surprise, she sent club dues, and is a member in good standing!

The Extra Step

Fred Rosebury, KA1GEN (SK), joined our license class in 1982 when he was 79 years young, and quickly obtained Novice, Technician and General licenses. He became an active ham—there was no mistaking his flawless CW—and remained so until his death in 1999 at age 96. In his later years, Fred moved to an assisted living facility. He had become hard of hearing, and couldn't hear voice signals, but discovered he could still copy CW! He got permission to put up an outside antenna, but couldn't do it himself. Several of us offered our services of installing an antenna, and he accepted it. As we left, he called out, "You fellows are wonderful!" He didn't communicate verbally with people very much because of his deafness, but could maintain CW schedules with several friends.

Public Service with an Accent

There is public service, and then there is *Public Service*. What our radio club has discovered is what some others have also discovered—and it is extremely gratifying. The more effort and time that our club members put into serving people, the more we *ourselves* get out of it!

TRI-RI ESCAPADE

By Ronald P. Cooper, WB9DKL

I participated as Amateur Radio bicycle mobile in the 1999 fall TRIRI (Touring Ride in Rural Indiana) escapade. The tour was a multiday trip between southern Indiana state parks, with Bloomington (Indiana) Bicycle Club members Barb (N9XSS) and Joe Anderson (N9SYH) as tour directors who provided public service communications for breakdowns or accidents. Barb, N9XSS, had cards preprinted with the ham frequency, offset and access tones of repeaters the bicycling hams could use throughout the ride. Bike club members Stu Sherfick, W9HRZ, and Chuck Kraus, N9ESO, drove vehicles — one covered with antennas and loaded with radio equipment, and the other carrying water.

Ronald Cooper, WB9DKL, (center) shows off his bicycle mobile set-up to Bloomington (Indiana) Bicycle Club members Stu Sherfick, W9HRZ, and Chuck Kraus, N9ESO.

I've done this tour several years, and always take my two-meter rig. This time, I purchased a Yaesu VX-5 to put in a waist pouch hung from the handlebars. I mounted my trusty whip J-pole on the bicycle's rear rack, and placed a spare battery and speaker mike in my seal pack that keeps things dry during rainstorms. I wrapped the 12-volt adapters and AA battery packs in towels in my duffel bag. I forgot to order the SMA to BNC adapter for the new radio, so packed my dependable RadioShack HTX-202 in case I needed to use the J-pole instead of just the rubber duck.

At meal stops I carried my H-T to where the riders congregated so they would know I had it on the road if help was needed. During the tour, I had lively QSOs on many Indiana repeaters, making me feel I was in contact with civilization throughout long, lonely sections of road. On the way to Turkey Run State Park, I talked with John Holley, KB9QBW, and arranged for him to come see my bicycle mobile station as I arrived at the park for the evening. After finding out that I was missing the SMA adapter, John brought one the following morning before the bicyclists took off! The adapter came in handy that day; I had to use the J-pole antenna to make the area repeater. One of our bicyclists did not negotiate a corner well, and Chuck, N9ESO, had to take the gentleman to the hospital…because of a broken collarbone.

The Amateur Radio Service and bicycle touring go hand in hand perfectly. There's the great tradition of usefulness for emergency communications, and also the offering of friendly conversation.

Sherri Brower, W4STB, Southern Florida Official Emergency Station, enjoyed operating during the ARRL-NWS special event.

Kevin Lynott, KC0FEH, shows off an ARRL-NWS certificate with special event call sign, N0A, used at the Goodland National Weather Service Office.

NATIONAL WEATHER SERVICE SPECIAL EVENT

The National Weather Service (NWS) and the ARRL will cosponsor a second annual special operating event, details to be announced later in 2000. The first one was coordinated in late 1999 by Goodland (Kansas) NWS Meteorologist-In-Charge Scott Mentzer, KB0WPY. The purpose was to recognize contributions amateurs make to NWS during threatening weather, and to allow NWS personnel and amateurs to learn about each other's capabilities. Hams brought their radios to NWS sites to work as many amateurs as possible. NWS personnel were encouraged to make QSOs under supervision of a control op, and to consider becoming licensed.

Scott said, "Logs contained comments saying the event was fun and informative. We received 300 requests, including from some DX stations, for the certificates!" QST

Field Organization Reports

Public Service Honor Roll
February 2000

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

904
NM1K
795
AD4IH
422
W7AMM
397
KB8ZYY
331
W9RCW
320
N5JZ
306
K7BDU
257
NZ4O
253
K5UPN
242
K5MC
238
WD8V
237
K5NHJ
235
KA2ZNZ
225
NN7H
221
WB5ZED

209
N2YJZ
198
N5IKN
196
WA9VND
K4FQU
195
KK3F
190
K7VVC
191
W4ZJY
W7TVA
188
KB2LML
186
WB8SIW
181
WB4GM
179
K2GTS
K9FHI
W6DOB
176
WB2UVB
174
N2LTC
173
N2OPJ

172
KB4WBY
W6IVV
171
NR2F
170
KA5KLU
169
W4EAT
N5OUJ
N2RPI
168
KA2GJV
K6YR
KA6UIV
167
N8FPN
166
N7YSS
165
K4IWW
WO0A
162
KC4VNO
161
WB5NKC
KB2VVB
159
KJ3E
158
W6QZ

157
WA5I
156
KB2VVD
155
KC4TLG
N2XOJ
154
W0OYH
N5NAV
N5XGI
WN0Y
152
KF1L
151
NY2CQ
WA1FNM
150
KB2KLH
WA1TBY
KC5OZT
148
W3YVQ
K2UL
NY2V
149
KC2ALG
147
WB2QIX
KC2AHS
W2EAG
K9RTB

146
N2JBA
AF4GF
145
WX8Y
144
N8FWA
KD2AJ
K8GA
143
KA4FZI
AF4PU
142
K4RBR
KB5W
141
WD4JJ
W0LAW
WB2ZCM
140
N0SU
KC4ZHF
N2KPR
W5GKH
WA3HJC
K5DPG
139
KE4JHJ
WA1JVV
K4SCL
N1VXP
W2MTA
N2XJ

W7NWP
W7ZIW
138
WD8MIO
K4YBX
WA4DOX
N0KJ
WB0ZNY
N9BDL
W7GB
KT6A
136
W5ZX
K1FP
W2AKT
135
NC4ML
K2DN
W2RJL
WD9FLJ
134
W1PEX
W9YCV
133
NN2H
132
AA3SB
KA1GWE
WA4QXT
N2AKZ
KB5TCH
W9CBE
131
N8JGS
K1JPG
130
WA8EYQ
WB2GTG
129
N3WK
WB4TVY
WA0TFC
K5IQZ
W7LG
128
W3BBQ
AA8SN
KD1LE
WD8DHC
WB2FGL
WX4H
127
W5CDX
126
WA0KS
AE2ED
KA4HHE

125
W1ALE
WD9HII
N2CCN
K9LGU
124
AA2SV
K7MQF
123
KR4MU
KT4PM
KE1AI
WI2G
WU4C
NZ1D
KF6OIF
122
WA2UKX
KC4PZA
121
KG2D
K7GXZ
KF4NFP
120
W9ZY
K5VV
W7GHT
KB2VRO
W2JHO
119
KI4YV
K0BXF
KC2EOT
W4NTI
K5DMC
W5/
PY2CGB
118
N8DD
K4MTX
AA3GV
KD4GR
K9GBR
W2FR
KA2DBD
W4CKS
W3OKN
N9TVT
KF6UMU
KA8WNO
117
W3VK
W0WWR
KO6RZ
W2MTO
115
KB0DTI
KC8CON
W5MEN

114
KC6SKK
KB2ETO
113
K0PIZ
112
WB5NKD
WB4PAM
K2PB
WD0GUF
K5WOD
AG9G
111
W3BL
K6VOA
N7AIK
N9MN
110
KG5GE
K4BEH
KD6YJB
109
WA2CUW
KC5VLW
108
WA2YBM
KA4LRM
KT4SJ
107
N4CQR
W2PII
AC4CS
106
W3CB
N3WKE
W4AUN
N3RB
105
KF5A
AA4HT
W4DGH
AC5Z
104
WA8SSI
N5JUU
KJ7SI
103
WB4UHC
N2WFN
WB2IJH
102
KC2DAA
101
WI8K
AF2K
100
KB2WII

99
AE4NW
KB2RTZ
KE0K
K5MXQ
98
KD4HGU
K8LEN
W5XX
97
N2GJ
K1SEC
KE6MIW
96
AA4YW
KD3JK
KC3Y
N3WAV
95
KB3AMO
AA4BN
N9KNJ
W3IPX
K9JPS
94
KE4IFD
N9PF
W5AYX
93
N3ZKP
K3CSX
N2WDS
W2GUT
W4XI
92
WA1QAA
W4PIM
WB7VYH
91
KF4KSN
KT4TD
90
KA1OTN
KC8GMT
89
K8IG
KA1VEC
88
W8SZU
KJ4N
86
K4AIF
N3SW
85
W4CC
K8ZJU

84
WA4GLS
KE4GYR
K3UWO
WA4EIC
KA2CQX
K3TX
N1IST
WB9GIU
83
KC8HTP
K8VFZ
KE4UOF
82
KG0IV
W2CC
81
WA8DHB
KC6NBI
80
KO4OL
79
KE4PAP
KB2GEK
KA9FVX
78
K4WKT
KA7TTY
WA4EYU
77
AC4ZO
76
KE3FL
K8SH
75
KD5AHW
74
W2LC
N7MPS
WA5WBZ
73
K4BW
AA8PI
K2VX
K4BG
72
KE2EH
N1LAH
N4MM
71
K8AE
KB1CTC
KE4DNO
70
KD1SM
KB2YBM
KC2ETU
KB2VSR

The following operator qualified for PSHR in December, 1999, but his results did not appear in this column in March QST: N2GJ with 89 points.

Section Traffic Manager Reports
February 2000

The following ARRL section traffic managers reported: AL, AR, AZ, CO, CT, EB, ENY, EPA, EWA, GA, IA, ID, IL, IN, KS, KY, LA, MDC, MN, MI, MO, MS, NC, NFL, NH, NLI, NNJ, NTX, NV, OH, OK, ORG, SBAR, SC, SDG, SFL, SJV, SNJ, STX, TN, VA, WCF, WI, WMA, WNY, WPA, WV, WWA, WY.

Section Emergency Coordinator Reports
February 2000

The following ARRL section emergency coordinators reported: AZ, CT, ENY, EWA, IN, KY, MDC, MI, MN, MO, OH, SD, STX, TN, VA, WCF, WMA, WPA,

Brass Pounders League
February 2000

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	773	314	969	5	2061
WX4H	2	818	1210	13	2041
AD4IH	682	92	730	5	1509
KF5A	0	225	1015	1	1241
N2LTC	0	589	634	6	1229
K7BDU	121	503	573	17	1214
KK3F	21	172	962	2	1157
W6DOB	0	490	594	42	1115
W1PEX	0	133	886	29	1048
K9JPS	4	450	58	421	930
KT6A	0	432	374	0	806
N5IKN	0	396	150	246	792
W7AMM	116	259	388	23	786
WB5ZED	21	390	342	32	785
WA9VND	19	418	294	9	740
K4FQU	252	109	345	4	710
K7VVC	18	273	411	4	706
W5SEG	44	337	294	0	675
K5UPN	119	301	251	4	675
W6IVV	14	322	314	0	650
KA2ZNZ	9	306	227	88	630
W9IHW	0	199	203	161	563
K7MQF	6	268	284	0	558
W9RCW	0	267	2	261	530
KA1VEC	6	250	241	11	508

BPL for 100 or more originations plus deliveries: K9GU 193, NZ4O 187, N5JZ 182, WZ7V 179, K5GBN 176, K5NHJ 139, K5MC 118. QST

Eyeball DXing in the Pacific Ocean

Per A. Mikalsen, LA3FL, is the Chief Radio Officer aboard the M/S Crystal Symphony. *He recently took a world cruise that commenced in Los Angeles, California on January 20, and will be completed upon arrival in Southampton, United Kingdom, on May 4. Per tells us this month about his unique travels through the Pacific as he meets some true-blue DXers along the way.*—W3UR

There are a few hams cruising with us, but no one is more dedicated to the hobby than my good friend and big DXer, Dave Kennedy N4SU. Dave, and his lovely and supportive wife Sonja, are aboard this vessel for 35 days, celebrating their 55th wedding anniversary by cruising from Los Angeles to Sydney.

On this voyage we have visited some good DX locations. The highlights were Easter Island and Pitcairn Island, where Dave and I met most of the local hams. Of course, Dave had made QSOs with these places before. He brought along QSL cards for QSOs on several bands with Henry, XQ0YAF, the only permanent resident ham on Easter Island, Dave's first stop.

On the way to Easter Island we tried to communicate with Henry by e-mail, but we did not receive a response. This made us question our chances of finding him when we reached the island. (Later we learned that there are very few international telephone lines or satellite downlinks to Easter Island. This often delays e-mail between the island and the outside world.)

Easter Island does not have port facilities to take our cruise liner alongside a pier, so the *Crystal Symphony* anchored off the island and tendered (using our motor launches) passengers and crew alike between ship and shore. This operation worked slowly at first because of heavy swells. Fortunately, the ocean calmed within a few hours and the tendering went on as normal.

I was working in the ship's radio room in the morning and contacted the Easter Island port captain on a marine VHF channel. The port captain knew Henry and asked me to stand by while he attempted to contact him. The port captain's luck was about as good as ours. After two hours without word I gave up.

Finding Henry

Dave and I eventually decided to ride a tender to shore where we negotiated with a taxi driver who knew Henry. (Does everyone on Easter Island know Henry?) For $5 US the driver agreed to take us to him. The driver did as promised, but wanted $10 at our destination—the Hotel Manu Tara. (After some discussion we paid the original $5.)

We introduced ourselves at the front desk and asked for Henry. It turned out that we were talking to one of his lovely daughters, Mito, who informed us that her father managed the Manu Tara.

Within minutes we were face to face with an overjoyed Henry. We asked his daughter to use our cameras and take a couple of pictures of us together. Afterward, Henry took us to his nice radio shack in the back of the hotel. We were treated with delightful drinks, and while we chattered away, I took a few more pictures.

Although Henry was very busy he took Dave and me in his car and drove us to Rapa Nui National Park to see the famous statues known as *moai*. It certainly turned out to be a most interesting day for all of us.

I've never contacted Easter Island from my Arctic home in northern Norway, so I was very happy to receive a QSL card from Henry for our "Eyeball QSO." It's another step toward my goal of DXCC Eyeball. This is a difficult challenge because I only count those Eyeball QSOs when I meet hams in their own country.

When Dave and I returned to the *Crystal Symphony*, we invited Henry to come with us for a tour of the ship. Because he was too busy at work, he sent Mito in his place. Mito is fluent in English, Spanish, French and the Rapa Nui dialect, so we had no problems communicating with her. I showed Mito around until I had to return to the ship's radio room and get back to work. Dave and his wife Sonja then took over, hosting Mito until she had to return to the island.

Soon it was time to haul up the anchor and head for our next destination: Pitcairn Island.

Pitcairn Island

On February 9 we anchored off Pitcairn Island. Surely you have heard about the

Dave, N4SU, Henry, XQ0YAF (ex CE0FFD), and Per, LA3FL, meet for an eyeball QSO at Henry's hotel on Easter Island.

Tom Christian, VP6TC (center), has been active on the air from Pitcairn since the 1960s. He came aboard the M/S *Crystal Symphony* to sell souvenirs and autograph copies of *Mutiny on the Bounty*. From left to right: Jukka, VP6BR/OH2BR; Per, LA3FL; Tom VP6TC; Dave, N4SU and Duke, K2MZ.

Bernie McClenney, W3UR ♦ 3025 Hobbs Rd, Glenwood, MD 21738-9728 ♦ howsdx@dailydx.com

The *Crystal Symphony* at anchor off Pitcairn Island.

Tom, VP6TC and Per, LA3FL, exchange QSLs for Per's "Eyeball DXCC."

mutiny on the *Bounty*. Books have been written and movies made about this incident that took place in 1790, which resulted in Fletcher Christian and his mutineers settling on Pitcairn. They hoped the island would be a safe haven where they could escape the long arm of British law forever. The islanders of today are mostly descendants of the mutineers.

The island measures only two square miles, it is very rocky, and it is difficult to come ashore. There are no beaches and the surrounding seas are often quite rough with strong undercurrents. A landing area has been made for the islanders to launch their big wooden longboats and they come out to greet the occasional cargo and cruise ships.

Dave and I sent a fax message to the island, inviting Tom, VP6TC (ex VR6TC) and Jukka, VP6BR/OH2BR (who was operating a DXpedition on the island), to join us on the *Crystal Symphony*, but they did not respond. Once again we were a little unsure of our chances of completing the rendezvous.

Meeting VP6BR, VP6TC & VP6YL

None of the ship's passengers were allowed ashore, but quite a few islanders sailed out to meet us, carrying souvenir items that they wanted to sell on board. These sales are a major source of income for the islanders. You can imagine our surprise when we saw Tom Christian coming aboard along with his wife, Betty, VP6YL, and Jukka!

Tom was terribly busy at his souvenir stand. He had to sign dozens of *Mutiny on the Bounty* books that he sold, and chat with the passengers. We managed to get him away for a few minutes for a group photo that included another ham passenger, Duke, K2MZ. Dave showed Tom a QSL card for a QSO that took place 43 years ago when Dave was W8BRA and Tom was VR6TC.

After a few pictures were taken I had to report to the captain to join him, and a small party of his choice, ashore. The island council only allowed the captain and his party to go ashore on Pitcairn. All others had to remain on board.

It is a very steep and narrow dirt road up to the small settlement called Adamstown, half way to the top of Pitcairn Island. The vehicles used on the island are Honda 4-wheel ATVs. A seat is arranged in front of the steering wheel and two persons can sit behind the driver, each with half their bottoms sharing a seat, holding on to whatever they can grip.

Because Tom, Betty and Jukka were on board the *Crystal Symphony*, I did not get to see their stations. Jukka's QTH was on a mountain range on the top of Pitcairn, while the others had their shacks in their homes in Adamstown.

I visited the elementary school, museum, cemetery and a few other places. Then I joined the local engineer to see the electrical powerhouse where two big diesel generators supplied power to the entire island. To conserve fuel the generators only operate a few hours in the morning and evening. The voltage is 240 V ac.

I also checked the commercial communication facilities on Pitcairn. They have an Inmarsat terminal that can be used for e-mail if necessary. The terminal only operates at about 9600 baud in the data mode and the charge is $6 to $7 per minute. Long message uploads and downloads are definitely discouraged!

As for fax messages, the sending parties pay the charges, so it costs nothing for the islanders to receive faxes. Responding to a fax is another (and quite expensive) matter, which explains why no one replied to our arrival message.

After returning to the *Crystal Symphony* I met again briefly with Tom and Jukka. By that time I had already received from them, as well as from Betty, QSL cards confirming our "Eyeball QSOs." It certainly was a pleasure to meet these amateurs in person!

Dave, N4SU, ended his trip aboard the Crystal Symphony *on February 24 in Sydney, Australia.*—Ed

VK9WI – WILLIS ISLAND

A DXpedition to Willis Island has been scheduled for May 2000. The crew, headed by David Gemmell, VK4ZEK, will set sail aboard the 43-foot catamaran *Bach and Byte* around May 6 and expects to land on May 10. Joining him will be David (Harry) Holton, VK4DH and Alan Meek, VK4BKM.

Willis ranked #47 in the ARRL's 1999 Top 100 list and is located in the Coral Sea at 16° 17′ South 149° 57′ East. There is a manned Australian weather station there. Planned frequencies are 3504, 7004, 10104, 14024, 18074, 21024, 24894, 28024 and 50115 kHz on CW and 3790, 7085, 14195, 18145, 21295, 24945, 28480 and 50115 kHz on SSB. The VK9WI web page will include photos, logs and other interesting information at **http://www.qsl.net/vk9wi/index.htm**. On 6 meters, VK9WI will have a 24-hour CW beacon on 50.009 MHz from the boat. If you can hear the beacon, try calling them on 50.110 or 50.115 MHz. QSL via VK4APG, P.J. Garden, 58 Minerva Court, Eatons Hill, Brisbane, Australia. Bureau cards will be answered also, after the direct cards.

WRAP UP

Rumor has it there may be a DXpedition to San Felix (CE0X) in May. Keep your ears open on the air and your eyes on your favorite DX bulletin.

That's it for this month. Special thanks to KE3Q, LA3FL, N4SU, OH2BR/VP6BR, VP6TC and XQ0YAF for making this month's column possible. Becky, N3OSH, and I look forward to seeing everyone in Dayton. Please stop by *The Daily DX* booth (520) to have an eyeball QSO. Until next month, see you in the pileups!—*Bernie, W3UR* QST

THE WORLD ABOVE 50 MHZ

DX Possibilities Abound

A world record and seven new North American distance records were set during the past year, including one in a previously unclaimed category (see Table 1). Four distances were extended in the microwave bands at 47, 75, 120 and 142 GHz. K5VH and KD4DFO broke the existing 2.3 GHz continental tropospheric record by just 20 km this past January. K5JL and VE1ALQ established an incredible 2856 km as the initial mark for 144 MHz ionospheric forward scatter in November.

W6QIW and W5UWB have claimed the newest addition to the records—a 2195 km contact via 222 MHz sporadic-E. The pair made this incredible link up in mid-February, during an unusual winter 144 MHz sporadic-E opening between Southern California and south Texas. This was one of just two 222 MHz contacts that were reported during that unusual opening. All signs suggested the MUF topped 220 MHz for only five minutes.

Finally, KH6HME was on one end of yet another record-breaking 144 MHz transpacific contact last August, this time to W1LP/mm off the coast of Mexico. The 4754 km is the longest distance ever reported for tropospheric propagation anywhere in the world. Nevertheless, it cannot be listed among the North American records because the criteria require at least one station to be on the North American mainland. The existing 144 MHz tropospheric record from the mainland across the Pacific remains at 4333 km. Congratulations to all the new record holders.

Will there ever be an end to distance records at VHF and higher? That is not likely. There is still a good deal of room to extend existing records at all frequencies and modes. In addition, initial marks for several specific modes and frequencies have not yet been established. In some cases, contacts that could serve as initial records have already been made, if only participants would step forward and make a claim.

Rain Scatter

Several pairs of 10 GHz operators in various parts of the country have reported rain-scatter contacts over the past decade, but none have stepped forward to claim a record. Certainly 250 km, commonly reported in Europe, would make a reasonable starting point for a 10 GHz rain-scatter record. Someone stake a claim! Rain scatter is also possible at 24 GHz, especially in drizzles and lighter precipitation, but few US stations have attempted such contacts.

Kimio Maegawa (JA9BOH) and his 2-meter EME array at 8J1RL, Showa Station, Antarctica.

Rain scatter is really a generic term for all sorts of precipitation scatter, including snow, sleet and even hail. Wet snow and sleet are more efficient scatterers at 10 GHz. It may be possible for large hailstones to be efficient scattering objects at 5.7 GHz. The western plains, where dramatic hailstorms are more common than elsewhere in the US, might provide the best opportunity for this most unusual propagation mode.

Microwave

Unlike many of the ionospheric modes, including aurora, meteor scatter and FAI, there is no theoretical limit on the distance radio signals can be propagated in a tropospheric duct. The current tropospheric record at any frequency is over 4750 km, made on 144 MHz across the Pacific Ocean. This suggests that contacts over similar distances could be made on any higher band, at least through 10 GHz.

On the bands above 10 GHz, atmospheric absorption increases dramatically and probably places insurmountable limits on distance. Even so, there is a lot of room to extend microwave records, whether so-called line of sight or with the aid of tropospheric ducts. None of the world distance records at 10 GHz and higher are held by a pair of American stations.

This Month

May 5	eta-Aquarids peaks
May 19-21	CQ Spring VHF Activity Weekend

UHF in the Caribbean

No one has claimed any tropospheric records over the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico higher than 432 MHz. Tropo (A) records are for contacts from the North American mainland across the Atlantic, Caribbean or Gulf to some station not on the mainland. Any contact at 1296 MHz or higher that meets these criteria, even a contact from Florida to one of the Bahama islands, would get a pair of stations listed. Someone might take a suitcase full of microwave gear to one of the nearby islands to give the Florida fellows a thrill of working a new country—and setting a few initial distance records. Tropospheric ducting is common throughout the Caribbean, so many records are probably just begging to be claimed.

Two-Meter Transatlantic

The Brendan Cups, awarded to the first pair of stations to complete a 144 MHz contact across the Atlantic, have yet to be awarded. See this column for June 1995 for details. When such a contact is made, it certainly will be a historic event and could even set a new distance record, depending on the propagation mode.

Although most of the efforts in recent years have focused on the path between the Canadian Maritime Provinces and Ireland, the shortest span is actually from Brazil's Rio Grande Norte province to the West African coast between Senegal and Liberia. Paths as short as 2900 km can be found across the mid-Atlantic in this region.

Sporadic E is virtually unknown in the equatorial region, so it is probably not the most likely propagation mode. The path is a bit long for routine meteor-scatter, but such distances have been achieved from time to time in Europe using high-speed CW. Tropospheric ducting is a remote possibility, but it is more likely somewhat further north during winter or early spring, even though the distance is greater.

The direct path from the Newfoundland coast near St. John's to western Ireland is as short as 3100 km. It is too long for a single sporadic-E hop, although such distances have been spanned on 144 MHz E_s often enough in Europe and the US to make it an attractive and practical possibility.

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Table 1

Claimed North American Distance Records

(Compiled by Al Ward, W5LUA)

Frequency and Mode*	*Distance (km)*	***Stations (grid locators)***		*Date*
144 MHz				
Aurora	2167	WB0DRL (EM18ct)	KA1ZE (FN31tu)	1986 Feb 8
Auroral-E	2236	VE4AQ (EN19lu)	K5MA (FN41qo)	1991 June 9
FAI	2370	KX0O (DM78pu)	WA4CHA (EL88qa)	1993 Jun 19
IFS	2856*	K5JL (EM15dp)	VE1ALQ (FN65nh)	1999 Nov 8
Meteors	3154	K5UR (EM35wa)	KP4EKG (FK68vg)	1985 Dec 13
Sporadic E	3635	WA7GSK (DN13so)	W4FF (EL96am)	1998 May 29
TE	6328	KP4EOR (FK78aj)	LU5DJZ (GF11lu)	1978 Feb 12
Tropo (A)	2365	W1JSM (FN43nc)	VP5D (FL31ut)	1988 May 10
Tropo (C)	2714	WB4MJE (EL94hq)	VE1KG (FN84cm)	1994 Nov 5
Tropo (P)	4333	KH6HME (BK29go)	W7FI (CN87ws)	1995 Jul 1
222 MHz				
Aurora	2088	WB5LUA (EM13qc)	WC2K (FM29pt)	1989 Mar 13
Meteors	2102	W7XU (EN13lm)	K1WHS (FN34mj)	1998 Aug 13
Sporadic E	2195*	W6QIW (DM04ck)	W5UWB (EL17ax)	2000 Feb 14
TE	5905	KP4EOR (FK78aj)	LU7DJZ (GF05rj)	1983 Mar 9
Tropo (A)	1854	WA4LOX (EL87sk)	WP4O (FK68km)	1998 Feb 26
Tropo (C)	2167	W5UWB (EL17ax)	K2YAZ (EN74ax)	1998 Oct 11
Tropo (P)	4142	KH6HME (BK29go)	XE2/N6XQ (DL29cx)	1989 Jul 15
432 MHz				
Aurora	1902	WB5LUA (EM13qc)	W3IP (FM19pd)	1986 Feb 8
Meteors	2040	N6RMJ (DM14cp)	W7XU (EN13lm)	1998 Nov 17
Tropo (A)	2273	W1RIL (FN42ah)	VP5D (FL31ut)	1988 May 10
Tropo (C)	2204	KM1H (FN42hr)	WB4MJE (EL94hq)	1992 Dec 16
Tropo (P)	4142	KH6HME (BK29go)	XE2/N6XQ (DL29cx)	1989 Jul 15
903 MHz				
Aurora	87	K3HZO (FM18qp)	WA3NZL (FM19jg)	1991 Nov 8
Tropo (C)	1741	N5WS (EL09ru)	K0VXM (EL98pj)	1998 May 22
Tropo (P)	4061	KH6HME (BK29go)	N6XQ (DM12jr)	1994 Jul 13
1296 MHz				
Tropo (C)	2071	KD5RO (EM13pa)	WB3CZG (FN21ax)	1986 Nov 29
Tropo (P)	4142	KH6HME (BK29go)	XE2/N6XQ (DL29cx)	1989 Jul 15
2304 MHz				
Tropo (C)	1553*	K5VH (EM00xe)	KB4DFO (EL89xc)	2000 Jan 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DM03tr)	1994 Jul 14
3456 MHz				
Tropo (C)	1352	WB5LUA (EM13qc)	WA0BWE (EN34lx)	1995 Jul 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DM03tr)	1991 Jul 28
5760 MHz				
Tropo (C)	1187	WB5LUA (EM13qc)	W9ZIH (EN51nv)	1994 Nov 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DM03tr)	1991 Jul 29
10 GHz				
Tropo (C)	1124	XE2/N6XQ (DL27qo)	WB6CWN (CM96qi)	1994 Aug 25
24 GHz				
Tropo (C)	267	WA6EXV (DM06wl)	K6OW (DM14kf)	1997 Jul 5
47 GHz				
Tropo (C)	135*	W0EOM/6 (CM88wj)	KF6KVG (CM97ae)	1999 Dec 8
75 GHz				
	110*	K2AD (EM96ur)	W2SZ (FM07fm)	1999 May 20
120 GHz				
Tropo	11.7*	KF6KVG/6 (CM87uk)	W0EOM/6 (CM87wj)	1999 Oct 19
142 GHz				
Tropo	11.7*	KF6KVG/6 (CM87uk)	W0EOM/6 (CM87wj)	1999 Aug 18
241 GHz		None reported		
Micrometer Radio		None reported		
Light				
678 THz	248	WA7LYI (DM34tf)	KY7B (DM42ok)	1991 Jun 8

*Frequency bands include Micrometer Radio (300 to 3000 GHz) and Light (3 to 30,000 THz). Propagation modes are tropospheric refraction and ducting (including line-of-sight paths), divided into in three categories: Tropo (A) (tropospheric modes across the Atlantic, Caribbean and Gulf of Mexico); Tropo (C) (tropospheric modes across continental North America; Tropo (P) (tropospheric modes across the Pacific); Aurora (auroral scatter); Auroral E (auroral E); Sporadic E (sporadic E); FAI (E-layer field-aligned irregularities); IFS (ionospheric forward scatter); Meteors (meteor scatter); TE (transequatorial field-aligned irregularities); and Rain scatter (precipitation scatter). Distance calculations for 120 and 145 GHz are based on actual latitude and longitude of both stations. All other records are based on the centers of six-place grid locators, as calculated by BD (the W3IP bearing and distance program).

Tropospheric ducting over such a distance is not likely at such a northerly latitude, but it is still a possibility.

The best chance may actually be via auroral E, which is a near-nightly occurrence in the auroral zone. The north Atlantic path crosses just south of the auroral zone, so it would not take much of a geomagnetic disturbance to expand the zone of auroral E into the right position. Experiences across Canada suggest auroral E commonly creates paths of up to 2000 km on 144 MHz.

It is not clear whether the longer distances of 2000 to 5000 km reported often enough via 50 MHz auroral E are possible at 144 MHz, but this is certainly a good possibility. Auroral E also has the advantage of being more predictable than other modes. High geomagnetic activity can provide warning. The presence of 50 MHz auroral E signals from Greenland and Iceland beacons would be reassuring signs. Auroral E generally persists for some hours, so auroral-E contacts need not be a matter of chance.

ON THE BANDS

Undoubtedly, the best place to be in the US for VHF during February was in the Southwest. Six-meter operators from Southern California to south Texas and north to Oklahoma had virtually the only 6-meter DX in the nation. Three days of sporadic E, primarily over the same region, provided some additional interest on 6 meters. The E-skip opening between Southern California and Texas on the 14th provided some real excitement. The MUF reached 144 MHz for about 20 minutes and peaked above 222 MHz for five minutes. One weak aurora across the northern tier of states and adjacent Canada rounded out the month's offerings. Dates and times are all in Universal Coordinated Time (UTC).

Six-Meter DX

Activity picked up a bit during February over the easier north-south transequatorial paths and east-west paths adjacent to the equator. Some of the most interesting contacts of the month took place between February 12 and 14, when the geomagnetic field was at storm levels.

Central and South America

Stations widely scattered throughout the southwestern US, including K6LMN, N6JV, K7ICW, K5SW and N0LL heard HC, HC8 and TI beacons after 1800 on February 7, but only HC8N was on the air making two-way contacts. K5SW heard HC8GR/b again on the afternoon of the 13th.

Ed Rodriguez, WP4O, had a busy time, despite the so-so conditions. He worked into Argentina, Uruguay or Brazil on at least a half dozen afternoons, probably via transequatorial field-aligned irregularities. On the 25th and 27th, he also made a few brief 144-MHz contacts with LU and CX stations via the same mode. Continental US stations had a tougher time. K2RTH/4 (EL95) worked several LU and CX stations via TE on February 25 and K0GU (DN70) did the same two days later, probably via a sporadic-E link.

There were a small number of contacts

from South America to southwestern Europe on a half-dozen afternoons during the second half of the month, mostly LU, CX and PY to EH and EH8, according to Nestor Zucchi, LW5EJU and others. Highlights included ZP5RPO to EH and EH8 and PY2XB to 9H1AW on February 18. CE3SAD had a QSO with EH7KW on the 21st, for his first ever European. LW5EJU worked CN8LI on the 22nd and IK5RLP on the 26th. WP4O found EH7KW on the 15th and both WP4O and KP4EIT made a weak skewed scatter-path contact with EH3ADW on the 26th.

The Pacific

US stations from Southern California to south Texas, including K6LMN, K7JA/6 and W5UWB worked New Zealand on the afternoons of February 7, 8 and 13. K5CM and K5SW, both in eastern Oklahoma, caught up with the ZLs on the 13th. It was the first time K5SW had worked New Zealand since the last cycle. Roman Flores, XE2EED, also worked New Zealand on the eighth and found a half dozen Australians on the 14th. K7JA/6 was surprised to work VK4FNQ after 0702 the same day—that is after 11:00 PM local time!

Perhaps the most unusual contacts from the US across the Pacific were made on February 13. "Smitty" Smith, W4UDH (EM52) in Mississippi, and others in the southerly EM grids worked YJ8UU in Vanuatu after 0150. Three hours later, VP6BR on Pitcarin Island hooked up with HK3YK and possibly others in Panama and Mexico. VP6BR made a greater stir on February 16 around 2340 when he worked EH7KW and EH8BPX.

Japanese operators made some impressive contacts during the month, according to Hatsuo Yoshida, JA1VOK. Highlights are summarized in Table 2.

7J6CCU started the February 28 excitement between 0025 and 0035, when he worked CT3HF and EH8BYR via the long path. Other Japanese stations quickly made the grade as well for the first-ever series of JA-EH8 contacts. LW5EJU found CE0Y/UA6AF on Easter Island at 0058 and then JH7MSB at 0137.

Africa and the Indian Ocean

Stations widely scattered throughout the Mediterranean basin, along with a few others as far north as Germany, worked into southern Africa and adjacent Indian Ocean on several days of the month. Prominent among the African and Indian Ocean calls were 5H3US, 8Q7QQ, FR1AN, V51KC, Z21FO, Z22JE and many ZS stations.

Sporadic E

There were 6-meter sporadic-E openings across the US only on February 12-13, 13-14 and15. Even so, three openings is above average for the month—statistically one of the poorest of the year. Much of the central part of the country was saturated with strong 6-meter E skip between 2200 and 0300 over February 12-13. John Butrovich, W5UWB (EL17) in south Texas, worked widely scattered stations from Idaho to South Dakota, south to Tennessee and Missouri, and as close as Kansas. Roger Wagner, K6LMN, also reported that paths got very short between south Texas and Arizona, but no 2-meter contacts resulted.

The openings the next afternoon also covered large area. Larry Lambert, N0LL, in central Kansas ran W2, 3 and 8 call-area stations after 2150 on February 13 for nearly an hour. Jim Stewart, WA4MVI worked into Louisiana from his South Carolina location. Pat Dyer, WA5IYX, and others in south Texas found many strong stations from Southern California and Mexico. On the 15th, the action shifted to the Pacific Northwest and south to Southern California.

Although these 6-meter openings were the usual single-hop affairs, the February 13-14 event would have been exceptional whenever it took place. WA5IYX (EL09) watched the MUF move through the lower TV channels and into the FM band after 0000 on the 14th. Then at about 0130, the MUF shot through 144 MHz. For 20 minutes, WA5IYX, W5UWB, KM5RG and at least half a dozen others in south Texas found K7JA/6, WB6NOA and several more Californians on 2 meters.

W5UWB topped off this excitement with two exceptional 222 MHz contacts. After a quick 144 MHz contact with N6HKF (DM13), the pair completed at 0135 on 222 MHz. This was surely a 222-MHz E-skip record, but it lasted no more than five minutes. At 0140, W5UWB duplicated the feat with W6QIW (DM04) over a 2195 km path for a new 222 MHz sporadic-E record. An attempt to make it with K6IBY (DM13) around 0138 failed due to QRM.

Table 2
Japanese 6-Meter DX "Bests" during February

Date	*Time*	*Japan*	*DX*
9	1329	JA1VOK	VK9CO
12	0345	JA3EGE	CX4AAJ
13	0805-0830	JA5, 6, JR6	8Q7QQ
13	1035-1040	JR6	A45ZN
14	0028-0034	JA1VOK	KH6
17	1430-1500	JA (many)	VQ9QM
19	0813	JA1VOK	UN3G
20	0949	JR6	Z22JE
21	1137-1200	JR6	FR1AN

Aurora

The geomagnetic field reached storm conditions on several days during February, but rarely during the late afternoon times that are prime time for aurora over North America. Only the aurora on the evening of February 12 (0045 to 0300) produced significant propagation. John Feltz, W9JN (EN54), made 36 QSOs on 50, 144 and 222 MHz, but all were limited to latitudes north of EN50 in northern Illinois. KM0T (EN13) hooked up with N7EIJ (DN17) for a 1700-km contact on 144 MHz, but this too was at a relatively high latitude.

NOTES FROM ALL OVER

EME From the Polar Regions

Kimio Maegawa (JA9BOH) operated 2-meter EME as 8J1RL from Showa Station, Antarctica, between last October and January. Despite the obvious difficulties of his location, Kimio completed 59 QSOs with 49 different stations. He used an FT-736 as the basic rig, a brick amplifier at relatively low power and various two-Yagi arrays.

Not surprisingly, many of the 2-meter EME big guns were among the first 10 in his log, including W5UN, KB8RQ, SM2CEW, SM5BSZ, I2FAK, HB9Q and SM7BAE. Many of his QSOs were made in response to CQs. Kimio provided many with a new country and a new continent, but he was not the first to operate 2-meter EME from Antarctica. K6MYC operated from an American base during December 1994.

More polar EME activity is planned for early June. A group of 25 Danish operators plan to operate OX2K from Greenland between May 29 and June 6. They will be on 144, 432 and 1296 EME, as well as 6 meters and the HF bands. The 144 and 432 MHz EME stations will run 1500 W into arrays of four long Yagis each. On 1296 MHz, the group hopes to use an existing huge dish, which it must share with other services. Look for more information at **www.qsl.net/ox2k**.

Getting Started on 47 GHz

Are you ready for the 6-mm band? The Radio Society of Great Britain Microwave Newsletter recommends several Web pages with 47-GHz information. Check out **www.g3pho.free-online.co.uk**, **www.geocities.com/SiliconValley/Vista/8063** and **http://www.mm-wave.demon.co.uk/radio.htm**.

VHF/UHF/MICROWAVE NEWS

High-Speed Meteor-Scatter Contest

Steve Harrison, K0XP/1, announces the Third Annual North American HSMS Contest, which runs the entire UTC days of April 29 through May 7. The minor eta Aquarids meteor shower occurs during this time. Operate a maximum of 48 hours in 30-minute minimum blocks. Listening time counts as operating. Make contacts on any band above 50 MHz using CW speeds of at least 99 WPM. Scoring and other rules are a bit complicated, so send an e-mail to Steve at **ko0u@os.com** and view log and summary sheets at **www.qsl.net/n7stu/hscw.html**.

CQ Spring VHF Activity Weekends

CQ magazine (which absorbed *CQ-VHF* this past January) sponsors three different VHF activity weekends based on transmission modes. April 28-30 is devoted to CW, SSB and all digital modes that occupy no greater bandwidth than an SSB signal. May 19 to 21 is for video, RTTY, AMTOR, packet and other wide-band digital modes. (News of the March 17-19 FM activity weekend arrived too late for the March column.)

Each weekend is divided into nine six-hour periods beginning 6:00 PM Friday and ending midnight Sunday local time. Work a station once per band (regardless of transmission mode) during each time period, for a maximum of nine times. Satellite contacts are permitted during the April 28-30 weekend. For further details on scoring, entry classifications and other rules, see *CQ* for February. QST

Okay in My Log

By Vic Curtis, WA3YUV
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My April *QST* arrived and, as I have for the past 20 years or so, I went right for the technical articles and Section News. Then I remembered it was the April issue, so I went looking for the goofs and spoofs. I found myself reading Correspondence and thought for sure I found one. As I read it and re-read it I came to the sad conclusion that the item was for real. I am referring to W7YV's frigid "welcome" to any newly upgraded Amateur Extra operators who have the misfortune to find themselves in his presence.

I was first licensed in the mid '70s and remember the "If we let them use a VFO they will be all over the place" attitude. (Novices had just been freed from the shackles of crystal frequency control and were intoxicated with the joy of simply twisting a VFO knob to shift frequencies.) I also had the distinction of having the scarlet "N" in my call, announcing to the whole world I was a lowly Novice. I was just 16, proud of what I had done and excited about talking to other people on the other side of the Earth. I *earned* my ticket in the shack of a kind man named Johnny. I was just a kid of 16 and never called a grown man by his first name in my life until Johnny told me it was okay because we were both OMs. He was from the old make-your-own condensers-and-rewind-your-dial-cord-when-needs-it school. I learned Morse five letters at a time every Saturday morning for what seemed like years. I learned what an end-fed Zepp was. And best of all, I learned from Johnny how to be an Amateur Radio operator.

I never did learn to copy 45 words per minute in my head like he could. Johnny never did learn how to boot a computer using paper tape like I did. He passed away the year I got my Technician ticket. I thanked him silently the day I passed my Advanced, the same license class he held. He never did get his Amateur Extra and I never knew why. He was an engineer for RCA for years, so I know he was technically savvy. I saw him laugh at jokes on 40 meters told at 40 words per minute, so it wasn't the code, either. I remember the first *ARRL Handbook* he gave me. It was well used and dog eared. He told me to read a particular page until it was well impressed on my memory. I did…and here is what it said:

The Radio Amateur is:

CONSIDERATE…never knowingly operates in such a way to lessen the pleasure of others.

LOYAL…offers loyalty, encouragement and support to other amateurs, local clubs. And the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE…with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY…slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interest of others. These are the hall marks of the Amateur spirit.

BALANCED…radio is an avocation, never interfering with duties owed to family, job, school or community.

PATRIOTIC…station and skills always ready for service to country and community.

These were the words of Paul Segal as they appeared in the *Radio Amateur's Code*, written in 1928.

I have been teaching radio classes for the club I belong to for more years than I care to remember. I make sure each one of my students gets a copy of the code and I read it to them. I am not saying these are the six commandments of Amateur Radio, but they aren't a bad start.

Radio spectrum is a precious, finite resource we must share. There have been a lot of changes in they way we (and the FCC) define ourselves and our role in the use of this resource. Harsh words and acrimony will only undermine our ability to justify our privileges in the years to come. Paul Segal and Johnny both understood this.

My son, KB3BTD, just passed his Technician exam. The future of our hobby rests in his hands, and in the hands of all the other new amateurs and upgrades. What sort of "welcome" will they receive? Will they find kind, patient operators who still adhere to the Radio Amateur's Code? For all our sakes, I hope so.

Five word-per-minute code testing is here to stay. It is time to come to grips with reality and move on. Let's not give the new guys the "scarlet 5." If someone loves radio enough to take the time to get a license, they are okay in my log! QST

QST Op-Ed Policy

The purpose of Op-Ed is to air member viewpoints that may or may not be consistent with current ARRL policy.

1) Contributions may be up to two-thirds of a *QST* page in length (approximately 900 words).

2) No payment will be made to contributors.

3) Any factual assertions must be supported by references, which do not necessarily have to be included in the body of the article to be published.

4) Articles containing statements that could be construed as libel or slander will not be accepted.

5) The subject matter chosen must be of general interest to radio amateurs, and must be discussed in a way that will be understandable to a significant portion of the membership.

6) With the exception that the article need not be consistent with League policy, the article will be subject to the usual editorial review prior to acceptance.

7) No guarantee can be made that an accepted article will be published by a certain date, or indeed, that it will be published at all; however, only articles that we intend to publish will be accepted, and any article we have decided against publishing will be returned promptly.

8) Send your contributions to ARRL Op-Ed, 225 Main St, Newington, CT 06111

STRAYS

A TREASURE FROM THE PAST

◊ Many hams boast of still owning their first radios, but how many can make that claim at age 96? Reginald Hoskin Sr, W7ROL, of Four Lakes, Washington was originally licensed in 1919 and crafted this spark-gap transceiver from a Ford Model T coil, a Murdock gap and other components. It still graces his shack, 81 years later.

Next Stray

By Dan Henderson, N1ND
Contest Branch Manager

1999 ARRL International EME Competition Results

(with apologies to *Dragnet*)

The stories you are about to read are true. None of the callsigns have been changed, because no one is innocent…

They were working the Moonrise/Moonset shifts the weekends of October 30-31, 1999 and November 27-28, 1999 during the 1999 ARRL International EME Competition. All of the usual suspects were present, along with many new operators anxious to test their capabilities at what may be the greatest challenge in Amateur Radio. When the last echo had faded, the paperwork began.

It's hard to imagine the detective work required to amass 2,763,000 points during a moonbounce contest. However, Gerald, K5GW, had done his homework and reported in with an effort that clearly outpaced the competition. Surely very few stations were not "investigated" by Gerald during the contest. He turned in a Single Operator, Multi-Band effort of 307 QSOs and 90 multipliers total from the 144, 432 and 1296 MHz bands. Our 1998 champion Ernst, OE5EYM, scanned the ether for 1,502,300 points to earn runner-up honors in this category in 1999.

We knew that 1998 top 144 MHz Single Op sleuths would be in a heated contest to show who was still the "ace detective" on that band. Torbjorn, SM5FRH, regained the crown that Dave, W5UN, had taken from him as he edged out his chief rival by a score of 1,920,000 to 1,711,000. Leif, SM5BSZ, was once again in hot pursuit, again finishing in third place.

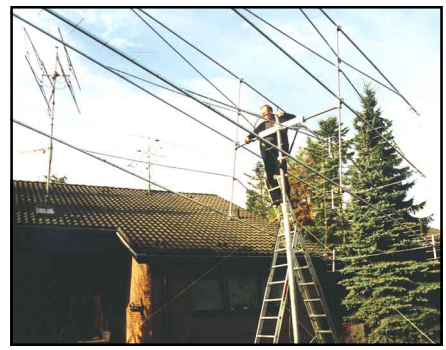
Down in the 432 MHz precinct, Jan, DL9KR, continued to lead the way for a seasoned band of 70-cm enthusiasts. Steve, K1FO, jumped from fourth to second place in this hotly contested category. K5JL continued to show why he is the "precinct captain" down in the 1296-MHz area with another outstanding win. There was some shuffling among the places, but any who tried to hide their signals while operating in the 1296-MHz range was sure to be spotted by several of the "sleuths" patrolling an increasingly popular beat.

While some outstanding detectives work well alone, many others pool their expertise and band together to share information and talent. After finishing a very respectable second in the Multi-Operator Multi-Band category in 1998, the JL1ZCG team that included JH1DYV, JR4ENY and JE8IVF, finished as the top team in that category in 1999.

The Multi-Op single band patrols produced few surprises. KB8RQ, with his talented sidekick N8DFN, led the way in 144 MHz. With a little shuffling of the final order of finish, the 1998 runners-up—the teams of IK3MAC, F5VS and HB9Q—all finished in close order behind KB8RQ. Another veteran crew at OH2PO duplicated

Is OK1DFC demonstrating his "armstrong" antenna rotation system on this 1296 MHz dish?

The secret to SM5FRH's success? He has lots of "moose power" at his station.



DJ3FI makes adjustments to his 6 x 36 element 70-cm array.

OZ6OL operating his homebrew transceiver during the EME contest.

their 432 MHz triumph of the previous year while the seasoned crew at ON5RR nabbed the top spot on 1296 MHz, up from their third place finish of 1998. Special congratulations to the team at OK1KIR who managed to snare three QSOs on 5760 MHz during the contest.

So roll call at the EME Competition was complete with several hundred officers reporting in from various precincts. All took great care in trying to dig out the evidence of completed QSOs on what is a very difficult "case" to be assigned. Rookies to the event learned new ways to patrol the beat. Judging from the number of QSOs reported, interest in this type operation is on the increase.

DL7MAT operating at DL5MAE.

No arrests will be made from among the suspects, but all of the participants are to be commended for outstanding efforts at plying the tools of the trade to make this another successful event. Come this fall, the "Old Man" will send out the word that the sleuths of the EME beat are to assemble and track down the faint signals. Watch for the announcement in September's *QST*. Until then, "let's be careful out there."

Scores

Each line score lists call sign, score, stations worked, multipliers, and band (A= 50 MHz, B = 144 MHz, C = 222 MHz, D = 432 MHz, 9 = 902 MHz, E = 1296 MHz, F = 2304 MHz, I = 10 GHz).

Single Operator, Multiband

K5GW	2,763,000	212	50	B
	88	34		D
	7	6		E
OE5EYM	1,502,300	80	33	B
	54	24		D
	47	26		E
N2IQU	1,008,000	101	36	D
	59	27		E
OZ4MM	942,400	91	33	D
	60	28		E
	1	1		F
SM3AKW	509,600	4	4	B
	44	22		D
	50	26		E
VE1ALQ	434,000	1	1	B
	27	25		D
	40	34		E
	2	2		H
DK3WG	427,200	39	24	B
	50	24		D
CT1DMK	424,000	35	21	B
	20	13		D
	25	19		E
G3LTF	394,800	46	24	D
	36	21		E
	2	2		F
EA3DXU	344,000	47	24	B
	33	19		D
KD4LT	290,400	36	21	D
	30	23		E
OZ6OL	287,000	31	18	D
	39	23		E
HA1YA	210,000	6	6	B
	54	29		D
OH2DG	187,200	25	16	D
	26	19		E
	1	1		F
VE6TA	176,000	38	20	D
	17	12		E
JA5NNS	143,100	9	6	B
	44	21		D
W7SZ	128,000	23	18	D
	17	14		E
YO2IS	114,800	23	16	B
	18	12		D
W5LUA	112,000	32	20	E
	2	2		F
	2	2		H
	4	4		I
W4AD	105,600	36	19	B
	8	5		E
S51ZO	62,000	17	10	B
	14	10		D
WB0GGM	56,000	18	13	B
	10	7		D
N3FA	43,700	17	14	B
	6	5		D
JH0WJF	35,200	13	8	B
	9	8		D
W7GJ	24,000	2	2	A
	18	10		B
JA4BLC	18,200	2	2	B
	5	4		D
	6	6		E
	1	1		F
JH0BBE	1,600	1	1	B
	3	3		D

Single Operator, 144 MHz

SM5FRH	1,920,000	320	60	B
W5UN	1,711,000	290	59	B
SM5BSZ	1,026,000	190	54	B
I2FAK	798,700	163	49	B
VE3KH	733,200	156	47	B
OZ1HNE	629,800	134	47	B
IK1FJI	544,500	121	45	B
W0HP	479,600	109	44	B
DL5MAE	473,000	110	43	B
SM7SJR	459,200	112	41	B
PA2CHR	450,000	100	45	B
LZ2US	449,400	107	42	B
G3ZIG	417,300	107	39	B
7K3LGC	331,200	92	36	B
K6MYC	291,600	81	36	B
K1CA	248,500	71	35	B
F6BSJ	234,500	67	35	B
DK9ZY	231,000	77	30	B
K0FF	223,200	72	31	B
K5AIH	217,600	64	34	B
N2WK	201,300	61	33	B
EA2AGZ	176,000	55	32	B
EA6VQ	155,000	50	31	B
IV3GBO	132,600	51	26	B
DL2MHS	126,900	47	27	B
W0PT	124,000	40	31	B
PE1OGF	117,500	47	25	B
S52LM	110,400	46	24	B
JA6AHB	110,400	46	24	B
SM2BYA	107,500	43	25	B
JH5FPQ	101,200	44	23	B
SM5CFS	94,300	41	23	B
DL7MAT	86,400	36	24	B
JH2COZ	70,300	37	19	B
LA9NEA	68,000	40	17	B
SP7DCS	66,000	33	20	B
SV1BTR	65,100	31	21	B
WB4JEM	62,700	33	19	B
I2RV	62,000	31	20	B
9A9B	58,900	31	19	B
UA4AAV	57,000	30	19	B
WA1JOF	57,000	30	19	B
PA3CWI	56,000	28	20	B
W0VD	51,300	27	19	B
WA6PY	48,600	27	18	B
DL2IAN	44,800	28	16	B
PE1LWT	44,200	26	17	B
I1ANP	40,000	25	16	B
F9HS	38,400	24	16	B
W6OMF	35,700	21	17	B
J6/K6MYC	34,500	23	15	B
W3SZ	32,200	23	14	B
K7YVZ	32,200	23	14	B
S51UE	29,400	21	14	B
SP2JXN	28,600	22	13	B
JR3REX	24,000	20	12	B
VK3CY	23,400	18	13	B
EA1ABZ	22,100	17	13	B
DL2OM	22,100	17	13	B
N0AKC	22,000	20	11	B
KV6J	20,800	16	13	B
YO2AMU	19,800	18	11	B
WA3BZT	18,000	15	12	B
DJ3MY	18,000	15	12	B
I3EVK	15,000	15	10	B
JH0ISW	13,000	13	10	B
F8DO	12,800	16	8	B
SM4HFI	12,000	12	10	B
JK1HIX	11,700	13	9	B
W0EKZ	11,700	13	9	B
K7MAC	11,000	11	10	B
SV4BGY	10,800	12	9	B
YO2II	9,100	13	7	B
N1RWY	7,000	10	7	B
JR5JXV	6,300	9	7	B
UA3DJG	6,000	10	6	B
W7OE	5,400	9	6	B
8J1RL (JA9BOH, op)	4,200	7	6	B
JA8LLE	2,500	5	5	B
W9JN	2,000	5	4	B
W5UWB	1,800	6	3	B
VE3EQQ	1,600	4	4	B
N6ZE	1,600	4	4	B
F6CRP	1,200	4	3	B
W3EP/1	1,200	4	3	B
G4DOL	900	3	3	B
K6AAW	900	3	3	B
EA1BFZ	900	3	3	B
JF4TGD/8	400	2	2	B
W4LNG	400	2	2	B
AL7EB	400	2	2	B
WB0OAJ	400	2	2	B
LY2SA	400	2	2	B
SM0NKZ	400	2	2	B
DK5YA	100	1	1	B
7J7ADB (KG6DX, op)	100	1	1	B
AC3A	100	1	1	B
PA3BUT	100	1	1	B

Single Operator, 432 MHz

DL9KR	413,000	118	35	D
K1FO	392,000	112	35	D
DL9NDD	367,200	108	34	D
DF3RU	339,900	103	33	D
N9AB	313,500	95	33	D
K0RZ	234,000	78	30	D
DL4MEA	229,400	74	31	D
DJ6MB	226,200	78	29	D
G3SEK	222,000	74	30	D
ON5OF	137,500	55	25	D
ON4KNG	98,900	43	23	D
K5WXN	92,400	44	21	D
7M2PDT	88,000	44	20	D
G4ERG	69,300	33	21	D
JH4JLV	68,400	36	19	D
DL1YMK	51,200	32	16	D
W8MQW	51,000	30	17	D
S52CW	38,400	24	16	D
DL3EAG	25,200	21	12	D
DK3FB	23,100	21	11	D
UT3LL	22,400	16	14	D
JJ1NNJ	21,600	18	12	D
IK5WJD	21,600	18	12	D
IK5QLO	20,800	16	13	D
JA2TY	16,500	15	11	D
JR1RCH	6,300	9	7	D
KB0VUK	3,000	6	5	D
JH1EFA	1,600	4	4	D
K6JEY	400	2	2	D

Single Operator, 1296 MHz

K5JL	247,500	75	33	E
K4QI	195,000	65	30	E
HB9BBD	191,400	66	29	E
F5PAU	167,400	54	31	E
OH2AXH	162,400	58	28	E
K2DH	140,000	50	28	E
W2UHI	135,200	52	26	E
EA3UM	112,800	47	24	E
DJ5MN	110,000	44	25	E
OK1DFC	98,800	38	26	E
K3HZO	96,000	40	24	E
JH5LUZ	71,400	34	21	E
JA6CZD	64,000	32	20	E
DH9FAG	54,600	26	21	E
W3XS	47,600	28	17	E
WA4OFS	19,200	16	12	E
W7QX	13,000	13	10	E
WD5AGO	12,000	12	10	E
JF3HUC	200	2	1	E

Multioperator, Multiband

JL1ZCG (JH1DYV, JR4ENY, JE8IVF, ops)				
	1,088,000	102	38	B
		68	26	D
W6TE (+WA6LUT)				
	16,500	14	10	B
		1	1	D

Multioperator, 144 MHz

KB8RQ (+N8DFN)				
	1,563,500	265	59	B
IK3MAC (+I3YXQ)				
	1,339,200	248	54	B
F3VS (+F8PKC, F5JTA)				
	1,276,000	232	55	B
HB9Q (HB9CRQ, HB9DBM, ops)				
	697,500	155	45	B
R1MVZ (RU1AA, RN1AM,ops)				
	444,600	117	38	B
S53J (S57EA, S53OQ, S56TZJ, ops)				
	115,000	46	25	B
VE2JWH (+VE2GUQ, VE2AAY, VE2SMG)				
	67,200	32	21	B
F1DDG (+F6HEO)				
	30,000	20	15	B
HB9MS (HB9OCW, HB9SUL, ops)				
	16,500	15	11	B
KK5IH (+KK5KK)				
	4,800	8	6	B
W6YX (W6QI, AD6FP, ops)				
	3,000	6	5	B

Multioperator, 432 MHz

OH2PO (+OH6DD)				
	414,800	122	34	D
F5FLN (+F6IRA, F5FVP, F6ARU)				
	171,600	66	26	D
DJ3FI (+DL1EJA)				
	42,000	28	15	D
F1CH (+F5SDD, F5IVP)				
	32,400	18	18	D
DK0MM (DL4ZAG, DL2FCN,ops)				
	2,800	7	4	D

Multioperator, 1296 MHz

ON5RR (+ON7EH)				
	81,400	37	22	E
WA9OUU (+WB8IFM, W8ULC, N8VZW, KB8UHY)				
	42,500	25	17	E
HA5SHF (+HA5BGL, HA5BMU)				
	16,800	14	12	E
KB4FEM (+W4JSS, N4SZ, KJ4X, KK4SO, N4AK, WA5AMM)				
	400	2	2	E

Multioperator, 5760 MHz

OK1KIR (+OK1DAI, OK1DAK)				
	600	3	2	H

2000 ARRL June VHF QSO Party Rules

By Dan Henderson, N1ND
Contest Branch Manager

1. Object: To work as many amateur stations in as many different 2° × 1° grid squares as possible using authorized frequencies above 50 MHz. Foreign stations work W/VE amateurs only.

2. Date and Contest Period: The second full weekend in June. Begins 1800 UTC Saturday, ends 0300 UTC Monday **(June 10–12, 2000).**

3. Entry Categories:

3.1. Single Operator. (See "General Rules for all ARRL Contests above 50 MHz" page 106 in the November 1999 issue of *QST* for new rules for this category.)

3.1.1. Low Power

3.1.2. High Power

3.2. Single Operator, QRP Portable.

3.3. Rover.

3.4. Multioperator.

3.5. Limited Multioperator.

4. Exchange: Grid-square locator (see April 1994 *QST*, p 86).

4.1. Exchange of signal report is optional.

5. Scoring:

5.1. QSO points:

5.1.1. Count one point for each complete 50- or 144-MHz QSO.

5.1.2. Count two points for each 222- or 432-MHz QSO.

5.1.3. Count three points for each 902- or 1296-MHz QSO.

5.1.4. Count four points for each 2.3 GHz (or higher) QSO.

5.2. Multiplier: The total number of different grid squares worked per band. Each 2° × 1° grid square counts as one multiplier on each band it is worked.

5.3. Final score: Multiply the total number of QSO points from all bands operated by the total number of multipliers for final score.

5.4. Rovers only: The final score consists of the total number of QSO points from all bands times the sum of unique multipliers (grid squares) worked per band (regardless of which grid square they were made in) plus one additional multiplier for every grid square from which they successfully completed a contact.

5.4.1. Rovers are listed in the contest score listings under the Division from which the most QSOs were made.

6. Reporting:

6.1. Electronic submissions may be e-mailed to JuneVHF@arrl.org. Hand written paper logs or diskettes should be mailed to June VHF, ARRL, 225 Main St, Newington, CT 06111.

6.2. Entries which have been electronically generated must submit their log file in acceptable ARRL file format. Paper print outs of electronic files are not acceptable substitutes.

6.3. Entries must be emailed or postmarked no later than July 12, 2000. Late logs will be designated as check-logs only.

7. Miscellaneous:

7.1. Stations may be worked for credit only once per band from any given grid square, regardless of mode. This does not prohibit working a station from more than one grid square with the same call sign (such as a Rover).

7.2. Only permitted one signal per band (6, 2, 1¼ meters, etc) at any given time is permitted, regardless of mode.

7.3. Multi-operator stations may not include QSOs with their own operators except on frequencies higher than 2.3 GHz. Even then, a complete, different station (transmitter, receiver and antenna) must exist for each QSO made under these conditions.

7.4. Forms may be obtained by:

7.4.1. Downloading from the Contest Branch Web site: **http://www.arrl.org/contests/forms**.

7.4.2. Sending an SASE to June VHF Form Request, ARRL, 225 Main St, Newington, CT 06111.

7.4.3. Send an e-mail request to: **info@arrl.org** with the text as follows:

HELP
SEND JUNEVHF.FRM
QUIT

8. Awards: Certificates will be awarded in the following categories:

8.1. Single operator.

8.1.1. Top single operator low and high power in each ARRL/RAC Section.

8.1.2. Top single operator low and high power on each band (50, 144, 222, 432, 902, 1296 and 2304-and-up categories) in each ARRL/RAC Section where significant effort or competition is evident. (Note: Since the highest score per band will be the award winner for that band, an entrant may win a certificate with additional single-band endorsements.) For example, if W1INF has the highest single-operator all-band score in the CT Section and his 50- and 222-MHz scores are higher than any other CT single operator's, he will earn a certificate for being the single-operator Section leader and endorsements for 50 and 222 MHz.

8.2. Top single-operator, QRP portable in each ARRL/RAC Section where significant effort or competition is evident. (Single-operator, QRP portable entries are not eligible for single-band awards.)

8.3. Top Rover in each ARRL Division and Canada where significant effort or competition is evident. (Rover entries are not eligible for single-band awards.)

8.4. Top multi-operator score in each ARRL/RAC Section where significant effort or competition is evident. (Multioperator entries are not eligible for single-band awards.)

8.5. Top limited multioperator in each ARRL/RAC Section where significant effort or competition is evident. (Limited multioperator entries are not eligible for single-band awards.)

8.6 Plaques, if sponsored, will be awarded in the following categories:

8.6.1. Top 10 Single Operator (both High and Low Power) scorers.

8.6.2. Top 5 Single Operator QRP Portable scorers.

8.6.3. Top 5 Rover scorers.

8.6.4. Top 10 Multi-Operator scorers.

8.6.5. Top 5 Limited Multi-Operator scorers.

9. Other:

9.1 See "General Rules for All ARRL Contests" page 101 and "General Rules for ARRL Contests on bands above 50 MHz (VHF)" page 106 in the November 1999 *QST*.

9.2. For more information e-mail **N1ND @arrl.org** or call 860-594-0232. QST

A More Level Playing Field for Single-Operator Stations

Effective January 1, 2000, designated ARRL VHF contests (such as the June VHF QSO Party) have broken down the Single Operator category into two power levels: Single Op Low Power and Single Op High Power. The idea is to encourage more activity among lower-power stations. Now smaller stations can participate with the knowledge that their scores will be matched against similar operations, not against Big-Gun single ops using high-power amplifiers.

To qualify in the Single Op Low Power category, your output power must not exceed 200 W PEP on 50 and 144 MHz, 100 W PEP on 222 and 432 MHz and 10 W PEP on 902 MHz and higher. If your power exceeds these limits on any band, your entry category will be a Single Op High Power.

The key to a good score is to be active on as many bands as possible. The Technical Information Service has developed a Web resource with various hints and helpful information for VHF/UHF/microwave operating. Point your browser to: **http://www.arrl.org/tis/info/uhfmw.html** and open the door to more fun and challenges in VHF/UHF contesting.

2000 ARRL Field Day Rules

By Dan Henderson, N1ND
Contest Branch Manager

1. Eligibility: Field Day is open to all amateurs in the areas covered by the ARRL/RAC Field Organizations. DX stations may be contacted for credit, but are not eligible to compete.

2. Object: To work as many stations as possible on any and all amateur bands (excluding the 30, 17, and 12-meter bands) and in doing so to learn to operate in abnormal situations in less than optimal conditions. A premium is placed on developing skills to meet the challenges of emergency preparedness as well as to acquaint the general public with the capabilities of Amateur Radio.

3. Date and Time Period: Field Day is always the fourth full weekend of June, beginning at 1800 UTC Saturday and ending at 2100 UTC Sunday. **Field Day 2000 will be held June 24-25, 2000**.

3.1. Class A and B (see below) stations that do not begin setting up until 1800 UTC on Saturday may operate the entire Field Day period.

3.2. Stations who begin setting up before 1800 UTC Saturday may work only 24 consecutive hours, commencing when on-the-air operations begin.

3.3. No Class A or B station may begin their set-up earlier than 1800 UTC on the Friday preceding the contest period.

4. Entry Categories: Field Day entries are classified according to the maximum number of simultaneously transmitted signals, followed by a designator of the nature of their individual or group participation. Below 30 MHz, once a transmitter is used for a contact on a band, it must remain on that band for at least 15 minutes. During the period, the transmitter is considered to be transmitting, whether it is or not, for the purpose of determining transmitter classification. Switching devices are prohibited.

4.1. (Class A) Club/nonclub portable: Club groups (or a nonclub group with three or more licensed amateurs) set up specifically for Field Day. Such stations must be located in places that are not regular station locations and must not use facilities installed for permanent station use, nor any structure installed permanently for Field Day use. Stations must operate under one call sign (except if a dedicated Novice/Technician Plus station is allowed, it must be operated under a call sign as provided later in these rules), and under the control of a single licensee or trustee for the entry. All equipment (including antennas) must lie within a circle whose diameter does not exceed 300 meters (1000 feet). All contacts must be made with transmitter(s) and receiver(s) operating independent of commercial power mains. Entrants who for any reason operate a transmitter or receiver from a commercial main for one or more contacts will be listed separately.

4.1.1. Any Class A group whose entry classification is two or more transmitters may also operate one dedicated Novice/Technician Plus operating position without changing its basic entry category. This station must be operated under a callsign issued to a Novice/Technician Plus operator and may only make contacts within the Novice/Technician Plus HF subbands. It must abide by Novice/Technician Plus power and mode restrictions. This station may only be operated by Novice/Technician Plus licensees. For Field Day purposes only, any Canadian Amateur HF licensee who has been licensed for six months or less prior to Field Day, shall be considered a "Novice" to provide a means for Canadian Field Day Class A stations to employ this rule. This station does not qualify for a 100-point bonus as an additional transmitter.

4.1.2. Any Class A group whose entry category is two or more transmitters may also operate one additional transmitter if it operates exclusively on any bands or combination of bands above 50 MHz (VHF/UHF) without changing its basic entry classification. This station does not qualify for a 100-point bonus as an additional transmitter. This station may be operated for the entire Field Day period for the club and all contacts count for QSO credit.

4.2. (Class A—Battery) Club/non-club portable: Club groups (or nonclub groups with three or more licensed amateurs) set up specifically for Field Day, all contacts must be made using an output power of 5 W or less and the power source must be something other than commercial power mains or motor-driven generator (eg: batteries, solar cells, water-driven generator). Other provisions are the same for regular Class A.

4.3. (Class B) One or two person portable: Nonclub stations set up and operated for Field Day purposes by no more than two licensed amateurs. Other provisions are the same for Class A. One and two person Class B entries will be listed separately.

4.4. (Class B—Battery) One or two person portable: Non-club stations set up and operated by no more than two licensed amateurs. All contacts must be made using an output power of 5 W or less and the power source must be something other than commercial mains or motor-driven generator. Other provisions are the same as Class A. One and two person Class B—Battery entries will be listed separately.

4.5. (Class C) Mobile: Stations in vehicles capable of operating while in motion and normally operated in this manner. This includes maritime and aeronautical mobile.

4.6. (Class D) Home stations: Stations operating from permanent or licensed station locations using commercial power. Class D stations may only count contacts made with Class A, B, C and E Field Day stations.

4.7. (Class E) Home stations—Emergency power: Same as for class D, but using emergency power for transmitters and receivers. May work stations in Class A, B, C, D, and E.

5. Exchange: Stations in ARRL/RAC sections will exchange their Field Day operating Class and ARRL/RAC section. Example: a three transmitter class A station in Connecticut which also has a Novice/Tech station and one VHF station would send "3A CT" on CW or "3 Alpha Connecticut" on phone. Foreign stations send RS(T) and QTH.

6. Miscellaneous Rules:

6.1. A person who participates by making a QSO from a Field Day operation using one call sign may not subsequently work that station for QSO credit using a different callsign.

6.2. A station used to contact one or more Field Day stations may not subsequently be used under any other callsign to participate in Field Day. Family stations are exempt provided the subsequent callsign used is issued to and used by a different family member.

6.3. Each Phone, CW and Digital (non-CW) segment is considered a separate band. A station may only be worked once per band.

6.4. All voice contacts are equivalent.

6.5. Cross-band contacts are not permitted.

6.6. The use of more than one transmitter at the same time on a single band is prohibited. Exception: a dedicated Novice/Technician Plus station may operate in any Novice/Technician Plus sub-band.

6.7. No repeater contacts are allowed.

6.8. Batteries may be charged while in use. Except for Class D stations, the batteries must be charged from a power source other than commercial power mains.

7. Scoring: Scores are based on the total number of QSO points times the power multiplier corresponding to the highest power level under which any contact was made during the Field Day period plus the bonus points.

7.1. QSO Points

7.1.1. Phone contacts count one point each.

7.1.2. CW contacts count two points each.

7.1.3. Digital contacts count two points each.

7.2. Power multipliers: **The power multiplier that applies is determined by the highest power output of any of the transmitters used during the Field Day operation**.

7.2.1. If all contacts are made using a power of 5 W or less and if a power source other than commercial mains or motor-driven generator is used (batteries, solar cells, water-driven generator) the power multiplier is 5.

7.2.2. If all contacts are made using a power of 5 W or less, but the power source is from a commercial main or from a motor-driven generator, the power multiplier is 2.

7.2.3. If any or all contacts are made using an output power up to 150 W or less, the power multiplier is 2.

7.2.4. If any or all contacts are made using an output power greater than 150 W, the power multiplier is one.

7.2.5. Only one power multiplier may be applied to the score of any entry.

7.3. Bonus Points: The following bonus

points will be added to the score, after the multiplier is applied, to determine the final Field Day score. Only Class A and B stations are eligible for bonus points. Bonus points will only be applied if the claim is made on the summary sheet and any proof required is enclosed with the entry.

7.3.1. 100% Emergency Power: 100 points per transmitter classification if all contacts are made only using an emergency power source. Free transmitters that do not count towards the group's total do not qualify for bonus point credit. All transmitting equipment at the site must operate from a power source completely independent of the commercial power mains to qualify. (Example: a club operating 3 transmitters plus a Novice station and using 100% emergency power receives 300 bonus points.)

7.3.2. Media Publicity: 100 bonus points may be earned for attempting to obtain publicity from the local media. A copy of the press release, or a copy of the actual media publicity received (newspaper article, etc) must be submitted to claim the points.

7.3.3. 100 bonus points for physically locating the Field Day operation in a public place (shopping center, community park, school campus). The intent is for Amateur Radio to be on display to the public.

7.3.4. 100 bonus points for a public information table at the Field Day site. The purpose is to make appropriate handouts and information available to the visiting public at the site. Visitor logs, photos or copies of club handouts are sufficient evidence for claiming this bonus.

7.3.5. Message Origination: 100 bonus points for origination of a National Traffic System (NTS) style formal message to the ARRL Section Manager or Section Emergency Coordinator by your group from its site. You should include the club name, number of participants, Field Day location, and number of ARES operators involved with your station. The message must be transmitted during the Field Day period and a fully serviced copy of it must be included in your submission, in standard ARRL NTS format, or no credit will be given.

7.3.6. Message Relay: 10 points for each formal NTS style received and relayed during the Field Day period, up to a maximum of 100 points total. Properly serviced copies of each message must be included with the Field Day report.

7.3.7. Satellite QSO: 100 bonus points for successfully completing at least one QSO via an amateur radio satellite during the Field Day period. Under the "General Rules for All ARRL Contests" (rule 3.7.2.), the no-repeater QSO stipulation is waived for satellite QSOs. Groups are allowed one dedicated satellite transmitter station without increasing their entry category. Satellite QSOs also count for regular QSO credit. Show them listed separately on the summary sheet as a separate "band."

7.3.8. 100 bonus points for Field Day groups making a minimum of five QSOs without using power from commercial mains or a petroleum driven generator. This means an "alternate" energy source of power, such as solar, wind, methane or water. This includes batteries charged by natural means (not dry cells). The natural power transmitter counts as an additional transmitter. If you do not wish to it to increase your operating category, you should take one of your other transmitters off the air while the natural power transmitter is in operation. A separate list of natural power QSOs should be submitted with your entry.

7.3.9. 100 bonus points for copying the special Field Day bulletin transmitted by W1AW during its operating schedule during the Field Day weekend (listed in this rules announcement). An accurate copy of the message is required to be included in your Field Day submission. (Note: **The Field Day bulletin must be copied via Amateur Radio. It will not be included in Internet bulletins sent from Headquarters and will not be posted to Internet BBS sites.)**

7.3.10. 100 bonus points for setting up a demonstration of a nontraditional mode of Amateur Radio communications. This includes modes such as APRS, ATV, and SSTV. This bonus is not available for demonstration of a mode for which regular QSO credit is available (such as packet, PSK31, or other digital modes.)

8. Reporting:

8.1. **Entries must be postmarked or emailed by July 24, 2000**. No late entries can be accepted. A complete entry consists of:

8.1.1. An official ARRL summary sheet (or reasonable facsimile) which is completely and accurately filled out;

8.1.2. A list of stations worked by band/mode during the Field Day period (dupe sheet or an alpha/numeric list sorted by band and mode);

8.1.3. Proofs of bonus points claimed.

8.2. Complete station logs are not required for submission. However, log files should be kept in case ARRL HQ requests them.

8.3. Electronic submissions should be e-mailed to: **FieldDay@arrl.org** and should include, as attachments to the e-mail, the required summary sheet and dupe files as well as document files and/or image files to support any bonus points claimed.

8.4. Paper submissions should be mailed to: Field Day Entry, ARRL, 225 Main St, Newington, CT 06111

9. Miscellaneous:

9.1. The list of bulletin times for W1AW is included in this announcement. While W1AW does not have regular bulletins on weekends, the Field Day message will be sent according to the schedule included with this announcement.

9.2. See "General Rules for All ARRL Contests," "General Rules for All ARRL Contests on Bands Below 30 MHz," and "General Rules for All ARRL Contests on Bands Above 50 MHz" (November 1999 issue of QST) for additional rules.

9.3. The national simplex FM calling frequency of 146.52 MHz cannot be used for making Field Day contacts.

9.4. The complete Field Day information package may be obtained by:

9.4.1. Sending a SASE with 3 units of postage to: Field Day Information Package, ARRL, 225 Main St, Newington, CT 06111;

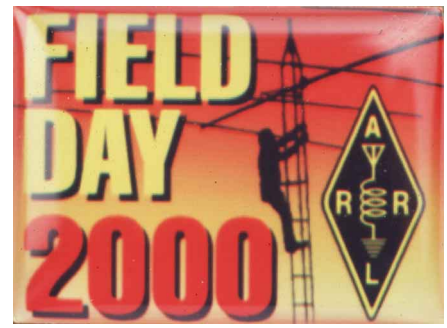
9.4.2. By downloading from the Contest Branch home page at: **http://www.arrl.org/contests/forms**.

9.5. For additional Field Day information or questions contact: **n1nd@arrl.org** or phone 860-594-0232. QST

W1AW Field Day Bulletin Schedule

	Mode	Pacific	Mountain	Local Times Central	Eastern
Friday	CW	5:00 PM	6:00 PM	7:00 PM	8:00 PM
	Teleprinter	6:00 PM	7:00 PM	8:00 PM	9:00 PM
	Phone	6:45 PM	7:45 PM	8:45 PM	9:45 PM
	CW	8:00 PM	9:00 PM	10:00 PM	11:00 PM
Saturday	CW	7:00 AM	8:00 AM	9:00 AM	10:00 AM
	Phone	8:00 AM	9:00 AM	10:00 AM	11:00 AM
	CW	5:00 PM	6:00 PM	7:00 PM	8:00 PM
	Teleprinter	6:00 PM	7:00 PM	8:00 PM	9:00 PM
	Phone	6:45 PM	7:45 PM	8:45 PM	9:45 PM
Sunday	CW	7:00 AM	8:00 AM	9:00 AM	10:00 AM
	Phone	8:00 AM	9:00 AM	10:00 AM	11:00 AM

Field Day Pins!



It's easy to earn an ARRL Field Day 2000 pin. There are no minimum number of contacts to make, no score levels to achieve. All you have to do is *participate* in the most popular annual operating event in the US and Canada. The pins are $5 each. Send your order to: ARRL Contest Branch, Attn. Field Day Pins, 225 Main St, Newington, CT 06111.

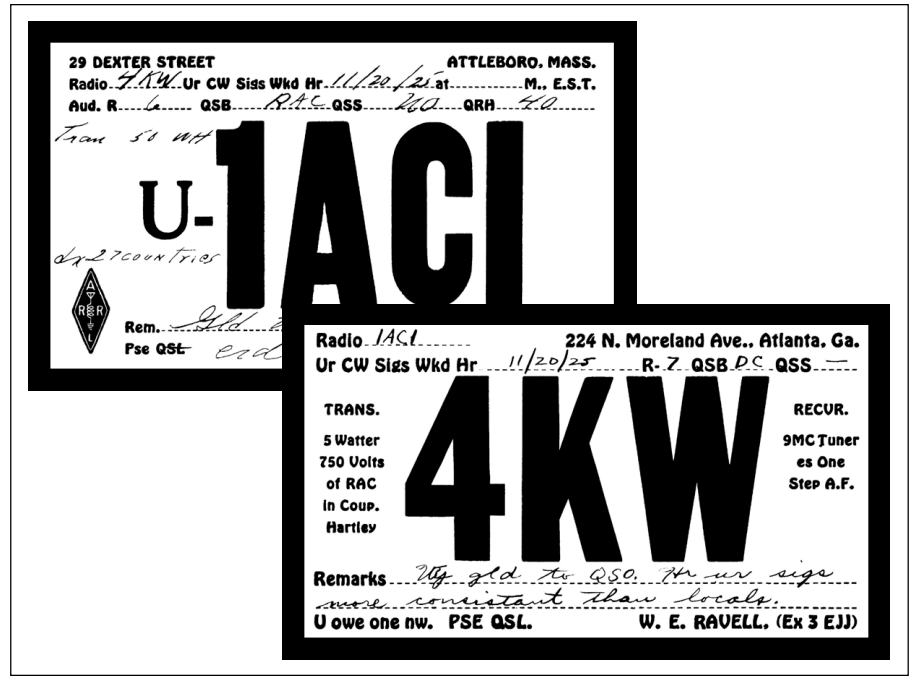
Field Day groups should collect the money for the pins and send a single order stating the number of pins needed. We will ship the pins back to the club for distribution.

These attractive pins are sure to become popular items. Show your Field Day spirit by displaying the Field Day participation pin! We sold out of pins in 1999. Order your FD 2000 pins early.

Collecting Vintage QSLs

An enjoyable part of ham radio has always been the exchange of QSL cards. It started in the early days of the hobby when operators wanted confirmation of their contacts. Over the years many of these earliest confirmations have been discarded or lost. Now it has become popular to collect them.

I collect vintage QSLs. I like them all, but I specialize in cards from southern New Jersey because I'm writing a history of Amateur Radio in my area. QSL cards are rich with history and information, and form the corner stone of my book. When the book is completed, I will have a page dedicated to each ham showing his or her QSL card, photo and any personal information I can find. Additionally, by researching *Callbooks*, I will add information on other calls held by that operator. With luck it will grow to be several pages on each ham. This history will be copied and donated to local historical societies and radio museums. It is my hope that someone in the future will continue to gather information and add to what I have done.



Confirming a contact between my Elmer (4KW at the time) and 1ACI almost 75 years ago, these QSLs hold a place of honor in my collection.

Your Own Collection

You can begin your QSL collection economically. An easy way to start is to ask some of your friends if they would consider selling you a few of their old cards. You may find more sources by placing an ad in your local club newsletter. You can also ask fleamarket vendors at hamfests.

Estate sales can be productive. Many times the cards and other important papers are considered trash. If you're lucky, they may just give them to you. Occasionally, you can find QSLs in antique shops, although they tend to be more expensive.

There are several collecting *themes* you might like to try. Local cards are a great way to generate interest at your club meetings. The old timers will remember some of the calls and start telling stories about them. Another idea would be to get a card from every state for each decade. How about YL QSLs, photo cards, or original art cards? Use your imagination to make your collection unique.

An Interesting Story That Started In 1925

On a trip to New England last year I attended a radio meet. A seller showed up with a pile of radios from a local auction house. Among the pile was a shoe box full of QSL cards. Someone told him they were worth a fortune and he wanted a lot of money for them. I asked if I could look through the box.

The cards were from the 1920s and 1930s. About half the way through the box, I spotted a 4KW card from one of my Elmers who had been operating as a young boy at the time in Atlanta. The card was dated November 20, 1925. He had sent it to 1ACI in Attleboro, Massachusetts. I became excited and tried to buy the card. The fellow let me have it for a buck after I told him why I wanted it so badly.

After returning home I visited my Elmer at the first opportunity. He had just celebrated 75 years in ham radio, so there was a lot to talk about. Later, I said I had something to return. I gave him the card and told the story of how I had acquired it. We talked about 1ACI and the QSO. Atlanta to Massachusetts was a great contact for a 5-W station in those days.

As I was getting ready to leave, he asked me to wait. Reaching under his desk, he pulled out an old shoebox. Inside, organized in perfect order, were his 1920s QSL cards. In a few seconds he located the matching QSL card from that QSO so long ago. He told me to place both QSLs in my museum, which I was honored to do.

Experiences like these make collecting so much fun. You never know when you will find something special.

Please check my Web site for additional QSL card information, including some interesting and rare cards on display at: **http://www.eht.com/oldradio/arrl/index.html**. I also have a schedule there for the Old Radio Museum.

K2TQN'S OLD RADIO MUSEUM SCHEDULE FOR MAY 2000

I was invited to bring the Old Radio Museum to the Trenton Computer Festival, in Edison, New Jersey on May 6 and 7. This is their 25th anniversary and they are planning, as part of this year's show, a large display of vintage computer equipment, my Old Radio Museum, and a display from the New Jersey Antique Radio Club. There are many Amateur Radio activities scheduled, including VE testing. For more information, check their Web site at: **http://www.tcf-nj.org/**. This is a big show with 500 inside exhibitor spaces and 1000 tailgating spaces. Look for my call letters on my hat and say hello. QST

John Dilks, K2TQN ♦ 125 Warf Road, Egg Harbor Township, NJ 08234-8501 ♦ k2tqn@arrl.org

QRP POWER

Last month we discussed several QRP transceiver kits that are on the market. It makes sense that a QRPer would want to build some or all of his/her station. However, there are many out there who don't have the time or inclination to build a rig. Well, take heart! This installment is for you!

For what ever reason, should you find yourself longing for a QRP rig and don't feel like building one, there are new and used QRP transceivers on the market. By doing a little homework and some careful searching, you will be able to acquire a QRP rig that meets your needs *and* fits your budget. Let's take a look at a few classic used transceivers.

Ten-Tec

Without a doubt, one of the most highly touted QRP rigs ever made is the venerable Ten-Tec Argonaut 509 CW/SSB transceiver. The 509 is the second in a three generation series of analog Argonauts built and marketed by Ten-Tec in Sevierville, Tennessee. The original model 505 came out in the mid 1970s and established a "niche market" for QRPers. Some improvements were made and the result was named the model 509. This was the most prolific model of all the analog Argonauts. In the early 1980s, Ten-Tec engineers completely redesigned the 509 and released the model 515, which is probably the most sought after analog Argonaut. Only about 800 of the 515s were ever made, making it a semi-rare find, especially in unmodified, mint condition. Prices range from around $250-$300 for a model 509 to $400-$500 for a model 515! Unfortunately performance is not in keeping with price.

While the analog Argonauts are what QRP purists deem "a *real* QRP rig", the fact remains that these radios were never great performers. Modifications abound but you are going to spend lots of time and money on the Argonaut trying to improve the performance of a mediocre radio. A better idea would be to obtain a Ten-Tec Argosy or Argosy-II (models 525 and 525D).

The model 525 Argosy (analog version) was introduced in the late 1970s and the model 525D (digital readout version) was released in the early 1980s. Many QRPers feel that the Argosy transceivers were the natural evolution of the Argonaut. The Argosy offers selectable IF crystal filters, on board noise blanker and audio filter options, as well as 5 and 50 W RF output at the flip of a switch. The legendary Ten-Tec full break in CW keying that was a trademark of the Argonauts is also present in the Argosy rigs. Either version of this radio would be a better buy for a working QRP rig than an Argonaut. Performance is much improved and options make this a very nice QRP radio. Add to this the ability to go to medium power (50 W) and you have a good all around HF rig at a reasonable price. Speaking of prices: a model 525 goes for around $250-$300 and a model 525D sells for between $300-$400.

The Ten-Tec Argonaut 509, one of the most popular QRP transceivers ever made.

In the late 1980s and early 1990 the QRP community kept hearing rumblings from Sevierville that there was a "new Argonaut" on the horizon. Finally, in 1991 the new rig, model 535, Argonaut-II, emerged from the hallowed halls of Ten-Tec. This new Argonaut (a fully digital unit) was basically a Delta-II without the 100 W RF deck. Full of bells and whistles, the Argo-II was designed for the discriminating QRPer. Of course, the price was a little on the steep side: about $1200! This works out to around $240 per watt! The Argo-II went out of production in the mid 1990s, but you can find a used one for around $600-$700.

Heathkit

In the early 1970s Heathkit released their HW-7 QRP transceiver kit. This triband (40, 20, 15 meters) rig was well received by the QRP community. Plagued by a horrendous receiver (the result of using a dual gate MOSFET as a mixer) it wasn't long before the HW-7 was replaced by the HW-8. This rig featured four bands (80, 40, 20 and 15 meters) and has the distinction of being one of the most modified QRP rigs ever produced. The redesigned receiver section of the HW-8 soon proved its worth and the HW-8 rapidly gained widespread acceptance among QRPers. In the late 1980s, Heathkit brought out their HW-9 transceiver kit which offered 9 bands (including 30, 17 and 12 meters) and a superhet receiver (the HW-7 and 8 had direct conversion receivers). This rig had a few design flaws, but you can still find them on the air today. Cost of a used HW-7: $75; HW-8: $100; HW-9: $150.

The HW-9 was the last of the Heathkit QRP rigs.

Kenwood, Yaesu

There are a couple other QRP HF transceivers that can be found on the used gear market. Kenwood's TS-130V (which had a 0-10 W RF output and both digital and analog readouts) was the same as its higher-powered brother (TS-130S), but lacked the 100 W RF deck. All the vast array of accessories that fit the "S" series also fit the low power "V" series, making these rigs a great choice for the frugal QRPer. Prices vary widely, so plan on spending about $300-$450 for a TS-130V.

Yaesu also introduced their FT-301S, a 0-10 W version of their FT-301 HF CW/SSB rig. This was the only low power rig of the time that covered 160 meters! There were several models, including a digital readout version (FT-301SD). All the accessories and options that fit the FT-301 will fit the low power "S" version, also. Prices for a FT-310S start at $250.

QRP WebSurf

Check out the Ten-Tec Virtual Museum at: **http://www.oakland.edu/~prvalko/tentec.htm**. This is Paul Valko, W8KC's, Web site and shrine to Ten-Tec QRP gear. On a personal note, I cannot overemphasize the support that the folks at Sevierville have given QRPers over the last 20 + years. Ten-Tec has continually strived to market QRP gear that is user friendly and lasts forever.

Until next time, 72, Rich K7SZ. QST

Rich Arland, K7SZ ♦ 25 Amherst Ave, Wilkes Barre, PA 18702 ♦ k7sz@arrl.org

APRS Digipeater in A Box

APRS digipeaters come in a variety flavors. Nowhere near the 28 varieties that Howard Johnson's offers, but enough to make things interesting

The original APRS digipeater flavor consisted of the requisite radio equipment (transmitter, receiver, antenna, cables and accessories) and a TNC connected to a computer running some version of APRS software. You configure the APRS software, which sets the TNC to act as an APRS digipeater.

The second flavor again consisted of the requisite radio equipment and a TNC connected to a computer. Instead of running some version of APRS software, the computer ran APRS digipeater emulation software. The TNC simply acted as a conduit for packets that it relayed to and from the computer. The APRS digipeater software is called *aprsdigi* and it runs on the *Linux* operating system. Alan Crosswell, N2YGK, created *aprsdigi*.

Around New Year 2000, Kenwood introduced its TM-D700A dual band (144 and 440 MHz) transceiver. The TM-D700A has a built-in TNC and APRS software, which can be configured as an APRS digipeater *without* a computer. The necessary configuration can be performed using the controls on the front panel of the radio.

Last month, Marco Savegnago, IW3FQG, announced the availability of APRS digipeater firmware, called *UIDIGI*. You replace the firmware in a TNC2 or TNC2 clone with the UIDIGI firmware and the TNC (with the requisite radio equipment) functions as an APRS digipeater. A computer is required to configure the software before burning the EPROM that contains the firmware.

These four flavors of APRS digipeaters have advantages and disadvantages.

The Pros

The "original" APRS digipeater supports the state-of-the-art WIDEn-n and/or TRACEn-n digipeater functions *only if* those functions are supported by the TNC used with the APRS software. (Current PacComm TNCs support TRACEn-n, while current Kantronics TNCs support both WIDEn-n and TRACEn-n.) The APRS software that configures the TNC is available for many computer platforms including *DOS*, *Mac OS*, *Windows*, *Linux*, *Palm OS* and *Windows CE*.

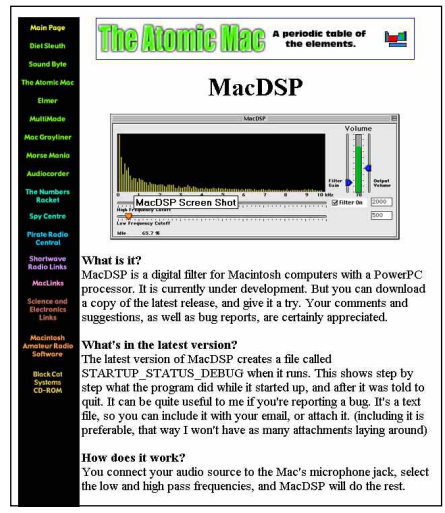


Figure 1—A view of the MacDSP Web page.

N2YGK's *aprsdigi* supports the WIDEn-n and TRACEn-n digipeater functions.

The TM-D700A is a good choice for emergency communications and public service events because it is self-contained "APRS in a box" and only requires an antenna and power source. It can be up and running very quickly.

UIDIGI supports the WIDEn-n and TRACEn-n digipeater functions. It is a good choice for remote sites because the configuration is permanently stored in memory. Power outages will not affect the configuration, so a computer is not necessary to reconfigure the system. It is also the most inexpensive APRS digipeater flavor because TNC2s and TNC2 clones are plentiful and cheap.

The Cons

The "original" APRS digipeater does not support WIDEn-n and TRACEn-n digipeater functions if those functions are not supported by the TNC used with the APRS software. It is not a good choice for a remote site because you need a computer to reconfigure the TNC whenever it loses its configuration due to power outages and such, which are more likely to occur in remote locations.

N2YGK's *aprsdigi* ties up a computer all the time. It also runs on the Linux operating system, which is not the most common, friendly or easy-to-learn operating system around.

The TM-D700A does not support the WIDEn-n and TRACEn-n digipeater functions, therefore, it is not a good choice for a permanent APRS digipeater installation in a network using WIDEn-n and/or TRACEn-n.

UIDIGI requires the equipment and the ability to burn EPROMs. Any changes in the digipeater configuration require burning a new EPROM and installing it in the TNC.

Getting It

There you have it. If you are interested in getting it, here is where it is available: Various versions of APRS are available from **ftp://ftp.tapr.org/aprssig**. N2YGK's *aprsdigi* is available from **ftp://ftp.tapr.org/aprssig/linux**. The TM-D700A is available from your favorite Kenwood dealer. *UIDIGI* is available from **http://gw.ir3ip.ampr.org/~iw3fqg/files/UIDIGI16.ZIP**. TNC2s and TNC2 clones are available at any ham radio flea market.

More New Good Stuff

Chris Smolinski, N3JLY, has released a preliminary version of *MacDSP*. As its name implies, it is a digital signal-processing (DSP) program for the Macintosh computer. Feed audio into your Macintosh's microphone jack, select the low and high frequency cut-off, then MacDSP filters the audio and plays the results through your Macintosh's speaker(s). MacDSP requires a PowerPC Mac. Download a copy at **http://www.blackcatsystems.com/software/macdsp.html**.

Rob Wittner, KZ5RW's, long awaited *APRS/CE* (APRS for the Windows CE operating system) is now available in a beta test version. Download a copy using the following URL: **ftp://ftp.tapr.org/aprssig/wince/aprs-ce.exe**. By the way, *APRS/CE* can use any *APRS* (*DOS*), *MacAPRS*, *WinAPRS*, or *pocketAPRS* map and they may be obtained at **ftp://ftp.tapr.org/aprssig/maps/**. QST

Stan Horzepa, WA1LOU ♦ One Glen Ave, Wolcott, CT 06716-1442 ♦ wa1lou@arrl.net, www.tapr.org/~wa1lou

Hear, Hear!

I run HF and VHF/UHF dual-band rigs in my 15-year-old truck. With all the squeaks, rattles and ignition noise, it's tough to hear the folks I'm talking to. I sometimes like to monitor 2 meters while I'm on HF SSB, but all the knob twiddling is driving me nuts! I've considered headphones and some sort of mixer, but I'm not sure that's a good idea. Any suggestions?

Actually, there are several approaches to improving the sound quality of a mobile installation, but using headphones isn't one of them. Even in the unlikely event they aren't illegal to wear while driving where you live, they're quite unsafe. Never compromise safety to hear those weak signals!

Plan A

One of the most effective ways to improve mobile audio is to employ an outboard speaker (or speakers). This is especially true with in-dash or under-dash installations. Depending on the rig, sound is usually aimed toward the floor or the bottom of the dash. Unless you drive with your head on the floorboard, that's not where you need audio. Sometimes I wonder why the radio manufacturers don't just leave out speakers altogether, filling the space with some useful electronics—for the same cost, of course (hint, hint).

Your choice of speaker is largely limited by your imagination and budget. I've had good results from various surplus land mobile radio speakers. They are readily available for very attractive prices at most hamfest fleamarkets. Many have plastic housings and swivel brackets that allow mounting flexibility. If you prefer something new, you can choose from a variety of communications speakers designed specifically for mobile use. Look for a speaker that offers adequate power handling capability and frequency response tailored to voice reproduction. MFJ markets a modestly priced model that boasts a frequency response of 600-4000 Hz and an 8-W power rating.

Plan C(assette)

If your vehicle has a cassette deck and you don't jam to Led Zeppelin while you chase DX on 20 meters, you can use the existing sound system for your radios. Simply use a "CD to Cassette Adapter" (sold at RadioShack, and other stores) to inject audio from your rig into your cassette deck. The adapter has a stereo plug, so you'll need a stereo-mono adapter plug if you wish to route the sound to all speakers. I used a cassette adapter with a temporary HF installation while on vacation one year. It allowed me to boost the CW sidetone to a usable level without the need for an outboard speaker. As a bonus, steering the audio to the front speakers alone boosted my popularity with my nonham family members!

Just as important as selecting the right speaker is installing it properly. Having the audio directed toward you (and possibly away from passengers) is the ideal goal. Running with the volume cranked *way up* to compensate for a poor speaker location is a real fatigue-builder. In one of my previous installations, I placed a four-inch speaker over my head between the headliner and the roof. Result? Great vibes aimed right at the old cranium. Above all, remember: Safety first. Avoid placing a speaker where you or a passenger can strike it during an accident. Especially avoid any area near an air bag.

Plan D(SP)

A good outboard speaker can really help you hear what you want to hear. Unfortunately, if those signals are plagued with static or other interference, you also hear the noise much better! HF installations are especially vulnerable. Naturally, the best approach is to treat the source, not the symptom. But, if you are piloting a four-wheeled electrical noise generator, no one has to tell you what a daunting task suppressing RFI/EMI can be. If you can't remove the noise and static from the input of your rig, you just might be able to remove it from the output. DSP, digital signal processing, electronically strips the offending signal(s), leaving the one you want to hear.

If you are shopping for a new radio, you'll want to check on models that offer DSP. If a new rig isn't in your immediate future, you can still have DSP. The NCT ClearSpeech speaker performs its DSP magic on the audio from your rig. Marketed by Am-Com, this speaker is receiving rave reviews from hams everywhere. The folks at Am-Com informed me that the insertion loss problem noted when the speaker was reviewed in the April 1999 *QST* has been resolved. The manufacturer has also added a speaker jack to allow you to feed the processed audio to a different speaker, if you desire. Now if someone will just develop a speaker with *ambient noise* cancellation to deal with road and wind noise. Don't laugh. It's probably in the works!

Mixed Signals?

The concept of mixing audio from multiple rigs and feeding it to a common speaker is a good one. So good in fact that multiband rigs do just that. Unfortunately, I'm unaware of a source for an outboard speaker mixer/combiner. The ARRL *Handbook* has construction plans for a headphone mixer that could be modified by a technically savvy ham to provide sufficient audio to drive a loudspeaker.

DAYTON 2000

What can I say about Dayton that hasn't been said before? If you enjoy ham radio, mobile or otherwise, you owe it to yourself to attend the granddaddy of all hamfests. You'll have the chance to view and touch the newest, most advanced ham radio gear in the world. In addition, a tour of the fleamarket and the parking lots will give you a glimpse of some of the most ingenious mobile antenna and rig installations on the planet. I hope to see you there.

QRZ

I receive lots of inquiries regarding automotive RFI and RF susceptibility problems. Many hams are looking for information about "Radio Friendly" automobiles. With so many available models and all the year-to-year changes, the definitive list would be impossible to compile and keep current. Nonetheless, a partial list is better than no list. Here's my request. If you've tried, successfully or unsuccessfully, to operate mobile from a 1990 or newer auto, drop me a note. Please include the following information.

- Make, model, year and relevant electronic options (ABS, etc.)
- Manufacturer's recommendations (if known) regarding radio transmitter use.
- Type of radio equipment and antenna(s) used.
- Problems encountered. If cured, how?

INFO-BOX

http://www.arrl.org: Links to pages about DSP. If you are a League member, be sure to register to access the "Members Only" pages.
http://www.mfjenterprises.com: MFJ's home page
http://www.amateurcommunications.com: Home page of Am-Com, Inc

Roger Burch, WF4N ♦ Box 100, Island, KY 42350 ♦ wf4n@arrl.org

Why We Fund Museum and Science Center Ham Radio Displays

Travel to any medium-to-large size town and you'll find at least one regional museum or newly built science center. Communities across the country are enjoying a boom in the trend to feature historic and hands-on technology displays in centralized, easy-to-get-to locations. The business sector has recognized what academia has known all along: Putting science and technology out where people can see and touch it is good public relations and educates the now and future consumer.

Academia has taken a page from the business sector: Museum shops abound and stock a plethora of informational and educational goodies you can cart home. The savvy science center has whiz-bang displays that are multi-media, interactive wonders that could easily have come from the minds of *Star Wars* creators (and sometimes do!). And when a visit to one of these special places can last all day, you know they've planned for it by providing eateries, restrooms and even IMAX theaters at some of the larger facilities.

Ham radio has always been high-tech, cutting edge *fun*. What better place than a museum or science center bursting with kids of all ages to show it's special magic? Fortunately, many hams have said to themselves, "Yes! Let's take hamming to where the action is and have a permanent display or working station."

It takes work and solid commitment to start and maintain a museum or science center station, but these stations are proven magnets for crowds, young and old. Many museums search diligently for those special displays that will excite and enliven the visitor. With the strong science themes that our unique hobby features (electronics, space communications, new modes of operation featuring new technologies) how can we miss? And unlike static, unmanned displays, real live hams often staff museum stations to provide ready answers for those eager to know more.

Over the years in *QST* we've featured stories about successful museum stations and displays. We'd love to feature your group's story. But it gets better: We can help you get a start on that special display or station. Send your detailed proposal to: The ARRL Foundation, Inc, at the address below. We'll need to know the who, what, when, and where of your group's plan, plus information about co-funding and follow-up. There's no better time than now to help ham radio reach science-loving, prospective hams. See you at the science center!

CLIFTON JENKINS, N7ZTY

Utah Section Manager Mel Parkes, N5UVP, presented certificates of affiliation and 100% ARRL membership to the students of Morgan Elementary School ARC in Morgan, Utah. Mel also helped club members assemble code practice buzzers. The school club was a 1999 Victor C. Clark Youth Incentive Program recipient.

WHAT DO WE DO NOW?

You've probably noticed that the line for making donations to the ARRL Foundation is no longer featured on the ARRL membership renewal form. What to do? You may still include a contribution when you mail your membership renewal back to ARRL. Just write a separate check and small cover note letting us know what you'd like your contribution applied to. We're a 501c(3) tax-exempt organization and every contribution is tax-deductible to the extent of IRS rules. You may also at any time contribute under separate cover to: The ARRL Foundation, Inc, 225 Main St, Newington, CT 06111. QST

Contributor's Corner

We wish to thank the following for their generous contributions to:

The Victor C. Clark Youth Incentive Fund
Susan & Paul O'Brien, in fond memory of Nathan Sinreich, W4PVC
John S. DeGood, NU3E in fond memory of Gerald B. Henney, W2GBH
Stan, K0QMS & Sarah Laidlaw in fond memory of William Frederick Abbott, K0ECB

The Jesse Bieberman Meritorious Membership Fund
Steel City ARC, Inc (Pennsylvania) in fond memory of Maurice K. Gibson, W3LBE

The ARRL Scout Handbook Fund
Middlesex ARS (Connecticut)

The General Fund
Richard G. Tucker, W0RT, in fond memory of Robert J. Wintle, Sr, KE0HC
Paul Tanksley, KM7PT; Marjory M. Prine, KB7DLT; James R. Prine, W5NUI, in fond memory of Calvin Culbertson, W7SAN
Gail B. Gregory; Mr & Mrs Mickey Finkle; Howard Cohen, W2IEJ; Harry Evans, W4OFI; Gerald Merblum, W2CRT; Bernard Goldstein, W2MNP; Gerald Kirschenberg, WB2BEC; George Kopstein, KF4UC; Seymour Denby, W2BNW; Norman Moss, W4PDG; Herb Taten, W2GMD; Jack Gutzeit, W2LZX; Bill Weinstein, KE4IEX; Sid Goldstein, KF4AO; Mort Brody, W2LRR; Paul Borden, WA2DKD; Louis Retzkin, W2KHV; David Weinstock, K4BCK; Robert Newman, WA2IES; Harold Merson, KF4EVC, in fond memory of Nathan Sinreich, W4PVC
Hamfesters Radio Club, Inc (Illinois)
Steven I. Altchuler, AB0DE, in fond memory of C. Frederick Koelsch, W0OK
Tom Ichikawa, W6GUN/2
Gordon Ichikawa, N6IN/2
Mt Beacon ARC (New York) in fond memory of Frederick Zipser, KB2QXB, and Russ Snedeker, W2EEQ
Joan L. Krenzel in loving memory of Stanley J. Krenzel, W2HEN
Harry W. Shenton, Jr, KA3UPS, and Isabelle C. Shenton in loving memory of our Elmer, Cliff Campen, W3LVC
North Jersey DX Assn in fond memory of George Wright, W2GW

As received and acknowledged during the months of **January** and **February**.

Mary E. Lau, N7IAL ♦ Secretary, ARRL Foundation, Inc

CONTEST CORRAL

Feedback

In the **1999 ARRL 10 GHz and Up Cumulative Contest** results, the call of **WB0LJC** was reported as WB0LJZ. The photo of **K4EFD** was inadvertently listed as K4FED.

In the **1999 IARU HF World Championship** results, **UX1UA** was incorrectly listed as European Russia instead of Ukraine. **PV8IG** should be listed as a checklog. An error in the scoring of **N2IC** changes his totals to 2051 QSOs, 199 multipliers and 1,687,321 points. This places him 8th in the world and 3rd among W/VE stations in the CW-only category.

In the **1999 September VHF QSO Party** results, the operator of **N9VM** should be listed as **N6AJ**.

W1AW CW Qualifying Runs will be held at 7 PM EDT Wednesday, May 3 and at 9 AM EDT Thursday, May 18. The **K6YR West Coast Qualifying Run** will take place at 9 PM on Wednesday, May 10. Check the W1AW schedule for details.

April

QRP to the Field, sponsored by the NorCal QRP Club, 1500 to 2400Z Apr 29. CW HF QRP only (5 W max), 40 20 15 10 meters. Operate any 6 hours. Exchange RST and state/province/country (SPC) and category ID. This year's theme is to operate as close to a body of water as possible. Categories: Marine Mobile (MM);Ocean (OC)—this category also includes the Great Lakes and the Gulf of Mexico; Other water (WT)—inland lakes, rivers, streams, park ponds, ditches, canals, etc.; Field station (FD)—any station that is outdoors and not using commercial power or fixed antennas; Home station (HO)—any station that is operating from an indoor or home location. Scoring: 25 pts for each MM station worked per band; 20 pts for each OC station worked per band; 15 pts for each WT station worked per band; 10 pts for each FD station worked per band; 5 pts for each HO station worked per band. SPCs: count once per band. Location Multipliers: MM = ×5; OC = ×4; WT = ×3; FD = ×2; HO = ×1. Final Score: Total pts × Total SPC × Location. Awards. Send logs by June 1 (include photo of operating location) to: Jan Medley, N0QT, QRPTTF 2000, PO Box 1768, Socorro, NM 87801; **n0qt@arrl.net**; **http://www.fix.net/~jparker/norcal.html.** *Please note that the QRP to the Field rules published in the April "Contest Corral" are incorrect. Use these rules instead.*

May

6-7

MARAC County Hunters Contest, CW. See your April 2000 *QST* page 101.

ARI International DX Contest, sponsored by the Associazione Radioamatori Italiani, from 2000Z May 6 until 2000Z May 7. 160 80 40 20 15 10 meters (no RTTY on 160 meters). Single op CW/phone/RTTY/mixed mode; multi-single (mixed mode only). Send RS(T) and serial no.; Italian stations send RS(T) and two-letter province identifier. Score 1 pt/QSO w/different countries on own continent; 3 pts/QSO w/different continent; and 10 pts/QSO w/I or IS stations. Work stations once per band and mode; multipliers count once per band. Stations in your own country may be worked for multiplier credit only. Final score is QSO pts × Italian provinces (max 103) and DXCC countries (except I and IS0) per band. Awards. Electronic entries accepted. Send logs within 30 days to ARI Contest Manager, Paolo Cortese, I2UIY, POB 14, I-27043, Broni (PV) Italy; **i2uiy@contesting.com**; **http://www.kkn.net/~i2uiy/**.

Danish SSTV Contest, sponsored by the Danish SSTV Group, from 0000Z May 6 to 2400Z May 7. 80 40 20 15 10 6 2 meters. Score 2 pts for the first QSO with a DXCC country, 1 pt for each additional contact with the same country, and 1 bonus pt for QSOs with Danish stations. Work stations once per band. Send logs postmarked by June 4 to Carl Emkjer, Soborghus Park 8, DK 2860, Soborg, Denmark; **carle@post5.tele.dk**; **http://home5.inet.tele .dk/carle/**.

Indiana QSO Party, sponsored by Land O' Lakes ARC, 1400Z May 6 to 2300Z May 7. Single op, multiop, club station, VHF/UHF; any class can be fixed and/or mobile. Exchange signal report and county for Indiana stations, signal report and state or county for others. 2 pts for SSB and AM contacts, all other modes count 3 pts. Multipliers: Indiana stations multiply QSO points by total of Indiana counties, states and countries worked. Out-of-state stations multiply QSO pts by the number of Indiana counties worked (max 92). No repeater QSOs. Awards. Send logs by June 11 to, Sharon Brown, 905 W Parkway Dr, Pleasant Lake, IN 46779; **lwwheeler@mindspring.com**.

Connecticut QSO Party, sponsored by the Candlewood ARA, from 2000Z May 6 until 2000Z May 7, with a rest period from 0400-1200Z. Phone, CW and RTTY. Work stations once per band and mode, mobiles as they cross county lines. No repeater QSOs. Single op, fixed/mobile; Novice; QRP (<5W); multi-single, multi-multi and CT clubs. Send RS(T) and state/province/DXCC country; CT stations send county. Score 1 pt/phone or RTTY QSO; 2 pts/CW QSO; and 5 pts/W1AW or W1QI QSO. Final score is QSO pts × CT counties; CT stations use CT counties/states/provinces plus 1 multiplier for DX. Awards. Send logs by Jun 3 to CARA, POB 3441, Danbury CT 06813-3441; **http://www.danbury.org/cara/**.

Massachusetts QSO Party, sponsored by the Framingham ARA, from 1800Z May 6 until 0400Z May 7 and 1100-2100Z May 2. Work stations once per band and mode. Classes: outside MA; MA single op; MA multiop; MA portable; MA team (5 MA single ops); MA Novice/Tech; MA club. Send RS(T) and state/province/DXCC country/MA county. Score 1 pt/phone and 2 pts/CW/digital/video QSO. Final score is QSO pts × MA counties (max 14)/band; MA stations use MA counties + states/provinces/DXCC countries. Awards. Send logs by June 6 to FARA, PO Box 3005, Framingham, MA 01701; **n1tyh@arrl.net**; **http://www.qsl.net/~fara/**.

US IPA Contest, sponsored by the International Police Association Radio Club, CW and Phone, 0000Z May 6 to 2359Z May 6 for CW; 0000Z May 7 to 2359Z May 7 for Phone. Single Op, Multi-Op and SWL. Exchange RST, serial number and member number (if member). Multipliers are IPA/IPARC club stations in each US state (max. 50). Score 1 point/QSO for each contact, International IPA stations are 2 points/QSO, US IPARC/IPA stations are 5 points/QSO, IPA Club stations are 10 points/QSO. Add a 100-point bonus for working a IPA club station on 5 bands. Send logs by May 31 to, Alexander Dutkeych VE3PIG/N2PIG, US IPARC Contest Chairman, Holiday Acres, Box 188, Stroud, ON L01 2M0 Canada; **alexdutkewych@webtv.net**; **http://www.ipac.org/**.

VHF/UHF Spring Sprint, 902 MHz/1296 MHz/2304 MHz. See your April 2000 *QST*, page 100.

13-14

CQ-M International DX Contest, sponsored by Krenkel Central RC of Russia, 2100Z May 13 to 2100Z May 14. CW, Phone, SSTV, 160 80 40 20 15 10 meters plus satellites. Categories: Single op-single band CW, SSB, mixed mode or satellites; single op, multiband CW, SSB, mixed mode or QRP (mixed mode, <5 W you must send /QRP); multi-single (multiband, mixed mode); SWL or WWII veteran (multiband, mixed mode); SSTV (single or multiop, multiband, SSTV only). Change bands only once every 10 minutes. Work stations once per band, regardless of mode. Exchange RST and serial no. Scoring 1pt/QSO with own P-150-C country, 2pt/QSO with another P-150-C country, 3pt/QSO with another continent. Multipliers: Each country in the P-150-C award country list counts as a multiplier only once per band. Final score is the sum of all QSO points, times sum of all multipliers. Awards. Send logs by July 1 to CQ-M Contest Committee, Krenkel Central Radio Club of Russia, Box 88, Moscow, 123459, Russia; **cqm@mail.ru**; **http://www.mai .ru/~crc/cq-m/cqmain_e.htm**.

Fists CW Club Spring Sprint, sponsored by Fists International CW Club, 1700-2100Z May 13. CW only, work stations once per band. 80 40 20 15 10 meters. Exchange name, state/province/DXCC country and Fists number if member or power output if non-member. 5 pts/QSO with Fists member, 2 pts/QSO with nonmembers. Final score equals QSO points times states, provinces (once for each) or DXCC countries (each time worked). QRP and QRO categories. Send paper logs only within 30 days to Alan Tanner, 3787 Trebein Rd, Fairborn, OH 45342; **http://www.fists.org/**.

Nevada QSO Party, sponsored by the Frontier ARS, 0000Z May 13 until 0600Z May 14. 160 80 40 20 15 10 6 meters, SSB/CW/RTTY. Work stations once per band/mode. Send RS(T) and state/province/DXCC country; NV stations send county. Score 2 pts/CW or RTTY QSO and 1 pt/SSB QSO. Final score is QSO pts × NV counties (NV stations use states/provinces/DXCC countries). Awards. Send logs by June 15 to Jim Frye, NW7O, 4120 Oakhill Ave, Las Vegas, NV 89121-6319; **nw7o@anv.net**.

Oregon QSO Party, sponsored by the Central Oregon DX Club, 1400Z May 13 to 0400Z May 14. Oregon stations work everyone. Others work Oregon stations only. Work stations once per band/mode, mobiles again as they cross county lines. No repeater QSOs. 1 pt/SSB QSO; 2 pts/CW QSO. OR stations multiply QSO pts by OR counties/states/provinces/DXCC countries; others multiply by OR counties worked (max 36). Add 50 bonus pts for working K7O and another 100 bonus points for working club station K7ZZZ. Awards. Send logs by May 25 to Oregon QSO Party, c/o CODXC, K7ZZZ, 19821 Ponderosa St, Bend, OR 97702.

VHF/UHF Spring Sprint, 50 MHz. See your April 2000 *QST*, page 100.

20-21

Major Six Club Contest, sponsored by the Six Club, 2300Z May 19 to 0300Z May 22, 6 meters only. Count 1 point/QSO within your country; 2 points/QSO outside of your country (KH6 and KL7 count as countries). Final score is the total QSO points times the number of different grid squares worked. Awards. Mail logs by June 21 to Six Club, PO Box 307, Hatfield, AR 71945; **sixclub@6mt.com**; **http://6mt.com/contest.htm**.

28-30

CQ WW WPX Contest, CW. See your March 1000 *QST*, page 100.

ARCI QRP Hoot Owl Sprint, CW, sponsored by QRP ARC International, from 2000 until 2400 local time May 28. Categories single band, all band, high band (20, 15, and 10 meters), low band (160, 80, and 40 meters). Work stations once per band. Send signal report, state/province/DXCC country and QRP ARCI number if member (nonmembers send power output). Count 5 points per QSO with ARCI members. Others count 2 points per same continent and 4 points per different continent. Multiply QSO points by state/province/DXCC countries worked per band and by power multiplier (>5 W × 1; <5W × 7; <1W × 10; <250mW × 15). Certificates. Mail entries by June 28 to QRP ARCI Contest Manager, Randy B. Foltz, 809 Leith St, Moscow, ID 83843; **rfoltz@turbonet.com**; **http://personal.palouse.net/rfoltz/arci/arcitst.htm**.

Memorial Day CW Sprint, sponsored by the Michigan QRP Club, 2300Z May 29 until 0300Z May 30. CW only, 160 80 40 20 15 10 6 meters. Classes <250 mW; 250 mW to 1 W; 1 W to 5 W; and over 5 W. Exchange RST, state/province/DXCC entity and power output (MI-QRP members send membership no.). Work stations once per band. Score 5 pts/QSO w/MI-QRP members, 4 pts/QSO w/non-members outside W/VE and 2 pts/QSO with W/VE nonmembers. Multiply QSO points by states/provinces/DXCC entities worked per band × 1.25 if you are using a home-brew receiver or transmitter. Awards. Send logs to L. T. Switzer, N8CQA, 654 Georgia Ave, Marysville, MI 48040-1243; **n8cqa@tir.com**; **http://www.tir.com/~k8dd/rules97.htm**.

George Fremin III, K5TR ♦ 624 Lost Oak Trail, Johnson City, TX 78636 ♦ k5tr@arrl.org

SILENT KEYS

It is with deep regret that we record the passing of these amateurs.

KV1A, Kare Helberg, Norwalk, CT
*W1BHZ, Thomas R. Carter, Monroe, CT
KA1BRZ, Douglas N. Gianino, Meriden, CT
W1CAS, Clement A. LeClair, Deland, FL
WB1DKS, Richard J. Stevenson, Bangor, ME
W1DNI, Vincent E. Volowski, Strong, ME
W1EZR, Bernard R. Langley, Auburn, ME
K1HAS, Lawrence P. Coolidge, Myrtle Beach, SC
W1HCR, John F. Barrows, East Falmouth, MA
W1KDW, John N. Edgerton, New Gloucester, ME
KA1KQY, Lorraine S. Evans, Flagler Beach, FL
W1MXT, Gerald H. Leavitt, Millinocket, ME
W2AUF, David W. Winter, Woodhaven, NY
W2CFU, Joseph W. Lyon, Pelham, NY
K2EII, Donald W. Shanks, Blue Hill, ME
W2KIJ, Joseph C. Patocka, Horseheads, NY
K2LV, William J. McCarren, Bronxville, NY
KJ2P, John F. Heveron, Rochester, NY
WA2QQZ, Erdem Yurtseven, North Massapequa, NY
K2WAK, William A. Kneaskern, Auburn, NY
WA2WHU, Robert L. Mallar, Lake Ronkonkoma, NY
WA2YPT, Helen A. Armstrong, Livonia, NY
W2YRH, Tyler C. Stewart, Fayetteville, NY
*NF2Z, Robert M. O'Connell, Rochester, NY
KA2ZPL, Sheldon L. Simmons, Jamestown, NY
*WA3AHK, Dave Strain, Long Beach, MS
WA3LLD, Joseph C. Ankele, Lafayette Hill, PA
*W3ML, George H. Reifenstein, Auke Bay, AK
K3NLX, Richard H. Altenburg, Camp Hill, PA
W3VR, Alfred S. Burke, Seminole, FL
W3ZTM, William H. Johnson, Chestertown, MD
WB4AHP, Thomas E. Riddell, Irvine, KY
*K4AWY, Ralph C. Scott, Clarks Hill, SC
WD4CDE, Barry L. Nadler, Sunrise, FL
KF4CZ, W. H. Lewis, Cookeville, TN
W4DKR, John Martin Dill, Huntingdon, TN
N4ENZ, Elizabeth M. Zimmerman, Knoxville, TN
K4GF, James M. Fisher, Ocala, FL
KA4GMA, Wade H. Murph, Kingsport, TN
K4IPG, Kenneth E. Neidig, Morristown, TN
KB4L, Charles A. Adams, Clarksville, FL
KA4LXI, H. G. Lissauer, Fort Lauderdale, FL
W4MBN, Walter Rule, Kingsport, TN
WA4MJI, Elizabeth S. Barry, Plantation, FL
KQ4ND, Francis R. Geng, Jupiter, FL
W4NJG, Marie K. Manthe, Port Charlotte, FL
KD4NOL, Joseph D. Brooks, Morristown, TN
W4PSN, Charles H. Green, Portland, TN
W4PVC, Nathan Sinreich, Tamarac, FL
N4PVL, William F. Potter, Fredericksburg, VA
N4RJG, Hubert R. King, Albany, GA
KB4TB, Jack P. Thacker, Montgomery, AL
WA4TNB, David E. Toms, Columbus, GA
W4TOI, Ernest L. Bishop, Sheffield, AL
WB4TOQ, Melvin L. Whitley, Fyffe, AL
KC4XP, James D. Crossett, Nashville, TN
AD4ZG, L. Mark Aceti, Punta Gorda, FL
W5BDR, Edward A. Moory, De Witt, AR
W5BIN, Leo Kennedy, Waco, TX
W5BRT, Ralph L. Cordell, Tulsa, OK
W5DS, Robert W. Edlund, Crescent, OK
W5FNA, Bill Case, San Antonio, TX
KC5GYG, Leo H. Arceneau, Hatfield, AR
K5IQV, Joseph Domino, Houston, TX
W5JT, Carleton N. Hughs, Houston, TX
W5MC, Theodore W. Bywaters, Dallas, TX
KB5NAF, Harold Finney, Waco, TX
KA5NPY, William W. Page, Lufkin, TX
W5OUJ, Albert W. Loughrige, Las Cruces, NM
K5PES, David W. Rule, Albuquerque, NM
KC5RD, Roderick C. Pulley, Grand Prairie, TX
K5RYT, Donald E. Dingus, Lamesa, TX
KB5WXU, Leon C. Rhodes, Heber Springs, AR
N6ALR, Harry H. Billings, Fresno, CA
KH6CCL, Ernest J. Kurlansky, Kamuela, HI
W6CTS, Asel C. Briggs, Yucca Valley, CA
KA6DXY, James W. Sheley, Pleasanton, CA
KF6EKP, Rosemary C. Willis, Sun Valley, CA
K6IIR, Wade G. Swoboda, San Diego, CA
K6IVD, Leland F. Gipson, Fort Jones, CA
W6MHQ, Johnny Vaucher, Dothan, AL
W6MNH, Calvin L. Heisinger, Escondido, CA
WA6MOZ, Elbert O. Lindley, Corona, CA
K6ND, Homer H. Biedebach, Pasadena, CA
*W6NZB, Arthur Lawler, La Mirada, CA
WB6OSE, Michael C. Madigan, Susanville, CA
WA6OSQ, Earle E. Pollock, Aptos, CA
KD6OT, Paul G. Dunmire, Yuma, AZ
WA6OVE, Harry L. Odgers, Mariposa, CA
WA6QNM, William Perry, Fresno, CA
WA6RYY, Eddy T. Railey, Morgan Hill, CA
W6SJZ, Kenneth W. Case, Heber Springs, AR
KE6TPG, Peggy W. Locascio, Rancho Palos Verdes, CA
WA6UOC, Victor M. Martin, Encino, CA
K7CDX, Elmer R. Cyr, Sandy, UT
WB7DLT, Jonathan K. Shafer, Tacoma, WA
*W7GHO, Jack L. Carlson, Kirkland, WA
W7GVC, Patrick L. Stewart, Walla Walla, WA
W7HV, David L. Johnson, Seattle, WA
W7ILL, Monte Norris, Big Piney, WY
W7JMH, Lemuel H. Allen, Boise, ID
WU7P, L. S. Preston, Shelton, WA
*N7SX, Jon S. Eastman, Palmdale, CA
W7UGK, La Verne Baker, Everett, WA
KB7VAA, Gary Staley, Price, UT
KG7YW, Jack Griffith, Battle Ground, WA
KB8HNW, Dennis M. Wright, Eastlake, OH
N8KAY, Richard Hunter, Big Rapids, MI
*K8NFP, Rebecca B. Nathanson, Farmington Hills, MI
*K8NXN, Jarold E. Shields, Peoria, AZ
W8PEV, James R. Malone, Westlake, OH
W8SDO, Clayton Bashford, Miamisburg, OH
K8SNJ, Charles J. Oebels, Englewood, OH
WA8YPT, John F. Suhadolnik, Cleveland, OH
K9CZM, Lee W. Smith, Libertyville, IL
KC9DI, Ralph F. Bruebach, Glenview, IL
W9DOD, Vernard Rush, Lafayette, IN
W9ELU, Robert L. Mawdsley, Dayton, OH
K9GRG, Floyd J. Brown, Hennepin, IL
WB9HZV, Guinevere R. Reed, Clinton, IL
KB9IFI, Dwaine H. Bell, Beloit, WI
KA9LVV, Le Roy C. Swanson, Pekin, IL
K9STP, Albert R. Turner, Morrison, IL
WB9SVA, W. R. Jones, Monticello, IN
W9UCT, Forest C. Kientz, Oak Ridge, TN
W0DYL, Wallace Leonard, Gladstone, MO
KI0FO, Herman B. Wade, Fulton, MO
*W0IHO, Arthur A. Barbeau, Colorado Springs, CO
W0OK, C. F. Koelsch, Saint Paul, MN
K0VVW, William H. Cunniff, Aitkin, MN
KB0YFU, Elizabeth V. Kennedy, Linn, MO
DL6ZZ, August Voss, Hamburg, Germany
VE4BJ, W. A. Stunden, Winnipeg, ON, Canada
VE7DCH, George Chase, Victoria, BC, Canada
ZL2MA, Ken McGuire, Titahi Bay, New Zealand

*Life Member, ARRL

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

STRAYS

WANTED: SCHEMATICS

◊ I'm looking for a schematic diagram for a FordHam 550-MHz frequency counter. Please contact Daniel V. Mackey, 70 Candlewood Gardens, Baldwinsville, NY 13027-2634; **KC2DCX@arrl.net**.

◊ I need a schematic for a RadioShack (Micronta) multimeter model 20-220A. Richard Smith, KB4OOW, 100 Elgin Hills Dr, Rogerville, AL 35652-0054

◊ I'm searching for a schematic for a Tenko 1210A, 2-meter FM transceiver. James Kimball, K9JXW, 602 N. 72nd Ave, Wausau, WI 54401.

◊ Looking for Rohde & Schwarz receiver-manual type EK-07. Harry A. Weber, 4845 West 107th St, Oak Lawn, IL 60453-5252.

NEW PRODUCTS

LOGWINDOWS, TNC AND WEFAX PROGRAM PACKS FROM CSS

◊ Creative Services Software announces the release of two new "Digital Trio" CD ROMS each containing three of their popular Amateur Radio software products packaged on a single CD.

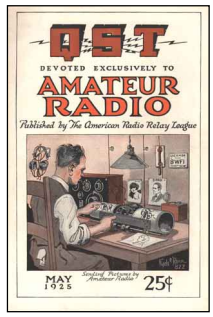
The Trio for Kantronics TNCs includes *Pacterm '98* version 1.4, *Wefax '99* version 1.01 and *LogWindows* version 3.06.05. The Trio for AEA/Timewave TNCs includes *PkTerm '99* version 1.4d, *Wefax '99* version 1.01 for the PK-232/900 and *LogWindows* version 3.06.05.

The CD also includes complete documentation, in *Word* or PDF format, for all of their products, and demo versions of additional CSS software and supported programs.

If purchased separately, the total price for the three software titles alone would retail for over $189. The retail price for either of the Digital Trio CDs is $129.95. For additional information visit your favorite Amateur Radio products dealer or contact Creative Services Software, 503 W State St, Suite 4, Muscle Shoals, AL 35661; tel 256-767-3739; fax 256-381-6121; **info@cssincorp.com**; **http://www.cssincorp.com**. QST

75, 50 AND 25 YEARS AGO

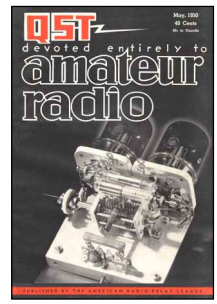
May 1925



◊ The cover, by Clyde Darr, 8ZZ, shows 8WFI "Sending Pictures by Amateur Radio." The editorial's first subject, "Local Vigilance Committee," tells how the Traffic Department is forming local hams into committees to deal with the increasing problem of ham interference to broadcast listeners. The editorial also reports on "The I.A.R.U. Congress," which will be convening as the issue goes to press, commenting that "… the time has arrived when the two-way telegraphers and experimenters actually need organization and coordination."

Frank Jones, 6AJF-6XM, describes the "Pioneer Short-Wave Work" done by three California hams, telling how they experimented to determine the proper length of "reflector wires", arranged in a parabolic arc behind the sending set's antenna at wavelengths below 3 meters, to produce stronger signals. Various results are noted, some of which can be explained, and others, not. Dan Wilkerson discusses "Visible Radio Communication," describing the "Jenkins Duplex Photogram Machine" and telling how the "automatic facsimile machine" can transmit and receive pictures via radio. Byron Minnium describes "The Isofarad Receiver." "Sending Licenses Suspended" reports that about 100 hams' licenses have been suspended for violation of the new radio rules! "Amateur Radio at Floyd Collins' Cave" tells how ham radio helped get the news of Collins' entrapment in a Kentucky cave to the outside world. 9BRK and 9CHK manned a portable station near the cave and relayed reports to the nearest telegraph line, several miles away. The "Experimenters Section Report" tells how an experimental transmitter was operated at a wavelength of 3/4 meter, and solicits suggestions for further experiments from *QST* readers. William Murphy tells of his experiments with "Top-Loading Antennas and Loops."

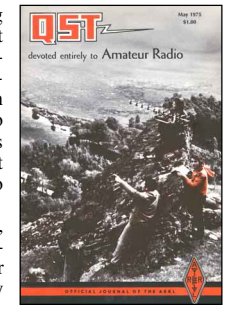
May 1950



◊ The cover photo shows a compact amplifier for 10, 6 and 2 meters, described in this issue, that uses a pair of 826 tubes. The editorial is a rare guest editorial written by Frank Fisher, W5AHT. His argument in support of organized Amateur Radio leads the editor to comment, "We wish we had written it!"

By Goodman, W1DX, tells about "A Variable-Selectivity Sharp I.F. Amplifier," to be used as "an outrigger 'Q10-er' for the C.W. man." Charles Dene, W3CPC, presents "A Low-Cost TVI filter." In "'Tailor Made' Antenna Couplers," George Grammer, W1DF, tells about optimum designs using new commercially made coils. Richard Smith, W1FTX, discusses "Utilizing the 826" in his compact 250-W amplifier for 10, 6 and 2 meters. Louis Hippe, W6APQ, writes about "Tower and Rotator Techniques," with Part I telling how to build a rugged wooden tower. The final 'phone results for the "16th Sweepstakes Contest" report that *three* hams broke the 100,000 point barrier for the first time—W6OGZ (with the top SS phone score of 122,400 points), W6ITH and W6QEU. The fourth-place score was W7PUM's 75,641 points, to put those six-digit scores in perspective. Henry Hayes, W3JUM, writes about "A Compact 2-Meter Station for Mobile Use." "Future-hamic," by Kermit Slobb, W9YMZ, imagines a two-way amateur television contact in the future year of 1980.

May 1975



◊ The cover photo shows Amateur Radio aiding education in Scotland. The editorial discusses the current chore of tallying the results of the recent membership questionnaire, noting the trend toward the fragmentation within Amateur Radio that sometimes works against the united front that we must present to external organizations.

Steve Gross, W9OJI, describes "A Parallel-4CX250B Amplifier for 144 MHz." In "The City Slicker," under the "Beginner and Novice" banner, Milton Drake, W2JPN, tells about his simple inductive loading system for using an 8-foot whip on the HF bands. [Coincidentally, Sam Harris, W8UKS, used "The City Slicker" as the name for his stack of four folded 144 MHz dipoles in his November 1949 *QST* article.—*Ed.*] John Kaufmann, WA1CQW, and Gary Kopec, WA8WNU, tell about "A Convenient Stub-Tuning System for Quad Antennas." Parts II are presented in the two series "Learning to Work with Semiconductors," by Doug DeMaw, W1CER, and Jay Rusgrove, WA1LNQ; and "Slow-Scan to Fast-Scan TV Converter," by George Steber, WB9LVI. The cover story, "Amateur Radio Boosts Education," by Barbara Dirrigl, tells how schools in Scotland are using OSCAR satellites to further classroom studies. "Fifi vs. Honduras" reports amateur emergency communication work in Honduras following hurricane Fifi. "Results, 41st ARRL November Sweepstakes" reports that, once again, there were a record number of participants—2425 entries. One notable entry was WB8OFR, who placed first on phone and second on CW from the competitive Ohio Section, using Drake-line gear and dipoles. Nothing special, you might think—but Frank is blind! The close contest in the affiliated club scores found the Potomac Valley Radio Club barely beating out Murphy's Marauders, 8,570,392 to 8,488,980.—*Al Brogdon, WIAB* 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 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 K6YR. 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. 3/00

COMING CONVENTIONS

ARRL NATIONAL CONVENTION

May 19-21, Dayton, OH

The ARRL National Convention, sponsored by the Dayton ARA, will be held at the Hara Arena Conference and Exhibition Center. Doors are open Friday 8 AM to 6 PM, Saturday 8 AM to 5 PM, Sunday 8 AM to 1 PM. Features include Amateur Radio, computer, and electronics show; giant outdoor flea market, inside exhibit booths (fax 937-964-2084, **exhibits@hamvention.org**); vendors; major manufacturers; forums; programs; VE sessions (reservations recommended, 937-276-3368 or **sandman@dnaco.net**; walk-ins accepted); Grand Banquet (Saturday, 6:30 PM, Nutter Center; $45 sold in advance only by May 10, special guest speaker Riley Hollingsworth, K4ZDH; entertainment only, 8:30 PM, advance $20, door $25); special event stations; camping. Talk-in on 146.94, 146.91, 223.94, 442.1. Admission is $16 in advance, $22 at the door (good all 3 days). Contact Dave Coons, WT8W, Box 964, Dayton, OH 45401-0964, 937-849-0604 or 937-276-6930; fax 937-276-6934; **info@hamvention.org**; **http://www.hamvention.org**. This is one Hamvention you will not want to miss! See "Dayton Hamvention 2000—A Once-in-a-Lifetime Gathering" in this issue.

April 21-22
Arkansas State, Little Rock*

April 30
Delaware State, New Castle*

May 5-6
Louisiana State, Baton Rouge*

May 6-7
Alabama Section, Birmingham*

June 2-4
Atlantic Division, Rochester, NY

June 11
Delta Division, Knoxville, TN

July 7-9
Utah State, Bryce Canyon

July 8
Georgia State, Gainesville
Central Division, Indianapolis, IN

*** See April *QST* for details.**

WASHINGTON STATE CONVENTION

May 13-14, Yakima

The Washington State Convention, sponsored by the Yakima ARC, will be held at the Masonic Center, 510 N Naches Ave; Exit 33 off I-82 to Yakima City Center, turn right onto Naches from Yakima Ave. Doors are open Saturday 9 AM to 4 PM, Sunday 9 AM to 1 PM (breakfast starts at 7 AM both days). Features include exhibitors, new equipment vendors, seminars and speakers (Rod Stafford, W6ROD; Greg Milnes, W7OZ, Jack Babbit, WA5ZAY), demonstrations and presentations, VE sessions (Saturday on site, walk-ins welcomed; Sean Byrne, N7EY, 509-966-9838), banquet (Saturday eve, $12.50, seating is limited so register early). Talk-in on 146.66. Admission is $5. Tables are $10 (plus admission). Contact Jack Wrenn, N7KNO, 621 S 15th Ave, Yakima, WA 98902, 509-249-0897, **n7kno@arrl.net**; **http://eagle.ykm.com/~w7aq/hamfest.html**.

WYOMING STATE CONVENTION

May 27-28, Casper

The Wyoming State Convention, sponsored by the Casper ARC, will be held at the Radisson Inn (formerly the Hilton), 800 N Poplar; take Exit 188B (Poplar St) off I-25, Radisson Inn is on N side of I-25. Features include swapmeet, major dealers, vendors, banquet (Saturday eve, $17; special guest speaker Jay Ostrem, W7CW), VE sessions (Nick Nicholson, W7TSM, 307-234-1220; **tsmnick@coffey.com**). Talk-in on 146.94. Admission is $7 in advance, $10 at the door. Tables are $5. Contact Warren (Rev) Morton, WS7W, 1341 Trojan Dr, Casper, WY 82609, 307-235-2799 or 307-237-9301, **mortonwg@aol.com**; **http://w3.trib.com/~carc/y2khamfest.html**.

GEORGIA SECTION CONVENTION

June 2-3, Marietta/Atlanta

The Georgia Section Convention, sponsored by the Atlanta RC, Gwinnett ARS, Kennehoochee ARC, and the North Fulton AR League, will be held at Jim Miller Park, Callaway Rd; from I-75 and Windy Hill Rd go W for approximately 5 miles to Austell Rd, turn left and go 1/2 mile to Callaway Rd, turn right and go 1/2 mile to Jim Miller Park on right. Doors are open Friday 3-6:30 PM, Saturday 8:30 AM to 3 PM. Features include large tailgate area (covered 10-ft space $15, open 10-ft space $10), indoor air-conditioned flea market, equipment dealers, vendors, VE sessions, RV camping with full hookups, free parking. Talk-in on 146.82. Admission is $5. Tables are $25. Contact Charles Golsen, N4TZM, 404-252-3303, **cgolsen@atlanta.com**; or Ben Dasher, KE4YZX, 404-869-6959, **bendasher@mindspring.com**; **http://www.saf.com/arc/**.

MIDWEST/DAKOTA DIVISION CONVENTION

June 2-3, South Sioux City, NE

The Midwest/Dakota Division Convention (Hamboree 22), sponsored by the 3900 Club and the Sooland ARA, will be held at the Marina Inn, 4th and B St. Doors are open Friday noon to 9 PM, Saturday 8 AM to 4:15 PM. Features include flea market, dealers, VE sessions, forums (MARS, ARRL, IARU, technical), QCWA luncheon, QRP programs, left foot keying contest, dinner (Friday eve, $10), banquet (Saturday eve, $15), handicapped accessible, free parking, full hookup campground (2 blocks). Talk-in on 146.91. Admission is $6 for both days. Tables are $10 (general area), $15 (perimeter), free electricity. Contact Leroy Baldwin, W0OFY, 645 S Mentzer Rd, Robins, IA 52328, 319-395-7183; **lgbw0ofy@aol.com**.

NORTHWESTERN DIVISION CONVENTION

June 2-4, Seaside, OR

The Northwestern Division Convention (SeaPac), sponsored by the Oregon Tualatin Valley ARC, will be held at the Seaside Convention Center. Doors are open for registration and setup Friday 11 AM to 8 PM; public Saturday 8 AM to 9:30 PM, Sunday 8:30 AM to 2 PM. Features include flea market (Lynn Hurd, WB7UNU, 503-624-1999), exhibits (Al Berg, W7SIC, 503-640-5456), seminars, forums, workshops, VE sessions (Saturday 9 AM, Our Saviour's Lutheran Church, preregister by May 1, no walk-ins; Carl Clawson, W7SL, 503-629-5796), Ladies Hospitality Suite (Room 125), banquet (Saturday 7:15 PM, $20; prebanquet happy hour 6:30 PM), refreshments. Talk-in on 146.66. Admission is $6 in advance, $8 at the door, under 13 free. Tables are $15 per table per day or $25 per table for 2 days. Contact Randy Stimson, KZ7T, 9890 SW Inglewood St, Portland, OR 97225, 503-297-1175, **KZ7T@arrl.net**; **http://www.seapac.org**.

TEXAS STATE CONVENTION

June 9-10, Arlington

The Texas State Convention, sponsored by HamCom 2000, will be held at the Arlington Convention Center, 1200 Ballpark Way, midway between Dallas and Ft Worth, just off I-30. Doors are open Friday noon to 7 PM, Saturday 7 AM to 5 PM. Features include indoor and outdoor flea market, commercial exhibitors, vendors, programs on the old to new, XZ0A DX program, SKYWARN school, tailgate party (Friday eve for interested clubs), VE sessions. Talk-in on 147.14. Admission is $9 in advance, $10 at the door. Tables are $25 each. Contact Maury Guzick, W5BGP, Box 12774, Dallas, TX 75225-0774, 214-804-0680 or 214-361-7574 (phone/fax), **chairman@hamcom.org**; **http://www.hamcom.org**.

EASTERN PENNSYLVANIA SECTION CONVENTION

June 10, Bloomsburg

The Eastern Pennsylvania Section Convention, sponsored by the Columbia-Montour ARC, will be held at the Bloomsburg Fairgrounds; I-80 (E or W) to Exit 34, take Rte 42 S to Rte 11 N to Fairgrounds on the right. Doors are open for setup Friday 6-10 PM, Saturday 6-8 AM; public 8 AM to 3 PM. Features include hamfest/computer show, indoor air-conditioned sales area, tailgating ($5 per 10x10-ft space), forums (special guest speaker Riley Hollingsworth, K4ZDH), VE sessions (10 AM, walk-ins welcomed), refreshments. Talk-in on 147.225 (203.5 Hz), 146.52. Admission is $5, under 12 free. Tables are $20 (8-ft, electricity $5 per drop, bring your own extension cords and power strips; $10 reservation per table required by Jun 1). Contact George Law, N3KYZ, 570-784-2299, **n3kyz@epix.net**; **http://www.bafn.org/~cmarc**.

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

Gail Iannone ♦ Convention Program Manager

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 **May 1** to be listed in the **July** 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.)

†**Arkansas (Siloam Springs)—May 6,** 8 AM to 3 PM. *Spr:* Siloam Springs ARC. St Mary's Catholic Church, 1996 Hwy 412 E. Flea market, tailgating ($4), vendors, seminars (computer troubleshooting, antenna building), auction (1 PM). *TI:* 146.67. *Adm:* $5. Tables: $6 (includes vendor/seller admission). Sherri Hyde, N5UXI, 502 E Garland St, Siloam Springs, AR 72761, 501-524-4797, **shyde3@juno.com**.

†**California (Fair Oaks/Sacramento)—May 21,** 6 AM to noon. *Spr:* North Hills RC. Bella Vista High School, 8301 Madison Ave; from I-80 take Madison Ave, go E for 5.8 miles to high school on left; from Hwy 50 take Hazel Ave, go N for 2.6 miles to Madison Ave, turn left and go W for 1.4 miles to high school on right. Swapmeet, free parking, refreshments. *TI:* 145.19 (162.2 Hz). *Adm:* sellers $10 (2 parking spaces), buyers free. Earl Mead, K6ESM, 916-331-1115, **nhrc@k6is.org**; **http://www.k6is.org**.

†**Connecticut (Newington)—Jun 4;** set up 8 AM; public 9 AM to 1 PM. *Spr:* Newington AR League. Newington High School, 605 Willard Ave (Rte 173). Flea market, tailgating ($10, 2 parking spots on a first-come, first-served basis), VE sessions (noon, walk-ins welcomed; preregister with special needs, Dan Miller, K3UFG, 860-206-3379; **k3ufg@arrl.net**), refreshments. *TI:* 145.45, 146.52, 224.84, 443.05. *Adm:* $5 (indoor and outdoor). Tables: advance $15 (make check payable to NARL and send with SASE to John DiSarro, KA1HQK, 134 Winslow Dr, Newington, CT 06111), door $20. Tom Ponte, WB1CZX, 99 Jeffrey Ln, Newington, CT 06111, 860-666-4539; **wb1czx@arrl.net**.

†**Connecticut (Vernon)—May 27,** 9 AM to 2 PM. *Spr:* Natchaug ARC. Tolland County Agricultural Center, on Rte 30; I-84 to Exit 67, follow signs, approximately 1/2 mile. Flea market, tailgating, demos (SSTV, ATV), refreshments. *TI:* 145.11. *Adm:* $3. Tables: advance $10, door $15. Wayne Rychling, N1GUS, 59 Clint Eldredge Rd, Willington, CT 06279, 860-487-1921, **warych@neca.com**; **http://users.neca.com/warych/narcfest.htm.**

Florida (St Petersburg)—May 7. Gerald Dee Turner, N2MNC, 727-548-7474.

Georgia (Marietta/Atlanta)—Jun 2-3, Georgia Section Convention. See "Coming Conventions."

†**Idaho (Caldwell)—May 20;** set up 6 AM; public 9 AM to 2 PM. *Spr:* Snake River ARC. Central Canyon Elementary School, 16437 Florida Ave; Exit 35 off I-84 at Nampa, turn N to Sugar Factory, left onto Karcher Rd, approximately 4.5 miles W to Florida Ave, turn right, school on left. New and used equipment, vendors, computers, VE sessions (10:30 AM sharp, all classes), refreshments. *TI:* 147.2, 146.52. *Adm:* $2. Tables: advance $8, door $10. Don Ingram, KK7VM, 208-459-2459; **ingramde@cyberhighway.net**.

†**Illinois (Princeton)—Jun 4,** 6 AM to 3 PM. *Spr:* Starved Rock RC. Bureau County Fairgrounds, 811 W Peru St; Exit 56 off I-80, S to Rte 6 (Peru St), W 3 blocks to Fairgrounds. Free outdoor flea market, free parking, free on-site camping. *TI:* 146.955 (103.5 Hz). *Adm:* advance $5, door $7. Tables: $10. Alan Erbrederis, N9PIB, 262 Easy St, Somonauk, IL 60552, 815-498-9675, **w9mks@arrl.net**; **http://www.qsl.net/w9mks**.

†**Illinois (Springfield)—Jun 3,** 6 AM (flea market) to 1 PM (building opens 8 AM). *Sprs:* Sangamon Valley RC and Shooting Stars 4-H Club. Illinois State Fairgrounds. Giant covered flea market, indoor exhibits, commercial vendors, VE sessions, handicapped accessible, free parking. *TI:* 146.685. *Adm:* $5. Tables: $5 (commercial vendors only); flea market must supply your own tables. Ed Gaffney, KA9ETP, 13997 Frazee Rd, Box 14A, Divernon, IL 62530, 217-628-3697, **egaffney@family-net.net**; **http://www.w9dua.net**.

Kentucky (Dawson Springs)—May 27. Curt Beshear, KE4UZE, 270-797-9117.

†**Maine (Hermon)—Jun 3,** 8 AM to 1 PM. *Spr:* Pine State ARC. Hermon High School, I-95 to Exit 44 (Cold Brook RD), N to US 2, W to High School, follow signs. Flea market, dealers, tailgating, VE sessions (all classes), free parking, refreshments. *TI:* 146.94, 146.52. *Adm:* $4, under 12 free. Tables: $8. Edward Richardson, K1DTW, 1205 Center Dr, Orrington, ME 04474, 207-825-4417; **edandglo@earthlink.net**.

†**Maryland (West Friendship)—May 28,** 8 AM to 2:30 PM. *Spr:* Maryland FM Assn. Howard County Fairgrounds, 2210 Fairgrounds Rd; I-70 to Rte 32, S to Rte 144, turn right, go W on Rte 144, approximately 1 mile to Fairgrounds. Tailgating ($5 per space). *TI:* 146.76, 224.76, 444.0. *Adm:* $5. Tables: advance $20, door $25. Mike Cresap, W3IP, Box 19, Annapolis Junction, MD 20701; 410-923-3829.

Massachusetts (Cambridge)—May 21. Nick Altenbernd, KA1MQX, 617-253-3776.

Michigan (Grand Rapids)—Jun 3. Kathy Werkema, KB8KZH, 616-698-6627.

†**Mississippi (Pascagoula)—May 26-27;** set up Friday noon; public Friday 5-9 PM, Saturday 8 AM to 2 PM. *Spr:* Jackson County ARC. Jackson County Fairgrounds Civic Center, 2309 Shortcut Rd; Exit 69 off I-10, Hwy 63 S to Hwy 90, W to Singing River Hospital, turn N on Hospital Rd to Fairgrounds behind hospital. Dealers, vendors, VE sessions (Saturday, 11 AM; $6.65, bring picture ID, original license and copy; no charge for Novice testing), forums (ARRL, ARES/RACES), RV parking available on site, refreshments. *TI:* 145.11. *Adm:* $2.50, under 13 free ($10 max per family). Tables: $8 (8-ft, first-come, first-served). Charles (Kim) Kimmerly, N5XGI, 19000 Busby Rd, Vancleave, MS 39565, 228-826-5811; **montehat@datasync.com**.

†**Missouri (Macon)—Jun 10,** 8 AM to noon. *Spr:* Macon County ARC. Macon R-I Vocational School, Hwy 63 N; turn S from Hwy 36, go 7 blocks, school on left side of road. Forums, VE sessions. *TI:* 146.805. *Adm:* advance $2, door $3. Tables: $10. Dale Bagley, K0KY, Box 13, Macon, MO 63552-1822, 660-385-3629, **n0pr@arrl.net**; **http://www.cyberusa.com/~kfoster/hamfest.htm**.

Nebraska (South Sioux City)—Jun 2-3, Midwest/Dakota Division Convention. See "Coming Conventions."

New Hampshire (Rochester)—May 13. Joe Demaso, K1RQG, 207-469-3492.

†**New Jersey (Teaneck)—Jun 3,** 8 AM to 2 PM. *Spr:* Bergen ARA. Fairleigh Dickinson University, 1000 River Rd; from George Washington Bridge take Rte 4 W to River Rd Exit, follow signs. Flea market ($10 per space, includes admission; limited number of spaces with power $20), vendors, VE sessions (8-10 AM, Novice thru Extra; bring original FCC license, photo copy, positive ID), lots of parking, refreshments. *TI:* 146.79. *Adm:* buyers $5, nonham spouses and children free. Jim Joyce, K2ZO, 286 Ridgewood Blvd N, Westwood, NJ 07675, 201-664-6725, **jjjoyce@cybernex.net**; **http://www.bara.org**.

†**New York (Cortland)—Jun 10,** 7 AM to 2 PM. *Spr:* Skyline ARC. Cortland County Fairgrounds; I-81 to Exit 12, Rte 281 S to Fisher Ave to Fairgrounds Dr. VE sessions. *TI:* 147.18. *Adm:* advance $4, door $5. Andrew Slaugh, KB2LUV, 1134 Old Stage Rd, Cortland, NY 13045-9007, 607-753-0597; **kb2luv@clarityconnect.com**.

†**New York (Farmingville)—May 21,** 8 AM to 1 PM. *Spr:* Radio Central ARC. Take LI Expressway to Exit 63, go N on Rte 83, take first left into Independence Plaza (K-Mart parking lot), next to Burger King. *TI:* 145.15 (136.5 Hz). *Adm:* $5, under 12 free. Neil Heft, KC2KY, 516-737-0019; **nheft@ibm.net**.

New York (Owego)—May 6. Bill Coleman, N2BC, 607-748-5232.

†**New York (Queens)—Jun 4;** set up 7:30 AM; public 9 AM to 3 PM. *Spr:* Hall of Science ARC. NY Hall of Science, 47-01 111th St, Flushing Meadow Corona Park. Tailgating, electronics and computer equipment, VE sessions (10 AM, all classes; Lenny Menna, W2LJM, 718-323-3464), VHF tune-up clinic, free parking, refreshments. *TI:* 444.2 (136.5 Hz), 146.52. *Adm:* buyers $5, sellers $10 (per space). Steve Greenbaum, WB2KDG, 85-10 34th Ave, Apt 323, Jackson Heights, NY 11372, 718-898-5599 eves only; **wb2kdg@bigfoot.com**.

North Carolina (Durham)—May 27. Paul Van Doren, KE4OXN, 919-309-2457.

†**North Carolina (Winston-Salem)—Jun 10,** 7 AM to 1 PM. *Spr:* Forsyth ARC. Dixie Classic Fairgrounds; US 52 to Akron Dr (Exit 112), follow signs to Fairgrounds, enter Gate 5 off Deacon Blvd. Tailgating ($3 buys unlimited space), free parking, refreshments. *TI:* 146.64, 145.47. *Adm:* $5. Tables: $10. John Kippe, N0KTY, Box 11361, Winston-Salem, NC 27116-1361, 336-723-7388; **http://members.xoom.com/w4nc/hamfest.htm**.

Ohio (Dayton)—May 19-21, ARRL National Convention. See "Coming Conventions."

Oregon (Seaside)—Jun 2-4, Northwestern Division Convention. See "Coming Conventions."

Pennsylvania (Bloomsburg)—Jun 10, Eastern Pennsylvania Section Convention. See "Coming Conventions."

†**Pennsylvania (Pittsburgh/Butler)—Jun 4,** 8 AM. *Spr:* Breezeshooters ARC. Butler Farm Showgrounds, PA Rte 68, W of Butler. Tailgating ($5 per space), forums, plenty of parking. *TI:* 147.36. *Adm:* $5. Tables: $15. H. Rey Whanger, W3BIS, 120 Cove Run Rd, Cheswick, PA 15024, 412-826-8006, **w3bis@breezeshooters.net**; **http://www.breezeshooters.net**.

†**Pennsylvania (Winfield)—May 27;** set up 6 AM; public 8 AM. *Spr:* Milton ARC. Winfield Fairgrounds, Rte 15, 5 miles S of Lewisburg, follow signs. Hamfest/Computerfest, flea market, tailgating ($5), free parking. *TI:* 146.985, 146.52. *Adm:* $5. Tables: $10 (under pavillion). Ray Grant, K3COD, 5 Dogwood St, New Columbia, PA 17856, 570-568-1727; **rgrant@csrlink.net**.

Quebec (Tracy)—May 28. Noble Steadworthy, VE2HQT, 450-743-4387.

Rhode Island (Forestdale)—May 20. Rick Fairweather, K1KYI, 401-725-7507.

Texas (Arlington)—Jun 9-10, Texas State Convention. See "Coming Conventions."

†**Virginia (Manassas)—Jun 4;** set up Saturday 2-10 PM; public Saturday 7 AM to 3 PM. *Spr:* Ole Virginia Hams ARC. Prince William County Fairgrounds, Rte 234, 1/2 mile S of Manassas. Amateur Radio, Electronics and Computer Show; tailgating ($5 per space plus admission); exhibitors; ARRL Roanoke Division reps; DXCC QSL card

†ARRL Hamfest

Gail Iannone ♦ Convention Program Manager

checking; handicapped accessible; free parking; refreshments. *TI:* 146.97, 224.66, 442.2. *Adm:* $5. Tables: $30 (8-ft, with electricity and chairs). Jack McDermott, N4YIC, 7977 Deward Ct, Manassas, VA 20109-3120, 703-335-9139, fax 703-330-7987, **n4yic@arrl.net**; **http://www.qsl.net/olevahams**.

†**Washington (Dryden/Wenatchee)—Jun 9-11;** Friday noon, Saturday and Sunday 9 AM. *Spr:* Apple City ARC. Dryden Gun Club; from WWA, Blewett Pass Hwy 97-2 junction, follow signs; from EWA go to Wenatchee, take 2-97 toward Seattle. Tailgating, VE sessions, Saturday breakfast and dinner, free RV camping (no hookups). *TI:* 146.68 (156.7 Hz). *Adm:* $5. Tables: Free (limited amount). Roger Eckhardt, WB7SHL, Box 456, Dryden, WA 98821, 509-782-4977, **dmeckhardt@juno.com**; **http://www.qsl.net/w7td**.

†**Washington (Stanwood)—May 13;** set up Saturday 6 AM; public 9 AM to 3 PM. *Spr:* Stanwood-Camano ARC. Stanwood Middle School, 9405 271st NW; I-5, Exit 212, W on SR 532, right at third stop light, left at next stop sign, proceed to school. Commercial displays, VE sessions (10 AM, walk-ins accepted). *TI:* 145.19. *Adm:* $4, under 12 free. Tables: $15 ($20 after Apr 30). Dave Huppert, KA7FDC, 360-387-6123; **huppert@whidbey.net**.

Washington (Yakima)—May 13-14, Washington State Convention. See "Coming Conventions."

†**Wisconsin (Manitowoc)—May 13;** set up Friday eve and Saturday morning; public 8 AM to 1 PM. *Spr:* Mancorad RC. Manitowoc County Expo, 5201 Vista Rd; take I-43 to Hwys 42 and 151 Exit, go E to Cty R, go left on Cty R to Expo Dr, follow signs. VE sessions, overnight camping, free parking, refreshments. *TI:* 146.61. *Adm:* advance $4, door $5. Tables: $7 (8-ft, electricity $6 each). Dick Swanson, N9QFY, 413 Riverview Dr, Manitowoc, WI 54220, 920-682-9264; **rswanson@lakefield.net**.

Wyoming (Casper)—May 27-28, Wyoming State Convention. See "Coming Conventions."

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**. QST

SPECIAL EVENTS

Marietta, GA: Island Rovers of Georgia, K4USI, 0000Z **Apr 29** to 0000Z **May 27**, to promote US island operating activity. 7.260 14.260 21.350 28.450. Certificate. M Condon, NE4S, 4641 Smoke Rise Lane, Marietta, GA 30062.

Novi, MI: Novi Amateur Radio Club, KC8FSW, 1600 to 2000Z **May 1**, commemorating the running of the Novi engine special Indy race car. 7.130 7.270 14.270. QSL. Novi ARC Special Event station, PO Box 268, Novi, MI 48376-0268.

Ansonia, CT: Connecticut Radio Society, W1CRS, 0000Z **May 1** to 2359Z **May 30**, commemorating the 60th anniversary of the first flight of the Vought Corsair F4U. 80-10 meters. Certificate. Connecticut Radio Society, W1CRS, 32 Benz St, Ansonia, CT 06401.

Louisville, KY: Amateur Radio Transmitting Society, W4CN, 1200Z **May 4** to 2359Z **May 6**, for the 126th running of the Kentucky Derby. 14.085 (digital) 14.250 21.350 28.450. Certificate. Shelby Summerville, K4WW, 6506 Lantana Ct, Louisville, KY 40229.

Aquinah, MA: Fall River ARC, W1ACT, 1800Z **May 5** to 2100Z **May 7**, operating from Gay Head Lighthouse—IOTA NA-046—at Martha's Vineyard. 14.260 21.260 28.460 146.55. QSL. Roland Daignault, N1JOY, 19 Davis Rd, Westport, MA 02790.

West Mifflin, PA: Belle Vernon High School Amateur Radio Club, KB3BKW, 1400 to 2000Z **May 5**, during Physics & Communications Day at Kennywood Park. 14.250 21.325 28.350. Certificate. Tom Thompson, Belle Vernon Area High School, 425 Crest Ave, Belle Vernon, PA 15012.

Greenville, NC: Brightleaf Amateur Radio Club, operating W4AMC and W1VOA, 1500-2200Z **May 6**, celebrating the 10th annual International Festival honoring the diversity of Greenville, home of the Voice of America. 7.240 14.240. QSL. Murray Merner, K4MHM, 1212 South Wright Rd, Greenville, NC 27858-3912.

Pomona, NY: Crystal Radio Club, W2DMC, 1400-2200Z **May 6**, celebrating the 69th anniversary of the club's initial chartering with the ARRL. 14.250 21.350 28.450. Certificate. Crystal Radio Club, 230 College St 2, Burlington, VT 05401.

DeKalb, IL: Kishwaukee Amateur Radio Club, W9K, 1700Z **May 6** to 1900Z **May 7**, for the KARC 50th anniversary. 7.108 7.235 14.250 28.390. Certificate. KARC, Attn: Bob Yurs, W9ICU, PO Box 371, DeKalb, IL 60115.

Washington, TX: Naturist Amateur Radio Club, NU5DE, 1800Z **May 12** to 2400Z **May 14**, operating from the Naturist Society's southwest gathering. 7.265 14.265 21.365 28.465. QSL. Naturist Amateur Radio Club, PO Box 200812, Austin, TX 78720.

Fairmont, WV: Mountaineer Amateur Radio Association, W8SP, 0000Z **May 13** to 2400Z **May 14**, commemorating the first official observance of Mother's Day. 3.850 7.225 14.225. Certificate. Charles T. McClain, RR 4 Box 161, Grafton, WV 26354.

Fairfield, CT: Fairfield ARA, WB1CQO, 1400Z **May 13** to 2000Z **May 14**, during the 65th annual Dogwood Festival. 7.266 14.266 21.366 28.366. Certificate. FARA, PO Box 486, Southport, CT 06490.

Unadilla, NY: Chenango Valley Amateur Radio Association, K2BSA, 2200Z **May 19** to 0200Z **May 21**, celebrating the 90th anniversary of Boy Scouts of America and Troop 1 Unadilla, the oldest continuously chartered troop in US. 7.275 14.275 21.375 28.375. QSL. Raymond Darling, 695 Ives Settlement Rd, Bainbridge, NY 13733-3350.

Winfield State, IL: DuPage Amateur Radio Club, W9DUP, 1630 to 2300Z **May 20**, to commemorate Armed Forces Day. 7.250 14.290 28.400 145.25. Certificate. John McCarty, N9HRT, DuPage ARC, PO Box 71, Clarendon Hills, IL 60514.

Baltimore, MD: Maryland Mobileers ARC, W3CU, 1400 to 2200Z **May 20**, operating from aboard the submarine USS *Torsk*. 7.240 14.240 21.340 28.340. QSL. MMARC, PO Box 935, Severn, MD 21144.

Holland, MI: Holland Amateur Radio Club, K8DAA, 1300 to 2100Z **May 20**, celebrating Tulip Time 2000 in Holland. QSL. Dave Lamer, 2866 East Chester Dr, Zeeland, MI 49464.

White River Junction, VT: Twin State Radio Club and area amateur operators, W1FN, 1600 to 2200Z **May 20**, during the Armed Forces Day celebration. 28.360, 14.260, 7.260, 7.105. QSL. Karl Zuege, KB1DSB, 2176 Drake R, Bomoseen, VT 05732.

Angels Camp, CA: Calaveras Amateur Society, WA6YGA, 1600Z **May 20** to 2300 **May 21**, operating from the Calaveras County Fair and Frog Jumping Jubilee. 7.240 14.240 21.320 28.385. Certificate. CARS, PO Box 391, Angels Camp, CA 95222.

Anderson, SC: Anderson Amateur Radio Club, N4AW, 1200Z **May 26** to 2400Z **May 29**, during Freedom Weekend Aloft, Anderson's hot air balloon festival. 14.050 14.250 21.350 28.350. Certificate. Anderson Amateur Radio Club, PO Box 1525, Anderson, SC 29622.

Athens, GA: Athens Radio Club and ARES, N4VHA or W4A, 1400 to 2000Z **May 27**, to celebrate the annual club barbecue and commemorate 10 years as an ARRL Special Service Club. 28.275 (Novice CW) 14.275 7.275. QSL. Ed Fuqua, N4VHA, 1037 College Station Rd, Athens, GA 30605-3611

Memphis, TN: Delta Amateur Radio Club, W4BS, 1400Z **May 27** to 2200Z **May 28**, during Memphis in May. 14.260 21.030 21.310 28.475. QSL. Delta Amateur Radio Club, PO Box 750482, Memphis, TN 38175.

Nutley, NJ: Robert D. Grant United Labor Amateur Radio Association, KB2YCT, 1200Z **May 27** to 2300Z **May 30**, for CQ Memorial Day "Labor remembers those who served." 28.420 52.525. Certificate. RDGULARA, PO Box 716, Nutley, NJ 07110-0716.

Staten Island, NY: Fraternal Order of Police ARC of Lodge #145, K2FOP, 1700 to 2200Z **May 29**, during Police Memorial Day. 28.355 21.415. Certificate. FOPARC Lodge #145, PO Box 205, Bowling Green Station, New York, NY 10274-0205.

Belleville, MI: Yankee Air Force Museum, W8YAF, 1200 to 2000Z **May 29**, celebrating Memorial Day at the Yankee Air Force Museum at Willow Run Airport. 7.270. Certificate. Frank Nagy, N8BIB, 24315 Waltz Rd, New Boston, MI 48164-9167.

Elgin, IL: Elgin Amateur Radio Society, W9IKN, 1300 to 1800Z **May 29,** for the 23rd Valley Foxtrot 10-Mile Run. 7.240 14.240 50.130 147.525. Certificate. Elgin ARS, PO Box 1351, Elgin, IL 60121.

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

SECTION NEWS

The ARRL Field Organization Forum

ATLANTIC DIVISION

DELAWARE: SM, Randall Carlson, WB0JJX—As we enter the summer months, there will be many public service events all over the section. These are important to Amateur Radio, so please take the time to participate in as many as you can. Field Day is just around the corner. This yearly operating event is a good chance for your club to do something as a group. If your club is not large enough to keep a station active for 24 hours, consider operating just a portion of the time and tailoring the event to the needs and capability of your club. For example, consider setting up a station for a few hours at a local park, or other public venue, to show off Amateur Radio. Another option maybe to have a club picnic with a couple of stations on the air for fun. This is also a great chance to test any mobile or portable equipment your club may have to use in an emergency. Be creative and have fun!! 73 Randall.

EASTERN PENNSYLVANIA: SM, Allen R. Breiner, W3TI—SEC: Eric Olena, WB3FPL. ACC: Alan Maslin, N3EA. OOC: E. Max Peters, KI6NJ. PIC: Paul Craig, N3YSI. STM: Cully Phillips, N3HTZ. TC: Allen, N3IRN. Milton ARC officers, President WA3IJU, VP NX3V, Secy K3COD, Treas K3VRH. Officers for Reading Radio Club, President WA3FYR, VP W3VBY, Secy W3UCQ, Trea W3DWH. Mobile Sixers Radio Club, President N3AHP, VP W3JG, Secy KA3VYQ, Treas W3DTZ. These were quite a number of county ECs and ARES groups who send us reports regarding their New Year eve set up and stand-by alert. The world didn't come to an end, the electric power didn't fail, there were no major catastrophes to cope with, and when I turned the computer on in the morning it stated "The year is 2000, if you wish to continue press NE key." Of all the years I've had this computer, I still haven't located the NE key. On the other hand, ARRL leadership is grateful and thanks to the leadership who took time out to plan their Y2K alert and all the volunteers for their time. We say KUDOS to all. Even though nothing happened, we can say we were prepared in the event we were needed. This year's hamfest season is in full swing, and we plan to attend as many as possible. As in prior years, if we are unable to attend your event, we'll arrange for one of our Assistant Section Managers to represent us. Don't forget the Eastern Pennsylvania Section ARRL Convention that will be held at the Bloomsburg Fair Grounds on June 10. FCC's Riley Hollingsworth will be one of the speakers on the program. Feb tfc: N3YSI 484, W3IPX 288, N3EFW 108, W3HK 107, K3AEB 104, W3JKX 99, W3IVS 84, K3TX 71, N3SW 58, N3AT 47, W3UAQ 44, W3TWV 23, W3NNL 22, N8JSO 15, 15, KB3CKD 14, KA3LVT 12, N3IRN 12, N3HR 11, AD3X 11, W3KOD 9, N3AO 9, N3KYZ 7, W3DP 6, KB3CEZ 6, KB3CVO 6, K3ARR 4, KB3BBR 4, W3TI 3, N3ZXE 3, W3DAB 2, W3BNR 1. Net reports : EPA 180, EPAEPT&N 171, PTTN 87, PFN 38, LCARES 9, MARCTN 9, SEPPTN 8, D4ARES 3, MCOES 1, SCASN 1, Milton 1.

MARYLAND/DC: SM, Bill Howard, WB3V, 410-551-6775 **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/.** ANAR EC N3QXW reports 38 members, 4 ANAR ARES Net sessions on 147.805 with liaison to EPA, NCAC, MEPN, WVA, BTN, and MDD. Two training sessions which include a packet training session and the monthly RACES COMEX. OES reports received from: N3QXW KO4A NU3D W3VVN W3CA. CARR EC N3JIA reports 64 members and 4 net sessions on 145.410 with liaison to MEPN, MDD, and MSN by KE3FL, and liaison to BTN, WVPN, DTN, MEPN, Central Net, and Western Net by KG6TU. OES reports received from: KE3FL N3SOK. MONT EC K3XO reports 83 members, an increase of 22; 4 sessions of the Montgomery County Emergency and Public Service Net on 146.955. WASH EC KD3JK reports 39 members, an increase of 12 since last report period; seven sessions of the Tuesday evening ARES/RACES net on 146.940 and the Thursday evening Four State Net on 147.090 with liaison to MEPN. These net sessions had more than 60 check ins. HOWA RO WA1QAA reports local activity during a special RACES exercise to evaluate RACES communications from and between the EOC and alternate EOCs. As a result of this exercise, HOWA RACES was able to provide recommendations, to the County, regarding the placement of permanent antenna installations on the roofs at some of the tested locations. 73, Bill Howard, WB3V and with the nets: NET/NET MGR/QND/QTC/QNI: MSN/KC3Y/29/38/309, MEPN/N3WKE/29/106/559, MDD/WJ3K/58/272/732, MDD Top Brass KJ3E 254, AA3GV 138, K3JL, 159. BTN/AA3LN/29/71/383, SMN/KE3OX/no report. Tfc: KK3F 1157, KJ3E 357, N3DE 156, AA3SB 128, N3WKE 111, AA3GV 97, W3YVQ 90, N3WK 68, N3KGM 58, KB3AMO 55, W3CB 50, KC3Y 44, K3CSX 41, WJ3K 28, W3VK 21, WA1QAA 18, N3EGF 18, N3ZKP 16, KD3JK 9, W3FZT 6, WA3WRT 6, KE3FL 4, WA3GYW 3. PSHR: KK3F 195, KJ3E 159, W3YVQ 148, AA3SB 132, N3WK 129, AA3GV 118, W3VK 117, N3WKE 106, W3CB 106, KD3JK 96, KC3Y 96, KB3AMO 95, K3CSX 93, N3ZKP 93, WA1QAA 92, KE3FL 76.

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. With an increase in hams through the new licensing program, I want to congratulate each new ham and all those who upgraded. Our new hams may want to look for equipment and other items at "The Hamfest by the Shore" on Aug 13, 8 AM in Bayville on Rt 9in NJ. Last year was a sellout. For info, contact WX2NJ at 732-269-6379. See you there. Each year Field Day is held and is a very important activity in our hobby. Whether you participate on the air, at a club Field Day site or go off by yourself, it is important to support Field Day. It only takes 2 or 3 people, radio equipment, camping supplies and maps to take you into a wonderful adventure. Rpt for Feb 2000: QNI Rpts; NJ Net Early 211; NJ Net Late 203; NJ Morning 154; NJ Slow Net 148; JSARS 385; SJVN 380; WB2UVB 171; WA2CUW 115, K2UL 113, K2UL-4 97, AA2SV 83, N2VQA 31, KB2RTZ 28, N2ZMI 15, KA2CQX 13, N2WFN 9, W2AZ 9, K2KID 8, KB2YJD 5, KE2EH 5, KB2VYZ 3, NN2Y 2, N2AYK, KB2VSR, KB2YBM, KC2ETU 1 each. Planning a vacation? Don't forget your radio items.

WESTERN NEW YORK: SM, Scott Bauer, W2LC— Welcome our new EC for Yates County Rick, KE2BV. Congrats to W2TZ for winning ARRL DX contest W/VE low power combined award presented to Fred by W2LC at RDXA meeting. Anyone in your area do something noteworthy? Let me know. HAMFESTS: May 6, 2000, Owego; June 2,3,4 Rochester Hamfest, ARRL Atl Div Convention; June 10 Cortland; July 16 Batavia; July 22 Utica at Frankfort. Net Summaries:

Net	*NM*	*Sess*	*QNI*	*QSP*
BRVSN	WB2OFU	29	201	3
CNYTN	WA2PUU	29	297	56
ESS	W2WSS	29	383	96
NYPON	N2YJZ	29	356	204
NYS/L	W2YGW	29	267	195
NYSCN	W2MTA	1	11	1
OARCN	N2KPR	4	41	5
OCTEN/L	KA2ZNZ	29	573	195
STAR	N2NCB	29	375	37
WDN/E	N2JRS	29	587	140
WDN/M	KB2VVD	29	586	103

Traffic (Feb 00), * indicates PSHR, # for BPL: N2LTC#* 1229, KA2ZNZ#* 630, WB2IJH* 444, KF1L* 381, KA2GJV* 323, W2MTA* 262, NN2H* 251, WI2G* 229, KB2VVD* 181, W2FR* 171, K2GTS* 155, WB2QIX* 146, KG2D* 131, N2KPR* 127, NY2CQ* 88, KA2DBD* 84, NY2V* 68, W2PII* 59, AA2ED* 59, W2GUT* 56, KC2EOT* 53, W2LC* 52, KB2ETO* 47, AF2K* 39, N2CCN* 37, KB2WII* 21, K2DN* 19, N2WDS* 17, W2RH 14, WA2UKX* 11. Digital; Stn Rx/Tx: N2LTC 381/205, KA2GJV 29/2, K2DN 4/0, NY2V 0/1. Nice job to all Net Managers and the individuals above. Club Officers: Walton RA, W2CD-P, N2WDV-VP, K2EZK-Tr, WB2JOW-S. Clubs please send a representative to the ARRL Affiliated Club Conference at the Rochester Hamfest, Friday June 2, 2:30 to 5 PM . Clubs please send me and Affiliated Club Coordinator Ed, N2EH, your club's success stories to share with other clubs. Congrats to TCARC, a club that does a bit of everything, and has a few young hams as well, like KC2DYR a HS senior who is club VP. By the time this prints restructuring day will be history. Follow-up on any new hams and recruit them for your club, local nets, ARES, public service events, the ARRL and for new field organization appointees. Say hello and bend my ear at the ARRL booth at hamfests this summer. CUL and "united"! Do you know who was famous for that? SM remembers Guz WB2EZU SK, a great guy.

WESTERN PENNSYLVANIA: SM, John Rodgers, N3MSE—ASM-ARES: WB3KGT. ACC: open. 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. As spring and summer quickly approach so does the season for thunderstorms and other severe weather possibilities. Keeping this in mind there will be SKYWARN training being offered in various parts of the section. If you are interested in obtaining this training contact your county emergency coordinator for details. Also remember to keep the batteries charged on your handhelds. By the time this letter appears the restructuring will have taken effect. When you hear new operators on the air signing with the temporary suffix please take a moment and congratulate and welcome them to the bands. If you hear a new operator on the area repeaters take a moment to invite them to your next club meeting. For the individuals that have recently upgraded there are many opportunities for you to join in with others and provide a service to the communities. Joining traffic or emergency nets. The Western Pa. Phone and Traffic Net is held daily on 3983 kHz at 6 PM. Join in and help deliver messages to the people of the section. There are also listservers available to provide information about activities in the section. If you need details contact me directly. 73 John Rodgers, N3MSE, WPA-SM, **n3mse@arrl.org**

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. A number of Amateurs have inquired about upcoming license exams in anticipation of the restructuring that will take place in a few weeks. To find out when and where sessions will be held, visit the Illinois section Web site at **www.qsl.net/kd9ul** or visit **www.arrl.org** for a complete listing for all sections. Volunteers are needed for the American Diabetes Tour de Cure bicycle marathon in northeastern Illinois on June 4. If you can help, contact Woody, KB9JHN, at his *Callbook* address, or at **kb9jhn@aol.com**, or 847-697-8035. Members of the Lamoine Emergency ARC assisted the Salvation Army canteen following a mid-air collision and crash of a military jet in McDonough County. LEARC members helped with mass feeding during the five-day investigation and recovery operation. The pilot of the downed plane ejected safely and the other plane was able to make it back to its base. K9LU has been named the 1999 Ham of the Year by the Fox River Radio League. He has been active in the club's Field Day operation, served as chairman for the hamfest and the repeater committees, and worked in other areas. FRRL officers for this year are Pres WA9TPQ, VP W9AX, Sec K9JE, Trea N9FYC. The Jacksonville ARS was recognized by the ARRL for 25 years as an affiliated club. The Section Manager presented a certificate to the club at their annual meeting in January. Schaumburg ARC is making plans to work six public service events this year. They include the Hoffman Estates St Patrick's Day Parade, MS Walk-a-thon, Tour de Cure forDiabetes and other activities. The Rockford ARA has named N9VJU as their Ham of the Year. RARA has discussed making up member packets that would include the club constitution, repeater information, membership directory and other items. The club also held a weekend upgrade session for the Advanced and Extra class exams in February. The Fulton County ARC retained the same officers as the previous year. They are Pres NA9RB, VP KB9LJJ, Sec N9TTD, Trea N9GA. Kishwaukee ARC plans to mark their 50th anniversary with special event station W9K May 6-7 in conjunction with the DeKalb hamfest in Sandwich. The year 2000 officers of the Western Illinois ARC are Pres N9DT, VP NA9Q, Sec KB9UNE, Trea N9KUT. WIARC won the club competition in the 1999 Illinois QSO Party. N9VOK has been named Hamfester of the Year by the Hamfesters ARC. February traffic: W9HLX 92, WB9TVD 32, NC9T 24, WA9RUM 22, W9FIF 7. Ninth Region, C4, report for Feb: traffic 276, sess 52, time 355 min, average 6.8, rate .777, percent rep 90%. QNI: ILN K9CNP KF9ME NS9F. W9VEY Memorial Net report de K9AXS 22 with 200 check-ins. ISN report: QNI-215, QTC-80, Sessions-28. 9RN report 473 check-in's with a total of 735 min, sessions held 58 traffic handled 201, average per session 3.46, rate of traffic 3.65, section represented 84% W9HLX, N9PLM NN9M, NS9M, NS9F, W9GZ, N9TZ.

INDIANA: SM, Peggy Coulter, W9JUJ— SEC: K9ZBM. ASEC: WA9ZCE. STM: N9ZZD. OOC: KA9RNY. SGL: WA9VQO. TC: W9MWY. BM: KA9QWC. ACC: N9RG. Sympathy extended to the families and friends of Silent Keys; 1/29, Charles J. Vance, KA9DIG, South Bend; 2/19, Robert L. Kennedy, K9DXB, Merom; 2/25, Donald L. Lecklitner, K9DFK, Frankfort; 3/1,Esther Clifton, W9PFO, Fort Wayne; 3/1, Lendel J. Cook, W9LNX, Franklin; and 3/4, Millard L. Thurman, WA9NKP, Bedford. They will be missed. ARES members of Elkhart, Saint Joseph and Porter Counties are testing antennas and 2 meter simplex frequencies between hospitals in Elkhart, South Bend and LaPorte with the object of maintaining emergency communications in the event of a disaster affecting 2 meter repeaters. Congratulations to Don Gagnon, WB8HQS, 1999 SOTA editor. For the second year in a row the 1999 State of the Arts newsletter took second place nationally in the Amateur Radio News Service Annual Competition. If you are interested in publicity and would like to be a Public Information Officer for your club or area please send an e-mail to KB9LEI our PIC at **kb9lei@arrl.net**. If you would like to be a net manager N9ZZD the STM is looking for someone for ITN. W9ZY has decided to retire. He has done a fabulous job. Also looking for someone for OOC as KA9RNY has resigned. I will certainly miss her. Congratulations to Marvin Carmony, W9KT commemorating 60 years a licensed radio amateur. 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	2751	457	1557	87
QIN	3656	1430/0000	79	38	283	22
ICN	3705	2315	99	36	515	28
IWN	3910	1310	2023	–	290	29
IWN VHF Bloomington			459	–	435	29
IWN VHF Kokomo			584	–	145	29
IWN VHF Northeast			1071	–	580	29
Hoosier VHF nets (9 nets)			555	42	764	42

D9RN reporting 58 sessions QTC 201 IN represented. 86 % by W9UEM, WB9QPA, N9TBK, KA9UBY, K9GBR, K9PUI, and KB9NPU. 9RN reporting 52 sessions QTC 276 IN represented by KO9D, K9PUI, AA9HN, N9PF, WA9QCF, WB9UYU and W9FC. Tfc: W9FC 273, W9ZY 109, WB9QPA 105, KO9D 91, N9ZZD 77, K9GBR 70, AB9AA 56, K9UEM 48, N9PF 48, W9JUJ 42, KA9EIV 30, AA9HN 25, K9PUI 25, KB9NPU 24, K9RPZ 20, W9BRW 16, KA9QWC 13, K9CUN 7, K9ZBM 7, W9EHY 6, K9DIY 5, K9SXM 4, W9MWY 4, AB9A 4, K9OUP 3, WB9NCE 2.

WISCONSIN: SM: Don Michalski, W9IXG—SEC: WB9RQR. STM: K9LGU. ACC: KF9ZU. SGL: AD9X. OOC: W9RCW. PIC: K9ZZ. TC: K9GDF. ASM: K9UTQ, W9RCW, W9CBE. BM: WB9NRK. It is with deep regret that I inform you of the passing of these three amateurs: Newton Loofboro, W9IQB. Newton was 93 and a member of the Blackhawk ARC. Also, Roy Hawkins, WA9KEC, 56, is now a SK. Roy was a life member

Continued on page 104.

Steve Ewald, WV1X ♦ Assistant Field Services Manager

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- DSP in I.F. Stage! • 100W, 12V DC
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- 100w HF, (100w on 6M TS-570SG only)
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- SSB, CW, AM, FM, • 12V Gen. Cov. RX,
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Optional 1.2GHz, 220 mHz, 6M Modules Available!

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- Optional 3rd band available • Back-lit mic
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- All mode HF/6M/2M/70cm
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- 100W HF/6M
- Newly designed 32 bit DSP
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- Digital IF filter with 41 passband widths
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- Multiple DSP controlled AGC loops
- Advanced CW functions
- Real time spectrum scope

- **Free World Time Clock from ICOM until 1000 units are gone**

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- 100W output for all bands
- IF-DSP+ twin pass band tuning (PBT)
- Large, multi-function LCD with band scope

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- Cool dual display
- 55 watts
- CTCSS encode/decode
- Backlit remote control mic
- Mil spec 810, C/D/E for shock & vibration

IC-207H Dual Band Mobile

- 2M/440 MHz
- Wide band rx (includes airband)
- 9600 BPS packet ready
- 45W VHF (2M), 35W UHF (440 MHz)

FULL COLOR LCD DISPLAY

Computer Programable, Win 95,98®

IC-2800H Dual Band Mobile

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Mounting Kit Included

- 2M/440MHz
- Band scope
- 3" TFT LCD disp
- NTSC video input
- CTCSS encode/decode
- Selectable RF attenuator
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NEW!

IC-718 HF Transceiver

- 100W (AM 40W)
- 12V Operation
- Simple to Use
- CW Keyer Built-in
- One Touch Band Switching
- Auto Tuning Steps (TS)
- VOX Built-in
- Large Front Firing Speaker

IC-T7H 6W, Dual Band Transceiver

Dual Bands at a Single Band Price!

- 2M/440 MHz
- 70 memories
- Great audio
- CTCSS encode/decode
- Auto repeater
- Easy operation!

IC-T8A 5W, Tri-Band Transceiver

FREE Alkaline Battery Case!

- 6M/2M/440MHz
- Easy intuitive operation
- 123 memories
- 5W @ 13.5 V
- Alphanumeric with optional software

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Worlds First 4-bander HT

- 50, 144, 440 MHz & 1.2 GHz bands
- 5 W at 13.5V DC/W/1.2GHz
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- AM, FM, WFM
- "Joy-stick", multi-function switch
- CTCSS encode/decode
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IC-Q7A Dual Band Transceiver

- 2M/440 MHz transceiver
- Wide band receiver - 30 to 1300 MHz**
- 200 memory channels
- Ultra compact
- Monitor function
- Large built-in speaker, 100 mW audio
- Tone squelch with pocket beep
- Multiple scan modes including band, VFO, priority, program

IC-W32A Dual Band Transceiver

- Advanced 2M/440 MHz
- 5W @ 13.5 V
- 200 memories w/alpha naming
- CTCSS encode/decode w/tone scan
- True dual band with V/V, U/U
- Optional PC programmable

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- **IC-T22A 5W, 2M Handheld**

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FT-1000MP HF Transceiver

- Enhanced Digital Signal Processing
- Dual RX
- Collins SSB filter built-in
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FT-100 HF/6M/2M/70CM Transceiver

- Compact Transceiver w/detachable front panel
- Rx 100kHz to 970mHz (cell blocked)
- Tx 100W 160-6M, 50w 2M, 20W 70CM
- Built-in DSP, Vox, CW keyer
- 300 Memories

Call Now For Low Pricing! NEW!

FT-2600M 2M Mobile

- Compact 2M 60W mobile • 12000/9600 baud
- 4 selectable power levels • Built-in CTCSS/DCS
- 175 mems, 8 character alpha-numeric display
- Low intermod Rx, Rugged

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Handheld Receiver

- 100kHz - 1300 mHz
- CW, LSB, USB, AM, FM (narrow and wide)
- Cell blocked in USA
- 1000 memory channels
- 8 character alpha-num display

Great Sound, Call Today! NEW!

VX-5R

50/2M/440HT

- Wideband RX, 6M-2M-440TX
- 5W output
- 220 mems, opt. barometer unit
- Alpha Numeric Display
- CTCSS/DCS built-in
- Li-Ion Battery

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VX-1R

2M/440 Sub-Mini HT

- 290 Memory Channels
- .5W output
- Receives 76-999mHz plus AM BCB (Cell Band Blocked)
- Lithium Ion Battery

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FT-50RD

2M/440mHz Compact HT

- DVR, Decode, Paging Built-in
- Alpha numeric display
- Wide Band receive
- Battery Saver
- 112 Memories
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Ultimate Base Station, HF, VHF, UHF

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- DSP • Full Duplex Cross-band
- 1200/9600 Baud Packet Ready

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FT-90R

2M/440 Mini Dualbander Transceiver

- 50w 2m, 40w 440mHz
- Wide Rx • Detachable Front Panel
- Packet Ready 1200/9600 Baud
- Built-in CTCSS/DCS Encoder/Decoder
- Less than 4" wide!

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FT-920 HF+6M Transceiver

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- Built-in DVR, CW Memory Keyer
- DSP, Auto-Notch • 99 Memories
- Computer controllable, CAT System

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FT-8100R 2M/440 Mobile

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- 9600 Baud ready
- 50 Memory chanels
- RX Range 136-174mHz/420-470mHz
- CTCSS built in

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HRO SPECIAL $599.95

DX-77EQ HF Transceiver

- 100W SSB, CW, FM, 40w AM
- 100 memories • Dual VFO • Speech Processor
- IF shift • CTCSS for 10M FM
- Gen Cov Rx 150kHz-30mHz
- Ham Band TX 160-10M
- CW filter + keyer optional
- Hand mic included • 13.8V DC

NEW!

DJ-C5T

- 2M/440 Tx + Rx
- Extended Rx VHF/UHF
- Built-in Enc./Dec.
- 300 MW Tx output
- 50 Mems. + Scanning
- Built-in Lithium-Ion battery
- Complete w/fast charger

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DJ-S41T/DJ-S11T

440 Tiny HT 2Mtr Tiny HT

- 340 mw
- 21 memories
- Uses 3 "AA" Batteries
- Encode built-in
- Pivot antenna
- Less than 5" high and 2 1/4" wide (DJ-S41T)

(DJ-S41T shown)

DX-70TH HF Transceiver

- 100W 160-10 Mtrs • 100W 6M, Gencov. Rx
- Full QSK, 100 Mems. • Compact, Remotable
- Dual VFO, 12VDC • 6.2 lbs.

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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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High Sunspots= Great HF Mobiling!

MSG Series

2M/70cm Mobile Antennas with spring-loaded whip to absorb impacts. Fold-over hinge included as well.

MSG-1000C	MSG-1100C
Length: 39 inches	Length: 43 inches
Max Pwr: 150W	Max Pwr: 150w
Conn: PL-259	Conn: PL-259

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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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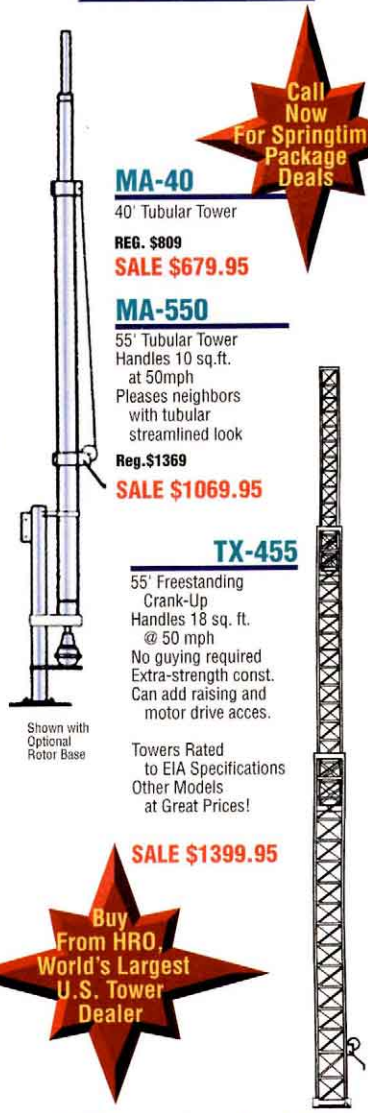

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- ***Super High Current edge-wound silver plated Roller Inductor***
- ***500 pf tuning capacitors with 6:1 vernier reduction drives***
- ***3 core choke balun***
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AMERITRON's ATR-30 *True Legal Limit*™ roller inductor antenna tuner is ham radio's toughest! It'll handle 1500 Watts *continuous carrier output* on *all* modes and *all* HF bands into most antennas -- even on 160 Meters where most antenna tuners fail.

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A 6 position antenna switch lets you select your desired operating antenna.

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Roomy extra-strong .080 inch thick aluminum cabinet gives highest efficiency and lowest loss. 13¼Wx5⅝Hx17½D inches.

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ATR-15, $399. Handles 1500 Watts RF output. Slightly less on 160 Meters. Bandswitched T-Network, peak reading SWR/ Wattmeter, covers 1.8-30 MHz, 6 pos. antenna switch, balun. 13½ W x5½x13¼ in. Perfect for AL-80B/AL572.

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$2845

Suggested Retail

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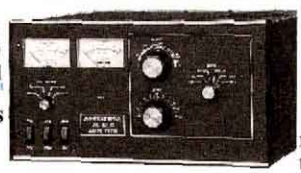
Ameritron's *toughest* Amp

with Eimac® 3CX1200A7 tube



AL-1200

$2395

Suggested Retail

TrueLegalLimit™

Get ham radio's *toughest* tube with AL-1200. The Eimac® 3CX1200A7 has a 50 Watt control grid dissipation and the lowest history of field replacement of any modern transmitting tube that we use. 90 Watts in gives you full power out. All HF bands, all modes. 76 pounds, 18½Dx17Wx10H in.

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of the West Allis ARC and served as president in 1975. W9MCU, Stan Onge, 85, is a SK. The M & M ARC celebrated their 50th anniversary on February 26. ARRL provided a special plaque to commemorate this achievement. President, Jim Callow- K8IR, received Ham of the Year honors!! Another banner month for Wisconsin hams in the 9RN net- 100% participation in February! Daniel, formally W9NXE, is now W9DGI. Thanks to all the clubs that held special testing sessions for hams before and after the April 15 deadline! Let us hope that these new upgrades spark interest in our HF bands. From our PIC, Jim, K9ZZ: "While it is true the HF bands will see a much higher activity level, and probably most of those just 'yakkers,' there will still be those who will be active in emergency communications, and the number may even grow. It's up to us to instill in the new 'lights' that encourages this kind of activity. We can't push it on anyone nor should we try. But we can gently encourage it and we can show it by example." Amen!! WARAC had a great swapfest. There are more on the horizon, and I am accepting invitations to attend hamfests and club meetings. Just call me at 608-274-1886. Check out my calendar of upcoming events on the section Website: MRAC is looking for a new, improved, repeater site. "Get well" wishes go out to GFARC members—Orlan, N9ALZ and Bev, W9ULM. Also, to EC, Lisa, N9VJL. Time to join your local SKYWARN organization! Training sessions are held periodically so please help out with communications. Congratulations to new EC, Rich, W9IBL! Is your club sending me the newsletter? If not, please add me to the mailing. Looking forward to hearing from you! 73, Don, W9IXG. Tfc: K9JPS 930, W9IHW 563, W9RCW 530, W9YPY 456, N9TVT 444, W9CBE 420, K9GU 414, WZ7V 388, K9FHI 150, N9CK 135, K9LGU 117, W9UW 111, N9KHD 105, N9BDL 95, KG9B 65, K9RTB 63, AG9G 57, KE9VU 55, KB9ROB 41, KA9FVX 38, WB9ICH 33, W9BHL 32, AA9BB 30, KB9QPM 28, W9ODV 20, WD9FLJ 15, N9JIY 11, K9UTQ 7, KN9P 4, W9PVD 1.

DAKOTA DIVISION

MINNESOTA: SM, Randy "Max" Wendel, N0FKU—Just a reminder, the MN ARRL Section Phone Net evening session (as well as noon net) is now back on 3860 kc at 5:30 PM CST. There continues to be traffic for major city areas such as St Cloud, Alexandria, Rochester, Duluth, Mankato, Albert Lea, Austin, and the Twin Cities, to name a few. There must be a few people in these cities with HF radios. Plus, all ARRL affiliated clubs are asked to participate. Please represent your ARRL club, bring your VE exam or hamfest announcements or whatever information you'd like to pass along to all the other stations scattered around the state. A big congrats to our ARES SEC Gary Peterson, N0ZOD, for being presented an award as Volunteer of the Year at the annual Governors Conference held in St Paul in early March. Gary...thanks for all you have done for ARES and Amateur Radio here in Minnesota. Keep up the great work! A reminder that the Twin Cities west side (west of MPLS) was split up with new area codes. Sure makes a challenge when making phone calls in the metro and having to keep track of 4 area codes! And, a few more may be on the way. I'm looking for volunteers who may be interested in our field organization by serving either as Official Observer Coordinator, Affiliated Club Coordinator, Technical Coordinator or Bulletin Manager. Please contact me (p.12) if interested. 73 from N0FKU.

Net	*Freq*	*Time*	*QNI/QTC/Sess*	*Mgr*
MSPN/E	3870	5:15 P	827/88/29	W0WVO
MSPN/N	3860	12 P	422/83/29	WA0TFC
MSSN	3710	6 P	N/A	vacant
MSN/1	3605	6:30 P	231/119/29	W0HPD
MSN/2	3605	10 P	122/28/29	K0PIZ
PAW	3925	9A-5P	2758/99/91	KA0IZA

Tfc: WO0A, W0LAW, W0GRW, KB0AII, WA0TFC, KB0OHI, W0HPD, W3FAF, K0PSH, K0PIZ, KB0AIJ, K0OGI, WD0GUF, N0JP, KN9U, K0WPK.

NORTH DAKOTA: SM, Bill Kurtti, WC0M—Peace Garden Hamfest July 7-9 at the International Peace Gardens. This Hamfest has activities for the entire family with camping & events Hams Spouses & children. I'm sad to report that WA0RWM is Silent Key. Lois was Section Mgr when I got my license in 1978 & called the YL wx net every morning at that time. The high speed packet system is ready to go on line in Dickinson as soon the wx warms up so the antennas can be installed. Also, the Dickinson YL net is back in operation at 6:30 PM, Tuesdays, WD0DAW, is net control. The reaction to the license restructuring has been generally positive in ND. I'm pleased to report that WC0M won the 75 meter mobile shootout at the Quartzite Good Sam campout with his Killer antenna. One comment I heard about was, "It ain't fancy, but it sure worked." I'm ready take on all challengers. Traffic: N0RDJ 16. Net Freq, Time, Sess/QNI/QTC Mgr. Goose River, 1895 kc 8:30 AM Sun 4/66/0, KE0XT; DATA, 3937 kc 6:30 PM daily 29/648/20, KE0XT. Wx Nets: 3937 kc 8:30 AM, 12:30 PM 51/1060/56, KE0XT. Storm Net 3937 kc continuous as needed during storms.

SOUTH DAKOTA: SM, R. L. Cory, W0YMB—I want to thank everyone that supported me in the election. Your support was greatly appreciated. Hot Springs ARC put on a Valentine's dinner and invited the widows of Silent Key ops. 52 people attended the dinner that was held after the annual auction at the Black Hills ARC at Rapid City. At the Black Hills ARC testing, 22 people tested. This was the largest group they ever had as people wanted to get test credit before April 15. Many clubs are having testing sessions scheduled for this purpose. Make plans now to attend Mid West, Dakota Division Convention at Marina Inn, South Sioux City, NB, on June 2-3. N0MEA and W6IVV report increased activity in the LARK area nets. At Watertown on Feb 5, 6 people upgraded to Extra. HUB ARC at Aberdeen has installed a station at the Brown Co Emergency Mangement office. Walter Wood, N0KUX, has received the KELO Jefferson Award for community service.

DELTA DIVISION

ARKANSAS: SM, Roger Gray, N5QS, e-mail **n5qs@arrl.org**

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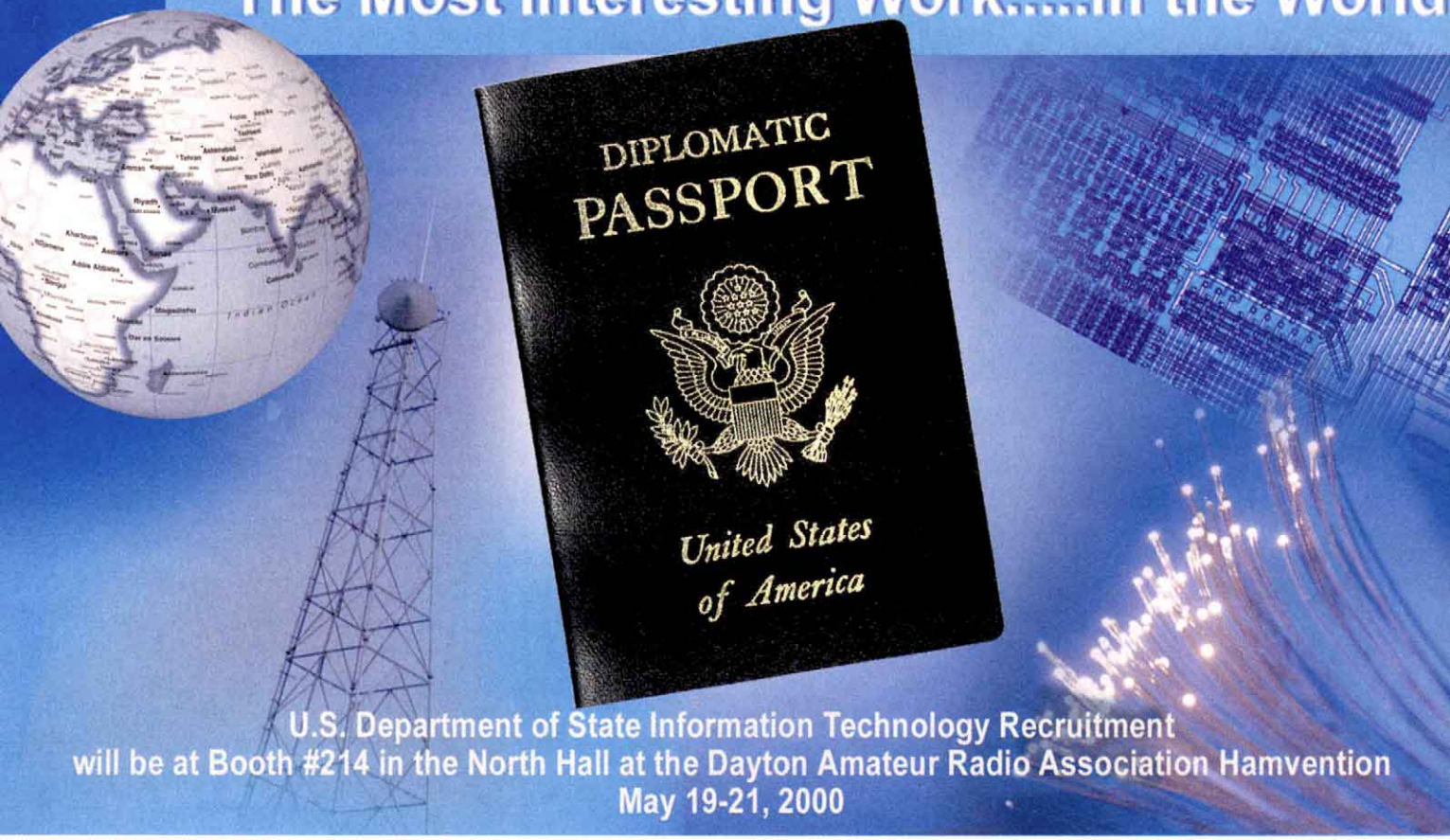

U.S. Department of State Information Technology Recruitment will be at Booth #214 in the North Hall at the Dayton Amateur Radio Association Hamvention May 19-21, 2000

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- Conduct fault isolation and technical control of voice frequency leased lines and digital/radio network components.

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Position Description: Foreign Service Information Management Specialists are responsible for all worldwide and domestic information resource management programs and information technology. The work is diverse and challenging. IM employees support a vast spectrum of computer technology, ranging from state-of-the-art systems to the older legacy systems. They are responsible for:

- Installing, maintaining and operating PC local and wide area networks;
- Operating telecommunications and cryptographic equipment;
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- Installing and maintaining telephone systems;
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— This month I had the pleasure of attending the Russellville Hamfest and presenting the ARRL Forum with the help of Rick Roderick, K5UR. Rick answered many questions and presented a lot of information about the new license structure. And we had a good general question and answer session. The hamfest was well attended by dealers, flea market tables (I am told they were sold out), and hams having a good time. I have just posted a link to the new packet map for Arkansas on the Section Web Page. There seems to be quite a bit of renewed interest in packet over the past few months. I would like to hear about your plans for Field Day and where they are going to be held so I can plan my travels and see where some of the ASMs will be going this year. I hope to visit with many of you at the hamfests and meetings I will be attending over the next few weeks. We have had some severe weather in the last month, and I want to thank those who helped keep the nets up and running and those who helped in the areas of damage. I am thankful that we did not have a repeat of last year and hope all our preparations for disaster are not used again for a long time, but we must stay ready. Tfc: K5BOC 158, KC5TMU 136, K7ZQR 87, AB5AU 22, W9YCE 22, W5RXU 16, AB5ZU 12, KF5PN 10, KC5UEW 5.

LOUISIANA: SM, Lionel A "Al" Oubre, K5DPG, e-mail **k5dpg@arrl.org**. ASM: KB5CX, K5MC. ACC: KA5IJU. BM: K5ARH. SEC: N5MYH. OOC: WB5CXJ. STM: KG5GE. NM LTN: WB5ZED, NM LCW: W4DLZ. The following were presented ARRA Certificates of Merit for services to the Louisiana Section: Carolyn, KA5IJU, Danny, K5ARH, Ron, WB5CXJ, and Ed, KB5CX. These folks have served with distinction during the past eight years. Congratulations to Mickey, K5MC, and Leon for earning BPL number eight and ten respectively. Hurricane season is just over the horizon. It is that time of the year when we must assess our emergency communications capability and our personal commitments. A reminder again of the emergency frequencies used in LA, MS and STX. Official traffic: 3873 kHz nights (7285 kHz days) and H & W Traffic 3935 kHz nights (7290 kHz days). Club officers for 2000: Opelousas AARC Pr WB5GAF, VP KC5INY, Sec KN5GRK, Tr N5KP. Twin City HC: Pr N5JMR, VP WB5ZVK, Sec/Tr W5WZ. Up coming hamfests: Baton Rouge May 5-6, Slidell July 15, Shreveport July 22. Go out and support your area hamfest events. Louisiana Section Net Schedule: LTN 6:30 PM, 3910 kHz, nightly, WB5ZED Mgr; LCW 6:45 PM, 3673 kHz, nightly, W4DLZ Mgr. Reports for February RN5 Cy 1 & 2 LA Rep 100% by K5DPG, K5IQZ, K5WOD, WB5ZED, W5CDX, KG5GE, KC5QAY. LTN QNI 362 QTC 72 in 29 sessions. LCW QNI 193 QTC 49 in 26 sessions. PSHR: WA5WBZ 74, KG5GE 110, K5WOD 112, W5CDX 127, K5IQZ 129, K5DPG 140, WB5ZED 221, K5MC 242. Tfc: K5WOD 18, WA5WBZ 26, K5DPG 26, KG5GE 32, K5IQZ 211, W5CDX 347, K5MC 360 BPL 8th, WB5ZED 785 BPL 10th.

MISSISSIPPI: SM, Malcolm Keown, W5XX—Section Web Page: **www.arrlmiss.org**. ASM: N5JCG, N5EZX. ACC: N5JGK. BM: W5EPW. SGL: AB5WF. STM: KJ5YY. The Central Mississippi Linked SKYWARN Net meets the last Sunday of each month at 8 PM. Check with N5XXX for details. Don Shaw, KD5P, has retired as STM after two years of service. Don has done an exceptional job in organizing and building up our nets. Thanks, Don! His shoes will be capably filled by Guy, KJ5YY. We also welcome KJ5YC as Manager of the Magnolia Section Net. Thanks to the Tupelo ARC for sponsoring another great Northeast Mississippi Swapfest. After 40 years of trying, W5XX broke 2,000 QSOs in the February ARRL CW DX Contest. During an intense search, Meridian ARES members successfully helped to locate an elderly mentally confused area resident. EC reports: KD5CKP, WB5OCD, N5ZNT. Net Reports: sessions/QNI/QTC. MSPN: 29/3156/66, MTN: 29/150/56, MSN: 29/940/1, PBRA: 29/1122/28, Jackson Co ARES/RACES: 29/548/28, MSSN: 29/109/3, Hancock Co ARES: 12/139/6, MAEN: 7/137/0, MCARA: 5/69/0, Lowndes Co ARES: 5/104/0, MBHN: 4/27/0, Stone Co ARES 4/53/0. PSHR: N5XGI 154, KB5W 132, K5VV 120, K5DMC 119, W5XX 98.Traffic: KB5W 591, K5DMC 197, N5XGI 97, KC5RID 40, W5XX 17, K5VV 16.

TENNESSEE: SM, O. D. Keaton, WA4GLS—ACC: WA4GLS. ASM: WB4DYJ. PIC: KE4CES. SEC: WD4JJ. STM: WA4HKU. TC: KB4LJV. MARC's Ham of the Year is Bill, K4BX. The ARES & SKYWARN programs are very good in the Columbia area. Part of the Feb program for DARC was the presentation of traffic, NTS traffic handling and how the NTS system works by K4TTA and KE4GYR. The official report from the "Dixiefest," is that it far exceeded expectations in all categories. So much so that plans are already being made to have Dixiefest 2001 on the same weekend next year. The ARRL TN State convention was held in conjunction with the hamfest. The forums were well attended and enjoyed. QRM reported amid all the snow and other bad weather conditions. The East TN group, including N4OFA & KB4NVD, roamed Roan Mt most of the night of Jan 22 & then visited Whitetop & Walker Mts on Jan 23 participating in the VHF-UHF contest. Bands used were 50 & 144 MHz along with 223 MHz, 432 MHz, 903 & 1296 MHz. This VHF-UHF contest must have been an adventure. The "Feedline" had a story also. NARC officers are: K4IHI, pres; KF4OAL-VP, wb4dxw -Treas, N4JUD-Sec. SMARC officers are: Charlie, AA4WX-Pres., Carroll W4PCA- Sec/Treas, Edward N4EFD-Newsletter. Dresden now has a repeater on 442.150. DRN-5 rpt: sess 28, msg 914, TN rep 60% by KE4GYR, K4WWQ & W4OGG. Net sess/QTC/QNI: TMPN 20/45/2189; TNCWN 23/33/208; TEMPN 21/37/657; TEPN 25/158/2716; TSCWN 23/4/115. Tfc: NZ4O 398, W4SQE 100, N4PU 86, KE4GYR 81, WB4DYJ 69, KA5KDB 26, W4SYE 19, WD4JJ 17, WA4GLS 13, KD4BAM 2.

GREAT LAKES DIVISION

KENTUCKY: SM, Bill Uschan, K4MIS—ASM: Tom, Lykins, K4LID. SEC: Ron Dodson, KA4MAP. SGL: Bill Burger, WB4KY. ACC: Todd Schrader, KF4WFZ. TC: Scotty Thompson, KI4AT. BM: Ernie Pridemore, KC4IVG. PIC: Steve McCallum, W2ZBY. STM: John Farler, K4AVX. Sure was good to see everyone at the Cave City Hamfest. This was my first chance to meet the new Great Lakes Assistant Director, Mr Gary Johnston. Attendance was good for the forums that were held at the hamfest. After checking with the SGL, I found out that some legislation

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EME12 *Handset w/vox* **56.95**
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Alinco DJ-195T Alinco has created a new 2 meter HT that sets new standards in features, convenience and easy operation. The DJ-195 sports an alphanumeric display for easy memory management. It has an ergonomic design that's "user friendly" and the 5 watt output battery is standard. You'll be ready to travel the world with CTCSS encode + decode, DCS and European tone bursts, all included at no extra cost. Best of all, the DJ-195 retains the proud Alinco tradition of quality construction and excellent value.

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$6.95

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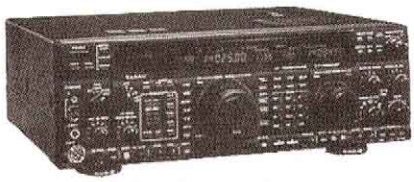


HF w/DSP & Dual Rcvr

FT-1000MP EDSP, Dual in band receive, Selectable antenna jacks, Collins SSB Filter built-in

(FT-847)

HF/50/144/430 Mhz

FT-847 Features include 100 Watt output on HF / 6-Meter bands, while 2-Meter and 430 MHz bands feature a full 50 watts power output. DSP Filters (Notch, NR, BPF). With its high-tech design and revolutionary features, the FT-847 is truly the one radio that can do it all!

(FT-100)

FT-100 Breaking new ground in the field of micro-miniature transceiver design, the FT100 is the only miniature mobile transceiver providing coverage of the 160-6 meter bands plus the 144 Mhz and 430 Mhz bands.

6M, 2M, 70cm in a HT!

VX-5R Yaesu, the world leader in amateur radio is pleased to announce the world's smallest durable tri band handheld transceiver on earth the "new" VX-5R

HF Economy rig

FT-840 Compact high performance HF transceiver. Direct digital frequency synthesis. Clean transmitter output (100 watts). Wide receiver dynamic range. Quality construction

VHF/UHF Mobile

FT8100R Compact Dual Band Mobile. 110 Memory Channels. Enhanced Smart Search. Crossband Repeat. 1200/9600 bps Packet Compatible

introduced that could of had a bearing on Amateur Radio in Kentucky seem to have been caught up in committee and may not even be voted on this session of the Legislature. May 27, 2000, is the Pennyrile Area Tailgatefest at Dawson Springs, KY. The Louisa Hamfest will be held in Louisa, KY, on May 6, 2000, followed by the Northern KY Hamfest on June 11, 2000. On August 20, 2000, the Bluegrass ARC will hold its hamfest in Lexington, KY. September 9, 2000, is the Greater Louisville Hamfest. There are several areas that are holding Severe Weather Spotter classes. To attend one check with your county EC or Area DEC for the times and dates. Net QNI/QTC/Sess: KRN 814/21/21; KMKPN 1051/45/29; KTN 1343/49/29; KYSN 223/52/29; TSTMN 500/29/29; CARN 228/26/24; 4ARES 484/31/29. Tfc: K4AVX 47, N4GD 24, K4YKI 24, AE4NW 55, WB4ZDU 16, KO4OL 35.

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: John LaRock, K8XD (**k8xd@voyager.net**). TC: Dave Smith (**DSmith@smithassoc.com**); Youth Activities: Carl Hillaker (**carln8zdw2@juno.com**). BM: Thomas Durfee, Jr. WI8W (**wi8w@arrl.net**) You can now send your ARRL Hamfest Approval Form electronically to your Division Director. On the Division Web Page, **http://www.mrrace.com/ARRL/** click on the "Division Electronic Forms" box to find the form. The process that used to take days or weeks, can now be done in moments. Make sure your e-mail address is entered correctly into the system, and that you choose YOUR Director to send the form to. Do you know who represents you in the U.S. Senate or House of Representatives? Have you ever wanted to send them an e-mail and could not find their address? You can now find them directly from our Division Web Page, **http://www.mrrace.com/ARRL** click on the Senator or Representative box near the bottom of the opening page. Send them your comments about Amateur Radio and let them know the value of Amateur Radio to your Community. Include them in your electronic mailing lists to keep them abreast of your Amateur Radio activities. You may even wish to invite them to one of your Club Meetings as a guest speaker. What a great way to let them see Amateur Radio in action! If you send any comments to your Senator or Representative, please copy our "Man In Washington," Steve Mansfield, **n1mza@arrl.org**. Your copy will provide an informal "invitation" for Steve to visit the Government Official you have contacted. If you have not been to a Dayton Hamvention, this is the year to definitely be there. Three days packed full of ARRL activities await you. Meet our new League President, as well as many other Officers and Directors of the League. Stop by our expanded League Booth and check out the latest in Amateur Radio publications and many other Membership items that will be available. Have you ever wanted to join the League's Inner Organization, the Wouff Hong? You can only join at a League Convention! The formal ceremony is being held this year in conjunction with the ARRL National Convention hosted by the Dayton Hamvention. The ceremony will be held at the Dayton Marriott Hotel, on the South side of Dayton, and will begin promptly at 11:00 PM Saturday night May 20th, 2000. Hope to see you there. 73, Dick. Thanks to Director George Race for this month's information. Traffic reports for February 2000: K8GA 295, KB8ZYY 265, KA9EIZ 174, K8LJG 140, AA8PI 118, WX8Y 78, W8RNQ 50, AA8SN 44, N8FPN 43, N8JGS 36, K8UPE 35, WI8K 34, K3UWO 32, N8OSC 28, WA8DHB 26, KC8GMT 26, K8ZJU 25, WR8F 25, K8AI 20, KI8GR 1, KB8EIW 9, WB8WJV 5, N8EXS 4, K8QA 3.

OHIO: SM, Joe Phillips, K8QOE, Fairfield, (to contact me, see page 12.) Remember that the 2000 ARRL National Convention is in our backyard. If you've never been to the Dayton Hamvention, this is the year. We will also have a Wouff Hong ceremony Saturday night at 11 PM at the Marriott Hotel....Another major Ohio event next month is the Great Ohio Bicycle Adventure (GOBA) which covers 10 NorthCentral Ohio counties and 3,000 riders, June 17 to 24. Ham radio is the main communications link coordinated by Jeff Ferriell, K8ZDA, GOBA communications Director. Hams along the route support 2 ambulance units, 5 repair units, 6 pick up vehicles and communications along the route. Participation is fun, a form of public service and sharpens our emergency skills...Don't forget Field Day on the weekend of June 24-25. Prepare now....Newsletter editors, you need to contact PIC Scott Yonally, KC8SS, for rules about the 9th Annual Ohio Section Newsletter Contest.....A major service for ARRL members is to have your own permanent e-mail address. It would be **yourcall @arrl.net** which means never having to change your E-mail address even when you change Internet providers. Just check into Members Only on the net to find out how. See page 10 of this issue…Speaking of Web sites, try **www.hamvention.com** for Hamvention info and **www.mrrace.com/arrl/ohio.htm** for Ohio Section news and links to over 40 Great Lakes Division Web sites ...OHIO SECTION CONGRATS: (A) To the Cambridge ARC 2000 officers, Sonny Alfman, W8FHF, pres; Betty Shoemaker, KC8MFL, veep; Bruce Homer, N8JMK, sec and trustee; Bruce McKim, tres; Jim Houser, KA8JIM, programs; Bill Brown, KC8JTO, activities; Lyn Alfman, N8IMW, publicity...(B) To Jeff Gould, N8HFP, Columbus, who is 1999 Ham of the Year for Central Ohio Amateur Radio Emergency Service for his work in the weekly nets...(C) To John Kametz, KC8KYW, of Cuyahoga Falls for his February "Chattering Relay" newsletter article on the magic of the 6m band.....MAY HAMFESTS, is of course, The Biggie in Ohio...Dayton Hamvention, May 19-20-21, which is also the 2000 ARRL National Convention. Now for the February traffic reports:

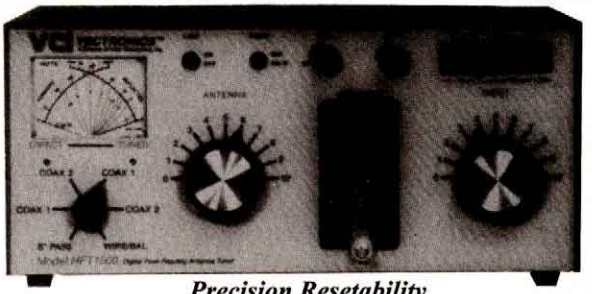
Net	*QNI*	*QTC*	*QTR*	*Sess*	*Time*	*Freq*	*Mgr*
BN (E)	137	58	235	29	1845	3.577	WD8KFN
BN (L)	203	87	324	29	2200	3.577	NY8V
BNR					1800	3.605	W8LDQ
OSN	182	54	650	29	1810	3.708	WB8KQJ
OSSBN	1762	586	2272	87	1030, 1615, 1845	3.9725	KF8DO
OH Section ARES Net					1700 Sun	3.875	WD8IHP

Tfc: N8IXF 324, KD8HB 140, WD8KFN 119, KF8DO 119, N8FWA 118, KA8FCC 109, WA8SSI 107, KC8HJL 106, N8DD

THE VECTRONICS HFT-1500 . . .
THE FINEST HIGH POWER ANTENNA TUNER MADE!

- *high current Roller Inductor*
- *SSB*Analyzer Bargraph™*
- *Cross-Needle Meter*
- *6 position Antenna Switch*
- *built-in 4:1 Balun*
- *gear driven Turns Counter*

HFT-1500
$459.95



The VECTRONICS HFT-1500 is not just an antenna tuner . . . it's a beautifully crafted work of art, using the finest components available and the highest quality construction.

Every HFT-1500 aluminum cabinet is carefully crafted with a durable baked-on paint that won't scratch or chip.

The attractive two-color Lexan front panel is scratch-proof. Take a quarter. Scratch the HFT-1500 front panel as much as you want. *You won't leave a mark!*

Arc-Free Operation

Two *heavy duty* 4.5 kV transmitting variable capacitors and a massive *high current* roller inductor gives you arc-free operation up to 2 kW PEP SSB.

Precision Resetability

A sturdy hand cranked roller inductor lets you quickly *fly* from band to band. A precision 5-digit *gear* driven turns counter lets you accurately return to your previous settings.

Large comfortable knobs and smooth vernier drives on the variable capacitors make tuning precise and easy. Bright red pointers on logging scales make accurate resetability a breeze.

Absolute Minimum SWR

***You** can tune your SWR down to absolute minimum!*

Why? Because *all* three matching network components, the roller inductor and both variable capacitors, are *fully* adjustable.

Tune any Antenna

You can tune any real antenna from 1.8 to 30 MHz, including all MARS and WARC bands. You can tune verticals, dipoles, inverted vees, yagis, quads, long-wires, whips, G5RVs, etc . . .

*SSB*Analyzer Bargraph™*

VECTRONICS' exclusive 21 segment bargraph display lets you visually follow your instantaneous voice peaks. Has level and delay controls.

Accurate SWR/Power Meter

A *shielded* directional coupler and backlit Cross-Needle meter displays *accurate* SWR, forward and reflected power simultaneously. Reads both peak and average power on 300/3000 Watt scales.

6 Position Ceramic Antenna Switch

Select two coax fed antennas (tuned or bypassed), balanced line/wire or bypass.

Built-in Balun

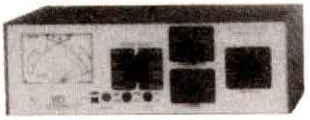
A 4:1 Ruthroff voltage balun feeds dual high voltage Delrin terminal posts for balanced lines. HFT-1500 is 5.5x12.5x12 inches.

Try any product for 30 days

Call toll-free 800-363-2922 and order any product from VECTRONICS. Try it for 30 days. If you're not completely satisfied return it for a full refund, less shipping and handling -- no hassles. All VECTRONICS products come with a one year warranty.

300 Watt Antenna Tuner

VC-300DLP
$159.95



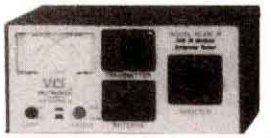
VECTRONICS uses the finest components available to build the highest quality 300 Watt antenna tuner ever made.

You can tune any antenna 1.8-30 MHz. Custom 48 position switched inductor and continuous rotation 1000 Volt capacitors provide arc-free operation. Handles 300 Watts PEP SSB, (150 Watts on 1.8 MHz).

8 position antenna switch, built-in 50 ohm dummy load, peak reading backlit cross-needle SWR Power meter, 4:1 balun for balanced line antenna. Scratch-proof Lexan front panel. 10.2x9.4x3.5 in. Weighs 3.4 lbs.

300 Watt *Mobile* Tuner

VC-300M
$109.95



The VC-300M *Mobile* Antenna Tuner is compact, lightweight, easy-to-operate and is our most economical tuner.

It's compatible with *any* mobile antenna and *any* mobile HF transceiver and is compact enough to fit in the most compact car.

It can also be used at home with dipoles, vees, verticals, beams or quads fed by coax.

Backlit dual movement meter simultaneously monitors Power and SWR. Covers 1.8-30 MHz. Handles 300 Watts SSB PEP, 200 Watts continuous, (150 Watts on 1.8 MHz.). 7.25x8.75x3.6 in. Weighs 3.4 lbs.

SWR/Power Meters

PM-30
$79.95
PM-30UV
$89.95

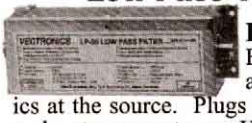
PM-30, $79.95, for 1.8 to 60 MHz. Displays forward and reflected power and SWR simultaneously on dual movement Cross-Needle Meter. True *shielded* directional coupler assures accuracy. Backlit meter displays peak or average power in 300/3000 Watt ranges. First-rate construction includes scratch-proof case/front panel. 5.3x5.75x3.5 inches. SO-239 connectors.

For 144/220/440 MHz, 30/300 Watt ranges. PM-30UV, $89.95, has SO-239 connectors. PM-30UVN, $89.95, has N connectors. PM-30UVB, $89.95, has BNC connectors.

1500 Watt *dry* Dummy Load

DL-650M, $64.95. Handles 100 watts continuous, 1500 Watts for 10 seconds to 650 MHz. Ceramic resistor. SWR < 1.3. SO-239 connector. **DL-650MN, $69.95** has N connector.

Low Pass TVI Filter



LP-30, $69.95. Eliminates TVI by attenuating harmonics at the source. Plugs between transmitter and antenna or tuner. Handles 1500 watts.

High Pass TVI Filter

HPF-2, $24.95. Installs between VCR/TV and cable TV or antenna lead-in cable. Eliminates or reduces interference caused by nearby HF transmitters.

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93, WA8EYQ 92, WD8MIO 83, WA8HED 82, N8POV 59, NS8C 57, N8TNV 53, N8CW 45, N8RRB 43, W8BO 41, WD8KBW 37, KI8O 32, WD8KBW 30, K8OUA 38, WB8PMG 26, NY8V 25, W8RG 25, KC8DWM 24, K8IG 24, KI8IM 23, K8JMP 23, WB8HHZ 20, KB8SBK 20, KB8ESU 20, KB8TIA 19, KD9K 19, KC8HTP 14, N8GOB 13, KF8FE 11, N8IBR 11, KC8HTR 10, W8RPS 10, N8YWX 10, N8RAK 9, KC8KYP 8, KE8FK 8, KC8IYD 7, KC8HFV 5, AA8XS 5, KB8ESY 4, K8QIP 1.

HUDSON DIVISION

EASTERN NEW YORK: SM, Rob Leiden, KR2L— STM: Pete Cecere, N2YJZ. SEC: Ken Akasofu, KL7JCQ. ACC: Shirley Dahlgren, N2SKP. SGL: Herb Sweet, K2GBH. PIC: John Farina, 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 (February 2000) Check-ins (QNI)/Traffic handled (QTC+QSP): AES 53/8 CDN 336/123 CGESN 62/0 ESS 383/192 HVN 468/168, SDN 323/122, NYPHONE 188/832 NYPON 356/420 NYS/E 372/399 NYS/M 229/155 NYS/L 267/398 Section News: Beaconfest (KL7JCQ) is 4/30 in Fishkill and the Metro 70cm (WB2SLQ) is 5/7. ENY Emerg Services Net 1st Tues of month on 145.25 Northeast Connect. 73 de Rob, KR2L. PSHR: N2YJZ 209, N2JBA 146, WB2ZCM 141, W2AKT 136, W2JHO 120, WA2YBM 108, KC2DAA 102. Tfc: N2YJZ 412, N2JBA 78, KC2DAA 66, N2TWN 56, WB2ZCM 47, W2JHO 23, W2AKT 22, W2CJO 17, WA2YBM 15, WA2BSS 4, KC2BUW 1, N2NMF 1, 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. Field Day is next month - June 24 & 25. The NLI staff would like to visit YOUR Field Day site! Please e-mail or call me with info on location and directions. Also, notify Tom, KA2D, the NLI Webmaster, so it will be included on the NLI Webpage! Contact George, WA2WKV, to help out at the Long Island Marathon on May 7 in Eisenhower Park. Next HRU 2001 planning meeting is July 17 at Babylon Town Hall, contact Phil Lewis, N2MUN, (**lewisp@hazeltine.com**) for more info. Look for me in the CQ WPX CW contest on May 27 & 28 as VP5GA from the Turks & Caicos Islands. 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, Islip Town Hall, 401 Main St, Islip, Len Battista, W2FX, 631-277-0893. Bears VE: ABC Bldg Cafeteria, 125 West End Ave at 66th St. Call Hotline 212-456-5224 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, 631-423-7132. 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/N3VT, 631-323-3646. Mid-Island ARC, Last Weds of each month at 7 PM at 36 Drew Flag Rd, Ridge, NY 11961, Contact Mike, W2IW, at 631-924-3535. HOSARC, 3rd Saturday at Queens Hall of Science, 9:30 AM. Pre-registration requested (for free admittance to the Hall), Lenny, W2LJM, 718-323-3464. Tfc: WB2GTG 340, N2AKZ 164, KB2KLH 77, W2RJL 48, N2XOJ 47, K2GCE 41, WA2YOW 31, KB2GEK 26.

NORTHERN NEW JERSEY: SM, Jeff Friedman, K3JF—The Northern New Jersey Section in conjunction with the Splitrock Amateur Radio Association hosted a meeting with Riley Hollingsworth (K4ZDH) on 2/17. Approximately 150 Hams from the NewYork Metro area listened intently to Mr. Hollingsworth's message. Basically, Mr. Hollingsworth indicated that Amateur Radio is healthy and needs to keep a high profile, particularly as it relates to community and emergency service. He went on to say that the FCC had not enforced its rules over the last several years which gave rise to a few "BAD APPLES." Enforcement has been stepped-up and these apples *will* fall from the tree leaving our legacy to our children " a healthier Amateur Radio Service." The Hams in New Jersey would like to thank K4ZDH for his participation in the meeting as well as the excellent work he has begun in continuing the Enforcement Process. I would like to thank those Hams who attended and SARA for its help in sponsoring the meeting, the Morris County OEM and Police & Fire Academy for providing an excellent facility as well as N2WZB, N2NH, N2LOP, N2UAK, N2OYU for providing their technical assistance. On another topic near and dear to us all, hamfest season in Northern New Jersey is upon us and that means lots of Saturday and Sunday participation. Last year I understand that several hamfests were visited by the NewJersey Tax Dept who, as I understand the story, caused a great deal of concern and problems for those of us buying and selling our personal equipment. Our capable SGL in the Northern New Jersey Section, Ray Makul, K1XV, has researched the problem and has found that the New Jersey Code, specifically Section NJSA 54:32B-8.6, identifies us as casual sales and therefore exempts us from Use Tax on personal equipment sales. Finally, our NNJ SGL (boy he is busy) has worked on the introduction of a bill in the NJ Legislature that corrects the current problem that prohibits Amateur Radio Operators with leased motor vehicles from obtaining Amateur Radio license plates. Please support this Bill #A1593 by writing your State Senator and Assemblyman and asking for the Bill to be passed. Net Sess/QNI/QTC: NJM 29/154/63; NJPN 33/164/34; NJSN 29/148/8; NJN/E 29/

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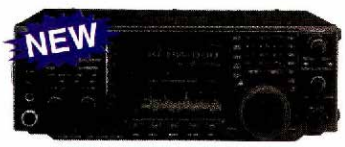

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IC-2800H NEW 2M/440MHz ... **CALL $$**
IC-2100H NEW 2M Mobile 55 Watts, Remote Control Mic..**SPECIAL CALL $$**

IC-207H Dualband Mob., 45W/35W Detach. Front Panel .....**CALL $$**

IC-T8AH 6M/2M/440MHz HT..**CALL $$**
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IC-T2A NEW 2M/HT 6 Watts.....**CALL $$**
IC-W32A 2M/440MHz HT 3/5W**CALL $$**
IC-R2 NEWAM, FM, WFM Receiver, .5-1300MHz, 400 Memories..... **CALL $$**
IC-R10 .5MHz-1.3GHz HT Rec...**CALL $$**
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TS-870S HF Transceiver All Amateur Bands .....**CALL $$**
TS-50S 1.8-30MHz HF Transceiver Super compact .....**CALL $$**

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TM-D700A APRS MOBILE

TM-G707A Dualband Mobile... **CALL $$**
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TM-V7A FM,Dual Band, Detachable Front Panel

TM-V7A SPECIAL
$439.95 **list $719.95**

NEW!!! TH-D7A Data Communicator
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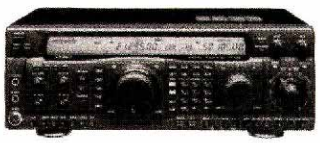

FT-920 NEW HF+6 Meters .....**CALL $$**
FT-1000D Deluxe, Allband HF .**CALL $$**
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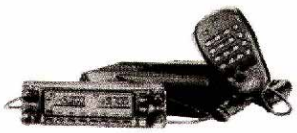
FT-847 HF/2M/430MHz Transceiver 100W HF/6M 50W 2M/430.....**CALL**
FT-100 Ultra Compact HF/VHF/UHF Transceiver .....**CALL $$**
FT-840 High Preformance Compact HF Transceiver.....**CALL $$**



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VX-1R NEW Mini 2 M/440MHz HT SALE ..... **CALL $$**
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DR-610T 2M/440MHz Mobile.....**CALL $$**
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Credit Card size 2M or 440MHz HT
SPECIAL!.....**$89.95**

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50 W, 2 meter Mobile
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JRC

JST-245 160-10M PLUS 6 Meter Transceiver
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211/109; NJN/L 29/203/103; CJTN 29/295/47; NJVN/E 29/391/46; NJVN/L 29/290/33. Tfc: N2XJ 179, W2MTO 89, KC2AHS 66, K2VX 60, N2OPJ 43, K2PB 38, N2RPI 31, N3RB 28, N2GJ 26, KB2VRO 23, N2QAE 20, W2CC 19, N2TTT 13.

MIDWEST DIVISION

IOWA: SM, Jim Lasley, N0JL—ASM: N0LDD—SEC: NA0R. ACC: N0IJP @KE0BX. BM: K0IIR @ W0CXX. SGL: K0KD. SEITS.ORG IS MISSING! Well, actually their provider is missing. I now find that they have found a new home. So... SEITS.ORG lives again! Looks like big changes for the 146.16/.76 repeater in northern Iowa. More info later. I am still seeing lots of exams and exam sessions. Ottumwa had an exam session with only three examinees! But... a 3B and two 4Bs were passed! A good average for only three exams given! Keep it up! How are they doing at your exams? Hey, Randy! Where is the light switch? (surprise birthday party!) DMRAA has a new banner for club activities. Can your club identify themselves? FMARC included the start of an excellent discussion on climbing belt usage this month. Looks like Cyclone ARC is playing with ATV and an ATV repeater. Story Co ARC had a program on FISTS. I would like to have been there. Sorry to note that W0DGZ and N0HAK have spent some time in the local hospitals. Both seem to be on the mend. OARC is starting to think about RAGBRAI. Jim Reider was a presenter at the First Annual Emergency Management Conference in Sioux Falls, SD. Well done. Sorry to note the loss of WA6JOV, W0MNA, WB0VMA, and KB0PEX this month. TSARC is working on more projects to keep their emergency van and the repeaters going. I'm getting info on the CVARC fest already. It is August 13 at Amana. Newsletters were received from SEITS, NIARC, DMRAA, FMARC, OARC, TSARC. Traffic: W0SS 138, KA0ADF 72, N0JL 49, WB0B 10.

KANSAS: SM, Orlan Cook, W0OYH—ASM/ACC/OCC: Robert Summers, K0BXF. SEC: Joseph Plankinton, WD0DMV. STM: Ron Cowan, KB0DTI. SGL: Marshall Reese, AA0GL. PIC: Scott Slocum, KC0DYA and TC: Frank Neal, N8FN. ARRL KS State Convention August 27 at Salina. N0LL Jan VHF sweepstakes, 50-1296 MHz 24,531 points. Smitty, W0CFY, became a Silent Key. EC June, KB0WEQ, reports a membership of 99 in her ARES group. Visit her Web site **http://www.colossus.org/ares/** W0TQ is asking for nominations for KS Amateur of the Year. If you would like to receive the "KAR" email newsletter, send me your e-mail address. We have 4 new appointments. TSs WA0CBW, Bill, and WB0VDF, Gary. ORS Dave, W0FCL, and OES Scot, KC0HFX. Many thanks to our NMs Louie, WB0YWZ, of KWN and KMWN; Bill, N0KFS, of KSBN and KPN; Jay, AB5PA of the CSTN, Tom, WB0ZNY of QKS, and Ron, KB0DTI, of QKS-SS. Tks for giving Kansas 7 fine nets. "KAR" **http://www.colossus.org/kar/** Jan. Kansas Nets: sessions/QNI/QTC, KSBN31/1404/91; KPN 23/338/17; KMWN31/578/490; KWN 31/1102/754; CSTN 26/1884/82; QKS 55/344/63; QKS-SS 10/28/8 SEC109/892/30QNS KB0AMY N0BTH K0BXF WD0DDG WD0DMV AA0IQ N0LJR N0LKK KF4LM W0PBV WA0SSR KB0WEQ. TEN 364msgs 62sessions Kansas 68% KB0DTI AC0E AA0FO KX0I K0PY NB0Z WB0ZNY W0SS mgr. BBS reports: W1AW Bul/ Per/NTS AA0HJ 5/594/0 N0OBM 38/292/0 Ks Stns. Tfc: N0JK 118, NB0Z 104, W0OYH 72, WB0ZNY 52, W0WWR 40, KB0DTI 29, N0RZ 15, K0BXF 13, KX0I 12, AC0E 10, KC0GL 6, K0BJ6, W0FCL 5, K0NK 4, N0ZIZ 4. This space reserved for your report.

MISSOURI: SM, Dale Bagley, K0KY—ASM: John Seals, WR0R. ACC: Keith Haye, WE0G. BM: Brian Smith, KI0MB. OOC: Mike Musick, N0QBF. PIC: Dennis McCarthy, AA0A. SGL: E.B. DeCamp, KD0UD. STM: Charles Boyd, KE0K. SEC: Patrick Boyle, K0JPB. TC: Wayland McKenzie, K4CHS. I had the honor of presenting the ARRL Affiliation Charter to the Four State ARC in Joplin, MO. Alan Shannon, KC0BUM, club President and the membership have, in the club's 2 year existence, sponsored two repeaters, organized a VE team, promoted Amateur Radio in parades, and many other activities. We appreciate the workers of the Zero QSL bureau who have been busy processing incoming DX QSL cards. I also want to thank Paul Poteet, AB0C and Jackie Hearrold, N0OID, owners of ABC Printers, in Macon, MO. They have for years donated the information insert that goes with each batch of cards processed and mailed by the Bureau. Congratulations to Eric Koch, NF0Q, who received a plaque from the St Charles ARC for his years of service as editor of their Newsletter. Patrick Boyle, K0JPB, from Springfield has volunteered to serve as Section Emergency Coordinator. Patrick is active in emergency communications, packet, and is currently Vice-President of Southwest MO ARC. To check on current happenings in the Missouri Section, Amateurs can check on the Section Website **http://www.qsl.net/arrl-mo**. Information on Hamfest can also be found on that site. 73. Nets: Audrain ARC 33/1/4/WB0SEN; WAARCI 94/0/4/KB0VZP; MTN 582/90/29/K0IPM; St L Rep 91/16/04; QCWA #35 66/00/4 N0UYN; Paul Revere 430/00/4/N0IWV; Macon ARES 71/00/4/K0KY; Jackson Co ARES 38/00/4 K0UAA; Rolla Billboard 311/3/28/NE0V; PSHR: KG0IV 82, KE0K 99. Tfc: KG0IV 12, KE0K 68.

NEBRASKA: SM, Bill McCollum, KE0XQ—ASMs: W0KVM, WY0F, WB0ULH, N0MT, WB0YWO. It is with deep regret to inform you that Snipe, W0WLO, became a Silent Key on February 10th. Snipe was a regular on several Nebraska HF Nets. Congratulations go out to Ron Blecha, W0WHY as the 1999 recipient of the "Nebraska Ham of the Year" award. He is the EC for 5 counties and a member of the Hastings ARC. He has also set up the repeater system the club uses. There were several nominees and all were deserving! The new president of the Ashland ARC is Evan Anderson, KC0CWP. He is believed to be the youngest ham to hold office of president at 12 years of age. It is great to see this kind of enthusiasm from our younger hams. It was great seeing you at the Nebraska State Convention in Norfolk. Thanks to the Elkhorn Valley ARC for such a fine event. Net Reports: ENE 2M ARRES: QNI 468, QTC 2 & 28 sessions, NE 40 Net: QNI 388, QTC 16 & 29 sessions, NESN: QNI 981, QTC 31 & 29 sessions, MIDNE 2M ARES: QNI 391, QTC 4 & 29 sessions. Tfc: K0PTK 105, W0AP 37, WD0BFO 26, KE0XQ 25, W0UJI 14, W0RWA 12, WY0F 8, W0EXK 2, KC0ERW 2, WC0O 2, KB0MTT 2.

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Wear it around your waist, over your shoulder, or clip it onto the tower while you work -- the fully-adjustable webbed-fabric carrying strap has snap hooks on both ends.

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MFJ-99, $54.85. Accessory Package for MFJ-259/B/249/B/209. Includes *genuine* MFJ-29C carrying case, MFJ-66 dip meter adapter, MFJ-1315 110 VAC adapter. ***Save $5!***

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MFJ-731, $89.95. *Exclusive* MFJ tunable RF filter allows accurate SWR and impedance measurements 1.8 to 30 MHz in presence of strong RF fields. Has virtually no effect on measurements. Works with all SWR Analyzers.

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NEW ENGLAND DIVISION

CONNECTICUT: SM, Betsey Doane, K1EIC—BM: KD1YV. OOC: WA1TJT. PIC: W1FXQ. SEC: WA1D. SGL: K1AH. STM: K1HEJ. TC: W1FAI. The long-awaited April 15 is just about here. All of us HFers need to be listening for newcomers and welcome them to the bands—I will try to be active and listen for the temporary suffixes—it will be fun! Now that the warmer weather is coming, I am looking forward to seeing many of you at the various Flea Markets and perhaps even at The Dayton Hamvention, this year's site of the ARRL National Convention. I will be meeting with several Section Managers throughout the country and sharing ideas. If your club, or you as an individual, is interested in working at the Amateur Radio booth at the Big E starting mid September, it is imperative that you contact Larry, K1HEJ, as soon as possible. A decision must be made soon about whether CT will again be responsible for the booth. We can only do it if we have sufficient volunteers. Contact Larry or me for more information. Rusty, NM1K, is once again being honored by Handi Hams as their volunteer of the year. Rusty spends hours sending out greetings on traffic nets from Handi Hams to members and newcomers studying for their licenses. Rusty is hoping to travel to the Courage Center—it's a great place located in Golden Valley, MN, not far from Minneapolis. Traffic handlers—please let STM K1HEJ or ASM K1STM know your preference about a dinner in the Spring or picnic this summer. No matter what our interest is in this hobby, groups getting together once in a while really is a worthwhile activity. So, let's do it! Net sess/QNI/QTC/NM: WESCON 29/339/89/KA1GWE; NVTN 29/194/103/KB1CTC; ECTN 29/323/65/WA4QXT; CPN/29/216/63/N1DIO; CN/29/108/48/N1AEH; BEARS of Manchester 29/290/407/NM1K. Tfc: NM1K 2061, KA1VEC 508, KA1GWE 154, KE1AI 136, KB1CTC 116, K1STM 95, N1VXP 75, WA4QXT 73, KB1ETO 16.

EASTERN MASSACHUSETTS: SM, Joel Magid, WU1F—The Eastern MA Section and ARES is re-activating the once-a-month section net as an ARES net. The net is on the Minute Man Repeater Association linked system (146.610- &c) on the 4th Sunday of each month, at 9:30 PM. The purpose of this net is to: 1) Introduce people to ARES. 2) Provide practice to ARES members. 3) Validate different communications paths for use in times of emergency. During emergencies, this net (on portions or whole of the linked system) may be called as a section ARES Liaison Net, with deference to prior allocation of repeaters to specific functions. The ARES Section Net is open to MMRA members, ARES members, and all hams interested in emergency communications. The MMRA can be reached for more information via e-mail: **mmra@mmra.org**; at **http://www.ultranet.com/~mmra/**; and US mail: P. O. Box 1127, Berlin MA 01503. Thanks to William Ricker, N1VUX, EMA ARES DEC/Suffolk-Metro.

Net	*Sess*	*QTC*	*QNI*	*QTR*	*NM*
EMRI	58	157	205	595	K1SEC
EMRIPN	28	117	187	497	WA1FNM
EM2MN	29	101	283	430	N1LKJ
HHTN	29	50	200	310	N1IST
CITN	29	65	354	629	N1SGL
WARPSN	4	12	55	NA	K1BZD
NEEPN	4	8	15	NA	WA1FNM
CHN	29	35	184	395	W2EAG

Tfc: W2EAG 286, WA1TBY 174, NZ1D 145, WA1FNM 72, K1SEC 61, N1TDF 41, N1OBL 40, NG1A 40, KY1B 39, WA1LPM 35, KD1LE 34, N1AJJ 33, K1BZD 32, K8SH 29, N1ZZN 29, N1BNG 27, N1IST 27, N1LAH 9, WA1VRB 7, KB1EB 4, N1XQC 4, W1ON 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. TC: N1BOK. Happy to announce Leo Langelier, N1BOK, has accepted the position as TC. Hopefully, clubs will take advantage of his expertise. Field Day is rapidly approaching, and putting the SM mobile office on the road, gives me the most fun this position has to offer. I enjoy seeing everyone's innovative ideas on how to set up in some of the most unique areas. I would like to visit as many sites as time allows, and if I cannot be there, I will try to have a cabinet member stop by and get you're comments and input. Remember that being in a public space brings a lot of free publicity to the hobby. With restructuring firmly in place, more and more hams are enjoying the thrill of HF. Although the 5 wpm is now a minimum requirement to get into the extra part of the CW band, it is very unlikely to help you survive in any type of contest. So don't stop at the minimum to get on the air, do your best. Remember Mother Goose: Good, Better, Best. Never, Never, Rest. Until the Good is Better, and the Better, Best. 73, Bill, N1KAT.

NEW HAMPSHIRE: SM., Mike Graham, K7CTW— ASMs: WW1Y, WB1ASL, W1NH. TC: WA1HOG. STM: WA1JVV. PI: KA1GOZ. OOC: WS1E. SGL: K1KM. BM: KH6GR. ACC: AA1QD. SEC (acting): WW1Y. It is with very deep personal sadness that I report that Harlan A. ("Buzz") Muzzle, KA1OMJ, is a Silent Key. A retired Marine, Buzz was a member of NARC, and his property was, for years, the site of many a superb Field Day. On a happier note, I am pleased to announce that the Section has obtained a new Website address. You can access it at **ht.//www.arrlnh.org**. Several folks have indicated interest in working on the new site, and I hope that, within a few weeks, it will be fully operational. Rich Force, WB1ASL, North Country ASM, is also looking at a new forum for an e-mail Reflector, perhaps to include threaded dialogue activity. By the time you read this, I hope to have an announcement. Also cleaning out bouncing e-mail Addis from old Reflector list. Send me an e-mail at **k7ctw@arrl.org** if you are not on the old list and wish to be added to the new one. Visited North Country and Nacho Clubs in March. With good weather, hope to visit more. Call me if you want a speaker. Hope to see all of you at Spring Hosstraders in Rochester, May 12th and 13th. For now, best 73. Net NM/Sess/QNI/QTC: GSFM N1RCQ/29/244/26; GSPN WB1GXM/28/122/22; VTNH WA1JVV/29/145/170. Tfc:

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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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You can match dipoles, verticals, inverted vees, random wires, beams, mobile whips, shortwave -- nearly any antenna. Use coax, random wire or balanced lines.

MFJ-989C **$359.95**

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.

MFJ's exclusive *Self-Resonance Killer*™ keeps damaging self-resonances away from your operating frequency.

Large, self-cleaning wiping contact gives good low-resistance connection. Solid 1/4 inch brass shaft, self-align bearings give smooth non-binding rotation.

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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.

MFJ-962D compact Tuner for Amps

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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

MFJ-969 **$199.95**

Superb *AirCore*™ Roller Inductor tuning. Covers *6 Meters* thru 160 Meters! 300 Watts PEP SSB. *Active* true peak reading lighted Cross-Needle SWR Wattmeter, *QRM-Free PreTune*™, antenna switch, dummy load, 4:1 balun, Lexan front panel. 3½Hx10½Wx9½D inches.

MFJ-949E deluxe 300 Watt Tuner

MFJ-949E **$149.95**

More *hams use MFJ-949s than any other antenna tuner in the world!* Handles 300 Watts. Full 1.8 to 30 MHz coverage, 48 position *Precision48*™ inductor, 1000 Volt tuning capacitors, *full size* peak/average lighted Cross-Needle SWR/Wattmeter, 8 position antenna switch, dummy load, *QRM-Free PreTune*™, scratch proof Lexan front panel. 3½Hx10⅝Wx7D inches. **MFJ-948, $129.95.** Economy version of MFJ-949E, less dummy load, Lexan front panel.

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.

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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 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.

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MFJ-16010 **$49.95**

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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/UHF Tuners

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.

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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.

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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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Tech Help: (601) 323-0549

W1PEX 1048, WA1JVV 143, N1NH 105, W1ALE 35, N1CPX 11, KA1OTN 8.

RHODE ISLAND: SM, Armand Lambert, K1FLD—Nice to see the arrival of Spring; time to repair and install antennas. Next month will bring the ARRL Field Day contest weekend. Please notify your Section Manager ahead of time as to the location of your Field Day site (e-mail works fine). It was a very memorable experience to have visited with all of you last year. The xyl, KA1YVF, and myself enjoyed touring and chatting with all of you. Looking forward to seeing you again this year. Along with new contest stations emerging, Rhode Island has sprouted a newly formed radio club. With pride we announce the GRIARC with a repeater on 147.370- 88.5 pl. You can contact Roger, KB1EJG, by checking out their Website: **www.qsl.net/griarc/**. Covering the emergency comms area, the SEC, Martin, N1JMA, and Rob, KD1CY, met recently with officials at the Taunton Weather Service explaining the role of Amateur Radio Operators of the area and their importance in reporting severe weather conditions to the SKYWARN Center. Volunteer Examiners are urgently needed to handle the record number of hopeful candidates at upcoming VE sessions. If your VE accreditation has expired, now is the time to answer the call by renewing through the ARRL VEC program today. 73, Armand, K1FLD.

VERMONT: SM, Bob DeVarney, WE1U—Well, the Milton Hamfest and Winter Vermont ARRL Convention seems to have been a big success by any measurement. Attendance on the hamfest side was down a bit, I think, from years past, but it was more than made up for by attendance in the two VE sessions. According to Mitch, W1SJ, they set a new record in terms of session size for the morning session. Looks like all hands will be needed for the post- April 15th VE sessions for all these paperwork upgrades. And that sure is a good thing. Winter has finally relinquished its grip on Vermont, and it's time to get out for all those spring and summer antenna projects. I hope to be able to go over my whole tower and all the feedlines because it looks like it took some damage from ice coming off the roof. Hope you all fared better than I did. 73 de WE1U.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, W1UD, **w1ud@arrl.org**—ASM: N1NZC. ASM digital) KD1SM. STM: W1SJV. SEC: K1VSG. OOC: WT1W. We have made it through another winter. No real emergencies in the section. Year 2000 turnover and leap year have come and gone, and my computer is still doing what it should. Can't say that about my wrist watch. On the 29th of Feb, my watch read the first of March. Oh Well! That was taken care of and now I'm good for the next four years. Our bands have been exceptional. Five watts and a dipole on ten meters and you can work the world. The CBers have found that out, too. Peruse your dial down into the CW portion and you will be surprised what you will hear. At times, it sounds like an extension of the phone band CW and traffic handling is far from dead. From the STM reports the last couple of months, we have had an influx of new traffic handlers. That's great! Between CW clubs like FISTS, contests and handling traffic, our newly licensed people have found that a modest HF station is very effective. It doesn't take a kW to work the world. Field Day is just around the corner. Make plans! Tfc: N1ISB 24, N1RFQ 52, K1TMA 317, N1RKY 6, W1ZPB 82, W1UD 198, KD1SM 9, W1SJV 16, N1RLX 5, W1BMK 5.

NORTHWESTERN DIVISION

ALASKA: SM, Kent Petty, KL5T—Welcome new Assistant Section Manager T.J. Sheffield, KL7TS of Anchorage, new DEC Robert Simpson, NL7XZ of Juneau, new Net Manager Pete Marsh, AL7PI for the Anchorage HF Pactor Traffic Gateway, and new Net Manager Susan Woods, NL7NN, PARKA Net. Contact Rob Wilson, AL7KK, for input to state PRB-1 effort. HAMs around the section busy with public service support: Yukon Quest in Fairbanks, Fur Rendezvous Grand Prix and World Championship Sled Dog Race in Anchorage, Iditarod start and restart in Anchorage and Wasilla, Su-Valley Dog Team Race at the Willow Winter Carnival, Dr. Howe Bartko Memorial Dog Team Race in Knik. Encourage section-wide check-in to HF nets: Sniper's Net 3920 daily 1800 AST, Bush Net 7093 daily 2000 AST, Motley Group 3933 daily 2100 AST, and Alaska Pacific Net 14292 M-F 0830 AST. Please report activities on FSD-157 to KL5T.

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP—I would like to thank all of the VEs and assistants who put in many hours of work with conducting extra test sessions for all of the hams who have wanted to up-grade before April 15. The VE teams in Wenatchee, Walla Walla, Spokane, Yakima, Goldendale, and all others are to be commended for your special efforts. The Canadian RAC has submitted a request to the Federal Authorities (Industry Canada) to reduce their code speed to 5 WPM to allow full access to the HF bands. Some of the Wenatchee hams helped with the Special Olympics Winter Games at Mission Ridge. STM Don, W7GB, is in need of someone for Digital Traffic Manager. The Yakima hamfest and State Convention is May 13-14. 7 out of 12 OO Stations reported monitoring activity in February. Net Activity: WSN: QNI 860, tfc 301; Noontime Net: QNI 8316, tfc 251; WARTS: QNI 3319, tfc 156. Tfc: K7GXZ 380, W7GB 229, K7BFL 101, KA7EKL 84, KK7T 71. PSHR: W7GB 138, K7GXZ 121.

IDAHO: SM, M.P. Elliott, K7BOI—OOC: N7GHV. SEC: AA7VR. STM: W7GHT. Idaho's Senator Mike Crapo introduced the Amateur Radio Spectrum Bill in the US Senate. He had some kind words too saying, "…we want to do something for Amateur Radio in return for all the good it has done the people of Idaho and elsewhere in the United States by providing a reliable means of backup communications in times of emergency." The Senator has pledged to promote the bill in the Senate. Thank you Senator! Plea for help – if your club has a newsletter (printed or e-mail) please add me to your mailing list. Also, please let me know of club activities so that they can be included in the Section news. 73 — Mike, K7BOI. Tfc: W7GHT 343, WB7VYH 70, KB7GZU 62, and N7MPS 29. PSHR: W7GHT 120, WB7VYH 92, and N7MPS 74. Net (SESS/QNI/QTC/ Mgr.): FARM-29/2670/35/W7WJH; NWTN-29/1182/64/KC7RNT; IDACD-21/517/11/K7UBC; IMN-28/416/163/W6ZOH.

MONTANA: SM, Darrell Thomas, N7KOR—Amateur activity in the Montana Section during February was very busy.

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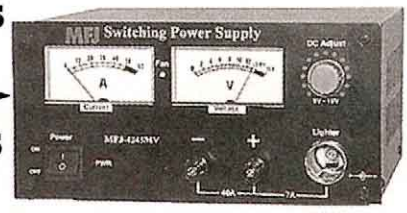

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Front-panel control lets you vary output from 9 to 15 Volts DC.

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Brightly illuminated 3 inch meters let you monitor load voltage and current.

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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. 5½Wx2½Hx10¾D in.

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In addition to many clubs getting a lot of news coverage due to restructuring many individual hams spent 5 days providing 24 hour communication between checkpoints for the annual Race to the Sky Sled Dog Race. I would like to recognize and thank those individuals who provided this support. At Lincoln for the start, a check point and finish line were Jerry KJ7TR, Gary W7DEO, Bill KC7CIS, Billy KC7NBU, Tish KC7WBM, Rollie KC7WBP, Enie KC7WBO, Todd KE6NVV, Oscia KC7WBI and myself, Darrell N7KOR. Whitetail Ranch Checkpoint Bob W7IPB, Jim W7CK. Seeley Lake Checkpoint Frank KA7LEB, Bob K7BA, Jerry N7STM. Holland Lake Checkpoint Darrell KG7MO, Ardis N7WKF, John N7BIR and Fred N7ZUY. Many of these folks have been assisting for several years and this has provided a tremendous boost for the image of Amateur Radio in Montana. Thanks again to all. Net/QNI/QTC/NM MSN 113/0 W7OW MTN 2041/60 N7AIK IMN 416/163 N7MPS. PSHR: N7AIK 111.

OREGON: SM, Bill Sawders, K7ZM—ASM: KK7CW. ASM: KG7OK. SEC: WB7NML. STM: W7IZ. SGL: N7QQU. OOC: NB7J. STC: AB7HB. ACC: K7SQ. With the summer months approaching, "Hamfest" time is here. For starters, mark down May 6th, for Up the Crick Radio Club's upcoming hamfest in Eugene. For Information about this event, call Karl Fuller, K7ARL, at 541-942-1624. The Coos County Radio Club will hold their ARRL approved hamfest in Bandon on July 29th. The Umpqua Valley Amateur Radio Club's hamfest is scheduled for August 12th at Rivers West, and Seapac will be held in Seaside on June 2-4. More info about these events, next month. I thank the many clubs, who are now sending me this information within their newsletters. It's a great way to let everyone know what's going on within our Section. Just a reminder, the Oregon QSO Party will NOT be held in May. It's scheduled for Saturday, August 19th from 7AM to 9PM PDT. This change was made to allow more stations to participate by traveling to, and activating some of the rarer counties...like Wheeler and Gilliam !! Also, this event is scheduled for just "one day" so it will not take up the entire "family weekend". I hope to see lots of you this summer. Keep in touch. NTS traffic totals for February: N7DRP 122, KA7AID 120, K6AGD 108, KC7SRL 107, KK1A 86, KC7SGM 76, W7VSE 76, KD7FLE 72, KC7SGL 70.

WESTERN WASHINGTON: SM, Harry Lewis, W7JWJ—The century was ushered in Western Washington with a hysterical rush to upgrade to a higher grade of theory class. During one week our VE team administered 4 exam sessions. Over 150 applicants were on hand to upgrade at the Mike & Key electronic flea market. Perhaps few amateurs realize that the VE teams spend long hours double checking paperwork before submittal to the VEC. Kudos to them! At this same flea market, a prize of $1000 was offered to anyone who could copy 13 wpm Morse code with difficult text for 5 minutes without error. With over 3,000 in attendance, there was only one who tried: KB7SVU, Alan Hughes, EC of Pierce County. We wave good-bye to CW. A lesson learned: Normally this SM carries in his briefcase a list of telephone numbers and e-mails of all appointees. While teaching a weekend General class at King County American Red Cross facilities, I left my emergency kits in the classroom overnight. Someone forgot to notify the building custodian to unlock for Sunday morning. Fortunately a trip to a nearby fire station yielded a list of emergency numbers for the Red Cross people. Welcome Barry Boyce, KC7BZC, the new Disaster Specialist for King County Red Cross. (Just don't lock your emergency numbers in his office.) A second lesson: Timely monthly reports were received from a number of appointees. Little did I expect the many dozens of e-mails asking about upgrade VE sessions. And so went the contents of my mailbox. Hardcopy next time! A recent third lesson learned was never to discount the wrath of the dozen amateurs that live on Quemes Island when this SM made a derogatory comment about that beautiful little Island of Puget Sound. K7MQF qualified for BPL with a traffic total of 558. K7BDU still leads the pack with a traffic total of 1214. A newcomer to traffic reporting is W7QM who submitted a respectable total of 70. The emergency preparedness in Clark County continues to improve. Repeater capabilities have been upgraded, and the local packet radio network now covers the entire county with the pactor station accessible from most county areas. At a recent ARES meeting the Clark County, ARES/RACES team established a new group of 13 members to monitor the 6 bridges that the county feels will give the first indication of flooding in an emergency. 73.

PACIFIC DIVISION

EAST BAY: SM: Andy Oppel, KF6RCO—SEC: KE6NVU. DECs: WA6TGF/Alameda County, KO6JR/Contra Costa County, WA7IND/Napa County, K6HEW/Solano County, N6UOW/Training, W6CPO/Technical Services, KQ6TM/Section Plans and Administration. OOC: W6NKF. EB Web Page at **http://www .pdarrl.org/ebsec/**. Webmaster is KB6MP. SARS welcomed new member KF6ZOK and congratulated KF6QZM on his upgrade. VVRC reported Y2K activities for K6HEW and the S.I.D. response team along with KF6KFP and KD6JSB at the Solano County EOC. KJ6Q received a plaque for his work on the VVRC Newsletter. EBARC reported successful Y2K coverage and received a letter of recognition from the Richmond Police Dept; they welcome new members WB6NER, K6USW, KE6FSU and KF6WXC. ORCA thanked Y2K participants K6JAT, KB6MP, KQ6JZ, KE6SSY, W6LL, N6RCG, KE6TYY, KE6MQW, WB6BYA, W6UAB, KF6GTT, KF6GYW, W6THD, KD6OAQ, KE6HKY, WA6CUY, KO6TI and KE6DVT. LARK reported Livermore EOC activation for Y2K; members KE6YCW and WA6TGF completed a new RACES operating plan for Livermore and Pleasanton. VVRC members K6ZU and NI6V donated a 2-meter radio, antenna and power supply to the Vaca High School Ham Club. EBARC's crab feed was a huge success. MDARC announced additional W6CX award recipients KF6EUM, KE6ZZS, W6UV, KE6ZZG, WA6DQN, KE6WRE and KE6SQV. Feb tfc: W6DOB/1115, WB6UZX/26. 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/3651/7052/8:30PM. Your check-ins are always welcome.

NEVADA: SM, Jan Welsh, NK7N—ASM: W7YDX. SEC: N7JEH. TC: NW7O. ACC: N7FFP. STM/SGL: N7CPP. PIC:

MFJ-1270C *VHF/HF* Packet TNC

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Plus much, much more!

32K RAM, IC sockets for easy service. 256K ROM, speaker jack, lithium battery backup, RS-232 and TTL serial ports, radio cable (you add a connector for your radio), *Fast-Start*™ manual, much more!

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Why tie up your expensive 2 Meter rig on a single packet channel? For an incredibly low $119.95, you can enjoy dedicated high performance packet from 1200 to 9600 baud on 2 Meters, 24 hours a day!

MFJ's *PacketOnly*™ data radios are compatible with all TNCs with hardware DCDs and most TNCs with software DCDs.

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MFJ-1278B/DSP, $379.95, has powerful DSP. **MFJ-1278B, $299.95,** less DSP. **MFJ-1278BT, $329.95,** built-in 2400 baud modem, less DSP.

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Switch between your TNC or Mic by pushing a button!

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Switch between your microphone and TNC by pushing a button!

You won't have to unplug your microphone and plug in your TNC *everytime* you want to work packet or other digital modes.

Just plug these pre-wired cables into your rig's microphone connector and into your TNC and you're ready to go -- no more hard-to-find connectors and wiring up cables.

Works with HF, VHF and UHF radios with 8 pin mic connectors -- including Kenwood, ICOM, Yaesu, Alinco, Radio Shack, Standard and others. *For radios with 8-pin RJ-45 modular telephone jack, select the new "M" models.*

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Icom[1]/Yaesu/ Radio ShackHTs	MFJ-5024	MFJ-5024YV	MFJ-5024X	MFJ-5024B
Kenwood[2] HTs	MFJ-5026	MFJ-5026YV	MFJ-5026X	MFJ-5026
Yaesu 8-pin	MFJ-5080	MFJ-5080YV MFJ-5080YH	MFJ-5080X	MFJ-5080Z
Icom[3] 8-pin	MFJ-5084	MFJ-5084YV MFJ-5084YH	MFJ-5084X	MFJ-5084Z
Kenwood/Alinco 8-pin	MFJ-5086	MFJ-5086YV MFJ-5086YH	MFJ-5086X	MFJ-5086Z
Yaesu 8-pin modular	MFJ-5080M	MFJ-5080MYV	MFJ-5080MX	MFJ-5080MZ
Icom[4] 8-pin modular	MFJ-5084M	MFJ-5084MYV	MFJ-5084MX	MFJ-5084MZ
Kenwood 8-pin modular	MFJ-5086	MFJ-5086MYV	MFJ-5086MX	MFJ-5086MZ
Radio Shack 8-pin modular	MFJ-5088M	MFJ-5088MYV	MFJ-5088MX	MFJ-5088M

1. does not include IC-W2A
2. does not include 2500
3. does not include 25A, 255A
4. does not include IC-100H, IC-2700H
5. YV for KAM VHF port, YH for KAM HF port. Other Kantronics use YV models
6. YV for KP9612 1200 baud port
7. YH models for KPC9612 9600 baud port
8. Excludes DJ-100, 120T, 200, 500

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WW7E. OOC: N7ELV. OO: K7ICB. OO: AA7WB. We will miss Nevada Section Manager SK Bob Davis, K7IY, greatly. Bob's support of all of us was phenomenal. I hope to give back a little of what I received in support to those he appointed over the next 15 months. I've been heavily involved in public service for many years, starting out with American Red Cross volunteer activities. Amateur Radio has allowed me to continue to provide service to the public and has been a most satisfying hobby. I don't have all the information on NV personnel appointee's yet, but I do want to thank those of you that have offered your support, and promise I'll do what I can to make our association an enjoyable and productive one. 73, Jan, NK7N. Tfc: N7CPP 10, K7OK 6.

PACIFIC: SM, Ron Phillips, AH6HN—It is with deep regret that I report the passing of David N. Ahia, NH6IZ. David was a member of BIARC and an employee of Hawaiian Airlines. He will be greatly missed. MARC elected new officers for 2000. They are KH7FX, president; KH6HE, vice-president; WH6CWD, secretary; K6GSS, treasurer; AH6GR and WH6KO, directors. Good luck in the coming year. Hawaii QRP Club is having a series of tail-gate swap meets. This month's was held on Feb 19 at Hilo's Wailoa State Park and attended by KH6AFQ, WH6CME, KH6BMM, W6ORS, NH6XB and KH6B. KARC's monthly meeting featured Mike Burger, AH7R talking on "Antenna Modeling on your PC" with live demo on lap-top. See how antenna configurations can be analyzed BEFORE you get up on the tower or roof! Many thanks to Corky Kirk, W6ORS, for a fine report on his several monthly activities. Feb. 29 was the "21st birthday" of Doc, KH6AUB. His 84th birthday was celebrated by KH6HME, KH6AFQ, W6ORS, KH6BMM, AH6HB, KH6AVF, KH6AFS, NH6WW, AH6NK and KH6B. Hisao, JA1AA, Yoshi, JG2LGM, and Daniel, KE6TKQ, joined the Hawaii QRP Club in February. Total membership now at 183. Thanks Dean for the info. Also, Dean reports the new Hawaii Section of ARRL is receiving tremendous support. Dean's committee is in the info gathering phase. If anyone wishes to comment, contact Dean, KH6B. Mahalo, Ron, AH6HN, Pac SM.

SACRAMENTO VALLEY: SM, Jerry Boyd, K6BZ—My sincere thanks and best wishes to recently "retired" Section Manager Jettie Hill, W6RFF, both for his years of leadership in the ARRL field organization and for his confidence in me as his successor. I look forward to Jettie's continued involvement in the activities of the Section. I will be corresponding with all Section Appointees to determine their willingness to continue in their present positions. Also on the agenda are modifying the Section ARES structure and filling some vacancies which do exist in the Section's field organization. Please contact me if you have interest in any of the appointments. Many of our clubs are getting ready for Field Day. I hope to visit a number of Field Day sites this year. It's a great opportunity for new operators to get their feet wet in fast paced QSOs. With the recent restructuring, many of our VEs are reporting not only an increase in upgrade tests but entry-level tests. I would ask that all clubs send a copy of their newsletters to me. Over the months to come, I'd like to visit as many of the Section's clubs as I can. Finally, it seems like we just finished fire season, but another one is nearly upon us. If you are not involved in ARES, please contact one of our DECs (WA6SLA, KD6GSD, and W7KEH), and they will be glad to put you in touch with your local EC. 73 de Jerry Boyd, K6BZ.

SAN FRANCISCO: SM, Len Gwinn, WA6KLK— ASM: N6KM. Thanks to Willits, Ukiah Fort Bragg, Lake County, and Redwood Empire DX Association Clubs for having me as a visitor at their meetings. Field Day plans are underway at all clubs in the section. Willits is planning a VHF/UHF Contest operation also. This is the time to elmer new upgrades in proper operation on the hf bands. Humbolt County hamfest and Field Day will be at the same time. A great time is planned for all attendees. Planning should be underway and in place for any emergencies that might come our way this summer. Welcome to the Hamilton Radio club in Marin County, a new ARRL affilated club. I will be visiting more clubs this summer. Have a safe summer and participate in your local club activities.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN — Hello all, it is once again time to begin plans for Field Day. The concept of Field Day is to practice readiness for emergency communications and, of course, have a great time. I encourage all clubs in the SJV Section to make plans to notify your local newspapers and TV stations of your Field Day activities so that the public better understands who we Amateurs are and what we do. While we are on the subject of emergency communications, I would like to encourage all operators to consider joining your local ARES or RACES groups. Ask your local radio club for information or you can contact Kent LeBarts, K6IN (Section Emergency Coordinator) by e-mail at: **k6in@elite.net**. Good luck to all on Field Day 2000. Tfc: K6VOA 93, KE6GTR 24.

ROANOKE DIVISION

NORTH CAROLINA: SM, W. Reed Whitten, AB4W—ASMs: AB4S, KE4ML. SEC: KE4JHJ. ASECs: WA4MOK, N4UCO, KU4KM. STM: K4IWW. ASTM: W4EAT. TC: K4ITL. SGL: KI4AN. OOC: W4ZRA. PIC: KN4AQ. ACC: W4CC. BM: KD4YTU. **http://www.ncarrl.org.** John Covington, W4CC, will succeed me as North Carolina SM. We are fortunate to have elected a Section Manager with his background and exceptional understanding of Amateur Radio and the ARRL Field Organization. I want to thank the many Amateurs of our Section who have participated in the activities of the Field Organization during my tenure. Your efforts have made our traffic nets, emergency communications activities, public relations efforts, and interactions with government succeed. Those who have accepted ARRL appointments and have coordinated all these activities deserve your thanks as well as mine. We can all be proud of the many accomplishments of Amateur Radio in North Carolina! I also want to thank you for the privilege of serving as Section Manager for the last 12 years and, prior to that, as SEC, SGL, & EC. This involvement has certainly enriched my Amateur Radio experience. I urge all North Carolina Amateurs to support our organization both by encouraging membership in ARRL and by participating in ARES, NTS and other Section activities. The privileges of Amateur Radio carry an obligation to use our equipment and communications skills to help others. We are fortunate that

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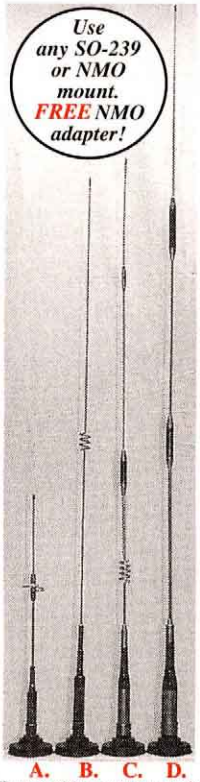

Shown on mini mag mounts, not included.

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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!

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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.

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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.
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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.
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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.
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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.
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144/440 MHz Antenna Tuner with built-in SWR/Wattmeter
Covers 136 to 175 MHz. Handles 150 Watts. Compact 4x2½x1½".
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MFJ *RuffRider*™ super heavy duty Antenna Mounts

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.

Trunk/Hatchback *Lip* Mount

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.

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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.

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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.

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MFJ's *MaxStrength*™ high-flux magnet mounts give you maximum pull strength -- your antenna stays on top of your vehicle at highway speeds.

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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.

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an activity we enjoy so much can be a tremendous benefit to our communities, especially during disasters. DFMA sponsored 26th annual Durhamfest May 27. Support our hamfests and enjoy the fellowship of putting a face with the voices you hear on your radio. Feb tfc: W4EAT 423, AB4E 316, AA4YW 296, KI4YV 166, K4IWW 163, NC4ML 146, W4IRE 111, KE4JHJ 97, AC4DV 81, K4AIF 41, AB4W 39, KE4AHC 35, AD4XV 30, N0SU 30, W3HL 29, W4CC 17, KF4OZF 16, WD4MRD 15, WA2EDN 13, KL7NL 11, AC4ZO 8, NT4K 8, W4DYW 7, KR4OE 6, WA4SRD 5, KT4CD 4, N2JLE 3, KF4YHG 2.

SOUTH CAROLINA: SM, Patricia M. Hensley, N4ROS—I am very honored to have been newly appointed as your Section Manager for South Carolina. It is with a sincere interest in furthering Amateur Radio generally and representing the more than 6000 operators in our state specifically, that I accept this responsibility. I truly believe that only through our cooperative efforts, under the guidance of the ARRL, will our hobby continue to be rewarding in the future. Therefore, may I ask your initial support in three areas: 1) encouragement, training and subsequent licensing of young people; 2) development of an extended club-sponsored mentoring program for new licensees; and 3) increased participation in Section appointee positions. I hope to have met many of you in March at the Charlotte Hamfest and hope to meet more of you at the Upstate Hamfest. On-the-air activities can be found on the SC SSB Net (daily at 1900 hours 3915 kHz) and the SC ARES/RACES Net (first/third Monday at 1800 hours 3993.5 kHz). Tfc: KT4SJ 134, KA4LRM 108, KA4UIV 79, W4DRF 70, K4JMV 56, WA4UGD 49, KG4BZH 36, K4BG 16, W4CQB 14, KQ4SY 6.

VIRGINIA: SM, Lynn Gahagan, AF4CD—SEC: K4EC. ASM/A: KE4NBX. ASM/B: W4TLM. ASM/C, TC: W4IN. ASM/D: KC4ASK. PIC: W2MG. ASM/D, SEC, OOC: KR4UQ. ACC, STM: AF4CD. Time is really flying by, and it is once again getting close to Field Day. It's time to start finalizing plans for this fun summer event. This year try to get some of the younger folks involved and show them how much fun Amateur Radio can be. We have got to recruit more of our younger generation into our hobby in order for it to survive. Field Day is a great tool to use for this. Plan on making it a family outing. Invite some of your neighbors to join in. I was invited over to the Eastern Shore by our DEC 8, Bill K4BW to attend the ESARC annual banquet meeting in March. ASM/A, KE4NBX, Earl also made the trip over with me. We had a great dinner and enjoyed the fellowship of the fine group assembled in Nelsonia. Earlier in the day Earl and I had the opportunity to visit the 911 center and the amateur repeater sites located in Accomac. Ben, KD4NVK, EC Accomack Co gave us the tour of the center. The Accomac 911 center is responsible for quite a large area, from the north side of the Chesapeake Bay Bridge Tunnel in Northampton Co to the Maryland - Virginia boarder, a stretch of over 70 plus miles. At the center, the ARES/RACES group has a complete set up to assist with back up communications when the need arises. This includes HF, VHF, UHF, phone and digital modes. There have been several times that they have been called upon to assist. After a discussion with K4EC our SEC, I have decided to consolidate the three Area Operations ASEC positions with the Area ASM positions. With this change I have appointed Earl KE4NBX ASEC/A and Ed W4IN ASEC/C, to the ASM positions. Area B will remain headed up by Terry W4TLM who has had the ASM appointment for almost two years. With these changes, these gentlemen will work directly under the SEC and myself to make sure the ARRL guidelines and Va. Section policies are carried out. If you have questions feel free to ask any of these people. They are eager to help you. Last but not least, Ben, KC4ASK, our Digital Operations ASEC will become the ASM/D for Digital Operations. Ben has done an excellent job along with all the other sysops around the section to completely turn around our digital operations statewide. Congratulations guys on your new appointments! 73 de AF4CD. Tfc: N4ABM 248, KR4MU 242, WA4DOX 235, W3BBQ 194, K4MTX 122, K4YVX 116, W4UQ 63, WB4ZNB 58, KD4FUN 54, W4CAC 49, KE4PAP 40, K0IBS 32, AF4CD 28, W4YE 23, WB4UHC 15, KB4CAU 7, W4TZC 4, W4IN 2, KF4HJW 2, W4VIC 2.

WEST VIRGINIA: SM, O.N. (Olie) Rinehart , WD8V—STM: KC8CON. SEC: W8XF. ASEC: KA8ZOO. SGL: K8BS. TC: K8LG. OOC: N8OYY. ACC: WD8MKS. APRSC: W8XF. The Roanoke Division has new Director. Dennis Bodson, W4PWF, past Vice Director was appointed to the Director position. Most of you already know Dennis, and let me assure you that we will enjoy a cooperative relationship and support from him. First and foremost in my mind and I believe in the minds of all amateurs is this April 15, 2000, date. The day the new license structure and examination elements for obtaining an Amateur license will be effective. It will be a matter of serious concern to VEs to ascertain those elements taken before this date are acceptable. As of Feb 15, the 610 form no longer is valid - use the 605. The FCC Enforcement Division is still, and according them, will be extremely active. Most recent events have been investigation of improperly handled VE sessions with several amateurs having their license issuance or upgrade revoked or suspended until they are re-tested. Hey! Hamfest season is open - hope to attend all - See you in Charleston, Beckley, Gassaway and all the rest including the State ARRL Convention at "The Mill" August 26, 2000. Tfc: KA8WNO 260, WD8V 125, WD8DHC 93, W8WWF 36. PSHR: WD8DHC 128, KA8WNO 119, WD8V 108, KC8CON 115, WVFN 1094/127/29 KC8CON; WVMDN 551/26/493, KC8CO; WVN E 150/83/29W8WWF; WVN L 143/75/29 W8WWF.

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. All of the VE sessions I've seen in the past two months have been full to overflowing. I've seen sessions sponsored by VE Teams in Denver (Mile High), Colorado Springs (PPRAA) and Woodland Park (MARC), and I've seen many folks passing the General and Extra written tests. Although I've seen and heard some negative comments

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Fits in your shirt pocket with room to spare -- smaller than a pack of cigarettes. Tiny 2¼x3¾x1 in., weighs less than 5½ ounces. Uses 9 volt battery (not included).

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concerning the reorg, most of the comments have been positive. We'll have to wait and see what the overall effect will be on our hobby, but I suspect that we'll all survive. Congrats to ARES District 11 which was awarded a Citizen Service Citation for exceptional community service by the City of Longmont at its annual awards banquet. Congrats also to Pat Lambert, WØIPL, who received a personal award from Longmont for his work in providing emergency and back-up communications. Good swapmeet at Brighton, hosted by ARA. I also attended the DRL's C-Rock Fest, where I learned a well-known vendor- Jess Miley, was in the hospital. We all wish him well and hope to see him at the next swap. EOSS had a great balloon launch in mid-March, with a 2M/70cm cross-band repeater on board that could be worked by stations hundreds of miles distant. Great fun! If you have items for this column, e-mail them to me at **n0wpa@arrl.net**. 73, de NØWPA. NTS traffic: ADØA 169, KØTER 105, NØUOD 25. CAWN: WØWPD 1072, NØNMP 458, WØNCD 421, NØJUS 352, WØLVI 336, NØDKK 326, KØHBZ 306, WBØVET 297.

NEW MEXICO: SM, Joe T. Knight, W5PDY—ASM: K5BIS & N5ART. SEC: K6YEJ. STM: N7IOM. NMs: WA5UNNO & W5UWY. TC: W8GY. ACC: N5ART. New Mexico Roadrunner Net handled 120 msgs with 1116 checkins. New Mexico Breakfast Club handled 232 msgs with 1082 checkins. Yucca Net handled 33 msgs with 702 checkins. Caravan Club Net handled 2 msgs with 39 checkins. SCAT Net handled 12 msgs with 539 checkins. Four Corners Net handled 25 msgs with 336 checkins. GARS Net handled 2 msgs with 37 checkins. Rusty's Net handled 102 msgs with 713 checkins. Valencia Co Net handled 8 msgs with 45 checkins. We have certainly had our share of grass fires (Ft Sumner being the largest) and more than our share of ELTs and SAR missions around the state. Our sincere thanks to all the ARES members who responded to these missions, sometimes two a day. Our ham population is expanding rapidly and our upgrade rate is outstanding. Don't know of anyone who is happy with the new DXCC checking program. Hope we can get some of the problems ironed out! We certainly had our share of Silent Keys with the passing of many old timers such as W5HYQ, NIØN, W5NOB, N5LIX, KA5GWA & ex W9EJI. They will certainly be missed! Hope to see many of you at Albuquerque Spring Tailgate Apr 29, Las Cruces "Bean Feed" on Apr 30. Ft Tuthill (Flagstaff) hamfest on July 28-30. The PVARC (Roswell) hamfest on Aug 5-6. NM State hamfest (Albuquerque) Aug 26-27. Alamogordo hamfest on Sept 2. Best 73, W5PDY.

UTAH: SM, Mel Parkes, N5UVP—I have been very pleased with all the activity in the clubs in our state. Keep up the good work. Many of our clubs have made an annual commitment to their members to be an active part of Field Day. It's time to start thinking about Field Day! If you haven't already been planning about where you will establish that special location get your group together to stake out your claim for this year's event. Dust off that generator and unroll those assorted antennas that will reach out across the country. The most important thing is to try and get more hams involved, show them how much fun it can be working all states in a tent in the middle of the night! Don't forget to enjoy the great food either. By the way, the Utah Hamfest 2000 will be here soon. Have you registered yet? **http://www.utahhamfest.org/**

WYOMING: SM, Bob Williams, N7LKH—The Wyoming State Hamfest is being held in Casper at the Radisson Hotel, May 27, 2000, from 8:00 AM until 5:00 PM and May 28, 2000 from 8:00 AM until 12:00 PM. Activities include: VE testing, vendor and swap tables, forums on 2 meter and 6 meter propagation, and the national weather service on weather spotting. There will be a buffet dinner Saturday evening with a special guest speaker. Sunday we will finish off the weekend with the ARES/RACES state meeting, the ARRL meeting and the drawing for first, second and third prize of the raffle. First prize will be a dualband mobile. We expect a large crowd for the first Wyoming state hamfest of the millennium, so get your reservations early. Registration forms can be found at **http://w3.trib.com/~carc/** or e-mail us at **carc@trib.com**—Christine Riegert, KC7MJI, Wyoming Assistant Section Manager. Tfc: NN7H 357. PSHR: NN7H 225.

SOUTHEASTERN DIVISION

ALABAMA: SM, Bill Cleveland, KR4TZ—ASMs: W4XI, WB4GM, KB4KOY. SEC: AF4HE. STM: K4JSJ. BM: KA4ZXL. OOC: WB4GM. SGL: KU4PY. ACC: KV4CX. TC: W4OZK. PIC: KA4MGE. The Birmingham ARC will have its hamfest on May 6 and 7 at the Zamora Temple. This year's hamfest will be the Alabama Section Convention. For more information about the hamfest, contact Glenn Glass (KE4YZK) by phone at 205-681-5019 or by e-mail at **ke4yzk@bellsouth.net**. You can also visit the BirmingHAMFEST Web site at **www.bro.net/barc/fest.html**. Please make plans to attend the Alabama Section Forum during the Birmingham Hamfest. One important topic that will be discussed is forming a committee of Alabama clubs that will share ideas and make sure that Alabama hams will have access to what is going on in the Alabama Section. I believe that Amateur Radio clubs represent the ideas and wishes of their ham community, and I would like to get all clubs intimately involved in Section Operations. Other topics to be discussed are ARES, Section's involvement with SKYWARN, Field Day, Jamboree on the Air, the Alabama Inter-City Network, and an open forum for comments and discussion. June is just around the corner, and that means its time to finalize your Field Day plans. If your club is planning Field Day operations, please e-mail me a summary so that I can report them to the rest of the section. My email address is **kr4tz@arrl.org**. Check out our Web site at **www.qsl.net/al-arrl** for more up-to-date news and information. 73, Bill Cleveland KR4TZ.

GEORGIA: SM, Sandy Donahue, W4RU—ASM/South 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. PIC: Matt Cook, KG4CAA. This month, I want to tell you about two young hams who may be the future of our hobby. Robert Harris, KF4OEG, is a first year student at Southern Tech.

MFJ ACCESSORIES

MFJ *W9INN* Balun Box

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Lets you use coax from your antenna tuner to the MFJ-912 mounted outside your ham shack. The MFJ-912 converts the unbalanced coax to a balanced transmission line (ladder line). Provides same function as an internal balun except it is located away from tuner. Giant 2 core balun wound with *Teflon*® wire connected to high voltage ceramic feedthru insulators. Handles full legal power with ease. 3¼x2¼x7 inches.

MFJ Artificial RF Ground

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Creates artifical RF ground that eliminates or reduces RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding.

Greatly improves your signal if you're using a random wire or longwire antenna with an ineffective ground.

Electrically places a far away RF ground directly at your rig by tuning out reactance of connecting wire.

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Throw this *tiny* MFJ 20 Meter CW Transceiver in a corner of your briefcase and enjoy DXing and ragchewing wherever you go. You get a high performance superhet receiver, crystal filter, RIT, AGC, vernier tuning, sidetone, speaker, up to 5 watts output, semi/full break-in, much more. *Free* manual. See *free* MFJ catalog for 40, 30, 17, 15 Meter versions, keyer, audio filter, power pack, tuner, antennas.

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**``World Radio TV Handbook''** says MFJ-1024 is a ``first rate easy-to- operate active antenna...quiet...excellent dynamic range...good gain... low noise...broad frequency coverage... excellent choice."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz - 30 MHz.

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and aux. or active antenna. 6x3x5 in. Remote has 54 inch whip, 50 ft. coax. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1312, $12.95.

$129.95 MFJ-1024

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Peak/ average Cross-Needle SWR/ Wattmeter. Shows SWR, forward/ reflected power in 2000/500 & 200/50 watt ranges. 1.8-60 MHz.

Mechanical zero. SO-239 connectors. Lamp uses 12 VDC or 110 VAC with MFJ-1312, $12.95.

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$21.95 MFJ-1702B

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MFJ-1702B, $21.95. 2 positions plus new Center Ground. 2.5 KW PEP, 1 KW CW. Insertion loss below .2 dB. 50 dB isolation at 450 MHz. 50 Ohm. 3x2x2 inches. **MFJ-1702BN, $31.95**, N-Connectors, DC-1.1 GHz.

MFJ-1704, $59.95. 4 position cavity switch with lighning surge protection. Center ground. 2.5 KW PEP, 1 KW CW. 50 dB isolation at 500 MHz. 50 Ohm. 6¼x4¼x1¼ inches. **MFJ-1704N, $69.95**, N-connectors. All have MFJ's famous *"No Matter What™"* 1 year unconditional warranty.

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MFJ's *compact* speaker mics have first-rate electret mic element and full size speaker gives superb audio on transmit and receive. Earphone jack, PTT, light-weight retractable cord. Gray. 1¼x2x3 in. **MFJ-284** fits Icom, Yaesu, Radio Shack and Standard. **MFJ-286** fits Kenwood.

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MFJ's *mini mics* give excellent audio from electret mic element and speaker. Has swiveling lapel /pocket clip, PTT button with transmit LED, earphone jack, lightweight retractable cord. Available with "L" or regular connector. Tiny 2x1¼x¼ inches.

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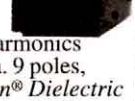
MFJ Low Pass Filter

MFJ-704
$39.95



Suppress TVI, RFI, telephone and other interference by reducing unwanted harmonics going to your antenna. 9 poles, MFJ's exclusive *Teflon® Dielectric Technology™* capacitors, hi-Q inductors, ground plane shielding, RF tight cabinet gives excellent TVI/ RFI protection. *Full legal power* 1.8-30 MHz. Mounting tabs. **MFJ-702, $24.95.** 200 Watts Low Pass TVI filter. 1.5-30 MHz.

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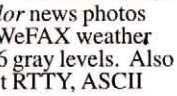

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Animate weather maps. Display 10 global pictures simultaneously. Zoom any part of picture or map. Manager lists over 900 FAX stations. Automatic picture capture and save.

MFJ Iambic Paddles

MFJ Deluxe Iambic Paddles feature a full range of adjustments in tension and contact spacing, self-adjusting nylon and steel needle bearings, contact points that almost never need cleaning, precision machined frame and non-skid feet on heavy chrome base. For all electronic CW keyers.

MFJ-564
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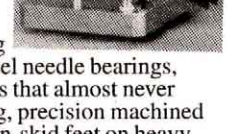
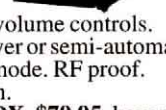


MFJ/Bencher Keyer

The best of all CW worlds --a compact MFJ Keyer that fits right on the Bencher iambic paddle!

MFJ-422D
$144.95



Iambic keying, speed (8-50 wpm), weight, tone, volume controls. Automatic keyer or semi-automatic ("bug")/tune mode. RF proof. 4⅛x2⅝x5½ in.

MFJ-422DX, $79.95, keyer only for mounting on your Bencher or MFJ paddle.

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Don't let harsh TVI ruin your DXing and your wife's favorite soap opera! Keep peace with your family and neighbors.

MFJ's exclusive *ShieldBreaker™* high pass filter effectively suppresses annoying TVI! Wipe out TVI caused by broadcast, commercial, two-way, amateur and CB radios operating below 30 MHz. Use between cable/ antenna and TV/VCR. For 75 ohm cable or 300 ohm twin lead.

12/24 Hour LCD Clocks

$19.95 MFJ-108B

$24.95 MFJ-112

MFJ-108B dual clock has separate UTC and local time displays. Huge 5/8 inch LCD digits are easy-to -see. Brushed aluminum frame.

MFJ-112 shows hour/minute/ second, day, month, date, year at any QTH on *world map*. 12 or 24 hour display. Daylight saving time feature.

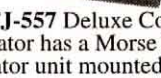
VHF SWR/Wattmeter

MFJ-812B
$34.95

Covers 2 Meters and 220 MHz. 30 and 300 Watt scales. Relative field strength 1-250 MHz, SWR above 14 MHz. 4½x2¼x3 in.

Code Practice Oscillator

MFJ-557
$24.95

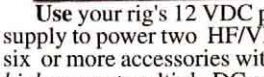


MFJ-557 Deluxe Code Practice Oscillator has a Morse key and oscillator unit mounted together on a heavy steel base so it stays put on your table. Portable. 9-volt battery or 110 VAC with MFJ-1305, $12.95.

Earphone jack, tone and volume controls, speaker. Adjustable key. Sturdy. 8½x2¼x3¾ in.

MFJ Multiple DC Outlet

MFJ-1118
$69.95



Use your rig's 12 VDC power supply to power two HF/VHF rigs and six or more accessories with this MFJ *high current* multiple DC outlet.

2 pairs of 30 amp 5-way binding posts separately fused for rigs. 6 switched, fused pairs for accessories. DC voltmeter, "on" LED, RF bypassed, 6 ft. of 8 guage power cable. 12½x2¾x2½ inches.

MFJ-1116, $44.95. 8 DC outlets, voltmeter, on/off switch, RF bypass, fuse.

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MFJ . . . the world leader in ham radio accessories!

He is President of the Amateur Radio club there as well as Chairman of the Kennehoochee ARC, the main club in Cobb County, as well as sponsor of one of the best hamfests in Georgia. In my memory, I don't recall someone that age with the communication and leadership skills to head a group of hams, all of whom are at least twice his age. Unless it is another young man, David Ziskind, KE4QLH, a senior at North Springs High School, who is going to Ga Tech this fall. Robert excels in public service events and this July will lead a massive communications effort for the Georgia Games. This mini-olympics with hundreds of sports in dozens of venues flung across all of North Georgia requires several hundred amateurs to participate. The organizational skills required for this are enormous, especially in one so young. When David calls, volunteer. And let's encourage the leadership skills of our young hams. New officers in Gwinnett ARS: Pres KA4KKF, Vice Pres KE4MLH, Sec N8IAA, Tres K4HS, Activities KE4GYM. GARS Techfest, postponed from January due to the ice storm, was a success with hundreds sampling the many mode demos and the chili receipes offered. Don't forget the Statesboro Hamfest, May 20, the Atlanta Hamfest, June 2-3, and the Ga State Conv, in Gainesville, July 8. 73 Sandy. Tfc: WB4GGS 346, K1FP 136, WU4C 110, KA4HHE 104, K4BEH 57, AF4NS 37, K4WKT 22, WB2NYM 20, K4JNL 12.

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—ASM-E Central: AC4PF. ASM WPAN: KO4TT. ASM-APRE: WY8O. ACC: WA4B. BM: N4GMU. OOC: AF4EW. PIC: KF4HFC. SEC: WA4NDA. SGL: KC4N. STM: WX4H. TC: KO4TT. Packet: N4GMU. The Orlando HamCation was the highlight for February. The Northern Florida Section Forum was well attended, and overflowing as matter of fact. Certificate of Merits were awarded to several of the staff for their outstanding performance: Bernie, NP2CB, DEC E Central District; Charlie, NR2F, DEC W Central District; Mike, KF4HFC, PIC, Northern Florida Section; Steve, WA4B, ACC, Northern Florida Section, Frank, AF4EW, OOC, Northern Florida Section. Also Ken Christian, Chairman Orlando HamCation. Special commendation to Ken for his assistance and cooperation of making the HamCation ARRL Northern Florida Forum one of the best. Special Guest Riley Hollingsworth, FCC, was awarded Certificate of Merit for his outstanding work, and was made an honorary member of the Northern Florida Section by the Section Manager. John Fleming, Communications Officer for the State of Florida was awarded Certificate of Emergency Commendation for his work and support of the Northern Florida Section. The attendees appreciated the comments by both John and Riley. It is always good to see and shake hands with fellow amateurs. One of the pleasures is the opportunity to talk eye ball to eye ball. Several comments were received by those attending how much they enjoyed the forum, and considered it one of the best. Now back to the basics, it is the right time to start planning and getting ready for the summer. Hurricanes, and other weather problems including forest fires will occur and the time to get all of the nuts and bolts together is now. Do not wait. The DECs and ECs should report their activity whether or not the Section Emergency Net is activated. A meeting with the Section ARES personnel will be in the next couple of months. Details will be worked out with John Fleming at the State EOC. WX4H, Mort, was the only one this month who made BPL. Congrats. 73 de Rudy, WA4PUP. Tfc: WX4H 2041, NR2F 441, K1JPG 233, KE4DNO 203, KE4PRB 181, AF4PU 181, WB8NER 94, W5MEN 92, KF4NFP 78, AF4GF 69, KF4TM 69, WB2FGL 55, N9MN 55, W4KIX 43, K4JTD 39, KB4DCR 36, KC4FL 35, K8KV 33, KM4WC 25, WB2IMO 18, N4JAQ 16, WA4PUP 14, KJ4HS 13, WB9GIU 12, KG4EZP 10, WA4EYU 8, AB4PG 8, KF4YHK 3, W8IM 3, K1CE 1.

PUERTO RICO: SM, Víctor Madera, KP4PQ—La FRA celebró su primer hamfest del 2000 exitosamente en Hatillo, P.R. El equipo de examinadores del ARRL/VEC rompió todos los récords anteriores con 4 sesiones de exámenes en 30 días cerrando el periodo de exámenes pre-reestructuración de licencias por la FCC. El programa de cumplimiento de la FCC bajo la tutela del Sr. Riley Hollingsworth a tomado auge en Puerto Rico, una gran cantidad de radioaficionados ha sido llamada a reexamen. Si le interesa el DX no falte a las reuniones del PRDXC los segundos lunes de mes en la UPR a las 7PM. Las clases para radioaficionados nuevos que ofrece el PRARL en la UPR terminaron el 29 de marzo. Obtuvieron sus licencias 17 candidatos. La próxima clase comienza el 12 de julio de 2000. Se pueden comunicar conmigo vía e-mail a **kp4pq@arrl.org**.

SOUTHERN FLORIDA: SM, Phyllisan West, KA4FZI, Visit **www.sflarrl.org** for SFL detailed section news, appointees, clubs, and reference info. Our thanks to Howard Gilpin, W3SRU, Lee Co for his many years of dedicated service as EC. Gil will pursue an uncharted area of emergency comm collaborating with hams on the east coast to set up operating guidelines in the new program. The new EC, Bob Dutka, KG4EAH, is eagerly learning his special duties. Family and other obligations necessitated additional transfers. New Martin Co. EC, Don Marquith, N3PYQ, was recommended by outgoing EC, Adam Levenson, N2PNO. New Indian River EC, Chris Myers, KF4DQY, was recommended by outgoing EC Russ McConnell, N2GBI. Both outgoing ECs gave many years of outstanding service and will remain in ARES as assistants to the new ECs. Our best wishes and thanks to Adam and Russ for their exemplary work. Members of the Ft Myers ARC operated a special event station at the Edison-Ford Estate complex during the Edison Pageant of Light Week, Feb. 14-18. Over 440 QSOs were made by 30 club members using club call, W4LX and the NTS message center originated 163 messages. Congratulations to the Okeechobee ARC for their re-affiliation with ARRL. Any club interested in affiliating can contact Jeff Beals, WA4AW, ACC, for info and help. Clubs interested in contending for the "Club 2000 Award" and $1000 prize can get details from Jeff or the ARRL Web page. The Vero Beach ARC reports attendance at their VE test sessions has doubled the last 2 months. The Indian River ARC is planning comm. support for the Veterans' Reunion, Beach Walk for Multiple Sclerosis, and March of Dimes in April. If your club has a special activity to report, please send the info to W4STB, PIC, WA4AW, ACC, or me for the Section News. For help and excellent tips on getting info into local news

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Toronto Surplus & Scientific Inc.

August 1999

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COMMERCIAL COMMUNICATIONS RECEIVER

Continuing the tradition of fine professional communications receivers designed and built by Rockwell-Collins Canada. The HF 2050 covers 14kHz-30MHz and features a built-in speaker, DSP, noise blanker, squelch, up to 30 memories, 3 speed 10Hz tuning resolution, keypad for data entry, scan, variable AGC, extensive built-in self test, and a large liquid crystal alpha-numeric display. Very Collectable!!

Price: $3000.00 Including operation/service manual. These are fully tested and burned-in.

HARRIS RF 131-122
EXCITER

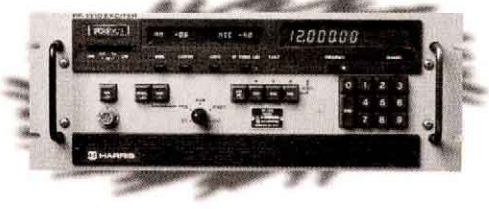
It features digital tuning with remote control capability in the 2-30MHz range, 100 mw output. Modes of operation are U/LSB, compatible AM, CW, and ISB. This is a very good reliable exciter.

Price:good tested condition $750.00ea

HARRIS RF 551A
PRE/POSTSELECTOR

Covers 2-30MHz via frequency controls on front panel or it can be remotely controlled via digital interface (installed). These units have an average 5dB gain and exhibit excellent rejection outside of the selected frequency.

Price: $325.00 Excellent Condition or 2 units for $595.00 (Fix it yourself, as-is: $145.00)



HARRIS RF 1310 / 1310A
HF Exciter

This microprocessor based unit covers the .4-30 MHz freq range. It features a high stability frequency standard, 100 channel memory, AM, CW, USB, LSB modulation in 10 Hz increments, 100 mw output and easy to read vacuum fluorescent displays. Operates on 115/230 Vac 47- 63 Hz.

Price: good cond $1750.00ea
Price: 1310A $2500.00ea

HARRIS RF 601A
ANTENNA COUPLER GROUP

Ruggedly designed to meet any weather conditions head-on. This 1kW manual/automatic coupler is solidly constructed and pressurized with inert nitrogen gas. It covers 2-30MHz & comes with the RF-601A/C coupler control unit. No expense was spared at $12K ea original gov't cost!

Price:good clean cond..... $1,150.00ea
Dirty and scratched but ok $750.00ea

CAL ASTRONAUTICS
MOBILE SATELLITE "COM" STATION

This is a box chock full of high-end technology. The terminal features a back-lit 4 line LCD display and illuminated keys; one of the transceiver's most impressive features is an "L" Band 1.65GHz 60 watt amp and helix antenna with built-in LNA. We consider this the ultimate gadgeteers goodie pack" with all kinds of RF satellite ground technology inside. Best of all they operate on 12VDC. Installation manual supplied (but, there is no subscriber data). Used, good condition, untested.

Price: $185.00 ea. or 2 units for $295.00

HARRIS RF-590
RECEIVER

This receiver meets MIL-STD-188C. This unit *has it all* starting with 1Hz tuning resolution over the entire bandwidth, AGC time constant and BFO offset. The following full compliment of Collins mechanical filters are included: 3.2kHz, USB/LSB/ISB, 16kHz FM, 1.0&0.3kHz CW, 16/6 and 3.2kHz AM. AGC modes are: data/slow/med/fast, in addition it's remote control hardware option (RS-232 or RS-422) is installed. All RF-590's are fully checked, burned-in and guaranteed for 30 days.

Very good condition.....$2,250.00
Selected Excellent condition.....$2,750.00
RF590A's give us a call!!!
P.S. We now have brand new displays in stock for the 590 we will offer the displays to those that purchase the $2750.00 version for an additional $100.00 installed! Thats for both displays!!!

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Orders must be prepaid by guaranteed instrument.
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papers, contact W4STB. Applications to run for SFL SM should arrive at HQ during April or May. Traffic by KJ4N: W7AMM 786, WA9VND 740, K4FQU 710, KB4WBY 287, KA4FZI 243, KC4ZHF 213, KD4GR 170, WB4PAM 149, KD4HGU 147, AA4BN 131, KE4IFD 119, W8SZU 118, KJ4N 108, WA4EIC 90, KE4UOF 60, W6VIF 60, WA4CSQ 51, W4DL 43, KT4XK 41, KG4CHW 32, WD4JNM 26, KE4WBI 22, K4OVC 10, W4WYR 9, AF4NR 6, W3JI 6. 73, de KA4FZI.

VIRGIN ISLANDS: SM, John Ellis, NP2B, St Croix— ASM: Drew, NP2E, St Thomas. ASM: Mal, NP2L, St John. SEC: Duane, NP2CY, St Thomas. PIC: Lou KV4JC, St Croix. ACC: Debbie, NP2DJ, St Thomas. NM: Bob, VP2VI/W0DX, Tortola. Welcome Duane, NP2CY, as new SEC, and tnx to Vic, WP2P, for his efforts. Vic is heading up a new TV station on St Croix. St John ARC provided communications for "8 Tuff Miles" foot race from Cruz Bay to Coral Bay on Saturday, Feb 26. Participating were Scotty, NP2DQ, Terry, NP2IW, David, KP2CN, Jody, N3RDL, Jim KP2L, Marie, KE3QL, and Sam, NP2FO, while Mal NP2L, provided comments while walking the course. George, KP2G, coordinated from finish line. Lou, KV4JC, now has beam back up. The Caribbean Maritime Mobile net operates every morning on 7241 at 1100Z with Caribbean / Atlantic weather from George, KP2G. Jerry, WB6RCN, now has blessing of the condo association for his vertical. Good work Jerry. It proves that it CAN be done! Congratulations to Al, KP2CF, Louise, NP2FG, Marty, NP2KC, and Manny Arroyo on their upgrades. Mal, KP2L, Jim NP2L, along with visitors George, KP2G, and Sam, NP2FO, and island visitors K8RF, W9EFL, W0CG, of the Carribbean Contest Consortium participated in the ARRL DX contest, CW, racking up 4700 QSOs. Good work folks! Hope everybody worked Clipperton! 73, John, NP2B.

WEST CENTRAL FLORIDA: SM, Dave Armbrust, AE4MR, **ae4mr@arrl.org** ,WCF Section Web Page at: **http://www.wcfarrl.org**—Congratulations and Welcome: I want to extend congratulations to all the upgrades that the new restructuring has brought. They have completed all of the current licensing requirements and they are entitled to the privileges they now hold. Please welcome these upgrades as they start to make use of their new privileges. Congrats to John Spark, W4LHP, on his receipt of a 60-year membership plaque on March 6 at the Lakeland Amateur Radio Club. Feb: OOC W3BL reports 1,056 total hrs. SEC KE4MPQ reports 196 ARES members, 46 operations and 163 hours.

Net/NM	*QNI*	*QTC*	*QND*	*Sess*		
AIN/WA4ATF	34	2	50	2		
ARES/KE4VBA	109	0	161	5		
SPARC/KF4FCW	457	33	699	29		
Turtle/KT4TD	450	200	683	29	1330	146.685
WCFIN/KR4YL	–	–	–	–	0030	3.9725

Be sure to check in to the WCF Section Net at 8:30 PM Sundays on 3.9725 MHz. Joe Pirkle, AD4IH, reports an impressive PSHR total of 795 and SAR total of 1509. PSHR: AD4IH 795, K4RBR 142, K4SCL 139, KT4PM 123, W3BL 111, W4AUN 106, AA4HT 105, KF4KSN & KT4TD 91. Tfc: AD4IH 1509 (BPL), AB4XK 431, K4SCL 335, KT4PM 144, AA4HT 63, W3BL 44, K4RBR 38, KE4VBA 37, KT4TD 18, KF4KSN 17, W4AUN 16, KT4WX 4, KG4DUF 4. 73, Dave, AE4MR.

SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford Hauser, KD6XH—The license structure changes are here. I hope many of you will now upgrade. I am now in deep study for my Extra class license. Fort Tuthill is coming (July 28, 29, 30) and we need to make sure we are prepared for this event. I have been told that MFJ will have a big display this year along with Kenwood and Yaesu. Our State convention is starting to become well known and attended. The year 2000 Southwest Division Convention will be held at the Ramada Inn in Scottsdale on 6-8 October. I hope you have made plans to attend this big event. Has your club ask to be involved? If not, contact me and I will steer you to the correct individual. The spring Hamfest was a big success with lots of people and a lot of vendors. Even the weather cooperated. Thanks to all the people who stopped by the ARRL booth. Talking with each of you is very helpful because I need your input on the important topics and subjects. My ideas are not always yours and I represent all amateur radio people of Arizona.Amateur radio has many different areas of interest and we all need to cooperate, courteous, and allow others to enjoy the hobby. The next Hamfest is in Sierra Vista, Cochise Community College, on 06 May 2000. Another item of concern is the state club roster. If your club or organization has not received a new updated roster by now, it will be coming soon. There have been many changes and the section club coordinator, Ron Reynolds, N7WTF, said it would be mailed out NLT 15 May 2000. I will be mailing to every ARRL volunteer a letter showing their official appointment and asking if they still want to keep this appointment. Please let me know if you are still able or want to be an ARRL volunteer. At this time my schedule for May is to be at the Williams ARC on 4 May, the Hamfest on 06 May, then RST ARC on 12 May. 73, Clifford Hauser, KD6XH. ATEN 946 QNI; 118 QTC; 29 Sess. Tfc: K7VVC 706, W7EP 139.

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF – Our dedicated Director, Fried Heyn, WA6WZO, reported that Mike Mitchell, W6RW, is responsible for initiating, RESOLUTION SB-1714 in our California State Legislature. This bill is an improved version of our Federal Preemption, PRB-1, covering towers and antennas. This new effort was officially started by Senator James L. Brulte, and must be pushed through the legislature by our efforts. Please write your State Senators and Representatives and ask them to vote for our right to communicate during Emergency Situations when telephones, cell phones and other means of communications are overloaded and out of service. Senator Brulte's brother is an active ham in Sacramento, WA6MNV. – As a result of complex regulatory questions concerning antenna towers and antennas which are constantly changing, I have appointed an experienced, "POINT MAN" to collect and disburse the latest information. This appointment

is Walt Bacon, N6SMT, who is currently the Chairman of LAACARC. **w4bacon@gte.net**. Walt is "up-to-speed" on all aspects of Los Angeles County and Los Angeles City Code requirements. - KA6GSE, Dennis Smith our DEC & Assistant SEC, is working with Mr. Stanley of LA City administration to set up communications with Sister Cities around the World. If you would like to assist Dennis in this interesting Sister City communications project, please e-mail Dennis or call him on the ARES, net.– AD6HR, Barry reports a traffic total of 129, for the month. We have a lot of good information on our Web Site, qsl.net/arrlsw/lax. Please use our Web site and help keep it up to date by sending updated information to our Web Master, Michael, KK6WO, listed on the Web. More of our readers are using our Web Site for general information so please send the latest info to our man "Mike." If questionable accuracy or new subjects are involved, please send me an e-mail with your suggestions. Remember this information is collected and assembled for your use. Please use it! 73 de W6BF, Phineas.

ORANGE: SM , Joe Brown, W6UBQ, 909-687-8394—ASM Riv Co: Joe, KO6XB, 909-685- 7531. ASM Org Co: Art, W6XD, 714-556-4396. ASM SB Co: James, KF6LWJ, 909-824-2454. Amateur participation in the Baker-to-Vegas Challenge Cup Race is becoming as popular as the Rose Parade, the Simulated Emergency Test or Field Day. These activities are good training for potential emergencies. The well-trained operator must be able to think and talk with a mic in his hand. Talking about training, Field Day is right around the corner. Words of Wisdom from Jeff KD6NXD, Pres. Citrus Belt ARC, apply to every Amateur Radio Group, "Two months to go. The Club is busy planning Field Day, as usual, we could use your help. There's a lot of work and planning that goes into this event. We need volunteers for station setup and tear down. On Sunday, the tired and weary people need help loading and unloading equipment and stuff. We also need operators and loggers. If you ever thought about contesting, now is your chance to give it a try. Experienced operators will help you along. If you are not sure you can handle that, you can log contacts. With the computers we have, it will be easy. The more people we have, the smoother the Club Field Day event will go." Director Fried, WA6WZO, has credited Michael Mitchell, W6RW, for helping to get Bill 1714 (Calif. PRB-1) introduced and he asks all CA Amateurs and clubs to contact their state lawmakers in support of this bill. Royce Bell, KX7Q, has been appointed Public Information Coordinator. Your help is needed to see that he receives club newsletters and activity information to insure it reaches QST and the local media. Phone 909-883-1629 or e-mail KX7Q@ arrl.net. FCC restructuring shows a surge in hams uprgrading ... don't be left behind. Traffic: W6QZ 266, KO6RZ 237, KC6SKK 137, Digital: W6QZ NTS BBS 340, NG6IW Mailbox 156. PSHR: W6QZ 158, KO6RZ 117, KC6SKK 114, SCN/V 29. Sessions, QNI 212, QTC 103, Avg. Time 15 mins. 73, Joe W6UBQ.

SAN DIEGO: SM, Tuck Miller, K6ZEC, 619-475-7333— Have you heard the HF bands lately? They are really buzzing now that all the new upgrades are effective. Now, hopefully some of these "newcomers" will get active not only in contesting, and DXing, but in such things as traffic handling. Yes, they still do that. Speaking of traffic, we want to thank Walt, WA6ODQ, who has given much time in the past to traffic handling, but recently had to give it up due to some neighborly rfi problems. Speaking of DX, the International DX convention in Visalia was once again a great success. If everyone had as much fun as I did, well it was well worth it. Mark it down, Sunday nights, starting at about 6:30 PM for a about half an hour, you can find me on 7.255, usually talking to Fred, AD6HB. Feel free to join us. When was the last time you have attended an ARES meeting? If it has been a while, why not join us. There are many activities of which we participate in, and would like for you to be a part. Well, looks like I will have to miss Dayton after all this year. Really wanted to go, but a closer look at finances said NO!! Maybe in the future. Hey, just a few weeks before Field Day. Have you made plans? It is a great operating event, and helps to give us that practice we sometimes need. Coming up in October is the SWD convention, to be held in Scottsdale, AZ. Also we are hoping to have a ham roundup this year. Plans are now underway. For folks outside of the San Diego section that read this as well, probably aren't many, I have been working on a page on the Web that shows pictures of many of your ARRL elected officials. Why not stop by, and check it out **http://www.qsl.net/sdgarrl** Remember, my e-mail box is always open, and I do try and answer within 24 hours.Tfc: KT6A 806, KD6YJB 285, KO6BU 2, WA6IIK 1. BPL: KT6A 806, PSHR: KT6A 138, KD6YJB 110. 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 (**w6yn@juno.com**) ASM- Internet, Jack Bankson, AD6AD (**jackbankson@jps.net**). DECs: Santa Barb-Dave Lamb,WA6BRW (**dlamb@silcom.com**). SLO-Bill Peirce, KE6FKS (**ke6fks@arrl.net**) & Ventura-Dave Gilmore, AA6VH (**aa6vh@arrl.net**). The Santa Maria ARC has reactivated its ARRL club affiliation. Thanks to Jim Black, N6VNU. Howard Coleman, W6HQA, is the newest Official Relay Station (ORS). He is a NCS on SCN/SB & an experienced traffic-handler. "On-line" Amateur Radio exam practice software keyed to the new license restructuring is available at http://www.wvara.org/wvexam/. Check it out. Make plans for the 2000 SW Div Convention in Scottsdale AZ! 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 168/514, KF6OIF 123/58, KC6NBI 81/-, KE6MIW 97/48, KM6RZ -/24 & KF6UMU 118/-. 30 in memory of John White, KB6LJL, SK. Rob, K6YR.

WEST GULF DIVISION

NORTH TEXAS: SM, Don Mathis, KB5YAM—STM: KC5OZT. BM: KC5OZT. SEC: K5MWC. SGL: N5GAR. OOC: WB5UDA.

YAESU

FT-1000D Transceiver

tx: 160–10m **rx**: 100kHz-30MHz • 200w • 100 mem. • Dual receive • Antenna tuner & AC • Dual bandpass filter • Temp. compensated crystal oscillator • 2.4kHz & 2kHz SSB filters, 500Hz CW crystal filter 6"h x 16"w x 15"d, 58 lbs **$4199.95**

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FT-90R Micro 2M/440 Transceiver

50/35w 2m/440 micro FM xcvr • Built-in CTCSS/DCS enc/dec • Select. TX power • 186 mem. • Direct keypad freq. entry • 8 mem. DTMF autodialer • ADMS PC program. • Auto repeater shift • RF-lavel squelch • Program. front panel/mic key func. • 1200/9600 bps compatible • 3.9"w x 1.2"h x 5.4"d.. **$399.95**

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2m 144–148MHz tx, 110–550 & 750-1300 MHz (cell blkd) rx • **70cm** 430–450MHz tx/rx • 208 mem. • 50-35/3/5w • CTCCSS encode • 5½"w x 1½"h x 6¼"d ..... **Special $429.95**

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VXR-5000U/TC 440 rptr w/PS..... **1399.95**
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Light, medium, heavy & extra heavy-duty models, plus elevation & azimuth – elevation.

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FNB-49 600MA 6V battery **9.95**
FRC-4 Pager unit; 5200/6200..... **4.95**
FRC-6 Pager unit; 2500M/7400H **4.95**
FT-290RMkII 2m, 25w Transceiver.. **559.95**
FTS-6 Encoder/decoder; 09 series **4.95**
FTT-12 16# keypad/dec/dvrs; FT-50R.. **19.95**
FTT-4 TTP unit; FT-23R/33R/73R..... **9.95**
FX-1 Xcvr-fax interface/controller **9.95**
MMB-21 Mobile bracket; 09/727R **4.95**
MW-2 Remote control wireless mic **39.95**

ACC: WN5PFI. ASMs: KX5K, K5RE, 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**. I would like to announce the following staff changes for the section. Bill Swan, K5MWC, is the new SEC. Best of wishes to Gary on his new job. Carolyn Womack, KC5OZT, is also taking over my old position of Bulletin Manager. Thanks to both of you for taking those positions. The DFW Net Managers for this year are: Net Manager Bill, WA5I, and his assistant Colin, W5/PY2CGB for Early Net. Net Manager Jim, N5JZ, and his assistant Bill, W5OMC, for Late Net. We will be making the HamCom in Arlington in June the major section activity for the year. More details on that in the next issue. We are also going to try something different for Field Day this year. We are planning on setting up a section headquarters site and being active on the air and will try to contact as many section members and clubs as possible. More details on that also in the next issue. February tfc: K5UPN 675, N5JZ 463, K5NHJ 311, KC5OZT 265, W5/PY2CGB 203, K5AO 187, W5AYX 141, WA5I 104, KB5TCH 86, K5MXQ 85, KC5VLW 76, AC5Z 19, KD5AHW 4, KB5YAM 3, KC5SMC 2, N8QVT 1. N5JZ, K5UPN, and K5NHJ made Brass Pounders League. 73, Don, KB5YAM.

OKLAHOMA: SM, Charlie Calhoun, K5TTT—ASMs: N6CL, W6CL. SEC: W5ZTN. ACC: KB5BOB. PIC: WA9AFM. OOC: K5WG. SGL: W5NZS. STM: K5KXL. Your SM's been busy here lately. I had a great time going out west and attending the Elk City Hamfest and the Tri-State AR Group hamfest in Mooreland. Really enjoyed seeing some familiar faces and meeting many new ones. I was able to attend a private dedication ceremony for the Oklahoma City Bombing Memorial last month. Thanks to Jon, KC5OEB, for making that possible. I am in the process of implementing a modification in the section cabinet structure. I feel that it is important that we get the word out to the public about what Amateur Radio does for the citizens of Oklahoma, so rather than having a single PIC and one PIO for each of the metropolitan areas, I see it as a benefit to appoint a PIO for each club or organization. If your club or organization has an elected Public Service Liaison position, I would like to see you apply for the PIO section appointment. You must be a league member, though. You may contact me or fill out an online form at **http://www.arrl.org/field/forms/fsd187/form.html** for consideration. The new DXCC field card checker program is now in effect. Your Oklahoma Section team consists of Ross Hunt, K5RH, and Clif Sikes, N5UW. Ross will cover the Eastern part of the state while Clif patrols the West. Field Day is coming up before long and I will be accepting your traffic live via mobile this year. More information on that to come. Let me know about your Field Day plans, though, so I might visit your site. 73, Charlie.

SOUTH TEXAS: SM, E. 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. May the flowers start blooming and the trees start budding. On March 10th, we lost another good ham and traffic handler at 4:22 PM. Charles Goble, NX5V, known as Chuck to most. Chuck will be missed here in South Texas. That same evening we had a severe storm move through the area, with several tornadoes, two of which left lots of destruction in their paths. We had two house trailers destroyed. I would sure like to see more hams get involved as spotters. There are several hams in the areas that were hit the hardest. We were on 3.873 and several 2 meter and 440 frequencies, giving warnings and looking for information as the storm moved through. This is for your benefit as well as the weather service. You will have advance warnings, and you have a chance to help others. The National Weather Service depends on our assistance. They can see a tornado, but they are unable to tell if it hits the ground. That's where you as spotters come in. I do want to thank all those that did assist, while I was at the weather station. While on the subject, Al Dreumont retired after 38 years of service for NWS. Coy Day, Don Smith, and I had a great time and meal, at the Austin Repeater Organization Club meeting. Good to hear N5TC back on the air. We have missed you, Tom. We're having Ham Com 2000 in Arlington June 9-10. We're having a great program this year, and I do hope you will join us for a great time. Field Day is upon us. I hope to get a radiogram from all the groups that take part this year. It's worth 100 points for your group to send a radiogram to your Section Manager. You have a golden opportunity to take some of the new comers to ham radio out in the field. It's good training for them. This could be one of their greatest learning experiences. I do hope that we will all give these new hams a welcome into the ham bands. They will be the ones to fill our shoes some day, so let's help them to get off on the right foot. I hope you have a good month. God bless. Tfc: W5SEG 675, KA5KLU 474, W5NRJ 177, W5KLV 157, W5TUK 156, W5GKH 132, N5NAV 68, KØYNW 58, N5OUJ 54, K5UCQ 38, W5ZX 34, N5JUU 5.

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. Over hill, over dale, they hit the dusty trail....Through the cacti and rattlesnakes, with temperature extremes from the 30s in AM to the 90s in PM., 800 competitive off-road bicyclists raced through the mountains of the Big Bend in TX. They went where a human wouldn't even want to walk, and the Big Bend and San Angelo ARCs were there to provide the communications for the safety of these competitors. Midland ARC has new officers: Pres, Pete Stull, WB7AMP; VP, Larry Mitchell, N5OKO; Secy., Norma Bentley, WA5STG; Treas., C. A. Ross, KM5OK. A big WTX welcome to our new ARRL affiliate-Lubbock Amateur Contest Club. WTX Section Ham of the Year is John Clement, KF5NI, Odessa. John has been an outstanding contributor of time and talent to the section for many years. Don't forget Field Day 2000 is fast approaching. It's never too soon to start preparing. Until next time, 73 de Charlie, WB5T.

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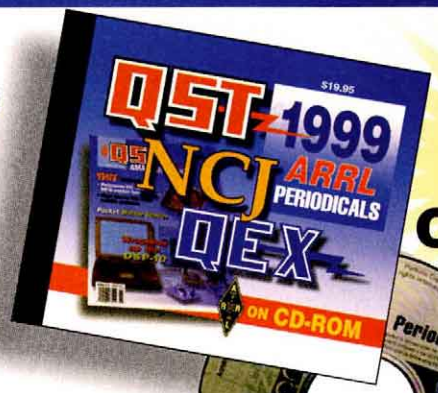

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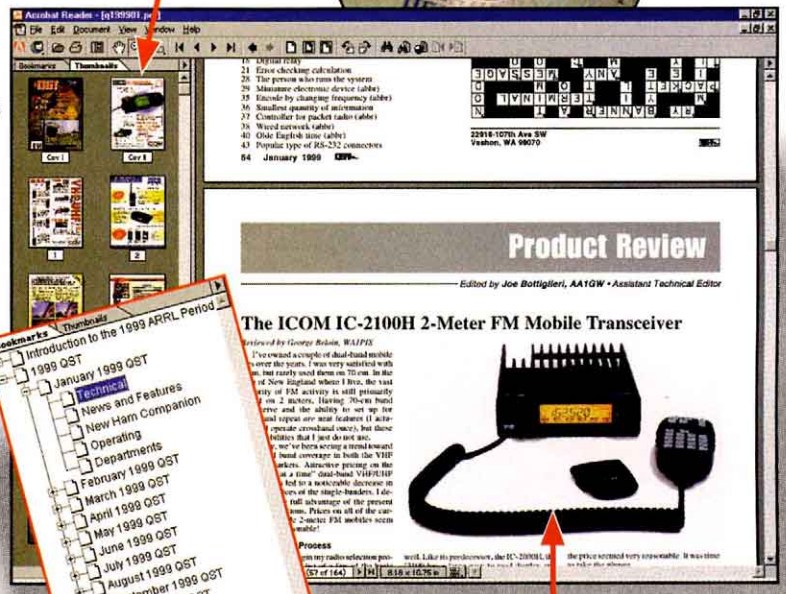

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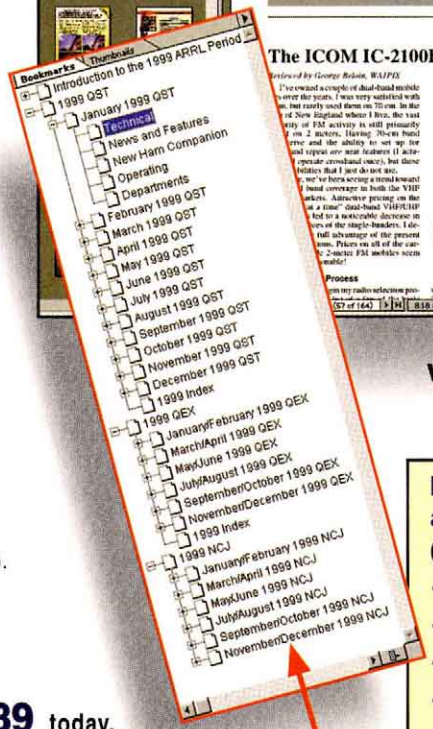

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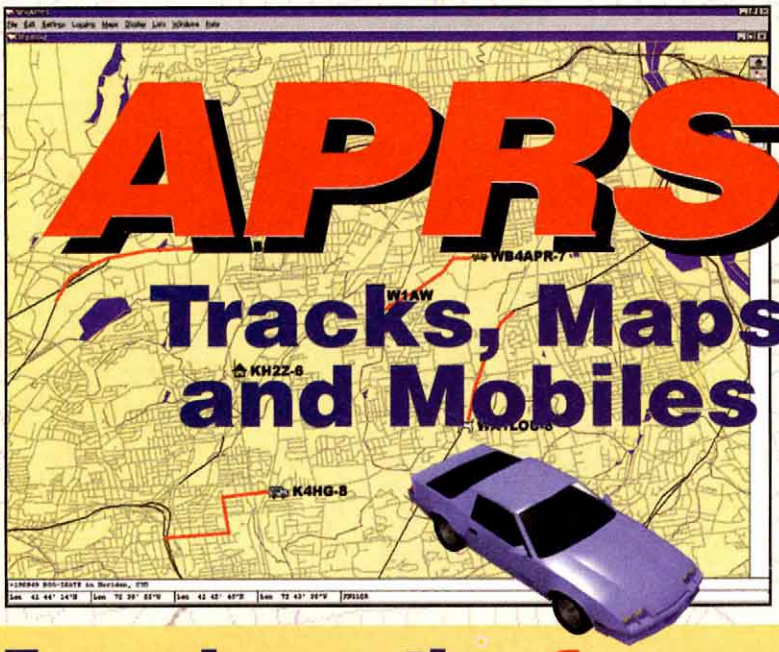

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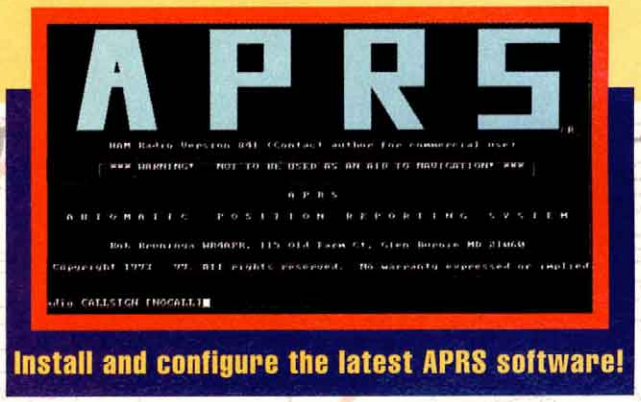

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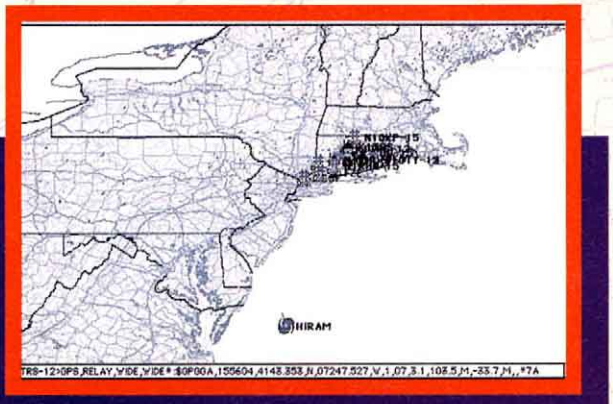

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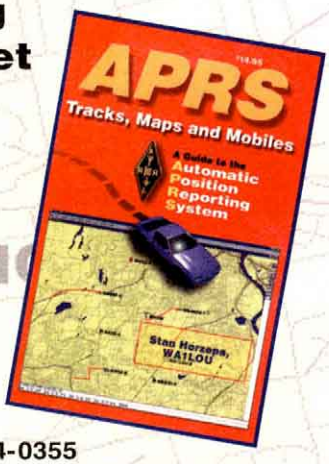

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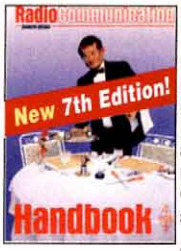

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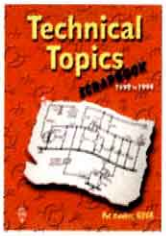

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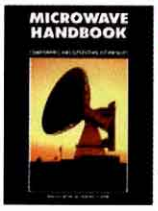

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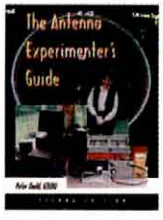

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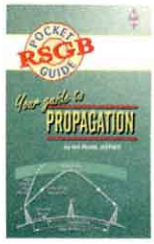

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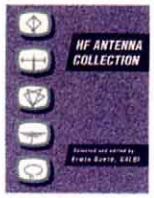

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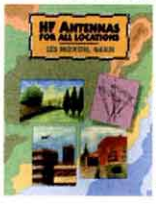

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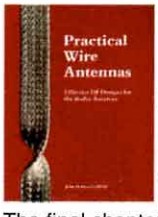

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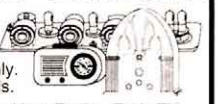

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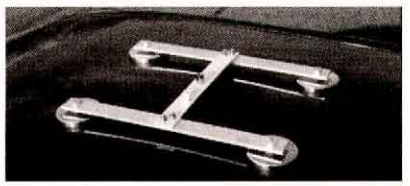

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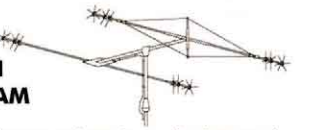

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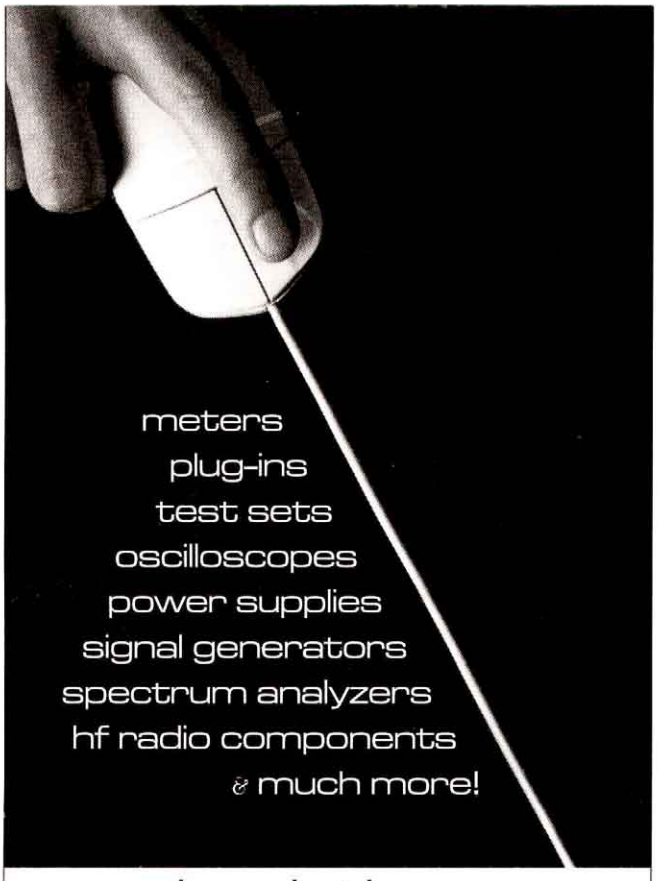

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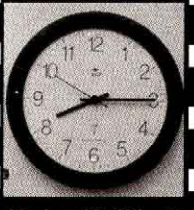

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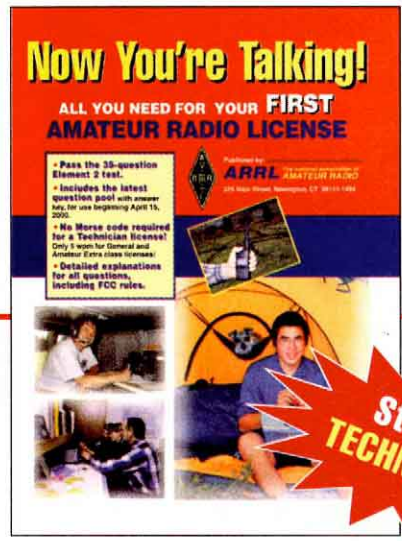

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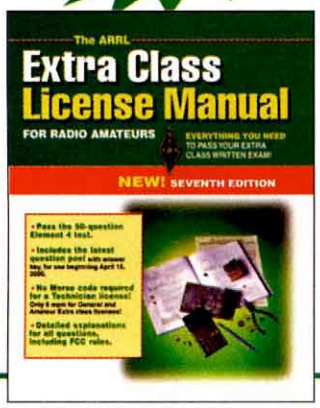

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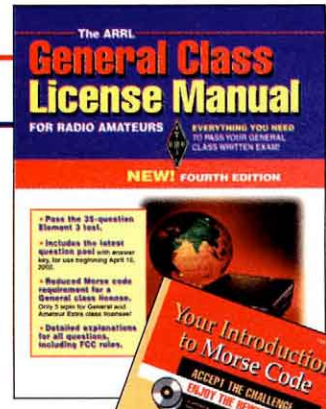

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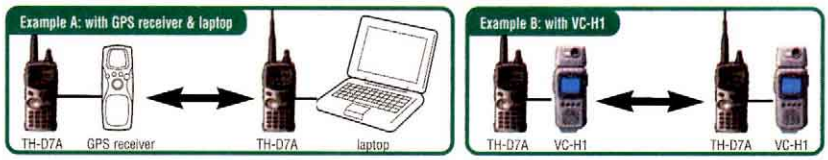

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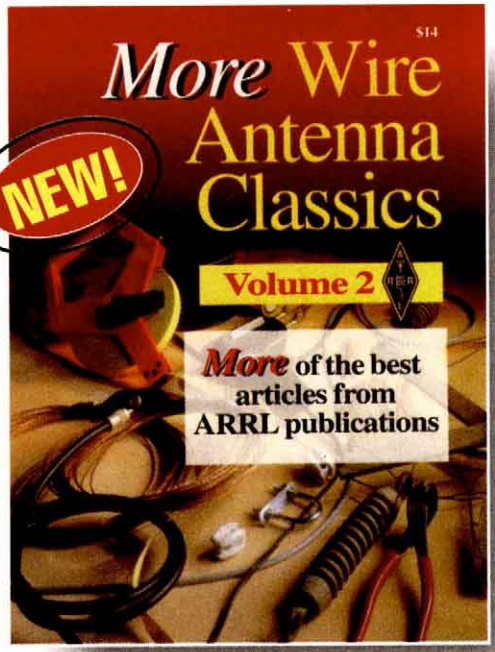

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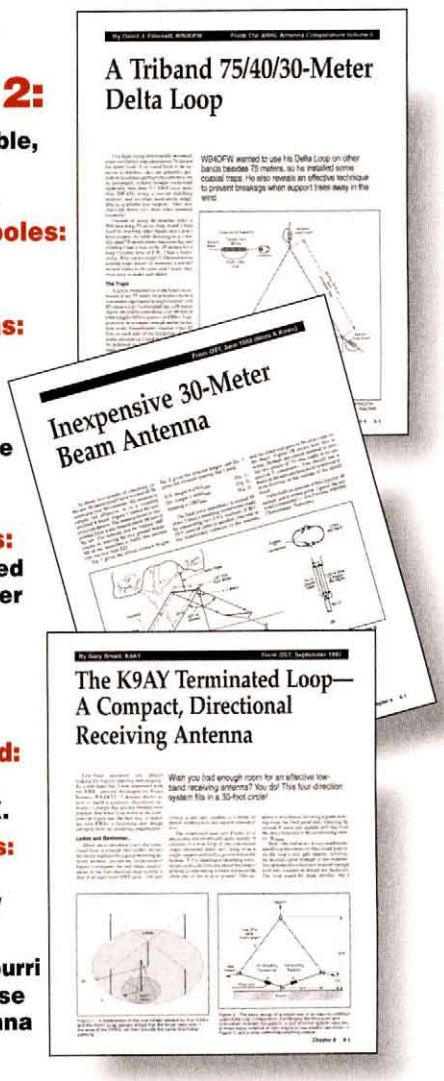

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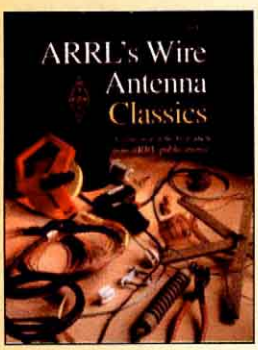

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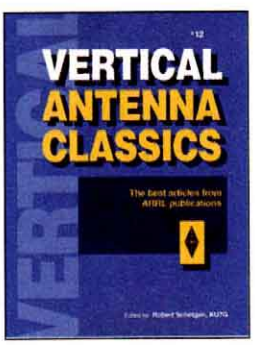

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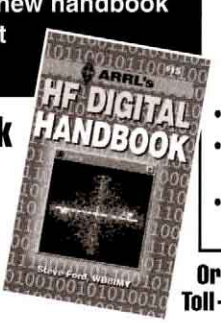

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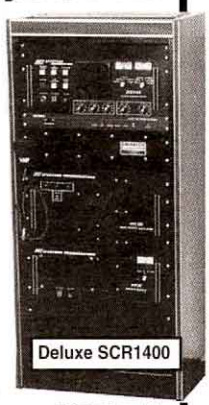

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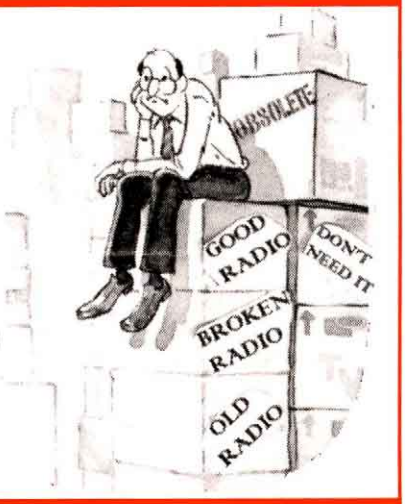

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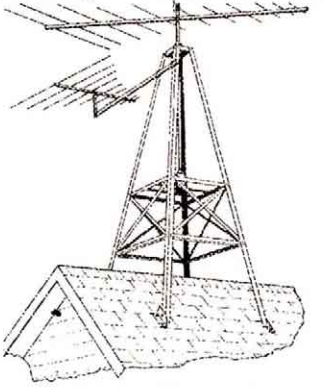

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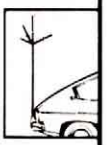

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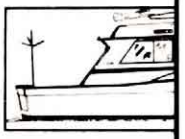

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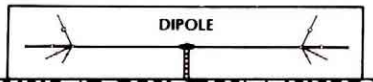

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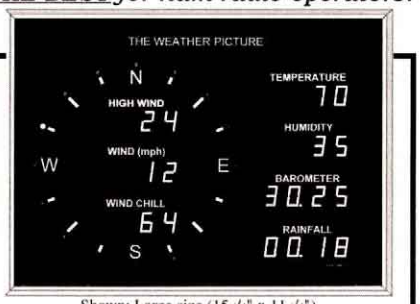

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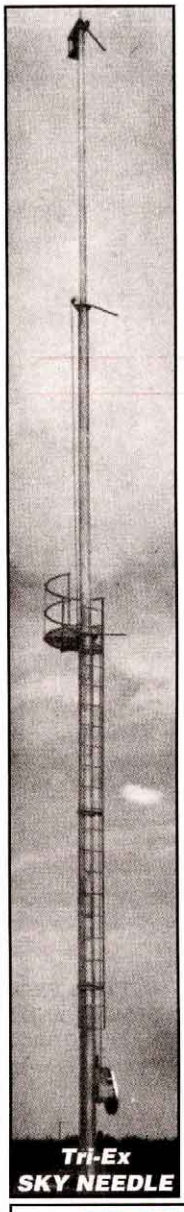

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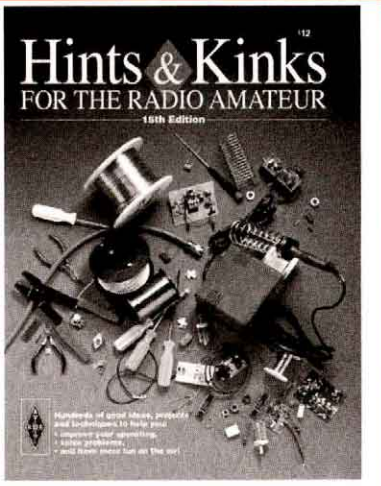

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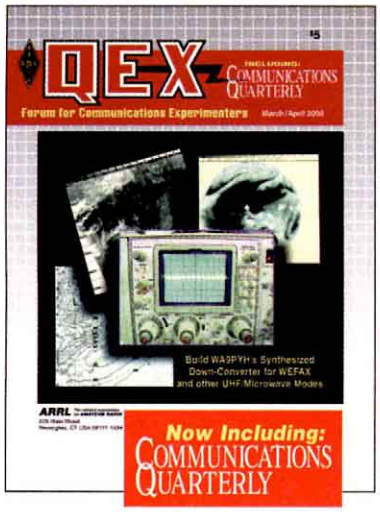

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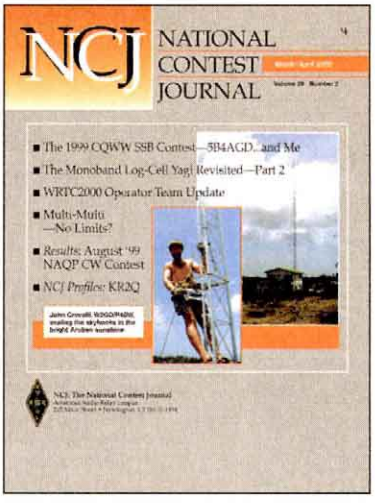

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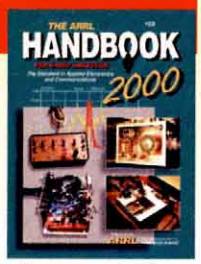

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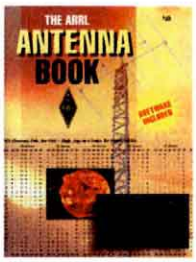

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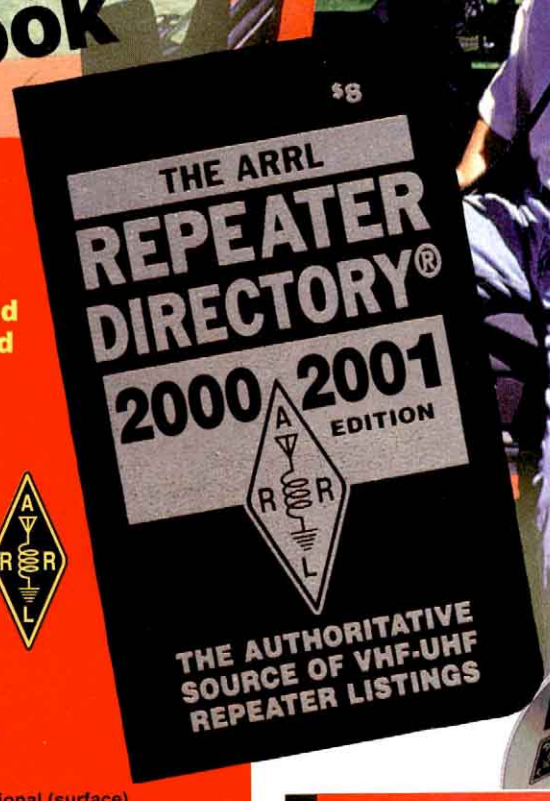

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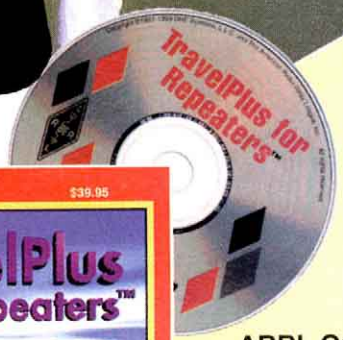

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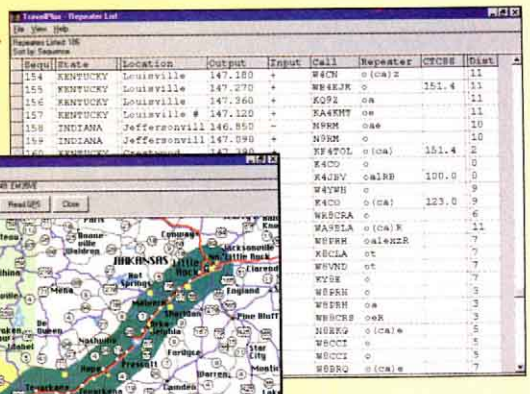

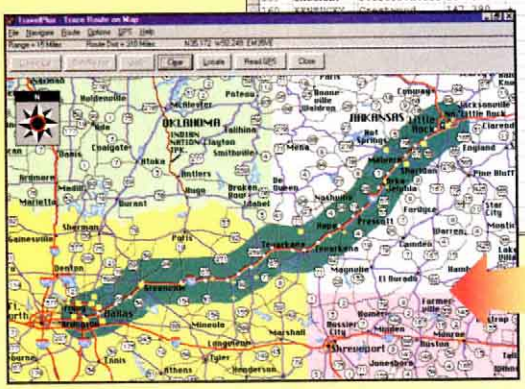

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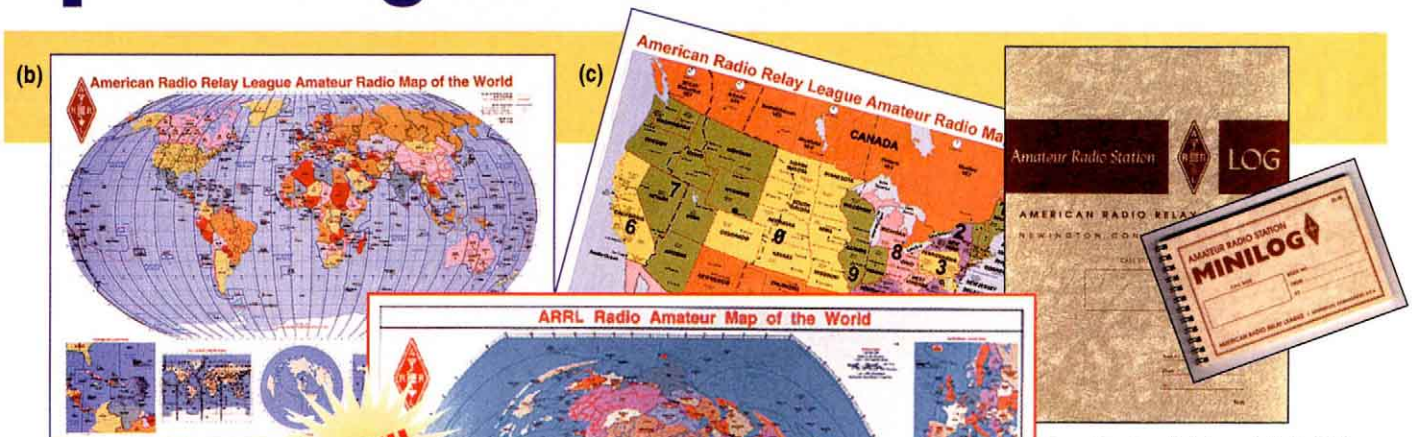

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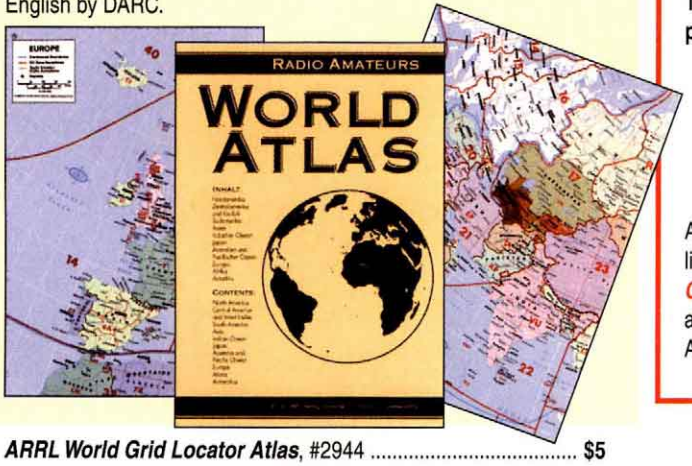

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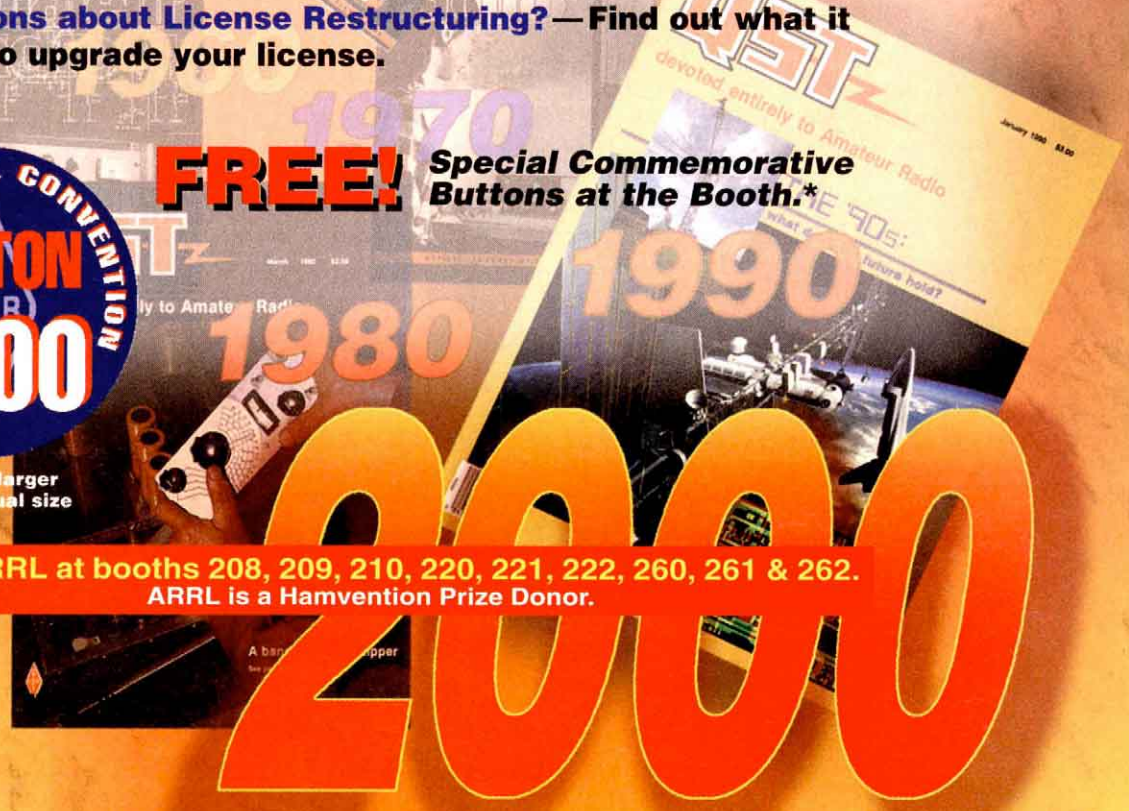

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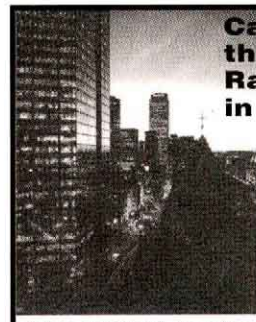

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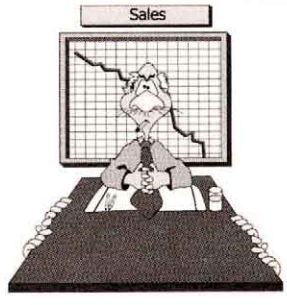

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LMR 400 SOLID CCA CNTR FOIL + BRAID 2.7dB @ 450MHz WP/UV JKT	.59/FT	.57/FT	.55/FT
LMR 400 "ULTRA-FLEX" STRD BC CNTR FOIL + BRAID 3.1dB @ 450 MHz TPE JKT	.87/FT	.86/FT	.85/FT
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LMR 600 "ULTRA-FLEX" STRD BC CNTR FOIL + BRAID 2.1dB @ 450MHz TPE JKT	1.95/FT	1.93/FT	1.90/FT

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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.	

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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
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	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
1216 8/COND (2/12 6/18) BLK UV RES JKT. Recommended up to 500ft	.78/FT	.74/FT	.70/FT
1806 18GA STRD 6/COND PVC JACKET Recommended for Yaesu Rotors	.23/FT	.21/FT	.19/FT

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	100FT/UP	300/FT	500FT	1000FT
14GA 168 STRD *"SUPERFLEX" (great for Quads & Portable set-ups etc.)*	.19/FT	.16/FT	.12/FT	.10/FT
14GA 7 STRD *"HARD DRAWN" (perfect for permanent Dipoles etc.)*	.15/FT	.12/FT	.08/FT	.06/FT
14GA SOLID *"COPPERWELD" (for long spans etc.)*	.15/FT	.12/FT	.08/FT	.06/FT
14GA SOLID *"SOFT DRAWN" (for ground radials etc.)*	.15/FT	.12/FT	.08/FT	.06/FT

ANTENNA & TOWER SUPPORT ROPE

	100FT/UP	250/FT	500FT	1000FT
3/32" DOUBLE BRAID *"POLYESTER"* 260# TEST WEATHERPROOF	.075/FT	.06/FT	.045/FT	.04/FT
1/8" DOUBLE BRAID *"POLYESTER"* 420# TEST WEATHERPROOF	.10/FT	.08/FT	.07/FT	.057/FT
3/16" DOUBLE BRAID *"POLYESTER"* 770# TEST WEATHERPROOF	.15/FT	.12/FT	.09/FT	.08/FT
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8GA (rated:40 amps)	50FT $24.50	100FT $44.50	250FT $107.50
10GA (rated:30 amps)	50FT $15.50	100FT $28.00	250FT $65.00
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14GA (rated:15 amps)	50FT $8.50	100FT $15.00	250FT $32.50
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COAX CABLE ASSEMBLIES

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

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200' $89.95 175' $79.95 150' $69.95 125' $59.95 100' $49.95 75' $39.95 60' $34.95
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RG8/U strd BC foam 95% braid UV resistant JKT. 0.9dB 1350 watts @ 30MHz.
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25' $14.95 15' $15.95 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
200' $47.95 175' $41.95 150' $34.95 125' $29.95 100' $24.95 75' $19.95 50' $15.95
25' $10.95 (18' $10.95 6' $9.95 3' $8.95 clear PVC JKT) (6' $4.95 3' $3.95 *China made*)

LMR 400 SOLID CCA CNTR FOIL + BRAID 2.7dB @ 450MHz WP/UV JKT 100' $72.95

With USA made Silver/Teflon®/Gold Pin male "N" connectors.

FLEXIBLE 9913 strd BC cntr foil+95% braid 2.7dB 400MHz NC/DB/UV JKT.
200' $147.95 175' $129.95 150' $110.95 125' $95.95 100' $80.95 75' $67.95 50' $54.95
35' $45.95 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.
200' $139.95 175' $123.95 150' $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

RG142/U 50 OHM COAX ASSEMBLIES

Double Silver Braid Shields, High Power Teflon® Dielectric & Jacket

3ft PL259 ea end $12.95/ea. 3ft "N" male ea end $19.95/ea. 3ft SMA Male to BNC Female $13.95ea.
6ft PL259 ea end $14.95/ea. 3ft R.A. BNC to "N" Male $19.95/ea.
18ft PL259 ea end $24.95/ea. 3ft R.A. BNC to "N" Female $19.95/ea.
3ft SMA Female to "N" Female $19.95/ea. 3ft R.A. SMA Male to "N" Female $19.95/ea.
3ft SMA Female to "N" Male $19.95/ea. 3ft SMA Male to "N" Male $19.95/ea.

HT Solutions: use any of these jumpers to improve & increase the life of your HT.
RG8 MINI (X) 6' PL259-male BNC 6' $9.95
RG58/U w/Right Angle Male BNC to SO239 3' $9.95
RG58/U w/Right Angle Male BNC to PL259 3' $9.95

Assemblies Discounted: visit our website www.cablexperts.com

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.

CONNECTORS

Both connectors fit 9913 types and LMR400 MADE IN USA

PL 259 SILVER/*Teflon®*/GOLD TIP.....10PC $12.50.....25PC $27.50.....50PC $52.50....100PC $100.00
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For our other connectors and adapters see http://www.cablexperts.com

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1 INCH WIDE (equivalent to 7ga).....25FT $24.00.....50FT $47.00.....100FT $94.00
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180A Beverage/Longwire matching unit.....$39.00/ea
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- **Very Low Loss Foam Dielectric.**
- **Use "N" and/or UHF connectors.**
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SAVE BIG ON ANTENNAS, TOWERS & CABLE

TELESCOPING ALUMINUM TUBING

DRAWN 6063-T832

.375	$.60/ft	1.375"	$1.55/ft
.500"	$.70/ft	1.500"	$1.75/ft
.625"	$.80/ft	1.625"	$2.00/ft
.750"	$.90/ft	1.750"	$2.25/ft
.875"	$1.00/ft	1.875"	$2.50/ft
1.000"	$1.10/ft	2.000"	$2.75/ft
1.125"	$1.25/ft	2.125"	$3.00/ft

In 6' or 12' lengths, 6' lengths ship UPS. Call for 3/16"& 1/4" rod, bar stock, and extruded tubing.

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13B2/17B2/26B2	$119/199/329
719B/729B	$115/179
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Please call for more Cushcraft items

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C3E	10/12/15/17/20m, 8 el	$559
C3S	10/12/15/17/20m, 6 el	$469
C3SS	10/12/15/17/20m, 6 el	$459
C4	10/12/15/17/20/40m, 8 el	$669
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C4XL	10/12/15/17/20/40m, 9 el	$939
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Please call for more Force 12 items

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SELF-SUPPORTING STEEL TOWERS

T200-64	64', 15 square feet	$989
T200-72	72', 15 square feet	$1199
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T200-88	88', 15 square feet	$1699
T200-96	96', 15 square feet	$1989
T300-88	88', 22 square feet	$1979
T400-80	80', 34 square feet	$1899
T500-72	72', 45 square feet	$1849
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Many more Trylon towers in stock!

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HF2V, 2 Band Vertical	$219
HF5B, 5 Band Minibeam	$429
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HF9VX, 9 Band Vertical	$349
A1712, 12/17m Kit	$54
CPK, Counterpoise Kit	$129
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STRII, Roof Radial Kit	$125
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More Bencher/Butternut–call

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144–148 MHz

2M4/2M7/2M9	$89/109/1119
2M12/2M5WL	$149/189
2M5-440XP, 2m/70cm	$129

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420-470-5W/420-450-11	$119/89
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440-18/440-21ATV	$119/139

Satellite Antennas

2MCP14/2MCP22	$155/209
436CP30/436CP42UG	$209/249

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Please call for more Rohn prices

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TX438/TX455	$1069/1319
TX472/TX489	$2649/4599
HDX538/HDX555	$1379/1919
HDX572MDPL	$6329

Please call for help selecting a US Tower for your needs. Shipped factory direct to save you money!

COMET ANTENNAS

GP15, 6m/2m/70cm Vertical	$149
GP6, 2m/70cm Vertical	$149
GP9, 2m/70cm Vertical	$179
B10NMO, 2m/70cm Mobile	$36
B20NMO, 2m/70cm Mobile	$49
SBB2NMO, 2m/70cm Mobile	$39
SBB5NMO, 2m/70cm Mobile	$49
SBB7NMO, 2m/70cm Mobile	$75
Z750, 2m/70cm Mobile	$55
Z780, 2m/70cm Mobile	$69

Much more Comet in stock–call

M2 ANTENNAS

50–54 MHz

6M5/X6M7	$199/279
6M2WLC/6M2.5WLC	$419/529

10/12/15/17/20m HF

10M4DX, 4 Element 10m	$379
12M4DX, 4 Element 12m	$379
15M4DX, 4 Element 15m	$419
17M3DX, 3 Element 17m	$379
20M4DX, 4 Element 20m	$499

More M2 models in stock–please call

GLEN MARTIN ENGINEERING

Hazer Elevators for 25G

H2, Aluminum Hazer, 12 sq ft	$359
H3, Aluminum Hazer, 8 sq ft	$269
H4, HD Steel Hazer, 16 sq ft	$339

Aluminum Roof Towers

RT424; 4 Foot, 6 sq ft	$159
RT832, 8 Foot, 8 sq ft	$229
RT936, 9 Foot, 18 sq ft	$389
RT1832, 17 Foot, 12 sq ft	$499

Please call for Glen Martin info

UNIVERSAL ALUMINUM TOWERS

4-40'/50'/60'	$519/739/1049
7-50'/60'/70'	$939/1369/1789
9-40'/50'/60'	$729/1049/1469
12-30'/40'	$559/869
15-40'/50'	$969/1399
23-30'/40'	$859/1289
35-30'/40'	$979/1509

Bold in part number shows wind-load capacity. Please call for more Universal models. All are shipped factory direct to save you money!

DIAMOND ANTENNAS

D130J/DPGH62	$79/139
F22A/F23A	$89/119
NR72BNMO/NR73BNMO	$39/54
NR770HBNMO/NR770RA	$55/49
X200A/X300A	$129/159
X500HNA/700HNA	$229/369
X510MA/510NA	$189/189
X50A/V2000A	$99/149
CR627B/SG2000HD	$99/79
SG7500NMO/SG7900A	$75/112

More Diamond antennas in stock

MFJ ANTENNAS

259B Antenna Analyzer	$219
1798, 80–2m Vertical	$239
1796, 40/20/15/10/6/2m Vert.	$179
1793, 80/40/20m Vertical	$159
1792, 80/40m Vertical	$145
1788, 40–15m Loop	$399
1786, 30–10m Loop	$349
1780, 14–30 MHz Loop	$229
1768, 2m/70cm Beam	$65
1762, 3 Element 6m Beam	$65

Big MFJ inventory–please call

COAX CABLE

RG-213/U, (#8267 Equiv.)	$.36/ft
RG-8X, Mini RG-8 Foam	$.19/ft
RG-213/U Jumpers	Please Call
RG-8X Jumpers	Please Call

Please call for more coax/connectors

TIMES MICROWAVE LMR® COAX

LMR-400	$.59/ft
LMR-400 Ultraflex	$.89/ft
LMR-600	$1.19/ft
LMR600 Ultraflex	$1.95/ft

TOWER HARDWARE

3/8"EE / EJ Turnbuckle	$10/11
1/2"x9"EE / EJ Turnbuckle	$15/16
1/2"x12"EE / EJ Turnbuckle	$17/18
3/16" / 1/4" Preformed Grips	$4/5

Please call for more hardware items

HIGH CARBON STEEL MASTS

5 FTx .12" / .18"	$35/59
10 FT x .12" / .18"	$65/110
15 FT x .12" / 17 FT x .18"	$95/180
20 FT x .12" / .18	$120/199
12 FT x .25" / 24 FT x .25"	$189/359

GAP ANTENNAS

Challenger DX	$259
Challenger Counterpoise	$25
Challenger Guy Kit	$14
Eagle DX	$269
Eagle Guy Kit	$22
Titan DX	$299
Titan Guy Kit	$22
Voyager DX	$389
Voyager Counterpoise	$49
Voyager Guy Kit	$38

Please Call for Delivery Information

LAKEVIEW HAMSTICKS

9106 ... 6m	9115 ... 15m	9130 ... 30m
9110 ... 10m	9117 ... 17m	9140 ... 40m
9112 ... 12m	9120 ... 20m	9175 ... 75m

All handle 600W, 7' approximate length, 2:1 typical VSWR ... $24.95

HUSTLER ANTENNAS

4BTV/5BTV/6BTV	$129/169/189
G6-270R, 2m/70cm Vertical	$149
G6-144B/G7-144B	$109/159

Hustler Resonators in stock–call

ANTENNA ROTATORS

M2 OR-2800P	$1095
Yaesu G-450A	$239
Yaesu G-800S/SDX	$319/399
Yaesu G-1000DXA	$479
Yaesu G-2800SDX	$1069
Yaesu G-550/G-5500	$289/589

ROTATOR CABLE

R51(#20)/R52 (#18)	$.22/.32/ft
R61 (#20)/R62 (#18)	$.28/32/ft.
R81/82/83/84	$.25/.39/.52/.85/ft

PHILYSTRAN GUY CABLE

HPTG1200I	$.39/ft
HPTG2100I	$.52/ft
PLP2738 Big Grip (2100)	$5.50
HPTG4000I	$.79/ft
PLP2739 Big Grip (4000)	$7.65
HPTG6700I	$1.15/ft
PLP2755 Big Grip (6700)	$10.95
HPTG11200	$1.55/ft
PLP2558 Big Grip (11200)	$16.50

Please call for more info or help selecting the Phillystran size you need.

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IC-775 DSP ...New Lower Price!

The Icom IC-775DSP is a competition class HF transceiver featuring 200 watt RF output, digital signal processing, automatic antenna tuner, true dual RX, CW memory keyer, CTCSS tone encode, twin pass band tuning, dual antenna inputs, 101 memory chanels, built-in power supply, and much more. Supplied with AC power cord.

PW-1 .....New Lower Price!

The Icom PW-1 is a 1000 watt solid state linear amplifier for HF and 6m operation, featuring a high power automatic antenna tuner, built-in power supply, and a removable front control panel, and more.

IC-746 .....Icom Special!

The Icom IC-746 is an all mode transceiver covering HF/6m/2m. The radio features digital signal processing, 100 watt RF output on all bands, twin PBT, a 4.9"multifunction LCD display with band scope, automatic antenna tuner, and more. Supplied with a hand mic and DC power cord.

IC-756PRO .....New!

The Icom IC-756 PRO is an all mode HF/6m transceiver featuring DSP, automatic antenna tuner, 100 watts RF output, digital twin PBT, a 5" multifunction LCD display with band scope function, and more. Supplied with hand mic and DC power cord.

FT-1000MP .....In Stock!

The Yaesu FT-1000MP is a competition class HF transceiver featuring advanced DSP, automatic antenna tuner, built-in power supply, RS-232 interface, and more!

FT-1000 / FT -1000D ....In Stock!

The FT-1000 is a competition class HF transceiver featuring true dual RX, automatic antenna tuner, 200 watts RF output, and a huge bank of crystal IF filters.

Quadra System ...Lower Price!

Solid state amplifier featuring 1 kW output, high power antenna tuner, and more!

FT-847 .....Yaesu Special!

The Yaesu FT-847 is an all mode transceiver covering HF/6m/2m/70cm! The radio is perfect for satellite operation, and features digital signal processing, built-in RS-232 interface, tone encode/decode, and more. Supplied with an up/down microphone and DC power cord.

FT-920 .....Yaesu Special!

The Yaesu FT-920 is an all mode HF/6m transceiver featuring digital signal processing, automatic antenna tuner, CW memory keyer, CTCSS tone encode/decode, 127 memories, and more. Supplied with up/down hand mic and DC power cord.

IC-706MK2G .....Icom Special!

The Icom IC-706MK2G is a compact HF/6m/2m/70cm all mode transceiver with digital signal processing, automatic repeater offset, built-in CW keyer, built-in CTCSS tone encode/decode/scan, 107 memory channels and more. A detachable front panel offers convenient mounting, even in compact vehicles.

IC-718 .....New!

The Icom IC-718 is an all mode HF transceiver featuring a front panel mounted speaker, IF shift, optional DSP module, multiple scanning modes, noise blanker, RIT, and more.

IC-2800H .....Icom Special!

The Icom IC-2800H is a 2m/70cm dual band mobile FM transceiver with a 3" color TFT display. The radio features a separate control face, video input, bandscope display, 9600 bps Packet jack, CTCSS tone encode/decode/scan, 232 memories, cross band duplex, and more. With DTMF hand mic, mounting brackets, and power cord.

IC-821H .....In Stock

The Icom IC-821H is an all mode 2m/70cm dual band transceiver. Great for satellite use, the radio offers dual RX, dual frequency display, tone encode, and more.

FT-90R .....New!

New ultra-compact 2m/70cm dual band mobile transceiver with detachable control panel, and huge extended RX range.

FT-2600M ...New Lower Price!

Rugged 2m mobile with intermod-proof receiver, big display, and an illuminated DTMF mic. Built to MIL-STD 810.

FT-8100 .....New Lower Price!

Great 2m/70cm dual band mobile, 45/35 Watts, removable front panel, and more!

FT-100 .....Yaesu Special!

The Yaesu FT-100 is an ultra-compact all mode transceiver for HF/6m/2m/70cm operation. The radio features a removable control panel, digital signal processing, CW memory keyer, built-in RS-232 interface, tone encode, 200 memory channels, VOX, and more. Supplied with a DTMF hand mic, DC power cord and mounting bracket.

FT-840 .....New Lower Price!

The Yaesu FT-840 is an all mode HF transceiver with 100 watt output, optional FM unit.

IC-W32A .....New Lower Price!
IC-Q7A .....Icom Special!
IC-T7H .....Icom Special!
IC-T8A-16 .....Icom Special!
IC-T81A .....New QuadBand HT!
IC-T2H .....Amazing Low Price!

IC-207H .....Great Low 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 sq. ft. of antenna load, and features 450° rotation, preset and variable speed.

G-1000DX A $479
G-800S/SDX $319/399
G-450A $239
G-5500 .....$589
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, extended RX with AM/FM and FW Wide modes, and more.

FT-50RD .....Yaesu Special!
VX-1R .....Yaesu Special!

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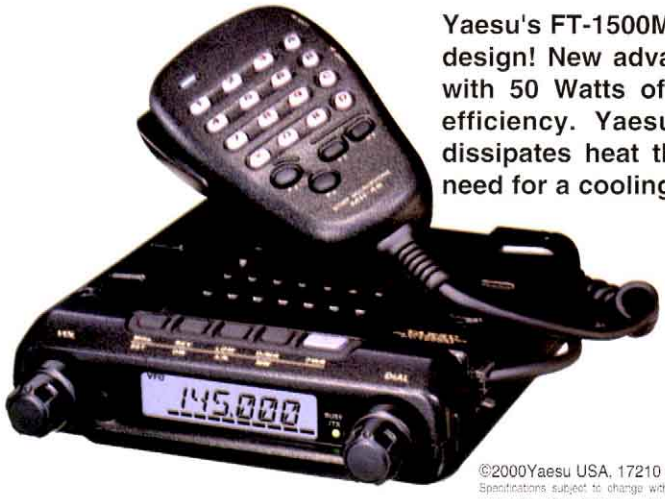

Yaesu's FT-1500M represents a technological breakthrough in radio transceiver design! New advances in power amplifier technology combine to provide you with 50 Watts of clean transmit power with enhanced current consumption efficiency. Yaesu's patent pending aluminum die-cast shell construction dissipates heat throughout the entire transceiver chassis and eliminates the need for a cooling fan. This allows the FT-1500 to fit in an incredibly small case size: less than 5 inches square X 1.4 inches high and offer superior operating specifications as well!

FT-1500M

50 W 2-m FM Mobile Transceiver

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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.

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Amateur Radio Products Group

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