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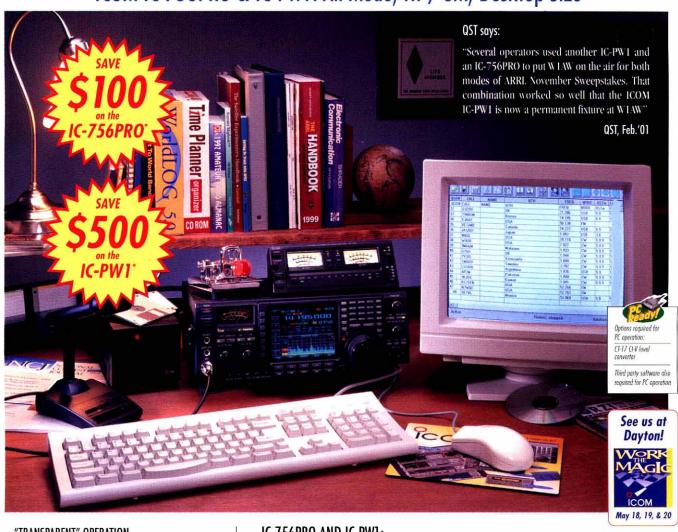
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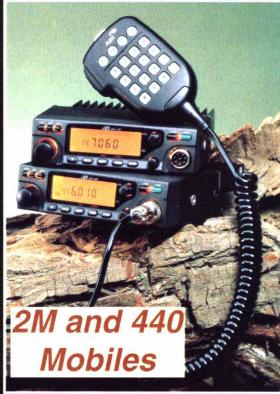
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### "IT SEEMS TO US...

### **Digital Developments**

While Web surveys are inherently unscientific and inaccurate, they can be fun as long as you don't take them too seriously. Once in a while you can learn something from them. The ARRL Web survey recently taught us something very interesting about PSK31, the new HF digital mode.

In case you don't recognize the name, PSK31 was developed by Peter Martinez, G3PLX, as a modern conversational keyboard mode for HF digital operators. Initially the province of experimenters, it moved toward the mainstream in late 1998 when Peter introduced a Windows version and distributed it free of charge on the Web. Anyone with a personal computer and a sound card could try PSK31 with no additional investment, and if you tried it you were bound to like it! It occupies an extremely narrow bandwidth, uses a coding scheme expressly designed for efficient conversation, and works well even when signals are weak. In May 1999 QST, just two years ago, Steve Ford, WB8IMY, asked: "Has RTTY's replacement arrived?" Many who have experienced PSK31, especially those who are limited to low power and small antennas, would now answer "Yes!"

And how many have experienced PSK31? The answer will surprise anyone who thinks we hams are a conservative lot, slow to embrace change. In January 2000, about one year after the first introduction of the mode to the general ham population, we used the ARRL Web Survey to ask the question. About 14% of respondents answered that they had tried PSK31, 40% hadn't but knew what it was, and 46% hadn't heard of it. Although Web survey respondents are not representative of the population as a whole, 14% was impressive for a new mode.

About a year later we asked again. If the degree of acceptance of PSK31 after just one year was impressive, after two years it was downright startling: 38% had tried it and just 15% said they didn't know what it was! As we had been promoting PSK31 unabashedly in QST and in other ways, this was delightful news.

A scientific survey of ARRL members conducted in November 2000 confirmed that PSK31 is now a mainstream mode, ranking in popularity with RTTY and well ahead of all other HF digital modes put together. G3PLX and the clever band of developers who have followed his lead have changed the face of the HF bands and have reinvigorated thousands of hams. The Dayton Hamvention has chosen Peter to receive its Technical Excellence Award for 2001, an honor he richly deserves.

As exciting as PSK31 may be, it's just the beginning. Other "designer modes" for HF have been developed, using PCs and sound cards to accomplish different objectives. We can say without fear of contradiction that in this particular field, amateurs are moving ahead faster than our commercial counterparts.

What about VHF? Recently QST has carried a couple of articles about meteor scatter using high-speed CW, a mode that makes effective use of PCs and sound cards (although there are also other ways of doing it). In the Pacific Northwest a group of experimenters working around Bob Larkin, W7PUA, designer of the DSP transceiver described in a landmark 1999 three-part QST article, are reporting remarkable results with several weak-signal modes developed for use with Bob's hardware and software. If you follow their lead, some day you may be working moonbounce at QRP power levels (5 W or less)! VA3LK and G3AQC recently applied similar techniques to lowfrequency communication to achieve the first amateur two-way contact between Europe and North America on 136 kHz.

Where do we go from here? To digital voice modes, is the obvious answer. While amateur experimentation with digital voice modes has been limited, it is only a matter of time before we begin to see progress on that front similar to what has already been accomplished with data modes. Analog singlesideband is already an efficient spectrum occupant; to gain acceptance in the harsh HF environment, digital voice must be at least as efficient and must offer additional advantages such as superior audio quality or better performance in the presence of interference or under weak-signal conditions.

It is easier to envision the advantages of digital voice on VHF and higher frequencies. To mention just a couple, digital repeaters could support multiple simultaneous conversations and could be designed so as to be much less vulnerable to interference, deliberate and otherwise, than our present analog FM repeaters.

Under the chairmanship of QEX editor Doug Smith, KF6DX, an ARRL working group of experts is striving to make digital voice a reality in Amateur Radio. Whether you are interested in contributing to their work or are simply curious, you can read their initial report at the ARRL Web site: www.arrl.org/announce/reports-01/ tt.html. This document also includes the recommendations that led the ARRL Board to create two additional working groups, for the development of high speed digital networks and software defined radios, at its January 2001 meeting.

If you're bored with Amateur Radio right now there's only one possible explanation: You're not paying attention.—David Sumner, K1ZZ

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# By Steve Mansfield, N1MZA Manager, Legislative and Public Affairs

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.

### Spectrum Legislation Alive Again on Capitol Hill

Legislation has been introduced in the US Congress that will preserve the total amount of radio spectrum available to Amateur Radio operators by requiring the Federal Communications Commission to provide equivalent replacement spectrum should the commission ever reallocate existing amateur spectrum allocations. Congressman Michael Bilirakis (R-FL-9th) introduced the legislation, HR.817, in the US House of Representatives. Senator Michael Crapo (R-SD) introduced the legislation, S.549, in the Senate. Hawaii Senator Daniel K. Akaka (D-HI), in the interest of bipartisanship, cosponsored the Senate bill. Both Congressman Bilirakis and Senator Crapo lived up to promises made earlier in the year to reintroduce the legislation as soon as they were able. Both the House bill and the Senate bill are the same as bills that were introduced but not passed in the last session of Congress.

In introducing S.549, Senator Crapo said, as reported in the Congressional Record, "Organized radio amateurs, more commonly known as 'ham' operators, through formal agreements with the Federal Emergency Management Agency, the National Weather Service, the Red Cross, the Salvation Army, and other government and private relief services, provide emergency communication when regular channels are disrupted by disaster. In Idaho, these trained volunteers have performed tasks as

various as helping to rescue stranded backcountry hikers, organizing cleanup efforts after the Payette River flooded, and helping the Forest Service communicate during major forest fires. In other communities, they may be found monitoring tornado touchdowns in the Midwest, helping authorities reestablish communication after a hurricane in the Gulf or send 'health and welfare' messages following an earthquake on the West Coast. Not only do they provide these services using their own equipment and without compensation, but they also give their personal time to participate in regular organized training exercises."

Senator Crapo was joined in his floor



ARRL President Jim Haynie, W5JBP, poses with Senator Crapo after the ARRL President stopped by Senator Crapo's office in Russell Senate Office Building to thank the Senator for his introduction of S.549 and his vigorous support of Amateur Radio.

statement by Hawaii Senator Akaka, who said, "In the State of Hawaii, the sole source of information in the immediate aftermath of Hurricane Iniki, which hit the island of Kauai on September 11, 1992, was from amateur radio operators. The devastation to the island was immense: one out of five of the island's power and telephone poles were out, cellular phone, microwave dishes, two-way radio antenna boosters, television station translators, and radio station transmitters were damaged. Kauai Electric Company was inoperable and 100 percent of its customers were without power. While the company did have a disaster plan, no one fathomed that a storm would have such a devastating effect. Fortunately, amateur radio operators on Kauai were able to keep state officials informed about the island's condition."

Both bills were introduced not long after personal visits by ARRL President Jim Haynie, W5JBP, and First Vice President Joel Harrison, W5ZN.

### **ARRL Leadership Visits Lawmaker Offices**

ARRL President Jim Haynie, W5JBP and Vice President Joel Harrison, W5ZN spent time on Capitol Hill telling the Amateur Radio story to a wide array of elected representatives and staff, and found time for some important meetings off Capitol Hill recently.



Jim Haynie, W5JBP; Joel Harrison, W5ZN; and Manager of Legislative & Public Affairs Steve Mansfield, N1MZA, meet with Congressman Michael Bilirakis (center, in checked tie) outside the House Energy and Commerce Committee hearing room shortly before the Congressman introduced HR. 817.



Joel Harrison, W5ZN, and Jim Haynie, W5JBP, meet with Max Leichman, Legislative Assistant to Senator Phil Gramm (R-TX) to discuss the ARRL's current legislative agenda.

Highlights of the Capitol Hill meetings included one with with Congressman Michael Bilirakis (R-FL-9th) who took time out of a busy hearing schedule to meet the ARRL delegation outside the House Energy & Commerce Committee hearing room. The ARRL group thanked the Congressman for his unswerving support for Amateur Radio and the introduction of a new spectrum protection bill, before traveling across the Hill to the Russell Senate office building to meet with Senator Michael Crapo briefly in his office.

The ARRL also had the opportunity to visit Peter Tenhula, Chief of Staff to Federal Communications Commission Chairman Michael Powell to discuss a variety of issues. Among the subjects discussed were the ongoing concerns about CC&Rs and amateur antenna structures and ARRL's petition for reconsideration, as well as several spectrum issues and ARRL educational efforts. ARRL also had the chance to visit with William T. Cross, W3TN,

Program Analyst in FCC's Public Safety and Private Wireless Division, who oversees day to day administration of Amateur Radio through the FCC.

In its trip back across town to The Hill, the ARRL crew paid informational visits to a number of Congressional offices including those of Representatives Nathan Deal (R-GA-9th), Vito Fossella (R-NY-13th), Cliff Stearns (R-FL-6th), Steve Largent (R-OK-1st), and Senator Phil Gramm (R-TX).

### **Capitol Hill Buried in E-Mail**

• A reported 80 million e-mails a year is such a daunting tide that members of Congress have little inclination to sort out good constituent messages from the thousands of "spam" messages that pour into Capitol Hill each day. A report from the Congress Online Project, entitled "E-mail Overload in Congress: Managing a Communications Crisis" concludes that the proliferation of interest groups using e-mail indiscriminately is probably at the heart of the problem.

ARRL members who write their Representative or Senators urging them to cosponsor the Amateur Radio Spectrum Protection Act will help the cause whether they use regular mail or e-mail. But if you choose e-mail, understand that Capitol Hill truly is inundated, and you should be sure to follow two important, and related, rules: First, be sure to e-mail only your own Representative and Senators. Whether it's e-mail or paper, the quickest way to have your message ignored is to write to a Congressman or Senator from another state. Second rule, be sure to include in the body of your e-mail your home postal address, which will help the overworked congressional staff member who reads your message determine that you're a legitimate constituent.

If you want to try something a little more creative and attention getting, try putting your message on your QSL card and sending that to your Congressional Representatives.

### ARRL Luncheon Draws Beltway Hams

Last September the ARRL reintroduced a long-dormant "tradition" of every now and then inviting "Beltway area" hams to a luncheon where they can hear from ARRL leadership about some of the major Amateur Radio "policy issues" and what the League is planning to do about them. At the same time, participants, many of whom are involved professionally in government or private sector telecommunications, can share their insights. The September luncheon was so successful and participants so enthusiastic that an encore was virtually inevitable, and when John Marino, KR1O, of the National Association of Broadcasters volunteered the impressive first floor conference room at NAB's national headquarters in Washington, we jumped at the chance. During the afternoon session, approximately 40 participants got to hear ARRL President Haynie, W5JBP talk about his views of the League and where we're headed in the future. Executive Vice President David Sumner, K1ZZ, outlined ARRL's extensive preparations for the World Radiocommunication Conference (WRC-2003) scheduled to begin June, 2003, and Steve Mansfield spoke about the ARRL legislative platform.



ARRL members from the Washington, DC Beltway area listen to ARRL representatives discuss association positions and activities. The luncheon featured spirited but friendly "Q and A" following the presentations!

### **Media Hits**

- A QSO with KD2YW might be music to your ears, according to a recent article in *The Flutist Quarterly*, the official magazine of the National Flute Association. It turns out that KD2YW is the preeminent flutist Julius Baker. If that isn't enough to keep him busy, Baker is also a faculty member of the prestigious Julliard School of Music. Thanks to Bryan H. Suits, WB8WKN, for bringing the article to our attention.
- The Daily Record of Parsippany, New Jersey captured the fun and excitement of ARRL's Annual School Club Roundup. In this event, schools with ham equipment try to contact as many other schools as possible. Mentioned prominently was Intervale Elementary teacher Richard Hibbard, KR2H.
- The struggle of Randy Palmer, N2NVH, with his hometown of Saratoga Springs, New York over a planning board application for a retractable tower, was sensitively chronicled by the Glens Falls *Post Star*, and Randy himself came across as thoughtful, tactful and knowledgeable in his comments to the town. There

was no word on the outcome of the struggle.

- The Arizona Republic reported that Arcadia High School Radio Club made its first contact with NA1SS, the International Space Station, even though the student members were on spring break and gathered at the school before 8 a.m. Student hams mentioned in the article include Dave Talenfeld, KD7LUS; Ari Lerner, KD7INW; Gwen Johnson, KD7LME, and Ross Tucker, AC7JO.
- Forrest "Bart" Bartlett, W6OWP, and Marvin DeBrunner, W6ATG, got a full page of coverage in the *Paradise Post* of Paradise, California. Bartlett gave reporter Trevor Warner a trip down memory lane, taking the reporter through his approximately 75 years of Amateur Radio, which actually began as a youngster hooked on broadcast DX. In fact, "Bart" was featured in a 1924 *News-Herald* (Boulder) story for the distinct achievement of having heard President Coolidge on the air!

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12 and 10 Meter Bands

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Noise Blanker

The new RCI-2950DX (25W PEP) and RCI-2970DX (150W PEP) offer a unique opportunity for operators to own a two band/multi-mode transceiver at a price anyone can afford. Tech Plus waiting to upgrade? This rig can get you started on HF!

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. are stronger, lighter, have less wind surface and last years longer. Why? Hy-Gain uses durable tooled components -- massive boom-to-mast bracket, heavy gauge element-to-boom clamps, thick-wall swaged tubing -- virtually no failures!



### TH-11DX, \$1079.95. 11-element, 4.0 kW PEP, 10,12,15,17,20M

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Every part is selected for durability and ruggedness for years of trouble-free service.

### TH-7DX, \$819.95. 7-element, 1.5 kW PEP, 10,15,20 Meters

7-Elements gives you the highest average gain of any Hy-Gain tri-bander!

Dual driven for broadband operation without compromising gain. SWR less than 2:1 on all bands.

Uniquely combining monoband

Features a low loss logperiodic driven array on all bands with monoband reflectors, BN-4000 high power balun, corrosion resistant wire boom support, hot dipped galvanized and stainless steel parts.

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and trapped parasitic elements give you an excellent F/B ratio.

Includes Hy-Gain's diecast aluminum, rugged boom-to-mast clamp, heavy gauge element-toboom brackets, BN-86 balun. For high power, upgrade to BN-4000.

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The broadband five element TH5-MK2 gives you outstanding gain.

Separate air dielectric Hy-Q traps let you adjust for maxi-

### TH-3MK4, \$439.95. 3-element, 1.5 kW PEP, 10,15,20 Meters

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You get an impressive average gain and a whopping average front-to-back ratio. Handles a full 1500 Watts PEP. 95 MPH wind survival.

Fits on average size lot with

mum F/B ratio on each band.

Also standard is Hy-Gain's exclusive BetaMATCH™, stainless steel hardware and compression clamps and BN-86 balun.

room to spare -- turning radius is just 15.3 feet. Four piece boom is ideal for DXpeditions, Rotates with CD-45II or HAM-IV rotator.

Features Hy-Gain BetaMatch™ for DC ground, full power Hy-Q<sup>™</sup> traps, rugged boom-to-mast bracket and mounts on standard 2"O.D. mast. Stainless steel hardware. BN-86 balun recommended.

### TH-2MK3, \$339.95. 2-element, 1.5 kW PEP, 10,15,20 Meters

The 2-element TH-2MK3 is Hy-Gain's most economical full power (1.5kW PEP) full size tri-bander.

For just \$339.95 you can greatly increase your effective radiated power and hear far better!

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performing, compact 6 foot boom, tight 14.3 foot turning radius. Installs almost anywhere. Rotate with CD-45II or HAM-IV. BN-86 balun recommened.

Ruggedly constructed, top-

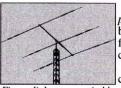
BetaMATCH™ provides DC ground to eliminate static. Includes BN-86 balun. Easily assembled. Truly competitive against giant

less than 2:1 VSWR. 1.5kW PEP.

tri-banders at half the cost!

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Compact 3-element 10, 15, 20 Meter Tri-Bander For limited space . . . Installs anywhere . . . 14.75 ft turning radius . . . weighs 21 lbs . . . Rotate with CD-45II, HAM-IV



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Excellent gain and F/B ratio let you compete with the "big guns".

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Model	No. of	avg Gain	avg F/B	MaxPwr	Bands	Wind	Wind (mph)	Boom	Longest	Turning	Weight	Mast dia	Recom.	Retail
No.	elements	dBd	dB	watts PEP	Covered	sq.ft. area	Survival	(feet)	Elem. (ft)	radius(ft)	(lbs.)	O.D.(in.)	Rotator	Price
TH-11DX	11	For Ga	in and	4000	10,12,15,17,20	12.5	100	24	37	22	88	1.9-2.5	T2X	\$1079.95
TH-7DX	7	F/B ratio	)See	1500	10, 15, 20	9.4	100	24	31	20	75	1.5-2.5	HAM-IV	\$819.95
TH-5MK2	5	wayay by	agin gam	1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	\$699.95
TH-3MK4	3	www.hy-		1500	10, 15, 20	4.6	95	14	27.42	15.33	35	1.9-2.5	CD-45II	\$439.95
TH-3JRS	3	• Hy-Gain		600	10, 15, 20	3.35	80	12	27.25	14.75	21	1.25-2.0	CD-45II	\$329.95
TH-2MK3	2	<ul><li>Call toll-</li></ul>	19	1500	10, 15, 20	3.25	80	6	27.3	14.25	20	1.9-2.5	CD-45II	\$339.95
EXP-14	4	800-973	3-6572	1500	10,15,20	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	\$549.95

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2. Tooled Boom-to-Element Clamp

Thick-wall swaged aluminum tubing

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# UP FRONT IN



The Orange Hat Christmas Gang. Carole Perry, WB2MGP, sent along this shot of the Amateur Radio crew that provided radio communication for the New York City Kennedy Airport "Operation Santa" in 2000. Thanks to these dedicated individuals, 4500 disabled children received the news that Mayor Giuliani and Santa had arrived from the North Pole.



Kid's Day visitors. Mark Simcik, WA1VVB, brought his three daughters (left to right: Brita, Linnea and Kerstin) to Don Wilson, K1IN's, station last January to experience Kid's Day. Their best DX was a contact with Dan, 5U7DG, and his son in Niger. Another Kid's Day is coming up next month. Watch your June *QST* for details.



**Ugly construction? No way!** Denny Payton, N9JXY, built this version of the Binaural IQ receiver by Rick Campbell, KK7B (see the March 1999 *QST*, page 44). Denny used the ground plane technique (sometimes referred to as "ugly construction"), but went to great pains to keep the leads straight and the soldering perfect. The result is a 40-meter receiver with remarkable performance.





Hams respond in San Diego. During the first week of January, Amateur Radio operators through out San Diego County geared up for one of the worst fires in years. The fire, which is believed to have been started by a careless smoker who threw his cigarette out his window of his car while driving down I-8 near Alpine, quickly spread. Fueled by high Santa Ana winds, the fire eventually consumed over 10,000 acres of land, destroying several homes and out buildings. Amateurs were busy providing communications for government agencies; Animal Rescue hams helped round up horses, cattle and even pot bellied pigs. Amateurs also assisted the American Red Cross and the California Department of Forestry. In this photo, George Roos, KO6BU (seated), and Dick McCready, AC6RZ, begin setting up the game plan in the thick of things at the Flynn Springs EOC.

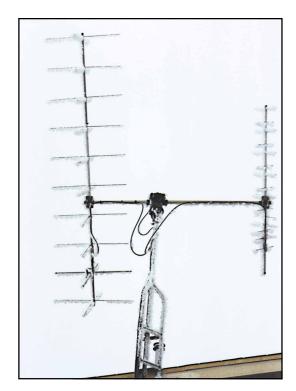
**Dad's 18-wheel QTH.** Cameron Tuttle, age 10, is proud to show off his father's truck on his QSL card. Dad is Randall Tuttle, WD8EJC, who operates HF and VHF from his cab during long drives on the road. In the summer, Cameron rides along with his father, but stays at home during the school year. That's not a problem, though. They keep in touch via Amateur Radio.



**Gee . . . thanks!** At the Florida State Convention last February (otherwise known as the Tropical Hamboree), Eric Swartz, WA6HHQ (left), from Elecraft presented a K2 transceiver to Ed Hare, W1RFI, ARRL Laboratory Supervisor (right), as donation to W1AW. The radio included noise blanker, SSB, antenna tuner and 160-meter options.



Meet the "Hamster." This eye-catching creation is a 10-meter "rover" vehicle owned by John Willier, K3ESS. In this photo, the Hamster is parked on the Sunshine Skyway Fishing Pier near St Petersburg, Florida. According to John, the antenna collapses easily when it's time to move.



Call it pogonip, frozen fog or hoarfrost, they had lots of it in South Dakota earlier this year. At KA0YOS, Gary Mayfield's 2-meter and 70-cm Yagis were encrusted with the odd-looking stuff. According to Gary, the 2-meter antenna isn't severely affected, but the 70-cm beam becomes unusable.



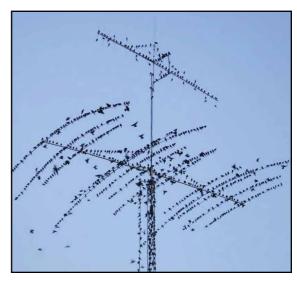
The closer you get to Hara Arena, the more numerous they become. Lewis (W3GHU) and Barbara (K6AGC) Ankerbrand snapped this photo (above, right) of an automobile dealership's appeal to visiting hams (or small mammals—we're not sure!). And the welcome signs didn't end when they reached the area complex!

How often does a letter from the FCC leave a ham operator smiling?

The happy fellow in the photo is Marvin Collins, W6OQI, who recently retired from the position of Chief Engineer for KFI(AM)/KOST(FM) in Los Angeles. He was surprised when he received a letter from Jim Zoulek, District Director of the FCC Los Angeles office, who wrote: "On behalf of the Commission it is my extreme pleasure to present you with the enclosed plaque honoring your for your tireless efforts in over-



seeing years of successful progress in the broadcast industry. Your achievements in the broadcast community and dedication to duty have certainly made it a pleasure to know and work with you." The plaque honored Marvin's 46 years in radio broadcasting. His career as a broadcast engineer was a direct consequence of his interest in Amateur Radio.



The dawn patrol. For reasons known only to the birds themselves, the antenna system of Jim Johnson, W6SC, in Morgan Hill, California, attracts this enormous flock of blackbirds *every morning*. There is something about Jim's 13-element 2-meter Yagi and Force 12 C31XR beam that the birds find "restful."



The nation association for the nation of the

The ARRL stars turn up in Virginia Beach. Hard working ARRL volunteers were in abundance at the Roanoke Division Convention last fall. Roanoke Convention veteran Art Thiemens, AA4AT, met up with ARRL International Affairs Vice President Rod Stafford, W6ROD (below, left). Rod Stafford and Roanoke Division Director Dennis Bodson, W4PWF, flank Les Shattuck, K4NK, Roanoke Division Vice Director, and his wife Joyce, N2PTW, the Roanoke Division Administrative Assistant (left). The 4-land QSL bureau was well represented by (I-r) Bill Rowlett, KC4ATU; Dick Maylott, W2YE and Roger Burt, N4ZC (below).



### Itimate Backpacker Ham Radio in the Great Outdoors: FIELD It's the Best with Yaesu's FT-817! CAMPING HOME YABSU 50.110.00° A∕B A≃B SPL USB) Actual Size Bring Ham Radio along on your next hiking, camping, or business trip with Yaesu's amazing new FT-817 Multimode HF/VHF/UHF Portable Transceiver! ●INCREDIBLE MEMORY RESOURCES:You get a total of 208 memories, including 200 "regular" memories which may be separated into ten groups of up to 20 channels each. And you can append an Alpha-Numeric "Tag" to each memory to aid in channel identification. OULTRA COMPACT: Measuring just 5.3"x 1.5"x 6.5" WHD (135 x 38 x 165 mm) and weighing about 21/2 pounds (1.17 kg, including the supplied antenna and alkaline cells), the FT-817 is small and light enough to take along wherever you're going. WIDE FREQUENCY COVERAGE: 160-10 meters on HF, plus the 50, 144, and 430 MHz Amateur bands. Plus FM Broadcast, AM Aircraft, and Public Safety ● A CW OPERATOR'S DREAM MACHINE: You get a built-in Electronic Keyer with adjustable weighting, adjustable CW Pitch, CW Normal/Reverse frequency receiver coverage. tuning, and you can even use the microphone's UP and DOWN keys to send MULTIMODE DESIGN: Ready for action on SSB, CW, AM, FM, FM-Wide (Rx), 1200/9600 bps Packet, and Digital, including dedicated USB and LSB PSK-31 CW via the Keyer.

configurations.

◆5 WATTS POWER OUTPUT: Using a new-technology all-band MOS FET power amplifier, the FT-817 provides 5 Watts of power output when using a 13.8 Volt DC source. When using Alkaline batteries or the optional FNB-72 Ni-Cd Battery Pack, power is automatically set to 2.5 Watts; via Menu, this can be changed to 0.5 Watt, 1 Watt, or up to 5 Watts.

◆WIDE CHOICE OF POWER SOURCES: The FT-817 is equipped with an alkaline "AA" cell battery case, and a 13.8 volt DC cable is also supplied. Available as an option is the FNB-72 Ni-Cd Battery Pack (9.6 V, 1000 mAh), which can be recharged using a 13.8 Volt power supply while the radio is being operated.

◆TWO ANTENNA PORTS: A "BNC" connector is provided on the front panel, and a type "M" connector on the rear panel, with Menu selection of which connector will be assigned for operation on HF, 50 MHz, 144 MHz, and 430 MHz.

◆OPTIONAL COLLINS® MECHANICAL FILTERS: An optional filter slot is

● OPTIONAL COLLINS<sup>5</sup> MECHANICAL FILTERS: An optional filter slot is provided, accommodating either the YF-122S (2.3 kHz) 10-pole SSB filter or the YF-122C(500 Hz) 7-pole CW filter. You get "base station" performance even from a mountain top.

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Today's elite-class operators demand the best RF weaponry available. Yaesu's exciting new MARK-V FT-1000MP answers the call, with an expanded array of receiver filtering, 200 Watts of power output, and Class-A SSB operation capability for the cleanest signal on the band. Enhanced front-panel ergonomics on the front panel save you seconds in a pile-up or a contest "run," and Yaesu's HF design and manufacturing know-how ensures that no short-cuts have been taken in our effort to bring you the best HF transceiver money can buy. For more QSOs in your log, and more awards on your wall, there is only one choice: the MARK-V FT-1000MP from Yaesu!

### I. Interlocked Digital **Bandwidth Tracking** System (IDBT)

The IDBT feature greatly simplifies SSB operation by matching the bandwidth of the DSP (Digital Signal section to the Processing) system to the net bandwidth of the 8.2 MHz and 455 kHz IF stages. The IDBT system accounts for the settings of the IF WIDTH and SHIFT controls, and automatically sets a DSP bandwidth which matches the analog IF bandwidth.



**Features** 

### II. Variable RF Front-End Filter (VRF

Protecting the MARK-V's receiver components from strong out-of-band signals, the VRF system acts as a high-Q "Preselector," located between the antenna and the main bandpass filter networks, providing additional RF selectivity on the 160-20 meter Amateur bands for multi-operator contest teams, DX-peditions, or for operation near MW/SW broadcast stations.





### III. 200 Watts of **Transmitter Power**

Utilizing two Philips® BLF147 Power MOSFETs in a 30-Volt, push-pull configuration, the MARK-V's transmitter puts out up to 200 Watts of clean output power, thanks to the conservative design of the PA

section.



T-Configuration Heat Sink

### IV. Class-A SSB Operation

Exclusively available on the MARK-V FT-1000MP, a press of a front-panel button engages Class-A SSB operation of the transmitter, operation of the transmitter, at a power output level of 75 Watts. Class-A operation produces incredibly clean signal quality, with 3rd-order IMD typically suppressed 50 dB or more, and 5th- and higher-order products typically down 80 dB or more!

### V. Multi-Function Shuttle Jog Tuning/ Control Ring

The immensely-popular The immensely-popular Shuttle Jog tuning ring, which is concentric with the Main Tuning Knob, has a new look in the MARK-V: it now includes the activation switches for the VRF (left side) and IDBT (right side) features, so you don't have to move your hand position to activate these important circuits during contest or circuits during contest or pile-up situations!



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- High-Performance Receiver Front End Automatic, Effortless Operation with MARK-V FT-1000MP
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Frequency Range: 50-54 MHz Antenna Impedance: 50 Ohms Power Output: 200 Watts PEP

Spurious Emissions: At least 60 dB down
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Dimensions: 9.6" x 5.4" x 13" WHD (243.5 x 136.5 x 331 mm)

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### AN "EASY PATH" IS STILL NEEDED

♦ The year 2001 marks 30 years of Amateur Radio for me. I first received my license in 1971 while a junior in high school, thanks to help from fellow hams and the advisors of our radio club. Radio was a hobby that taught me how to work hard toward the goals I wanted to achieve. It was a hobby that would inspire me to degrees in Electrical Technology, Computer Science and Physics. I eventually became an engineer.

As a Novice, WN9IRO, I was chasing after the Worked All States award, but fell a couple of states short when my two-year license expired in 1973. To celebrate my anniversary I am reliving my Novice days by trying to earn WAS while staying within the limits of the Novice license that were in effect back then.

So far, it has been a lot of fun. I've forced myself down to 5 WPM and it seems that there are a lot of guys listening on the Novice bands for someone they're not afraid to work. It only takes one or two CQs before I receive a reply. Since this pursuit began, I've collected QSLs from Ohio, South Carolina, West Virginia and South Dakota (which I never did get as a Novice).

At 5 WPM it doesn't take much to earn the Rag Chewers Certificate and most of the operators are so happy they have someone they can keep up with that they don't want to sign off. I ran into one fellow who was only licensed two months ago. He had a nice fist, although he was slow and didn't quite have the prosigns down. The easing of the code requirement didn't dampen his enthusiasm for the mode. He said it was code's uniqueness that drew him to the hobby.

So before we make any rash decisions about code requirements and band reallocation, let's remember that we still need an easy path into ham radio that respects the efforts of those who went before, or are working hard on the finer points of the hobby.—Brian Cieslak, AE9K, Waterford, Wisconsin

### POWER IS NOT THE PROBLEM

♦ I appreciate W0IPL's concern about QRM on PSK31 as expressed in the February 2001 "Correspondence," but it appears power is *not* the real problem. The real problem, when trying to copy an S1 or S2 signal 300 Hz away from a S-9 signal, is transmitter and receiver bandwidth and system dynamic range.

Using the example Pat gave, where the interfering signal was S9 plus 10 dB and de-

sired signal only S2, with the S meter on my ICOM IC-751A transceiver we can determine the "power difference" of these signals at my receiver. A reading of S2 on my IC-751A measures –110 dBm. S9 plus 10 dB measures –80.2 dBm. The difference between these signals would be about 30 dB (S meters are almost never linear, and almost never the commonly rumored 6 dB per S unit).

Thirty dB is a power ratio of 1000. If the "bad boy" S9-plus-10-dB PSK31 station in Pat's example was running 200 W, he really would have to run 200 *milliwatts* to have a signal comparable to a "good guy" PSK31 operator running only 30 W. (Or, the 30-W "good guy signal" could boost power to 30 kW and even the playing field with the "bad boy.") Adjusting power by 30 dB at either end does not appear to be a good solution, or one that will be well received by anyone.

A reasonable power reduction from 200 W to 30 W would probably not have totally cured Pat's QRM problem, and might not even have helped a noticeable amount. After all, that's only an 8-dB change! On a perfect S meter, the "bad boy" would have dropped from S-9 +10dB to S-9 +2dB, hardly a significant change!

The problem with PSK (and MFSK) is overselling users on how narrow the modes are. In order to do that, all flaws in the system are laid squarely at the feet of operators who are "too powerful."

PSK and MFSK operators dump audio tones into SSB transmitters that were never designed to have exceptionally clean harmonic distortion or IMD performance in audio and modulator stage. They then expect signals from these transmitters can be stacked nearly on top one another, if they all simply set their power to some magic value.

PSK and MFSK operators expect to use wide filters in the transmitters and receivers, and let the software sort it all out. Most skilled operators wouldn't dream of operating SSB with a 125 kHz filter in the transmitter and receiver, or CW with a 10-kHz receiver IF filter. Why do PSK or MFSK operators expect to get away with transmitter and receiver filters many times the bandwidth of the signal, with the resulting mess cleaned up in a \$49.95 sound card of unknown quality?

I often hear "properly adjusted" PSK transmitters with noise, hum, and multiple signals that are only suppressed 30 dB or so. As a matter of fact, it is rare to hear a signal cleaner than that!

A 30-40 dB clean, unmodulated signal several hundred hertz away from an above-the-noise-floor PSK signal injected into some of my modern transceivers will cause copy to vanish as the AGC pushes the weak PSK signal into the noise of the later IF, detector, and audio stages of the receiving system.

We all regularly hear stations more than 50 dB apart in level who are running comparable power levels.

It is quite obvious there will be QRM, because the dynamics and filtering of the real-world systems are not adequate. Sound cards and software might be good enough to allow 40 or 50 dB of dynamic range in a test environment. But when the passband of a broad receiver is loaded with dozens of less-than-perfect transmitters while depending only on a post-receiver audio filter to sort them out, QRM will be an inevitable part of life on these modes.

Operators need to address the real problem, which is excessive bandwidth of transmitters and receivers, rather than assuming a power reduction of less than 10 dB will magically make all QRM problems vanish.— Tom Rauch, W8JI, Barnesville, Georgia

### THANKS, LARRY

♦ After apologizing to two stations in a contest the previous weekend for not being able to copy them through the QRM, I decided it was time to do something. I dug out my transceiver's manual to see if I could figure out how to make the slope tuning work more effectively. Nothing new there.

I couldn't believe it. The very next day the February issue of *QST* arrived containing "How to Maximize your Receiver's Effective Selectivity, Part I," by W4QEJ. All the effects I had observed but not understood, and a lot more, were explained in a logical fashion, ready to absorb and put to use. The conventional wisdom that the RF gain control should always be run wide open is a hard habit to break. W4QEJ's explanations and graphs have certainly opened my eyes.

Part II of the series really put the icing on the cake and I've since been testing my new knowledge with those down-in-themud QRP or DX stations. Mastering the techniques of receiver adjustment narrows the "equipment gap" and may reduce the situations where "the poor craftsman blames his tools." Keep up the good work for another 68 years, Larry!—Jim Jordan, K4QPL, Raleigh, North Carolina

### **DESTRUCTION FROM WITHIN**

♦ Okay, all you guys who can't copy CW at 60 WPM and don't have your licenses endorsed by Marconi, get off the bands this instant!

Has anyone noticed the word "Amateur" in the title of our service? I didn't get a PhD with my ticket in spite of the fact I took it at the FCC and had to draw schematics. I suspect that after 44 years I can hold my own technically with anyone on this or any other ham venue. But at the same time, I recognize that little technical ability is needed to pass messages for people in need of assistance. Are these operators somehow diminished by their lack of technical proficiency? If we spent as much time giving back to Amateur Radio as we do debating who is a "real ham," we would have no end to people beating down the doors to become associated with such a positive group.

If Amateur Radio is destroyed, it will be from within. Thirty years ago we had folks who used to wait every month for their copies of *QST* so that they could send nasty letters about the photographs that showed Novices with VFOs. Those same personality types now play "ain't it awful" on a minute-by-minute basis on the Web. Little has changed over the years—we just have wider communications and instantaneous complaining.— *Fred Hambrecht*, *W4JLE*, *Manchester*, *Georgia* 

### **BENCHMARKING DIGITAL MODES**

♦ The fine articles in the January QST amply illustrate that the future of amateur communications is digital. Claims about the performance of these new modes raise the question of how various modulation and coding schemes should be compared.

The fundamental problem is to send information to a remote point that can be reproduced with sufficient accuracy. The basic element of information is, of course, the binary digit or bit and the fidelity of communications is therefore the bit error rate (BER) in recovered information.

When information sent at rate R bits per sec (bps) and occupies bandwidth B (Hz) the ratio R/B provides a measure of the efficiency in using our precious spectrum and is a key differential in comparing digital modes.

The ability to recover information accurately is determined by the signal-to-noise ratio (SNR) at the receiver. The measure of a digital signal level is the energy of a bit (Eb). From physics, recall that energy is a product of power and time, in our case Watt-seconds. Dashes in Morse have more energy than dots, for example. Under ideal conditions the noise present is due to unavoidable thermal motion and is proportional to bandwidth and temperature.

The level of noise in a given bandwidth is called the spectral noise power density (No) in W/Hz. It is usual to consider noise in the same bandwidth as required by the signal.

Conventional CW is a very interesting special case for several reasons. The information rate in bps is not obvious as the dot, dash, letter space, and word space symbols have different duration, the number of symbols per character varies and the code has certain rules (a word space can not follow a letter space, for example). In his landmark paper published in 1948, Claude Shannon, the father of information theory, addresses these questions and we need to be reminded of them. [Note: Claude Shannon passed away on February 24, 2001—Ed] The optimum bandwidth for CW is also controversial. As information energy resides in the sidebands, when do we lose the benefit of narrowing the noise bandwidth? How much does that adaptive neural network filter in our brain help?

Lots of practical issues remain but as a minimum, new amateur digital modes could be compared on the basis of R/B, BER and Eb/No as is the practice in commercial systems. Proponents of CW, PSK 31 and MFSK, etc, should show us where they fit on the following chart or offer an alternative. I urge the ARRL to adopt a benchmark of some kind.—Ron Skelton, W6WO, Capitola, California

### **TOP BAND COURTESY**

♦ For many years there has been a DX window for SSB and other wideband modes set aside for Top Band operators between 1840 and 1850 kHz, as listed in *QST's* "Considerate Operator's Frequency Guide" and elsewhere. It seems that this window is being used routinely by US ragchewers who operate on or about 1845 kHz. I realize that wideband modes are relatively uncommon on top band, but with 150 kHz available above this window, is it unreasonable to expect some consideration?—

Bob Snyder, KD1VV, Andover, Massachusetts

### **CHANGE THE LEGAL POWER LIMIT**

♦ With the growing attention given to energy conservation, I think it would be a good time for the ARRL to get behind a petition to the FCC to change the legal power limit to 400 W (continuous duty). Some operators already have gone to QRP, and many others rarely exceed 100 W. Avoiding high power not only conserves energy, it helps keep the peace in the neighborhood. I have been enjoying Amateur Radio to the fullest for many years and have never run over 400 W.—Wesley Wiley, W6ZU, Brookings, Oregon

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3CX2500F3	4CX350A & C	4CX15000A	3-1000Z
3CX2500H3	4CX400A	4CX20000A7	4-125A
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# Get On 222 MHz with a Ten-Tec 1210 Transverter!

relation you operate on 6 and 2 meters, you know how popular the Ten-Tec 1210 transverter units are.1 They remind me of Heath's popular Heath Benton Harbor "Lunch Boxes" that gave 6- and 2-meter activity a muchneeded shot in the arm some decades ago. The 1210 allows you to operate on 2 meters with a power output of 10 W using your 10-meter transceiver. A while ago, a friend and fellow VHF enthusiast, Bill, WB4WEN, approached me with an idea. He wanted to increase the local activity on 222 MHz. One way to do this, he suggested, was to try converting a Ten-Tec 1210 transverter to operate on 222 MHz. Bill had studied the unit's schematic and it looked like a good candidate for the job. Besides, he already had a nonworking unit he had picked up at a bargain price! Other than a new crystal for the band change, the other additional components needed for the modification are a few disc-ceramic capacitors and some RF chokes to retune the circuits to 222 MHz.

Later-production models of the 1210 transverter use a Motorola MRF-2628 transistor in place of the BLW-81 device in the early transverter PAs. The modifications we made to the transverter's PA stage are the same for either device. However, because the MRF-2628 has lower gain at 222 MHz, the power output of a unit using this transistor in the PA is about 2 W

Before we began the conversion, Bill and I set the following criteria for a successful project:

- Low cost
- Few (if any) modifications to the PC board. The unit should be able to be re-

<sup>1</sup>Joe Bottiglieri, AA1GW, "Ten-Tec 1210 10-Meter to 2-Meter Transverter," Product Review, *QST*, Jun 2000, pp 73-74.

using your 10-meter transceiver!

Here's a quick way to explore 222 MHz

- mum of effort, if need be.

   Stable operation
- A power output of 5 W across the band (with a BLW-81 in the PA stage) using a 12.6 V power supply.

turned to 2-meter operation with a mini-

• Require just a few simple hand tools and a minimum of test equipment

### **Initial Steps**

Before you start heating up your soldering iron, I suggest you read this entire article and familiarize yourself with the original 1210 tune-up procedure as outlined in the Ten-Tec manual. If you don't have the manual, get one! Also, get and use the proper tuning tool for the slug-tuned coils and get the feel of tuning the unit's different stages. (If you don't use the proper tool for tuning these coils, you're likely to break their powdered-iron slugs.) For receiver alignment, you'll need a signal generator or a local beacon to provide you with a stable, constant signal level. To tune the transmitter, you'll require an RF-output meter; the more sensitive, the better. Consult the Ten-Tec manual for references to aid you and refer to the description of the duplicated RF detector mentioned later. Take a look at the "Parts List" sidebar and gather the components you'll need. In addition to your soldering iron, you should have a solder-removing tool and/ or wicking as you'll need to remove some components and replace them with others having different values.

Pay attention to the tuning of the local-oscillator (LO) output stage and how that tuning affects the transverter's power output and the receiver section's performance. After conversion, you'll likely find that the most critical tuning is that of the LO's push-pull output stage. That's because we'll then be using it as a tripler to reach 222 MHz. As outlined in the T-Kit instruction manual, make some voltage measurements at various points in a properly working unit while it is still operating on 2 meters. If you have not already done so, record these readings for reference; there's space provided on page 27 of the manual. Pay particular attention to the voltages in the LO chain, especially the levels measured at TP1 and the emitters of Q4 and Q5 during the Phase 1.0 Progress Test described in the manual before the mixer components are added. Once the mixer components are added, making measurements at TP1 is extremely difficult. When the conversion is complete, your records can be used to aid tune-up on 222 MHz.

### **Getting to Work**

In the following steps, refer to the schematic in Figure 1, the other accompanying graphics and those in your Ten-Tec 1210 manual. The components involved in the modification and their new values and/or wiring are shown in heavy lines and bold type in Figure 1.

First, remove the PC board from its enclosure. This involves removing the regulator IC and the driver and PA transistors from their heat-sink shelf. Remove the screws near two corners of the PC board, the two screws at the PA transistor and one screw at the regulator IC and driver transistor. Remove the large nut on

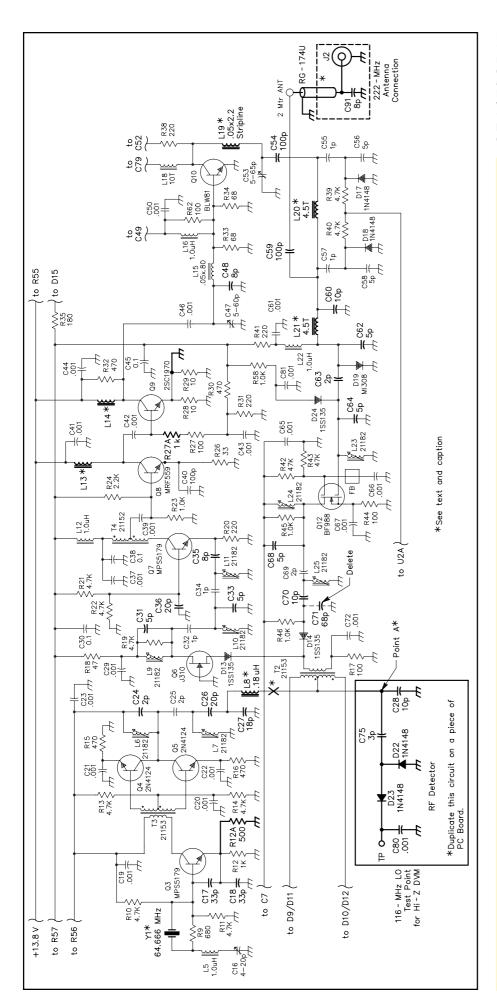


Figure 1—Schematic of the Ten-Tec 1210 10-meter to 2-meter transverter prototype modified for 222-MHz operation. The components involved in the modification and their new values are shown in heavy lines and bold print. Parts are available from a number of suppliers; see the "Parts List" sidebar. Equivalent parts can be substituted; n.c. indicates no connection.

### **Parts List**

Components with an A suffix are either added units or duplicates of existing components. Other components listed are either direct replacements for existing parts or are modified parts. See text. Equivalent components can be used. (All capacitors are 25-V disc-ceramic units)

C17, C18—33 pF

C24, C63—2 pF C26, C36—20 pF

C27—18 pF

C31, C33, C62, C64, C68-4.7 or 5 pF

C35, C48, C91-8 pF

C54, C59—100 pF

C60, C70-10 pF

C71—Remove this capacitor.

C75-3 pF

L8—1/8-inch-ID air-wound inductor: 5 turns #24 or #26 enameled wire closely wound; see text.

L13—0.18-µH molded inductor (Ten-Tec Co 865-453-7172.\*); see text.

L14—See text.

L19—See text.

R12A—500  $\Omega$ ,  $^{1}/_{8}$ -W carbon-film or carbon resistor

R27A—1 kΩ, <sup>1</sup>/<sub>8</sub>-W carbon-film or carbon resistor

Y1-64.6666-MHz, fifth-overtone series resonant crystal, HC-49 holder, 0.001% tolerance; JAN Crystals, 2341 Crystal Dr, PO Box 60017, Ft Myers, FL 33906-6017; tel 800-JAN XTAL, 941-936-2397, fax 941-936-3750; www.jancrystals.com.

Duplicate RF-Detector Circuit

C75-3 pF

C28-10 pf

C80A -0.001 μF

D22A, D23A-1N4148 diode

1-Piece of PC board (RadioShack 276-150 or similar); see text.

Parts are available from a number of suppliers including Digi-Key Corp, 701 Brooks Ave S, Thief River Falls, MN 56701-0677; tel 800-344-4539, 218-681-6674, fax 218-681-3380; www.digikey.com and Mouser Electronics, 958 N Main St, Mansfield, TX 76063-4827; tel 800-346-6873, 817-483-4422, fax 817-483-0931; sales@ mouser.com: www.mouser.com. See the References Chapter in The ARRL 2001 Handbook and the on-line database at www.arrl.org/tis/tisfind. html for additional part suppliers.

\*Ten-Tec, 1185 Dolly Parton Pkwy, Sevierville, TN 37862; tel 800-833-7373; information tel 865-453-7172, fax 865-428-4483; sales@tentec. com, www.tentec.com/.

the PA-transistor stud; it's accessible through the large hole in the bottom plate. Note which hardware goes where and be careful not to misplace any of the hardware or the driver transistor's insulating pads and shoulder washer. Other than the wires to the front-panel LEDs, the other wiring can be left intact; be careful not to break any wires. With the PC board out of its enclosure, you are ready to begin the modification. Of course, when removing and installing any components, ensure power is not applied to the transverter.

### Modifying the LO

First, we modify the LO to provide a stable injection frequency to the double-balanced mixer at 194 MHz at a power level of approximately 15 mW (+12 dBm). This is accomplished by substituting a 64.6666-MHz third-overtone crystal at Y1 for the original crystal and modifying the push-pull doubler stage that follows the overtone oscillator to operate as a tripler. To increase the LO output-stage efficiency, make the following changes to the oscillator portion of the LO: Change C17 and C18 to 33 pF each. Change the value of R12 to approximately 330  $\Omega$  by placing a 500- $\Omega$  <sup>1</sup>/<sub>8</sub>-W resistor (R12A) in parallel with the original 1-k $\Omega$  resistor; see Figure 2. Next, change the value of C24 to 2 pF, C26 to 20 pF and C27 to 18 pF (all are disc-ceramic capacitors). Remove and save L8, the original molded choke. Make a replacement for L8 by winding five closely spaced turns of #24 or #26 enameled wire on a 1/8-inch form (the shank of a 1/8-inch-diameter drill bit will do). Slip the coil off the form and temporarily set it aside. Do not install the new L8 until told to do so!

### RF Detector Duplication

Next, duplicate the RF-detector circuit that provides the relative output reading at TP during the initial LO tune-up. This circuit (within the box at the bottom of Figure 1) consists of two 1N4148 diodes (D22, D23), one 0.001 µF capacitor (C80) and one 2- or 3-pF disc-ceramic capacitor (C75) and one 10-pF capacitor (C28). You can build the replicated detector on a small piece of PC board. The duplicate parts of this detector are identified in the "Parts List" with an A suffix. Keep the interconnecting leads as short as possible. By duplicating this circuit, you'll save time and not need to unsolder a number of mixer-circuit components that would have to be reinstalled later. The duplicate circuit also takes the load off the LO output circuit allowing you to tune that stage with a simple VOM connected to point TP of the duplicated



Figure 2—Change the value of R12 to approximately 330  $\Omega$  by placing a 500- $\Omega$ ,  $I_8$ -W resistor (R12A) in parallel with the original 1-k $\Omega$  resistor. C17 and C18 are also shown here.

### Make sure that the crystal is operating on its third overtone.

detector. You can use this little detector circuit later during the transverter's transmitter-alignment procedure and for other projects involving low-level RF detection at VHF/UHF.

Retune the LO to its new output frequency of 194.000 MHz. Begin by installing the replacement L8 you made earlier;

connect it between L8's original connection at the junction of C26 and C27 and the duplicated RF detector Point A using the shortest wire length possible. See Figure 3. With power applied to the transverter, connect a frequency counter to the collector of Q3 via a 47-pF capacitor. Make sure that the crystal is operating on its third overtone and adjust its frequency to 64.6666 MHz (or as closely to that frequency as you can get) using trimmer capacitor C16. If the oscillator fails to start each time power is applied

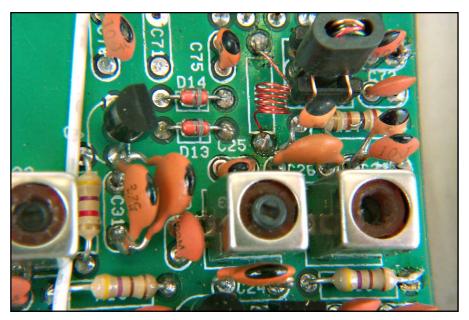


Figure 3—A homemade inductor replaces the original L8 as described in the text. C71 is removed. In this prototype, the new value for C31 (as those of some other capacitors) is created by soldering smaller capacitor values in parallel. C7, C26 and C70 are also in this general area.

to the transverter, you may have to retune C16 to a value that sustains oscillation. Doing so will cause the frequency readout of the unit used as the IF to be in error. You can either live with this situation (compensating by noting the frequency difference), or purchase a higher-accuracy crystal.

With power applied to the transverter, connect a high-impedance dc voltmeter to the *duplicated* detector's test point (TP) and alternately tune L6 and L7 for maximum indicated output. With all circuits peaked, you should see a minimum

of 2.5 V dc at TP. (You may need to slightly spread the turns of the new L8 to optimize the LO output.) The emitter voltages of Q4 and Q5 should range from 4.1 to 4.4 V dc. If the voltages are less than 4.0 V, try adjusting the value of R12 slightly to increase the amount of drive from the oscillator stage.

The values of C24 and C26 are chosen to allow their associated inductors, L6 and L7, to tune to 194 MHz near the midpoint of their tuning range. Check the output with a frequency counter coupled to the LO output at Point A (*not* 

TP) to verify the operating frequency of 194.000 MHz. These adjustments are most important in assuring maximum overall performance of the modified unit. After peaking all the circuits for maximum output, make the following test: With power applied to the transverter, briefly detune C16 to the point at which the crystal stops oscillating and verify that there is *no* indicated output from the LO chain. If there is output, it's an indication of instability. Find and correct the instability problem before continuing. Once you're satisfied that the LO is operating properly, you may disconnect L8 from its temporary connection to the duplicated RF detector and reconnect it to its original point on the PC board, the junction of the center tap of T2 and capacitor C28.

### **Transmitter Modifications**

Continue with the conversion of the transmitter section. This involves changing the value of capacitors C31 and C33 to 4.7 or 5 pF each; C35, C48 and C91 (see text) to 8 pF each; C36 to 20 pF; C59 and C54 to 100 pF each and C60 to 10 pF.

Once that's done, make the following inductor changes. Change L13 to a 0.18  $\mu$ H molded inductor. You can use the original L8 you removed from the LO portion earlier. (Note: In later transverter production models, this molded inductor's value was changed from 0.47  $\mu$ H to 0.10  $\mu$ H. If a 0.10- $\mu$ H choke is present, there's no need to change L13.)

Replace L14 with a **U**-shaped loop of #22 or #24 tinned solid hookup wire. The width of the loop's open end is determined by the spacing of the solder pads that held the original molded inductor. The loop is  $^{3}/_{8}$  inch high and centered between the pads. See Figure 4.

# You can reduce the inductance of the stripline inductor in either of two ways.

Stripline Inductor

You can reduce the inductance of L19, a stripline inductor etched on the PC board, in either of two ways. The first approach is shown in Figure 5. At one open end of the two loops of this stripline, use a sharp knife to carefully remove a <sup>1</sup>/<sub>16</sub>-inch-wide area of the foil's protective covering on both sides of an open end (mouth) of a loop trace. *Be careful not to cut the stripline itself*. Tin the cleaned areas; don't overheat or damage the trace. Solder a piece of wire or narrow-width copper braid across this end of the loop.



Figure 4—L14 is replaced by a U-shaped loop of #22 or #24 tinned solid hookup wire, the width of its open end determined by the distance between the solder pads that secured the original molded inductor; see the text. The loop height is 3/s inch centered between the pads. Small jumper wires short R28 and R29. The C48 replacement is visible to the right of these resistors.

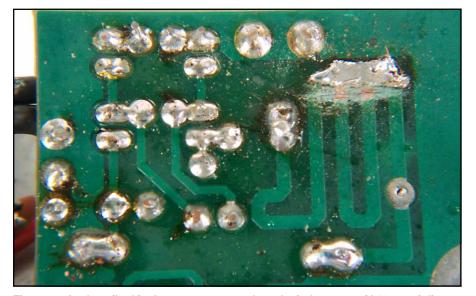


Figure 5—As described in the text, you can reduce the inductance of L19, a stripline inductor etched on the PC board, in either of two ways. In the approach used here, a length of wire or braid is soldered across the two loops of this stripline.

Reducing the stripline inductance allows the PA output to tune 222 MHz with the original output-tuning capacitor, C53. If need be, the inductor can be returned to its original state by removing the jumper.

The second way to decrease the stripline inductance involves cutting traces. This method exhibits a 10% power-output increase over the first approach. Carefully cut through the trace on both sides of the loop with a sharp knife for a width of 1/32 inch. These cuts can be repaired with jumpers if the unit must be returned to 144-MHz operation.

Reduce the inductance of L20 and L21 by using a solder bridge to short the first two turns of each coil (from the PA-transistor end). Place the bridge across the top of each coil as shown in Figure 6. These solder bridges can be removed to return the unit to 144-MHz operation.

### Feedback Network

In later 1210 production models, Ten-Tec added a feedback network consisting of a small disc-ceramic capacitor in series with a resistor that connects from the base to the collector of the PA transistor, Q10. This network is physically across the top of the transistor. We removed this network and saved it just in case instability showed up later in testing. Removal of the network netted us a bit more amplifier gain. If you experience amplifier instability, reinstall these components as a first step in correcting the problem.

### Notch Filter

Next, modify the third-harmonic notch filter. This originally consists of a four-inch piece of RG-174 subminiature co-axial cable that connects the RF output of the PC board to the output connector (J2) and C91. Shorten this cable to a length of three inches plus a short pigtail used to reconnect the cable to the output connector. Change the value of C91 to 8 pF.

Make the following resistor-value changes in the transmitter section: Add a 1-k $\Omega$ , <sup>1</sup>/<sub>8</sub>-W carbon resistor between the base of Q9 and in series with R27 (see Figure 7). Place short jumper wires across R28 and R29 (see Figure 7). This completes the required changes to the transmitter section.

### **Receiver Modifications**

To modify the receiver portion of the transverter for 222-MHz operation, make the following changes: C70 to 10 pF; C63 to 2 pF; C62, C64 and C68 to 4.7 or 5 pF each (whichever value is available) and remove C71 (the empty C71 pads are visible in Figure 3).

### Repackaging

To aid circuit stabilization, I removed the paint from inside the mating surfaces of the enclosure along the top and bottom where they attach to the PC-board mounting plate. Remove the paint on the sides of the mounting plate also. This enhances the unit's RF shielding when it is reinstalled in its enclosure.

When reinstalling the PC board on the heat-sink shelf, ensure all the hardware is in its proper place, including the three brass washers used as spacers (if they have not already been soldered to the underside of the PC board during initial transverter construction). Pay particular

attention to the reinstallation of the "silipad" and shoulder-washer insulators on the driver transistor and the fiber-board-insulating sheet between the PC board and shelf.

When reassembling your unit, use care when tightening the nut on the PA-transistor stud. *Do not overtighten it!* If you have any doubts as to what is considered "sufficient tightening," consult page 42 of the transverter manual.

### **External Filter**

When the modified transverter prototype was tested locally, it appeared clean. When tested in the ARRL Lab, however,

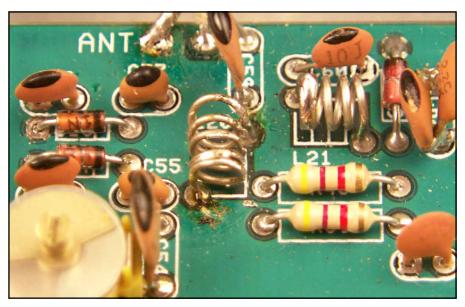


Figure 6—Reduce the inductance of L20 and L21 by using solder bridges to short the first two turns of each coil (from the PA-transistor end) at the top of each coil as shown here. These solder bridges can be removed to return the unit to 144-MHz operation.

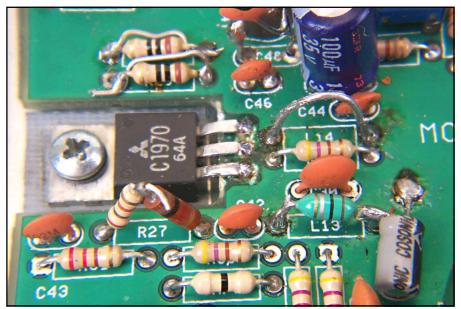


Figure 7—Here you can see R27A added in series with R27 and the jumper wires added across R28 and R29. L13 and L14 are also visible in this photograph.

### **External-Filter Requirements**

♦ The spectral purity of the modified transverter (without adding external filtering) does not comply with FCC spectral-purity specifications for commercial equipment. The levels measured in the ARRL Lab for the two highest spurs are 30 and 35 dB below the carrier at 5 W output. The frequencies of these spurs are about 28 MHz above and below the output frequency (f<sub>carrier</sub> ± IF).

The FCC specification for spurious-signal suppression at 5 W on 222 MHz is –53 dBc. Although this project is not a commercially manufactured unit, following good engineering practice means complying with FCC specifications. To this end, the ARRL Lab recommends adding an external narrow-bandpass filter to the transverter. A commercially available filter suitable to the task is the four-pole DCI-223.5-3H.\* This filter provides 50 dB of attenuation at 10 MHz above the passband and 60 dB at 10 MHz below the passband. Another means of meeting FCC spectral-purity specifications is to build a homebrew filter with an attenuation of at least 23 dB at the spur frequencies.—*Mike Tracy, KC1SX* 

♦ Reducing the value of C34 to a 0.5-pF chip capacitor improves the modified transverter's spectral purity, but the 194-MHz LO signal at the output is still at −39 dBc and the 260-MHz mixing product is at −44 dBc. (I used a tiny 0402-cased chip cap, but larger sizes should also work.) The DCI filter Mike mentioned earlier will easily clean up the modified transverter's output with a typical insertion loss of about 1 dB, according to manufacturer's specification. A simple homebrew, two-pole filter for this application is described in my "RF" column in the May/June 2001 issue of QEX. This filter has an insertion loss of about 1 dB. Its rejection at 194 and 260 MHz is about 35 dB.—Zack Lau, W1VT

\*Digital Communications Inc, Box 293, White City, SK, Canada, S0G 5B0; tel 800-563-5351, 306-781-4451, fax 306-781-2008; dci@dci.ca; www.dci.ca/amateur\_pricing\_us.htm.

the modified transverter failed to meet FCC specifications for spectral purity. (For more details, see the sidebar, "External-Filter Requirements.") To comply with the FCC specifications, you should use an add-on filter as mentioned in the sidebar. The filter addition has an additional benefit of suppressing strong out-of-band received signals that could cause "birdies" and images in the receiver. Adding the filter externally aids

in isolation and simplicity of construction. Connect the filter to the 222-MHz output of the transverter (J2) through a short length of coaxial cable.

### Tune-Up

Tune up the transverter on 222 MHz following the general alignment procedures outlined in the Ten-Tec manual. The low-level RF output detector circuit you duplicated earlier, used in conjunction

# When reassembling your unit, use care when tightening the nut on the PA-transistor stud.

with a VOM, can aid in tuning up the transmitter section should you not be able to obtain any indicated output on your VHF wattmeter initially. Keep in mind, however, that this RF detector circuit is not capable of handling more than a few hundred milliwatts or so for short periods.

### Acknowledgements

My thanks go to the engineering staff of Ten-Tec, Inc, in particular, Allan Kaplan, W1AEL, for his interest and assistance with this project. Thanks also to Bill, WB4WEN; Ed Walker, WA4DFS; Dave Saul, WA4QYK, and to Mike Tracy, KC1SX, and Zack Lau, W1VT, of the ARRL Lab for their help. Don't consider the modifications presented here as the last word on the subject, but rather as a whetting stone for your imagination that will lead to more experimentation!

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### **NEW PRODUCTS**

### PREFABRICATED INTERCONNECT CABLES FROM CABLE X-PERTS

♦ Cable X-Perts assembles and stocks coaxial cable jumpers in a wide variety of connector configurations. Connector types that are available are SMA, TNC, BNC, N and UHF. Genders and special configurations include male (plug), female (jack), reverse polarity and right angle. Cable options include RG-58A/U, RG-142/U, LMR-400, 9913Fx type, RG-8/U and RG-213/U.

For more information contact Cable X-Perts Inc, 416 Diens Dr, Wheeling, IL 60090; tel 800-828-3340; fax 847-520-3444; www.cablexperts.com.

### NEW LOW-NOISE RECEIVER PREAMPS FROM HAMTRONICS

♦ A new LNK series of preamps is replacing Hamtronic's popular LNG units. As

with the earlier products, several different models—covering bands of frequencies between 28 and 470 MHz—are available. Gain is specified at 18 to 26 dB with noise figures from 0.6 to 0.8 dB, depending on the specific frequency range.

The preamps use a new low-noise MOSFET designed for best performance at VHF and UHF frequencies. The device has built-in diode protection and very low feedback capacitance. The manufacturer claims good stability and rugged performance over a wide range of voltage, signal and load impedance conditions.

The LNK preamps are enclosed in a small aluminum case and can be installed



at the antenna or in the shack. Input and output connectors are type BNC. For remote mount applications, provisions are included on the PC board for installing an RF choke, allowing the dc supply voltage (12 to 15 V dc at 10 mA is required) to be delivered through the coax.

The LNK series preamps sell for \$59 each and come factory assembled. For more information contact Hamtronics Inc, 65-F Moul Rd, Hilton, NY 14468; tel 716-392-9430; jv@hamtronics.com; www.hamtronics.com.

**Next New Products** 

### **FEEDBACK**

♦ In the April 2001 *QST* "Test Your Knowledge!" quiz, question 10, the E.F. Johnson Thunderbolt amplifier used 4-400 tubes, not 4-1000s. In addition, in question 2, Leo *Myerson* was the proprietor of World Radio Labs, not Leo Myers.

# A Beginner's Guide to Transmission-Line and Antenna-Tuner Modeling

Using the new *TLW* software bundled with the 19th edition of *The ARRI Antenna Book*.

editor of *The ARRL Antenna Book*<sup>1</sup> for the last three editions, I've had a great deal of fun working on the software bundled with each book. In the 17th and 18th editions, outside software authors provided some programs, while I wrote some software myself. All the software in the last two editions was DOS-based.

For the newest Antenna Book I wanted to "get modern," finally. Thus I jumped headfirst into the wild and wonderful world of Windows programming. My first two Windows programming efforts are included on the CD-ROM bundled with the book: TLW (short for "Transmission Line for Windows") and YW ("Yagi for Windows"). I'm writing this article as a mini-tutorial and introduction to the TLW program. [And if enough readers request it, I'll write a tutorial for YW for publication sometime later.]

The advantages and problems inherent in the *Windows* environment challenged and frustrated but ultimately energized me. What a learning experience! One of the advantages of an "interrupt-driven" operating system like *Windows* is that the user can click almost anywhere on the screen and see something happen immediately. This is also one of the sources of extreme frustration for an old-timer like me, since I had to learn to anticipate *all* the possibilities much more rigorously than in a linear, step-by-step programming world like DOS. In other words, there are so many

more opportunities for the program to crash when a user presses some key or clicks somewhere I hadn't anticipated! Nonetheless, the power of the *Windows* 

environment allowed me to incorporate abilities into *TLW* that its DOS ancestor *TLA* (Transmission Line, Advanced) couldn't handle.



Figure 1—The *TLW* opening page.

### Practical Tip #1: Measure that Coax!

Here's a tip for you. When you install a coax going out to an antenna, whether for a new or an existing antenna, make sure you measure the physical length. Let's say that you are taking coax off a new 500-foot roll to replace the old coax going to an existing beam on your 90-foot high tower. Let's also assume that your tower is about 50 feet away from your shack. You estimate that you will need an additional 20 feet for a rotator loop and for some spare cable inside the shack. The total length of the new coax would thus be 90 + 50 + 20 = 160 feet. You could simply measure off that length using a long tape measure, and then cut the coax off the roll.

However, if you're not really sure of the overall length you'll need, mark off 120 feet with the tape measure. Put a permanent marker label at that point, but don't cut the coax yet. Leave the roll of coax at the bottom of the tower and take the coax up the tower, connect it to the beam and then dress the coax down the tower. Now you can unroll exactly as much as you need off the roll to get to where you want in the shack. Measure the exact length beyond the 120 feet you have already marked and record the overall length in your notebook or your log. Now you can use *TLW* to make exact computations at the tower end of the cable.

<sup>&</sup>lt;sup>1</sup>The ARRL Antenna Book is available from your favorite ham dealer, or directly from the ARRL (call 888-277-5289 or order on line at www.arrl.org/shop/).

#### Exploring TLW

So let's get started on our virtual tour of *TLW*. Figure 1 shows the sort of opening window that greets you when you first start the program. Here, the mouse cursor has been placed over the arrow at the right side of the **Cable Type** list box. This brings up a *Tool Tip* that gives a brief description of what the user can expect when he clicks here. I programmed Tool Tips all throughout *TLW* to give instant information about what each entry does. (Although I recommend that you read the TLW.PDF operator's manual, you can navigate through *TLW* by using the Tool Tips alone.)

So follow along with me and start up *TLW*. If you did a standard installation of the *Antenna Book* software, from your Desktop click **Start**, **Programs**, **Antenna Book Software**, and then the **TLW** icon. Use your mouse to explore the 16 places on the main *TLW* screen where you can enter or change information or click to initiate further action. Each has a Tool Tip associated with it.

#### **Main Data-Entry Points**

There are five main places where you will be entering numbers or choosing a cable type on the *TLW* main screen:

- Cable Type—choose the type of transmission line. The default is RG-8A (Belden 8237).
- **Length**—the length of the transmission line, in feet or meters. The default length is 100 feet (or 100 meters).
- **Frequency**—in MHz. The default is 3.5 MHz.
- Resistance—resistive portion of the load (or input) impedance. The default is  $50 \Omega$ .
- Reactance—reactive portion of the load (or input) impedance. The default is 0 Ω.

Since you will be using these five boxes often, their data is highlighted in blue, with your standard *Windows* background color. (The default *Windows* color scheme for text boxes is a white background with black text.) This tends to draw your eyes to these data-entry points immediately.

Output data shown in the bottom quarter of the *TLW* main window are also highlighted in blue. This is with a gray background color, unless you've overridden the default *Windows* choice.

#### Changing the Load

Let's change the load at the end of the default RG-8A (Belden 8237) line, without changing anything else. Put the cursor in the **Resistance** input box towards the center of the window, double-click to highlight the default **50** there and then type

#### Practical Tip #2: Did I Blow the Balun?

Let's say that one day the SWR for your triband beam goes high. You suspect that you've blown the balun at the beam's feed point, but you're worried that maybe water has gotten into the coax somewhere. Most of the time when a balun blows it becomes a dead short, so you should be able to figure out what the impedance down in the shack will be if the balun is shorted. (Note that the losses inside a coax will rise if water gets into a piece of coax, but sometimes water in a connector will cause it to arc over internally and sometimes will result in an open circuit.)

Let's say that your RG-213 coax is 160 feet long, as you carefully measured in the first Sidebar above. Set the frequency in TLW to 28.5 MHz. With a load resistance of 0  $\Omega$  at the end, TLW tells you that you should see an SWR of 4.78 down in the shack, with an input impedance of 10.74 + j7.36  $\Omega$ . You can read an SWR of 4.78 on most SWR meters, even though the meter scale becomes compressed at this level of SWR.

If you have a Noise Bridge or an Autek RF-1 impedance meter, TLW makes things even easier. Let's say you have an RF-1 and you read an impedance of 13  $\Omega$  and an SWR of 4.8. Click the **Autek** option in TLW and enter those numbers. Since you are looking for a positive reactance at the input, click the **Positive** option on the Autek screen. Now click the **OK** button and look at computed impedance at the load, which is  $-0.09 + j0.08 \Omega$ . The negative resistance shown is an artifact of the limited number of digits shown by the RF-1, which cannot display the actual **4.82** SWR, but instead shows **4.8**. The problem must indeed be a short in the balun.

You can also use a Noise Bridge to check the impedance at the shack-end of the line. Let's say you measure a parallel resistance of 16  $\Omega$  and a negative capacitance (that is, an inductance) of –240 pF, the **Noise Bridge** option in *TLW* computes that the load is 0.11 + j 0.12  $\Omega$ , again close to a dead short.

Let's say, however, that you don't compute a dead short at the feed point. You need to do further troubleshooting. Sorry, this time you have to go up the tower to see if the cable itself has a problem. The simplest thing to do is take an SWR indicator like the RF-1 up there with you. Before you start climbing, do some calculations using TLW, but this time for an open circuit. At 28.5 MHz, enter 100,000  $\Omega$  Resistance (which is close enough to represent an open circuit) and 0  $\Omega$  Reactance at the load. TLW computes a 4.77 SWR at the other end of the coax, with an impedance magnitude of 191.80  $\Omega$ .

Now, disconnect the coax down in the shack—This creates an open circuit at the shack-end of the transmission line. Now climb your tower, taking the RF-1 with you. At the balun connector, disconnect the coax and connect it to the RF-1. If you see something drastically different from an SWR of 4.8 and an impedance of 192  $\Omega$  that you should be seeing, then you can investigate whether water might have gotten into a connector or a splice somewhere. If the coax checks out OK, then you have narrowed down the problem to one in the antenna itself, since the balun and feed line are OK.

**522.** You will see things changing at the bottom of the *TLW* window as you type each number of **522.** *TLW* automatically recomputes as you enter any number. That is one of the neat things that *Windows* allows a programmer to implement.

Once you've entered the complete number 522, look at the bottom of the window. You should see that the SWR at Load is 10.00 and that the SWR at Line Input is 7.28. The fact that there is some loss in 100 feet of RG-8A even at 3.5 MHz is what causes the SWR at the input of the line to be different from that at the load end of the line. The total loss is 1.334 dB for the 10:1 level of SWR at the load end of the line.

You may be wondering why I chose the number **522** as a resistive load? Look at the **Characteristic Z0** for this transmission line. This is located about  $^{1}/_{3}$  way down from the top of the window, at the left side. The resistive portion of the complex Characteristic Impedance Z0 is 52.2  $\Omega$ , so a load resistance of 522  $\Omega$  will yield an SWR of 10:1. So would a value

of 5.22  $\Omega$ . Try it if you like.

#### Changing the Length

Now, let's see what happens when we change the length of the line, say, to 1000 feet. But before you change the present value, look at the box just to the right of the **Feet** label. This is the electrical line length, expressed in wavelengths. The text is shown in gray to indicate that you can't actually type anything in that box. At 3.5 MHz, 100 feet of RG-8A with a Velocity Factor of  $0.66 \text{ is } 0.539 \text{ } \lambda$ , just over a halfwave long.

Now, click on the input box labeled **Length** and move the cursor just before the decimal point. Type the number  $\mathbf{0}$ , making the line length 1000 feet. Now the SWR at the input of the line has dropped to 2.24 and the total loss has gone up to 7.447 dB and the electrical length is 5.392  $\lambda$ .

This is a bit of an aside, but one of the really neat things *TLW* does is allows you to specify the length in wavelengths. For example, double-click the Length input box and type .492w (or 0.492w if you

like). As soon as you type the "w" the length instantly changes to 91.253 feet. Now, go back to 1000 feet (or **5.392w**).

#### Changing the Frequency

Use your mouse to place the cursor just before the decimal point in the **Frequency** input box, and press the "Del" key on your keyboard to erase the decimal point and make the frequency **35** MHz. See how the total loss has risen to 16.274 dB, and the input SWR has dropped to only 1.12. Change the frequency to **350** MHz and you'll find that the input SWR drops to 1.00, while the total line loss is 46.256 dB. Now, set the load resistance to 0  $\Omega$ . The loss goes sky high to 108.440 dB.

This whole exercise shows that a long,

lossy line at a high frequency will resemble a good dummy load with a low SWR at its input. You've now had a chance to try out three of the places in *TLW* where you can manually enter numbers and see things change instantly. Now let's explore the other possibilities some more.

#### **Changing the Cable Type**

First, let's restore things back to what the programs starts with. The easiest way to do this is to exit *TLW* and start it up again. Click on the button labeled **Exit**, or use the keyboard shortcut [ALT] [X], or click on the **X** exit icon at the upper right corner of the *TLW* window.

Each "command button" you encounter in *TLW* has a keyboard shortcut. Note

that the "x" on the Exit button is underlined to show the shortcut. Similarly, pressing the [ALT] key and the [T] keys simultaneously will get you into the Tuner window, but more on that later.

If you now click on the **Yes** button to answer the question, "Are you sure you want to exit?" you will exit back to your desktop. Start up *TLW* again. Now, click the arrow at the right-hand side of the **Cable Type** box. You will see a drop-down list of the 32 different types of transmission lines built into *TLW*. The basic ordering scheme is by "RG" number, with the Belden type number in parentheses for most RG cables, since Belden is the defacto standard for most lines in the US.

There's even an entry for "User-Defined Transmission Line," which allows you to specify the exact characteristics of any transmission line that is not among the 32 built-in choices in *TLW*. This user-defined type of transmission line tracks changes in the attenuation and the complex characteristic impedance as you change frequency, and it saves the data to disk so that you can start up with the same parameters at a later time.

Scroll up and down the listings to check out the various types of cables. Let's use a  $450-\Omega$  "window" ladder line. Scroll down towards the bottom of the listings, and click on the "450-Ohm Window Ladder Line" selection and the dropdown box will close.

Now, let's do my favorite "horrible example" to illustrate how to really stress a line: Use a 100-foot long dipole as a load on 160 meters for 100 feet of 450- $\Omega$  window line. This dipole is assumed to be 50 feet above flat ground. Change the frequency to **1.83** MHz, leaving the length of the line at 100 feet. Notice that the characteristic impedance of so-called "450- $\Omega$ " window line is actually closer to 400  $\Omega$ , as TLW reports  $404.9 - j 1.14 \Omega$ .

Double-click on the **Resistance** input box to highlight the default **50** there. Note that double-clicking any input box will highlight the number there. This allows you to change the value as soon as you start typing in another number. Type the number **4.5**. Double-click on the **Reactance** box and type in **–1673**. (The minus sign is for a capacitive reactance.) These two numbers represent the feed-point impedance of this electrically short dipole on 160 meters, as calculated by *EZNEC*.

The resulting **SWR at Load** is 792.97 and this leads to a total loss in the line of 8.931 dB! If this line were operated into a matched 450- $\Omega$  load, it would have a loss of only 0.032 dB per 100 feet, so the high SWR has really drastically affected the performance. For a real eye-opener, go back again and change the line back

#### Practical Tip #3: Making a Stub

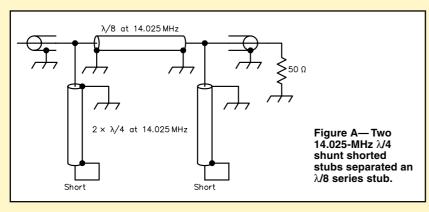
The ability to enter lengths in terms of wavelength in *TLW* gives you some real flexibility in designing and evaluating a transmission-line stub. Let's say that you want to put a quarter-wave shorted stub on the output of your transmitter to knock down the second harmonic of your 20-meter transmissions. We'll assume here that you are feeding a triband Yagi, which radiates effectively on both the 14-MHz fundamental and on the 28-MHz second harmonic. We'll use RG-213 cable and design this stub for the 14.025 MHz in the CW band.

Start up TLW and select **Cable Type**: RG-213 (Belden 8267) and **Frequency**: 14.025 MHz. Double-click in the **Length** text box and type .25w for a quarter-wave stub. TLW instantly computes that the length of this stub is 11.571 feet (or 3.527 meters, if you use metric measurements). Now, put a short by specifying  $\mathbf{0}$   $\Omega$  at the load end. Note that the impedance at the input of the stub is high: 4826.71  $-j38.16\ \Omega$ . This is as it should be, because at the fundamental frequency you want the stub to have no effect on your transmitter.

Now change the frequency to 28.05 MHz. The impedance at the input of the stub is  $0.76 - j~0.00~\Omega$ . This is pretty close to a short-circuit for the 28.05 MHz second harmonic. Compared to the  $50-\Omega$  load presented by the triband Yagi at 28.05 MHz, the stub will give an attenuation of  $10~\log~(50/0.76) = 18.1~dB$ . This isn't bad, but it could be better.

See Figure A, which shows two 14.025-MHz  $\lambda/4$  shunt shorted stubs separated an  $\lambda/8$  series stub. Why  $\lambda/8$  long?—Because at the second harmonic this is a  $\lambda/4$  length, and at its input this will effectively invert whatever impedance is at its end. And we know that the impedance of a  $\lambda/4$  stub at twice its fundamental frequency is 0.76  $\Omega$ .

Back in TLW, specify a frequency of 14.025 MHz and a length of .125w for the  $\lambda/8$  stub, which comes out to be 5.786 feet long. Change the frequency to 28.050 MHz, and specify the load at the end of the  $\lambda/8$  stub as  $0.76\,\Omega$  due to the shorted stub. I'm neglecting the much-larger 50  $\Omega$  load of the triband Yagi that parallels the output stub's impedance. The impedance at the input of the  $\lambda/8$  stub at 28.050 MHz is now 2194.16 – j25.24  $\Omega$ , whose parallel equivalent across the 0.76  $\Omega$  input shorted stub is 2194.45  $\Omega$  in parallel with –190,768  $\Omega$  of capacitive reactance. The attenuation is thus close to 10 log (2194.45/0.76) = 34.6 dB, a lot more than before.



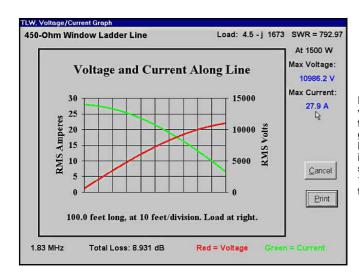


Figure 2—The voltage (in red) and the current (in green) along the line, where the load is at the right-hand side of the graph, 100 feet from the transmitter end.

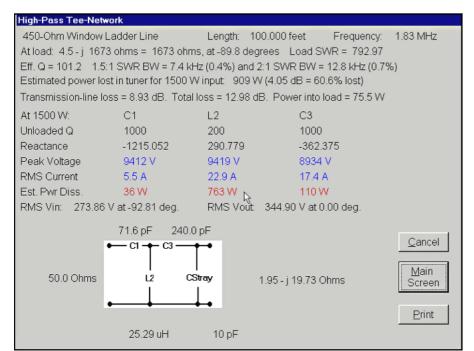


Figure 3—When you click on Draw Tuner, you're presented with this window. Note that I located the cursor arrow near an interesting piece of information: The estimated power lost in the tuning inductor for 1500 W input to the antenna tuner is 763 W.

to RG-8A (Belden 8237), leaving everything else the same. The total loss using the 100-foot dipole as a load is now an astounding 25.591 dB. I suppose the 8.931 dB loss for the 450- $\Omega$  line looks pretty good by comparison.

#### **Graphing the Voltage and Current**

Now, let's look at the stress this kind of load places along the length of the transmission line. Click on the **Graph** button. As in most *Windows* programs, you may grab the window at the top label bar and move it around on the display screen as you like. *TLW* retains the information about where you place many of its *Windows* and saves them to disk so that the next time you bring up the program your preferences will remain intact.

Figure 2 shows the voltage (in red) and the current (in green) along the line, where the load is at the right-hand side of the graph, 100 feet from the transmitter end. For 450- $\Omega$  line, the peak voltage is almost 11,000 volts—this will likely result in an arc or flashover somewhere along the line, especially if the window line has been up in the air, exposed to air-borne pollutants for any period of time. The maximum current occurs at the input of the line, and is almost 28 amperes. Exit the graph by clicking on the **Cancel** button. You will be placed back in the main TLW window.

#### **Tuner Considerations**

Let's continue this "horrible example" of the poor, mistreated transmission line and see what happens to an antenna tuner

feeding this line. Click the **Tuner** button. A new window opens up, giving you a number of selections. At the top right, click on the **High-Pass Tee Network** option. You'll see a new input box open at the bottom of the form, labeled **Tee Network Series Capacitor**, **pF**. The default value is 100 pF, but override that and type in 240 pF. This is the maximum capacitance available in several commercial antenna tuner designs. Leave the rest of the default values alone for now. Now, click the **Draw Tuner** button.

A new window will appear. See Figure 3. There is a lot of information on this screen. Note that I located the cursor arrow near an interesting piece of information: The estimated power lost in the tuning inductor for 1500 W input to the antenna tuner is 763 W. This is an impressive amount of power and I know of few inductors in use by amateurs that can handle this amount of power gracefully. Also impressive is the amount of voltage that appears across the tuning components: 9412 V peak across the input capacitor; 8934 V across the output capacitor and 9419 V across the inductor. If things don't get fried, they'll surely arc inside this beleaguered tuner!

In fact, the **Power into load** is only 75.5 W out of the 1500 W put into the tuner, which by itself loses 909 W or 4.05 dB. I bet you're a little surprised that output capacitor C3 burns up more than 100 W all by itself because of the 17.4 A of RF flowing in it. The net result of the loss in the ladder line and the loss in the tuner means you'll be radiating only 75.5 W, almost 13 dB down from 1500 W. And yes, if you were running QRP (5 W), you'd be radiating 0.3 W—I guess that's "QRPP," but at least you wouldn't fry the tuner.

What about a more efficient tuner than the high-pass T? OK, go back to the tuner selection screen by clicking the **Cancel** button on the tuner screen. Then click the **High-Pass L-Network** option and click on **Draw Tuner**. This tuner is much less lossy. It only loses 0.26 dB of the input power (86 W out of 1500 W), but it still can't make up for the loss of 8.93 dB in the line itself. However, the tuner components have a much better chance of survival.

Go back and select the High-Pass Tee Network again, to gain more insight about what happens inside the tuner. The Eff. Q is 101.2 for the Tee, while it is only 1.7 for the High-Pass L network. This very high-Q situation would make the tuning extremely "touchy" on the High-Pass Tee configuration.

To paraphrase the old advertisement: "Try *TLW*; you'll like it!"

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<u>05∓</u>

# **BEACONet**

# Dust off your packet radio TNC and use it to identify band VHF openings!

magine a system that can probe the ether for propagation anomalies, pursue long distance transmissions via meteor-trail refraction and allow VHF contest rovers to announce their locations as they move from grid-to-grid using nonassisted all-amateur means. If Amateur Radio had a versatile Swiss Army knife, it may very well be called BEACONet.

The introduction of the BEACONet concept occurred in the November 1999 issue of QST. That issue contained an article that described setting up a packet station to "bounce" signals off the ionized trails of Leonids meteors. Since that time, the system has grown to encompass a much broader visionary experiment for the summer of 2001 that includes 24/7 propagation experimentation, and has assumed the name: BEACONet.

Think of BEACONet as a sort of an "ether tester." When the RF path is "open," signals will propagate. When the RF path isn't open, they won't. No matter what the condition of the RF path, BEACONet will be able to display it for participants graphically, using software called *UI-View* on their *Windows*-based computer.

<sup>1</sup>Notes appear on page 42.

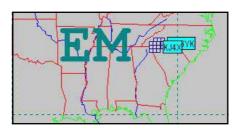


Figure 1—This is a simulation of the 2meter band "at rest" (147.585 MHz), as viewed from BEACONet station KJ4X. Notice that only icons representing local stations appear on the map.

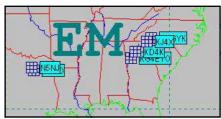


Figure 2—This is a simulation of a band opening in progress. Notice that, in addition to the local stations, others have appeared on the map as well.

Would you be surprised to know that this system is based on AX.25 packet radio technology? Don't be. Packet is a much-maligned mode that is capable of much more than simple "BBSing." The BEACONet concept takes known packet technology to the next level by using it as a basis on which to build a multifaceted, graphical, continuous propagation-plotting system. No matter what your band of interest (at present: 10 meters, 6 meters, 2 meters and 125 cm), BEACONet has something to offer.

The concept is straightforward: establish a network of stations that periodically

transmit their call signs, locations and a few station-specific items (such as power output, antenna type, etc) and let a computer program decode any received information to a map. As conditions ebb and flow, stations will enter and retreat from range right before your eyes (see Figures 1 and 2). The system will instantly display not only the fact that a band is open, but also in what direction and how far! While at first, it may seem like a 21st century version of a standard propagation beacon system, BEACONet is so much more.

According to the Amateur Extra ques-

## The Frequency Is In Use: How To Peacefully Coexist

It is always best to use the good amateur practice of listening before participating. In some areas of the country, it is possible that a BEACONet frequency may be used for simplex voice communications. If this is the case, it may be possible to determine a time of day in which the voice users aren't likely to be active and confine your transmit participation to then.

You may confine your BEACONet activity to certain times of the day or night very easily by using a simple appliance timer. Power your TNC with it. Set it to power-on during times of the day when the frequency is clear.

Alternatively, there is nothing wrong with being a BEACONet lurker. Go through the steps outlined in the article and simply leave your TNC-to-transceiver microphone plug *unplugged*. Your system will stay in receive mode and not bother any local voice activity. The good news is that you will be able to receive and decode any DX transmissions that happen to make it into your area anyway!

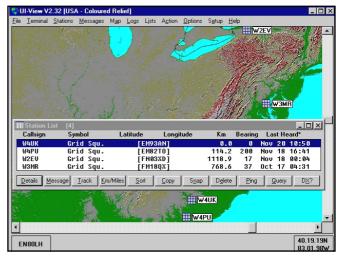


Figure 3—An actual BEACONet screen shot from W4UK showing successful receptions of 147.585 MHz transmissions made during the November 2000 Leonid meteor shower.

tion pool, packet has been identified as a mode that is particularly well adapted for meteor scatter work<sup>2</sup>; and BEACONet proves the point. Reception reports exceeding 1000 kilometers are not uncommon for "Meteor Mode" experimenters (see Figure 3).

It is even possible for Rover-category VHF contesters to place a BEACONet transmitter and GPS receiver in their vehicles. Doing so allows them to transmit their location precisely, allowing anyone in range to know that they are ready and available to make contact. In this mode, BEACONet is an all-amateur, non-relayed means of communication.

For the purposes of this article, we will key-in on the propagation-tracking aspects of the BEACONet system. Of course, it is no coincidence that this is being published just as the summer sporadic-E season is about to get underway!

## So Simple, So Easy...So Participate!

Dust off that KISS-capable packet TNC and get it connected and communicating with your *Windows*-based computer and transceiver. Once you've reached that point, you're about 45 minutes from being a BEACONeter!

Follow these six simple steps to get BEACONet active:

- 1. Prepare your TNC for "Level-I" functionality using simple terminal software. See the sidebar "Preparing your TNC for Level I."
- 2. Download *UI-View* from the BEACONet Web site at go.to/BEACONet under a hyperlink titled "Turbo Links." *UI-View* will run on any Intel-type PC that is running *Windows 3.11* or newer.
- **3. Install UI-View on your** *Windows* **based computer.** After downloading the program, "double-click" on the icon and the installation process will occur. *Do not* launch the program yet (this will be covered in step 5).
- 4. Identify your station's operational parameters and encode them into a station Configuration Code. You'll encode things like: operating frequency, antenna gain, power output, etc, into a 6-character field that others will receive...allowing them to analyze the communication circuit more accurately.

If you wish to skip this step, simply use the value of "CQ" with nothing else and continue to the next step. However, by spending a little extra time here, you can help to provide others with valuable data to analyze. The Configuration Code will take the following form: **BSNPAH-D**.

 $\mathbf{B} = \mathbf{B}$  and. For the purposes of this ar-

ticle, this value is either "H" for HF or "V" for VHF<sup>3</sup>.

S = Segment. For the purposes of this article, this value is one of the following (depending on which BEACONet frequency you choose to operate on). Y=28.128 MHz, B=53.530 MHz, K=

147.585 MHz, S=223.780 MHz. See Table 1 for a more detailed explanation of the BEACONet frequency-labeling system.

**N** = Network personality of your station. This can be a little confusing. For your TNC: use the value of 1 if your TNC is a Kantronics with ROM 8.2 or above.

#### **Preparing your TNC for Level I**

The BEACONet system is designed to be able to operate, even if you don't wish to leave your computer powered-on. By following the Level I instructions, you will be able to power-off your computer but leave your TNC and transceiver "on" to provide a signal that others can listen for, should the band "open" for long distance propagation. Once again, even if you can't leave your computer powered-on all the time, be sure to leave your transceiver and TNC functioning for others to use as signal sources!

Do not skip this step. Open a communications terminal session between your computer and TNC. Connect to the TNC and follow the instructions that are associated with the type of TNC that you own.

TNC Function	Kantronics w/ROM 8.2 or greater	TNC2 or compatible
Restore factory default values	RESTORE D INTFACE TERM	RESET
Set TNC call sign	MYCALL	MYCALL [your call]
Configure your Grid (6 characters)	BT 1 [your grid] <sup>11</sup> UNPROTO	BTEXT [your grid] BSNPAH-D <sup>12</sup>
Transmit once every 5 minutes	BLT 1 EVERY 00:05:00	B E 30 <sup>13</sup>
Activate network support	UITRACE HOP,60	Not applicable
Decode with squelch "open"	CD SOFTWARE	Not applicable

Table 1
Transmit Frequency Designators

Note: All frequencies are shown in MHz. Amateur bands are in **bold** type.

	(X)tra	(L)ow	(M)ed	(H)igh	(V)ery	(U)Itra	(S)uper	(E)xtra
	Low				High	High	High	High
0	0.003	0.030	0.300	3	30	300	3000	30000
Α	0.004	0.040	0.400	4	40	400	4000	40000
В	0.005	0.050	0.500	5	50	500	5000	50000
С	0.006	0.060	0.600	6	60	600	6000	60000
D	0.007	0.070	0.700	7	70	700	7000	70000
Ε	0.008	0.080	0.800	8	80	800	8000	80000
F	0.009	0.090	0.900	9	90	900	9000	90000
G	0.010	0.100	1	10	100	1000	10000	1000000
Н	0.011	0.110	1.1	11	110	1100	11000	1100000
1	0.012	0.120	1.2	12	120	1200	12000	1200000
J	0.013	0.130	1.3	13	130	1300	13000	1300000
K	0.014	0.140	1.4	14	140	1400	14000	1400000
L	0.015	0.150	1.5	15	150	1500	15000	1500000
M	0.016	0.160	1.6	16	160	1600	16000	1600000
Ν	0.017	0.170	1.7	17	170	1700	17000	1700000
0	0.018	0.180	1.8	18	180	1800	18000	1800000
Р	0.019	0.190	1.9	19	190	1900	19000	1900000
Q	0.020	0.200	2.0	20	200	2000	20000	2000000
R	0.021	0.210	2.1	21	210	2100	21000	2100000
S	0.022	0.220	2.2	22	220	2200	22000	2200000
T	0.023	0.230	2.3	23	230	2300	23000	2300000
U	0.024	0.240	2.4	24	240	2400	24000	2400000
٧	0.025	0.250	2.5	25	250	2500	25000	2500000
W	0.026	0.260	2.6	26	260	2600	26000	2600000
Χ	0.027	0.270	2.7	27	270	2700	27000	2700000
Υ	0.028	0.280	2.8	28	280	2800	28000	2800000
Z	0.029	0.290	2.9	29	290	2900	29000	2900000

#### Table 2 **RF Output Designators**

•	•
Designator	Output
0	<2 mW
1	2 mW
2	4 mW
3	8 mW
4	16 mW
5	32 mW
0	
6 7	64 mW
	125 mW
8	250 mW
9	500 mW
Α	1 W
В	2 W
C	4 W
Ď	8 W
F	16 W
E F	32 W
G	64 W
H	125 W
	250 W
-	
J	500 W
K	1 kW
L	2 kW

The values above should be understood as "starting at this level and continuing until the next level is reached.'

If it is not, then use a value of 0. For *UI*-*View*: Use a value of 1, without regard as to the type of TNC you have. Yes, it is possible to have a different Configuration Code programmed into your TNC than used within UI-View. This all comes down to identifying your station's ability to respond to future BEACONet network functions (visit the Web site for a more in-depth discussion of this topic).

 $\mathbf{P}$  = Power output. Use Table 2 to determine the correct value.

A = Antenna gain or Yagi element count. Use Table 3 to determine the correct value.

**H** = Antenna Height Above Average Terrain (HAAT). Use Table 4 to determine the correct value.

 $\mathbf{D}$  = Directivity vector of the antenna. Use Table 5 to determine the correct value

For examples of some common Configuration Codes, see Table A.

Assemble your Configuration Code from the tables, write it down and proceed to Step 5.

5. Set up *UI-View* with your personal station information and input the station Configuration Code that you calculated in the previous step. This is considered establishing a Level-II graphical station.

Before doing any "in program" reconfigurations, it will be necessary to edit *UI-View's* initialization file. That file isn't created until you launch the program for the first time. So, launch the UI-View software that you had previously installed. A notice that "This looks like

Table 3 Antenna Designators

Note: Unless you are certain of your antenna's gain, use the element count. Gain Designator Gain (dBd) Element Designator Element Count

Α	0	0	1
В	3	1	2 or 3
С	6	2	4 to 7
D	9	3	8 to 15
E	12	4	16 to 31
F	15	5	32 to 63
G	18	6	64 to 127
Н	21	7	128 to 255
I	24	8	256 to 511
J	27	9	512 to 1023

a new system" will greet you. Press the **OK** button. Next, a pop-up window titled "Quick Start Guide" will need to be closed. Lastly, exit from the program entirely.

In your *UI-View* folder, edit (using Notepad) the file called UI-View.ini, scroll to the end of the data file. Adding the following statements to the end of that file will prepare your system for proper BEACONet operation in the future:

[DIGI\_OPTIONS] UI-FLOOD= UI-TRACE=HOP

Save the file and exit.

There is one last piece of housekeeping to take care of. There is a useless map that comes with the distribution of the software. It offers no substantive advantage to keep, and tends to clutter your screen later. Now would be a good time to simply delete it. Go to your *UI-View* folder, enter your Maps folder and delete Colorado.gif and Colorado.inf. The remaining maps are of Europe, the UK, the USA and USA/SouthernCanada<sup>5</sup>.

Assure that your TNC is on and launch UI-View again. Your screen will show a map of the UK and a notice that the software isn't registered<sup>6</sup>. Select **OK**. From the drop-down menu titled "Map," select the option "Load a Map" and select the one titled "The USA."

Configure UI-View to talk to your TNC correctly

Setup Coms Setup

Ta

223.78 MHz

28.128 MHz

Close the Pop-up Notification window and the Help window that follows

UI-View software

TNC2 (Level-I)

Setup Coms Setup (again)

Set Baud Rate, Parity, Data Bits, Stop Bits and Com Port to communicate with your TNC properly

From the Drop-menu titled "Host Mode," select "KISS"

Press the Setup button to the right of "Host Mode"

Under "Easy Setup," select the button that most closely describes your TNC (TNC2, Kantronics, etc)

Press **OK** and **OK** again, returning you to the map screen.

Configure UI-View with your station information (note: enter only the parameters noted, leaving others blank or on default values)

Setup|Station Setup

Close both pop-up windows that appear

Setup|Station Setup (again)

Call sign = your Amateur Radio call sign

Unproto Address = the Configuration Code from the previous section<sup>7</sup>

Beacon Comment = [GR##ID]

e-mail@host.com

Where: [GR##ID] is your 6-character Maidenhead Grid Locator, placed between square brackets and your e-mail address is included to make reception reports easier

UI-View Tag = un selected Beacon Interval Fixed = 5Select **OK** 

10-element Yagi 50 feet Due East

4-element Yagi 20 feet West

Advertise your connection with the BEACONet project:

Config Code

HY1G02-15

VB1G03-15

VS1G43-3

HY0E22-9

VK1H23-6

Table A					
Frequency	Network Function⁴	RF Output	Antenna	HAAT	Pointing
28.128 MHz	UI-View software	100-W	1/2-wave vertical	30 feet	Omni
147.585 MHz	UI-View software	160-W	4-element Yagi	40 feet	Due South
53 53 MHz	I II-View software	100-W	1/2-wave vertical	60 feet	Omni

120-W

25-W

Setup|Status Text

Status Text = Stay connected with BEACONet at: **go.to/BEACONet** 

Select OK

There is a feature of BEACONet operations that will support the need for digipeating certain types of information. This will support a future feature of

Table 4 **Height Above Average Terrain Designators** Designator Height (in feet) 0 (up to, but not including, 10 feet) 10+ 2 3 20+ 40+ 4 5 6 7 8 80+ 160 +320 +640 +1280 +9 5120 +

Table 5 Antenna Dire	ectivity Designators
Designator	Direction (+/–15°
	unless otherwise noted)
-0	undisclosed
-1	30°
-2	60°
-3	90°
-4	120°
<b>-</b> 5	150°
-6	180°
<b>–</b> 7	210°
-8	240°
<b>-9</b>	270°
-10	300°
-11	330°
-12	0 or 360°
-13	undefined
-14	undefined
<b>–15</b>	omnidirectional

BEACONet. Please do not skip this step unless the program tells you that your Host mode doesn't support digipeating.

Setup Digipeater Setup

Close both pop-up windows that appear

Setup|Digipeater Setup (again)
Enable Digi = x
Alias Substitution = x

HOPn-N = x

NOTE: leave WIDEn-N unchecked for now

Alias(es) = your call sign Sub Alias = your call sign Dupe Secs = 60 Select **OK** 

Normally, *UI-View* will cause icons to disappear from the screen once 60 minutes have elapsed without a reception from a given station. Once we've reached a critical mass of participants, this will be a nice feature. However, until then it may be a good idea to set the icon expiration time to 24 hours (1440 minutes). You can leave the system functioning and check it periodically to see what it caught over the previous 24 hours!

Setup|Miscellaneous
Expire Time = 1440
"More" in detail windows = x
Note: leave all other items at default values

Select OK

Lastly, you may wish to setup *UI-View* to display field and grid lines to make for a nicer visual display:

Options|Show Grid Squares

## 6. Power-up your transceiver and see what comes your way!

Tune your transceiver to one of the several BEACONet frequencies: 28.128, 53.530, 147.585 or 223.780 MHz. With the exception of 28.128 MHz, which uti-

lizes the USB mode, all other BEACONet operations take place using FM. The most popular bands are 10-meters and 2-meters. Interest on the 6-meter band is growing, with pockets of activity in the Northeast and Southwest. The 223-MHz band has just recently been added to the BEACONet repertoire, with sparse activity to date.

Although there is a high probability that these frequencies are vacant in your area, please follow the good amateur practice of listening for a period of time before transmitting. Pockets of FM voice activity have been found on 147.585 MHz. By listening first, and making contact with other users of the frequency in your area, you may be able to determine what time(s) the frequency is not used and occupy it then. You may even be able to persuade existing users of the frequency to join you in your Summer/Fall 2001 BEACONet endeavors.

#### **Odds and Ends**

For the sake of simplicity and ease of participation, VHF BEACONet uses 1200-baud packet on a standard FM carrier. While FM is far from optimal within the context of maximum efficiency of communication, it provides a noncritical tuning component that makes the system extremely easy to use. The use of FM makes the system as close to "plug and play" as it can be—mostly due to the proliferation of FM transceivers. In retrospect, this has proven to be an excellent compromise.

Ten meters is a different story. At present, FM-based data communication is prohibited in the US, even though it is the only HF band on which 1200-baud data is allowed. As such, BEACONeters

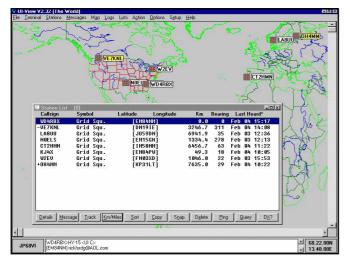


Figure 4—This is a screen shot from WD4RBX showing BEACONet in action on 28.128 MHz in February of 2001. Compare this screen shot to Figure 5 taken on the same day, but from N1NCO.

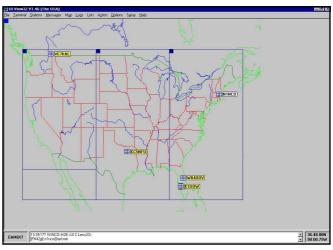


Figure 5—A view of BEACONet 10-meter activity from N1NCO.

#### **Establishing a BEACONet Hub**

This information is for those folks who see the true potential for this system, and are in a position to provide continuous BEACONet service to the amateur community. All it takes is a TNC (Kantronics-brand preferred), transceiver (the higher power, the better) and a vertical (omnidirectional) antenna. No other connected computer or software is required.

A Hub-class station is one that is operated without a local computer (in unattended mode) and ideally operated at altitude (house-top, tower-top, hill-top, mountain-top, etc), with high power. The TNC is configured according to the instructions found in the sidebar "Preparing your TNC for Level I." In this case, the use of a Kantronics-brand TNC (with ROM 8.2 or greater) is probably your best choice because it will provide participants with future BEACONet advantages<sup>8</sup>.

Imagine the continent (or world, in the case of 10-meter operation) blanketed with these stand-alone Hubs, periodically pinging for propagation. Home users may come and go on a whim, but Hubs can be constant features on the BEACONet landscape. This is not unlike the NCDXF's HF CW beacon system that presently operates on several HF bands. The difference is that anyone can (and is actually encouraged to) establish a BEACONet Hub<sup>9</sup>. No other coordination is necessary because the TNCs CSMA<sup>10</sup> circuitry will do its thing to keep the frequency as QRM-free as possible. The more Hubs (or any participants) that exist, the better the BEACONet system works!

With enough participants, it will be possible to visually identify band openings in progress, easily charting their course and destination. Establish a Hub or two if you can. Join- n on the pioneering spirit that is Amateur Radio!

tune 28.128 MHz USB. At this part of the solar cycle, 10 meters can be open for world-wide communication. Figures 4 and 5 illustrate this fact quite well.

As previously mentioned, the system is based on UI-Frame AX.25 packet radio technology. This is the same technology on which the APRS system is based—a similarity that ends there. Rather than being a tactical and emergency communications system, BEACONet is—in a broad sense—a real-time propagation-experimenter's tool.

Antennas are generally vertically polarized. This makes for easily obtained omnidirectional patterns, a major advantage when you don't know to which direction the band may open at any given time. Additionally, this affords a little extra isolation to the VHF SSB/CW operator who may choose to use BEACONet as a supplementary propagation-monitoring tool in support of chasing DX or Rovers on the low end of the band.

BEACONeters use a variety of methods of staying in communication with one another (when the bands aren't propagating, that is). One method is through the official BEACONet Web site at **go.to/BEACONet**. Another is through an Internet e-mail list. Information on joining the Tucson Amateur Packet Radio (TAPR) sponsored remailer is found on the Web site.

## The Summer Season Starts to Sizzle

BEACONet is designed to regularly test for anomalous events. Sit and wait, periodically checking your screen to see if anything was caught. Think of this as a digital fishing trip. You can go a long time with nothing, only to be rewarded with "the big one" when you least expect it. When the band opens, icons will magically appear on your map.

The summer months are known for a great deal of Sporadic-E (E<sub>s</sub>) propagation on the 10, 6 and 2-meter bands, and tropospheric inversions on 2 meters and 222 MHz. This would be an excellent time to set up your BEACONet station and let it run continuously. Who knows? You may be the one to alert others to a band opening in progress! The experiment is slated for the Summer and Fall of 2001. Come join the fun!

#### Notes

- ¹An update and follow-up article on the use of the BEACONet system for meteor scatter work appeared on the ARRLWeb in November 2000.
- <sup>2</sup>The "Meteor Mode" application of BEACONet has even spawned Web sites that are dedicated to keeping folks informed of that facet of activity. Rich Parry, W9IF, has developed one such site at go.to/METEORegistry.
- <sup>3</sup>HF encompasses the frequencies from 3 to 30 MHz. VHF is defined as the frequencies from 30 to 300 MHz.
- <sup>4</sup>This identifies the personality of your station from the perspective of the BEACONet network. If your station is capable of contributing to the BEACONet network as something more than a simple signal source, then this value will be something other than "0" (zero). An in-depth discussion of this aspect of the Configuration Code is contained on the BEACONet Web site at go.to/BEACONet.
- <sup>5</sup>A world map is also available, for those inclined to be joining the participation on 10 meters. Visit the BEACONet Web site (go.to/BEACONet) and select the "Turbo Links" button to download it. Once downloaded, it needs to simply be moved into the UI-View/Maps folder in order to be accessed.
- <sup>6</sup>UI-View is fully functional from a BEACONet perspective as-is. However, this is a 16-bit application that is designed to get people

familiar with the program. If it is of use to you, please register it. Registration then allows use of the 32-bit version, which will continue to be developed into the future. Registration may be accomplished on-line at <a href="https://www.uksharereg.com/uiview.html">www.uksharereg.com/uiview.html</a>.

- Alternately, you may simply use "CQ". While doing so is easy, participants are strongly encouraged to use a properly calculated Configuration Code to make analysis of band openings easier. Minimally, include the antenna-pointing vector as part of your CQ, with a clock-face as your guide. CQ-3 means you are using an antenna that is pointed East, CQ-9 means your antenna is pointed West, CQ-15 means you are using an omnidirectional antenna.
- In the future, BEACONeters will be able to utilize Hub-class stations to digipeat. The advantage is that two or more stations that are in range of each other may be experiencing differing degrees of anomalous propagation. By enabling HOPn-N call-substituted digipeating (as the Kantronics TNC does, uniquely) it will be possible to not only be given a heads-up that conditions are building, but the path that is propagating will be traceable, too! For more information, visit the BEACONet Web site at go.to/BEACONet.
- Of course, it makes little sense to locate Hubs too close together. Where multiple Hubs are established, local and regional land topology should dictate their separation distance.
- <sup>10</sup>Carrier Sense Multiple Access
- 11You may wish to include your e-mail address after the [GR##ID], making it easy for people who receive your transmission to contact you to let you know. In that case, invoke using the format: BTEXT [FN03XD] w2ev@arrl.net
- <sup>12</sup>See Step 4 for the correct values for "BSNPAH-D."
- <sup>13</sup>Use whatever value your TNC manual states will provide one transmission every 5 minutes

You can contact the author at 17050 LaDue Rd, Holley, NY 14470-9736; w2ev@arrl.net

#### **Update!**

As this article went to press, BEACONeters were experimenting with the marriage of the BEACONet concept and PSK31. This is highly experimental at this time. For more information, visit the BEACONet Web site at **go.to/BEACONet** and/or join the BEACONet e-mail list (details are available on the Web site).

#### **STRAYS**

#### **HAM CLUB DATABASE 1.0**

♦ Ham Club Database 1.0 is now available. Keep track of Amateur Radio club member addresses, telephone numbers, membership status and other important details for your organization. The handy Search function lets you easily create and print mailing lists on a key word of your choosing to organize your data for a specific use. Easily copy and paste data into spreadsheet programs such as Excel to generate reports. The program will also search by any criteria such as ZIP code, city, call, etc. This Windows-based shareware is free to try and only \$10 to register. Download the program from www.n3fjp.com.

**Next Strays** 

# An Automatic Sealed-Lead-Acid Battery Charger

This nifty charger is just what you need to keep your SLA batteries up to snuff!

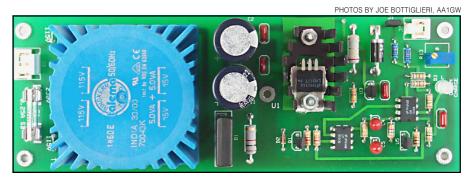
fter experiencing premature failure of the battery in my Elecraft K2 transceiver (most likely because I forgot to keep the battery on a regular charge schedule), I began searching for an automatic battery charger.1,2 The K2 uses a Power-Sonic PS-1229A 12-V, 2.9-Ah sealed lead-acid (SLA) battery. SLAs are commonly called gel-cells because of their gelled electrolyte. As with all things, to obtain maximum service life from an SLA battery, it needs to be treated with a certain degree of care. SLA batteries must be recharged on a regular basis; they should not be undercharged or overcharged. If an SLA battery is left unused, it will gradually self-discharge.

Although my SLA battery experiences related here are linked to my K2 transceiver, you can think of the K2 simply as a load for the battery. The comments pertaining to the SLA batteries and chargers apply across the board and the charger described here can be used with any similar battery.

#### **Using a Three-Mode Charger**

My first attempt at keeping my K2's SLA battery healthy was to purchase an automatic three-mode charger. I soon discovered that most three-mode chargers work by sensing current and were never intended to charge a battery under load.

Three-mode chargers begin the battery charging process by applying a voltage to the battery through a 500-mA current limiter. This stage is known as *bulk-mode* charging. As the battery charges, its voltage begins to climb. When the battery voltage reaches 14.6 V, the charger maintains the voltage at that level and moni-



tors the battery charging current. This is known as the absorption mode, sometimes called the overcharge mode. By this time, the battery has achieved 85% to 95% of its full charge. As the battery continues to charge—with the voltage held constant at 14.6 V—the charging current begins to drop. When the charging current falls to 30 mA, the three-mode charger switches to float mode and lowers the applied voltage to 13.8 V. At 13.8 V, the battery becomes self-limiting, drawing only enough current to offset its normal self-discharge rate. This works great—until you attach a light load to the battery, such as turning on the K2 receiver. The K2 receiver normally draws about 220 mA. When the charger detects a load current above 30 mA, it's fooled into thinking that the battery needs charging, so it reverts to the absorption mode, applying 14.6 V to the battery. If left in this condition, the battery is overcharged, shortening its service life.

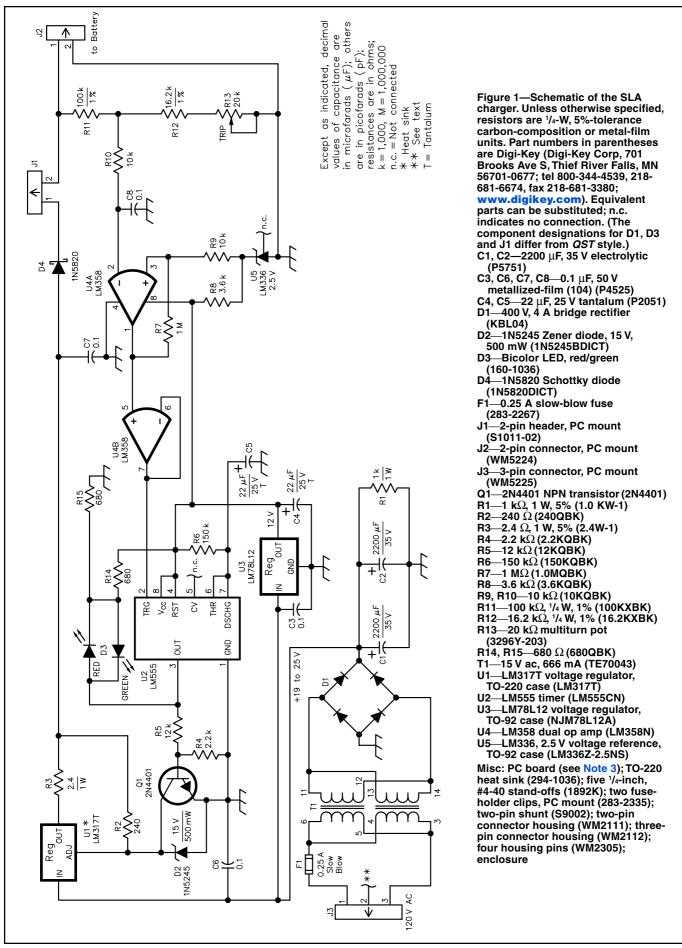
#### **UC3906-IC Chargers**

Chargers using the UC3906 SLA charge-controller IC work just like the three-mode charger described earlier except that their return from float mode to absorption mode is based on voltage rather than current. Typically, once the charger is in float mode it won't return

to absorption mode until the battery voltage drops to 10% of the float-mode voltage (or about 12.4 V). Although this is an improvement over the three-mode charger, it still has the potential for overcharging a battery to which a light load is attached.

First, let's look at the situation where a UC3906-controlled charger is in absorption mode and you turn on the K2 receiver, applying a load. The battery is fully charged, but because the load is drawing 220 mA, the charging current never drops to 30 mA and the charger remains in absorption mode, thinking that it is the battery that is asking for the current. As with the three-mode charger, the battery is subject to being overcharged.

If we remove the load by turning off the K2, the current demand drops below 30 mA and the charger switches to float mode (13.8 V). When the K2 is turned on again, because the charger is able to supply the 220 mA for the receiver, the battery voltage doesn't drop, so the charger stays in float mode and all is well. However, if the transmitter is keyed (increasing the current demand), the charger can't supply the required current, so it's taken from the battery and the battery voltage begins to drop. If we unkey the transmitter before the battery voltage reaches 12.4 V, the charger stays in float



mode. Now it takes much longer for the charger to supply the battery with the power used during transmit than it would have if the charger had switched to absorption mode.

#### SLA batteries must be recharged on a regular basis.

Let's key the transmitter again, but this time keep it keyed until the battery voltage drops below 12.4 V. At this point, the charger switches to the absorption mode. When we unkey the transmitter, we're back to the situation where the charger is locked in absorption mode until we turn off the receiver.

#### Why Worry?

So, why this concern about overcharging an SLA battery? At 13.8 V, the battery self-limits, drawing only enough current to offset its self-discharge rate (typically about 0.001 times the battery capacity, or 2.9 mA for a 2.9 Ah battery). An SLA battery can be left in this floatcharge condition indefinitely without overcharging it. At 14.6 V, the battery takes more current than it needs to offset the self-discharge. Under this condition, oxygen and hydrogen are generated faster than they can be recombined, so pressure inside the battery increases. Plastic-cased SLA batteries such as the PS-1229A have a one-way vent that opens at a couple of pounds per square inch pressure (PSI) and release the gases into the atmosphere. This results in drying the gelled electrolyte and shortening the battery's service life. Both undercharging and overcharging need to be avoided if we want to get maximum service life from the battery.

Continuing to apply 14.6 V to a 12-V SLA battery represents a relatively minor amount of overcharge and results in a gradual deterioration of the battery. Applying a potential of 16 V or excessive bulk-charging current to a small SLA battery from an uncontrolled solar panel can result in serious overcharging. Under these conditions, the overcharging can cause the battery to overheat, which causes it to draw more current and result in thermal runaway, a condition that can warp electrodes and render a battery useless in a few hours. To prevent thermal runaway, the maximum current and the maximum voltage need to be limited to the battery manufacturer's specifications.

#### **Design Decision**

To avoid the potential of overcharging a battery with an automatic charger

locked up by the load, I decided to design my own charger, one that senses battery voltage rather than current in order to select the proper charging rate. A 500-mA current limiter sets the maximum bulk rate charge to protect the battery and the charger's internal power supply. Like the three-mode chargers, when a battery with a low terminal voltage is first connected to the charger, a constant current of 500 mA flows to the battery. As the battery charges, its voltage begins to climb. When the battery voltage reaches 14.5 V, the charger switches off. With no charge current flowing to the battery, its voltage now begins to drop. When the current has been off for four seconds, the charger reads the battery voltage. If the potential is 13.8 V or less, the charger switches back on. If the voltage is still above 13.8 V, the charger waits until it drops to 13.8 V before turning on. The result is a series of 500-mA current pulses varying in width and duty cycle to provide an average current just high enough to maintain the battery in a fully charged condition. Because the repetition rate is very low (a maximum of one current pulse every four seconds) no RFI is generated that could be picked up by the K2 receiver. Because the K2's critical circuits are all well regulated, slowly cycling the battery voltage between 13.8 V and 14.5 V has no ill effects on the transmitted or received signals.

# Thermal runaway can warp electrodes and render a battery useless in a few hours.

As the battery continues to charge, the pulses get narrower and the time between pulses increases (a lower duty cycle). Now when the K2 receiver is turned on and begins drawing 220 mA from the battery, the battery voltage drops more quickly so the pulses widen (the duty cycle increases) to supply a higher average current to the battery and make up for that taken by the receiver. When the K2 transmitter is keyed, it draws about 2 to 3 A from the battery. Because the charger is current limited to 500 mA, it is not able to keep up with the transmitter demands. The battery voltage drops and the charger supplies a constant 500 mA. The battery voltage continues to drop as it supplies the required transmit current. When the transmitter is unkeyed, the battery voltage again begins to rise as the charger replenishes the energy used during transmit. After a short time, (depending on how long the transmitter was keyed) the battery voltage reaches 14.5 V and the pulsing begins again. The charger is now fully automatic, maintaining the battery in a charged condition and adjusting to varying load conditions.

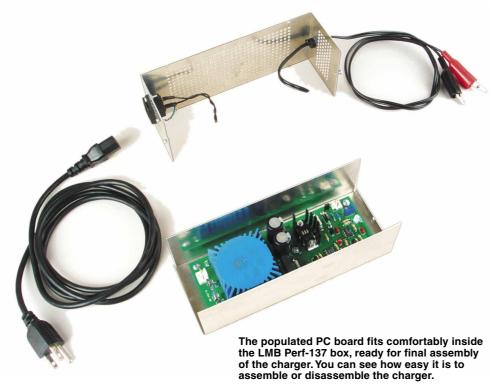
The great thing about this charging system is that during transmit the majority of the required 2 to 3 A is taken from the battery. When you switch back to receive, the charger is able to supply the 220 mA needed to run the receiver and deliver up to 280 mA to the battery to replenish what was used during transmit. This means that the power source need only supply the average energy used over time, rather than being required to supply the peak energy needed by the transmitter. (You don't need to carry a heavy 3-A regulated power supply with your K2.) As long as you don't transmit more than about 9% of the time, this system should be able to power a K2 indefinitely.

Have you ever noticed that sometimes when your H-T has a low battery and you drop it into its charger you hear hum on the received signals? This charger's power supply is well filtered to ensure that there is no ripple or ac hum to get into the K2 under low battery voltage conditions.

#### **Circuit Description**

The charger schematic is shown in Figure 1. I've dubbed the charger the PCR12-500A, short for Pulsed-Charge Regulator for 12-V SLA batteries with maximum bulk charge rates of 500 mA. U1, an LM317 three-terminal voltage regulator, is used as a current limiter, voltage regulator and charge-control switch. A 15-V Zener diode (D2) sets U1 to deliver a no-load output of 16.2 V. R3 sets U1 to limit the charging current to 500 mA. When Q1 is turned on by the LM555 timer (U2), the ADJ pin of U1 is pulled to ground, lowering its output voltage to 1.2 V. D4 effectively disconnects the battery by preventing battery current from flowing back into U1. A Schottky diode is used at D4 because of its low voltage drop (0.4 V).

An LM358 (U4A) operates as a voltage comparator. U5, an LM336, provides a 2.5-V reference to the positive input (pin 3) of U4. R11, R12 and R13 function as a voltage divider to supply a portion of the battery voltage to pin 2 of U4A. R13 is adjusted so that when the battery terminal voltage reaches 14.5 V, the negative input of U4A rises slightly above the 2.5-V reference and its output switches from +12 V to 0 V. When this happens, the 1-M $\Omega$  resistor (R7) causes the reference voltage to drop a little and provide some hysteresis. The battery voltage must now drop to approximately



13.8 V before U4A turns back on.

U4B is a voltage follower. It pulls the trigger input (pin 2) of U2 to 0 V, causing its output to go to 12 V. U4B's output remains at 12 V until C5 has charged through R6 (approximately four seconds) and the trigger has been released by U4A sensing the battery dropping to 13.8 V or less. While the output of U2 is at 12 V, emitter/base current for Q1 flows via R5 and Q1's collector pulls U1's ADJ pin to ground, turning off the charging current.

The output of U2 also provides either +12 V or 0 V to the bicolor LED, D3. R14 and R15 form a voltage divider to provide a reference voltage to D3 such that D3 glows red when U2's output is +12 V and green when U2's output is at 0 V. When ac power is applied but U1 is switched off and not supplying current to the battery, D3 glows red. When U1 is on and supplying current to the battery, D3 is green. As the battery reaches full charge, D3 blinks green at about a four-second rate. As the battery charge increases, the on time of the green LED decreases and the off time increases. A fully charged battery may show green pulses as short as a half-second and the time between pulses may be 60 seconds or more.

T1, D1, C1 and C2 form a standard full-wave-bridge power supply providing an unregulated 20 V dc at 500 mA. U3, an LM78L12 three-terminal regulator, provides a regulated 12-V source for the control circuits.

Note that the mounting tab on U1 is not at ground potential. U1 should be mounted to a heat sink with suitable elec-

trically insulated but thermally conductive mounting hardware to avoid short circuits. Suitable mounting hardware is included with the PC board (see Note 4).

#### Other Bulk-Charge Rates

The maximum bulk-charge rate is set by the value of R3 in the series regulator circuit. The formula used to determine the value of this resistor is  $R_{\rm ohms} = 1200 \, / \, I_{\rm mA}$ . T1 must be capable of supplying the bulk charge current and U1 must be rated to handle this current. The LM317T used here is rated for a maximum current of 1.5 A *provided* it has a heat sink sufficiently large enough to dissipate the generated heat. If you increase the bulk-charge rate, you'll definitely need to increase the size of the on-board heat sink. Mounting U1 directly to the housing (be sure to use an insulator) may be a good option.

#### **Transformer Substitution**

I selected T1 because of its small size and PC-board mounting. You can substitute any transformer rated at 15 or 16 V ac (RMS) at 500 mA or more. You may find common frame transformers to be more readily available. You can mount such a transformer to an enclosure wall and route the transformer leads to the appropriate PC-board holes.

#### Construction

There is nothing critical about building this charger. You can assemble it on a prototyping board, but a PC board and heat sink are available. The specially ordered heat sink supplied with the PC

board is <sup>1</sup>/<sub>4</sub>-inch higher than the one identified in the parts list and results in slightly cooler operation of U1. The remaining parts are available from Digi-Key.

Be sure to space R1 and R3 away from the board by <sup>1</sup>/<sub>4</sub> inch or so to provide proper cooling. R13 can be a single-turn or a multiturn pot. You'll probably find a multiturn pot makes it easier to set the cutoff voltage to exactly 14.5 V.

#### R13 Adjustment

To check for proper operation and to set the trip point to 14.5 V dc, we need a test-voltage source variable from 12 to 15 V dc. A convenient means of obtaining this test voltage is to connect two 9-V transistor-radio batteries in series to supply 18 V as shown in Figure 2. Connect a 1-k $\Omega$  resistor (R2) in series with a  $1-k\Omega$  potentiometer (R1) and connect this series load across the series batteries with the fixed-value resistor to the negative lead. The voltage at the pot arm should now be adjustable from 9 to 18 V. During the following procedure, be sure to adjust the voltage with the test supply connected to the charger at J2 because the charger loads the test-voltage supply and causes the voltage to drop a little when it's connected.

Remove the jumper at J1 and apply ac line voltage to the unit at J3. Turn R13 fully counterclockwise. D3 should glow green. Connect the test voltage to J2 and adjust R1 of Figure 2 for an output of 14.5 V. Slowly adjust R13 clockwise until D3 glows red. To test the circuit, wait at least four seconds, then gradually reduce the test voltage until D3 turns green. At that point, the test voltage should be approximately 13.8 V. Slowly increase the test voltage again until D3 turns red. The test voltage should now read 14.5 V. If it is not exactly 14.5 V, make a minor adjustment to R13 and try again. The aim of this adjustment is to have D3 glow red

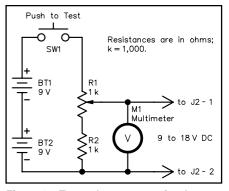


Figure 2—Test voltage source for the battery charger. (The component designation for the push-button switch differs from *QST* style.)

just as the test voltage reaches 14.5 V.

To test the timer functioning, remove the test voltage from J2 and set it for about 15 V. Momentarily apply the test voltage to J2. D3 should turn red for approximately four seconds, then turn green. The regulator is now calibrated and ready for operation. Remove the test voltage and ac power and install the jumper at J1.

#### A Suitable Enclosure

I used an 8×3×2.75-inch LMB Perf-137 box (Digi-Key L171-ND) to house the charger. An alternative enclosure is the Bud CU482A Convertabox, which measures 8×4×2 inches (available from Mouser). If you use the Convertabox, be sure to add some ventilation holes directly above the board-mounted heat sink. The LMB Perf box comes with a ventilated cover. If you are inclined to do some metal work, you could build your own enclosure using aluminum angle stock and sheet and probably reduce the size to perhaps 8×3×2 inches. If you use a PC-board-mounted power transformer, watch out for potential shorts between the transformer pins (especially the 120-V ac-line pins) and the case. If you use a metal enclosure, connect the safety ground (green) wire of the ac-line cord directly to the case.

#### Operation

It is very important that this charger be connected directly to the SLA battery with no diodes, resistors or other electronics in between the two. The charger works by reading the battery voltage, so any voltage drop across an external series component results in an incorrect reading and improper charging. For example, the Elecraft K2 has internal diodes in the power-input circuit, so it's necessary to add a charging jack to the transceiver that provides a direct connection to the battery. Now I can leave my K2 connected to the charger at all times and be assured that its internal battery is fully charged and ready to go at a moment's notice.

#### Notes

<sup>1</sup>Larry Wolfgang, WR1B, "Elecraft K2 HF Transceiver Kit," Product Review, *QST*, Mar 2000, pp 69-74.

2Although this charger was designed specifically for use with the Power-Sonic PS-1229A SLA battery used in the Elecraft K2 transceiver, its design concepts have wide ranging applications for battery operated QRP rigs of all types.

<sup>3</sup>Although it's labeled a 12-V battery, the terminal voltage is nominally 13.8 V with no load

<sup>4</sup>A PC Board (double sided, plated through holes, solder masked and silk screened) and heat sink are available from Intelligent Software Solutions, PO Box 522, Garrisonville, VA 22463-0522. Price: \$18 plus \$1.50 shipping in the US and Canada.

Bob Lewis, AA4PB, became interested in Amateur Radio during junior high school in the late '50s. With the encouragement of his cousin, Al Krugler, K8DDX, Bob obtained his Technician license (K8KNI) and spent most of his time on 6-meter AM in the Detroit, Michigan area. His early interest in Amateur Radio resulted in a career in electronics, first as a radio mechanic in the air-transport industry, followed by ten years in the Navy as an aviation electronics technician. While in the Navy, Bob found 6-meter activity to be a bit sparse in the middle of the Atlantic Ocean, so he upgraded to General, then Advanced and finally, Extra class. He enjoys QRP, PSK31 and homebrewing. Bob is retired from Civil Service, currently working part-time for an electronics consulting firm. You can contact him at Box 522, Garrisonville, VA 22463; rlewis@staffnet.com.

#### **NEW PRODUCTS**

#### ATTENTION WRITELOG USERS

♦ WriteLog contest logging software (version 10.23 and later) now includes the ability to use K6STI's RITTY high-performance sound-card-based program. RITTY is available from Brian Beezley, K6STI, 3532 Linda Vista Dr, San Marcos, CA 92069; k6sti@n2.net. \$100, check or money order only. For more information about WriteLog, go to www.writelog.com.

## VHF PHANTOM ANTENNA FROM ANTENEX

♦ Antenex Inc has recently released an improved version of their VHF Phantom mobile antenna.

The Antenex Model TRA(B)1420 can



be tuned to cover any 1 to 1.5-MHz frequency range between 142 and 164 MHz (versions for other bands and frequency ranges are also available). The antenna is contained in a rugged cylindrically shaped ABS radome that's approximately 3<sup>1</sup>/<sub>2</sub> inches tall and 2<sup>1</sup>/<sub>2</sub> inches in diameter. A tuning inductor, adjustable with an Allen wrench, is easily accessible through a small hole in the side of the enclosure. The TRA(B)1420 mounts on standard NMO-style bases. Mount and cable components are sold separately.

For more information on the TRA(B) 1420 and the entire line of Antenex antennas, antenna mounts and antenna related products, visit your favorite Amateur Radio products dealer or contact Antenex, 2000-205 Bloomingdale Rd, Glendale Heights, IL 60139; tel 800-323-3757 or 630-351-9007, fax 630-351-9009; sales@antenex.com; www.antenex.com.

## DK9SQ ALL-BAND FOLDED VERTICAL

♦ Kanga US has added the DK9SQ Folded Vertical to its line of DK9SQ products.

The new antenna covers all amateur bands from 80 through 10 meters. The 60-foot long wire is designed to be mounted on a 33-foot DK9SQ telescop-

ing mast (available separately). Jumpers are provided at 33, 41 and 50 feet. The collapsible DK9SQ mast makes it easy to connect the appropriate jumper for the band of interest. Only one coil (not a trap) is used to resonate the antenna on 80 meters. A length adjustment is provided at the feedpoint for fine tuning the resonant frequency.

No antenna tuner is required, but a good ground or radials are necessary for proper operation. The antenna can also be used on all bands without changing the jumpers by opening the 50-foot jumper and employing a tuner. In this configuration, the antenna is said to present a low feedpoint impedance on all bands except 12 meters and can be matched with a tuner.

As with all DK9SQ products, the new vertical antenna is designed to be easily and quickly erected by one person.

The antenna will be available at the DK9SQ booth (Booth #9—shared with the DARC) at the Dayton Hamvention (May 18th through the 20th, 2001).

Kanga carries the entire line of DK9SQ antenna products. For further information contact Kanga US, 3521 Spring Lake Dr, Findlay, OH 45840; tel 419-423-4604; kanga@mail.bright.net; www.bright.net/~kanga/.

Previous • Next New Products

Jordan by Radio

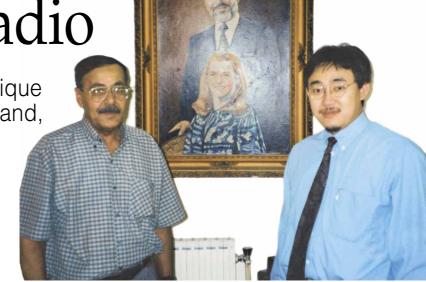
Operating from Amman is a unique experience regardless of the band, but as this author discovered, the real surprise was waiting on 6 meters.

hen I learned in 1997 that I would be spending three years in the Kingdom of Jordan, many thoughts and feelings ran through my mind, including "What a great DX location!" Jordan, at the time, was led by one of Amateur Radio's most famous operators, the late King Hussein, JY1, and the kingdom welcomed foreign hams. In addition, I assumed that licensing would be easy because the United States and Jordan had a reciprocal licensing agreement, so I photocopied my license and mailed an application to the Royal Jordanian Radio Amateurs Society (RJRAS) in Amman.

By the time my wife and I were ready to depart in September, however, I still hadn't received any response to my application. Hoping that things would eventually work out, I shipped my radio gear (a 2-meter H-T, a Uniden HR-2510 10-meter transceiver and a Cushcraft R-7 multi-band vertical antenna) along with our household goods. With the sunspot cycle improving and an undetermined amount of time available for operating, I thought that 10 meters would keep me occupied. If my application wasn't approved, the equipment could easily be stored in a closet.

#### Working Through the Red Tape

After getting settled in western Amman, I stopped by the RJRAS head-quarters at the King Hussein Sports City complex, conveniently located only a few blocks from our house. In Jordan, as in many other countries, Amateur Radio is considered a sport rather than a hobby, and the headquarters building is located right next to the soccer stadium. Ibrahim Khader, JY5IM, the RJRAS caretaker,



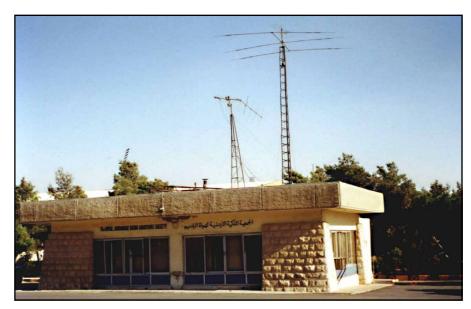
Ibrahim Khader, JY5IM and Toji Tahara, JY9NX, at the Royal Jordanian Radio Amateurs Society headquarters.

graciously showed me JY6ZZ, the society's club station, and explained the procedures for obtaining a license. I also met with the society's secretary, Mohammad Balbisi, JY4MB, who provided me with an application. He noted that the society no longer took applications by mail but, because I had an Advanced-Class US license, it would be no problem to obtain a JY call sign.

There was a small catch, however. The annual license fee was 60 dinars—about

\$87—and all licenses expire in December of each year, regardless of when they are issued. Because it was October by this time—and my equipment probably wouldn't arrive until December—I decided to wait until January of 1998 to apply for a license.

When I finally did submit my paperwork, Ibrahim explained that the JY9 prefix was assigned to resident aliens, JY8 to temporary visitors and JY6 to club stations. JY1, of course, was held by the



The Royal Jordanian Radio Amateurs Society headquarters at King Hussein Sports City, Amman.

king! I would therefore be granted a call sign with a JY9 prefix. At the time, the only other JY9 station belonged to George Schmidt, JY9QJ, a German ham and avid contester. I became JY9NE in early March.

#### On the Air at Last with a Magic Band Twist

Now that I was legal, I mounted the Cushcraft R-7 on the roof of our house and began operating. The Uniden only put out 25 W and, although I was making lots of contacts into Europe and Africa on 10 meters, I wanted to do more. After several months on the air I bought an Alinco DX-70TH, which opened up 6 meters and the HF bands. For 6-meter operation I put a simple dipole on the roof. Unfortunately, because of space limitations, it wasn't possible to erect a beam for HF or 6 meters.

The HF bands were fun, and I usually generated the biggest pileups on 12 and 17 meters, although 10 meters continued to be my favorite band. In fact, as the sunspot cycle improved I was able to work the world on 10 with only 100 W. I also enjoyed operating on 15, 20 and 40 meters.

Prior to going to Jordan I had never played with 6 meters. When I first arrived, Ibrahim told me that 6-meter work was legal, but that no locals really operated on the band. British hams had mounted a 6-meter DXpedition years earlier, but Jordanian hams hadn't been very active on the band since then and the country was in great demand.

When sporadic-E propagation brought my signal into Europe, *intense* pileups resulted. I liked 6 meters so much that I volunteered to be the Jordanian liaison with the Six Club, and I encouraged other local hams to try the band.

About a year into my stay, Koji Tahara arrived and became JY9NX. Koji quickly became interested in 6 meters, bought a beam antenna and declared that his goal was to earn DXCC on the Magic Band. His Magic Prefix couldn't hurt!

It wasn't long before I began seeing his call sign mentioned in *QST*. Koji made contacts over amazing distances into the Americas and the Far East. Aside from working 6 meters, he was also an outstanding HF contester. When George transferred to Saudi Arabia, Koji took his place as Amman's high-power contest

Ali Yashruti, JY4NE, a local Jordanian, became active about the same time that Koji arrived in Jordan and, like Koji, he took an interest in 6-meter operations and HF contesting. When Palestine was granted its E4 prefix and became a sepa-



From left to right: Sami Tarazi, E44B; Gabi Mardiros, OD5NJ, the author and Ali Yashruti, JY4NE.



The author at his station in Amman.

rate DXCC entity, he obtained E44A and now periodically operates from Gaza. He travels to Lebanon quite often, too, and has a well-equipped shack in Beirut where he operates as OD/JY4NE. Operating from all of these rare countries has made him skilled at running pileups!

#### The Social Side

Ali had frequent "ham radio gettogethers" at his home in western Amman. He would invite local and visiting operators and their spouses for a social evening. On occasion, the hams would migrate to his shack, but we would usually simply enjoy each other's company.

I met Salah Khalaf, JY5SK, at one of these gatherings. Salah was educated in the United States and still maintains a schedule with one of his best friends, an American ham in the Midwest. Ali's last event before I left the country included Sami Tarazi, E44B, and Gabriel (Gabi) Mardiros, OD5NJ. Sami and Ali were fellow students at Syracuse University. A

few Amman-based Syracuse alumni stopped by as well. No matter how many people showed up, Ali and his wife Hoda were always wonderful hosts.

Another popular meeting spot for Jordanian hams was, not surprisingly, the lounge at RJRAS headquarters. Ibrahim would open the building on Sundays, Tuesdays and Thursdays at about 4 PM. Many members would stop by to play cards or chat. One regular was Mahmoud Wreikat, JY5HL. Mahmoud worked for the Jordanian Telecommunications Regulatory Agency and sometimes represented his country at international telecommunication meetings. On Friday, which was the weekend for most people, the station was available for use if arrangements were made with Ibrahim ahead of time.

I met other Jordanian hams only on the air, not in person. Zeidan Hussein, JY3ZH, ran a local net on 14.252 MHz every Friday morning in English and Arabic. Aside from local Jordanians, amateurs from a number of neighboring countries would check in. On the WARC bands I often ran into Dr. Munzir Qraini on 12 and 17 meters. Dr. Munzir was well known in local circles for his equipment and antenna system. To my disappointment, I never had the good fortune to hear King Hussein on the air.

With all the good friends my wife and I made in Jordan, it was with mixed emotions that we left Amman in August of 2000. The Jordanian people, and especially the Amateur Radio operators, treated us like family. We will miss them. You can contact the author at 1325 Crestwood Dr, Westminster, MD 21157; n3fne@netscape.net.

# Sagar 2000: Public Service in India

Has your public service club ever been overwhelmed while providing communications for large community events? Want to try handling a million-plus attendees who speak 20 languages and 300 dialects—with mostly homebrew gear?

January 2000 the Mobile Operations Team (MOT) of the Calcutta VHF Amateur Radio Society ventured to the sprawling sand and sea at Ganga Sagar to help the district administration during the Ganga Sagar Mela (translated as "the sea carnival at Sagar Island"), an annual festival that takes place on the 14th and 15th of January, when millions of pilgrims throng to Sagar Island to take a holy dip in the Ganges.

Ganga Sagar, located in the East Indian state of West Bengal (bordering Bangladesh, S21, in the east and Bhutan, A5, and Nepal, 9N, in the north) is a remote delta island in the Bay of Bengal where the Ganges River empties into the Indian Ocean.

There are two main crossover points from the mainland, namely Lot 8 and Namkhana. The Namkhana ham station was manned by Anup, VU3BIS, and Dalim, VU3BIV. Lot 8 was manned by

Nikhil, VU2NKI; Kiddy, VU2PDG; and Jishnu (an SWLer who has passed the ASOC exam and is awaiting his ticket).

Kachuberia, opposite Lot 8 on the island, was staffed by Swapan, VU3SJR, and Sanjib, VU2TIL. Chemaguri, opposite Namkhana, was operated by Som, VU2EWS, and Santosh, VU2SKI,

## Islands On The Air (IOTA) Recognizes Sagar Island

The Calcutta VHF Amateur Radio Society operated from Sagar Island during Sagar Mela 2001, which took place from January 11 to 16. In addition to providing the usual public-service comms, the ham team handled Sagar Island's IOTA debut as IOTA No. AS-153. Sagar Island, part of the West Bengal Island Group, has been given permanent IOTA recognition from the RSGB. The CVARS group will again operate from Sagar at the same time in 2002.

a veteran ham but a fresh face in mobile operations.

Horey, VU2HFR, and Joy, VU2JSH, operated the HF and VHF base stations at Sagar Tower. The information centers at the Mela grounds were manned by Debashish, VU2DBA, and Surojit, VU2SKD.

Kitchu, VU2KFR, and Raju (SWL) patrolled the Mela grounds and the beach.

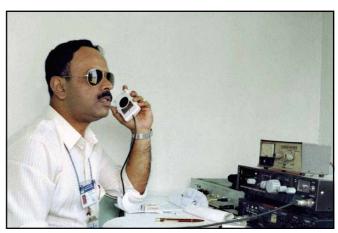
#### **Public Service**

This was our second Ganga Sagar operation, the first being in 1998 (we missed 1999). Sagar 2000, however, was special. As the new century got underway, we comprised a well-knit Mobile Operations Team with nearly a dozen outings behind us. The most recent and most involved was in Orissa, where we succeeded despite our meager resources.

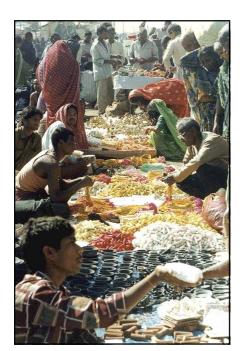
We journeyed to Sagar in a bus provided by the state government. The trip—in the dead of night—was spectacular



Setting up the ground-plane and five-element Yagi antennas built by VU3BIS.



Kitchu, VU2KFR, on the air.



The splendor of the Sagar 2000 bazaar.

thanks to a mystical blanket of thick fog that shrouded our bus during the trip. VHF propagation was fantastic, and we maintained S9 communication with VU2EM and many other operators from Calcutta (a 100 km or so) with only our bus-mounted dipole.

We spent an uncomfortable night sleeping inside the bus. This was a bit of an omen, as Sagar operations are quite tough. They definitely test personal character and tenacity. Accommodations and sanitation fall far short of five-star standards. Hoglas—makeshift thatched shelters made from hogla tree leaves—and straw beds provide the basics and add to the adventure.

The teams split at Lot 8, with the island groups crossing to Kachuberia, exactly opposite Lot 8 on the island. The crossover was uneventful except for the fantastic view of the meandering Ganges on its way to meet the ocean. Sagar Island slowly appeared on the horizon, dotted with little ferries that seemed like insignificant spots on Mother Nature's natural canvas. I felt like shouting, "Land Ho!" as our ancestors would have done centuries ago. Scenery aside, I kept a sharp eye on the water, always fearing that a crocodile or a shark (the island is in an estuary) might suddenly lunge out of the murky depths.

At Kachuberia, the teams again split into two groups—one for Chemaguri and the other for the Sagar Mela grounds, the main venue for the carnival. From here on it was an endless sea of humanity, with countless heads and hoglas.

By the evening of January 13 we had



Work begins at dawn for the Sagar 2000 amateurs.

settled in at our respective posts and had started dress rehearsals for the grand finale. Most of the 2-meter links we used were made via our homebrewed, 2-meter, double-channel, crystal-controlled transceivers, barefoot (1.5 W) or with homebrewed amplifiers feeding vertical dipoles or ground-plane antennas. Only at Sagar, which was the southern-most station located the farthest from Calcutta, did we use a ground-plane and a five-element Yagi homebrewed by VU3BIS.

#### **Homebrew HF**

This year's star attraction at Sagar was the Sunspot 2000, or SS2000, the 20-meter HF SSB transceiver (15-W output from a single 12-Vdc source) designed specifically for mobile work by our Mobile Operations Team. The SS2000 was the warhorse of the Orissa operation that had enabled us to venture into that region after a huge cyclone had wreaked havoc in October of 1999.

The SS2000, installed at Sagar tower at the Mela grounds, fed a 20-meter dipole. The HF station enabled us to maintain a 24-hour link with Dipu, VU2DPD, in Calcutta, as a second emergency link in case of any calamity. The HF link worked well except for a few near-skip periods on 20 meters when signal reports with Calcutta stations fell to about S4.

#### A Sea of Humanity

With as many as a million people gathering to wade into the confluence of the river and the sea, getting lost or losing loved ones is quite easy and can happen to anyone. This is where our ham team triumphed. We handled all of the "lost and found" traffic at Sagar, which turned out to be the experience of a lifetime.

All missing persons comms were routed through the CVARS team, as were the announcements made over the public address systems. It was a difficult task indeed, especially handling people who had lost everything and might be sobbing

and wailing uncontrollably.

The main event took place on the dawn of 14th and 15th of January, when close to a million people took a dip on what is regarded as a very auspicious occasion. By the 15th it was all over. We pulled down our antennas the same night and were back in Calcutta the following afternoon.

#### The CVARS Wants You

The Calcutta VHF Amateur Radio Society is trying to make the Sagar celebration an annual and national event. Members are looking for hams from all over the country—and abroad—to join and strengthen our operation. The necessity of developing a digital network is obvious. A 2-meter data link would be of great value in exchanging information and transferring files.

The possibility of using amateur television equipment may also be explored. A UHF modulator and down-converter has been developed and tested. The hardware, designed by Rudolph Graph, KA2CWL, and William Sheets, K2MQJ, appeared in *QST*.

Maintaining an ATV link between Sagar and Calcutta—a distance of more than 100 km—should be quite challenging. With a little help from Mother Nature, however, the link may prove easier than one might think. During the 2000 Mela, the thick evening fog often enhanced VHF communications to the point where S9 QSOs with hand-held transceivers were possible between Sagar Island and Calcutta—over a seemingly incredible distance!

The Sagar operation gave us the opportunity to test our skills, improve our endurance and, above all, maintain the best tradition of Amateur Radio—service to the nation.

You can contact the author at 9 Mandeville Gardens, #5F, Calcutta 700019, India; foxradio@cal.vsnl.net.in

Q<del>ST</del>,

# Get Your QSOs on Route 66!

Since Bobby Troup wrote a catchy little tune called *Get Your Kicks* on *Route 66* in 1946, more than 100 musicians have recorded the song, making it—and the highway it glorifies—unquestionably famous. In that spirit, a dozen Amateur Radio organizations put "the Mother Road" on the air to celebrate its storied history.

he Northern Arizona DX Association (NADXA), based in Flagstaff, Arizona, is a small ARRL-affiliated club dedicated to DXing and contesting. During one of its 1999 meetings, members expressed a desire to try something different. Discussions on exactly what our new activity should be continued over several months. One question eventually emerged: "Is it possible to experience the thrill of a DXpedition without actually going on one?"

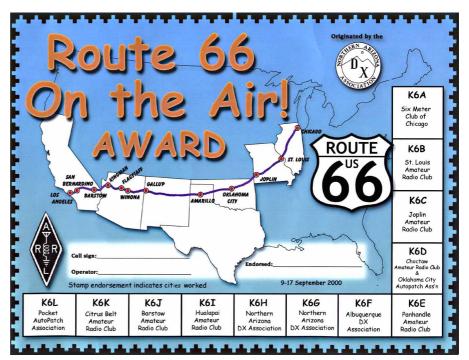
Special-event stations, eligible for temporary 1X1 call signs, celebrate specific people, places, anniversaries, etc. These operations have become quite popular, and many generate lots of activity. What special event could NADXA promote?

#### Route 66

US Route 66 was dedicated in 1926. It stretches 2448 miles from Chicago, Illinois, to Santa Monica, California, and passes through eight states. Paving wasn't completed until 1932. During the Great Depression, this highway was a major thoroughfare for those escaping the dust bowl and looking for a better life in the West.

After World War II, many discharged soldiers used Route 66 to get home. During the 1950s, Americans took advantage of post-war prosperity and traveled the road as part of their newly discovered leisure time. From 1960 to 1964, the popular television show *Route* 66 immortalized the highway in the minds of drivers across America and around the world.

As the nation's transportation infrastructure modernized, however, stretches of this historic road were bypassed by interstate highways. The process started in 1953 (Oklahoma City to Tulsa) and ended in 1984 (Williams, Arizona). US Route 66 was officially decommissioned in 1986. Pieces of the road are still in use today, renamed "Historic Route 66." I'm fortunate enough to live near Flagstaff,



Here is the Route 66 on the Air! certificate for the 2000 event. A minimum of one QSO with any of the special-event stations was required for the basic award. A red endorsement stamp (the outline of a US highway sign) is used to indicate the stations worked.

#### Route 66 on the Air—2001

In 2001, Route 66 on the Air! will be held from 0000Z September 8 to 2400Z September 16. Certificates may be obtained by sending \$3 and an application to NN7A. QSLs may be obtained directly from the individual clubs; SASEs are mandatory. We plan to add one or more new twists to our special event to celebrate the 75th anniversary, so stay tuned. For complete event information and an application, send an SASE to NN7A or check www.nadxa.com.

where some 28 miles of this highway still exists. Like many small towns in the Midwest and West, Historic Route 66 is Flagstaff's main drag.

#### Route 66 on the Air!

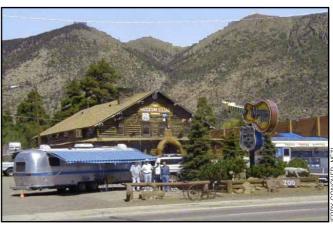
Jerry Ellison, W7ST, was the first person to suggest a Route 66 theme for our special-event operation. His arguments were quite persuasive. The road passes

through downtown Flagstaff and is integral to the city's identity. The mystique surrounding the highway has elevated it to near cult status among the many Route 66 associations the world over. (Enter "Route 66" into any web search engine and many thousands of URLs will appear.)

Route 66 is a big road and an even bigger concept, so Bob Wertz, NF7E, pro-



Here is the K6F "take-down" crew (shown top, I-r, are KE5BL, K5TA, KB5YAY and KC5WDV; shown bottom, I-r, are KB5VQC and KM5GH).



The K6H remote operation was located in front of the world famous Museum Club, a popular country music dance club in Flagstaff. The operators in this picture (shown I-r are W7ST, KA7TDH, NN7A and N3AIU) graciously allowed themselves to be dwarfed by the real star of the show, historic Route 66 (foreground).

posed that we enlist the help of other Amateur Radio clubs in cities along the highway. For the sake of novelty and simplicity, Jerry Conover, NE7I, suggested that we concentrate on cities mentioned in the Bobby Troup song, *Get Your Kicks on Route 66*.

We mustered support for our growing idea in several ways. For example, we used electronic mail extensively and found it to be a great communication tool. Who says that Amateur Radio and the Internet don't mix? We also spoke to friends and handed out flyers at hamfests. There was even a chance on-air encounter that led to a club joining the fold. Isn't ham radio great?

Over the next few months, we fleshed out the details. The clubs would be responsible for reserving their respective 1X1 call signs—K6A (Chicago) through K6L (Los Angeles). Club members (and any other hams they authorize) would use these call signs. The actual operating details (times, bands, modes, etc.) would be left up to the clubs, although we did decide on a number of suggested frequencies (± QRM). Anyone who worked one or more of the authorized stations would qualify for a stylish certificate. Certificate requests would go to NADXA, with QSL requests (including SASEs) going to the respective clubs.

A special event sponsored by a single organization requires time and dedication, but what about a special event sponsored by 12 organizations? As far as we knew, no other group of clubs had ever attempted such an ambitious (and possibly complicated) undertaking. We had originally planned to hold the special event in 2001, the 75th anniversary of Route 66's dedication. To identify possible problems, we decided to try a "dry run" in 2000, and hastily scheduled it

#### 2000 Event Call Signs and Clubs

Here are the 2000 special-event call signs and their associated cities and clubs. For more infomation about the clubs, pictures and QSL routes, see <a href="https://www.nadxa.com">www.nadxa.com</a>.

Call K6A K6B K6C	City Chicago, IL St. Louis, MO Joplin, MO	Club Six Meter Club of Chicago St. Louis Amateur Radio Club Joplin Amateur Radio Club
K6E K6F K6G	Oklahoma City, OK  Amarillo, TX  Gallup, NM  Winona, AZ	Choctaw Amateur Radio Club & Oklahoma City Autopatch Assn Panhandle Amateur Radio Club Albuquerque DX Association Northern Arizona DX Association
K6H K6I K6J K6K K6L	Flagstaff, AZ Kingman, AZ Barstow, CA San Bernadino, CA Los Angeles, CA	Northern Arizona DX Association Hualapai Amateur Radio Club Barstow Amateur Radio Club Citrus Belt Amateur Radio Club Pocket Autopatch Association

#### **Route 66 Event Frequencies**

Mode	80	40	20	15	10	6	
CW	3.533	7.033	14.033	21.033	28.033	50.033	
SSB	3.866	7.266	14.266	21.366	28.466	50.166	

from 0000Z on September 9 through 2400Z on September 17. Thus, "Route 66 on the Air!" was born!

#### Year 2000

To say that our special event was successful would be an understatement. The feedback from those we worked was entirely positive. A number of hams jumped at the chance to reminisce about their personal experiences on Route 66 (see the "Soapbox" at the end of the article). Nearly 14,000 QSOs were made by all of the clubs. In spite of the large number of hams trying to work us, every QSO was handled in a relaxed, friendly manner. At the time of this writing, we verified that more than 80 hams worked the special-event stations in all 12 cities.

Most of the special-event operators, including yours truly, had never been on

the receiving end of a pileup. I had a blast, and from what I've heard, so did everybody else. The most common questions heard among "Route 66 chasers" were, "Did you work that station?" and "Where is that station operating now?" On numerous occasions, the special-event stations were posted on the Internet DX cluster at www.dxsummit.com. We were hunted like rare DX!

Some of the clubs operated under Field Day conditions. In addition, many QSOs were generated from club members' home stations. The amount of public exposure varied among the participating clubs. The St. Louis Amateur Radio Club (K6B) operated from Route 66 State Park on the first weekend. NADXA operated K6H from the Museum Club and Buffalo Park on the first weekend, and K6G from the Winona Texaco on the second. The Albuquerque

DX Association (K6F) helped local hams in Gallup, New Mexico, on both weekends. The San Bernadino club (K6K) has a good reason to be proud. On the second weekend, members operated as part of the "Route 66 Rendezvous," a major local event. They erected towers and used trailers for sleeping quarters at their remote site. Great job, everyone!

Among the oldest hams we worked was Jim Mitchell, WA8ZTH, age 94, who drove on Route 66 in 1927 and 1928. At the other extreme we worked Tammy McCoy, AD6LH, age 10, who was born six years after the last section of Route 66 was bypassed. Other hams we worked include country music star Colin Rae, W4RAE, and Don Wilbanks, KC5MFA, from the Amateur Radio news service "Newsline." Although 2-meter frequencies were not on the suggested list, a number of QSOs were made on that band, allowing some Technician ops to qualify for a certificate.

For statistics and pictures from the 2000 special event, see www.nadxa.com.

#### **Lessons Learned**

The 2000 dry run turned out to be a really good idea. What we learned will benefit Route 66 on the Air! in 2001 and other prospective multi-organization special events.

Lesson 1: Your special event will always be more popular than originally envisioned. The general consensus among NADXA members was that the special-event stations would make between 5000 and 10,000 QSOs. We significantly underestimated that number.

Lesson 2: Get all of the organizational work done ahead of time so you can concentrate on operating during the special event. Because NADXA had only a few months to organize the 2000 special event, we didn't get everything quite finished. For example, we delayed designing the certificates and QSL cards until October, but we were receiving requests while the special event was still in progress! As a result, we started preparations for 2001 almost immediately after the 2000 special event concluded.

Lesson 3: When you publicize your certificate and QSL information, make sure it's complete and accurate. Initially, there was some confusion concerning the information for the 2000 special event, but we eventually straightened everything out. We posted our information on www.nadxa.com, but unfortunately, some hams don't have access to the Web. Most of the special-event operators periodically gave out the information on the air, but even this isn't a perfect solution. We've found that there is no substitute for publicity in major ham magazines.

#### Soapbox

"I love the program and I really appreciate it. I came back from school on Route 66 many years ago."—N1UDH

"The pileups were incredible! I had to resort to taking callers by call areas. Maybe they thought I was in North Korea?"—NF7E (K6G)

"I will never forget turning onto Route 66 in Santa Rosa, New Mexico, on a full moonlit night, heading east in my 1962 Corvette with the top down and KOMA playing the Route 66 theme. Even then I knew the Mother Road was special. It doesn't get any better than that!"—WA1MKS

"This event was so popular that we were working a station a minute in several pileups."—AC7BN (K6I)

"I grew up in San Bernadino in the 1940s and lived in two houses on Route 66, as well as attending two schools that were located on Route 66. As a little boy I remember watching the military convoys drive by on their way out of the Cajon Pass to the desert camps around Barstow and Victorville —K6MDG/5

"I travelled Route 66 in 1941. I was in the army at San Luis Obispo. I hitchhiked from San Bernadino to Barstow..."—W5GZI

"Route 66 on the Air! was a memorable special operation for me. I was born and raised in Chicago, lived in Santa Monica and spent a lot of time at the corner where Route 66 ended."—W7LII

"I recently traveled much of Route 66 and it brought back many fond memories."—WB3DJU

Lesson 4: When the time for sending certificates and QSL cards finally arrives, give your members a unified log. Each K6G and K6H operator logged in a different manner, ranging from pencil-andpaper to various computer programs. Because of the large number of QSOs, we divided the QSLing chores among NADXA members. We found that the amount of time spent on writing out cards was negligible compared to searching through many logs in different formats. If possible, everyone should use the same logging program. If that program doesn't support a multiple-log merge feature, create ASCII files, import and combine them into a spreadsheet, and sort the QSOs by date and time (a separate log sorted by call sign is also useful).

Lesson 5: Publicize your special event, before, during and after the fact. Special events celebrate history, but they can also act as a "hook" to interest the general public in Amateur Radio. Local media outlets are ideal for this sort of publicity. If you're

operating remotely, a display poster is an effective form of advertising. And make sure to take pictures! They will come in handy when it's time to write that *QST* article or create a Web site for the event. Chances are good that someone in your group has a digital camera or scanner. Use these digital pictures to create a Web site. If you don't have or can't afford a Web site, check out free web hosting services such as GeoCities or Tripod.

#### Route 66-2001

With all that we've learned from our year 2000 effort, we're confident that we can do a better job in 2001 and make the event even more enjoyable for everyone. Those of you who plan to participate and send us certificate and QSL card requests in 2001 can help us, too.

First, make sure your certificate and QSL information is correct. This information includes addresses, costs, etc, and may be obtained from <a href="https://www.nadxa.com">www.nadxa.com</a>. We expect the cost of the certificate to increase in 2001. If you don't have Internet access, ask someone who does or check the major ham radio magazines for an announcement. Always send an SASE when requesting QSL cards. Special events are generally not money-making propositions, so don't be surprised if you don't receive a card if you don't send an SASE.

Also, we noticed that about five percent of the QSL cards we received were filled out incorrectly, making it difficult to find QSOs in the log. Remember, the harder it is for us to find your QSO, the longer it will take for us to respond. The most important information on your QSL card, aside from your call sign, is the date and time. Always use 24-hour UTC and never use AM/PM local time. In this era of computer logging, some of us forget to periodically check the date and time reported by our PCs. Make sure your machine is synchronized with reality!

Greetings from the "Mother Road," and see you in 2001!

#### **Acknowledgements**

The special-event operators would like to thank everyone we contacted for their good wishes, compliments and encouragement. Also, the NADXA would like to thank the other 11 clubs for their enthusiastic and highly professional participation before, during and after the event. Everyone owes Jerry Conover, NE7I, a great deal of thanks for stepping in as overall coordinator. Last, I'd also like to thank Jerry for his Route 66 research that appears earlier in this article.

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# Seventy-Five Years of JARL

Since the earliest days of Amateur Radio, Japanese hams have been active, enthusiastic and universally respected. Join them as they celebrate a landmark birthday. **Happy 75<sup>th</sup>, JARL!** 

Figure 1—Shozo Hara, JA1AN, president of the JARL.

The HQ occupies an eight-story building not far from a small station on Tokyo's circle-line railroad (see Figures 3 and 4). The ops and staffers there have much to be proud of, including HQ station JA1YAA (see Figure 5); the control center for Japan's three amateur satellites (see Figure 6); and office space for the staff required for such a large and active organization.

JARL Millennium Spec

The JARL produces a monthly journal; helps license foreign and Japanese hams; sponsors contests; conducts training and educational seminars; prepares for emergencies which, in a country afflicted with cyclones and earthquakes, come all too often; and all the other activities you'd expect from a League supporting a large and active membership. It's no surprise that the building is now too small!



Tokyo. Last year, an old friend, Atsumi Kawaguchi, JA4CX (see Figure 2), a new JARL Director, invited me to come to Tokyo to meet Hara-san and to have a look at JARL headquarters. I quickly agreed!



#### **Shared History**

Japanese hams and the JARL have had one serious bump in an otherwise smooth history. On December 8, 1941, the Imperial Government banned all Amateur Radio transmissions (and on December 13, all Amateur Radio reception). In 1945, after the war, the new National government once again permitted amateur reception, but not transmission.

To further their cause, JARL members asked Professor Yagi (co-inventor of the Yagi-Uda antenna) to serve as their president. A respected figure, his negotiations led to the enactment of a Radio Law in 1950 and an amateur band allocation in 1951. That year, 106 radio enthusiasts passed the first national exam to license radio amateurs. The ban on ham radio transmission was officially lifted with the signing of the Peace Treaty of San Francisco in 1952.



Figure 2—JA4CX and W8JJO look over an exhibit of antique radio gear at JARL HQ.



Figure 3—JARL headquarters in Tokyo, a shiny, silver building with HF antennas just visible from the narrow street. The modest front door shows a simple sign for the JARL.



Figure 7—Shown (left to right) are, Shozo Hara, JA1AN; Kumiko Fujihara, JH4MVN; and the author, W8JJO/7J4GWB.

The JARL QSL bureau—known for its efficiency—now handles about one million cards every month.

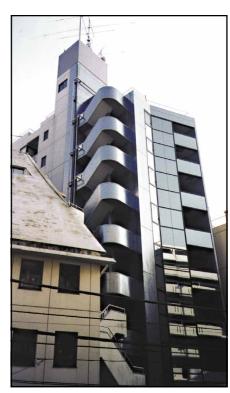


Figure 4—Another view of JARL HQ.

The JARL QSL bureau—known for its efficiency—now handles about one million cards *every month*. As of February 2000, the Bureau moved from its long-time Tokyo address to JARL QSL Bureau, Shobara Post Office, Shimane 699-0588. The Bureau's new manager, Kumiko Fujihara, JH4MVN (see Figure 7), says the JA Bureau is, in some measure, a model for other national QSL bureaus.

After I toured the building, Hara-san, Atsumi, Kumiko and I walked to a nearby shop to chat and enjoy some excellent tea. I learned that Hara-san started his radio

career right after World War II, when the government permitted amateur reception again in 1945. Starting in 1946, he edited a shortwave listeners' DX column in the Japanese magazine *CQ Ham Radio*. After Japan's hams got on the air again in 1952, Hara-san became quite active, especially on 6 meters.

Now, as JARL President, he's disturbed by what seems to be a crisis in numbers for Japanese licensed amateurs. According to the IARU, in 1998 Japan had more than 1,350,000 licensed amateurs (about twice the 675,000 licensed in the US). Too few, in his estimate, ever

transmit, and too few belong to the JARL.

He was pleased that the JA League had negotiated with the Ministry of Posts and Telecommunications for an expanded allocation in the 160-meter band: 15 kHz above 1.810 in addition to the 5-kHz sliver above 1.9075, all CW only. US hams should keep those frequencies in mind when trying to work Japan on the Gentleman's Band!

You can contact the author at Watari-cho 2257, Shantedorimu A101, Mito, Ibaraki 310-0902, Japan; bfield@ipc.ibaraki.ac.jp.



Figure 5—JARL headquarters station JA1YAA, with W8JJO/7J4GWB at the helm.



Figure 6—The control center for the Japanese satellites JAS-1, JAS-2 and JAS-3.

# Amateur Radio Direction Finding: USA Holds Its First National Championships

A ham radio foxhunt is even more exciting than the traditional English hare-and-hounds horseback sport, and no animals are put in danger. To ham radio operators, a foxhunt is a radio direction finding (RDF) contest. A "fox" is a hidden radio transmitter. Your opportunity to win foxhunting medals is coming this summer.

Tuesday July 31, hams from all over the world will arrive in Albuquerque, New Mexico. In their luggage will be loop, rod, and Yagi antennas, 80- and 2-meter receivers, batteries, compasses, running shoes and bottles of sunblock. There will be some room left, however, to pack their medals for the trip home.

Their passion is radio direction finding (RDF). Depending on local preferences, they call themselves foxhunters, foxtailers, radio-orienteers, and ARDFers. Their destination is the First USA Championships of Amateur Radio Direction Finding (ARDF).

Members of the Albuquerque Amateur Radio Club (AARC) are working hard to put out a first-class welcome. At head-quarters on the University of New Mexico campus, practice and training sessions begin on arrival day. Most competitors will stay in campus dorms, although they have the option of staying elsewhere.

Opening ceremonies, team and jury meetings, order-of-start selection and more training will fill Wednesday. There will also be time for everyone to get acquainted. Meals are included in the registration fee, and the servings are "all you care to eat."

On Thursday, all competitors board busses for an undisclosed location in the nearby mountains. Upon arrival, the hunters' 2-meter RDF equipment will be impounded as they warm up and await their start times. They can't turn on their receivers until they reach the end of the corridor beyond the starting line.

In accordance with worldwide standardized rules of the International Amateur Radio Union (IARU), five fox transmitters will be on the air. They won't be within 0.4 kilometer of each other, nor

less than 0.75 km from the start point. With these exceptions, they can be anywhere within the hunt boundaries.

The shortest distance to find all foxes and get to the finish is 5 to 10 kilometers. The only things hunters may use to navigate and find them is their RDF gear, their eyes, their magnetic compasses, and



Team USA 2000 members stood in formation for 90 minutes at the Nanjing opening ceremonies so attendees could take photos. Left to right in back row: Jack Loflin, KC7CGK; Gyuri Nagy, KF6YKN; Jay Thompson, W6JAY; Csaba Tiszttarto; Bob Cooley, KF6VSE. Front row: Karla Leach, KC7BLA; Harley Leach, KI7XF; Marvin Johnston, KE6HTS; Bob Frey, WA6EZV; Dick Arnett, WB4SUV. (Dale Hunt, WB6BYU, had not arrived yet.)

the detailed orienteering map they receive ten minutes before they start. Other assistance, either from humans (including teammates) or from high-tech gear (such as GPS) is strictly forbidden.

Fox number one repeats MOE slowly in Morse for 60 seconds. Then number two sends MOI, number 3 sends MOS, number 4 sends MOH, number 5 sends MO5, and the cycle repeats. You don't have to know the code to tell which fox is on, just count the dits.

Depending on their age and gender, competitors must try to find three, four or all five foxes within a preannounced time limit of 100 to 140 minutes. One hunter in each age/gender division is started each time Fox #1 begins transmitting.

#### Flags and Steel-Tape Beams

You might think that finding bricksized transmitter boxes in a 2000-acre woods would be as hard as finding needles in a haystack, but it's just a matter of stamina and skill. The foxes aren't truly "hidden," since rules call for a 3-sided redand-white orienteering prism to be placed within two meters of each one. Foxhunters can locate the transmitter, mark their competitor cards, and leave to find the next one without giving away the location.

Most VHF radio-orienteers prefer simple RDF antennas, such as 3-element Yagis or 2-element phased arrays. For ruggedness and safety, beams usually have flexible elements. Some are made from steel measuring tapes.

Receivers have wide-range RF attenuators, built-in or external. Headphones are preferred over loudspeakers on ARDF equipment. On many sets, the S-meter indication is the pitch or level of a tone in the headphones, so users can keep their eyes on the terrain instead of on a panel meter.

World champion foxhunters complete a full-sized two-meter course in about 45 minutes. They quickly mark the bearings to each fox on their maps as they head into the woods. There's no time to fiddle with a protractor, so they have trained to mark angles quickly and accurately without one. Some tape their pencils to a fingertip so they can't be accidentally dropped.

Radio-orienteers don't have to be marathoners to be successful. The best ones run almost all the way, but observers see lots of walking and pausing out on the course. Even if they don't find all the required transmitters, competitors make every effort to get through the roped corridor to the finish line within the time limit. One second late means disqualifi-



At age 15, Jay Thompson, W6JAY, of Santa Ana, California (wearing #198) was Team USA's youngest competitor in Nanjing. He's counting down the last seconds at the starting line. The others are in different age divisions.

cation, all effort going for naught.

ARDFers who find all the required foxes score highest, ranked by their elapsed times. Those finding all but one required fox are next in order of time, and so forth. Gold, silver and bronze medals await the best three finishers in each division. But before the medal ceremony takes place, the competitors must do it all again.

#### **Eighty Meters is Next**

IARU ARDF events always have two

#### **What's Your Division?**

The 2001 USA Championships will use nine new age/gender divisions that have been tentatively approved for future World Championships by IARU leaders in Europe.

Females	Males	Age range
D19	M19	19 and younger
D21	M21	Regardless of age
D35	M40	35/40 and older
D50	M50	50 and older
_	M60	60 and older

Competitors belong to the M19 or D19 division up to the end of the calendar year in which they reach age 19. Men age 40 or older or women age 35 or older belong to each division from the beginning of the calendar year in which they reach the given age.

Competitors in M21 division must search for all five fox transmitters. Competitors in D50 and M60 search for three foxes. All other divisions search for four. Required foxes for each division are designated in advance.

For more information on the new divisions, go to the Web site of the IARU Region 1 ARDF Working Group at www.ardf-r1.org/.

competitions, one on two meters (MCW) and one on 80 meters (keyed CW). The 80-meter hunt is a fresh start on a much different band. Once again, the site and the map are unfamiliar. Success or failure in yesterday's 2-meter hunt counts for nothing, as this is a separate competition for a separate set of medals.

Eighty meter signals don't reflect from trees, mountains and buildings the way 2-meter signals do. They follow the curvature of the earth within the hunt boundaries almost perfectly, except perhaps near long power lines or fences. Most hunters' 80-meter RDF sets have loop or ferrite rod antennas. Their bearing nulls are almost always sharp and accurate.

Overall, 80-meter RDF gear is smaller, lighter and less cumbersome. As a result, almost all competitors do better on 80-meters. Elapsed times are typically five to fifteen minutes less across the divisions, compared to two meters.

Once the 80-meter scores are all tallied by the jury, it's time for the final banquet, closing ceremonies, and presentation of medals. As in any contest, ham or non-ham, there are a few who are victorious, but many who have the joy of participation and learn many ways to improve next time.

#### The Past is Prologue

The roots of ARDF are in eastern Europe, where many young people learned the sport in schools when it began forty years ago.<sup>2,3</sup> In 1980, eleven nations competed in the first World Championships. After that, World Championships were staged somewhere in Europe about every two years until 2000, when they

#### **One Team USA Member's Story**

(Dick Arnett, WB4SUV, of Erlanger, Kentucky is a hospital manager by day and a radio-orienteer on weekends. An experienced mobile transmitter hunter, he first learned about radio-orienteering as Foxhunt Forum co-chair at the 1999 Dayton Hamvention. Here he describes his experiences in Nanjing.)

I decided in March 2000 to go to China for the ARDF World Championships. My wife gave me the overseas flight ticket as an early birthday present. Happy birthday!

Bob Frey, WA6EZV, and I spent many hours practicing in the park. In June, we went to California to participate in the Team USA Qualifying Runs, hosted by Joe Moell, K0OV. I came away from that and from every training event with new knowledge and a better understanding of some phase of ARDF.

As part of the Nanjing check-in procedure, we were issued photo ID badges. On the back in both Chinese and English were messages asking anyone we might approach to help us find our way, in the event we became separated from our group. It is fortunate that I did not have to use this, but having it was reassuring.

Surprise, our room had a computer! Within minutes Bob and I were on the Internet. As our room was one of a very few that had one, we had the opportunity to meet and talk with many other competitors. Whenever we were in the room, we had visitors waiting to send e-mails.

Another high point was BT4ARDF, the ham station on the twenty-ninth floor of the hotel. With temporary licenses, we spent some time on the air. QSL cards were provided to send from back home.

It took 25 busses to transport all teams to the exciting, colorful opening ceremonies. With most competitors wearing their team uniforms and the costumed entertainers, it was an impressive sight. The Chinese people made us feel welcome and honored. Any of us could have been the President of the USA and they wouldn't have treated us better. For at least an hour and a half, they stood in line to have their picture or their child's picture taken with the USA team. Other teams had their pictures taken too, but none for that long.

Next day, the locals came out to view the two-meter competition. Youngsters among them were curious about our belongings and would look in our bags. They wanted our flags, lunches, and anything else they found of interest. The

fenced-in waiting area had no seats, so we had to sit on the hillside. From my perspective it wasn't bad, but Bob almost sat on a snake and might have another opinion.

Ten minutes prior to my start time, my number was called and I was given the map. Oh my, there's an awful lot of dark green! The key says that this is heavy vegetation, or "fight." As it turned out, fight I did.

The trail led directly up a hill and after the first 750 meters, it was still going up. I heard MOS quite strong to the northeast. I left the trail and quickly realized what a struggle getting through the dark green

area would be. After about a hundred meters, I broke into an area of bamboo. It was much easier running, but the downhill was extremely steep, forcing me to grab onto the bamboo to slow myself while running down the hill. I ran through a garden area at the bottom of the hill looking for a trail that was marked on the map, but I didn't find it

The signal took me up another hill that was thick with vegetation. After fighting my way, I found MOS at the top. I knew I had passed MOH and decided to go for MOE and MOI that were both to the north. This route took me down a steep hillside with heavy pine tree vegetation. Once in the valley, I managed to find a trail that led north. It turned to the east and went up over another steep hill. I was following the signal north towards MOE when I realized MOI was at about thirty degrees. The common sense thing to do was to go after MOI first, then MOE.

The trail toward MOI ended in heavy vegetation, but I continued toward it for four more cycles, as the signal was quite strong. Then with time running short, I decided to head for the finish. I was traveling along as quickly as the vegetation would allow when I fell down a cliff through dense trees. My injuries were relatively minor, but my headphones had been ripped from my head and would not work. I tried my back-up pair, still nothing. My receiver was broken. Somewhere back up the cliff in the heavy vegetation was my map.

Using my compass, I went west and found a north/south trail. Supposing that I was north of home, I went south. After a mile, I realized that I was actually south. I retraced and found the finish corridor. With everyone cheering, I crossed the finish and went to the first aid station.

They next day was set aside for rest and local tours. I got additional treatment from the Slovakian team doctor. The following morning, we took another long bus ride to the 80-meter hunt. The tops of the hills vanished into the rain clouds. It was another day of heavy undergrowth, missing trails and wet bamboo.

Along my route, I had to cross a stream with rocks spaced across it. A French woman stepped back to allow me to charge across. I noticed the fear on her face as she tried to cross behind me, so I reached back to lend her a steady hand. Her expression turned to gratitude. (At the closing banquet, she thanked me and explained that she already

RICHARD THOMPSON, WA6NOL

had a severely sprained ankle.)

through the finish corridor

Coming down hill

was exciting, as it was lined with people cheering for all of the runners. After rehydrating, I spent the next several hours in the rain, cheering for the other finishers. It was interesting to see the expressions on the faces of those that had done well, done poorly, lost their card, and lost them-

Dick Arnett, WB4SUV, imprints his card at the finish line of the 2-meter competition in Nanjing.

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Arnett, WB4SUV

selves. I kept going over

the many things that I

could have done dif-

ferently, but I realized

that is all part of the learn-

ing process. I was just

happy to be there and to

finish on time.—Dick

took place in Asia for the first time.

In the years between World Championships, the three IARU regions are encouraged to hold their own multi-nation championships.<sup>4</sup> Many countries have National Championships yearly to select members of the national team for the next IARU Region or World Championships. Visitors from other countries are welcomed.

The Friendship Amateur Radio Society (FARS) introduced hams in the Americas to ARDF. Members of FARS-USA, based in Portland, Oregon, experienced it in 1989 on a visit to Khabarovsk, Russia for the first Friendship Radiosport Games (FRG). 5 When Russian hams paid a return visit in 1991, FARS-USA put on North America's first multination foxhunt for them and a FARS team from Japan.6 Hams in Victoria, British Columbia hosted the next FRG in 1993.7 The tradition has continued every two years and in 1999, the FRG foxhunts in Portland were designated as the first IARU Region 2 ARDF Championships.<sup>8</sup>

Beginning in southern California, ARDF has attracted the interest of increasing numbers of stateside hams during the last decade. Practice and demonstration sessions take place about once a month in parks from Santa Barbara to Huntington Beach. The outdoor action is spreading nationwide, with regular or occasional local sessions in Portland, Oregon, Dayton/Cincinnati, Ohio, Albuquerque, New Mexico, Atlanta, Georgia and Raleigh, North Carolina. Canadians are enjoying it at sessions in Victoria and Montreal.

The Western Hemisphere joined the ARDF World Championships for the first time in 1998, when five USA hams made the journey to Nyiregyhaza, Hungary. Interest surged in the following two years, swelling our team size for the 2000 World Championships in Nanjing, China. The maximum allowable three positions in two divisions were quickly filled. USA had competitors in all other divisions, too. Dale Hunt WB6BYU made ARDF history by being the first person from IARU Region 2 to serve on the International Jury.

As is customary for sponsoring national societies, ARRL funded Team USA's registration fees, which included lodging and food during the Championships. Each competitor was responsible for his or her own travel expenses to and from Nanjing. Fortunately, air fares went down as the dates approached.

Team USA 2000 was a cross-section of Amateur Radio in the USA. Our twelve attendees were from seven states. Ages ranged from 15 to 59. Seven were over 50. The roster included students, managers, engineers and a professor.

#### **Read More About ARDF**

The Web site of ARDF Coordinator Joe Moell, KOOV, has many foxtailing resources including history of ARDF in the USA, results and photos of recent events, announcements of future activities, equipment suggestions for both ARDF bands, and a bibliography of RDF-related articles. See it at www.homingin.com.

An active attenuator for 2-meter ARDF by Anjo Eenhoorn, PA0ZR, is in recent editions of the ARRL Handbook, Chapter 23. Plans for a popular 2-meter ARDF steel-tape Yagi are at the Web site of Joe Leggio, WB2HOL, home.att.net/~jleggio/projects/rdf/rdf.htm.

Recent ARDF construction projects in Amateur Radio publications include an active attenuator<sup>10</sup> for VHF by Joe Moell, K0OV and a complete 80-meter ARDF set<sup>11</sup> by Jerry Boyd, WB8WFK. Also there are Fox transmitters for 2 meters<sup>12</sup> by K0OV and for 80-meters<sup>13</sup> by Rik Strobbe, ON7YD.

Transmitter Hunting—Radio Direction Finding Simplified by Joe Moell, KOOV, and Tom Curlee, WB6UZZ (TAB/McGraw-Hill #2701) has a chapter on international-style foxhunting plus a wealth of technical information about RDF on both ARDF bands. This book is available from the ARRL. Just call 888-277-5289, or go to the Web site at www.arrl.org/shop/.

Although no medals were in their suitcases, our team members brought home a wealth of knowledge that they are eager to impart. Bob Frey, WA6EZV says, "We learned many things from the experts, such as what routes they took and why. We watched how people carried things on the course, what they carried and didn't carry. I'm very confident that I can now compete with these people, and I know what I have to do to be even better. I know what my strengths and weaknesses are and what training I need."

ARDF definitely helps your fitness. Many radio-orienteers take on a personal training program to prepare themselves. One Team USA 2000 member uses the sport to regain strength and stamina after heart bypass surgery. Another has taken off forty pounds, aided by his ARDF training efforts.

#### **Make Your Plans**

If ARDF excites you, be sure to share your excitement with others in your hometown. Why not plan an on-foot foxhunt in the park to get the ball rolling? Even if you don't have a large group at first, you can still get plenty of practice, as WB4SUV explains: "WA6EZV and I would go to a park, divide it in half and each hide a transmitter in our half.

We would then find each other's transmitter, re-hide it and repeat the process."

It doesn't matter whether you are an experienced ARDF Team USA member or if you're someone who has never been in a formal foxtailing event before—there's fun and education awaiting you in Albuquerque. If you're an expert at ARDF, you can prove it by being a medal winner. If you're a beginner, you can learn from the best. If you're a "techie," you'll get a wealth of ideas from the wide variety of portable RDF gear for 80-meters and 2-meters that competitors will bring from around the world.

The hams of Albuquerque are waiting to hear from you. Write to AARC, PO Box 11853, Albuquerque, New Mexico 87192. The official Web site of the 2001 USA ARDF Championships is groups .yahoo.com/group/abqardf/files/web/index.html. Don't miss this opportunity for competitions, celebrations and camaraderie. See you there!

#### Notes

<sup>1</sup>Tone-modulated AM (A2A) is always used for two-meter radio-orienteering in Europe and Asia. Tone-modulated FM (F2A) is more common in North America. Most ARDF receivers can be tuned to accommodate either mode. <sup>2</sup>Nicolai Holter "Badio Foxburgting in Europe."

<sup>2</sup>Nicolai Holter, "Radio Foxhunting in Europe," QST, August 1976, p 53.

<sup>3</sup>David Sumner, "Direction Finding, European Style," *QST*, September 1978, p 38.

 <sup>4</sup>Richard Baldwin, "Amateur Radio Direction Finding in China," QST, March 1994, p 22.
 <sup>5</sup>Portland Amateur Radio Club, "The First Sister Cities US-USSR Radio Sports Games,"

QST, May 1990, p 14.

Go Moell, "Homing In: Foxhunters Invade Oregon," 73 Magazine, September 1991, p 91.

<sup>7</sup>Joe Moell, "Homing In: Foxhunting Fun at the Friendship Games," *73 Magazine*, October 1993, p 48.

 Boe Moell, "Homing In: City of Roses—And Foxes," 73 Magazine, October 1999, p 54.
 Dale Hunt, "Amateur Radio Direction Finding: The 1998 IARU World Championships," QST, May 1999, p 28.

<sup>10</sup>Joe Moell, "Homing In: Build an Offset Attenuator," 73 Magazine, May 1998, p 76.
 <sup>12</sup>Joe Moell, "Homing In: Radio Foxes Don't

Howl," 73 Magazine, March 1998, p 61.

11 Jerry Boyd, "You Can Build the FoxFinder80," 73 Magazine, November 2000, p 29.

<sup>13</sup>Joe Moell, "Super-simple 80-meter Fox," 73 Magazine, November 2000, p 24.

Joe Moell, KOOV, serves as ARDF Coordinator for both ARRL (USA) and IARU Region 2, and as a Technical Advisor on RDF to ARRL. Since he went on his first hidden transmitter hunt at age 11, radio direction finding has been his favorite aspect of ham radio, whether it be mobile "T-hunting," on-foot foxtailing, or interference tracking. Joe has written about the tactical and technical aspects of RDF in over 150 magazine articles and a book. You can contact him at PO Box 2508, Fullerton, CA 92837; homingin@aol.com.

# **WORKBENCH**

#### PROJECTS AND INFORMATION FOR THE ACTIVE AMATEUR



As a new ham I am a little confused about the concept of "phase." Can you enlighten me?

When tracing a sine-wave curve of an ac voltage or current, the horizontal axis represents time. We call this the *time domain* of the sine wave. Events to the right take place later; events to the left occur earlier. Although time is measurable in parts of a second, it is more convenient to treat each cycle as a complete time unit that we divide into 360°. The conventional starting point for counting degrees is the zero point as the voltage or current begins the positive half cycle. The essential elements of an ac cycle appear in Figure 1.

The advantage of treating the ac cycle in this way is that many calculations and measurements can be taken and recorded in a manner that is independent of frequency. The positive peak voltage or current occurs at 90° along the cycle. Relative to the starting point, 90° is the *phase* of the ac at that point. Thus, a complete description of an ac voltage or current involves

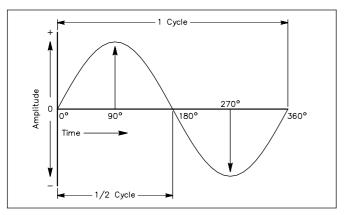


Figure 1—An ac cycle is divided into 360° to measure phase.

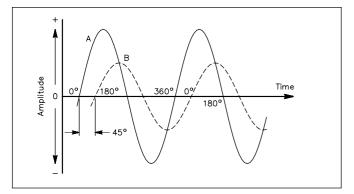


Figure 2— When two waves of the same frequency start their cycles at slightly different times, the time difference or phase difference is measured in degrees. In this drawing, wave B starts 45° (one-eighth cycle) later than wave A, and so lags 45° behind A.

reference to three properties: frequency, amplitude and phase.

Phase relationships also permit the comparison of two ac voltages or currents at the same frequency, as Figure 2 demonstrates. Since B crosses the zero point in the positive direction after A has already done so, there is a *phase difference* between the two waves. In the example, B *lags* A by 45°, or A *leads* B by 45°. If A and B occur in the same circuit, their composite waveform will also be a sine wave at an intermediate phase angle relative to each. Adding any number of sine waves of the same frequency always results in a sine wave at that frequency.

Figure 2 might equally apply to a voltage and a current measured in the same ac circuit. Either A or B might represent the voltage; that is, in some instances voltage will lead the current and in others voltage will lag the current.

Two important special cases appear in Figure 3. In Part A, line B lags 90° behind line A. Its cycle begins exactly one quarter cycle later than the A cycle. When one wave is passing through zero, the other just reaches its maximum value.

In Part B, lines A and B are 180° out of phase. In this case, it does not matter which one is considered to lead or lag. Line

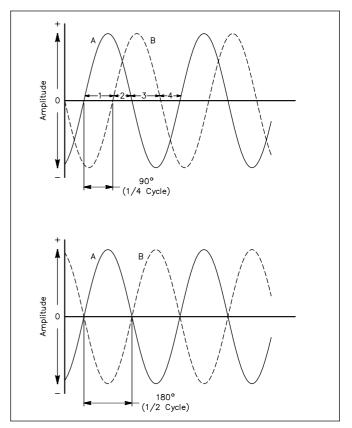


Figure 3—Two important special cases of phase difference: In the upper drawing, the phase difference between A and B is 90°; in the lower drawing, the phase difference is 180°.

B is always positive while line A is negative, and vice versa. By properly adjusting the amplitudes of two signals 180° out of phase and combining them, they can be made to cancel each other out completely.

Brad, W1AMC, asks, "I noticed that both W1AMC and KB1FZZ are listed as my call signs in the FCC database. KB1FZZ was assigned to me when I received my license. I later requested and received W1AMC as a vanity call. Is it legal to use both calls when this happens?"

A Searching for your name on the FCC's ULS Web site (www.fcc.gov/etb/uls) does, indeed, give two call signs. However, if you click on KB1FZZ in the search results, you will find a cancellation date listed—the same date on which W1AMC was granted.

Any amateur who has changed his call since ULS was implemented will find all previous call signs when searching under his name. Only the most recently issued call is valid.

I was licensed as a Technician in 1989 and I passed the code test, of course, at that time. I'm confused about where I stand in the restructured license system. I mean, if somebody hears me operating on HF and looks me up in the database, how do they know if I passed a code test?

A They don't.

In the restructuring proceeding of 1998, the Commission elected to no longer distinguish between the Technician and Technician Plus classes, effective April 15, 2000. The Technician Plus class is being phased out by issuing Tech Plus licensees new licensees that are stamped "Technician." The ARRL believes this is an error, and has petitioned for reconsideration, but since the Commission works very slowly, there is no reason to believe that relief is imminent.

You do not lose privileges in this situation, but if you want to upgrade someday, the onus to prove that you passed a code test is yours. The easiest way to do this is to retain your Technician class license document issued before February 14, 1991. Another way is to retrieve your license record from QRZ.com. When I looked up your call sign, it indeed showed a Technician license issued in 1989, which means you passed a code test.

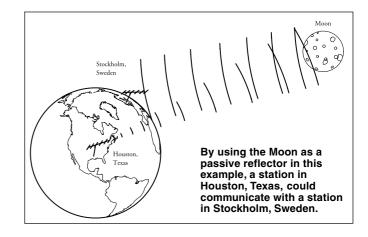
# QI've been fascinated by what I've read in QST about hams who are into moonbouncing. Can you tell me a little more about it? Do you need a monster station to do it?

AEME (Earth-Moon-Earth) communication, also known as "moonbounce," is based on a simple concept: use the moon as a passive reflector for VHF and UHF signals. With a total path length of about 500,000 miles, EME is the ultimate DX!

Amateur involvement in moonbounce grew out of experiments by the military after World War II. While the first amateur signals reflected from the moon were received in 1953, it took until 1960 for the first two-way amateur EME contacts to take place. Using surplus parabolic dish antennas and highpower klystron amplifiers, the Eimac Radio Club, W6HB, and the Rhododendron Swamp VHF Society, W1BU, achieved the first EME QSO in July 1960 on 1296 MHz. Since then, EME activity has proliferated onto most VHF and higher amateur bands.

EME is primarily a CW mode. However, improvements in equipment now allow the best-equipped stations to make SSB contacts under the right conditions. Regardless of the transmission mode, successful EME operating requires:

- Power output as close to the legal limit as possible.
- A good-sized antenna array. Arrays of 8, 16 or more Yagis are common on the VHF, while large parabolic dish antennas are common on UHF and microwave frequencies.



- Accurate azimuth and elevation.
- Minimal transmission line losses.
- The best possible receiving equipment, generally a receiver with a low system noise figure and a low-noise preamplifier mounted at the antenna.

What I've just described is probably what you'd call a "monster station." I'm talking about the type of station that would assure you of success most of the time. However, it's possible to get a taste of moonbounce with just a single Yagi antenna and a 2-meter all-mode radio. The trick is to listen during the ARRL International EME Competition this fall (the results of last year's contest are elsewhere in this issue). That contest brings all of the big-gun moonbouncers out of the woodwork. Assuming your radio is sufficiently sensitive (or assuming you're using a receive preamplifier), you should be able to hear the big-gun signals as they reflect off the Moon. It is an experience you're not likely to forget.

You'll find an excellent source of EME information on the ARRLWeb at www.arrl.org/tis/info/moon.html.

I am running *Windows 98* on my station computer. Is it possible to digitally record small portions of my received audio (say, a minute or less) using my PC's sound card? Do I need special software to do this?

A Yes, you can digitally record your receive audio directly to your hard drive—and you already have the software to do so!

In Windows, click on your START button, then click AC-CESSORIES and ENTERTAINMENT. That's where you'll probably find a neat little application called Sound Recorder. (Sound Recorder is also available on Windows 95 and ME.) If you can connect an audio cable between your transceiver (at the accessory jack or external speaker) and the line or mike input of your sound card, you should be able to use Sound Recorder to grab brief audio files up to about 60 seconds in length. For Sound Recorder to work, however, you may need to go into your audio mixer record settings (not the volume controls!) and make sure that the line or mike inputs are enabled. Just be aware that the resulting audio "WAV" files could be quite large. You'd better set aside a folder on your hard drive just for them.

Sound Recorder is nice for brief audio sampling, but you'll find more extensive audio recording capabilities in many of the Amateur Radio logging programs available today. See the advertising pages of QST.

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; www.arrl.org/tis/. Also see, "The Doctor is On-line" at www.arrl.org/members-only/qst/doctor/.



# Working Split: What's the Secret?

Master this technique and you'll add more DX contacts to your log.

et's say you've decided to spend a little time hunting the airwaves for the elusive DX—the distant station from a part of the world you've never contacted before. After a bit of tuning and listening you discover your prize. Battle stations!

But wait...

The DX operator is announcing that he is "listening up" or "working split." What does that mean, and what should you do now?

Trying to work DX stations that are working split can be a trying experience for beginners and those not familiar with the methods needed to take advantage of this operating scenario. But for those who master a few simple "tricks," working split can be a successful and satisfying operating experience.

#### Why Work Split?

Just prior to my trips to St Paul Island (CY9) I would generally get at least a few messages from hams stating they wished I would work transceive so they would have a chance to work me. Some were limited by the capabilities of their equipment, while others were uncomfortable with split frequency operation. So, why do DX stations operate split anyway?

Listen to virtually any DX pileup. Typically, you will hear many stations calling the DX, many seemingly without regard to timing their calls to correspond to when the DX station is actually listening. This continuous calling is what causes the problem for the DX station. Although the DX station identifies a call and replies, the continuous calling by those in the pileup buries his signal, resulting in confusion and chaos on the frequency.

Using split operation allows the DX operator to spread the calling stations out over a range of frequencies, making it easier to single out a station. Having the DX station and the callers on different frequencies allows the DX operator to more easily pick out call signs and helps the callers to hear who the DX operator has contacted.

You could say the DX station's goal by working split is to make it *harder* for stations to work him. Calling stations must use skill and strategy if they hope to contact the DX station. But it makes it easier for the DX operator who can work more stations at a faster rate. With a little practice and strategy you will find it *easier* to work a DX station operating a split frequency pileup than it is to duke it out in a large pileup on a single frequency. Rather than rely on brute strength alone to get you through a pileup, you can develop the skills needed to know where to call to ensure DXing success.

#### Where to Call

Say you find a rare DX station you would like to work transmitting on 14.195 MHz (see Figure 1). The station indicates

Listen to virtually any DX pileup.
Typically, you will hear many
stations calling the DX, many
seemingly without regard to timing
their calls to correspond to when the
DX station is actually listening.

he is listening "up," between 14.200 and 14.210 MHz. What should you do now?

Well, you could just pick a frequency in the listening range and call. And call, and call, and call. If you have one of the loudest signals on the band this method will work. It may take minutes, hours or even days, but if your signal is loud enough eventually the DX station will stumble across you. If you have only an average station, or desire some measure of control over the process, then a little more effort is required.

Rather than calling just anywhere in the DX station's listening range, your first priority should be to find exactly where in the listening range the DX station is hunting. To do this will require a lot of listening. When the DX station identifies a calling station and sends a report, quickly switch to the opposite VFO and tune the DX station's listening range looking for the station he is contacting. Once you are able to find the station you will have an advantage over others in the pileup. While dozens or even hundreds of other stations call blindly in the listening range, you will be in the position of calling where the DX station may actually be looking for contacts.

Even with this advantage you will likely not be the only DXer to find the DX station's listening frequency. You may still find yourself outgunned on the frequency. In that case you will not only have to identify where the DX station is listening, but where he is *going to listen*. Or, to put it another way, you will need to discern his pattern of listening.

Most DX stations will start at the lower end of the listening range. When many stations have found the listening frequency and it starts getting tough to pull stations out, the DX operator

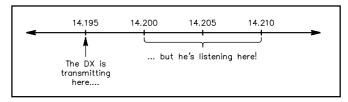


Figure 1—The DX station is on 14.195 MHz. This is his transmitting frequency. However, he is listening for contacts between 14.200 and 14.210 MHz.

will tune higher in the listening range looking for a signal which stands out. Your best bet will be to find a spot just above where the DX operator is now listening to make your call. When too many stations find the listening frequency and the DX station tunes higher, he may find your signal with little or no competition from other DXers.

The pattern the DX station uses is your key to getting a contact, and must be determined by listening. Most times the DX operator will start at the bottom and tune up until he reaches the top of the specified listening range. Then he may jump back to the bottom of the range, or simply reverse the direction of his tuning and tune back down. Some stations will use only two frequencies in the range, the lower and upper specified limits, and jump back and forth between these two.

I have heard some experienced DXpeditioners who tune for a clear spot, then drop a quick hint about where they are listening. They will say something like, "208 is a good spot." For those paying attention, this is a golden opportunity to snag a contact while most of the pileup continues to blindly call not even aware of what has happened.

With careful listening and practice you will learn to capitalize on the pattern established by the DX operator. When he reaches an edge of the tuning range you will know what he will do next and where to call so your signal will be there when he makes his move. As the DX operator tunes through the listening range you will know which way he is tuning and where to call so that he'll find your signal when he makes his next move.

Some DX operators seem to tune in random fashion, hopping about without an identifiable pattern. In this case there may be no choice but to pick a frequency in the listening range and hope the DX operator finds you. But even in this case a frequency can be picked wisely. Don't call where everyone else is calling. Listen through the specified range and try to pick a quiet spot where your signal will not have to compete with other strong signals.

Some DX operators seem to tune in random fashion, hopping about without an identifiable pattern. In this case there may be no choice but to pick a frequency in the listening range and hope the DX operator finds you.

By listening carefully, and using your knowledge of how the DX operator is working you will find you can be very competitive in working split frequency pileups. Rare DX call signs will start finding their way into your logbook.

#### **Cautions**

64

Several cautions are in order before tackling a split frequency pileup. Before calling in the listening range of the DX station it is imperative to tune the range to see if there are any on-going QSOs that you might interfere with should you call near their frequency. Often, when a DX operator first goes from working on a single frequency to working split, the calling stations start calling in the announced range without listening first. This may result in an ongoing QSO getting clobbered by a number of calling stations that seem to suddenly appear out of nowhere. When this situation arises it accomplishes nothing positive for the cause of DXing, but makes DXers seem like rude operators without concern for their fellow hams.

Attention should also be paid to calling at the proper time. Usually, the DX operator will end each QSO the same way making it apparent when he is ready for another call. Listen for "QRZ," "next" or whatever statement the particular operator uses to indicate he is ready for another call.

Calling while the DX operator is transmitting, when he has identified another call or partial call not resembling yours, or when he is asking for a call area or geographic area other than the one you are in is not only a waste of time, but is counterproductive to your goal of working the DX station. After all, if the DX station acknowledges your call, wouldn't you expect other callers to stand by while you finished your contact? Be sure to extend the same courtesy to others in the pileup. If you call when the DX station is asking for a different call sign, even if the DX operator hears you, he will more likely tune on rather than give the next contact to someone calling out of turn. Most DX operators also will not work a station in an area other than the one specified. If someone calls in from a different area, the DX generally will say something like, "I'm sorry, I was looking for number three only."

# The DX station's transmit frequency should not be used to ask things like, "Who's the DX? What's the QSL route?"

The DX operator's transmit frequency should also be kept clear. Occasionally a DXer may transmit on the DX frequency due to confusing his VFOs, or because he hasn't yet realized the DX station is operating split. There is no reason to be what is called a "DX Policeman," or one who feels the need to correct others making such a mistake. The so-called policemen cause much more QRM on the DX stations transmit frequency, and their unidentified transmissions are not mistakes. Falling into this bad habit should be avoided; the mistake will most likely be discovered quickly and corrected without any "help."

The DX station's transmit frequency should not be used to ask things like, "Who's the DX? What's the QSL route?" Patient listening should answer any questions, but if not, other resources are available. Transmitting on the DX station's frequency is considered poor form, and potentially might keep a fellow DXer from making his well-deserved contact.

#### Give it a Try

The next time you hear a rare DX station you would like to work, get in there and try the tricks you have learned. Find the listening frequency, discern the pattern, listen for any hints or direction from the DX operator and choose your calling frequency wisely. Soon you'll have the satisfaction that comes from knowing you worked that rare DX station by working *smarter* not *harder*.

99 Oregon Hill Rd Lisle, NY 13797 wv2b@earthlink.net

Q<del>5T</del>-



## **SHORT TAKES**



## N4PY Pegasus Control Program, version 1.45

In February 1999, *QST* published a Product Review of the TenTec 550 Pegasus transceiver based on the user software provided by Ten-Tec. The Ten-Tec folks have generously made their software "open source" so that others can use it as a guide to fashion their own versions. Carl Moreschi, N4PY, took up the challenge and the result is a remarkable piece of software known as the *N4PY Pegasus Control Program*. Not only is it easy to use, the software adds a number of features to the Pegasus, many of which are not available in any other transceivers on the market.

#### A Guided Tour

Figure 1 shows a screen shot of the front panel display. You can see three columns of band-change buttons on the right side. Note the heading on each column (CW, SSB and SWL). Clicking on the "20" button under SSB causes the button lettering to change color (default is blue) as you're suddenly transported to the phone portion of the 20-meter band. Likewise, if you want to operate in the CW portion of 15 meters, you only have to click on the "15" button under the CW column. When a selection of a band is made under SSB, the sideband (upper or lower) is automatically selected for the band. The "SWL" mode configures the Pegasus for shortwave listening on any given band.

If you use your Pegasus with VHF transverters, you'll appreciate the "6" and "2" meter buttons. They configure the Pegasus' frequency display to show the actual 6 or 2 meter frequency being worked, not the 10-meter "IF" frequency. The frequency display can be adjusted to zero beat to WWV at 10 MHz, then independently adjusted to compensate for any frequency error generated by the transverters themselves.

The N4PY software adds a new function that causes the analog frequency scale to vary with the step size. You can now define your license class and have your transmit privileges displayed on the analog frequency scale! You can also decide to have your transmitter follow your license class. That is, the background of the frequency scale will be blue for CW and digital mode-only operation, green for phone operation and burgundy for "forbidden" spectrum. (A constant incentive to upgrade!) If you select this feature, transmit will be blocked when you tune to a frequency that is not authorized by your current privileges.

The *N4PY Pegasus Control Program* adds a configurable RTTY button. The label for this button can be specified, the actual operating mode can be set to USB or LSB, and the frequency offset in hertz can be specified. A second RTTY mode has been added as well. If you right click on the RTTY, you'll be allowed to define a second digital mode. In other words, you can define one mode as RTTY and the other, for example, as PSK31.

Finally, I was impressed with the added ability to run the frequency sweep continuously and stop when a signal reaches a user-selectable threshold. Very handy!

This review only summarizes the highlights of the N4PY

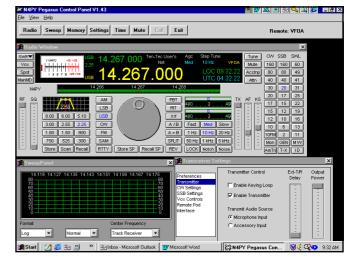


Figure 1—The N4PY Pegasus Control Program with the sweep and transceiver-settings windows enabled.



In this view, the *N4PY Pegasus Control Program* is configured for a General licensee. Note the red colored "forbidden" Amateur Extra areas at the bottom of the 20-meter phone and CW subbands.

Pegasus Control Program. Other fascinating features include an ID timer and the ability to personalize the "front panel" with your own call sign.

#### **Outstanding Work**

Carl Moreschi, N4PY, has done a great job with this software. It adds extraordinary convenience and functionality to the Pegasus at a nominal cost.

Manufacturer: Carl Moreschi, N4PY, 173 Cody's Way, Franklinton, NC 27525; n4py@earthlink.net. To order the latest registered version, send a check for \$25 to Carl at the address indicated along with your e-mail address. The software will be e-mailed to you. You can also download a free demo version on line at www.qsl.net/tentec/ (go to the "software" section).



# Pedestrian Portable in Australia

G'day, mate. It's time for a bit 'a VHF fun Down Under.

hat can you do with 1 W and a whip antenna on 6 meters? I had a chance to find out this past year when an opportunity developed to take a three-and-a-half week adventure tour of Western Australia.

Six-meter DX propagation would be enhanced around the March equinox, when the trip was planned. Even better, most of my traveling would be between 12 and 25 degrees south latitude, prime for transequatorial propagation (TEP). I was eager to do a little operating on the trip, but the amount of luggage I could take was limited.

An IC-706 transceiver, switching power supply, and big Yagi, for instance, were out of the question. So I decided on the AEA DX-Handy 6-meter SSB/CW hand-held (no longer sold in the US) as my main rig. It puts out 1 W and the receiver is sensitive enough, but it has limited frequency coverage. Still, it would do.

For an antenna, I resurrected a 3-element Yagi previously constructed for kayaking trips. The Yagi consisted of telescopic whips for the elements and chopped up ½-inch PVC tubing to make up the 8-foot boom. The maximum length of any of the tubing segments was 17 inches, and it took little space in my daypack. I counted on finding a temporary mast in Australia.

Licensing was no problem. A good friend in Australia volunteered to attack the paperwork. I was delighted when he reported that he had secured a conditional license with the call VK1XQ. I was all set to go.

#### The Journey Begins

We flew into Sydney, New South Wales. After sightseeing for a few days, my traveling companion and I departed on the Indian-Pacific Railway to Perth, more than 2000 miles across the continent, where our real adventure would begin. The rails provided a comfortable way for us to see the southern portion of Australia. We enjoyed making many Aussie friends on the three-and-a-half day train ride.

Coming into Perth, we had a 2-meter train mobile contact with Wally Howse, VK6KZ. Wally is a fellow microwave enthusiast and until recently, he was co-holder of the 10-GHz world's distance record, made across Australia's Great Southern Bight in 1994. Wally picked us up at the train station and gave us the Cook's tour of beautiful Perth.

The ocean-side city of Perth reminded me a lot of my hometown, San Diego. Wally hosted a barbecue so we could meet some of the locals (no shrimps on the barbie, but there were a few prawns sizzling for show, I think). We shared sea and radio stories with Perth's finest VHF operators, including Don Graham, VK6HK; David Minchin, VK5KK (visiting from Adelaide); Graham Rogers, VK6RO; Cec Andrews, VK6AO; Bruce Douglas, VK6BMD, and Al Edgar, VK6ZAY. We spent a few more days viewing the sights around the city and vicinity before departing on the coach tour across the state of Western Australia.



Jack set up his portable Yagi on the beach at Monkey Mia on Australia's West Coast. A PVC joint slipped, causing one of the elements to twist out of alignment. No matter, as VK1XQ worked 30 JAs with his 1-W hand-held from this location.



The complete VK1XQ portable 6-meter station, with coax, PVC boom sections, telescoping Yagi elements, the AEA Handy, a keyer (almost as big as the rig), and telescoping whip fits neatly in a small pack.



Western Australian VHFers gathered in VK6KZ's shack in Perth to meet Jack. From left to right are VK5KK (visiting from Adelaide), VK6HK, VK6ZAY, VK1XQ, VK6RO, VK6BMD, VK6KZ, and VK6AO.

Our overland odyssey to Darwin, Northern Territory, was more than 2000 miles away by road and scheduled to take 18 days. We started north along the coast as far as the northwestern seacoast city of Broome, then cut across inland toward Darwin. Along the way, we motored across the rugged Pilbara region (which contains the oldest rocks in the world) and the picturesque Kimberley Plateau. Traveling more than 500 km (about 350 miles) per day and stopping for anything remotely resembling a tourist attraction usually left only 6 to 7 PM to do some operating. Fortunately, the TEP path is in full force during this time.

#### Monkey Mia and Exmouth

The first opportunity to operate was from Monkey Mia (grid locator OG64) on the West Coast. Monkey Mia is a beautiful ocean resort where dolphins come into the shallow water for petting and feeding. Dugongs (relatives of the manatee) also frequent the waters. I borrowed the telescoping pole used for cleaning the coach to use as a mast and raised the 3-element Yagi on a sandy knoll. I was pleasantly surprised with a minipileup of Japanese. I proceeded to work 28 JAs on CW and 2 others on SSB. I returned later in the evening to find the band dead. I did not know it at the time, but these were the only OSOs I would make with the Yagi.

The next opportunity to operate was from Exmouth (OG78) on the northwest cape. Here, I stood on the second-story balcony of the motel and used a \$^1/4\$-wave whip on the hand-held. I had my biggest pileup. The hand-held would not operate split, so I requested the JAs call by prefix. I worked 56 Japanese during the next half hour and then was called by a ??8CQ. I thought to myself, "This JA can't send his prefix correctly or his transmitter is not initially keying right." It then sunk in that this was not a JA, but rather EY8CQ in Tajikistan.

There was another nice opening from Port Hedland (OG99) further along the north coast, where I worked 10 JAs on SSB while pedestrian portable walking around the motel. That was superb propagation. One of the Japanese was himself portable



Jack Henry, VK1XQ, operating 6 meters from a motel balcony in Exmouth, Western Australia. The hand-held is standing on the railing with the whip extended. From this makeshift shack, Jack ran off 56 JA QSOs and worked EY8CQ during a single half-hour period.

on a mountain and running only 20 W. My attempt to make perhaps the first intercontinental 6-meter camel mobile contact later in the day was aborted due to close-in lightning strikes.

#### **Excitement in El Questro**

One of the most exciting spots to operate from was El Questro Station (PH33) in the interior part of northeastern Western Australia. Stations are not radio stations, but are cattle

or sheep ranches in the outback that usually range from 1000 to 10,000 square miles in size. Our quarters that evening was a metal framed two-man tent. As I sat on a cot in the tent, I pulled out the hand-held and extended the whip. I was greeted by loud Russian 49.750 MHz video and a 6-meter band full of Japanese stations. Eleven JAs went into the log that evening. In the morning light, I could see a close-in mountain to the north in the direction of Japan. My launch angle must have been incredibly high.

There were some opportunities to check band conditions and do a little bit of operating during other times of the day. The coach religiously stopped in mid-morning and mid-afternoon for tea time. Normally, the guides searched out some interesting place to stop with a little shade, but other times they would simply pull off the side of the road in the boondocks and use the coach for a shade. I actually came to like and to look forward to the tea stops.

Surprisingly, my total operating time came to only about six hours. During those few hours, I made 114 contacts with JAs, 1 with a VK6, and 2 QSOs with EY8CQ, one while pedestrian mobile at a tea stop. In addition, I heard KH6SX, KH6/K6MIO, HL5XF and VK6JQ.

One of my disappointments of the trip was not hooking up with Bill Webber, VK6JQ, while I was in Broome. Bill is the only active 6-meter operator in all of northwestern Australia. Two weeks after I returned to San Diego, I heard Bill's 10-W signal on 50.110 and completed with him for my first VK6. I had been trying for years to work Western Australia, as it was the last state I needed to have worked all Australian states and call areas. Ironically, Bill had been looking for US stations for just as long. I was also Bill's first QSO with the US on 6 meters.

This was my first trip to Australia, but it definitely will not be my last. It is a country with breathtaking scenery and very friendly people. Thanks to Wally, VK6KZ, and Steve, VK3OT, for helping me with the little things that make it happen.

An earlier version of this article appeared in "VHF-UHF— An Expanding World," published in the June 2000 issue of Amateur Radio, thanks to David Minchin, VK5KK.

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Q<del>5T</del>~

#### **NEW BOOKS**

# RADIO WIZARD: EDWARD SAMUEL ROGERS AND THE REVOLUTION OF COMMUNICATIONS

By Ian A. Anthony

Published by Gage Educational Publishing Company, Toronto, Ontario, Canada M1S 3C7. First edition, 2000, hardcover, 6 x 9 inches with black and white photographs. ISBN 7715-8050-9. Available for \$20 US from Ian Anthony, Rogers Historian, 1 Mount Pleasant Rd, Floor 12, Toronto, Ontario, Canada M4P 1L6; ianthony@rci.rogers.com. Checks or international money orders only.

Reviewed by Gil McElroy, VE3PKD

We take electricity for granted. Plug something into the wall, and it works, no questions asked. Obviously, it wasn't always so. The introduction of electricity into American homes in the earliest years of the twentieth century had enormous consequences.

Radio wasn't one of them, at first. Electrical wiring in homes was originally designed for lighting alone. If you wanted to supply power to some external device, the lightbulb in your wall mounted fixture had to be unscrewed and a slotted socket inserted in its place.

Listening to radio in the early days involved none of this, for until the midnineteen twenties, ac-powered receivers didn't exist. To listen meant using different batteries to separately heat tube filaments (the "A" battery) and provide plate current (the "B" battery).

The phenomenal growth of interest in radio had everything to do with the development of ac-powered vacuum tubes, and it was a Canadian Amateur Radio operator named Edward S. ("Ted") Rogers

who helped change all of that. Radio Wizard: Edward Samuel Rogers and the Revolution of Communications by historian Ian A. Anthony chronicles the contributions and fartoo-brief life of this young ham and entrepreneur whose family name still graces the communications corporation founded by his son.

Born in 1900, Rogers was 11 when he was first bitten by the wireless bug. In early 1912 while with his family at their cottage, Rogers picked up wireless reports about the sinking of the ship *Titanic*. By 1913 Rogers' radio activities had earned him Canadian press coverage, and in 1916 he had qualified to be

an commercial operator for the Marconi Company, working on the passenger ferries plying the Great Lakes.

Of most interest to historically-minded hams, though, was Rogers involvement with the Transatlantic Tests sponsored by the ARRL in 1921. Paul



Godley was sent by the League to Scotland to listen for North American amateur transmissions, and Rogers, now officially licensed as 3BP, qualified as one of the select few official transmitting stations. On December 11, Rogers received confirmation from ARRL Headquarters in Hartford: the spark signal of 3BP had been heard in Scotland, one of but a handful of North American spark and CW stations that made it across.

It's here that Anthony's account of Rogers' life veers away from his Amateur Radio activities and toward the world of corporate radio. Rogers' turned his passion for radio toward something profitable, and he determined that what the world really needed was a radio that could be plugged into

an electrical socket like any other appliance. In April of 1924 he met Frederick S. McCullough, a Westinghouse engineer in Pittsburgh who had been working on an ac vacuum tube. According to Anthony, Rogers purchased the Canadian patent rights to a tube that didn't function properly, and came back to Canada with a mind to make it work. In August of that same year, he managed to do just that with his Rogers Experimental Tube 15S, successfully insulating the tube's heater filament from the input and output circuitry and so eliminating the ac hum that had plagued previous efforts.

Anthony details the steps Rogers took to turn his new tube into a commercial success. Devising an ac tube that worked was one thing, manufacturing an entire radio that could plug into an outlet was quite another. But by April of 1925, he had done it with the Rogers Model 120 receiver that used five of his ac tubes. A month later, with his father and brother, Rogers formed the Standard Radio Manufacturing Corporation and began marketing a B-battery eliminator that allowed existing battery-powered receivers to run from ac outlets, and his own Rogers Batteryless Radio Receiving Sets.

Rogers branched out into broadcasting, in 1927 launching a radio station, CFRB, still on the air today. The manufacturing arm of his corporate empire acquired a new name: Rogers-Majestic, and went on to become the largest radio manufacturer in Canada. Rogers himself died suddenly in May of 1939 at the age of thirty-eight. His family was convinced he had worked himself to death.

Ted Rogers' contributions to the development of early radio have typically merited only slight mention in histories of the period. Radio Wizard: Edward Samuel Rogers and the Revolution of Communications, then, is a very welcome rectification (no pun intended) of that state of affairs.

Next New Books



# **Test Your Knowledge!**

## Just a bit about bytes...

The digital communication modes are getting more popular every month. Do a few mental pushups in the land of ones and

- 1. In PSK31 the "PSK" stands for ...
- a. Power Saving Keying
- b. Phase Shift Keying
- c. Peter S. Kingsgate and the "31" stands for...
- d. Phase Sensed, Keyed
- a. 31 baud
- b. 3 data, 1 parity
- c. 3 sidebands, 1 signal
- d. 3 amplitude, 1 phase
- 2. How many data bits are sent in a single Baudot character?
- a. 3
- c. 8
- 3. The AMTOR protocol sends characters in groups of...

- c. 5
- d 8
- 4. The Clover modulation scheme exchanges data in how many simultaneous channels?
- a. 1
- b. 2
- c. 4
- d. 8
- 5. FEC stands for...
- a. Farnsworth Error Code
  - b. Fairly Easy Correction

c. Helvetica d. EBCDIC

- c Fast Ethernet Connection d. Forward Error Correction
- 6. LTRS and FIGS are characters found in what character set?
- a. RTTY b. ASCII
- 7. Data rates above 1200 bits per second are not permitted below what frequency?
- a. 50.1 MHz b. 28 MHz c. 144 MHz d. 1296 MHz
- 8. Which protocol is used for VHF packet?
- a. SPI
- b. AX.25
- c. ZMODEM d. XMODEM
- 9. Routing and handling information at the beginning of a data packet is called the...
- a. Preamble b. Header c. Checksum d. CRC

- 10. What does the "mo" in modem stand for?
- a. Motorola b. Motion
- c. Molecular
- d. Modulate
- 11. The set of bits making up a single character in an asynchronous serial link are called a...
- a. Frame
- b. Raster
- c. Window d. Protocol
- 12. "Squirt the bird" is an operation over what kind of communications link?
- a. HF point-to-point
- b. Digital satellite
- c. VHF tropospheric
- d. Meteor scatter
- 13. APRS (Automatic Position Reporting System) uses location data from what source? c. GPS
- a. NOAA
- b. LORAN
- d. WWV
- 14. What is the abbreviation for a station that can respond to connect requests without an operator?
- a. ABS
- b. ACK
- c. ARO
- d. ALE
- 15. The interface between the Internet and amateur digital communications systems is called a...
- a. Digipeater b. Gateway c. Mailbox
- d. Daemon

**Bonus:** What is the name for the set of phase and amplitude values in a QPSK signal?

#### **Total Your Score!**

Count one point for each correct answer.

- 12-16 Your brain is overclocked!
- 6-11 Crank up the bus speed.
- 1-5 Your digital knowledge needs debugging.

22916 107th Ave SW Vashon, WA 98070

Q<del>5T</del>-\_

deometric pattern on a modulation analyzer or oscilloscope). Bonus—A "constellation" (because the points form a regular networks to Internet Protocol (IP) networks.

15. b—These are computers that relay messages from amateur 14. d—The abbreviation stands for Automatic Link Enable.

system could be used if it is formatted properly. change format. Data from a LORAN or other navigation 13. c—APRS systems support the GPS NMEA data inter-12. b—This refers to sending data to a satellite in a burst.

as the data bits. 11. a-A frame includes the start, stop, and parity bits, as well scribes the function of the circuit or IC.

10. d-Modem stands for "modulate-demodulate" and ded .6 over commercial networks.

gggs brotocol used in computer-to-computer communications 8. b—The AX.25 protocol is the amateur version of the X.25 chapter 13 of "The FCC Rule Book."

7. a—The complete table of allowed bit rates by frequency is in different character sets.

characters, the LTRS and FIGS characters are used to select 6. a-Because the Baudot character set has only 32 unique

data packet without a retransmission 5. d—FEC allows receiving systems to correct some errors in a

J .4

(2 to the fifth power).

2. b—This limits the total number of unique characters to 32 1. b and a

Answers

## THE HELP DESK

## VHF/UHF Propagation in the Troposphere



All radio communication involves propagation through the troposphere for at least part of every signal path. The troposphere is where most of our weather takes place, so changing weather conditions can play an important role.

Radio waves traveling through the lowest part of the atmosphere are subject to refraction, scattering and other phenomena, much like ionospheric effects. Tropospheric conditions are rarely significant below 30 MHz, but they are very important at 50 MHz and higher. Much of the long-distance work on the VHF, UHF and microwave bands depends on some form of tropospheric propagation.

#### Line of Sight

At one time it was thought that communications in the VHF range and higher would be restricted to line-of-sight paths. Although this has not proven to be the case even in the microwave region, the concept of line of sight is still useful in understanding tropospheric propagation. In the vacuum of space or in a completely homogeneous medium, radio waves do travel essentially in straight lines, but these conditions are almost never met in terrestrial propagation.

Radio waves traveling through the troposphere are ordinarily refracted slightly earthward. The normal drop in temperature, pressure and water-vapor content with increasing altitude change the index of refraction of the atmosphere enough to cause refraction. Under average conditions, radio waves are refracted toward the Earth enough to make the horizon appear 1.15 times farther away than the visual horizon. Under unusual conditions, tropospheric refraction may extend this range significantly.

#### **Tropospheric Scatter**

Contacts beyond the radio horizon out to a working distance of 100 to 500 km (60 to 310 miles), depending on frequency, equipment and local geography, are made every day without the aid of obvious propagation enhancement. At 1.8 and 3.5 MHz, local communication is due mostly to ground wave. At higher frequencies, especially in the VHF range and above, the primary mechanism is scattering in the troposphere, or *troposcatter*.

The maximum distance that can be linked via troposcatter is limited by the height of a scattering volume common to two stations. The highest altitude for which scattering is efficient at amateur power levels is about 10 km (6 miles). An application of the distance-to-the-horizon formula yields 800 km (500 miles) as the limit for troposcatter paths, but typical maxima are more like half that. Tropospheric scatter varies little with season or time of day, but it is difficult to assess the effect of weather on troposcatter alone. Variations in tropospheric refraction, which is very sensitive to the weather, probably account for most of the observed day-to-day differences in troposcatter signal strength.

#### Rain Scatter in the Troposphere

Scatter from raindrops is a special case of troposcatter practical in the 1296-MHz to 10-GHz range. Stations simply point their antennas toward a common area of rain. A certain portion of radio energy is scattered by the raindrops, making possible over-the-horizon or obstructed-path contacts, even with low power. The theoretical range for rain scatter is as great as 600 km (370 miles), but the experience of amateurs in the microwave bands suggests that expected distances are less than 200 km (120 miles). Snow and hail make less efficient scat-

tering media unless the ice particles are partially melted. Smoke and dust particles are too small for extraordinary scattering, even in the microwave bands.

#### Refraction and Ducting in the Troposphere

Radio waves are refracted by natural gradients in the index of refraction of air with altitude, due to changes in temperature, humidity and pressure. Refraction under standard atmospheric conditions extends the radio horizon somewhat beyond the visual line of sight. Favorable weather conditions further enhance normal tropospheric refraction, lengthening the useful VHF and UHF range by several hundred kilometers and increasing signal strength. Higher frequencies are more sensitive to refraction, so its effects may be observed in the microwave bands before they are apparent at lower frequencies.

Ducting takes place when refraction is so great that radio waves are bent back to the surface of the Earth. When tropospheric ducting conditions exist over a wide geographic area, signals may remain very strong over distances of 1500 km (930 miles) or more. Ducting results from the gradient created by a sharp increase in temperature with altitude, quite the opposite of normal atmospheric conditions. A simultaneous drop in humidity contributes to increased refractivity. Useful temperature inversions form between 250 and 2000 m (800-6500 ft) above ground. The elevated inversion and the Earth's surface act something like the boundaries of a natural openended waveguide. Radio waves of the right frequency range caught inside the duct will be propagated for long distances with relatively low losses. Several common weather conditions can create temperature inversions.

#### **Radiation Inversions in the Troposphere**

Radiation inversions are probably the most common and widespread of the various weather conditions that affect propagation. Radiation inversions form only over land after sunset as a result of progressive cooling of the air near the Earth's surface. As the Earth cools by radiating heat into space, the air just above the ground is cooled in turn. At higher altitudes, the air remains relatively warmer, thus creating the inversion.

The cooling process may continue through the evening and predawn hours, creating inversions that extend as high as 500 m (1500 feet). Deep radiation inversions are most common during clear, calm, summer evenings. They are more distinct in dry climates, in valleys and over open ground. Their formation is inhibited by wind, wet ground and cloud cover. Although radiation inversions are common and widespread, they are rarely strong enough to cause true ducting. The enhanced conditions so often observed after sunset during the summer are usually a result of this mild kind of inversion.

Large, sluggish, high-pressure systems (or anticyclones) create the most dramatic and widespread tropospheric ducts due to subsidence. Subsidence inversions in high-pressure systems are created by air that is sinking. As air descends, it is compressed and heated. Layers of warmer air—temperature inversions—often form between 500 and 3000 m (1500-10,000 ft) altitude. Ducts usually intensify during the evening and early morning hours, when surface temperatures drop and suppress the tendency for daytime ground-warmed air to rise. In the Northern Hemisphere, the longest and strongest radio paths usually lie to the south of high-pressure centers.—*Excerpted from* The 1999 ARRL Handbook.

### **HINTS & KINKS**



#### MORE ON "THE MATH IS EASY" AND WALL WARTS

♦ This message is a comment about "The Math is Easy!" sidebar in the March column (p 58). While I cannot fault the arithmetic, I believe the assumption concerning how these chargers work is off base. It seems to me that battery resistance is independent of the charger rating.

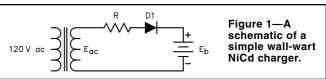
Most of the chargers that come with the radios are simple: a transformer and full-wave rectifier. There may be a regulator in the radio, but here I address only the simple type.

A charged NiCd battery will reach about 1.4 V/cell and will exhibit a low resistance. Current will flow into the battery when the voltage at the transformer exceeds the battery voltage plus two diode junction-voltage drops. The current flow is determined primarily by the transformer impedance, which is usually high enough to prevent a fire in case the wall wart output is shorted. From this explanation, the charge current flows in pulses. The calculation might result in the correct resistor value, but that would seem to be accidental.

Further, the power-dissipation calculation will always be low unless the current is pure dc. Ripple, or a pulsed charging current, will result in greater dissipation. For example, consider a rectangular wave with 50% duty cycle. The actual power dissipation is twice that calculated by considering the average value.

For many years, I have trickle-charged auto batteries while the vehicles are stored. I use wall warts and series resistors determined by trial and error. It works!—Gene Pentecost, W4IMT, 42 Maximo Way, Palm Desert, CA 92260-0361; gene.pentecost@ieee.org

♦ I stand corrected. The General Electric *Nickel-Cadmium Battery Application Engineering Handbook* (second edition, General Electric, 1975) explains the situation. For a half-wave

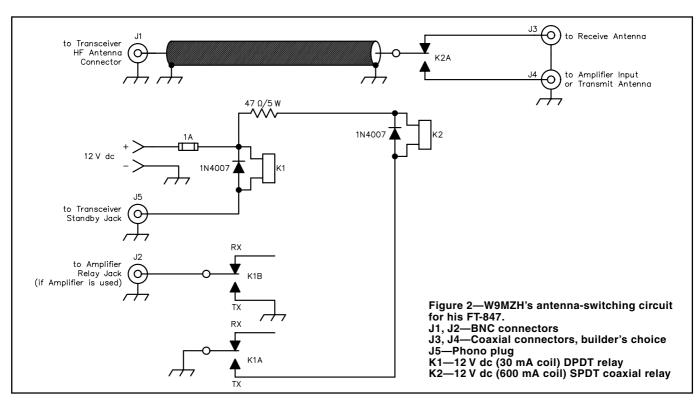


supply, as shown in Fig 1, the charge current and  $I_{\rm RMS}$  depend on the battery voltage  $(E_{\rm b})$  diode junction drop  $(E_{\rm d})$  and the transformer output voltage  $(E_{\rm ac})$ .  $E_{\rm ac}$  increases as the charge current lessens, requiring much more resistance than predicted in "The Math is Easy." The General Electric book addresses this by means of two coefficients determined by a nomograph based on  $(E_{\rm b}+E_{\rm d})/E_{\rm ac}$ .

Easy math doesn't work in this case because this is not a simple resistive dc-supply feeding a load. The transformer output voltage is influenced by the charge current. The result of my calculation is only coincidentally close to the value the author found by experimentation.—Bob Schetgen, KU7G, Hints and Kinks Editor

### YAESU FT-847: A SEPARATE RECEIVE ANTENNA; BAND SWITCHING VIA MEMORY

♦ I recently purchased a Yaesu FT-847 transceiver after using an FT-767GX for many years. My station is in an extremely high-noise location: an industrial area surrounded by power lines. Receiver noise is a major problem, especially on 160 meters, so I use a six-foot tuned coaxial-loop receive antenna made out of ³/₄-inch CATV Hardline hung inside the back wall of our building. The loop reduces "20 dB over S9" power-line



noise to about S1. I connected the loop to the separate receiveantenna jack on the FT-767.

The FT-847, however, has no provision for a separate receiver antenna, so I improvised the circuit shown in Figure 2. My coax relay requires more current (600 mA) than the FT-847 standby transistors can handle, so I added a second relay (K1) to switch the coax relay.

The  $47-\Omega$  resistor in series with relay K2 works in conjunction with the 1N4007 to help suppress arcing across the contacts of K1 when keying K2, yet still passes enough current to operate the coax relay reliably. (I've been using this circuit for two years with no problems at all.) For coaxial relays requiring much less current, the  $47-\Omega$  resistor could be omitted.

The FT-847 has no VOX, so the relays are only active during PTT operation. My circuit has a 13.6 V dc, 4 A power supply, but something less would suffice.

Last night, I was talking to Morton Howard, W2ATO, who also has a Yaesu FT-847. He was complaining about needing to change out of the "fast tune" mode every time he wants to change bands. I told him that I stored CH1 in the memory at 160 meters and three or four frequencies in memory for each band up to 10 meters. With a few more frequencies for 6 meters and VHF and UHF, all 78 memories are used.

To change bands, simply change the VFO/M switch to memory and use the MEM/VFO CH switch to select the band. As soon as you move the tune dial, the rig is in the memory-tune mode. To change bands again, just hit the VFO/M CH switch and repeat the process in the memory mode. W2ATO and I prefer the fast-tune mode and don't need to leave it when switching bands in this manner.—Gene Fisher, W9MZH, 1815 Taylor St, Fort Wayne, IN 46802; w9mzh@juno.com

#### PL-259 ASSEMBLY USING TUBING CUTTERS

♦ Here's another method of connector-cable assembly. I realize that it's common for more than one person to come up with similar ideas, but I have never seen this idea before.¹ I have been using it for more than 10 years, and it certainly simplifies connector assembly.

Please refer to Figure 3. I use small clamp-style tubing cutters to cut through the jacket—and later, the tinned braid. Af-

ter first removing the cable jacket, tin the braid to make it smooth and solid. Use the tubing cutter again to cut through the tinned braid. Use a hacksaw to cut (at an angle) through the waste side of the tinned braid to make it easier to remove. Remove the dielectric and prepare the center lead. Fit the cable into the body of the connector and solder the body to the tinned braid. The tinned braid makes this step easy and ensures a solid connection. Finally, solder the center conductor to the pin.—Kevin Dean, VE7CFS, #207 15140 29A Ave, South Surrey, BC V4P 1H1, Canada

## REPLACING BROKEN O-RINGS IN MFJ VERSA TUNERS

♦ Perhaps this will help many owners of MFJ Versa Tuner antenna tuners. As you may know, the digital readout for the inductor tuner coil is connected to the tuning knob by a very fragile O-ring. This ring always seems to fail during the heat of an SS contest; no fun! My solution is simple. Refer to Figure 4 and read on.

Remove the top cover. Stuff a small rag under the inductor shaft to catch the filings, and use a hacksaw blade (blade only—no handle) to carefully cut through the shaft. With the shaft cut, you can pull the tuning knob out just far enough to slip a new O-ring through the gap in the shaft. Reconnect the two shaft pieces with a coupler. (I use a homemade brass coupler about one-half-inch long.) If your junk-box doesn't contain a suitable coupler, try the local hardware store or a fleamarket. You can buy replacement O-rings at hardware stores, but take the broken one along to check the size.<sup>2</sup> (If the exact size is not available, I have used rings that are one size smaller.)

I keep a spare O-ring stored inside the tuner so it's always available. In fact, I leave the tuner cover in place but unfastened. (The cover screws are in a small plastic bag right next to the spare O-ring.) Now I can replace a broken O-ring and be back on the air in less than 30 seconds.—Don Miller, W2MQB, PO Box 3005, The Springs, NY 11937-0395

'How true! A similar hint by Ralph Hirsh, K1RH, appeared in the Aug 1988 column on p 48. This method bears repeating, but be careful not to melt the dielectric when tinning the braid.—Ed

<sup>2</sup>William Wornham, NZ1D's article about drivebelts (QST, Apr 2001, p 83) tells how to calculate belt length.

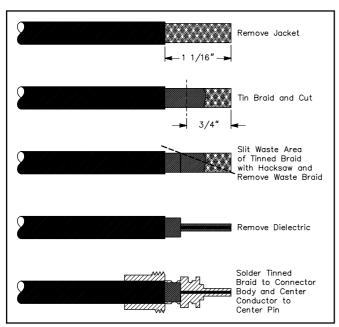


Figure 3—Details of VE7CFS's PL-259 installation.



Figure 4—A photo of W2MQB's Versa Tuner fix. The shaft coupler (right center) secures the inductor shaft that was cut to facilitate O-ring replacement. The tuner front panel is at left, with the turns-counter mechanism visible at the lower left corner.



Figure 5—Label *QSTs* (and other magazines) on their edges so you can spot the one you want in a pile.

#### SPOT THAT QST IN A PILE!

 $\Diamond$  It just occurred to me that many hams probably keep recent QSTs stacked flat on a shelf as I do at HQ. As each issue arrives, I use a permanent marker to write the month and year on the top and bottom edges of the magazine, near the spine (see Figure 5). That is, squeezing the issue near its spine makes the page edges a solid surface for writing. Thus labeled, it's easy to locate a specific issue in a stack. The numbers also make it easy to sort the issues before retiring them to a binder at the end of a year.

An abbreviation of the title allows you to distinguish between different magazines as well. For example, QST, Bicycling and Field and Stream all look similar in a stack. I use the same trick on catalogs too.—Bob Schetgen, KU7G, Hints & Kinks Editor

#### KITCHEN RFI SOURCE

♦ I was recently battling a case of intermittent RFI when I discovered the source appeared to be my newly installed halogen spotlights. These are 10- or 20-W lights, which can be used as "spots" under kitchen cabinets or inside cabinets. I had installed two strings of these lights in the kitchen.

The source of the RFI is actually the power supply, which appears to be nothing more than a wall transformer. The power-supply case actually contains a circuit that produces a square wave at about 25 kHz. The harmonics were very audible throughout the HF bands. I believe the primary purpose for the higher frequency is to reduce the size of the transformer, rather than to antagonize Amateur Radio operators.

Interestingly, one of the strings was noticeably louder than the other one. The waveforms for the two strings looked nominally the same on the scope. I operated in peace by switching off the lights.

Many months later, one of the strings ceased to operate; it happened to be the noisier of the two. I took the opportunity to rewire all of the lights to a single, regular 12 V ac transformer suitable for the two 5-A strings of lights. Now I don't need to turn off the lights to operate the radios. When I dismantled the broken power supply, one of the leads inside the case was broken. I wonder if the weak lead was the source of the higher noise level?—Dan Hinz, W6LSN, 1738 Manitou Ct, San Jose, CA 95120; dan.hinz@ieee.org

#### MICROWAVE YOUR SILICONE!

♦ After constructing dipoles or vertical antennas, I like to seal the coax and other connections with silicone sealant to keep the rain out. The trouble is that silicone sealant kept in the garage is usually cold and tough to force out of the tube. By removing the plastic sealant cartridge from the dispensing gun and warming the cartridge in the microwave, the problem is solved. The required heating time depends on the amount of sealant remaining in the tube: 20 seconds on high is enough for a quarter of a tube. Experiment by lengthening the time in 20-second increments until you reach a consistency you like. Put the cartridge into a plastic shopping bag before heating—just in case!—Bruce Fleming, KI7VR, 7401 NW 16th Ave, Vancouver, WA 98665

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.

### **NEW PRODUCTS**

#### **ROCKWELL COLLINS HF PROPAGATION SOFTWARE**

♦ Rockwell Collins has released an upgraded version of its HF Propagation Resource Manager software.

Collins *PropMan 2000* software is designed to simplify complex HF propagation predictions. Working with information that it gathers from Internet sources, it identifies and displays the best frequency for an HF communications link in a user-friendly *Windows* format.

The program factors in temporal, seasonal, ionospheric, solar and equipment parameters, improving communications quality and reliability. *PropMan*'s predictions are would be a valuable aid for any HF radio operation, commercial, amateur or shortwave.

Key features include real-time plots that respond to changes made by the user, user-definable HF link parameters, signal to noise ratio plots that are shown in dB-Hz and dB relative to bandwidth, signal-to-noise ratio plots over 24 hours to ease forecasting, past and future plot generations for any station pair and best frequency ranking for any minute within a 24-hour period.

Minimum computer system requirements are an IBM or compatible PC running Windows 95, 98 or NT, a CD-ROM drive, 256-color VGA display, 15 to 20 MB hard disk space and Internet access via a modem or LAN.

*PropMan* uses Microsoft *Internet Explorer* to gather data from various Web sites for its computations.

Price: \$99. For additional information contact Rockwell Collins, PropMan Department 120-130, 400 Collins Rd, Cedar Rapids, IA 52498, tel 319-295-5100/800-321-2223; fax 319-295-4777; collins@collins.rockwell.com; www.propman.com.

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## PRODUCT REVIEW

### ICOM IC-910H VHF/UHF Multimode Transceiver

Reviewed by Steve Ford, WB8IMY

It's easy to pigeonhole the IC-910H as a "satellite transceiver," but that would be a mistake. This radio offers a range of versatility—not to mention a hefty 100 W output on 2 meters and 75 W output on 70 centimeters—that makes it a truly multipurpose rig.

The IC-910H is disarmingly compact at only  $9^{1}/2 \times 3^{11}/16 \times 9^{13}/32$  inches. Despite its size, all of the front-panel controls and switches are ergonomically placed for effortless operation (even with big fingers like mine). The VFO knob is large and its rotation is smooth. The expansive LCD display is easy on the eyes and readable from every angle. Since the IC-910H is a dual-band radio (actually, it's triband if you purchase the 1296 MHz module), you have separate RF/AF gain and squelch controls on the front panel. The microphone and headphone jacks are on the front panel as well. (A small hand mike is included.)

Turn the radio around and you find antenna jacks for 2 meters and 70 centimeters (installing the optional UX-910 1296-MHz module adds a third antenna jack). There are three accessory sockets, two data jacks for digital communication, a pair of external speaker jacks, the obligatory dc power connector and an interface jack for computer control. All in all, it is a clean, uncomplicated layout.

### The IC-910H as Terrestrial SSB/CW Transceiver

The IC-910H is an exceptional tool for exploring the mysteries of the so-called "weak signal" modes. The convenience of being able to jump back and forth between bands is something that could spoil me in a heartbeat. The IC-910H displays both the "main" and "sub" band frequencies vertically (main on top, sub below) along with bargraph-style signal-strength indicators in each section. You can receive simultaneously on both bands, but you can transmit from the main band only (this arrangement is reversed when you are in the satellite mode). Of course, a quick press of the button flips the main/ sub frequency assignments. The '910H has two VFOs for each band. You can opt to use the main VFO knob to make frequency changes on either the main or sub bands-or assign the RIT or IF SHIFT



knobs to function as the sub band VFO control (clever!). You can even punch your chosen frequencies in directly from the front-panel keypad.

I used the '910H primarily to hunt contacts on 2 meters and 70 centimeters. Even with my puny attic-mounted Yagis, the range was impressive. SSB contacts spanning 150 miles were not uncommon on 2 meters. During a brief band opening on 70 centimeters, I enjoyed an SSB contact on 432.1 MHz over a distance of about 100 miles. With outdoor antennas, low-loss coax and receive preamps, I'm confident that my communicating range would have been considerably greater.

On 1296 MHz I set up a couple of skeds with a local station just to see how the IC-910H played on this band. Reports on my transmit signal were very favorable, and the local station that I was communicating with sounded good as well. The overall lack of activity on the band in my area and my less than optimal antenna (a small helical) gave me less suc-

#### **Bottom Line**

The ICOM IC-910H offers a great selection of capabilities and features for the VHF/UHF enthusiast. Its multiple modes and ample power output—and optional 23-cm coverage—make it a versatile tool for FM, weak-signal terrestrial and satellite operation.

cess with unscheduled contacts than I had on the other bands.

#### IC-910H as FM Transceiver

The IC-910H is a fully capable FM transceiver. The considerable output power on 2 meters and 70 centimeters gives the radio a formidable punch on FM simplex. For repeater operation the '910H offers most of the same convenience functions you find on many mobile FM rigs. The duplex offset frequencies are programmable for each band. There is a 50-tone subaudible (CTCSS) tone encoder/decoder for use with repeaters that require the tones for access. The stock microphone, however, does not include a DTMF pad for control or phone patch applications.

Testing the '910H on FM was an ideal opportunity to experiment with the memory and scanning functions (although these functions are available for other modes as well). The IC-910H sports 106 memory channels—99 regular channels, 6 scan-edge channels and one call channel for *each* band. The memory channels can be programmed with the frequency, mode, simplex or duplex and subaudible tone frequency. Alphanumeric memory naming is not supported.

There's also 5 (or 10—your choice) "Memo Pad" memories. These are very handy for temporarily storing interesting frequencies. This storage system is set up as "first in, first out." When you program in the sixth (or 11th) frequency, the first frequency that you memorized will be erased.

Memory programming is straightforward and probably familiar to most FM operators. You can transfer VFO contents to a memory channel, or vice versa. The call channels are convenient memory slots to store a single frequency (or frequency combination) for each band that you use often. To access one of these, you simply push the MS/BAND button to select the desired band, then press the CALL button.

There are three scanning modes in the IC-910H: memory scan, programmed scan and mode-select scan. The memory scan, as the name suggests, scans through the memory channels, automatically excluding blank, call or scan-edge channels. A "memory channel lockout" feature, for temporarily excluding a specific memory channel from a scan, is not included. The scan resume conditions (what happens after the scan stops on a busy channel) and the scan speeds are selectable. In the programmed scan mode, the '910H scans in the VFO mode between the two frequencies programmed in the scan-edge memory channels. Mode-select scan is intriguing. It allows you to scan through only those memory channels that are programmed with a particular mode (FM, SSB or CW). For example, you can set up the '910H to scan only your SSB "hot spots" if that is your interest at the moment!

I've already mentioned that the IC-910H can generate subaudible tones for repeater access. As it turns out, the tone-scan function allows you to *detect* these tones as well. If you don't know the frequency of the subaudible tone in use on a particular repeater, the '910H can scan the incoming signal and alert you to the exact tone frequency. In fact, you can configure the transceiver to activate its own tone squelch function. In this mode, the '910H remains silent until the proper subaudible tone is received.

Related to the various scanning functions is the IC-910H's *simple band scope*. This feature allows you to sweep both sides of a center frequency to check for activity. Detected signals are displayed as part of the signal-strength indicator for each band. This feature is available for SSB as well as FM.

#### IC-910H as Satellite Transceiver

Despite the versatility of the '910H, its use as a satellite transceiver garners the most attention in the amateur community. Considering the innovative satellite-operating features this rig provides, this is easy to understand. I'd be less than honest if I said that I wasn't eager to try the '910H on the satellites as quickly as possible.

I put the IC-910H to work primarily on the Fuji-OSCAR 29 and 20 satellites

because these birds operate in Mode J listening on 2 meters and retransmitting on 70 centimeters. In addition, both satellites use *inverting* transponders. Whatever you transmit on the uplink is inverted on the downlink—LSB on the uplink becomes USB on the downlink; a signal at a frequency in the *lower* portion of the uplink passband appears at the upper portion of the downlink passband. Add the considerable Doppler frequency shift that's present on the 70-cm downlink and you have the potential for serious operator confusion. (A condition that may also exist on the new AO-40 satellite—it uses inverting transponders.) The IC-910H promises features to alleviate the headaches. Does it deliver?

Prior to my first Fuji-OSCAR attempt with the '910H, I set the downlink frequency on the main band at 435.900 MHz—the top end of the downlink passband. I entered the uplink frequency in the sub band at 145.900 MHz, which is the bottom end of the uplink passband. By switching to the satellite mode and enabling reverse tracking, I was ready to go. It's worth noting that the '910H includes 10 separate satellite memories that you can preprogram with all the necessary setup information for your favorite birds.

When OSCAR 20 rose above 10 degrees elevation, I was able to hear the CW beacon clearly with my attic Yagis. I began tuning up through the downlink passband and watched as the '910H's uplink frequency stepped *downward* automatically in perfect sync. Despite that fact that I wasn't using a receive preamplifer, I was able to eavesdrop on several SSB conversations without difficulty.

A quick phone CQ brought a response and a 59 report. Doppler shift on the 70-cm downlink was tricky, but the IC-910's automatic reverse VFO tracking made it easy to compensate. I didn't have to remind myself to *raise* my uplink frequency to compensate for Doppler shift on the downlink.

And even with my mediocre antennas, the '910H provided more than enough output for my signal to be heard through the satellite. In fact, I often discovered that I was a little too strong. (The rule of thumb is that your own signal on the downlink should be roughly equal in strength to the satellite's CW beacon.) Thankfully, the '910H's output is adjustable all the way down to 5 W.

Digital satellite enthusiasts will be pleased to hear that ICOM has paid particular attention to data communication in the IC-910H. As you can see in the accompanying ARRL Lab test results, the bit-error-rate (BER) performance of the '910H was impressive. Using a 9600-baud modem and WiSP software, I was able to

consistently grab large amounts of data during two KITSAT-OSCAR 25 passes.

#### **IC-910H** as Contest Transceiver

If the '910H performs well for terrestrial weak-signal and satellite work, would it perform just as well during a contest?

If your contesting interest is more than casual, this transceiver may disappoint. In fairness, however, the IC-910H is not designed to be a competitive contest radio, and it would be unreasonable to compare it to, say, a VHF/UHF contest station based on high-performance transverters. The dynamic range performance on 2 meters and 70 centimeters wasn't adequate to deal with numerous nearby signals. I set up a contest simulation with a couple of stations and it quickly became clear that the '910H wasn't up to the task of sorting through the chaos (even with judicious use of the IF SHIFT control and RF attenuator).

It is important to note that our Lab tests revealed that the IC-910H generated a substantial amount of phase noise on all bands. In casual applications, this would not be a problem. Unlike HF phase noise, these signals would not travel very far. However, if you were using the IC-910H in a multioperator contest environment, the transceiver has the potential to create a fair amount of interference to the other radios, depending on the bands and frequencies in use.

#### **Additional Highlights**

ICOM has also packed in some features that you may not expect to find in a VHF/UHF transceiver. Some examples are VOX, a sideband speech compressor and a variable attenuator. A speech synthesizer—the UT-102 is available as an optional accessory. This will announce the current operating frequency and mode (and the S meter reading, if desired) at the push of a button. Optional DSP noise reduction boards can also be installed. Separate UT-106 DSP units can be added to the main and sub receivers.

There's even a built in CW keyer. The keying speed is adjustable from about 6 to 60 WPM, and you can vary the breakin delay time, the weighting, the paddle sense, the pitch and the side tone level. In a pinch, you can use the **UP/DOWN** buttons on the microphone for sending CW

#### Conclusion

With a decent antenna system, feed line and preamp, the IC-910H has the capability to be a worthy contender for point-to-point terrestrial communication on SSB and CW in noncontest environments. On FM its power and features

Table 1	
ICOM IC-910H, serial number 01	242

Manufacturer's Claimed Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 136-174, 430-450, 1240-1300 MHz; <sup>1</sup> transmit, 144-148, 430-450, 1240-1300 MHz. <sup>1</sup>	Receive and transmit, as specified.
Power requirement: Receive, 2.5 A; transmit, 23 A (max output). 11.7-15.9 V dc (13.8 V nominal)	Receive, 1.5 A; transmit, 21.5 A. Tested at 13.8 V.
Modes of operation: SSB, CW, FM.	As specified.
Receiver	Receiver Dynamic Testing
SSB/CW sensitivity, bandwidth not specified, 10 dB S/N: $<\!0.11~\mu\text{V}.$	Noise floor (MDS), 500 Hz filter: 144 MHz —141 dBm 432 MHz —142 dBm 1240 MHz —144 dBm
FM sensitivity, 12 dB SINAD: $<0.18~\mu V$ .	For 12 dB SINAD: 146 MHz 0.13 μV 440 MHz 0.14 μV 1240 MHz 0.17 μV
Blocking dynamic range: Not specified.	Blocking dynamic range, 500 Hz filter: 144 MHz 106 dB* 432 MHz 104 dB* 1240 MHz 92 dB*
Two-tone, third-order IMD dynamic range: Not specified.	Two-tone, third-order IMD dynamic range, 500 Hz filter: 144 MHz 85 dB* 432 MHz 80 dB 1240 MHz 78 dB*
Third-order intercept: Not specified.	144 MHz —6.4 dBm 432 MHz —5.8 dBm 1240 MHz —14.5 dBm
FM adjacent channel rejection: Not specified.	20 kHz channel spacing: 146 MHz, 66 dB; 440 MHz, 73 dB; 1240 MHz, 51 dB.
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing: 146 MHz, 66 dB*; 440 MHz, 73 dB*; 1240 MHz, 51 dB*; 10 MHz channel spacing: 146 MHz, 93 dB; 440 MHz, 85 dB; 1240 MHz, 65 dB.
S-meter sensitivity: Not specified.	S9 signal: 146 MHz, 25 $\mu\text{V};$ 432 MHz, 14 $\mu\text{V};$ 1240 MHz, 11 $\mu\text{V}.$
Squelch sensitivity: SSB, <1.0 $\mu$ V; FM, <0.18 $\mu$ V.	At threshold: SSB, 144 MHz, 0.58 μV; FM, 146 MHz, 0.14 μV; 440 MHz, 0.10 μV; 1240 MHz, 0.09 μV.
Receiver audio output: 2.0 W at 10% THD into 8 $\Omega$ .	2.8 W at 10% THD into 8 $\Omega$ .
IF/audio response: Not specified.	Range at –6 dB points, (bandwidth): CW-N (500 Hz filter): 358-1123 Hz (765 Hz); CW-W: 147-3084 Hz (2937 Hz); USB-W: 129-2887 Hz (2758 Hz); LSB-W: 148-3098 Hz (2950 Hz).
IF and image rejection: 144, 430 MHz, 60 dB; 1240 MHz, 50 dB.	First IF rejection, 144 MHz, 91 dB; 432 MHz, 99 dB; 1240 MHz, 126 dB*; image rejection, 144 MHz, 85 dB; 432 MHz, 86 dB; 1240 MHz, 99 dB.
Transmitter	Transmitter Dynamic Testing
Power output: 144 MHz, 100 W high, 5 W low; 430 MHz, 75 W high, 5 W low; 1240 MHz, 10 W high, 1 W low.	144 MHz, typically 96 W high, 1.1 W low; 430 MHz, typically 73 W high, <1 W low; 1240 MHz, typically 10 W high, <1 W low.
Spurious-signal and harmonic suppression: 144, 430 MHz, ≥60 dB; 1240 MHz, ≥50 dB.	144 MHz, 68 dB; 430 MHz, 71 dB; 1240 MHz, 71 dB. Meets FCC requirements for spectral purity.
SSB carrier suppression: ≥40 dB.	As specified. >40 dB.
Undesired sideband suppression: ≥40 dB.  Third order intermedulation distortion (IMD) products. Not appointed.	As specified. >47 dB.
Third-order intermodulation distortion (IMD) products: Not specified.  CW keying characteristics: Not specified.	See Figure 1, 3 and 5. See Figure 7.
Transmit-receive turn-around time (PTT release to 50% audio output): Not specified.	S9 signal, 70 ms.
Receive-transmit turn-around time (tx delay): Not specified.	SSB, 32 ms; FM, 32 ms. Unit is suitable for use on AMTOR.
Composite transmitted noise: Not specified.	See Figures 2, 4 and 6.
Bit-error rate (BER), 9600-baud: Not specified.	146 MHz: Receiver: BER at 12-dB SINAD, 7.4×10 <sup>-4</sup> ; BER at 16 dB SINAD, 1.1×10 <sup>-5</sup> ; BER at -50 dBm, <1.0×10 <sup>-5</sup> ; transmitter: BER at 12-dB SINAD, 1.5×10 <sup>-3</sup> ; BER at 12-dB SINAD + 30 dB, <1.0×10 <sup>-5</sup> .  440 MHz: Receiver: BER at 12-dB SINAD, 7.1×10 <sup>-4</sup> ; BER at 16 dB SINAD, 1.7×10 <sup>-5</sup> ; BER at -50 dBm, <1.0×10 <sup>-5</sup> ; transmitter: BER at 12-dB SINAD, 1.6×10 <sup>-3</sup> ; BER at 12-dB SINAD + 30 dB, <1.0×10 <sup>-5</sup> .  1240 MHz: Receiver: BER at 12-dB SINAD, 9.4×10 <sup>-4</sup> ; BER at 16 dB SINAD, <1.0×10 <sup>-5</sup> ; BER at -50 dBm, <1.0×10 <sup>-5</sup> ; transmitter: BER at 12-dB SINAD, 1.7×10 <sup>-3</sup> ; BER at 12-dB SINAD + 30 dB, <1.0×10 <sup>-5</sup> .
Size (HWD): 3.7×0.5×0.4 inches: weight 10 pounds	

Size (HWD): 3.7×9.5×9.4 inches; weight, 10 pounds.

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 indicated.

Third-order intercept points were determined using S5 reference.

'With the optional UX-910 1200 MHz Band Unit.

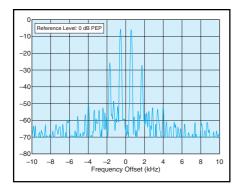


Figure 1—Spectral display of the IC-910H transmitter during two-tone intermodulation distortion (IMD) testing on 2 meters. The worst-case third-order product is approximately 27 dB below PEP output, and the worst-case fifthorder product is approximately 51 dB down. The transceiver was being operated at 100 W output at 144.2 MHz.

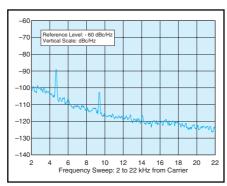


Figure 2—Spectral display of the IC-910H transmitter during composite noise testing on 144.02 MHz. Power output is 100 W. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.

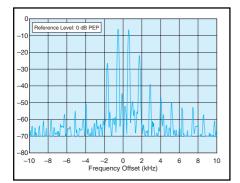


Figure 3—Spectral display of the IC-910H transmitter during two-tone intermodulation distortion (IMD) testing on 70 cm. The worst-case third-order product is approximately 23 dB below PEP output, and the worst-case fifth-order product is approximately 41 dB down. The transceiver was being operated at 75 W output at 432.2 MHz.

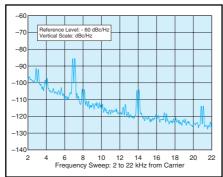
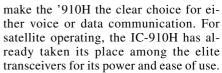


Figure 4—Spectral display of the IC-910H transmitter during composite noise testing on 430.02 MHz. Power output is 75 W. The carrier, off the left edge of the plot, is not shown. This plot shows composite transmitted noise 2 to 22 kHz from the carrier.



I had only one nit to pick with the IC-910H—and it is a nit this radio shares with many other rigs in its class. As a ham who would like to explore the higher microwave bands (especially on the new AMSAT-OSCAR 40 satellite), I plan to use transmit and receive converters. With that in mind, I would love to see: (A) a low-power (1 W or less) output port on the rear panel to drive a transmit converter and, (B) the ability to select alternate frequency displays that would show the actual frequency being received rather than the frequency of the IF transceiver. In other words, when I am listening to an S-band downlink signal from AO-40, I would prefer to see the 2.4 GHz frequency on the '910H display, not the 2-meter frequency my receive converter is supplying. These may seem like niggling requests, but they make a substantial difference in operating ease and convenience for satellite operators and terrestrial microwave enthusiasts.

Manufacturer: ICOM America, 2380 116th Ave NE, Bellevue, WA 98004; 425-454-8155; fax 425-454-1509; 75540.525@compuserve.com; www.icomamerica.com. Manufacturer's suggested list price: \$1799. Typical current street price: \$1450.

Manufacturer's suggested list pricing for selected optional accessories: CR-293 high stability crystal unit, \$380; CT-17 level converter (for computer control), \$169; FL-132 500 Hz CW filter (main band), \$133; FL-133 500 Hz CW filter (sub band/satellite), \$133; UT-102 voice synthesizer, \$74; UT-106 DSP unit, \$166; UX-910 1200 MHz Band Unit, \$599.

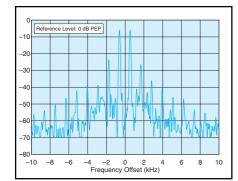


Figure 5—Spectral display of the IC-910H transmitter during two-tone intermodulation distortion (IMD) testing on 23 cm. The worst-case third-order product is approximately 25 dB below PEP output, and the worst-case fifth-order product is approximately 38 dB down. The transceiver was being operated at 10 W output at 1240.2 MHz.

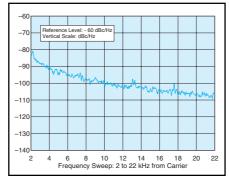


Figure 6—Spectral display of the IC-910H transmitter during composite noise testing on 1240.02 MHz. Power output is 10 W. The carrier, off the left edge of the plot, is not shown. This plot shows composite trans-mitted noise 2 to 22 kHz from the carrier.

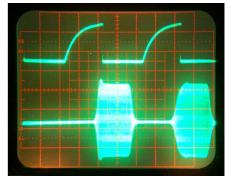


Figure 7—CW keying waveform for the IC-910H, showing the first two dits using external keying. The equivalent keying speed is 60 WPM. The upper trace is the actual key closure; the lower trace is the RF envelope. The transceiver was being operated at 100 W output at 144.02 MHz.

### DB6NT MKU 10 G2 10-GHz Transverter Kit

Reviewed by Zack Lau, W1VT ARRL Senior Lab Engineer

Kuhne Electronic bills their DB6NT 10-GHz transverter as a "third generation" product, as each iteration of the device has come ever closer to fulfilling the wish list of microwave experimenters. It does an admirable job in meeting this objective—the latest version features a 2-meter IF (a 432 MHz IF version is also available); single board construction; tune up with basic test equipment; and very good transmit and receive performance.

With a transmit power output of 200 mW and a receive noise figure of 1.2 dB, the level of performance is quite adequate for troposcatter work from a good location. I've made numerous contacts on the 3-cm band in excess of 200 km in which the other station was running just 200 mW to a 2-foot dish.

Single board construction is very desirable, as it is highly time consuming and expensive to wire up lots of little subassemblies into a complete transverter system. A successful single board design, however, does require considerable effort, particularly when it comes to eliminating spurious signals. Minute details, such as the exact height of the enclosure, can make a big difference in the stability of high gain microwave circuits.

#### **Design Details**

The kit is assembled on a double-sided PC board with plated through holes. There are just a handful of leaded components used though—the vast majority of the parts are surface mount devices. The substrate material is Rogers RO4003. While it is not as low loss as 5880 Duroid, it is cheaper to fabricate with plated through holes. Producing Teflon substrate boards with plated through holes can be quite expensive, especially when a few cycles of prototyping and circuit debugging are typically necessary during the development stages. Plated through holes simplify construction and improve performance by providing repeatable, low-inductance ground connections between the top and the bottom of the board. RO4003 also has a higher dielectric constant, which reduces board radiation problems.

The heart of any transverter—the local oscillator—is well designed in this unit. It uses four helical filters and a microstripline filter. I like to use helicals in my own designs, whenever I can find them cheaply. Apparently Kuhne has secured an affordable supply of these. The relatively large number of filters used in this transverter is actually an advantage—the local oscillator chain can be tuned up with just a voltmeter. This also simplifies troubleshooting—



an incorrectly wired stage won't tune up properly. This can be a problem with notune transverter designs—the lack of tuning can make it tougher to isolate defective or improperly installed parts.

The MKU 10 G2 transverter incorporates a few innovations that are quite obvious to those of us who have designed our own microwave transverters. One example is the use of closely spaced circuit board traces in place of discrete coupling capacitors. This eliminates the headaches that may be encountered in identifying faulty coupling capacitors. While this might seem to be a minor concern, unlike audio circuitry, signal tracing is much more challenging when a  $^{1}$ /4-inch is a  $^{1}$ /4- $^{1}$  $^{1}$ Λ.

The use of a shared filter for transmit and receive is also clever. The receive and transmit chains meet at a Wilkinson divider, and this connects to the balanced mixer through a single filter. Be cautious when you're tuning this filter though, as the image is only 288 MHz—or just 3%—away, so it is quite easy to accidentally align the unit on 10080 instead of 10368 MHz. A procedure in the tune up instructions outlines how to do this properly. A second similar filter, located in the transmit amplifier chain, is used to clean up the output signal.

The receiver uses a pair of low noise NE325684C HEMT transistors driving an MGF-1902 GaAs FET. The transmitter uses three MGF-1902s driving an MGF-1601. The transmit FETs run off a regulated 8-V supply, while a 5-V regulator supplies power to the receive FETs.

A separate 5-V regulator is used for the local oscillator to enhance frequency stability. An ICL-7660 provides the necessary negative voltage needed to bias the FETs. The bias voltage is adjusted with 10 k $\Omega$  potentiometers. A built-in directional coupler and diode detector allows you to monitor the power output with a voltmeter.

There are two methods of activating the T/R switching. One is to ground the PTT line. The second is to place a voltage of at least +9 V dc on the 144 MHz IF input. This voltage is available from the Yaesu FT-290 and ICOM IC-402 (432 MHz), but not the more modern FT-290MkII. It is quite possible that an old ICOM IC-2AT will switch the transverter, even though the voltage is below 9 V.

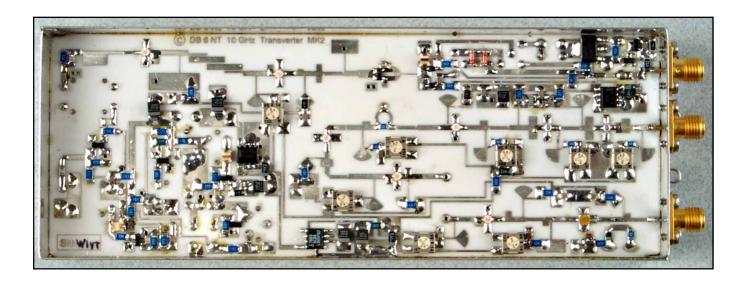
#### **Assembly**

Most of the components come packed in two compartmentalized plastic boxes. There were no missing or extra parts. The lids of these boxes have maps that clearly identify all of the different pieces, even the bits of hardware and wire. This is essential for the SMD capacitors, as I was not able to discern any identifying marks. The instructions warned about sharp edges on the tinplate panels that make up the enclosure. I lightly filed the edges of the metal parts to eliminate this hazard.

A disappointment was the quality of the instructions. Not only where they sketchy, but in some cases they were irrelevant or incorrect. Not having assembled a German tinplate enclosure before, I could have used some additional assembly details.

I began by studying the photographs on the Kuhne Web site (www.db6nt.com) to determine how the two L-shaped components that make up the side panels fit together. Each of the short legs has a small flap, and the instructions do not indicate whether the flaps should be positioned on the inside or the outside of the enclosure. They belong on the inside, so I needed to notch two corners of the circuit board with a nibbling tool to provide room for these seams.

After soldering the two pieces together, I carefully inspected the parts with a caliper and soon realized that I should



## Table 2 DB6NT MKU 10 G2 10-GHz Transverter

## Manufacturer's Claimed Specifications

Frequency coverage: 10368-10370 MHz.

Power requirements: Transmit, 0.35 A (nominal); receive, not specified, at 12 V (nominal).

Size (HWD):  $1^{1}/_{8} \times 2^{3}/_{16} \times 5^{7}/_{8}$  inches; weight: 7.0 oz.

Modes of operation: Not specified.

#### Receiver

Conversion gain: 20 dB. Noise figure: 1.2 dB.

#### **Transmitter**

Transmit RF input: 3 W (max).

Transmit RF output: 200 mW.

Spurious signal and harmonic suppression: Not specified.

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### Measured in the ARRL Lab

As specified (for 144-146 MHz IF).

Transmit, 0.40 A; receive, 210 mA, tested at 12 V.

Tested on SSB and CW.

20.5 dB.

As specified.

180 mW (min) input at 144 MHz required for typical 200 mW output.<sup>1</sup>

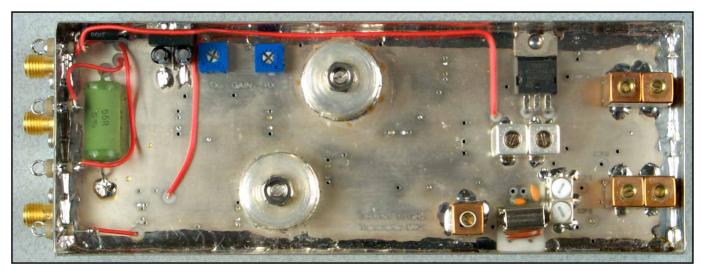
As specified.

45 dB.

have jigged the parts together to achieve a precision fit. I unsoldered them, removed the excess solder with Solder-Wick, and gave it another go.

To assure better results this time around, I made a jig out of a piece of <sup>1</sup>/<sub>4</sub>-inch thick plywood 2.1 inches wide by 5.75 inches long—approximately the same dimensions as the circuit board. I positioned the two side panel components in one of the two covers and slipped the plywood inside. This prevented the tinplate sides from curving. (One side of the plywood wasn't quite straight, so I used a bit of shim stock to straighten out the tinplate side.) I then slipped on the other cover and soldered the outside of the two seams, taking care not to solder the covers to the sides. I then used the same piece of plywood to position the circuit board in the enclosure, so that the center pins of the SMA connectors would just touch the microstrip traces. The center pins of the connectors were too long, so I had to cut them down slightly.

There were also instances of irrelevant instructions. There was no need to mark



<sup>&</sup>lt;sup>1</sup>Lower drive levels are possible with simple modifications. Contact SSB Electronic USA for details.

or drill holes for the SMA connectors, as the panels came pre-drilled. According to Gerry Rodski, K3MKZ, of SSB Electronic USA, this was the result of product improvements he requested for the US market. Also, the PC board has little index holes for properly locating the resonators so there is no need to mark their positions with dividers, as stated in the instructions.

The instructions were also wrong. The voltage measured at test point MP4 should be tuned for a maximum, not a minimum. As the RF input to this stage is maximized, the FET is moved away from its  $I_{dss}$  point, so the *current* actually decreases.

It took me about 8 hours to assemble the transverter. I found it quite useful to have two soldering stations—one with a very fine tip for most connections and another for soldering near plated-through holes to ground, or ground vias. The ground vias require considerably more heat to solder properly. A larger tip helps a lot, particularly when using 2% silver no-clean solder. For the SMD components, I hunted around for the smallest tip I could find—there are many of these small parts to install and no solder mask to ease the task.

As the instructions clearly state, this is no project for a beginner. Indeed, some hams might be intimidated with just the task of properly positioning the components in the right locations. Installing all of the components onto the PC board is just a single step in the instructions. Large parts placement diagrams, however, help to simplify this task.

#### A Few Assembly Tips...

I ended up having to unsolder and reposition the 1  $\mu$ F gate bias cap for the receive amplifiers—it got in the way of a 10 k $\Omega$  bias adjustment potentiometer.

I had trouble installing the 8 V transmit regulator—it seemed just too big to install in the proper location, even after I filed down the pins and the edge of its case. I solved the problem by slicing off part of its mounting tab with a shear. It turns out that this was the result of the PC board not being installed precisely flat—the circuit board rising up a mm or two is too much. Thus, you should ascertain that the board height is accurate for the regulator, as well as the three SMA connectors *before* you solder its perimeter to the inside of the enclosure.

#### **Debugging and Alignment**

Adjustment and debugging took another couple of hours. I had one bit of solder that shorted out the bias for a transistor and other stage that wasn't quite soldered adequately. Both situations were easily identified, as the stages wouldn't tune properly.

After tune-up, I measured the local oscillator frequency and found it to be roughly 60 kHz high. I found it easy to move it down in frequency by tuning the oscillator coil. I initially moved it down a little more than needed, just to verify that it had sufficient adjustment range.

Stability seems good for a simple PTC (positive temperature coefficient) crystal heater. After warm-up stability was within about 4 kHz over a 1.5-hour test.

Sixty-six percent of the drift was observed in a simulated transmit test. After 20 minutes of continuous transmit the frequency drifted upwards by 2.6 kHz. This is not surprising, as the current nearly doubles during transmit, from 0.21 to 0.40 amps.

The current draw is rather low, making this transverter an excellent choice for battery-powered operation. The heater increases the initial current draw by about 0.2 amps, but it takes only about 5 seconds or so for it to drop to 0.1 amps of extra current, according to a room temperature test.

Alignment by voltmeter worked just fine. Without any further adjustment the unit met its claimed specifications of a 1.2 dB receive noise figure and 20 dB gain, as well as 200 mW of RF output from of the transmitter.

Tuning the resonator and locking down the screws was a bit of a challenge. This is somewhat of an art, as tightening down the lock nuts pulls the screws back out of the resonators, detuning them. It was almost impossible to make these adjustments with a digital multimeter. I'd strongly recommend using a 'scope or analog meter for this particular task.

## Assembling the Transverter into a 10 GHz System

Attaching a standard SMA relay to the transverter is simplified by the spacing of its receive and transmit ports. The distance between the two connectors on standard SMA relays match those on the transverter, so barrel connectors can be used to make the connection. Most hams purchase these relays on the surplus market. They cost several hundred dollars new, but can usually be found at hamfests for between \$10 and \$50. The majority of these are designed to operate on 24 V, but 12 V ones have been showing up lately. I used a 24-V relay that I rewound for 12 volts.

The IF transceiver is connected to the transverter through a third SMA bulkhead connector. Four feed through capacitors serve as the connection points for the dc power, manual PTT control, 12 V output on transmit (for controlling additional system components) and MON output. This connection allows you to monitor the relative RF power output with a voltmeter.

To mount the transverter near a dish feed, I decided to machine two Lexan plates so that the transverter would fit snugly between them. The plates are held together with screws. One plate provides an attachment point for a mounting bracket.

## Is 200 mW Sufficient Power to Make the Path?

Many hams are confused by the path loss equation (there are actually three different equations!). The most intuitive is for an isotropic radiator and a fixed aperture receiving antenna. In this case, the path loss is independent of frequency. The most often quoted example uses isotropic radiators on both ends—in this case the path loss increases with frequency, as the receiving antenna gets smaller. However, with microwave antennas, it is most common for the aperture to be the same size on both ends. In this case, path loss actually decreases with increasing frequency. Thus, in terms of free space loss, a pair of 2-foot dishes exhibits 13 dB less loss on 10 GHz than they do on 2.3 GHz. Similarly, a pair of 2-foot dishes at 10 GHz has 10 dB less path loss than 4-element Yagis on 2 meters  $(67 \text{ dBi} - 20 \text{ dBi} - 37 \text{ dB} = 10 \text{ dB})^2$ 

A system built around this transverter and a 2-foot dish would be quite adequate for hilltopping. I've heard a pair of 200 mW stations make a 300-mile contact when the band peaked. However, I find that more power is needed to operate from the flatlands of the Connecticut shoreline. I'd consider 3 W RF output, a 2-foot dish and good CW skills the minimum for reliably making 100-mile contacts. Amplifiers up to 10 W output can be purchased from SSB Electronic USA.

#### In Conclusion

I'd recommend this assembly project only for advanced kit builders who are comfortable installing surface mount parts. Fortunately (for everyone else) assembled and tested versions are also available. Kuhne Electronic has also announced a version housed in a professional quality milled aluminum case that is designed to ease installation in mastmount applications.

Manufacturer: Kuhne Electronic, Birkenweg 15, D-95119 NAILA/Hölle, Germany. Kuhne Electronic products are available in the US from SSB Electronic USA, 124 Cherrywood Dr, Mountaintop, PA 18707; 570-868-5643; fax 570-868-6917; www.ssbusa.com.

Price: \$580 assembled and tested, \$385 in kit form. Similar transverters for other microwave frequency ranges are also offered.

<sup>1</sup>Harvey W. Lance, K7IT, "Conversion of Surplus Relays to Other Operating Voltages," Technical Correspondence, QST, May 1980, p 34.

<sup>2</sup>Rick Campbell, KK7B, "Does Path Loss Increase with Frequency?" Technical Correspondence, *QST*, Jan 1991, p 38.

### **HAPPENINGS**

## QST Gets New Editor, Publisher

Steve Ford, WB8IMY, became the editor of ARRL's official journal *QST* on April 2. Ford, who was *QST* managing editor and supervised the magazine's editorial staff, succeeded Mark Wilson, K1RO, as *QST* editor and Editorial and Production Department manager. Announcement of the change came March 20 from ARRL Executive Vice President and CEO David Sumner, K1ZZ.

"This is a natural extension of Steve's current work as managing editor of QST," Sumner said. "He already handles much of the responsibility for QST content and was heavily involved in the two recent and highly successful QST redesign efforts."

Ford said that under his leadership QST will maintain its current editorial direction. "QST has been very successful," he said. "The membership clearly enjoys the magazine, and I don't foresee any changes in the near future."

Wilson, who was designated earlier this year as ARRL's chief operating officer, was named *QST* publisher, a title that had been held by Sumner.

Ford, 46, came to ARRL Headquarters in 1991 as an editor on the Book Team and is the author of several League publications. He became assistant managing editor of *QST* in 1993 and managing editor in 1995.

In his new role, Ford is responsible for the QST and ARRL book editorial teams, as well as production of CD-ROM publications and the graphics and editorial production areas at ARRL Headquarters.

Taking over as QST managing editor



QST Editor Steve Ford, WB8IMY.



QST Managing Editor Joel Kleinman, N1BKE.

and editorial team supervisor is former Book Team Supervisor Joel Kleinman, N1BKE, a 25-year HQ veteran. Kleinman, 52, came to ARRL Headquarters in 1976 as an OSCAR education program assistant. He subsequently served as *QST* features editor, editorial/production supervisor and assistant managing editor. In 1988, he became Book Team supervisor, responsible

for the development and editorial integrity of ARRL books, tapes and audio CDs.

"QST is Joel's first love, and we're looking forward to putting his excellent editorial and organizational skills to use there," Sumner said. "We believe that he and Steve will make a great team."

A successor to Kleinman was being sought to head the Book Team.

### AMSAT Details Likely AO-40 Failure Scenario

AMSAT-NA President Robin Haighton, VE3FRH, has issued a likely explanation of why AO-40 suddenly went silent in mid-December. Haighton's approximately 1200-word statement, released March 16, outlined a three-part failure scenario theorizing that AO-40's problems began with a fault in a helium valve.

"Initial thoughts were that the spacecraft was completely dead and that chances of recovery were remote, with the possibility that AO-40 was in multiple pieces," Haighton said. The satellite's 2-



meter beacon quit while ground controllers were attempting to test the onboard 400-newton motor system after anomalies with an orbit-shifting burn that mysteriously lasted several minutes too long. It was almost two weeks before ground controllers were able to reset the onboard computers and restart a beacon on 2.4 GHz.

Ground controllers have been somewhat successful in regaining control of the next-generation amateur satellite since telemetry transmissions resumed Christmas Day, but Haighton conceded that some onboard systems might not be recoverable.

Haighton said that, while the Phase 3D team may never know exactly what happened, the likely scenario includes what

Haighton—in an interview with ARRL—called "a minor explosion" aboard AO-40 that apparently damaged or destroyed some systems. Haighton said in his statement that the motor could have "burped" or "popped" as out-of-place fuel mixed and then ignited as a result of a blocked exhaust port on a helium valve that kept the fuel system pressurized.

AO-40 went dead during subsequent efforts to "cycle" the troublesome helium valve. "It is believed that during this exercise the system became pressurized and that a leakage of fuel was the end result," Haighton said.

"We think it was a human error thing," Haighton conceded in an interview with the ARRL. He did not elaborate. Before reaching any firm conclusions, Haighton said, the AO-40 team would have to talk out the issues and come up with an answer. The most important goal, he said,

would be to avoid a similar occurrence in future AMSAT projects.

By late March, ground controllers had used AO-40's magnetorquing system to reduce the satellite's spin rate to around 5 RPM and were optimistic that they'd be able to re-orient the satellite for communication with Earth. The satellite's omni-

# "We think it was a human error thing."

directional antennas appear to be lost, but ground controllers were hoping the highgain directional antennas still work and that reorienting the spacecraft might bring about a resumption of signals from other transmitters.

With the spin reduction, AO-40's heat pipe system—which could not work at the

higher spin rates—also began operating again, considerably reducing internal temperatures. But ground controllers were pessimistic about being able to restore AO-40's 2-meter and 70 cm transmitters.

"The 2-meter and 70-cm transmitters still are in doubt," Haighton said. "We think we've got a problem with both of those." Haighton said the 2-meter and 70-cm receivers appear to be working, however. Yet to be tested was the onboard arc-jet motor, which ground controllers hoped to use to adjust the satellite's orbit for future use.

Haighton said one of the things ground controllers determined that the satellite had lost quite a lot of its 400-newton motor fuel—and thus a substantial amount of weight. "We're fairly sure there was a leak," he said.

"Following the reorientation it will be possible to test the remaining systems on

### **FCC News -**

### FCC DENIES LA 2.4-GHZ EXPERIMENTAL APPLICATION,

Following objections from the ARRL, AMSAT and others, the FCC has turned down an application from Los Angeles County, California, for an experimental license permitting airborne microwave TV downlinks (TVDL) in the 2402-2448 MHz range. The FCC also canceled an experimental license grant to the City of Los Angeles to operate a TV downlink system in same band. Amateurs have a primary domestic allocation at 2402-2417 MHz and a secondary allocation in the rest of the affected band.

"Experimental licenses are not substitutes for regular radiocommunication service licenses," said Charles Iseman, deputy chief of the Electromagnetic Compatibility Division in the FCC's Office of Engineering and Technology. OET issues all experimental licenses.

The ARRL, AMSAT and the Amateur Television Network as well as ARRL members Art McBride, KC6UQH, and Thomas O'Hara, W6ORG, filed informal objections to the County's application. The League, AMSAT and ATN also had objected to the City's experimental grant. The FCC gave the City until December 1 to terminate its operation and reserved the right to accelerate the cancellation date if harmful interference occurs.

The Los Angeles County proposal, filed in August 1999, sought FCC authorization to develop a TVDL system on four 2.4 GHz channels for use aboard sheriff's and fire department airborne units. The FCC had granted the City's WB2XEN experimental license based on

a similar submittal. The FCC said other public safety agencies in Southern California, including Long Beach, Glendale and Burbank, plan to deploy similar airborne units.

In protesting the County's plan, the ARRL called the application a "foot in the door" toward gaining a permanent berth in the 2.4-GHz band. The County and the City already are authorized to operate TVDL systems under Part 90 rules in the 2.450-2.483.5-GHz band, but both told the FCC that they had experienced coordination and interference problems and sought the experimental TVDL authorization as a result.

In light of the denial and the cancellation, the FCC did not address potential interference issues raised by the objectors

#### **Amateur Radio Enforcement**

♦ FCC launches review of Los Angeles-area repeater: The FCC has launched a review into the operation of the W6NUT repeater in the Los Angeles area. The repeater, which has attracted a following of what some observers call "nontraditional" amateur users, also was said to have been the radio home of Richard Burton, ex-WB6JAC, now in prison for unlicensed operation. "We've gotten more complaints about that repeater than any other repeater in the country," FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth said of the W6NUT machine, which operates on 147.435 MHz. "If there's a control operator, we sure haven't seen any evidence of it."

Hollingsworth wrote the repeater's trustee, Kathryn Tucker, AA6TK, and two W6NUT users regarding lengthy broadcasts made over the repeater in early February. Hollingsworth told Tucker that the FCC has received complaints that control operators and the repeater licensee "fail to address long periods of jamming by users, broadcasting, music playing as well as a plethora of other violations."

He cited one transmission of more than two hours on the evening of February 1-2 that included music and commentaries on many of the songs. A similar lengthy broadcast aired over W6NUT a few evenings later, he said. Both transmissions repeatedly timed out the repeater, Hollingsworth said, and there was no evidence that a control operator was present at any time.

In separate letters to Technician licensees Ted R. Sorensen III, KC6PQW, and Gregory S. Cook, KC6USO, Hollingsworth cited monitoring information alleging that Sorenson actually transmitted both broadcasts. On the first occasion, on February 1-2, Sorenson is said to have acted in concert with Cook, who was hooked in via phone patch. The second similar transmission February 4-5 was said to have featured only Cook, again via phone patch to Sorenson's transmitter, Hollingsworth said.

Cook's license is due to expire May 7, 2001. Hollingsworth advised Cook that his renewal application would "not be routinely granted unless these issues are resolved" and that his renewal application could wind up being designated for hearing.

board the spacecraft and to determine which systems and bands will be available for future operations and under what conditions," Haighton said.

### ARRL 160-METER BAND PLAN COMMITTEE READY FOR INPUT

ARRL President Jim Haynie, W5JBP, has selected five amateurs to serve on the ad hoc 160-Meter Band Plan Committee. The panel is open for input from the amateur community regarding the current band plan for "Top Band" and recommendations for changes. The ARRL Board of Directors approved formation of the committee at its annual meeting in January.

"With the ever-increasing activity on 160, it is time to revisit the band plan," said ARRL Delta Division Director Rick Roderick, K5UR, who was named to chair the committee.

Also asked to serve on the panel were ARRL New England Director Tom Frenaye, K1KI; ARRL Dakota Division Director Emeritus Tod Olson, K0TO; Jeff Briggs, K1ZM, and Bill Tippett, W4ZV. All of the appointees are veteran amateurs and familiar with 160 meters and the issues facing the band. Briggs, a perennial Top Band contester and DXer, literally wrote the book on 160 meters, *DXing on the Edge—the Thrill of 160 Meters*. Tippett has more than 300 DXCC entities to his credit on 160.

ARRL Membership Services Manager Wayne Mills, N7NG, will serve as Head-quarters staff liaison with the committee.

Unlike other HF bands, 160 meters never has been divided by the FCC into mode-specific subbands. Since manufacturers began including 160 meters on transceivers and HF LORAN was phased out, 160 meters has grown steadily in popularity. Today, CW, SSB, AM, RTTY and other digital modes coexist there, although not always harmoniously. Most operation also tends to cluster on the lower 100 kHz of the band, and the lines between which modes operate where are becoming increasingly blurred.

Roderick says the band plan committee is open for comments "from all parties—the digital folks, DXers, ragchewers, anyone." The e-mail address for comments is 160-bandplan@arrl.org.

All comments must include a subject line. The committee plans to report back to the ARRL Board of Directors with its recommendations at the Board's July meeting.

All ARRL band plans are on the ARRL Web site, www.arrl.org/FandES/field/regulations/bandplan.html.

#### LEAGUE SEEKS AMATEUR ACCESS TO 216-220 MHz

In comments filed in separate FCC proceedings, the ARRL has urged the

FCC to retain and enhance the 219-220 MHz shared Amateur Radio allocation and make it a bit easier for hams to use the segment. The League also has proposed expanding amateur access to include the entire 216-219 MHz band.

The 219-220 MHz amateur segment was created in 1995 as a result of an ARRL petition for rulemaking. The FCC

has designated the band on a secondary basis for amateur fixed point-to-point digital message forwarding systems under strict limitations.

In PR Docket 92-257, the FCC proposed to designate licensing regions for the Automated Maritime Telecommunications System (AMTS) facilities at 216-220 MHz and to authorize a single

#### **NOTABLE SILENT KEYS**

Jack R. Carter, KC6WYX, SK: Jack Carter, KC6WYX, of Rancho Palos Verdes, California, died February 20. He was 71. An ARRL member, Carter served as executive officer of the World War II Tank Landing Ship *LST-325*, which earlier this year completed a 4200-mile journey from the Island of Crete to Mobile, Alabama, and gained extensive news coverage en route. A retired electrical engineer, Carter had ham radio gear aboard and used the WW2LST call sign of the USS LST Amateur Radio Club while under way. According to a report in *Stars and Stripes*, 29 sailors—men in their 60s, 70s and older, most US Navy veterans—signed on to deliver the ship to a permanent berth to be used as a floating museum. Carter was past president of the Palos Verdes Amateur Radio Club. He was buried at sea. The family has invited memorial donations to the American Cancer Society.

Richard "Rick" Vahan, N4PBF, SK: Well-known Southern Florida amateur Rick Vahan, N4PBF, of Miami, Florida, died February 28, of leukemia. He was 73. Vahan served as president of the Dade Radio Club, was a past director of the South Florida FM Association and a member of Dade County ARES, as well as an acclaimed volunteer for W4EHW at the National Hurricane Center. He also served as an ARRL Public Information Officer. Vahan's interest in scuba diving led to a position as a curator at the New England Aquarium, where he also did public relations. He later became curator of education at Shedd Aquarium in Chicago. In 1972 Jacques Cousteau invited Vahan to ghostwrite *The Ocean World of Jacques Cousteau*. Vahan later worked for the Dade County Office of Film and TV Coordination, where he promoted the county as a TV and film location.

10-10 Net President Thomas A. Henderson, K4CIH, SK: 10-10 International President Tom Henderson, K4CIH, of Tuscaloosa, Alabama, died March 4. He was 64. Henderson reportedly had suffered a massive heart attack February 14 and had been in a coma. He was an ARRL member. Known to other 10-10 International Net members as #33233, Henderson was licensed in 1959 and had been active in 10-10 since 1980. He joined the board as a director in 1993 and became president in 1995. Henderson was a retired nursing supervisor. Chuck Imsande, W6YLJ, was named to succeed Henderson.—Gerry Gross, WA6POZ

George Thurston III, W4MLE: Broadcast journalism pioneer, Amateur Radio writer and ARRL field volunteer George Thurston III, W4MLE, of Tallahassee, Florida, died March 20. He was 75. Thurston helped edit the first ARRL Radio Amateur's Operating Manual, the author of QST "Public Service" columns and at least 10 other QST articles from 1951 to 1994. A Virginia native and a victim of tuberculosis as a teenager, Thurston was first licensed in 1947. He went on to become a respected broadcast news reporter and print journalist who covered stories of national and international interest during his career and spent two decades in the state capital press corps. In the 1960s, Thurston, then the Section Emergency Coordinator for the old Western Florida Section, and Andy Clark, W4IYT—then SEC of Southern Florida and now a Silent Key—put into place what is now the Amateur Radio Emergency Service in Florida and established close ties with the National Traffic System. Thurston later served as SEC of the Northern Florida Section—from July 1990 through November 1996—and is credited with helping to strengthen the ARES organization in the section. W4MLE also was an ARRL Official Relay Station and a past president of the Tallahassee Amateur Radio Society. ARRL Southeastern Division Vice Director Evelyn Gauzens, W4WYR, called Thurston "a backbone in emergency communications in Florida." Northern Florida Section Manager Rudy Hubbard, WA4PUP, said Thurston was dedicated to Amateur Radio and an experienced and knowledgeable operator.

licensee for each unassigned AMTS frequency block on a geographic basis. The current AMTS system uses a site-based licensing structure. Amateur Radio now is secondary to AMTS at 219-220 MHz.

While the ARRL said it's unaware of any amateur interference to AMTS stations, attempts by hams to use the band to construct digital backbone systems "have been largely thwarted to date" because of the inability to get consent from AMTS licensees within 50 miles of the proposed operation, as rules now require.

In its comments, the ARRL suggested letting amateurs seeking to use 219-220 MHz submit computer-generated field strength contours that demonstrate a lack of interference potential at the relevant AMTS boundaries in lieu of having to get written permission.

The ARRL said the FCC should "provide some flexibility in the engineering of amateur systems in that band, to the extent consistent with avoidance of interference to AMTS stations."

In a second proceeding, the ARRL suggested that the FCC expand the secondary amateur allocation to provide hams with access to the entire 216-220 MHz band. The League commented in response to a *Notice of Proposed Rule Making*, ET Docket 00-221, that proposes to reallocate 27 MHz of spectrum in various bands, including 216-220 MHz, from government to non-government use. In general, the FCC seeks to allocate the entire 216-220 MHz band to the Fixed and Mobile services on a primary basis.

While the FCC has promised to protect AMTS and other operations from new interference, it extended no such assurances to amateur operations at 219-220 MHz. In its comments, the ARRL expressed fears that additional co-primary users "will essentially foreclose what limited opportunities there are now for amateurs to make use of the 219-220 MHz segment."

The League suggested that in the face of such potential constraints at 219-220 MHz, permitting amateur access to the entire 216-220 MHz band on a non-interference basis would be one means to accommodate Amateur Radio operations in that portion of the spectrum.

The ARRL further suggested that amateurs who proposed to operate in the 216-220 MHz band be allowed to use "fixed-distance separations" in lieu of the present consent requirements, as a means to demonstrate the absence of interference potential to AMTS and other co-primary users.

## ARRL URGES FCC TO NIX PART 15 PETITION AFFECTING 420-450 MHz

The ARRL has urged the FCC to deny or dismiss a petition that seeks to boost

#### ISS Expedition 2 Crew Hits the Airwaves Early

International Space Station Expedition 2 crew member Susan Helms, KC7NHZ, had barely settled in aboard the ISS when she apparently felt the urge to do a little hamming. Helms, who traveled to the ISS in mid-March aboard the shuttle *Discovery* with crewmates Yury Usachev, UA9AD—the Expedition 2 commander—and fellow US astronaut Jim Voss—worked a couple of US stations March 18 and 19 and was monitored by another in Australia.

The ham who had snagged the first-ever casual ham contact with the ISS—Randy Shriver, KG3N, of Hanover, Pennsylvania—got lucky again with the Expedition 2 crew. Shriver heard Helms calling CQ early on the morning of March 18 and gave her a call. Helms came back to him using NA1SS, and they chatted for about 45 seconds. On November 13, Shriver worked Expedition 1 crew commander William Shepherd, KD5GSL.

At press time, Helms, Usachev, and Voss were reported to be adapting to the new quarters they'll call home for four months. Amateur Radio on the International Space Station—or ARISS—contacts were pending with schools in California and Mississippi.

The Expedition 1 crew of Commander William Shepherd, KD5GSL, Yuri Gidzenko, and Sergei Krikalev, U5MIR, arrived back on Earth March 21. Before Shepherd's return, ARISS representatives personally thanked Shepherd via Amateur Radio for his

participation in several ARISS school contacts.

ARRL Field and Educational Services Manager Rosalie White, K1STO, expressed appreciation to Shepherd on behalf of ARRL and AMSAT for taking time out of his busy schedule to answer questions posed by kindergarten through high school students. Students in Illinois, New York, Virginia, Texas, Hawaii, American Samoa, Arizona and Ontario, Canada, got a chance to speak with Shepherd during his tour of duty aboard the ISS. "He affected quite a few young lives," White said.

For his part, Shepherd said he enjoyed his experience with the ARISS school contacts. "I can't tell you how much this has meant to me. It's been great!" he said. "It's been fun to tell people about it too." Shepherd also complimented the technical quality of the Amateur Radio transmissions.

ARISS Board Chairman Frank Bauer, KA3HDO, also thanked Shepherd, as did Will Marchant, KC6ROL, who's involved in setting up the operational aspects of each ARISS school contact and coordinating schedules with NASA.

Shepherd requested the contact as his mission aboard the ISS wound down, in part for the opportunity to chat with his wife, Beth, as well as with his good friend and fellow shuttle astronaut Kevin Chilton, KC5TEU and his wife, Sunny.

For more information on the ARISS program, visit the ARISS Web site.

NASA PHOTO



Crew Commander Yury Usachev, UA9AD, is flanked by astronauts Jim Voss (left) and Susan Helms, KC7NHZ, aboard the International Space Station.

the field strength and duty cycle of RF identification systems deployed as unlicensed Part 15 devices in the 420-450 MHz band. The League filed comments March 1 in a petition filed by SAVI Technology Inc.

The petition, designated RM-10051, asked the FCC to change certain Part 15 rules affecting unlicensed, periodic, intentional radiators. SAVI, which markets radiolocation and wireless inventory control products, says it needs the rules changes to satisfy customer demand for increased RFID system capabilities.

The ARRL argues that the field strengths and duty cycles SAVI proposes for its RFID tags "are completely unreasonable and would undoubtedly seriously disrupt amateur communications in one of the most popular of the Amateur Service allocations."

The League said SAVI obviously did not have interference avoidance in mind when it chose the 420-450 MHz band. "It is among the worst choices SAVI could have made from that perspective," the ARRL said, adding that the 902-928 MHz band would be a better choice. The ARRL said SAVI also failed to demonstrate why it needs such extremely high field strengths to communicate over paths of 100 meters.

The ARRL said its limited anecdotal studies of noise levels from unlicensed devices in certain metro areas indicate that manmade RF noise "is substantially increasing." The League warned the FCC to "be extremely careful in evaluating rulemaking petitions proposing substantial departures from present Part 15 rules."

## DAYTON HAMVENTION NAMES 2001 AWARD WINNERS

Dayton Hamvention has named broadcasting engineer and propagation guru George Jacobs, W3ASK, as its 2001 Amateur of the Year.

A renowned international broadcast engineering pioneer, Jacobs is perhaps best known in the amateur community as propagation editor for CQ for the past 50 years. Jacobs has authored hundreds of technical articles, is a co-author of a handbook detailing shortwave radio propagation characteristics and has been a contributing editor for *World Radio-TV Handbook* for 39 years.

Jacobs is credited with pioneering and developing the worldwide Voice of America system and with overseeing the post-1974 modernization of Radio Free Europe and Radio Liberty. He's also served as a delegate to international regulatory conferences.

Amateur Radio on the International Space Station Board Chairman Frank

Bauer, KA3HDO, will receive Dayton Hamvention's 2001 Special Achievement Award. The Hamvention Awards Committee credited Bauer with "countless hours of behind-the-scenes work" to make the Space Amateur Radio EXperiment and ARISS programs successful. Bauer organized and led the teams that provided the links to schools, so students could talk with the astronauts orbiting Earth. He also developed band plans for spectrum utilization for Amateur Radio space operations and continues his leadership role as a technical liaison between the Amateur service

and NASA.

Peter Martinez, G3PLX, will receive Dayton Hamvention's Technical Excellence Award for 2001. Martinez, active on RTTY since the 1960s, was recognized as the father of PSK31, an increasingly popular mode of digital communication. "PSK31's elegant and effective design has helped revitalize interest in HF digital modes," the committee said.

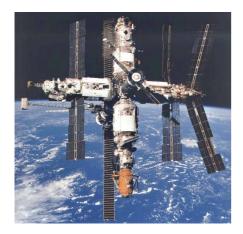
All three awards will be formally presented at the Dayton Hamvention banquet on May 19. This year's Dayton Hamvention, May 18-20, will be the 50th.—Dayton Hamvention news release

### In Brief

- Eastern New York gets new Section Manager: The ARRL Eastern New York Section has a new Section Manager. Rob Leiden, KR2L, who had served as SM since March 1996, has stepped down because he has moved out of the section. On March 1, ARRL Field and Educational Services Manager Rosalie White, K1STO, appointed Peter A. Cecere, N2YJZ, of Woodstock, New York, to complete Leiden's term of office, which expires March 31, 2002.
- ARRL seeks articles for Antenna Compendium: ARRL is looking for original, unpublished articles for the next volume of the extremely popular book series The ARRL Antenna Compendium. Articles should be about antennas, propagation, transmission lines, antenna tuners, or towers—anything dealing with antennas! Submit articles to Dean Straw, N6BV, c/o ARRL HQ, 225 Main St, Newington, CT 06111.
- Vote on QST Cover Plaque Award: The winners of the QST Cover Plaque Award for March were Dave Benson, NN1G, and George Heron, N2APB, for their article "The Warbler—A Simple PSK31 Transceiver for 80 meters." Congratulations, Dave and George! ARRL members are reminded that the winner of the QST Cover Plaque award—given to the author(s) of the best article in each issue—is determined by a vote of ARRL members. Voting takes place each month on the ARRL Web site at www.arrl.org/members-only/qstvote.html.
- AMSAT-NA 2001 Annual Symposium issues call for papers: A call for papers has been issued for the AMSAT-NA 2001 Annual Symposium, set for October 5-6 in Atlanta, Georgia. Papers may be presented by the author during the symposium or simply offered for inclusion in the Symposium Proceedings. Subject matter should be of general interest to Amateur Radio operators involved in satellite communications. Suggested topics include operating techniques, antenna design and construction, spacecraft design and construction, current mission status, proposed satellite missions, telemetry acquisition and relay, satellite microwave projects, etc. Outline abstracts are due by June 30. Completed papers must be received no later than August 15. Electronic submittal—MS Word-compatible or ASCII text—is preferred. Send electronic documents as e-mail attachments to Symposium Chairman Steve Diggs, W4EPI, w4epi@amsat.org.—AMSAT News Service
- QCWA honors Bob Baird, W9NN: Some 30 hams and friends gathered February 17 in Mosinee, Wisconsin, to honor and recognize a ham of 80 years, Bob Baird, W9NN. Baird, who turned 95 February 18, was one of the founding fathers of the Quarter Century Wireless Association in 1947. He also founded the W9DXCC gathering, which attracts hundreds of hams, DXers and DX each year. In his younger years, Baird was an engineer for WGN Radio, Chicago. He still frequents HF CW.—Badger State Smoke Signals
- YHOTY nominations are open: Nominations are for the *Amateur Radio Newsline* Young Ham of the Year Award for 2001. Created in 1986, the award recognizes one young amateur under the age of 18 in the continental United States for his or her contributions to society through Amateur Radio. Nominating forms and additional information are available at the *Amateur Radio Newsline* Web site, www.arnewsline.org. *Amateur Radio Newsline* must receive all nominations and materials that the official rules require before May 30, 2001. Complete details and application forms also are available by sending a self-addressed stamped envelope to The *Amateur Radio Newsline* Young Ham of the Year Award, 28197 Robin Ave, Santa Clarita, CA 91350.

#### Mir's Deorbiting Ends an Era

The Russian *Mir* space station was brought down early on March 23—safely and according to plan. Despite fears that something might go awry, the only thing that got pelted with space debris was the Pacific Ocean. Over its 15 years, *Mir* housed Amateur Radio gear and hosted several Amateur Radio operators as crew members, who often used the ROMIR call sign.



Early on March 23, mission controllers in Moscow fired engines on a Progress cargo ship attached to *Mir* to deorbit the spacecraft and send it hurtling through Earth's atmosphere. While most of the aging spacecraft was believed to have burned up upon reentry, upwards of 30 tons of debris were expected to survive the trip and end up in the Pacific between Chile and Australia.

The demise of *Mir* ended a long and proud chapter in the history of Russian space exploration. The initial module of the space station was launched February 20, 1986.

Right up until the end, some in Russia held out hope that a way would be found to keep *Mir* in space. But last year, the Russian government decided it could no longer afford the \$250 million a year cost. Russia has reaffirmed its intention to continue its cooperation with the US, Canada, ESA, and Japan in the development of the International Space Station.

The Russian Space station also had long outlived its anticipated three to six-year life span, and crews sometimes found themselves spending less time on research and more on repairing systems that broke down. *Mir* was plagued by a series of computer breakdowns that, at times, left the station running at reduced power and drifting in space.

Countless earthbound hams and many

students—as part of the Space Amateur Radio EXperiment—got the chance to speak directly with Mir's crew, which, at times, has included US, astronauts. Hams also accessed Mir's packet messaging system, and pictures transmitted via an SSTV experiment installed aboard Mir a few years ago also delighted earthbound

In all, more than 100 astronauts and cosmonauts did tours of duty aboard *Mir*, including the current International Space Station Expedition 2 crew commander Yury Usachev, UA9AD.

While Mir's ham gear was installed in part to help boost crew morale, it became a vital communication link after a fire broke out and when—not long after—the space station's hull was pierced in a collision with a cargo rocket.

The February 24, 1997, fire broke out while ham-astronaut Jerry Linenger, KC5HBR, was aboard *Mir*. Linenger, a physician, later reported via Amateur Radio that no injuries had occurred and all crew members were in good health in the wake of the near disaster in the *Kvant* 1 module. Linenger later detailed his experiences in his book, *Off the Planet—Surviving Five Perilous Months Aboard the Space Station Mir*.

### Right up until the end, some in Russia held out hope that a way would be found to keep Mir in space.

US astronaut Mike Foale, KB5UAD, was part of the *Mir* crew when, a few months after the fire on June 25, 1997, a Progress rocket collided with the *Spektr* module. Foale used ham radio to update reports of efforts to stabilize the station during the near-decompression.

Foale never was able to recover his personal belongings, which were stranded in *Spektr* and literally went down with the ship. Also left aboard was a collection of paperback books brought aboard by US astronaut Shannon Lucid, who did a tour aboard *Mir*.

Russian space officials planned no attempts to recover any of the *Mir* debris. Perhaps they should have given the idea more thought. Postings on an Internet auction site within hours of the deorbiting were selling what purported to be recovered remnants of the Russian space station.

### SECTION MANAGER ELECTION NOTICE

To all ARRL members in the Colorado, Georgia, Los Angeles, Sacramento Valley, San Francisco, South Texas, Eastern Washington, Western Washington, and West Virginia. 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 8, 2001. Whenever more than one member is nominated in a single section, ballots will be mailed from Headquarters on or before July 1, 2001, to full members of record as of June 8, 2001, which is the closing date for nominations. Returns will be counted August 21, 2001. Section Managers elected as a result of the above procedure will take office October 1, 2001.

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, 2001. If *no* petitions are received from a section by the specified closing date, such section will be resolicited in the October 2001 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, K1STO, Field & Educational Services Manager

### HOW'S DX?

### Chesterfield Islands

The Chesterfield Islands were added to the ARRL DXCC list on March 23, 2000 and immediately afterward were activated by the TX0DX crew.

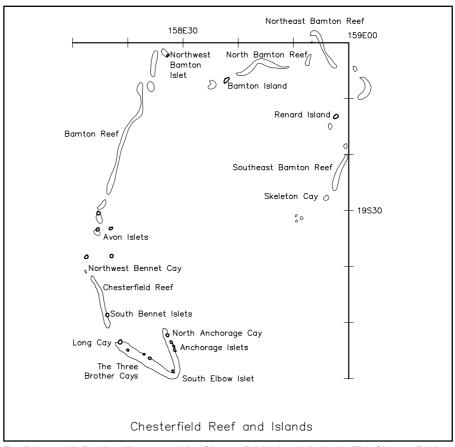
H. Booker aboard the HMS Chesterfield discovered the islands in 1793. In 1870, British Austral, a guano company based out of Sydney, mined the islands for guano and phosphates to depletion the following year. The French assumed that the Chesterfields had been abandoned, so they claimed the group and decided to administer it from Noumea, New Caledonia. The French claim was bitterly contested for a number of years, but was finally resolved in 1882.

The Chesterfield Islands consist of the Bampton, Bellona and Chesterfield Reefs and are located (158° 28' East 19° 53' South) approximately 395 kilometers west of New Caledonia (FK), their parent country. The group of small islands and reefs are spread out across the Coral Sea between Australia and New Caledonia. They measure about 10 square kilometers and are uninhabited—except for some 50,000 birds. The Chesterfield Reefs almost form a circle with a wide opening into a lagoon to the southeast.

The southernmost reef in the Chesterfields is the South Chesterfield Reef, a large V-shaped area made up of multiple island groups, including Anchorage, (19° 53' South, 158° 28' East), South Elbow (19° 58' South, 158° 29' East) and the Long Cay (19° 52' South, 158° 18' East). The TX0DX team was located on Les 3 Ilots du Mouillage, which is part of the Anchorage group and is the highest above sea level at approximately 6.5 meters. There was an established settlement there in 1894. On South Elbow are the remnants of weather and seismic observation stations and several huts, all of which were abandoned in 1976. In the Chesterfields you'll also find the ruins of a lighthouse that was destroyed by a storm in 1926. The largest island, Long Cay, has a monument that was erected in 1956 to commemorate the World War II battles that took place in the area.

#### Now You See Them, Now You Don't

TX0DX, the first DXpedition to this new addition to the DXCC list, netted some 72,000 QSOs with more than 24,000 different stations. But before the



Englishman H. Booker discovered the Chesterfield Islands in 1793. The Chesterfields are the newest entities on the DXCC list and have only been active twice in the last couple of years.

Chesterfields could be officially added to the DXCC list, a few questions needed to be resolved.

One of the biggest concerns was the possible existence of "Sandy" or "Sable" Island. Many modern atlases show what seems to be a long, cigar-shaped island that runs north/south. In 1876 the British expedition aboard the HMS Nereus reported a large, sandy island at 19° 13' South, 159° 56' East. Dr W. Follower in London published a report in 1877 of a similar island measuring 25 kilometers long and 5 kilometers wide. Two years later, the captain of the HMS Lady Darling found several islands between 19° 20' South 159° 57' East. In 1884, a skilled exploration team out of Noumea, aboard the D'Estress, spent two months trying to find the island or islands, but failed. Despite the lack of evidence for the existence of the mysterious island, the French claimed it anyway.

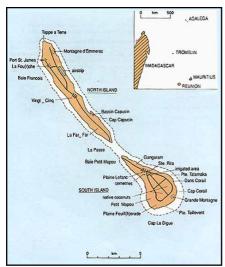
Several other sightings were reported and disputed over the years. In 1965, several small reefs were photographed by satellite in between 19° 09' South and 19° 21' South and 159° 59' East. A French research ship acknowledged the position of the reefs, but discovered that they were under water! The existence of the reefs was again confirmed in 1968 by a diving team that was exploring the wreck of a ship known as the Sable. From that day onward, the reef was known as Sable Reef. Despite the latest data available, atlases persist in showing a landmass called "Sandy Island" at the same location.

Only two operations that count for DXCC have taken place from the Chesterfield Islands. That's about to change. Veteran DXpeditioner Jacky Calvo, F2CW, will head a group of four operators to activate the newest entity to the DXCC list starting in late April. In early March, he was in Noumea, New Caledonia (FK) and has been operating as FK/F2CW and TX5CW. Arrangements have been made for a chartered 14-meter sailboat to take the team to the Chesterfield Islands between April 24 and May 8. Dany, F5CW, and at least two other operators will join the group. They expect to have three stations making a special effort on the low bands and 15 meters. Yaesu Japan and Kan Mizoguchi, JA1BK, are sponsoring this operation. QSL cards for 6 meters will be handled by JA1BK. All others go to ZL3CW.

#### 3B6RF—AGALEGA

The Agalega Islands consist of North Agalega and South Agalega and both belong to Mauritius. They are located at 10° 40′ South, 56° 55' East, approximately 869 kilometers east-north-east of Madagascar (5R) and 1102 kilometers north of their parent entity Mauritius (3B8). Both the islands of Agalega and St Brandon (3B7), which are also known as Cargados Carajos Shoals, count as one DXCC entity. Mauritius was added to the original DXCC list in November 1945. In December 1957, Rodriguez Island (3B9) was added to the DXCC list under "Point 2," which was a geographical criterion that did not involve a particular distance. By January 1960, a distance criterion was in place and Cargados Carajos Shoals, which included Agalega, was added to the list because it was more than 260 miles from the parent country. Under the current rules, Agalega is not far enough from St Brandon to count as a separate entity. (Agalega must be at least 800 km from St Brandon to qualify, but it is only 762 km away.)

In late 1999, the mostly Swiss team that put on 3B7RF announced they would be going to Agalega in the fall of 2000. Due to a political complication, the team had to cancel just days before they were about to depart. They were obviously disappointed, but continued in their quest to mount a serious DXpedition to this rare risland. The last two operations from here were 3B6CF (op 3B8CF) in 1981 and 3B6CD (op 3B8CD) in 1980. IOTA (Islands on the Air) award hunters will want to work this one as it



Agalega and St. Brandon ranked # 31 on the ARRL's 100 Most Needed List for 2000.

counts as a separate island (AF-001).

An Agalega team of up to 20 members expects to depart either by ship or plane from Port Luis, Mauritius to Agalega on May 1. If by plane, they will be there later that day; if by ship they expect to arrive May 3. The group will be led by Hans-Peter, HB9BXE. Other members include Rene, HB9BQI; Christine (YL), HB9BQW; Hermann, HB9CRV; Cedric, HB9HFN; Karl, HB9JAI; Freidhelm, HB9JBI; Fred, HB9AAQ; Jacky, 3B8CF; Leonid, 4Z5FL; Luis, CT1AGF; Antonio, CT1EPV; Matthias, DL3KUD; Mart, DL6UAA; Jack, F6HMJ; Derek, G3KHZ; Steve, N3SL; Ken, NK6F; Stefan, SP9RTI and possibly one other operator.

The DXpedition expects to be on the air as 3B6RF starting May 5 and they plan to shut down on May 17 or 18. Operations are expected on 6 through 160 meters on CW, SSB, RTTY, FM, SSTV and PSK31. Suggested frequencies, propagation forecasts and much more can be found on the 3B6RF home page at www.agalega2000.ch. Pilot stations for this operation will be Yasu, JA3LDH (ja3ldh@ tcct.zaq.ne.jp), for Asia; Daniel, PT7BI (mdmassun@fortalnet.com.br), for South America and Bill, K6GNX, (bavery@ telemetry.com), for North America, OSL via HB9AGH either via the bureau or direct to Ambrosi Fluetsch, Lerchenberg 29, CH 8046 Zurich, Switzerland. US stations only may QSL via Steve Larson, N3SL, 22 N Hidden Acres Dr, Sioux City, IA 51108.

#### **AMATEUR RADIO IN SRI LANKA**

Amateur Radio in Sri Lanka started back in 1927 when the nation was known as Ceylon. Call signs 2VX, 3VX, etc were assigned. Sometime in 1929, the VS7 prefix was allocated. The Radio Society of Sri Lanka was formed in July 1950 and they celebrated their 50th anniversary last year.

Presently there are about 200 hams in Sri Lanka. The licensing authority is the Sri Lanka Telecommunications Regulatory Commission. The amateur exams are held twice a year. There are three license classes: Novice, General (500-W limit) and Advanced (1 kW limit).

My experience as a Sri Lankan amateur started in 1957. Today I am active on all bands including 6 meters and satellite. I am also active on CW, SSB and RTTY. I am a retired telecomm engineer and my only son Kavi is licensed as 4S7KA. My wife Chandra is also very supportive of ham radio.—*Ernest*, 4S7EA



Ernest, 4S7EA, has been licensed since 1957 and is active from Sri Lanka on all bands from 6 to 160 meters on CW, SSB and RTTY. Look for him most days on 20 meters between 0100 and 0200Z, usually near 14195 or 14025 kHz.

#### VK0MM—FINALLY A QSL ROUTE

Normally we don't put QSL information in this column, but since many of you worked Alan, VK0MM, during 2000, and because he did not have a QSL route at that time, we make an exception. Alan, VK4AAR, has been chosen to handle the VK0MM QSL cards *only*—not AX0LD or VK0LD. Any excess proceeds from the QSLing process will be donated to Camp Quality, a charity providing care for children with cancer and other serious illnesses. QSL direct only to Alan Roocroft, VK4AAR, PO Box 421, Gatton, QLD 4343, Australia.

#### 59(9) DX REPORT NOW THE WEEKLY DX

59(9) DX Report editor Bob Nadolny, WB2YQH, has decided to retire from the DX bulletin business. This was a difficult decision for Bob, who started the publication seven years ago. Nadolny stated, "We have sold the subscription list for all versions to Bernie McClenny, W3UR, publisher of The Daily DX." McClenny will rename the publication The Weekly DX and make it available in paper and PDF versions. Bob will retain the name the 59(9) DX Report for his distributorship of the Flying Horse Callbook business and will continue to offer the WARC Award and QSL Pipeline Directory. Good luck, Bob, and thanks for the many years of DX info!

### OUTGOING QSL BUREAU RATE INCREASE

In response to the recent postal rate increase and price restructuring, the ARRL Outgoing QSL Bureau has announced new rates. It is still possible to send ten cards for one dollar, but the 20- and 30-card rates have been discontinued. The new rate is \$4 per each half pound or portion thereof. This rate structure helps to cover the basic cost of handling the minimum number of QSL cards in a package, while actually offering a price reduction for sending a half-pound of cards (approximately 75 cards) which previously cost \$6. The new rates went into effect March 1, 2001. The last Outgoing QSL Service fee increase was in January 1999.

#### **DX EXTRAVAGANZA**

The Lone Star DX Association (LSDXA) have announced a DX program for HamCom 2001, June 8-10 in Arlington, Texas. It will be a full day event at the Wyndham Hotel, which is adjacent to the Arlington Convention Center (the site of HamCom 2001). The LSDXA will have several world-class DXers speaking at various forums. The lineup includes Martti Laine, OH2BH, as the main speaker at the DX luncheon, plus John Devoldere, ON4UN, and Wes Lamboley, W3WL as afternoon speakers. For more details, check the LSDXA Web site at www.dxer.org.

#### **WRAP UP**

That's all for this month. Please stop by for an eyeball QSO at the Dayton Hamvention. I'll be in booth # 520 along with other members of my family. Keep those letters, pictures and newsletters coming. This month I would like to thank the following individuals for helping to make this column possible: 4S7EA, DC3MF, HB9BXE, N1FOC, VK4AAR, WB2YQH, WW5L and ZL3CW. Until next month, see you in the pileups!—Bernie, W3UR

### **PUBLIC SERVICE**

## **EMCOMM** Operations in a Helicopter Environment

By Jerry Boyd, K6BZ, ARRL Section Manager, Sacramento Valley

Helicopters are wonderful tools, and they are increasingly used by public safety organizations in emergency and special event situations. Helicopters first became available to the public safety community as surplus following the Korean War some 50 years ago. Police, fire and emergency medical agencies throughout the world have come to rely on helicopters for their multiple capabilities. They serve as excellent platforms for observation as well as tools for aerial command and control functions. They may be used quickly and efficiently to insert and remove public safety personnel into and out of incident scenes. They are also used to evacuate and transport injured or ill persons to distant medical and trauma centers.

Because of their increasing use, it is likely that Amateur Radio operators involved in emergency communications (EMCOMM) or public service events will find themselves operating in a helicopter environment. For efficiency, and above all for safety, there are some points regarding helicopter operations that those working around them, including hams, should be aware of.

Helicopters come in many different sizes, shapes and colors. Depending on their mission, they are equipped differently, have different load carrying capabilities, etc. However, operating around them safely requires the same basic knowledge and skills regardless of the particular aircraft. Here are some things to keep in mind.

#### LZs

An LZ is a landing zone, and persons who work around such areas or, even more, who help establish such zones, need to know the helicopter's requirements. It is not beyond the realm of possibility that an Amateur Radio operator may be asked to help identify and/or establish a landing zone, assuming that operations are occurring away from a dedicated helipad. This is particularly true in an emergency situation where onscene emergency responders have their hands full with injured persons, crowd and traffic control and so on.

In every case, the approach path to and



Amateur Radio operators are seeing more opportunities to perform public service in or near a helicopter.

from the landing area must be free of obstructions such as trees, structures, power lines or antennas. The pilot in command will take a close look in a "fly by" prior to landing. However, some potentially dangerous obstructions may not be clearly visible to him or her. It is the responsibility of persons on the ground, who are establishing or maintaining the LZ, to be vigilant for such threats and to make sure that any potential safety issues are communicated to the pilot.

As a general rule, a landing zone should be at least 100 feet in diameter, larger if possible. The landing surface should be level and solid enough to support the weight of the aircraft. If possible, the area should be free of loose debris as the wind effect generated by the aircraft's rotor(s) can turn debris into missiles dangerous both to the aircraft and to persons on the ground.

Once an LZ is selected, it needs to be marked so that it can be identified from the air and secured against persons entering the zone during aircraft operations. During times of clear visibility, the LZ may be identified by bordering the perimeter with vehicles, yellow "crime scene tape," or chalked or painted markings on the ground. At night, or under poor visibility conditions, some sort of illumination may be necessary. There are special-purpose LZ lights that many fire agencies carry on their engines that may be used around the perimeter of the LZ. Highway safety flares may be used as well. Vehicle headlights shining into the center of the LZ from vehicles parked outside the LZ itself may be used, although this is not a desirable option. In each case, it is critical that light not be directly focussed on the aircraft at any time. The pilot, particularly if he/she is wearing a night vision devise, can be blinded by light focused on the aircraft. That, of course, can have tragic results.

#### **Operating Around the Aircraft**

On ingress to, or egress from, the landing zone, a helicopter's rotor down wash generates considerable "wind." That wind can hurl small rocks or other pieces of ground debris great distances and at amazing speed. Such debris can become projectiles that can do significant damage to the human body. Thus, when the helicopter is landing or taking off from the LZ, those on the ground are well advised to take cover behind a solid object such as a structure or vehicle. If that is impossible, turn away from the approaching or departing aircraft to avoid being struck in the face by debris. Wear goggles or other eve protection if available.

It is unlikely that an Amateur Radio operator will need to approach a helicopter that is on the ground in the landing zone. That is generally the task of the public safety personnel on scene. If it is necessary to approach, wait until the helicopter's engine(s) has been shut down and all rotor blades have ceased movement. In a major trauma case where rapid patient transport is critical, the helicopter may remain "hot" while the patient is loaded aboard. That means the engine will not shut down and the rotor blades will

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continue to turn. Trained personnel should only make approaches to hot aircraft.

If an approach to a helicopter at rest is required, it should only be made with the knowledge and approval of the pilot in command of the aircraft. Approaches must always be made from the front of the aircraft and from such an angle that the pilot can keep you in constant view. Obey any commands (generally communicated in the form of hand signals) given to you by a helicopter crewmember. Approaches from the rear are particularly dangerous, as the pilot cannot observe you and the rear vertical (tail) rotor (on helicopters thusly equipped) are particularly dangerous.

#### **Operating Aboard the Aircraft**

On rare occasions, an Amateur Radio operator may be assigned to use his/her communications skills and equipment from an operating helicopter. This may occur when communications from the helicopter to a public safety Incident Commander is required and the helicopter does not have the necessary communications equipment aboard. This can happen when a private helicopter, not equipped with a public safety radio transceiver, is brought in to assist with an incident. Such a situation provides Amateur Radio with yet another opportunity to shine. Take it from one who has flown in law enforcement helicopters many times, it will also prove to be an exciting experience.

There are just a few "rules" to keep in mind when flying as crew on a rotory wing aircraft. One is that the pilot may need to know your weight for purposes of determining aircraft weight and balance. This is critical to safety, so don't be offended by the question. Second, always obey instructions given you by the pilot before and during the flight. Third, prior to takeoff, suggest to the pilot that checks be made using whatever radio equipment you will be using during the flight. While it is highly unlikely that a hand-held VHF/UHF transceiver will cause interference to the aircraft radio or navigation equipment, it can happen. It is far better to find that out on the ground than in the air.

Helicopters, even the most expensive, are noisy environments. To effectively communicate from one, an amateur will need (at the minimum) an earphone/earpiece and an external microphone. It is preferred that an earpiece should be used as it can fit under the headset that might need to be worn to communicate with the pilot by intercom. Ideally, the microphone should be of the noise-canceling variety.

#### Conclusion

Amateur Radio operations from a helicopter in an emergency or during a public

#### **New Chair for NTS Eastern Area Staff**

Marcia Forde, KW1U, has been appointed as the Chair of the Eastern Area Staff of the ARRL National Traffic System. From Edgartown, Massachusetts, Marcia was nominated by her fellow Eastern Area Staff members for the two-year term. She continues as Transcontinental Corps (TCC) Director for Cycle 2, a position that she has held since 1984. Marcia has been a member of the ARRL for 19 years and also holds Official Relay Station and an Official Emergency Station appointments in the League's Field Organization.



Marcia Forde, KW1U (left) and her husband, Terry, N1MLO, share a moment together on Martha's Vineyard Island.

service operation can be a valuable contribution to the success of the endeavor. Operating from and around helicopters in a manner that is safe is of paramount importance. The points made in this article should contribute to that outcome.

## EXCITEMENT ON THE BALTIMORE - WASHINGTON DC PARKWAY

By Murray Green, K3BEQ

On the morning of July 4, 2000, my wife and I encountered an erratic driver on the Baltimore-Washington Parkway, just below the Washington beltway. I engaged the Green Mountain Repeater Association's (GMRA) 146.880 MHz autopatch to the US Park Police, providing information about the incident and the car's make/color/license plate/ location and direction.

My first reaction was that the driver was intoxicated. I also told the police that I would follow the car, keep the connection open and give them periodic position reports. The make, color and plate number of my car was also provided. Cruisers were enroute.

At that moment, the erratic driver almost hit two passing cars and then drove off the road, onto the grass, and back on the road again. He proceeded onto Interstate 295 where it splits off the Parkway. Since he had Virginia license plates, I assumed he was heading for the Wilson Bridge. Wrong!

He turned off at the Howard Street exit heading for the South Capital Street bridge into downtown DC. I looked up in my rearview mirror and smiled. Two US Park Police cruisers were behind me. They quickly passed and I followed behind slowly as we crossed the bridge. When the driver almost swerved into one of them, they turned on their lights and pulled him over. I stayed back and parked. After a few minutes, one of the officers motioned for me to come over.

The officer explained that the driver was not intoxicated, but that he had driven all night from New York and was exhausted. Since he resided only a short distance away, they would follow him home to make certain he arrived safely.

#### **Epilog**

Thanks to John Pak, KB3EBN, Keith Poptanich, KB3EGL, and C.T. David, K3GXF, who stood by and assisted as re-

quired. After the officer's comments, I learned not to hastily judge the condition of a driver. Fatigue, drugs, medication, sudden illness, alcohol or even an unlicensed kid out for a joy ride can be the underlying cause.

In any event, the autopatch on the GMRA repeater proved invaluable. The repeater's controller is preset so that just by pressing a few buttons you are connected to the appropriate enforcement office. This feature was installed by GMRA Board of Directors member Bruce Crabill, N3ZUY. If I had to use a cell phone (and not knowing the US Park Police number), I would have had to dial 911 and have them switch me over. The rapid response by the US Park Police was impressive and commendable.

#### **MISSOURI SNOWSTORM vs ARES**

By Pat Conway, WA6JGM

Pat Conway, WA6JGM, is the ARRL Emergency Coordinator (EC) for Christian County in southwestern Missouri. On December 12, 2000, a snowstorm dumped 16 inches of snow in a 10-hour period! Here's a report of their Amateur Radio Emergency Service (ARES) response.

"We are only three strong here in the county. One of the members drives trucks interstate, and he was on the road during this time. That left me and my Assistant EC, Terry Shoemaker, KE4LQW, in the county. We both have 4-wheel drive vehicles, and we decided earlier in the day to run the roads as the storm came into the area. The storm hit our area just after 10 PM, and the rate of snowfall was almost 2 inches an hour.

"Some hams in the area thought we were crazy for even doing this, and in a sense they were right. However, we approach these things with great caution and care. We sure don't want to be a victim of our own doings! We had quite a lead-time on this storm front, and many people listened to the Weather Service and their local broadcasters and stayed off the road that night.

"During our 72-hour run, we helped 30 to 40 motorists. Many of those were on the side roads and had become stuck. Thank God there were no serious accidents. Terry and I firmly believe that helping people who are in need is what it's all about. And yes, if we have another storm like this last one hit us again, you can bet that Terry and I will be out there to help."

#### **ARRL's Amateur Radio Emergency Communications Course**

ARRL's first-ever on-line certification and continuing education course, *Level I: Introduction to Amateur Radio Emergency Communications*, is off to a good start. Inperson class materials for this course are being Beta-tested for future use by those who prefer this type of class over on-line courses. The following statistics and comments were compiled from 68 students that have completed and responded so far via the on-line course evaluation.

On a scale of 1 to 5, where 1 = poor and 5 = good, these averages were recorded over the first three-month period of the course's existence (since mid December, 2000).

Access to course	4.6
Accurate replies from Mentors	5.0
Amount of assistance provided	4.8
Timely Responses	4.9
Skill level BEFORE course	3.2
Skill level AFTER course	4.6

#### **Student Comments**

"This was my first on-line course. I was very pleased with the ease in using it and with the information that I learned by completing it. My Mentor, Jim, was most helpful throughout the course and very prompt in answering my questions and replying to the student activities that I sent in."—Lee Davis, WD4PEL

"I really liked the information on traffic handling. I'm involved heavily with the ARES, but haven't spent much time with the NTS and traffic handling. It really answered a lot of questions I had about traffic handling but 'was afraid to ask.' I think NTS and ARES go together like SKYWARN and ARES. I consider them inseparable partners. I just appointed an EC for one of the GA Section counties who's been involved with NTS for years. I'll use his skills and this course to help train others in traffic handling."—Lowry Rouse, KM4Z

"Great course! I would recommend it to any ham who wanted to get into ARES/RACES." —Richard Doggett, KH2JA

"I've been a teacher for 22 years, a Community College Instructor 13 of those years and an Amateur Radio operator since 1972. This was the most informative, well prepared and delivered course in Amateur

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Radio I've ever taken. I'm 54 years of age and was drawn to this class working on it until 2 or 3 in the morning. My Mentor, Rick, was great. His comments and encouragement drove me even harder. I found that as I progressed, I studied harder and my grades improved from the low 80% to the high 90% with the final exam. I am 'charged' and awaiting the next level. I firmly believe this was an excellent decision on the part of the ARRL and all those who supported the program. I believe this type of presentation and certification will be very well received by the Amateur Radio community. Thank you for the opportunity to participate in the class. If I should ever be needed as a Mentor, I'd feel honored."—Donald Anderson, WK6Q

#### **Background Information**

To learn more about the ARRL Certification and Continuing Education Program, and the Amateur Radio Emergency Communications Course, log onto this ARRL Web address: www.arrl.org/cce/. Course registration announcements appear in the news portion of the ARRL Web site.

#### **Field Organization Reports**

### Public Service Honor Roll February 2001

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 radiogramformatted 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

422 K4FQU 390 WZ7V 343 K7MQF 316 K5MC 280 WA4GQS 262 K7VVC 253 W7TVA 252 KA2ZNZ 244 K9JPS 241 KB1AJ 234 N5JZ 233 WB5ZED 223 N9VE	219 WD8V 213 AD4GL 210 N2LTC KV4AP 208 KK3F 197 WB5NKD 195 AF4NS 194 W6IVV 193 W4ZJY 191 W2EAG 184 WA4DOX 182 K8PJ WOOA K2UL WB2UVB 181 NN7H	178 W7BO 177 WB4GM KC5OZT 176 N8IO 175 W6DOB N7YSS 174 KB2RTZ KA4FZI 173 W5ZX N2RPI W84TVY 172 W8YS 170 W4EAT 169 KG9B KC2AHS 168 KA2GJV K9FHI K6YR AD6LW	164 N1LKJ 163 WN0Y 162 K4IWW W4CAC 160 W84BHH 159 WB5NKC 158 N5OUJ W6QZ 156 K4SCL 155 W00YH K0IBS N2OPJ 152 KC8CON 151 KE4JFS KE4JFS KE4JFS KB2VRO 150 W3HK	148 WOWWR KA1GWE W3YYQ WB2ZCM K4RBR WA51 147 N9KNJ K5NHJ 145 KB2EV 144 W5GKH K0PIZ WD4JJ KC4ZHF 143 W2MTA N2JBA 142 N8BV KY1B N2YJZ KT6A 141 WA1FNM N3ZKP N2AKZ WOLAW
WA9VND			KB1DSB	KT4PM

AC4CS KW1U N2CCN KJ4N KC6SKK	WAUTEC WD8DHC 127 AA3SB 126 W5CDX	M2MTO 116 W2GUT WA2YBM AB4XK N2GJ	N1JBD KJ7SI 101 WA1QAA KG0IV	W0FCL KA2IWK 85 AE4MR KD4HGL
139 KC7ZZB W3BBQ W4AUN W7ZIW	K4BEH 125 WA2UKX KB2KLH	115 N8DD KB0DTI KB2ETO K2DN	100 KB4DXN 99 W4XI	KA2ZKM W2JHO 83 W1JTH
138 KE4JHJ N0SU N2KPR K4YVX	124 N2WDS W1ALE 123 K5DPG	114 K1JPG N7AIK 113	98 KC4VNO WB2LEZ 97 K3CSX	AC5Z WA4EYU W2CC KC2ANN 82
K9LGU N9BDL W7GB KD4GR	NC4ML W2AKT AA2SV W7QM	KG2D W5AYX K4UOF 112	K1FP 96 W4CC KC6NBI	KF4OPT WB9GIU 81 K1SEC
KB2VVB 137 W3VK 136 WB2GTG	W7GHT 122 W3CB AG9G KA4HHE	N3WK W1JX W3NNL N3SW 111	95 KC7SGM K8LEN N3WAV	W4SEE WA4CSC K2VX 80 KE4PAP
KC2DAA 134 WA4QXT N3WKE W2RJL	W7LG 121 WD9HII N3EFW	AB4E 110 K8QIP 109	KT4TD N4JAQ 94 KM5YL KC8HTP	KAODBK 79 KE3FL K3TX WW8D
133 KC2EOT AD4IH WX4H	120 AA4AT K9GBR W3IPX N3YSI KF6OIF	KB2KOJ WI2G KG4FXG 108 W4DGH	KE4GYR KG4CHW 93 KA8VWE WA2EDN	KM4WC 77 W7VSE KC3Y
132 W1PEX N5NAV W9YCV 131	W4WXA 119 KA7AID NZ1D	KA2BCE WA1JVV WD0GUF KF4KSN WA2CUW	KO4OL KO4A WB9OFG 91	76 KF4NJP N3RB 75
W4NTI K5IQZ WB0ZNY 130	N9TVT WU4C 118 N7DRP	107 KJ3E 106	WB2IJH AF2K WB4PAM 90	W4QAT K2DBK 74 W7EP
KI4YV AD4XV NN2H W9CBE	W4CKS KD1LE KA2DBD K4MTX	WA2GUP KV4AN KA2CQX 105 N8OD	W5CU KC5VLW AA4BN 89 W2LC	KB4WBY 73 N1IST 72
WD9FLJ KB5TCH WB2FGL W6JPH 129	W1QU KA8WNO K4WKT WA4EIC K4DMH	104 WA8SSI AA3GV WB7VYH	N1CPX 88 WA2YOW WA4GLS	NC1X W2RH 71 N1LAH
KC7SRL KR4MU 128 KK1A	N9MN K2PB K7GXZ 117	103 AA4YW W2PII W8SZU	87 WB4ZNB KE4DNO 86	N4CQR K1YLB KA7TTY 70 AF4PX
WR2OIX	K6AGD		KG5GE	AF4FX

The following stations qualified for PSHR during the months indicated, but were not previously recognized in this column: (January) K4IWW 151, WN0Y 163, WA2CUW 100, KA2UEC 78. (Nov 2000) WD4JJ 142, WA4GLS 107, KE4GYR 104.

KG5GE

WB2QIX

### Section Traffic Manager Reports February 2001

The following ARRL Section Traffic Managers reported: AL, AR, AK, AZ, CO, CT, ENY, EPA, EWA, GA, IA, ID, IL, KS, KY, LA, MDC, ME, MN, MO, NC, NFL, NH, NLI, NNJ, NTX, OH, OK, OR, ORG, SBAR, SD, SDG, SFL, SNJ, STX, TN, VT, WCF, WI, WMA, WNY, WPA, WV, WWA.

### Section Emergency Coordinator Reports February 2001

The following ARRL Section Emergency Coordinators reported: CT, EWA, IN, KS, KY, LA, MDC, MI, MN, MO, NFL, NLI, SD, SF, STX, SV (North), TN, VA, WMA, WNY, WCF.

#### Brass Pounders League February 2001

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
KK3F	4Ŏ	1906	1866	20	3832
W5SEG	0	1476	1473	0	2949
WX4H	12	661	701	24	1398
KT6A	4	688	662	0	1354
W1PEX	0	102	914	18	1034
K7VVC	64	3878	551	20	1022
KY1B	10	470	502	40	1022
W7BO	53	513	422	.0	988
N2LTC	.1	481	462	41	985
KB1AJ	13	353	475	110	951
W6DOB	1	448	441	26	916
WB5ZED	18	450	360	47	875
N1LKJ	8	425	383	28	844
KW1U W7TVA	0	410	392	2	804
W71VA W9IHW	38	293 328	244 33	87 298	662 661
WZ7V	2	318	30	304	654
W7AMM	187	128	293	22	630
KF5A	0	314	312	0	626
K4FQU	254	66	297	2	619
KB5W	254		237	_	616
WA9VND	22	319	228	22	591
W4EAT	-0	298	278	-2	578
WOWWR	Ĩ	88	452	29	570
KA2ZNZ	22	263	190	92	567
WB2GTG	1	222	338	17	578
K6YR	0	271	288	0	519
K5MC	190	65	248	5	508
W2EAG	3	263	228	10	504
BPL for 100	or mor	e originatio	ns plus d	eliveries:	K9GU
188, K9JPS	3 167,W	450ŪV 15	B, N9VE 1	52.	NST.

Q5<del>T</del>~

### THE WORLD ABOVE 50 MHZ

## Cycle 23—What Next?

Scientists reported that the sun's magnetic field underwent a reversal this past February. This always happens around the time of solar maximum, according to the announcement on the Science @NASA Web page. It is also a good indication that Cycle 23 has reached its peak and is now beginning several years of decline.

#### Solar Peak

The timing of the peak of the current solar cycle has been the subject of lively discussion for some months now. Some experts placed it as early as the summer of 2000, but the graph of monthly sunspot numbers in Figure 1 suggests that the current cycle may not have peaked until late 2000. The more recent reversal of the sun's magnetic field pushes a possible peak date into early 2001. The actual peak cannot be determined for several more months, because it is based on 13-month smoothed-average data. Whatever the exact timing, it seems clear that the cycle is entering a long downward trend that will not bottom out until 2007 or so.

The current cycle has been disappointing for those who expected the sunspot numbers (and equivalent solar flux) to be sustained at significantly higher levels than they were. There was a good deal of interesting worldwide 6-meter activity, but some parts of the world, including North America, enjoyed relatively less of it than Europe and other hot spots. We have undoubtedly seen the best of the Cycle 23 and must prepare for the slow slide downward.

#### Six Meters on the Declining Side

Worldwide 6-meter DX will not suddenly disappear just because the peak has passed. There has undoubtedly been a lively equinox season, possibly still in progress as you read this, with strong north-south paths and much longer contacts that cross the equator (such as New Zealand to the southern US). There is little chance for F-layer DX in the summer, regardless of the solar indicators, but the fall equinox season should again be productive.

Beyond that, it is difficult to tell what to expect. There is a slight possibility for a return fall-winter season, as solar activity may remain high enough. Many cycles have exhibited a double peak, and one detailed forecast is showing just that

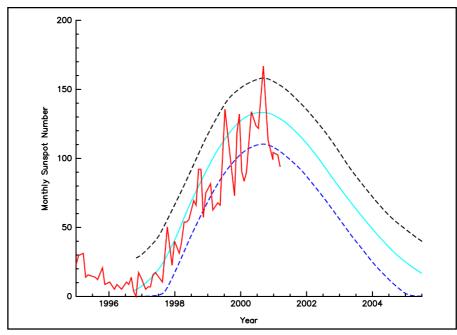


Figure 1—Progress of Cycle 23 as of February 2001. The graph shows monthly Sunspot Number. The center curve is NASA's 13-month smoothed forecast, with upper and lower confidence intervals. Source: Science@NASA.

for Cycle 23. Even so, it seems unlikely that worldwide 6-meter propagation will continue into 2002, unless this cycle becomes very atypical.

#### **Geomagnetic Conditions**

Although solar activity that sustains high levels of F-layer ionization will be declining, geomagnetic disturbances are expected to increase over the next two or three years. Severe solar disturbances that induce geomagnetic storms and aurora tend to peak a year or two after each solar-cycle maximum. This phenomenon is shown in Figure 2 for the previous six cycles. The graph plots the number of days each year that the geomagnetic planetary-A index exceeded 40, a level sufficient to cause auroral conditions well into the US.

#### **This Month**

May 1-9 North American High speed Meteor Scatter Contest May 5 eta-Aquarids peaks May 5 Microwave Sprint\* May 12-13 Six-meter Sprint\* Very good EME conditions May 27 \*See April column for details.

Thus, the next few years might provide increased chances for somewhat different opportunities on the VHF bands. The possibilities for great aurora and auroral-E events should be improved. If solar activity is also reasonably high during such events, especially if they take place in the spring or fall, unusual F-layer propagation is also possible. This includes transequatorial enhancement, long east-west paths adjacent to the equator, and paths skewed by intense ionization just north and south of the equator.

#### Sporadic E

Finally, there is always sporadic E. This reliable propagation mode returns every summer and provides many hours of single-hop (500 to 2200 km) contacts from May to August. Multihop sporadic E also supports worldwide 6-meter DX every summer from the US to Europe, Central America and the Caribbean, and across the Pacific to Japan up to 10,000 km. Some multihop sporadic-E seasons have been spectacular. During the summer of 1995, stations in the eastern half of the US worked Europeans on more than 30 days. Activity on the somewhat longer path between the western US and Japan is less common, but it is still a nearly annual occurrence as well.

What this summer may bring is uncertain, as sporadic-E activity is quite variable from year to year. Long-term data collected by Pat Dyer, WA5IYX, suggests that there may be a 6- or 7-year cycle of sporadic-E activity (at least as observed from south Texas), but it is not clearly related to the solar cycle. As discussed in last June's column, that data indicated that the summer-2000 season would be the best in several years. Sure enough, it was. Pat recorded 7055 minutes of sporadic E at 88 MHz or higher between May and August—the highest tally since 1994, when there were 7050 minutes.

So what do Pat's data suggest for the coming season, just getting ready to begin? If the trends hold up, this should be another better-than-average season with plenty of opportunities to make multihop DX contacts on 6 meters.

#### ON THE BANDS

Solar activity indicators continued to decline through February and the geomagnetic field was unusually quiet. Although there was little auroral activity in the US, there were still some opportunities to work South America on 6 meters. Six-meter operators elsewhere in the world had better luck. A few surprising days of sporadic-E openings were the only other propagation to enliven the winter doldrums. Dates and times are UTC throughout. Some summaries are based on reports from the WWW DX Cluster, UKSMG Announcement Page, K0AZ, N0JK, N0LL, G4UPS and YV4DDK.

## Six Meter DX The Americas

DX opportunities from the US were limited primarily to South America, but there were some additional surprises. Six-meter operators in many widely scattered parts of the country had opportunities to work PY, LU, CX, CE and ZP stations during the late afternoons and early evenings of February 6, 20-23 and 27-28. NOJK (EM17) and others noted the characteristic flutter of TE propagation on most signals. In addition to working LUs, Roman Flores, XE2EED, nabbed ZL4LV on February 21 around 2250.

Mick McManus, W1JJM (FN41), provided the surprises. Sometime after 0000 on February 15, Mick began monitoring 50.115 MHz, where South Americans had spotted PW0S. After some time, Mick began to hear PW0S weakly on SSB and decided to try CW to attract his attention. Finally around 0045, Mick worked him on CW, apparently the only North American to do so and certainly the first US station ever to work St Peter and St Paul Rocks. He duplicated his unique coup on February 23 around 1532, when he caught C56/DL7CM in the midst of a European run. Mick was the only US station to work the Gambia expedition in February. K1SIX and VE9AA reported hearing C56/DL7CM the next morning, but neither could make a QSO.

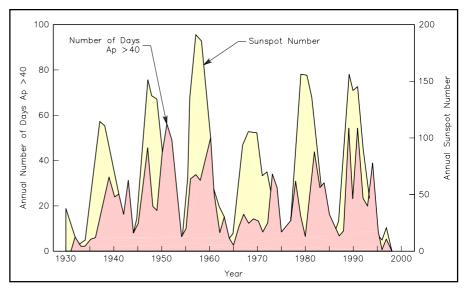


Figure 2—The number of days per year with geomagnetic storms (defined as an Ap index greater than 40) is graphed in pink. The annual Sunspot Number is graphed in yellow for comparison. Note that geomagnetic storms are more likely to occur during the years following the peak of each cycle. Source: NOAA National Geophysical Data Center.

South Americans also made some contacts across the Atlantic during the month. PY5CC, along with other PY and LU stations, worked sporadically into Europe and as far eastward as JY9NX and 4X6ON. CE3SAD logged EH and CT stations on February 16. PW0S logged lucky EH, DL and OZ stations among additional contacts.

#### **Europe and Africa**

EH, CT, 9H and perhaps others in southwestern Europe made contacts into the Caribbean and South America, but European openings to Africa were more commonplace. Among those most often reported in European logs were 3C5I, 3Y0C, 5N6EAM/6, 5U2K, C56/DL7CM and C56/DL2OE, D68C, J28NH, S92DX, several TR, V51K and several ZS. John Larribeau (KR6MR), operating as ZD8CA on Ascension Island, made QSOs in 15 countries during his brief operating period, February 3 to 5, including 3C, CN, EH9, EH, CT and 9H. He heard no North Americans.

#### Asia and the Middle East

DX activity from Japan, Hong Kong and other areas of East Asia rebounded a bit from January's slump. VR2XMT and other Hong Kong enthusiasts reported February contacts across the Pacific and east to Africa, including KH6, V7, DU, 9V, 9M, VK, VU, D6 and FR. Japanese operators added 3D2CI (Fiji). Eduardo Valdez, DU1EV (Philippines), was delighted to work VU2ZAP and VU2MKP on the Indian's spot frequency of 50.350 MHz. VU2ZAP, at least, worked as far eastward as Europe. EY8MM (Tajikistan) again worked into Europe as well.

Activity in the Middle East stirred up some excitement, especially the appearance of a station from Syria, operated by a team of Americans. The American-led YK9A expedition made just 20 QSOs on 6 meters and was reported into South Africa on February 11. 5B4AGM made a surprising contact with ZL3TY on February 23. JY9NX and 4X stations worked PY5CC and others in South

America, as well as participating in some of the openings into southern Africa.

#### Sporadic E

February is probably the least likely month of the year for 6-meter E-skip, yet WB2AMU (FN30), N0JK (EM17), N0LL (EM09), K0AZ (EM48) and others reported the band open on February 8, 15, 20, 21 and 23. The openings of February 20-21 were more like summer conditions. Tim Havens, N1RZ (FN44), worked stations throughout the W4 call area nearly all day on the 20th. Bob Aldridge, KB4DVG (EM60), made contacts in Texas, Michigan and the East Coast with his MFJ-9406 and a dipole at 20 feet after 0125 on February 21.

#### 24-GHz EME

On March 7, Al Ward, W5LUA, reported that he had documented echoes from the moon on 24 GHz. Although some amateurs claim to have heard 24-GHz echoes in the past, it's believed that this marks the first time they have been documented. Al says he was able to hear and record the Earth-moon-Earth echoes on 24192.1 MHz running 20 W to a three-meter dish. On March 10, VE4MA reported hearing W5LUA's echoes on 24 GHz. See <a href="https://www.ntms.org">www.ntms.org</a>. Watch future issues of QST for more developments.

## VHF/UHF/MICROWAVE NEWS 2.3 GHz Rain Scatter

Andrea Mancini, IW4CJM, has claimed the first-ever rain-scatter contact on 2.3 GHz with I1TEX over a 427-km path this past April 16. SSB signals were distorted, as is typical of the more common 10-GHz rain-scatter contacts. Signal strength also peaked when Andrea elevated his antenna about 5°. Andrea believes that similar contacts are possible with stations running the equivalent of 10 W and a 1-meter dish antenna.

It has been generally assumed that 5.6 GHz was about the lowest frequency at which precipitation scatter is practical. This was because scattering is most efficient when

Table 1	
Claimed North American Distance Records	

Compiled by Al Ward, W5LUA

	,				
Mode*	Distance	e (km)	Stations (gr	rid locators)	Date
144 MH	lz				
Aurora		2167	WB0DRL (EM18ct)	KA1ZE (FN31tu)	1986 Feb 8
Auroral-	-E	2236	VE4AQ (EN19lu)	K5MA/1 (FN41qo)	1991 June 9
FAI		2370	KX0O (DM78pu)	WA4CHA (EL88qa)	1993 Jun 19
IFS		2856	K5JL (ÈM15dp)	VE1ALQ (FN65nh)	1999 Nov 8
Meteors	3	3154	K5UR (EM35wa)	KP4EKG (FK68vg)	1985 Dec 13
Sporadi	ic E	3635	WA7GŠK (DN13so)	W4FF (EL96am)	1998 May 29
ΤĒ		6328	KP4EOR (FK78aj)	LU5DJŽ (GF11lu)	1978 Feb 12
Tropo (	A)	2365	W1JSM (FN43nc)	VP5D (FL31ut)	1988 May 10
Tropo (0	C)	2714	WB4MJE (EL94hq)	VE1KG (FN84cm)	1994 Nov 5
Tropo (I	P)	4333	KH6HME (BK29go)	W7FI (CN87ws)	1995 Jul 1

<b>222 MHz</b> Aurora 2088 WB5LUA (EM13qc) WC2K (FM29pt) 1989 M
Meteors         2102         W7XU/0 (EN13Im)         K1WHS (FN34mj)         1998 A           Sporadic E         2195         W6QIW (DM04ck)         W5UWB (EL17ax)         2000 F           TE         5905         KP4EOR (FK78aj)         LU7DJZ (GF05rj)         1983 M           Tropo (A)         1854         WA4LOX (EL87sk)         WP4O (FK68km)         1998 F
Tropo (C) 2167 W5UWB (EL17ax) K2YAZ/8 (EN74ax) 1998 C
Tropo (P) 4142 KH6HME (BK29go) XE2/N6XQ (DL29cx) 1989 J
432 MHz

Aurora	1902	WB5LUA (EM13qc)	W3IP (FM19pa)	1986 Feb 8
Meteors	2040	N6RMJ (DM14cp)	W7XU/0 (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 (ÈL09ru) (	K0VXM (ÈL98pj)	1998 May 22
- ' )-(	4004	TOTAL TRACE (DICCO)	NOVO (DNAO')	4004 1 140

<b>1296 MHz</b> Tropo (C) Tropo (P)	2071 4142	KD5RO (EM13pa) KH6HME (BK29go)	WB3CZG (FN21ax) XE2/N6XQ (DL29cx)	1986 Nov 29 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

N6XQ (DM12jr)

W9ZIH (EN51nv)

KH6HME (BK29go)

1187 WB5LUA (EM13qc)

4061

3456 MHz				
Tropo (C)	1352	WB5LUA (EM13qc)	WA0BWE (EN34lx)	1995 Jul 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DMÒ3tr)	1991 Jul 28
5760 MHz				

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)	375	K6GZA/6 (CM97hm)	AD6FP/6 (DM04ms)	2000 Sept 16
<b>47 GHz</b> Tropo (C)	135	W0EOM/6 (CM88wi)	KF6KVG/6 (CM97ae)	1999 Dec 8

75 GHz Tropo (C) W0EOM/6 (CM88wj) KF6KVG/6 (CM97bc) 2001 Feb 1

120 GHz Tropo (C) 11.7 KF6KVG/6 (CM87uk) W0EOM/6 (CM87wi) 1999 Oct 19 142 GHz

61.6 W2SZ/4 (FM07fm) Tropo (C) WA4RTS/4 (FM08ib) 2001 Jan 1 241 GHz None reported

Micrometer Radio† None reported

Light†

Tropo (P)

Tropo (C)

678 THz 248 WA7LYI/7 (DM34tf) KY7B/7 (DM42ok) 1991 Jun 8 the scattering media (in this case, raindrops) are at least a few tenths of a wavelength in cross section. The wavelength at 2.3 GHz is 13 cm—somewhat more than half an inch, but raindrops are considerably smaller in diameter than that.

Andrea was surprised when he made the initial contact with I1TEX and sought some verification that it was indeed via rain scatter. Two days later, he noticed an unusually intense storm over Trieste and called his friend IW3RMR to make a further test. Both pointed their antennas toward the area of most intense rain, as indicated on weather radar. After some experimenting with beam headings, IW3RMR heard IW4CJM with an oddly broken signal over a clearly skewed path. Signal strength was again strongest when IW4CJM elevated his antenna somewhat. This second test seemed to confirm that some form of scattering was responsible.

Raindrops may be larger in intense storms and thus have the potential to scatter signals with longer wavelengths. Weather textbooks suggest that raindrops as large as 0.50 to 0.75 cm in diameter can form in the most severe storms, but this size still appears a bit small for efficient scattering of 13-cm waves. Perhaps the answer lies elsewhere. Hailstones, which can grow considerably larger than 1 cm in severe storms, might play a key role in scattering at lower frequencies.

#### New 4-mm Band World DX Record

Will Jensy, W0EOM/6, has broken yet another microwave record, this time extending the 75 GHz distance to 145 km. The newest DX contact was made with Bob Johnson, KF6KVG/ 6, who was operating from the home of W6NL near Loma Prieta Mountain (CM97bc) with 1 mW of power and a 12-inch dish (that is 76  $\lambda$ across!). Will was on Mt Vaca (CM88wj) with AD6FP running a much larger station with 5 mW and an 18-inch dish. Photos and further details can be found at home.pacbell.net/ val\_gary/ad6fp.html. Congratulations on another superb technical achievement!

#### **DX Records Update**

1994 Jul 13

1994 Nov 12

New records at 24, 75 and 142 GHz were added to the list of claimed North American distance records over the past year. See the complete list in Table 1. The upper microwave bands seem to hold the greatest promise for operators to break additional records in the coming year, especially as receiver and transmitter designs continue to improve.

There have been no Tropo (A) category contacts reported at 902 MHz and higher. Any such contact would constitute a new record. The requirements for the Tropo (A) listing are that a tropospheric contact be made from continental North America across the Atlantic, Caribbean or Gulf of Mexico to some place not on the continent, such as a distant island or a ship at sea. Contacts between Florida and the Bahamas or Cuba could provide an easy starting point for these unclaimed records. 05T~



<sup>\*</sup>Propagation modes: 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 E; Sporadic E; FAI, E-layer field-aligned irregularities; IFS, ionospheric forward scatter; Meteors; TE, transequatorial field-aligned irregularities; and Rain scatter. Distance calculations for 120 and 145 GHz are based on actual latitudes and longitudes of both stations. All other records are based on the centers of six-place grid locators, as calculated by BD, the W9IP bearing-and-distance program. At least one station must be located on land in North America or on an island rising from the continental shelf. †Micrometer Radio (300 to 3000 GHz) and Light (3 to 30,000 THz).

### **COMING CONVENTIONS**

#### WYOMING STATE CONVENTION

May 26-27, Casper

The Wyoming State Convention, sponsored by the Tri-County 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. Doors are open for setup Friday 4-8 PM; public Saturday 8 AM to 5 PM, Sunday 8 AM to noon. Features include swapmeet, major dealers, vendors, foxhunt, forums (NTS, antennas, DX, ARRL, ARES/RACES), home brew contest, DXCC card checking, banquet (Saturday, 6:30 PM, \$17), VE sessions (Saturday, 1-4 PM). Talk-in on 146.94. Admission is \$7 in advance, \$10 at the door. Tables are \$5. Contact Paul McTee, KB7FGN, 332 Thomas Ave, Worland, WY 82401; 307-347-8255; kb7fgn@trib.com; www.qsl.net/wb7s/.

### NORTHWESTERN DIVISION CONVENTION

June 1-3, 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; **lhurd@pacifier.com**), exhibits (Al Berg, W7SIC, 503-816-7098; **w7sic@qsl.net**), seminars, forums, workshops, VE sessions (Saturday 9 AM, Our Saviour's Lutheran Church, preregistration only by May 1, no walk-ins; Carl Clawson, WS7L, 503-629-5796; ws7l@arrl.net), Clawson, WS/L, 303-029-3/70, WS/16 at Lance, Ladies Hospitality Suite (Room 125), banquet (Saturday, 7:15 PM, \$20; special guest speaker ARRL President Jim Haynie, W5JBP; pre-banquet 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, Box 219295, Portland, OR 97225; 503-641-3776; KZ7T@arrl.net; www.seapac.org.

#### **GEORGIA SECTION CONVENTION**

June 2, Marietta/Atlanta

The Georgia Section Convention, sponsored by the Atlanta RC, Gwinnett ARS, Kennehoochee ARC, and the Paulding County ARC, will be held at Jim Miller Park, 2245 Callaway Rd; from Atlanta take I-75 N to Exit 260 (Windy Hill Rd), turn left (W), go approximately 5 miles, turn left on Austell Rd, go <sup>1</sup>/<sub>2</sub> mile and turn right on Callaway Rd, go <sup>1</sup>/<sub>2</sub> mile to Jim Miller Park on right. Doors are open for setup Friday 10 AM to 6 PM, Saturday 6:30 AM; public 9 AM to 4 PM. Features include Hamfest and Computer Fair, unlimited tailgating, indoor air-conditioned flea market, equipment dealers, vendors, forums (ARRL, QRP, Basic/Stamp controller), VE sessions (9 AM; off site at

April 20-21 Delta Division, Little Rock, AR\* Southeastern VHF Conference, Nashville, TN\*

April 20-22 International DX, Visalia, CA\*

April 21-22 Washington State, Yakima\*

April 29 Delaware State, New Castle\* Eastern New York Section, Poughkeepsie\*

May 4-5 Louisiana State, Baton Rouge\* May 5 South Carolina State, Greenville\*

May 5-6 Alabama State, Birmingham\* West Texas Section, Abilene\*

June 2-4 Atlantic Division, Rochester, NY

June 15-16 Midwest/Dakota Division, South Sioux City, NE

June 23-24 San Francisco Section, Ferndale, CA \*See April *QST* for details.

First United Methodist Church, 56 Whitlock Ave; off the square in Marietta, a few miles N of the hamfest location), RV camping with full hookups (\$10), handicapped accessible, free parking, refreshments. Talk-in on 146.82. Admission is \$5. Tables are \$25. Contact John Talipsky, KA4VQH, 385 Madison Chase Dr, Lawrenceville, GA 30045; 770-995-6446 (before 9 PM); johnka4vqh @aol.com or johnjr@talipsky.com; www.saf.com/arc/atlfest.htm.

#### WEST GULF DIVISION CONVENTION

June 8-10, Arlington, TX

The West Gulf Division Convention, sponsored by Ham-Com 2001, 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, Sunday 7 AM to 1 PM. Features include indoor and outdoor flea markets, commercial exhibitors, manufacturers, dealers, vendors, programs on the old to new (including ARRL's Amateur Radio Emergency Communications course), Lone Star DX Assn Luncheon (with special speaker Martti Laine, OH2BH), educational programs (including SKYWARN school), VE sessions (all 3 days). Talk-in on 147.14. Admission is \$9 in advance, \$10 at the door, under 13 free. Tables are \$30 each. Contact Maury Guzick, W5BGP, Box 12774, Dallas, TX 75225-0774; 214-361-7574 (phone/fax); chairman@hamcom.org; www. hamcom.org

## EASTERN PENNSYLVANIA SECTION CONVENTION

June 9, 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 after 6 PM, Saturday 6 AM; public Saturday 8 AM to 3 PM. Features include convention/ computer show, indoor air-conditioned sales area, tailgating (\$5 per 10×10-ft space), forums, VE sessions (10 AM to noon; walk-ins welcomed), free parking, refreshments. Talk-in on 147.225 (203.5 Hz), 146.52. Admission is \$5, nonham spouses and under 12 free. Tables are \$20 (8-ft, electricity \$5 per drop, bring your own extension cords and power strips). Contact George Law, N3KYZ, 10 Whitenight Ln, Bloomsburg, PA 17815; 570-784-2299; n3kyz@jlink.net; www.qsl.net/cm-arc; or Dave Schack, WC3A, 570-752-6851; wc3a@arrl.net.

#### **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.

### **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.)

<sup>†</sup>Connecticut (Newington)—Jun 3; 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. Adm: \$5 (indoor and outdoor). Tables: advance \$15 (make check payable to NARL and send with

†ARRL Hamfest

SASE to Bob Stanwood, KB1EYZ, 21 Stuart Dr, Bloomfield, CT 06002), door \$20. Tom Ponte, WB1CZX, 99 Jeffrey Ln, Newington, CT 06111; 860-666-4539; wb1czx@arrl.net.

†Connecticut (Vernon)—May 26, 9 AM to 2 PM. Spr: Natchaug ARC. Tolland County Agricultural Center, on Rte 30; 1-84 to Exit 67, follow signs, approximately ½ mile. Indoor/outdoor flea market, tailgating. Tl: 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.

Florida (Ft McCoy)—Jun 9. Tom Bench, W4BTB, 352-546-2448.

†Georgia (Albany)—Jun 9, 9 AM to 4 PM. Spr: Albany ARC. Potter Community Center, Wildfair Rd. Outdoor flea market only, refreshments. TI: 146.82. Adm: Free. Bob Smith, K4PHE, c/o ARC, Box 70601, Albany, GA 31708-0601; 229-883-9633; k4phe@isoa.net.

Georgia (Marietta/Atlanta)—Jun 2, Georgia Section Convention. See "Coming Conventions."

†Georgia (Statesboro)—May 19, 8 AM to 2 PM. Spr: Statesboro ARS. Ogeechee Technical College, Kennedy Blvd; from Statesboro take Hwy 301 S, about 2 miles to OTC on left; from I-16 (Statesboro Exit) take Hwy 301 N, about 8 miles to OTC on right. Tailgating, forums (ARES, SKYWARN, Weather Spotting, ARRL), VE sessions (10 AM), demonstrations and exhibits (computers, GPS, APRS, packet, satellite), foxhunts, QSL card checking, refreshments. Tl: 147.105. Adm: \$5. Tables: inside \$5, outside free. Tom Evans, KF4YLF, 1367 Goloid Church Rd, Sylvania, GA 30467; 912-863-4970; kf4ylf@arrl.net; www.cs.gasou.edu/stars.

†Illinois (Princeton)—Jun 3; 6 AM (flea market), 8 AM (buildings) to 3 PM. Spr: Starved Rock RC. Bureau County Fairgrounds, 811 W Peru St, ½ mile W of IL Rte 26; Exit 56 off I-80, S to Rte 6 (Peru St), W 2 blocks to Fairgrounds. Hamfest and Computer Show, free outdoor flea market, free parking, free on-site camping. TI: 146.955 (103.5 Hz). Adm: advance \$5 (by May 15), door \$7. Tables: \$10. Jerry Hagemann, N9ZJK, c/o SRRC, Box 198, Leonore, IL 61332; 815-538-6932; w9mks@arrl.net; www.qsl.net/w9mks.

†Illinois (Springfield)—Jun 2, 6 AM (flea market) to 1 PM (building opens 8 AM). Sprs: Sangamon Valley RC and Shooting Stars 4-H Club. Illinois State Fairgrounds, Cooperative Extension Building; from I-55 take Sangamon Ave W to Fairgrounds, enter Gate 11. Giant covered flea market, indoor exhibits, commercial vendors, VE sessions (9 AM, walk-ins accepted, no registrations accepted after 10 AM), handicapped accessible. TI: 146.685. Adm: \$5 each or 3 for \$10. Tables: \$5 (vendors only); limited indoor flea market tables may be available. Ed Gaffney, KA9ETP, 13997 Frazee Rd, Box 14A, Divernon, IL 62530; 217-628-3697; egaffney@familynet.net; www.w9dua.net.

†Illinois (Wheaton)—Jun 10, 6 AM to 3 PM. Spr: Six Meter Club of Chicago. DuPage County Fairgrounds, 2015 Manchester Rd; 24 miles W of Chicago, N of Roosevelt Rd (Rte 38), E of County Farm Rd. Ham Radio and Electronics Flea Market, ARRL and dealer displays, antique and vintage radios, VE sessions (9-11 AM), limited overnight RV parking with electrical hookup (advanced registration required by May 25), free parking, refreshments. Tl: 146.97 (107.2 Hz), 146.52. Adm: advance \$5, door \$6. Tables: \$15 (with electricity), \$12 (without electricity). Joseph Gutwein, WA9RIJ, 7109 Blackburn Ave, Downers Grove, IL 60516-3925; 630-963-4922 (days) or 708-442-4961 (eves); wa9rij@mc.net; cyberconnect.com/orion/smcc.html.

Indiana (Michigan City)—Apr 21. Ron Stahoviak, N9TPC, 219-325-9089.

†Indiana (Wabash)—Jun 10, 6 AM. Spr: Wabash County ARC. Wabash County 4-H Fairgrounds, located on State Rd 13N. Hamfest and Computer Show, large indoor flea market, major vendors, free outside flea market space, free overnight camping with electrical hook-ups, refreshments. TI: 147.03, 442.325. Adm: advance \$5, door \$6. Tables: \$10. Ralph Frank, KB9PLV, 4010 N 700 W, Wabash, IN 46992; 219-563-8487 (office) or 765-833-7372 (home); fax 219-563-8489; wia1@netusal.net.

**Iowa** (Newton)—May 26. R.J. Hellstern, K0FAT, 641-792-2222.

\*Kentucky (Dawson Springs/Hopkinsville)—May 26; set up 6 AM; public 7 AM to 1 PM. Sprs: Dawson Springs ARC, Hopkins County ARC, Hopkinsville ARS, Princeton ARS. Pennyrile Forest State Park, on Hwy 109 between Dawson Springs and Hopkinsville. Pennyrile Area Tailgate/Fest, dealers, electronics, computers and accesso-

ries, VE sessions (\$10), refreshments. *TI*: 147.09. *Adm*: Free. Tables: Free, but limited. Mike Taylor, KF4QDX, 270-365-7777; kf4qdx@apex.net.

\*Kentucky (Independence)—Jun 10, 7 AM to 2 PM. Spr: Northern Kentucky ARC. Summit View Middle School, 5002 Madison Pike/KY Rte 17; 1-275 to Exit 80, KY Rte 17, go S 5 miles, school on left. Flea market, forums, foxhunt, VE sessions. TI: 147.255, 147.375. Adm: advance \$4, door \$5. Tables: \$15 (includes 1 ticket per table). Robert Blocher, N8JMV, 2061 St Rte 125, No 10, Amelia, OH 45102-2047; 513-797-7252; nkarc@juno.com; home.fuse.net/dom/.

Kentucky (Murray)—Apr 21. Bill Slayman, KE4JFS, 270-437-4215.

\*Maine (Hermon)—Jun 9; set up 6:30 AM; public 8 AM to 1 PM. Spr: Pine State ARC. Hermon High School, Rte 2; from I-95 take Exit 44 (Cold Brook Rd) to US 2, take US 2 E about 1 mile to High School. Flea market, dealers, vendors, VE sessions (all classes), 3 campgrounds within 5 miles, free parking, refreshments. TI: 146.94, 146.52. Adm: \$5, under 12 free. Tables: \$8. Edward Richardson, K1DTW, 1205 Center Dr, Orrington, ME 04474; 207-825-4417; edandglo@earthlink.net.

†Maryland (West Friendship)—May 27, 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. Commercial vendors, tailgating (\$5 per space), refreshments. *TI*: 146.76, 224.76, 444.0. *Adm*: \$5. Tables: advance \$20, door \$25. Craig Rockenbauch, WA3TID, 429 Severnside Dr, Severna Park, MD 21146; 410-987-6042.

Massachusetts (Cambridge)—May 20. Nick Altenbernd, KA1MQX, 617-253-3776.

†Massachusetts (Falmouth)—Jun 9; set up 7 AM; public 9 AM to 2 PM. Spr: Falmouth ARA. Barnstable County Fairgrounds, Rte 151; from the N take Rte 495S to Rte 28S to the Rte 151 Exit, go E on Rte 151 approximately 5 miles to Fairgrounds; from the E take Rte 28W to the Mashpee Rotary, take Rte 151 approximately 6 miles to Fairgrounds. Amateur Radio and Electronics Flea Market, vendors (8-ft space, advance \$7, door \$8), talk-in station, amateur radio display table, VE sessions. TI: 146.655. Adm: \$3. Ralph Swenson, N1YHS, 99 Fox Run Ln, E Falmouth, MA 02536; 508-548-6405; depsher911@aol.com; www.falara.org.

†Massachusetts (Greenfield)—May 14, 6 PM. Spr: Franklin County ARC. Wesco Parking Lot, Munson St; Rte 91 to Exit 26 to Rte 2A E, turn right at 1st traffic light, follow signs. Flea market, tailgating (no charge), refreshments. TI: 146.985 (136.5 Hz). Adm: \$3. Kathy Hebert, N1XSQ, 260 S Scofield Mountain Rd, Winchester, NH 03470; 603-239-4480 or 413-498-2292; tim@cheshire.net.

†Michigan (Chelsea)—Jun 3, set up 6 AM; public 8 AM. Spr: Chelsea ARC. Chelsea Community Fairgrounds, Old US-12 and Old Manchester Rds; take Exit 159 (M-52) N off I-94, go approximately 1 mile to first stoplight (Old US-12/Jackson Rd) and turn left (W); Fairgrounds are 1 block W of M-52 on S side. Good old-fashioned swap, runk sales (\$5 plus admission), handicapped accessible, refreshments. TI: 145.45. Adm: advance \$4, door \$5, under 12 free. Tables: \$10. Bill Altenberndt, WB8HSN, 19501 Bush Rd, Chelsea, MI 48118; 734-475-7938; wd8iel@hotmail.com; www.chelsea-mi.net/hamswap/.

Michigan (Grand Rapids)—Jun 2. Kathy Werkema, KB8KZH, 616-698-6627.

†Mississippi (Pascagoula)—Jun 1-2; 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 right on Hospital Rd to Fairgrounds behind hospital. Dealers, vendors, VE sessions (Saturday, 10 AM; \$10.00, bring picture ID, latest license and/or all applicable CSCEs and 1 copy of each; copies must be legible), forums (ARRL, ARES/RACES), refreshments. TI: 145.11. Adm: \$3.50, under 12 free (\$10 max per

family). Tables: \$8 (8-ft, first-come, first-served; tables must be paid in advance to assure reserved space). Ira Groff, NN5AF, 17200 Spring Lake Dr, Vancleave, MS 39565; 228-826-5095; nn5af @arrl.net.

†Missouri (Macon)—Jun 9; set up 5-8 AM; public 8 AM to 1 PM. Sprs: Macon County, Nemo, Tri-County, and Schuyler County ARCs. Macon Vo-Tech School, on US 63; turn S on US 63 from US 36, go 1 mile to School. Commercial vendors, dealers, displays, tailgating, technical forums, ARRL forum, DXCC card checking, equipment testing, radio tower demo, VE sessions (9:30 AM), handicapped parking, refreshments. TI: 146.805. Adm: \$3 each or 2 for \$5. Tables: advance \$10, door \$15. Dale Bagley, K0KY, Box 13, Macon, MO 63552; 660-385-3629; n0pr@arrl.net; www.istmacon.net/~kfoster/hamfest.htm.

**Nevada (Reno)—May 12**. Glen Haggard, KK7IH, 775-673-6401.

†New Jersey (Hackensack)—Jun 2; set up 6 AM; public 8 AM to 2 PM. Spr. Bergen ARA. Bergen County Technical School, 200 Hackensack Ave (S lower parking lot of the Hackensack campus, behind the Orie de Noir auditorium); go W on Rte 4 to Hackensack Ave S Exit to Bergen County Academies Campus. Vendors (\$10 per space, includes 1 free admission, no reservations required; reservations required for limited number of spaces with electrical power at \$20 per space), VE sessions (8-10 AM, Novice thru Extra), DXCC card checking, refreshments. TI: 146.79, 146.52. Adm: \$5, wives and children free. Jim Joyce, K2ZO, 286 Ridgewood Blvd N, Westwood, NJ 07675; 201-664-6725; jjjovce@cybernex.net or hamfest @bara.org: www.bara.org

†New Jersey (Trenton)—Apr 28-29; 8 AM to 5 PM. Spr: SETI League. The College of New Jersey (formerly Trenton State College), Department of Engineering, Armstrong Hall, Room 136, 2000 Pennington Rd, Ewing; I-95/I-295 to Rte 31 to main entrance. SETI League Technical Symposium and Annual Membership Meeting, Awards Banquet (Saturday eve at the Campus Center). Adm: advance \$30 (members), \$80 (non-members); door \$40 (members), \$90 (non-members). Dr. H. Paul Shuch, N6TX, 121 Florence Dr, Cogan Station, PA 17728; 201-641-1770; n6tx@setileague.org; www.setileague.org/admin/meet2001.htm.

\*New York (Bethpage)—Jun 10; sellers 7 AM; buyers 8:30 AM. Spr.: Long Island Mobile ARC. Briarcliff College, 1055 Stewart Ave. Electronics Hamfair and Flea Market, ham radio equipment, computers, vendors, tailgating (\$15 per space, includes 1 admission; additional workers will be \$6 each), tune-up clinic, VE sessions, refreshments. TI: 146.85 (136.5 Hz). Adm: \$6, nonham sweethearts free and under 13 free when accompanied by a paying parent. Tables: \$15. Ed Muro, K2EPM, Box 392, Levittown, NY 11756; 516-520-9311; hamfest@limarc.org; www.limarc.org.

<sup>†</sup>New York (Farmingville)—May 20; sellers 7 AM, buyers 8 AM. *Spr*: Radio Central ARC. K-Mart Shopping Center; take LI Expressway to Exit 63, go N on Ocean Ave to K-Mart parking lot on left. *TI*: 145.15 (136.5 Hz). *Adm*: \$5. Frank Peppe, KB2WQU, 631-289-7757; frank.peppe@verizon.net.

†New York (Newburgh)—May 12, 6 AM to 2 PM. Spr: Orange County ARC. Temple Hill Academy, 525 Union Ave; I-84 to Exit 75 (Rte 300 S), take Rte 300 S and make a left turn at 5th traffic light (2 miles), continue for ½ mile and make a left onto Union Ave, continue for ½ mile to school on right. Vendors, VE sessions (9 AM to noon). TI: 146.76. Adm: \$5 (spouse and kids of ham are free). Tables: \$10 (club supplies table), \$8 (vendor supplies table). Ed Moskowitz, N2XII, 123 Harold Ave, Cornwall, NY 12518-1701; 845-534-3492 (after 7:30 PM); n2xji@banet.net.

\*New York (Queens)—Jun 3; set up 7:30 AM; public 9 AM to 3 PM. Spr: Hall of Science ARC. NY Hall of Science Museum Parking Lot, 47-01 111th St, Flushing Meadow Corona Park. Tailgating, electronics and computer equipment, VE sessions, 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, Jackson Heights, NY 11372; 718-898-5599 eves only; wb2kdg@bigfoot.com.

\*North Carolina (Winston-Salem)—Jun 9, 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 (\$5 buys unlimited space), free parking, refreshments. TI: 146.64, 145.47. Adm: \$5. Tables: \$15. Paul Jordan, KG4LDB, Box 11361, Winston-Salem, NC 27116-1361; 336-723-7388; info@w4nc.org; www.w4nc.org.

Ohio (Dayton)—May 18-20. "50th Anniversary." Jim Graver, KB8PSO, 937-276-6930; info@hamvention.org; www.hamvention.org/.

†Ohio (Suffield/Akron)—Jun 10, 8 AM to 3 PM. Spr: Goodyear ARC. Wingfoot Lake Park; enter from Rte 43, 1 mile S of Rte 224, 10 miles E of Akron. Outdoor and indoor flea market, picnic, VE sessions. Tl: 146.985, 146.52. Adm: advance \$4, door \$5 (1 ticket admits ham, spouse, and children). Tables: advance \$8, door \$10 (Pavillion); \$5 (Flea Market). Don Longshore, N8QCA, 1834 Esther Ave, Akron, OH 44312-1014; 330-733-7989; donel@stratos.net.

Oklahoma (Eufaula)—May 12. Mark Magreevy, N5PNE, 918-689-5366.

**Oregon** (Eugene)—May 12. Karl Fuller, K7ARL, 541-942-1624.

**Oregon (Seaside)**—**Jun 1-3**, Northwestern Division Convention. See "Coming Conventions."

Pennsylvania (Bloomsburg)—Jun 9, Eastern Pennsylvania Section Convention. See "Coming Conventions."

†Pennsylvania (Pittsburgh/Butler)—Jun 3. Spr: Breezeshooters ARC. Butler Farm Showgrounds, PA Rte 68, W of Butler, E of I-79. Large indoor and outdoor flea market, vendors, tailgating (\$5 per space), forums. TI: 147.36. Adm: \$5. Tables: \$15. H. Rey Whanger, W3BIS, 120 Cove Run Rd,

Cheswick, PA 15024; 412-826-8006, w3bis.sat@juno.com; www.breezeshooters.net.

Rhode Island (Forestdale/North Smithfield)—May 19. Rick Fairweather, K1KYI, 401-725-7507 (7-8 PM only).

†Tennessee (Knoxville)—Jun 8-9; Friday 5-9 PM, Saturday 9 AM to 4 PM. Spr: RAC of Knoxville. National Guard Armory, 3330 Sutherland Ave; off I-40. Hamfest and Electronics Flea Market, inside dealers, large outside tailgate area, amateur radio and computer equipment, forums, clinics, exhibits, displays, demonstrations, CW contests, foxhunt, free on-site HT checking, free manufacturer product literature area, VE sessions (Saturday, 2 PM), DXCC and VUCC QSL card checking, special event station in operation, handicapped accessible, free parking, refreshments. TI: 147.3, 224.5, 444.575, 53.77. Adm: advance \$10 (for both days), door \$6 (for Saturday, Jun 9 only). Tables: \$15. David Bower, K4PZT, c/o RAC of Knoxville, Box 50514, Knoxville, TN 37950-0514; 865-690-8360 or 865-670-1503; d.bower@ieee.org; www.korrnet.org/rack.

Tennessee (Mountain City)—May 12. John Hillsman, K9HE, 423-727-4889.

Texas (Arlington)—Jun 8-10, West Gulf Division Convention. See "Coming Conventions."

†Virginia (Franklin)—Jun 9, 9 AM to 3 PM. Spr: Franklin AR Repeater Assn. Bronco Club, Delaware Rd; Rte 258 to Rte 687 (Delaware Rd), approximately 3 miles to W, follow signs. Picnic and Tailgate, NC-style barbeque, Skywarn Program. TI: 147.3. Adm: \$5. Tables: bring your own and lawn chairs. Stewart Tyler, WA4JUO, 801 Normandy Dr, Suffolk, VA 23434; 757-934-2115 or 757-934-5127; stu.tyler@juno.com; or Ralph Atkinson, WB4ZNB, 757-562-5710.

†Virginia (Manassas)—Jun 3, 7 AM to 3 PM. Spr: Ole Virginia Hams ARC. County Fairgrounds, 10624 Dumfries Rd. 4th Call Area QSL Bureau Reps, DXCC QSL card checking, "Virginia QSO

Party" awards, VE sessions. *TI*: 146.97, 224.66, 442.2. *Adm*: \$5. Tables: \$30 (with electricity and chairs). Mary Lu Blasdell, KB4EFB, 9727 Loudoun Ave, Manassas, VA 20109-3231; 703-369-2877; mblasd1638@aol.com; www.qsl.net/olevahams.

Washington (Dryden/Wenatchee)—Jun 8-10. John Lathrop, N7RHY, n7rhy@gte.net.

\*Washington (Stanwood)—May 12, 9 AM to 3 PM. Spr: Stanwood-Camano ARC. Stanwood Middle School, 9405 271st NW; N or S on I-5 to Exit 212, W on SR 532, right at third stop light, right on 88th NW, left at next stop sign, proceed to school on right. Flea market, VE sessions, refreshments. TI: 145.19. Adm: \$4. Tables: advance \$15 (\$20 after Apr 30). John McCann, N7MZ, 27312 56th Ave NW, Stanwood, WA 98292; 360-629-2921; huppert@whidbey.net.

\*Wisconsin (Eau Claire)—Jun 9; set up 6 AM; public 8 AM. Spr: Eau Claire ARC. Eau Claire County Exposition Center, Lorch Dr; I-94 to Eau Claire, Hwy 93 (Exit 68), S on Hwy 93, ¹/s mile to Lorch Dr, right on Lorch to Expo Center. Flea market, vendors, tailgating (\$10 per space), VE sessions, refreshments. TI: 146.91 (110.9 Hz). Adm: advance \$5, door \$6. Tables: advance \$10, door \$15. Jim Staatz, KG9RA, Box 1867, Eau Claire, WI 54702-1867; 715-838-9108; w9eau@ecarc.org; www.ecarc.org.

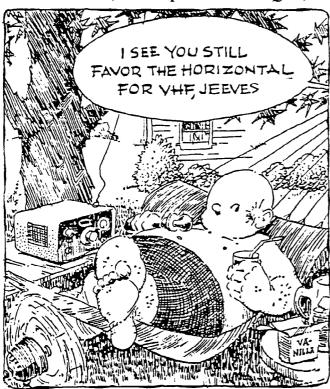
Wyoming (Casper)—May 26-27, Wyoming State Convention. See "Coming Conventions."

#### 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 Head-quarters, 225 Main St, Newington, CT 06111. Or send e-mail to giannone@arrl.org.

#### Classic Gil (from September 1966 QST)



### **NEW PRODUCTS**

#### 12 V BATTERY IN A BAG FROM CUTTING EDGE

♦ Cutting Edge Enterprises has taken a heavy duty nylon carry case and stuffed it with a gel cell battery.

The weather-resistant black nylon bag features a buckle down lid and an adjustable carry strap. Extra space within the lid can be used for carrying additional accessories.

The included 12 V/7.5 Ah gel cell battery is just the ticket for powering portable radio equip-



ment—an H-T, mobile radio—or one of the new compact multiband rigs—out in the field. A battery charger is not included.

The PB7A is priced at \$33.95. For further information, contact Cutting Edge Enterprises, 1803 Mission St, Suite 546, Santa Cruz, CA 95060; tel 800-206-0115, fax 831-426-0115, cee@cruzio.com; www.powerportstore.com.

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## Rescaling the MRX-40 Receiver for 80 Meters

Last October I found myself on a flight to Tyndall Air Force Base in Florida to meet my new grandson, Kyle Charles Stanfield II, born Sept 27, 2000, to my daughter, Gwen, KB4UNT, and her husband, Kyle, KF4TIV. Before leaving, I put a request on the QRP-L e-mail reflector (qrp-l@lehigh.edu) for ideas or designs for a companion receiver kit to match the NoGANaut 80-meter transmitter. Several folks replied, including Mike Boatright, KO4WX, who said he'd meet me at the Atlanta airport during my layover and show me his newly completed design.

After a two-hour flight, I met Mike in Atlanta. He took me into the Delta Air Lines Crown Room, where we had a great

time talking QRP. Mike pulled out his new receiver, a redesign of the MRX-40 ("The MRX-40 Mini Receiver" by Steve Bornstein, K8IDN, *QST* September 1997, page 59), for use on 80 meters. Mike furnished me with a basic parts kit, a PC board and a set of modification instructions. I decided to build the receiver while on vacation in Florida.

#### **Subbing Parts**

Figure 1 shows the modified schematic of the MRX-80 receiver, set up for operation on the NoGA (North Georgia QRP Club) net frequency, 3686.4 kHz. Mike substituted the NE612 (U1) used on the MRX-40 with a NE602 since the latter has 4 dB more conversion gain. The LM380 (U2) was also changed to a LM386, which is a more easily obtainable part. Although the LM386 has less output power, it is adequate for use with headphones. C10 was included in the audio stage to increase the LM386's gain to approximately 200 (46 dB). Finally, the 6-V regulator used in the 40 meter version was replaced with a 78L08 (8-V) regulator. The 78L08 is about top end for the mixer chip, but it yields an additional 1dB of conversion gain in the NE602.

In order to make the MRX-40 work on 80 meters, the LC ratios had to be rescaled. C1 worked out to 172 pF. By paralleling one 150 pF with a 22 pF capacitor, the desired value is achieved. Mike thinks a 180 pF would also work

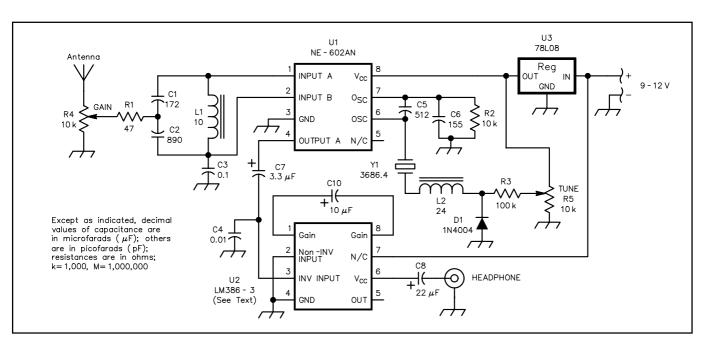


Figure 1—Schematic diagram for the MRX-80 receiver (an MRX-40 converted to 80 meters).

#### Component Changes:

- U1, the NE612, was replaced with an NE602. Either component will work in this circuit, however, the NE602 has 4 dB more conversion gain than the NE612.
- U2, the LM380, was replaced with an LM386. The LM386 is a more easily obtainable part (available at most Radio-Shack stores) than the LM380N-8. However, it does have less power output. The LM386-3 provides up to 700 mW of power, more than adequate for headphone use. Note that C10 was
- added to the circuit to boost the LM386 gain to 46 dB (200).
- U3, the 78L06 was replaced with a 78L08. Either component will work in this circuit, but running the NE602 at 8 V yields an extra 1 dB of conversion gain.

#### RF Component Scalings:

- C1—scaled to 172 pF ( $X_a = 250 \Omega$ ); not a standard value, but can be made using a 150 pF and a 22 pF (or 20 pF) in parallel. A 180 pF would probably work also.
- C2—scaled to 890 pF ( $X_a = 48 \Omega$ ); not a standard value, but can be made using

- an 820 pF and a 68 pF (or 82 pF) in parallel.
- C5—scaled to 512 pF ( $X_a = 84 \Omega$ ); not a standard value, but 470 pF works just fine as a replacement.
- C6—scaled to 155 pF ( $X_a = 277 \Omega$ ); not a standard value, but 150 pF is close enough.
- L1—scaled to 10.6 mH (X = 246  $\Omega$ ); can use standard value 10 mH molded inductor
- L2-–scaled to 28 mH (X, = 660  $\Omega$ ); can use standard value 27 mH or 33 mH molded inductor.

0<del>51</del>-

well. Same with C2, which scaled to 890 pF. By paralleling an 820 pF with a 68 pF you can get very close to the 890 pF capacitance. C5 and C6 were rescaled to 512 pF and 155 pF respectively. A 470 pF works for C5 while 150 pF works for C6. L1 and L2 are rescaled to 10.6  $\mu$ H and 28  $\mu$ H respectively. Standard-value 10  $\mu$ H and 27  $\mu$ H molded inductors work just fine for these two inductors.

Mike's PC board is what I call "Ugly Style" construction. Manhattan Everything is soldered to the circuit pads etched on top of the PC board. This saves drilling holes and, in the case of standard "Manhattan Style" construction, gluing the small pieces of PC material to the main PC board groundplane. I'd never tried this style construction before and was pleasantly surprised at how easily and rapidly the circuit went together. Total construction time was around one hour. I clipped a 9-V battery to the circuit, plugged in the headphones and wire antenna and was rewarded with CW near the 3686.4 kHz operating frequency. There are virtually no alignment steps after the receiver is built and working.



Figure 2-My version of the MRX-80.

Just plug everything in and listen to 80 meters.

#### **Great Little Receiver**

How well does this little receiver work? Considering the simplicity of design and minimal parts count, I am amazed! Granted there is only a 500-600 Hz swing using the tune control, which severely limits the tunable reception, but for coupling to a NoGANaut transmitter or KnightLite SMiTe transmitter (also on 3686.4 kHz) the MRX-80 is just the ticket. There is no AF filtering to speak of, so you hear a lot of stuff around the

operating frequency. It would not be hard to include an active AF filter on output of the receiver to help limit the AF bandwidth. Figure 2 shows my MRX-80 receiver.

Mike's idea of rescaling the MRX-40 into an 80-meter receiver was brilliant. The overall simplicity of design and common parts means that most people can build one on a shoestring budget. While the MRX-80 is not on par with a superhet design, it certainly will work well for the intended purpose, which is 80 meter net operations. You could pair the MRX-80 with any 80-meter transmitter. Those folks who modified their Tuna-Tin II transmitters for operation on 80 now have a companion receiver.

This is a fun project. My thanks to Mike Boatright, KO4WX, for sharing his redesign of the MRX-40 with the readers of "QRP Power." This receiver should be dead simple to duplicate using perfboard or Manhattan Style construction. Parts are easily obtainable and there's not much to go wrong. Should you desire a one-night project, why not try the MRX-80 receiver?

### **NEW BOOKS**

#### **DANGEROUS CROSSINGS**

By John H. Bryant and Harold N. Cones

Published by Naval Institute Press, USNI Operations Center, 2062 Generals Highway, Annapolis, Maryland 21401; 800-233-8764; www.usni.org. First edition, hardcover, 232 pages, 6½×9½ inches with black and white illustrations. \$27.95.

Reviewed by Steve Ford, WB8IMY QST Managing Editor

Dangerous Crossings tells the story of the first "technological" expedition to the North Pole undertaken in 1925. The expedition was headed by Donald B. MacMillan, Eugene F. McDonald (who was largely responsible for Zenith Corporation's prominence in the radio industry) and the famous Richard E. Byrd. What made this journey unique was its extensive use of shortwave radio and aviation (open-cockpit Loening Amphibian biplanes).

The voyage was harrowing, to say the least, as the expedition's ships made their way north to Greenland and beyond. *Dangerous Crossings* makes ample use of diary entries and other first-person accounts

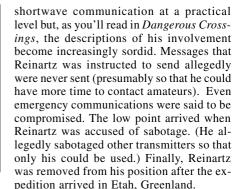
to add even more drama to the tale. With their amphibious aircraft they were able to extensively explore well beyond the range of the ships, charting areas of the polar islands never seen before. Of course, they had to contend with frequent gales



dangerous crossings

According to the authors, the use of Amateur Radio during the expedition was controversial. The radio operator aboard the *Bowdoin*, and the chief radio operator for the entire expedition, was John L. Reinartz, then licensed as 1XAM. Just two years prior (in 1923), Reinartz had distinguished himself as part of the team that made the first transatlantic radio contact. But according to the account in *Dangerous Crossings*, Reinartz focused primarily on making contacts with amateurs during the voyage, neglecting more critical duties.

Reinartz did indeed prove the value of



The ARRL had played a major role in the communication planning for the expedition, but this incident apparently did not reflect badly on the League. As the authors of *Dangerous Crossings* note: "...President Maxim and the other ARRL officials felt the evidence against Reinartz was overwhelming." Even so, Reinartz went on to a prominent career in radio, retiring from the Eimac Corporation in 1960. Other articles have detailed Reinartz's role in the MacMillan Expedition (the most recent published in 1981 in *Ham Radio*), but none mention the controversy, or his demotion at Etah.

It is the thorough, unflinching nature of *Dangerous Crossings* that makes it so compelling. This is raw, unvarnished history.

Previous New Books

99

### \_D RADIO

### Build Your Own 1920s Transmitter

Finding an early homebrew 1920s transmitter is difficult; there just aren't enough of them left to go around. During the late 1920s and early '30s when money was short, these rigs were dissembled and the parts reused in other circuits. Sometimes the same parts found themselves in several radios over the years.

After World War II, when inexpensive high-quality surplus gear hit the market, the old 1920s parts were relegated to the "junk boxes" that most hams had at the time. These junk boxes have been showing up at hamfest for years now, and their ancient '20s-era electronics are often sold at bargain prices.

I have been buying vintage parts at hamfests for several years now. I have almost everything I need to achieve my goal: building an authentic 1920s transmitter. The one I plan to build is the twotuber shown in Figure 1. You can do this, too. The trick is learning how to find and identify the components.

The best technique is to study antique parts at a radio museum. If you're lucky, you'll find someone in your area who already owns the components and will let you examine them firsthand.

The next best method is to find a radio catalog from that era, or a reprint on CD-ROM or paper. Carefully study the parts listed for sale. Old *QST*'s and the *QST* CD-ROM sets are also excellent resources. There are many transmitter circuits, photos and parts shown in each issue.

For this column, let's concentrate on two particularly rare parts. Should you spot either of these for sale, don't let them get away!

#### The Rotary Chopper

Amateur "spark" reception was easy when most hams had crystal sets or those early one-tube detectors; the spark signals were modulated. With the introduction of vacuum tube continuous-wave (CW) transmitters, spark reception became increasingly difficult for those with older receiving equipment.

So that others could hear their signals, hams first tried buzzers. They were wired into the transmitter's grid circuit, so when the key was pressed, the "buzzing sound" modulated the radio wave. This worked, but it needed improvement.

The following is quoted from a 1922

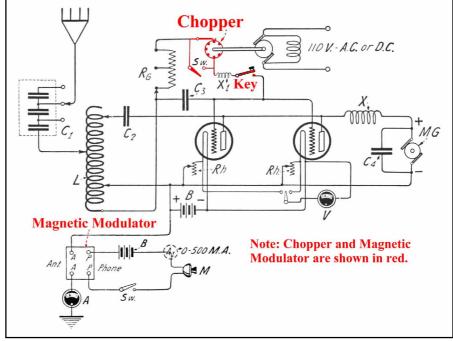
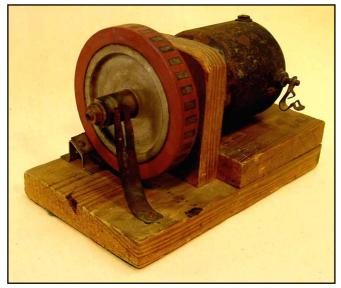


Figure 1—A schematic diagram of a two-tube transmitter from 1922 (adapted from the Robertson-Cataract Electric Company catalog).

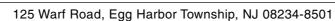


A rotary chopper assembled and owned by W5AWA in the early 1920s.

radio catalog: "Long experience in the use of audio frequency buzzers to modulate the output of a tube set to produce damped wave trains has proven that this method is not entirely satisfactory, principally for the reasons that the operation of the buzzer is not constant, necessitating frequent adjustment, and that great care is required in adjusting the circuit to obtain 100 percent modulation.

"The Rotary Chopper, PX-1638, has been developed primarily to overcome the above objections. When used to secure interrupted continuous wave, or

John Dilks, K2TQN





ICW telegraphy, the motor-driven interrupter, or rotary grid chopper, has the following inherent advantages over the other methods:

- "(a) Gives positive interruption, requiring no adjustments. The note obtained can be varied to any desired pitch by changing the driving motor speed, typically at 600 cycles.
- "(b) This system of securing damped wave trains does not require modulating tubes, the interrupter being used in series with the transmitting key.
- "(c) The system inherently gives 100 percent modulation, since oscillations can be completely started and stopped at audio frequencies.
- "(d) The output obtained from a given number of oscillators is in general greater than if some of the tubes are used as modulators.

"The interrupter wheel is built with 34 conducting and 34 insulating segments, making 34 interruptions per revolution. The insulating segments are molded in a single piece."

The cost for the wheel and electrical contactors, without a motor, was \$7.25 in 1922 dollars. To see how it was connected, see Figure 1.

#### The Magnetic Modulator

This device is essentially a transformer wired in series with the ground leg of the antenna circuit.

From the 1922 radio catalog: "One of the most important inventions brought forth in the field of amateur radio telephony during the past year is the Magnetic Modulator. This development has resulted from RCA's experiments with the Alexanderson Magnetic Amplifier, a device that is used at all its high-power transoceanic stations to control the output of 200-kW radio frequency alternators. The same fundamental principle has been adopted here....

"[The modulator] utilizes the properties of iron at radio frequencies to control or modulate the output of an oscillating vacuum tube.... It simply acts as a variable resistance connected in series with the antenna circuit."

Three models were manufactured: UT-1643, for  $^{1}/_{2}$  to  $1^{1}/_{2}$  A antenna current, \$9.50; UT-1357, for  $1^{1}/_{2}$  to  $3^{1}/_{2}$  A, \$12.00; UT-1367, for  $3^{1}/_{2}$  to 5 A, \$17.00 in 1922 dollars. The one shown here is the UT-1643 model.

#### Conclusion

The time spent studying will pay off when you spot a goodie sitting on or under a hamfester's table. You'll recognize it immediately and be able to beat out the other collectors.



A magnetic modulator, circa 1922.



K2TQN's early transmitter parts. From the left: a filament transformer; an oscillation transformer (coil); a 50-W filament rheostat; a 5-W 202 tube and socket; a 50-W 203 tube and socket; a blocking condenser; a rotary chopper, an old tube transmitter panel with various meters; an early microphone; and a magnetic modulator.

Don't expect to complete your search for parts overnight. Patience pays in radio collecting. It may take you several years, depending on where in the country you're located, and how many hamfests you get to. Also, read the classifieds in *QST* and in the specialized collector magazines. I hate to say it, but eBay (www.ebay.com) may be a place to find those elusive parts, at higher costs, though.

An alternative: you can build this or a similar transmitter with all *newer* parts. This will give you great satisfaction and

an opportunity to learn about older circuits.

A note of caution: Not all old circuits are legal to run on the air under today's communications laws. Please be careful. Make sure you check your transmitter for spectral purity before attempting to put it on the air.

Additional information and a parts list are available on my Web site: www.eht. com/oldradio/arrl/index.html. Good hunting, and look for my call letters on my hat at the hamfests and say "hello."

—K2TON

### DIGITAL DIMENSION

## Softradio's Progress

Back in November 1996, the topic of this column was "softradios." That is, radios that use DSP under software control to execute some of the functions formerly performed using analog techniques including tuning, filtering, phase shifting, frequency conversion and demodulation. Following up, in July 1997, I wrote that a first cut at softradio software was ready for downloading

In September through November 1999, Bob Larkin, W7PUA, described in QST how to build a softradio, which he dubbed the DSP-10. W7PUA's softradio is a 2-meter SSB, FM and CW transceiver that can be used on the 2-meter band or as a VHF IF for UHF and microwave operation.

The DSP-10 has a minimal amount of RF hardware contained on a single PC board. The hardware translates the signal frequency up and down using the DSP of an Analog Devices EX-KIT Lite DSP demonstration board. A DSP program processes the IF and audio portions of the radio signals, while software running on a PC controls the DSP and presents a front-panel user interface.

#### **TAPR to Kit Softradio Hardware**

To simplify matters, in March 2001, Tucson Amateur Packet Radio (TAPR, www.tapr.org) announced that it would soon have DSP-10 kits available that include the radio PC board and all of its components. An enclosure may or may not be provided. You provide or obtain the Analog Devices DSP demonstration board, a PC to run the DSP-10 software and maybe an enclosure with its requisite hardware. TAPR did not announce a kit price or exact date of availability, but they did say that they expected to take two to three months to gather all the parts for the kits and the assembly of those parts into kits, which puts availability in the late spring or early summer.

In the meantime, you can get the rest of the parts you need like the Analog Devices EX-KIT Lite DSP demonstration kit (www.analog.com) and a computer for running the DSP-10 software. The DSP demonstration kit costs approximately \$90, while the software is free and may be downloaded from the DSP-10 Project Web page (see Figure 1).



Figure 1-It may only be software, but it is an operational multimode 2-meter software radio. Learn more about W7PUA's softradio at his DSP10 Project Web page (www.proaxis.com/ ~boblark/dsp10.htm).

#### Very-Weak-Signal QSOs

As if the reality of softradios wasn't enough, the amazing things that are being done with softradios and their associated software are icing on the cake. The DSP-10 is doing very-weak-signal work, that is, receiving signals so weak that they are not audible to the human ear, but are O5 with the DSP software.

Get this! In February, Ernie, W7LHL, and Larry, W7SZ, completed a successful QSO on 1296-MHz EME (moonbounce) using a QRP power level of 5 W and backyard 10- and 12-foot diameter TVRO dishes. To accomplish this feat, they used the DSP-10 software's PUA43 mode, which uses 43-tone FSK with adaptable "very-long-term integration." Dish antennas are not even necessary as W7PUA received his own 2-meter EME echoes using 5 W and a 4×12-element Yagi antenna array.

You might think that you need a fast PC to run the DSP software, but that is not true. The software works with any DOS PC, a serial port and VGA graphics. No math coprocessor is required, but if your PC has one, it noticeably speeds some operations.

By the way, to support the DSP-10 project, there is an e-mail reflector on QTH.NET, which covers all aspects of the softradio. The reflector provides a way for all those interested in the project to share questions, answers and experiences quickly and informally.

To subscribe to the DSP-10 project reflector, send e-mail to majordomo

@qth.net. Leave the subject field blank, but include only the words "subscribe dsp-10" in the message. In the future, TAPR plans a Web page relating to their DSP-10 kit, stay tuned for updates.

#### **HAAT Calculations Simplified**

As I mentioned last time, I write a weekly column called "Surfin" for the ARRL Members' Web page. In March, I ran an item in Surfin' that I want to repeat here.

The FCC has a Web page (www.fcc .gov/mmb/asd/bickel/haat.html) that takes the drudgery out of calculating your station antenna's height above average terrain (HAAT). You no longer need to pour over topographical maps covering a 10-mile radius around your antenna to find 40 equally spaced elevation points along each of the eight required compass directions and compute the HAAT. To get your HAAT from this FCC Web page, you need only your antenna's height above sea level (ASL) and its location (latitude and longitude in degrees, minutes and seconds). By the way, height (ASL and HAAT) is input and output in meters, so you will need to perform a conversion if you prefer feet. Check out www. psinvention.com/zoetic/convert.htm for conversion assistance.

### **STRAYS**

#### **FOUR DAYS IN MAY**

♦ QRP ARCI is proud to announce Four Days in May (FDIM) for 2001, scheduled for May 17, 18, 19 and 20, 2001, during the Dayton Hamvention. For a detailed explanation of this year's event and a view of the several past FDIM events, please visit the QRP ARCI Web site at www.qrparci.org/ and click on the FDIM-Dayton link. Last year, nearly 400 QRP enthusiasts participated in the FDIM 2000. FDIM 2001 will have traditional design and building contests for homebrew and kits. As usual, these two categories are wide open so bring your latest kit, homebrew project, antennas, whatever!

Previous • Next Strays

### **OP-ED**

### Kids and the Dark Side of the Force

By Bob Bruninga, WB4APR 115 Old Farm Ct Glen Burnie, MD 21060-7425 wb4apr@arrl.net

Now that my kids are showing an interest in ham radio and have joined our local Amateur Radio kids club, I have some new perspectives on our avocation. I remember how my first CW QSOs as a Novice were devoid of real human contact. I was "talking" to my key and "listening" to the beeps. I was lucky to comprehend half of what the other guy was sending. Once I got his QSL address, TNX, QSL, BCNU or 73 was usually my response.

But my realization today is that probably no matter what he sent, he could not intimidate, belittle or offend me. The difficulty of the medium (from a new CW operator's point of view) acted as a kind of psychological insulator to help overcome apprehension and shyness. We were both having fun just struggling with Morse. If I screwed up, the other Novice probably missed it anyway. I never knew if the other guy was man or woman, kid or adult, or even if he or she spoke fluent English. There was a friendly sense of community among the beginners.

On the other hand, stick a voice rig and a microphone in front of any kid and he or she usually freezes. Why? The insulating veil has been stripped away, exposing every vulnerability and inadequacy in plain English for the world to hear. There is no community of equals. The kids know perfectly well who and what is on the other end of the circuit—a bunch of intimidating grownups.

Our own local 2-meter FM commuter net includes some of the most friendly and welcoming folks you'll find anywhere. Even so, it is still populated by adults and can seem intimidating to kids.

For example, recently I was reprimanded on the air for using my 3-letter suffix to join the morning roundtable since it was not my complete call sign. Apparently, unbeknownst to me, this topic is a hot potato in some amateur circles (DX operations in particular). In the pregnant pause that followed, my kids wanted to know, "...what was up with that? Daddy, were you doing something wrong?" There was a definite chill in the air!

A few days later the subject of kids

and Amateur Radio came up on the net. One ham lamented that his daughter had gone from Novice to Amateur Extra in 6 months, yet within the first week of being on the air she was subjected to a hostile rant from some old barnacle. She hasn't touched the radio since. Another parent said the same thing had happened to his child. After months of preparation and support, the newly minted amateur took to the airwaves and immediately ran into a bitter Old Timer who launched into a tirade about how kids didn't have to learn the code like he did and, as a result, did not deserve to be hams. Strike two. Another licensed amateur never heard on the air again.

And just months ago, as three of us dads were carrying our kids to school during the commuters net, we tried a few times to hand the mikes to our children in the hope of getting them to talk to each other. It worked! We were excited. After doing this for a few mornings, we thought we were on to something. The other adults in the net were more than happy to give up a minute or so to let them say "Hi" or "Bye." Inevitably, a curmudgeon appeared on the repeater and declared that kids should not be using radios until they got their licenses. The curmudgeon went on to quote rules and procedures, but by then the children were no longer listening. They retreated into their backseats and haven't shown much of an interest in our 2-meter commuter nets since. Strike three for us.

In general, hams are a great bunch of folks. The mean-spirited minds among us are but a tiny minority. Despite this fact, when the Darth Vaders appear out of the woodwork to intimidate children, they do far more damage than their small numbers would suggest.

One thing I have learned is that it is probably not a good idea to encourage my kids to get on the voice bands. There is just too much potential for insult, insinuation and bigoted behavior. For some voice experience, I'm probably going to put my son and some of his neighborhood friends on CB or FRS with just enough antenna to hear each other so they can talk about kid stuff and not be attacked. With years of gentle nurturing of my children's Amateur Radio interests, the investment is just too high and the risk too great to expose them to the "full body language" of voice at their young age.

The point is that new, young amateurs

need a "place" of their own, separate from the adult world. It is a place where they can feel comfortable communicating with others, a place with that "insulating" character I enjoyed with CW as a Novice. One solution we came up with was a kid's net on Thursday evenings. Encouraging CW operation may be part of the answer. On the other hand, I'm willing to bet that digital modes such as PSK31 have the best potential. Imagine local PSK31 roundtables on 80 meters, for example. Internet savvy kids would recognize them right away as wireless "chat rooms."

To ensure the future of Amateur Radio, we need to encourage those who will eventually replace us. As part of that process, it is crucial that we shelter them from exposure to the "dark side of the Force."

#### **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 twothirds of a *QST* page in length (approximately 900 words).
- 2) No payment will be made to contributors.
- 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.
- 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

### **RADIOS TO GO**

### Mobile/Portable News...

Okay, I confess, I'm a hands-on ham. Finding a way to accomplish that "impossible" mobile installation, tweaking antennas, solving noise/interference problems, putting together a new QRP rig—those are things upon which I thrive. Sometimes my soldering iron sees more action than my microphone and CW key. I know many of you share my do-it-yourself spirit. But, this time around, I'm leaving the drill and soldering iron in the toolbox as we take a peek at current events in the world of mobile/portable ham radio.

#### **Fatal Distractions?**

Unless Captain Kirk and the crew of the Enterprise have been holding you captive in a far-away galaxy, you can't help but have heard all the racket about the dangers of cell phone usage while driving. Although some might dismiss those concerns as a knee-jerk reaction to an insignificant, over-hyped bogeyman, statistical evidence suggests otherwise. The National Highway Safety Administration reported that of approximately 37,000 fatal auto crashes in 1999, 10% were related to driver inattention. And, those figures don't address the thousands of other nonfatal, injury and noninjury accidents that occur annually. Hardly insignificant if you or a loved one become a part of those statistics! In fact, it's an issue that Ford Motor Company considers so serious they are investing \$10 million in the construction of a driving simulator laboratory, named VIRTTEX, for Virtual Test Track Experiment. In this lab, they plan to study how various different electronic devices installed in autos affect the concentration and accident avoidance skills of the driver.

Even as the cell phone steadily becomes a ubiquitous automotive fixture, Web access, GPS-based navigation aids, satellite radio and a plethora of other distracting devices —dubbed Telematics are all arriving at a showroom near you. Hot on the heels of those gadgets is a tide of proposed state and local legislation aimed at restricting or prohibiting their use. In a recent QST "DC Currents" column, there was a sampling of legislative bills from various states. Twenty-six of those bills dealt in some manner with the use of mobile communications devices while driving. Most were worded specifically toward cellular phones, and while six made exemptions for amateur or Citizen's

#### Info Box

auto.mit.edu/consortium/

Site of the MIT/Industry Consortium on Advanced Automotive Electrical/Electronic Components and Systems.

www.nhtsa.org/

National Highway Transportation Safety Administration home page.

www.aaafts.org/Text/research/cell/cell0toc.htm

View this synopsis of an excellent study on a variety of driving distractions.

Band radios, *twelve did not*. Some cities have already passed ordinances banning the use of cell phones while driving.

What does all this mean to mobile hams? Certainly, we don't want to see any restrictions placed on our ability to operate our radios anywhere, any way and anytime we wish. And, being the mostly self-policed group that we are, surely we know when to turn off the radio. Right? But, does possession of an Amateur Radio operator license prove that we are more capable of driving while manipulating a radio device than the average cell-phone user? Or, are we often guilty of paying more attention to our radio than our driving? Many of us have heard something like this: "Boy, traffic is heavy on the Five today. I'm just coming up on the...Hey! You moron! Where'd you learn how to...(add appropriate sound effects and expletives)."

What do you think? Have you ever had an accident or near-collision that involved the use of your radio? To what degree, if any, do you limit your mobile radio operation? Replies welcome.

#### **HV For Your SUV?**

Is there a 36-V mobile rig in your future? Possibly. A group of automakers and suppliers, in an association known as the MIT Consortium on Advanced Automotive Electrical/Electronic Systems and Compo*nents*, is working to develop the standards that will allow a transition to 42-V automotive electrical systems. (That's a nominal operating voltage based on the use of a 36-V battery.) Why the increase? Consider this: A typical automobile presents a peak electrical system load of about 2 kW. Given the figurative and literal electrification taking place in our modern chariots of fire, that's probably not surprising. What is surprising is that peak load levels are estimated to be in the neighborhood of 12 kW in only five years! The change to higher voltage electrical systems is a natural and rational progression. Tripling system voltage reduces current levels by one third; more if the higher voltage devices are more efficient. This enables automakers to employ lighterweight wiring, as well as integrated starter/alternator assemblies, all things that will translate directly into reduced production and fuel costs. Presently, it's proposed that initial systems be comprised of dual 14/42-V systems. This could be implemented either with separate batteries or a suitable dc-dc converter supplying the necessary 14-V from the high voltage system. The added complexity, cost and weight of dual battery/dual voltage systems suggest it's more likely we'll see a single 42-V system with converters supplying the necessary reduced voltages.

Should you rush to sell your 12-V mobile rig before it's obsolete? Not at all. There will be a backward compatibility to accommodate low-voltage devices for quite some time. Even more encouraging, the availability of higher supply voltages will enable radio manufacturers to produce higher powered, more efficient transmitters and amplifiers. Busting pileups with a "full gallon" mobile amplifier that requires only 50A could be just around the corner. Stay tuned!

#### Dayton

It's hard to believe, but the snow and ice are gone, the grass is growing too fast, and once again, it's time for the granddaddy of all hamfests, the Big Kahuna, the Dayton Hamvention, May 18-20. If you've made the trek to Ohio for this legendary hamfest, you know it's nearly beyond description. If you haven't, you don't know what you've missed! How about a goatmobile ATV station cruising the flea market, for starters? I plan to be there, on the prowl with camera in hand, looking for those unique portable and mobile stations and antennas. Between my rounds, I'll be hanging out at flea market space #3844. 05T~ Stop by and say, "howdy."

## AT THE FOUNDATION

## The Power of A Bequest

Have you ever wondered how to make an impact long after you're gone? Have you considered how many long-standing programs of importance to hams manage to remain financially healthy? Let's take a look at the phenomenon known as a *bequest*.

Over the decades, amateurs have shown a commitment to the continuation of the hobby by making contributions of time and money to their favorite ham causes. Both commodities are essential. Much that we enjoy as hams depends on voluntary acts of generosity—our government's, by giving us frequencies to use; our club's, by educating and offering public service opportunities; our League's, through the efforts of several thousand Field Volunteers; and your everyday acts of good operating, helpful mentoring, and gifts of funds to support programs.

As the hobby continues to evolve, new needs are identified. Hams quickly marshal the effort to meet most any new challenge. Thankfully, a fair number of hams turn their gaze to the future and wonder how they might shape the hobby in years ahead. Some remember reading about bequests and wonder how such a thing might work for insuring a bright future for ham radio. Webster's definition of a bequest is enlightening: be-quest \bikwest\ 1. a legacy; 2. something given or transmitted by will.

We all know how popular transmitting is. Receiving is pretty important, too! It would seem that bequests are just another way that hams communicate for the benefit of future hams—specifically, by a financial gift given after their death. Since bequests involve language contained in a will or similar testamentary document, most people seek legal consultation when considering making a bequest.

Most bequests specify a use that funds are to be put to, after the bequest gift passes to the beneficiary. Hams typically spell out precise uses that they favor, including, but not limited to:

- 1. sponsoring a scholarship
- 2. funding an Amateur Radio educational project
- 3. funding legal or frequency preservation initiatives
- 4. support of efforts to aid disabled
- 5. support of Amateur Radio space, science and experimental innovations

Because the transfer of funds is deferred until after a ham's passing, many hams give considerable thought to the best uses a bequeathed gift could be put to during the time when will preparation is underway. If you are considering making a bequest to support Amateur Radio, please visit our Simple Will Web site at: www.arrl.org/arrlf/simpwill.html.

Your generous gift will insure a future where hamming not only exists, but thrives!

#### **Contributor's Corner**

We wish to thank the following for their generous

CADXA Scholarship Fund (Proposed) Central Arizona DX Association (Arizona)
Fred S. Jones, N7QV, in fond memory of Frank Shottke, W2UE

Martin J. Green, K2TEO, Memorial Scholarship Fund Martin J. Green, Jr, K2PLF

Mississippi Scholarship Fund Jackson County ARC (Mississippi) and the West Jackson County ARC (Mississippi) in fond memory of Charles "Kim" Kimmerly, N5XGI

Victor C. Clark Youth Incentive Program Fund Alexander F. Hastie, W1PJL, in fond memory of Leonard W. Geier, NM1C

The General Fund

Andrew Young, KE3GY, and Laura Young in loving memory of Charles Nuzum, WG7P Mohawk ARC (Massachusetts) in fond memory of

Harley L. Smith, KB1FCC Raymond A. Duda, Kenneth and Deborah Booth,

Suzanne R. Oxford and T. L. Batts in fond memory of Wade Homer Apple, W4AIT Ruby S. Felt Ren Roderick, WA7QFR

Tom and Gordon Ichikawa, W7GUN and N6IN
Richard Shuman, W8QGG, in fond memory of
Robert Treue, Jr, K8OUN
Gerald E. Trimble, Jr, KG8HZ
James H. Scott, W9KV, in fond memory of Edwin R.
Rethbus, W37W, and Robert Flore, No IXV

Rathbun, W3ZW, and Robert Flagg, N0JYL Joan C. Patience in loving memory of Edwin N Patience, KA2GHO R.M. Sawyer, N4BV, in loving memory of Henry A.

DeWitt, W4RSW

As received and acknowledged during the months of January and February. 0<del>5T</del>~

Mary E. Lau, N1VH



Secretary, ARRL Foundation Inc

### **NEW PRODUCTS**

#### **BUCKMASTER HAMCALL CD-ROM**

♦ The most recent version of the Buckmaster HamCall CD-ROM contains over 1.6 million US and International call sign listings.

The data provided for each listing includes the call sign; the name; the license class and issue/expiration dates; the previous call and class; the birth date (if available); the country; the continent; the CQ and ITU zones; the time zone; the area code and the grid square. The country's flag and a simple map are also displayed.

Latitude and longitude information is given for over 90% of the listings, and the program will automatically calculate short and long path bearings and distances. For those listings that do not include the latitude and longitude, approximate values will be computed.

Many of the listings include e-mail

addresses, QSL managers and Web site URLs. This latest version features "live links" for initiating e-mail or for visiting Web sites.

The database can be searched by call sign, class, name, street address, city, state, postal code, county or country. Mailing labels can be generated directly from the program.

If desired, all of the information contained on the CD-ROM can be downloaded directly to your hard drive. This allows more rapid access to the data and frees the CD-ROM drive for other applications.

Several of the popular logging programs can access information directly from the database. Visit the Buckmaster Web site for a list of supported products.

The HamCall CD-ROM now comes with a password that allows access to Buckmaster's HamCall Internet Search Service free of charge for 6 months. This Search Service allows you to query the online database not just by call sign, but also by name, address, license class and more.

A Subscription Service that provides discount pricing on from two to six updated discs per year, and full use of to the online database, is also available.

Minimum computer system requirements are an IBM or compatible PC, DOS 3.1, a CD-ROM drive and 640k of RAM. Photo display requires a VGA adapter, but SVGA is highly recommended. Supported operating systems are DOS or Windows 3.1/ 95/98/Me/NT/2000.

The Buckmaster HamCall CD-ROM is priced at \$50. Shipping is additional. For more information visit your favorite Amateur Radio products dealer or contact Buckmaster Publishing, 6196 Jefferson Hwy, Mineral, VA 23117; tel 800-282-5628; fax 540-894-9141; info@buck.com; www. buck.com/haminfo.html. Also available from ARRL. Call 1-888-277-5289 or order on-line at www.arrl.org/catalog/.

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Q<del>ST</del>∠

### CONTEST CORRAL

#### **Feedback**

In the 2000 10 GHz and Up Cumulative Contest, the call sign of NOUK was reported as NOUX.

In the 2000 September VHF QSO Party, the call sign of KC0FXY was reported as WC0FXY in the N0UK multioperator entry from Minnesota.

In the 2000 IARU HF World Championships, the stations competing as the Headquarters station for the OEVSV in Austria did not submit their scores as a single HQ entry. The OEVSV entry OE1XHQ, combined with OE2S and OE6Z, should read 4,128,921 points on 5015 QSOs and 279 multipliers.

W1AW Qualifying Runs are 7 PM EDT, Wednesday, May 2, and 9 AM EDT, Thursday, May 17. The K6YR West Coast Qualifying Run will be at 9 PM PDT on Wednesday, May 10. Check the W1AW schedule for details.

#### May 5-6

MARAC County Hunters Contest, CW, sponsored by MARAC, 0000Z May 5 to 2400Z May 6. 80 40 20 15 10 meters, Exchange RST, county and state or Canadian province or country. Score fixed stations 1 point, mobiles/portables 15 points, DX 5 points. No net contacts. Final score is total QSO points times total US counties worked. Awards. Send logs by June 8 to Norm Beavers W3DYA, 3320 McMillan Dr, Tyler, TX 75701-8239; w3dya@inno.com.

ARI International DX Contest, sponsored by the Associazione Radioamtori Italiani, from 2000Z May 5 until 2000Z May 6. 160 80 40 20 15 10 meters (no RTTY on 160 meters). Single op CW/ phone/RTTY/mixed mode; multi-single (mixed mode only). Once on a band or mode, you must remain there for 10 minutes. Everybody works everybody. Send RS(T) and serial number; 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 entities (except I and ISO) 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; www.kkn.net/~i2uiy/.

Danish SSTV Contest, sponsored by the Danish SSTV Group, from 0000Z May 5 to 2400Z May 6. 80 40 20 15 10 6 2 meters. Score 2 pts for the first QSO with a DXCC entity, 1 pt for each additional contact, and 1 bonus pt for QSOs with Danish stations. Work stations once per band. Send logs postmarked by Jun 5 to Carl Emkjer, Soborghus Park 8, DK 2860, Soborg, Denmark; carle@post5.tele.dk; home5.inet.tele.dk/carle/.

Indiana QSO Party, sponsored by Land O' Lakes ARC, 1400Z May 5 to 2300Z May 6. 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. Work stations once per band and mode; work mobiles in each county. 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 OSOs. CW: 1.810 3.539 3.739 7.035 7.115 14.035 21.120 28.040 28.120. Phone: 1.860 3.890 7.280 14.285 21.385 28.585 50.14 144.215 432.120. Awards. Send logs by Jun 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 5 until 2000Z May 6, 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; QRP (<5W); multi-single, multi-multi and CT clubs. Send RS(T) and state/province/DXCC entity; 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. CW: 40 kHz up; Novice/Tech, 25 kHz up. Phone: 1.860 3.915 7.280 14.280 21.380 28.380; VHF: 50.150 144.200 146.58. Awards. Send logs by Jun 6 to CARA, POB 3441, Danbury CT 06813-3441; www.danbury.org/cara/

Massachusetts QSO Party, sponsored by the Framingham ARA, from 1800Z May 5 until 0400Z May 6 and 1100-2100Z May 6. 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 entity/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. CW: 1.810 3.550 7.050 14.050 21.050 28.050; phone: 1.850 3.890 7.290 14.270 21.390 28.390 144.220; VHF: FM—146.550, SSB— 432.150, FM 446.000; Novice/Tech-3.705 7.130 21.130 28.130. Awards. Send logs by Jun 6 to FARA, PO Box 3005, Framingham, MA 01701; sr@ultranet.com; MAQSOParty.fara.org/.

Ten-Ten International Net Spring CW QSO Party, sponsored by Ten-Ten International, from 0000Z May 5 until 2400Z May 5. CW only, 10 meters only. Single op, club or QRP categories. Send call, name, state/country and 10-10 number (if member). Score 1 pt/QSO w/nonmembers, 2 pts/QSO w/US members and 3pts/QSO with DX members. Final score is total QSO pts. Send logs by May 17 to Gateway Chapter, c/o Con Ward W0RTV, 4514 Ferrer Dr, St. Louis, MO 63129-3741.

VHF/UHF Spring Sprint, 902 MHz/1296 MHz/2304 MHz. May 5, see Apr *QST* page 109.

#### 12-13

CQ-M International DX Contest, sponsored by Krenkel Central RC of Russia, 2100Z May 12 to 2100Z May 13. CW, Phone, SSTV, 160 80 40 20 15 10 meters plus satellites. Categories: Single opsingle 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 per 10 minutes. Work stations once per band, regardless of mode. Exchange RST and serial number. 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 Jul 1 to CQ-M Contest Committee, Krenkel Central Radio Club of Russia, Box 88, Moscow, 123459, Russia; cqm@mail.ru; www.mai.ru/ ~crc/cq-m/cqmain e.htm.

Fists CW Club Spring Sprint, sponsored by Fists International CW Club, 1700-2100Z May 12. CW only, work stations once per band. 80 40 20 15 10 meters. Exchange name, state/province/DXCC entity and Fists number if member, or power output if nonmember. 5 pts/QSO with Fists member, 2 pts/QSO with nonmembers. Final score equals QSO points times states, provinces (once for each) or DXCC entities (each time worked). QRP and QRO categories. Send paper logs only within 30

days to Alan Tanner, 3787 Trebein Rd, Fairborn, OH 45342; www.fists.org/.

Nevada QSO Party, sponsored by the Frontier ARS, 0000Z May 12 until 0600Z May 13. 160 80 40 20 15 10 6 meters, SSB/CW/RTTY. Work stations once per band/mode. Send RS(T) and state/province/DXCC entity; NV stations send county. CW: 15 kHz up in General; SSB: 25 kHz up; Novice/Tech: 25 kHz up. 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 entities). Awards. Send logs by Jun 15 to Jim Frye, NW70, 4120 Oakhill Ave, Las Vegas, NV 89121-6319; nw70@anv.net.

Oregon QSO Party, sponsored by the Central Oregon DX Club, 1400Z May 12 to 0200Z May 13. Oregon stations work everyone. Others work Oregon stations only. Work stations once per band/mode, mobiles again as they cross county lines. CW: 1.810 3.540 7.035 7.125 14.035 21.035 21.125 28.035 28.125; phone: 1.855 3.905 7.280 14.280 21.380 28.580; VHF: 50.125 145.025 146.55. No repeater QSOs. 1 pt/SSB QSO; 2 pts/CW QSO. OR stations multiply QSO pts by OR counties/states/provinces/DXCC entities; 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. May 12-13, see Apr *QST* page 109.

#### 26-28

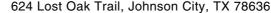
**CQ WW WPX Contest, CW**. May 26-27 see March *QST* page 114.

ARCI QRP Hoot Owl Sprint, CW, sponsored by QRP ARC International, from 2000 until 2400 local time May 27. 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 entity and QRP ARCI number if member (nonmembers send power output). 1.830 3.560 3.710 7.040 7.110 14.060 21.060 21.110 28.060 28.110. 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 entities worked per band and by power multiplier (>5 W  $\times$  1; <5W  $\times$  7; <1W  $\times$  10; <250mW  $\times$  15). Certificates. Mail entries by June 28 to QRP ARCI Contest Manager, Randy B. Foltz, 809 Leith St, Moscow, ID 83843; rfoltz@turbonet.com; personal.palouse.net/ rfoltz/arci/arcitst.htm

Memorial Day CW Sprint, sponsored by the Michigan QRP Club, 2300Z May 28 until 0300Z May 29. 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 number). Work stations once per band. Score 5 pts/QSO w/MI-QRP members, 4 pts/QSO w/nonmembers 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 homebrew receiver or transmitter. Awards. Send logs to L.T. Switzer, N8CQA, 427 Jeffrey Ave, Royal Oak, MI 48073-2521; n8cqa@tir.com; www.tir.com/~k8dd/rules97.htm.



George Fremin III, K5TR



# SPECIAL EVENTS

Arlington Heights, IL: Peace Corps ARC, KA9NLX, 1600-2200Z May 1, celebrating the Peace Corps' 40 years of making a difference. 7.283 4.325 21.375 28.550. Certificate. John Paskevicz, 1423 North Ridge Ave, Arlington Hts, IL 60004.

West Mifflin, PA: Belle Vernon High School ARC, KB3BKW, 1400-2000Z May 4, for Amusement Park Physics/Communications Day at Kennywood Park. 14.280 21.280 28.480. Certificate. Belle Vernon HSARC, c/o T. Thompson, 425 Crest Ave, Belle Vernon, PA 15012.

Beavercreek, OH: Upper Valley Amateur Radio Club, KI8CJ, 1200Z May 4 to 1800Z May 5, for the 7th annual Adopt-A-Ham Program with the 3rd graders of Parkwood Elementary. 14.250 Elementary School, 1791 Wilene Dr, Beavercreek, OH 45430.

Louisville, KY: Amateur Radio Transmitting Society, W4CN, 1100-1700Z May 5, for the 127th Kentucky Derby. 14.090 21.350 28.450. Certificate. Shelby Summerville, K4WW, 6506 Lantana Court, Louisville, KY 40229.

Caldwell, NJ: West Essex ARC (WEARC), W2EF, 1400-2200Z May 5, operating from Grover Cleveland's birthplace. 28.350 21.330 14.250 7.250. Certificate. WEARC, PO Box 54, Essex Fells, NJ 07021.

**Dresden, TN:** Amateur Radio Operators of Weakley County, N4I, 1500-2300Z **May 5**, celebrating the Tennessee Iris Festival. 7.240 14.250 28.450 29.450. Certificate. Alan McClain, PO Box 672, Dresden, TN 38225-0672.

**Greenville, NC:** Brightleaf Amateur Radio Club, W1VOA and W4AMC, 1500-2200Z **May 5**, celebrating the international festival honoring the diversity of Greenville, a home of the Voice of America. 7.240 14.240. QSL. Murray Merner, K4MHM, 1212 South Wright Rd, Greenville, NC 27858-3912.

Dodge City, KS: Boothill Amateur Radio Club, W0PMW, 1100Z May 5 to 0600Z May 6, to raise awareness of International Missing Children's Day (May 25, 2001). 7.260 3.945. Certificate. John Kohler, KC0ALR, 1203 Hennessy St, Apt 116, Dodge City, KS 67801.

Aquinah, MA: Fall River Amateur Radio Club, W1ACT, 1800-1900Z May 6, operating from Gay Head Lighthouse, NA046. 14.260 21.260 28.460 50.130. QSL. Fall River ARC, 19 Davis Rd, Westport, MA 02790.

**Delaware Water Gap, PA:** Eastern Pennsylvania Amateur Radio Association, N3IS, 1200-1700Z **May 6**, during the annual MS Walk for 2001 in Monroe County. 14.285. QSL. Eastern

Pennsylvania Amateur Radio Association, PO Box 51, Delaware Water Gap, PA 18327.

Camden, NJ: The Battleship *New Jersey* Amateur Radio Station, NJ2BB, 1500-2000Z May 6, commemorating Memorial Day and the commissioning of the battleship *New Jersey*. General-class bands. Certificate. Joe Cramer, PO Box 43, Lanoka Harbor, NJ 08734.

Brownsville, TX: CHARRO ARC, W5CRC, 1500-2300 May 12, commemorating the last battle of the Civil War fought outside Brownsville. 14.250 21.325 28.325. Certificate. CHARRO ARC, 2414 Central Blvd, Brownsville, TX 78521.

Hammondsport, NY: Keuka Lake ARA, KV2W, 1400-2100Z May 12, commemorating the birthday of aviation pioneer Glenn Curtis from the grounds of the Glenn Curtis Aviation Museum. 3.900 7.250 14.250 28.400. Certificate. Send an SASE to Roy Koehler, KB2WXV, PO Box 451, Avoca, NY 14809.

Jamestown, NC: Tri-County ARC, NC4AR, 1400-1900Z May 12, for Field Day practice and a memorial to the club's Silent Keys. 14.278 7.268. Certificate. NC4AR, PO Box 747, Trinity, NC 27370.

Monroeville, AL: Monroe ARC, KT4WE, 1600-2300Z May 12, honoring local author Harper Lee's play, *To Kill a Mockingbird*. 28.450 14.250 50.135. Certificate. Howard McKinley, 810 N. Mt. Pleasant Ave, Monroeville, AL 36460.

New Orleans, LA: Jefferson Amateur Radio Club, W5GAD, 1700-2200Z May 12, celebrating ham radio forging ahead with Big Easy steam train. 14.260 28.420. QSL. Jefferson Amateur Radio Club, W5GAD, PO box 73665, Metairie, LA 70033.

Newport News, VA: Peninsula Amateur Radio Club, W4MT, 1000Z May 12 to 1700Z May 13, operating at the Airpower Over Hampton Roads Air Show at Langley Air Force Base. 14.260 145.23. Peninsula Amateur Radio Club, 494 Pamela Dr, Newport News, VA 23601-1723.

Fairfield, CT: Fairfield ARA, WB1CQO, 1400Z May 12 to 2000Z May 13, during the 66th annual Dogwood Festival. 7.266 14.266 21.366 28.366. Certificate. FARA, PO Box 486, Southport, CT 06490

**Fairmont, WV:** Mountaineer Amateur Radio Association, W8SP, 0000Z **May 12** to 2400Z **May 13**, celebrating the first official observance of Mother's Day in Grafton, West Virginia. 3.850 7.225 14.225 14.100. Certificate. Charles T. McClain, RR 4, Box 161, Grafton, WV 26354.

**Dayton, OH:** Dayton Hamvention, W8BI, 1400Z **May 14** to 2300Z **May 20**, celebrating the 50th Dayton Hamvention. 7.270 14.270 21.370 28.670.

Certificate. DARA, W8BI, PO Box 44, Dayton, OH 45401.

Ontario, CA: N7LFK, 1600Z May 16 to 0700Z May 26, during the "Run For The Wall (POW-MIA)" 13th pilgrimage across the US. 14.265 21.365 28.465 146.52. Certificate. Mike Paxton, N7LFK, PO Box 2625, Gearhart, OR 97138.

Arlington, TX: Arlington Amateur Radio Club, K5SLD, 1400-2400Z May 19, for the 45th anniversary of the Arlington ARC. 28.350 14.250 7.245 3.920. QSL. Ed McGinley, W5ETM, PO Box 14407, Arlington, TX 76094.

**Sylva, NC:** Jackson County ARES, NC4ES, 1500-1900Z **May 19**, in recognition of Shriner's Hospitals of North America. 7.240. Certificate. Alvin Frady, K4AHF, 49 Allman Rd, Sylva, NC 28779.

Wheaton, IL: Dupage ARC, W9DUP, 1600-2300Z May 19, 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.

**Downey, CA:** Downey Amateur Radio Club, W6TOI, 1500Z May 19 to 0100Z May 21, celebrating the 50th anniversary of W6TOI. 7.260 14.260 21.350 28.350. Certificate. Tom Van Buskirk, 8230 Comolette Ave, Downey, CA 90242.

Chestertown, MD: Kent Amateur Radio Society, K3ARS, 1400-2100Z May 26, during the reenactment of the 1774 Chestertown Tea Party. 7.040 7.240 14.240 28.340. Certificate. Paul Gerhardt, K3PG, 313 Chesterfield Ave, Centreville, MD 21617.

Hampton, VA: Peninsula Electronic Amateur Radio Society, W4W, 1600Z May 26 to 1600Z May 27, commemorating Memorial Day. 7.240 14.240 28.400. Certificate. Peninsula Electronic Amateur Radio Society, PO Box 7385, Hampton, VA 23666.

Baton Rouge, LA: USS Kidd Amateur Radio Club, W5KID, 1500-2300Z May 28, commemorating Memorial Day. 28.440 21.340 14.240 14.060. QSL. W5KID, 305 River Rd, Baton Rouge, LA 70802.

**Belleville, MI:** Yankee Air Force Museum, W8YAF, 1200-2000Z **May 28**, during Memorial Day at the Yankee Air Museum at Willow Run Airport. 7.270. Certificate. Frank A Nagy, N8BIB, 24315 Waltz Rd, New Boston, MI 48164-9165.

Nutley, NJ: Robert D. Grant United Labor Amateur Radio Association, N2UL, 1200-2400Z May 28, commemorating Memorial Day. 28.420 14.240 21.380. Certificate. RDGULARA, WA2VJA, 112 Prospect St, Nutley, NJ 07110-0716.

George Fremin III, K5TR

624 Lost Oak Trail, Johnson City, TX 78636



k5tr@arrl.org

# **STRAYS**

# LOOKING FOR RADIOMEN FROM THE BB62

♦ The Battleship New Jersey Amateur Radio Station is restoring the radio rooms aboard the BB62 and would like to hear from any Radiomen who were stationed on board the BB62. They would also like to hear from any amateurs who were stationed in any capacity on the ship. You can contact the group by visiting their Web site at www.qsl.net/bb62/.

#### JAPAN RADIO COMPANY NET

♦ An HF net has been established for hams who own Japan Radio Company (JRC) equipment. The

net meets every Sunday at 1730 UTC on 14,267 kHz. For more information contact Fabio, IK0IXI, at ik0ixi@arrl.net.

# OZ2001-70TH ANNIVERSARY SPECIAL EVENT

♦ In 1931 one of the very first Amateur Radio club stations in Denmark was established in Randers, located on the East coast of Jutland. Since that time, the call sign OZ7RD has been on the air during various activities.

Because November 8, 2001 is the 70th anniversary of the station, special-event call sign OZ2OOI will be active throughout the year. A special QSL is available for a self-addressed envelope and one International Reply Coupon sent to: Eksperimenterende Danske Radioamatører, OZ7RD, PO Box 351, DK-8900 Randers, Denmark.

#### **BANDS COMPUTER USER INTERFACE**

♦ Bands is an instructive, interactive radio-control software package developed by Bill Dubin, AB2FM. For the beginner it is like having a virtual Elmer. For the expert it functions as an on-line assistant that facilitates day to day operations. Bands incorporates a database that includes amateur band plans, worldwide short wave frequency listings, and an assortment of mode-specific calling frequencies. The database is fully editable and can be queried by frequencies, band, mode, or directly with Structured Query Language statements. Currently, Bands only supports the Kenwood TS-570 transceiver. However, if you send the communications protocol for your radio Bill will attempt to update Bands to work with your transceiver. For more details, and to download Bands (10 Mbytes), go to www.columbia.edu/~wd16/Bands.htm.

Previous • Next Strays

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# SILENT KEYS

# It is with deep regret that we record the passing of these amateurs.

W1AXO, George W. Wilkinson, Portsmouth, RI NM1C, Leonard W. Geier, Natick, MA \*WA1COA, James F. O Keefe, East Hartford, CT N1CSG, Richard C. Hammond, Amesbury, MA N1DRY, Gregory R. Wright, North Billerica, MA W1DVS, Robert B. Mills, Falmouth, MA KO1E, David L. Maxham, Woodstock, VT W1NJV, Ernest J. Chipman, Brewster, MA N1PDD, Thomas R. Johnston, North Granby, CT \*K1PVT, William L. DeBenedetto, Madison, CT W1PXI, William H. Mowbray, Wakefield, RI K1TMT, William S. Brown, Charleston, SC WA1UVW, James F. Haire, South Burlington, VT W2ANF, Sidney R. Teich, Hallandale, FL WB2BBX, George A. Williams, Brooklyn, NY W2BJI, Francis H. Thisse, Manlius, NY \*W2CB, Wallace A. Utley, Monroeville, NJ W2CI, Charles F. Van Atta, North Port, FL W2EAM, Donald L. Brown, Lakehurst, NJ N2EJQ, Jerome A. Shiviskis, Kearny, NJ KI2E, Hyman Davidowitz, Brooklyn, NY K2FR, Fredrick R. Gern, Webster, NY ex-WA2KWC, Frank Bolen, Highlands, NJ W2LP, John C. Grzelecki, Schenectady, NY N2MEF, Mal Ochs, Larchmont, NY WB2NPI, Harold W. Shaw, Geneva, NY K2QMS, LeRoy M. Forbes, Clifton, NJ K2TC, T. C. Heine, Monroe Township, NJ W2VYX, Everett H. Colburn, Ilion, NY KB3AHT, Harold A. Monyer, Reading, PA N3BCT, Michael Tracz, Harrisburg, PA KB3BFC, Mitchell Berman, Jim Thorpe, PA W3BJI, W. S. Johnson, Severna Park, MD N3KEH, Donald F. Vollant, Carnegie, PA KA3OGL, Donald J. Falls, Abbottstown, PA \*KB3RE, Bruce P. Rossanese, Allentown, PA W3SLA, Kenneth E. Smith, Wyomissing, PA N3VBG, Henry E. Hope, Aberdeen, MD \*W3XE, Carl E. Andersen, Silver Spring, MD KC4ATO, Pauline M. Leaver, Louisville, KY AG4B, Mitchell J. Boho, Woodbury, MN KP4BFC, Robert L. Mayer, Isla Verde, PR KB4BSO, Harold F. Arnold, Orange Park, FL W4CEW, Ollie G. Lawson, Destin, FL K4CKX, Elizabeth A. Halpine, Largo, FL WA4DXX, Robert A. Boisseau, Mathews, VA N4EWB, Clarence K. Seigler, Webster, FL K4FHG, Eli B. Bell, Chattanooga, TN KR4IH, Joseph G. Beale, Norfolk, VA W4IWD, Paul Offutt, Louisville, KY WB4JOY, George E. Alderson, Birmingham, AL

N4LIH, Barbara A. Metzger, Clearwater, FL WA4LYH, Robert F. Gordon, Fairfax, VA W4MDD, William W. Hutchison, Winston Salem, NC K4MQU, Lloyd G. Renaud, Birmingham, AL WA4MXD, C. W. Scarbrough, Owensboro, KY W4OTW, John T. Land, Charlotte, NC KD4PVQ, Joseph R. Lensbower, Seaford, VA WA4RBM, Tom F. Lourigan, Blairsville, GA W4RSW, Henry A. DeWitt, High Point, NC K4RXP, Michael Turaniczo, Largo, FL WA4TKN, Carl E. Michaels, Knoxville, TN K4TN, Fred D. Kierstead, Brandon, FL KC4TRY, Joseph W. Tallent, Knoxville, TN W4VBZ, Wallace R. Borger, Trussville, AL \*K4VGN, Robert W. Sloat, Fort Myers, FL WB4WJB, James R. Hamilton, Chattanooga, TN WA4WMA, Donald E. Vandergrift,

West Palm Beach, FL WJ4X, Andrew G. Swanson, Williamsburg, VA K4YGE, James H. Kunnecke, Calvert City, KY \*N5ADP, Thomas W. Stevens, Baton Rouge, LA KD5DFS, Kurt W. Kruz, Harlingen, TX AJ5G, Harold H. Alam, Whitney, TX KE5HP, James L. Bain, Needville, TX KC5IGI, Paul Aberle, El Prado, NM W5IGO, James D. McKenzie, Homer, LA K5IRM, Charles H. Armstrong, Dallas, TX KK5ME, Thomas Carr, Jackson, MS W5NNU, John J. D. Andriole, Fort Worth, TX \*W5NO, J. Lowell Otto, Carriere, MS W5ORP, Walter L. Andre, Alamogordo, NM W5SME, Glenn E. Crowder, San Antonio, TX KC5USI, Aubrey W. Hawkins, Balch Springs, TX K5VEU, Kenneth G. Ikels, New Braunfels, TX W5ZYA, Walter L. Jackson, Grand Prairie, TX W6BPS, Richard Garello, Yucaipa, CA KK6BX, Robert J. Kiernan, La Mirada, CA WB6EFY, Roland A. MacCubbin, San Rafael, CA K6HQE, Walter Serniuk, Cupertino, CA W6IWX, W. F. Pfeiffer, Pasadena, CA WB6LQG, James W. Wallace, Pittsburg, CA N6LTR, Raymond J. Bailey, Victorville, CA W6SAI, William I. Orr, Menlo Park, CA WB6VDX, W. D. Runge, Dinuba, CA AI6W, Fred Mealer, Fresno, CA AA7AJ, Rodney V. Moorman, Portland, OR N7CVT, G. A. Mimnaugh, Payson, AZ KD7EAZ, Keith R. Seaton, Vancouver, WA K7IRO, L. A. Whitney, Friday Harbor, WA W7JPA, Arthur F. MacArthur, Greenbank, WA KA7KKS, Raymond P. Stout, Phoenix, AZ K7LHV, Joseph M. Gates, Colville, WA KB7NNJ, Richard E. Seiler, Blaine, WA W7RBM, Russell A. Lawton, Seattle, WA

N7USB, Larry Logen, Seattle, WA W7WFP, Ty A. Kearney, Vancouver, WA W7WO, Eugene M. Hyatt, Albany, OR W7ZNZ, Bernard G. Tracy, Salt Lake City, UT K8BTA, Billy J. Carlton, Goshen, OH W8CFG, Richard H. Johnson, Westerville, OH N8CG, E. L. Goodwin, Nitro, WV WA8FLF, Edward W. Sutton, Charleston, WV \*AA8GQ, Helmut K. Seike, Toledo, OH \*WB8IFS, Thomas B. North, Charleston, WV \*W8LDQ, Jesse M. Wilson, Canton, OH \*N8LS, Leon W. Stuber, Munroe Falls, OH K8MIF, Nandor Zimmersmann, West Bloomfield, MI W8NA, Omar H. Mitchell, Charleston, WV W8NOV, Charles L. Gordon, Rocky River, OH K8WPQ, Martha Sempert, Allegan, MI N8XIX, Norman P. Owings, Springfield, OH K8ZBA, James R. Ford, Grover Beach, CA WB9FYI, Raymond G. Anderson, Rhinelander, WI W9GF, Gerald D. Fadness, Stevens Point, WI W9OGH, Donald N. Dille, Marion, IN K9OGT, John P. Klein, Kewaunee, WI WB0BSV, Morris Levinson, Pueblo, CO \*W0EUJ, Arlo W. Andersen, Viborg, SD KB0EY, William E. Oehlert, Salina, KS NOJYL, Robert C. Flagg, Durango, CO WONYJ, Floyd C. Drew, Saint Paul, MN NOOKB, Paul P. Geier, Saint Paul, MN WOSC, Allan W. Swayze, Shawnee Mission, KS K0VZR, Thomas M. White, Jesup, IA G4AGJ, Chris Price, Lancaster, Great Britain

#### \*Life Member, ARRL

‡Call sign has been re-issued through the vanity call sign program.

Note: Silent Key reports must confirm the death by one of the following means: a letter or note from a family member, a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address and call sign. Allow several months for the listing to appear in this column.

Many hams remember a Silent Key with a memorial contribution to the ARRL Foundation. If you wish to make a contribution in a friend or relative's memory, you can designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund, or the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation Inc, 225 Main St, Newington, CT 06111.

Kathy Capodicasa, N1GZO



Silent Key Administrator

# **NEW PRODUCTS**

# ARRAY SOLUTIONS ACQUIRES MARKETING RIGHTS TO RF APPLICATIONS PRODUCT LINES

♦ RF Applications and Array Solutions have announced that Array Solutions has acquired the exclusive marketing rights to the RF Applications VFD, P-3000 and P-5000 wattmeters, and the IBS-1 Intelligent Band Switch.

RF Applications will continue to manufacture and support these products from its facilities in Mentor, Ohio.

RF Applications Inc President Bruce R. Knox, W8GN, stated, "We are excited that Array Solutions has elected to add our products to their product line. We feel that our

products need better exposure to the marketplace, and Array Solutions' market presence is a perfect answer to that need."

Array Solutions Inc President Jay Terleski, WX0B added, "These products complement the high performance solutions offered by Array Solutions. Their addition to our offerings help us round out our 'between the amplifier and antenna' product line. RF Applications' power measuring devices will be an important part of our vertical array phasing products that we are introducing this year."

RF Applications has also announced that it will no longer manufacture its P-2000A, P-5000A and P-2000CW wattmeters. The WinWatt, however, will still be marketed and sold exclusively through them.

For additional information on the prod-

ucts offered by these companies, contact RF Applications Inc, 7345 Production Dr, Mentor, OH 44060; tel 440-974-1961; fax 440-974-9506; sales@rfapps.com; www.rfapps.com and Array Solutions, 350 Gloria Rd. Sunnyvale, TX 75182; tel 972-203-2008; fax 972-203-8811; wx0b@arraysolutions.com; www.arraysolutions.com.

Previous New Products

# **STRAYS**

# WANTED: "RADIO ROW" REFERENCES

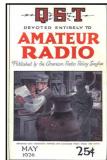
♦ I am searching for references to articles written about New York City's famous "Radio Row" on Cortlant St. Please contact Louis L. D'Antuono, WA2CBZ, 8802 Ridge Blvd, Brooklyn, NY 11209.

Previous • Next Strays

# **75, 50 AND 25 YEARS AGO**

## May 1926

♦ The cover, by Clyde Darr, 8ZZ, shows a railway stationmaster reading an A.R.R.L. radiogram just received at the ham station on the other side of the room, with the caption under-neath, "Amateurs give emergency service for railroads when wires are down." The lead editorial, "The Lust for DX," recognizes the lure of



working the new and faraway ham stations that are appearing on our bands, cautioning, "But when this craving for DX reaches the proportions of an obsession, when it blinds its possessor to the realization that there are other forms of amateur activity, it is just as bad as any other form of intemperance.

Robert Kruse tells about "Taming the Synchronous Rectifier," a rotary machine used to produce high-voltage D.C. for a transmitter's plate supply. John Clayton presents Part 2 of "Breaking into Amateur Transmission," telling this month about the power supply and how to tune the transmitter. In "Simplifying Operating," the proper use of the semiautomatic key—the "bug"—is discussed in detail. The article ends with the admonition to practice off the air until you can send perfect code for a half hour before you venture onto the air waves with it. "Picking a Good Antenna for the Short-Wave Station," by C. H. Starr, discusses the antenna requirements for the higher frequencies.
"PRR," by A. L. Budlong, tells about the ham

radio organization that was put together to serve one railroad, and how its training regime was set up. "Progress of the Wilkins Expedition" reports on the activities of Mason and Waskey in supporting the Detroit Arctic Expedition. Now that amateurs are starting to convert to crystal control, Stanley McMinn helps them understand "Adjusting the Crystal-Controlled Transmitter." The "Amateur Radio Stations" column this month tells about 2CXL-2XBB, the superb Amateur Radio station at the Army's Signal School, in Fort Monmouth, New Jersey. The "Traffic Topics" column features a photo of Mae Burke, W3CUL, the iron lady of brasspounding, and tells of her traffic-handling prowess.

# May 1951

♦ The cover photo shows National Emergency Coordinator (and CW traffic man extraordinaire) George Hart, W1NJM, trying out the Civil Defense portable 6-meter phone transceiver that's described in this issue. The editorial discusses the new Disaster Communications Service and the segments of the ham bands that are earmarked for Civil Defense communications.



George Grammer, W1DF, tells the readers about "D.S.R.C. Telephony" (double-sideband, reducedcarrier) that can be used for higher efficiency in phone transmission. Gene Handsaker, W6QCK, in "Horizontal Hamming," tells how he rigged up a bedside ham station to help him pass the time during a flu attack. Don Mix, W1TS, presents Part I of "The Novice One-Tuber," a 6AG7 crystal oscillator coupled via a pi-section output to the antenna, with 11 watts input. This rig is of interest to the prospective hams who want to go for the new Novice license, which will be issued beginning July 1.

Dick Baldwin, W1IKE, tells about "Awards," and how the readers can qualify for the various operating awards in ham radio. In the cover article, Ed Tilton, W1HDQ, describes "A Civil Defense Portable" for 6-meter AM phone, powered by internal dry-cell batteries. Richard Brayley, W1PRZ, describes "A Coaxial-Tank Amplifier for 220 and 420 Mc.", a high-efficiency amplifier using a single 4X150A tube.

# May 1976

◊ The Tuna-Tin 2 Transmitter (and an interested feline) are featured in the cover photo. The editorial presents a "WARC Update," telling what work has been done by the ARRL on behalf of Amateur Radio, and what challenges lie ahead.

Wayne Overbeck, K6YNB, tells about his



"Boondoggle in the Boondocks," in which he hauled gigantic VHF antenna arrays into the desert for EME attempts, and the results—some good, some not so good. Doug DeMaw tells how to "Build a Tuna-Tin 2" teeny transmitter, with a half watt output on 40 meters. It looks like a classic! David Madison, K3ACN, tells about his design for "A PROM for the Accu-Keyer." Byron Self, WB6UFW, describes "The 40-Meter Triangle," a triangular loop antenna. John Troster, W6ISQ, has us laughing out loud once again, this time about "Home for Sweepstakes...?"

Jim Cain, WA1STN, tallies the "Results, 42nd ARRL November Sweepstakes." In the "Public Service" column, the announcement is made that the FCC has finally deregulated RACES. In "The World Above 50 MHz," Bill Tynan, W3KMV, urges us who work new hams on FM, to encourage them to try other modes, with the hope of sparking their interest in the many facets of VHF and UHF operating. Q5<del>T</del>-

# Contributing Editor

# 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. 110baud 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.

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.

# Al Brogdon, W1AB

#### AW Schedule **PACIFIC** MTN CENT **EAST** MON TUE WED THU FRI 6 AM 7 AM 8 AM 9 AM **FAST** SLOW FAST SLOW CODE CODE CODE CODE 7 AM-8 AM-9 AM-10 AM-VISITING OPERATOR TIME 1 PM 2 PM 3 PM 4 PM (12 PM - 1 PM CLOSED FOR LUNCH) 1 PM 2 PM 3 PM 4 PM SLOW FAST SLOW **FAST** CODE CODE CODE CODE CODE 2 PM 3 PM 4 PM 5 PM CODE BULLETIN 4 PM 5 PM 3 PM 6 PM TELEPRINTER BULLETIN 5 PM 6 PM SLOW FAST SLOW SLOW 4 PM 7 PM **FAST** CODE CODE CODE CODE CODE 5 PM 6 PM 7 PM 8 PM CODE BULLETIN 6 PM 7 PM 9 PM TELEPRINTER BULLETIN 645 PM 7<sup>45</sup> PM 8<sup>45</sup> PM 9<sup>45</sup> PM **VOICE BULLETIN** 10 PM FAST SLOW 7 PM 8 PM 9 PM FAST SLOW FAST CODE CODE CODE CODE 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.

# 2000 ARRL International EME Competition Results

ot long ago the American Film Institute rated my favorite movie Casablanca as the number two American film of all-time (trailing only Citizen Kane). You probably remember Claude Rains, playing Capitaine Louis Renault. When ordering his gendarmes into action after Major Stoesser had been shot, Renault utters one of the more memorable lines from the cinema: "Round up the usual suspects."

It is quite easy to make the connection between *Casablanca* and the 2000 ARRL International EME Competition. When you review the results of the contest, you will find almost all of the "usual suspects" present and accounted for.

The Single-Operator Multiband category is an excellent example of the usual suspects. Gerald, K5GW, and Ernst, OE5EYM, again finished one-two in the standings. In fact, if 1999 third place finisher Mark, N2IQU (now known as N2IQ), had entered as multiband instead of as single band entry, the top five finishers in the category would have been the same. Instead, OZ4MM, SM3AKW and G3LTF finish in the three-four-five

slots in this difficult entry class.

The battle in the Single-Operator 144-MHz category again saw a good contest between perennial standouts Torbjorn, SM5FRH and Dave, W5UN. After finishing first-second in 1999, these two outstanding EME contesters flipped positions, with Dave finishing ahead of Torbjorn in a good race. VE3KH moved from fourth in 1999 to third this year while and I3DLI improved from sixth to fifth. The newcomer to the category and box was RU1AA, who finished in the fourth position.



Single-Operator 432-MHz winner Jan, DL9KR, takes a moment from the contest to smile for the camera.

Jan, DL9KR, was a repeat winner in the Single-Operator 432-MHz category. Moving from multiband to 432 MHz only allowed Mark, N2IQ, to place a strong second, bumping 1999 category runner-up Steve, K1FO, down one notch to third place. KA0Y placed a strong fourth while N9AB repeated last year's fifth place finish.

Rounding out the Single-Operator category was another repeat winner as Jay, K5JL, took top honors in Single-Operator 1296 MHz, followed by Dave, K2DH, who jumped from a sixth place finish in 1999 to second. G4CCH, K0YW and F5PAU round out the category's top five finishers

In the Multioperator categories, old faces also dot the landscape, though a few changed categories for the year 2000. A strong effort and a move to the multiband category allowed HB9Q to take top honors, after finishing fourth in the Multioperator 144 MHz category in 1999. Last year's category winner JL1ZCG slipped into second place. The ops at S53J finished in third place.

In the 144 MHz Multioperator class, 1999's top three finishers all emerged at



The multiband multioperator crew at Tommy, WD5AGO's, received plenty of activity both on the air and from a visit to the shack by the gifted and talented students in his daughter Emily's class from Cooper Elementary School in Tulsa, Oklahoma.



That's Bob, K0YW, perched on top of the tower tripod making adjustments to his 30-foot dish before the contest.

the top of the pack, though with a slightly shuffled order of finish. F3VS moves from third to first this year, while 1999 champion KB8RQ drops one position to second. IK2MAC finishes third after being last year's runner-up. 1999 Multi-operator 432 MHz champion OH2PO and crew repeat as champions in the category, while the talented crew at OH2AXH take top honors in the 1296 MHz Multi-operator category. Several other stations should receive special mention for the contest efforts. The OK1KIR multi-operator station again completed a QSO at 5760 MHz while ZS6AXT reported 10 QSOs completed at 2304 MHz as a single operator.

All told, 121 stations participated and sent in reports to the ARRL in both the 1999 and 2000 contests—about 65% of the entries received this year. This underscores what is one of the basic premises of the annual ARRL EME Competition: it takes time, talent and a great deal of effort to consistently perform well in this event, which is considered by many to be one of the most difficult challenges in the



Jean Pierre, F1ANH, standing beside his 2.6 meter dish for 1296 MHz.

entire hobby. The "usual suspects" have achieved their status because of the countless hours of hard work, experimentation, successes and failures that they have

WB8FMJ

poured into the hobby. Why do they do it? It is just like a DXer who has stayed up until 4 in the morning trying to bust a pileup to work an all-time new country. It is like a contester who is running on pure adrenaline in the final hours as the press to set a new personal record for a contest. EME contesters devote their energy and talents to this special area of the hobby because, bottom line, they *love* it.

The 2001 ARRL EME Competition is scheduled for the weekends of October 13-14 and November 10-11. Since it takes specialized planning and preparation, now is the time to start working on your station. Who knows? In a few years, with some dedication, you may be joining the ranks of the "usual suspects." Whether you complete one EME QSO in the contest or take top honors, one thing is certain: At the end of the contest, you will be able to look at your EME compatriots and say (just like Ric Blaine, Bogart's character in Casablanca, did to Capitaine Louis Renault), "Louis, I think this is the beginning of a beautiful friendship."

JL1ZCG ((JZ1DYV, JR4ENY, JP1NWZ, ops)

#### **Scores**

Single Operator, Multiband

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, H = 5760 MHz, I = 10 GHz).

	Operator, i				DL5MAE	523,600	119	44	В		ps)
K5GW	2,940,000	160	45	В	LZ2US N5BLZ	508,500	113 110	45 45	B B	7J7ADB (KG6DX, op) 882,000 75 34 100 1 1 B 65 29	B
		71	29	D		495,000				0501/05754_050771	D
		63	26	E	IK1FJI OZ1HNE	442,900 426,400	103 104	43 41	B B	Single Operator, 432 MHz S53J (S57EA, S56TZJ, ops) 159,000 47 24	В
OE5EYN	A 2,036,700	99	37	В	SM5BSZ	384,000	96	41	В	DL9KR 448,400 118 38 D 159,000 47 24 6 6	D
		70	29	D	W0HP	352,000	96 88	40	В	N2IQ 429,400 113 38 D WD5AGO (+W5HL, N6CL, W6CL)	D
074144	4 440 000	50	27	E	GM4JJJ	327,600	84	39	В	K1FO 388,800 108 36 D WD5AGO (+W5FIE, N6CE, W6CE)	В
OZ4MM	1,443,000	99	35	D	7K3LGC	302,600	89	34	В	KA0Y 323,000 95 34 D 116,800 14 11	Ë
		72	30	E F	IK2DDR	252,000	72	35	В	N9AB 316,200 93 34 D SM31KW (1SM3ELN)	_
CMOMIC	N 700 100	14 9	13 7	В	WB9UWA	220,400	76	29	В	G3SEK 246,400 77 32 D SM2ERW (+5M2ELW)	В
SM3AK\	V 702,100			D	K1CA	173,400	51	34	В	DL4MEA 210,000 70 30 D	Ď
		51 56	24 25	E	PA2CHR	148,500	55	27	В	K0RZ 182,000 65 28 D	D
		3	25 3	F	JH5FOQ	126,900	47	27	B	DJ6MB 168,000 60 28 D <b>Multioperator, 144 MHz</b>	
G3LTF	604,800	3	2	В	S52LM	116,100	43	27	В	K5AZU 150,000 60 25 D F3VS (+F8PKC)	
GSLIF	604,600	46	22	Ď	I2RV	105,000	42	25	В	G4ERG 125,000 50 25 D 1,390,800 244 57	В
		55	28	Ē	9A9B	105,000	42	25	В	JA6AHB 98,900 43 23 D KB8RQ (+N8CUT)	
		4	4	F	PE1LCH	98,900	43	23	В	JH4JLV 96,800 44 22 D 1,148,000 205 56	В
DK3WG	588,600	65	30	В	YO2AMU	93,600	36	26	В	ON5OF 83,600 38 22 D IK3MAC (+I3YXQ)	
DROWG	300,000	44	24	Ď	EA6VQ	86,400	36	24	В	DJ3FI 78,000 39 20 D 1,067,000 194 55	В
F2TU	500,500	22	18	Ď	UA4AAV	84,000	40	21	В	K8UC 72,200 38 19 D I2FAK (+IK2LZT)	
1210	300,300	61	29	Ē	N0AKC	80,000	40	20	В	JR9NWC 63,000 35 18 D 855,000 171 50	В
		8	8	F	WOPT	78,000	39	20	В	K5WXN 57,600 32 18 D F1FLA (+F6BSJ)	
VE9DW	464,100	39	24	D	EA2AGZ	73,500	35	21	В	JJ1NNJ 48,000 30 16 D 351,000 90 39	NB
	,	52	27	Ē	IW5CNS	62,700	33	19	В	UT3LL 30,800 22 14 D LZ1DP (+LZ1ZX)	_
HA1YA	379,200	17	16	B	PA3CWI	60,800	32	19	В	KE2N 30,000 20 15 D 241,800 78 31	В
	,	62	32	D	I1ANP	58,000	29	20	В	YO2IS 28,000 20 14 D 4U1ITU (PA2CHR, PE1OGF, ops)	_
DF3RU	356,700	71	30	Ď	K0FF	52,200	29	18	В	JA2TY 27,300 21 13 D 119,600 46 26	В
		16	11	E	W3SZ	47,500	25	19	В	S52CW 25,200 18 14 D 3A/IZ1BPN (+IK1MTZ) KL7HFQ 23,400 18 13 D 51,000 30 17	_
EA3DXL	J 348,300	50	27	В	K7YVZ	47,500	25	19	В		В
		31	16	D	SV1BTR	46,800	26	18	В		В.
CT1DM	( 292,400	26	17	В	AC3A	45,000	25	18	В	DK3FB 11,700 13 9 D 36,000 24 15 DL5LF 7,000 10 7 D F6KCP (F1EBN, F6ACA, F5RZA, F6EZV,	ь
		15	12	D	SM7WSJ	44,800	28	16	В		
		27	14	E	PE10GF	44,200	26	17	В	JH1EFA 1,600 4 4 D F1EWS, ops) YO2DM 900 3 3 D 26,600 19 14	В
JA5NNS	204,000	25	15	В	HA2RG	43,200	24	18	В	MACHINE MACHINE	ь
		35	19	D	DM2BHG	42,500	25	17	В	311gle Operator, 1230 Miliz	В
W7SZ	192,500	30	18	D	UA4API	40,000	25	16	В	K5JL 343,000 98 35 E EEGK (,E1EHY E1DDI.)	ь
		25	17	E	S51UE I3EVK	40,000 38,400	25 24	16 16	B B	K2DH 280,500 85 33 E 3500 7 5	В
JA4BLC	192,200	21	11	В	SP7DCS	37,800	27	14	В	G4CCH 268,800 84 32 E K0GH/±logger) 2 500 5 5	В
		10	6	D	JA9BOH	17,000	17	10	В	K0YW 226,300 /3 31 E	
		27 4	10 4	E F	K6PF	16,500	15	11	В	F5PAU 195,200 61 32 E Multioperator, 432 MHz	
PA3DZL	181,300	26	20	В	JR3REX	15,000	15	10	В		_
FASDZL	101,300	5	5	Ď	SM5CFS	15,000	15	10	В	DF4PV 173,600 62 28 E 421,800 114 37	D
		18	12	Ē	KJ9I	12,100	11	11	В	K4QI 170,800 61 28 E DL7APV (+DJ9BV, DL4EBY)	_
VE6TA	173,400	25	16	Ď	W0EKZ	8,800	- 11	8	В	OZ6OL 164,700 61 27 E 175,500 65 27	D
VLOTA	173,400	26	18	Ē	W7FG	6,400	8	8	В	DL6LAU 110,400 46 24 E LA9NEA (+LA8KV, LA0BY) K3AX 109,200 42 26 E 101,200 44 23	_
WA1JO	147.000	34	20	B	W5UWB	6,400	8	8	В		D
WATOO	147,000	15	10	B	N2WK	6,000	10	6	В	DK0ZAB (DL4DTU, op) F5FLN (+F8BBZ, F5OZF) 100,700 53 19 E 65.100 31 21	D
S51ZO	137,600	30	20	В	K6AAW	5,600	8	7	В	F1ANH 92,000 40 23 E K4EME (+KR4V)	D
	,	13	12	D	YO2II	5,600	8	7	В	EA3UM 78,000 39 20 E 47,600 28 17	D
W5LUA	109,200	28	17	E	F8DO	5,000	10	5	В	W2UHI 76,000 40 19 E F5KDK (+F5IVP, F5SDD, F4CJV, F1IKA)	U
	,	9	9	F	SM5TSP	4,800	8	6	В	JH5LUZ 74,100 39 19 E 10,000 10 10	D
		2	2	- 1	N3FA	4,800	8	6	В	KORCT 54,000 27 20 E	D
W4AD	104,400	21	17	В	I8TWK	4,200	7	6	В	JA6CZD 52,800 33 16 E Multioperator, 1296 MHz	
		15	12	Е	JH0MHE	3,600	6	6	В	JF3HUC 45,500 35 13 E OH2AXH (+OH2BDQ, OH2BNH, OH2BSH	1)
WB0GG	M 56,700	11	9	В	K6CYS	3,000	6	5	В	JA8IAD 39,200 28 14 E 187,600 67 28	É
		16	12	D	SL4BP	3,000	6	5	В	WA4OFS 30,800 22 14 E DJ5MN (+DK5MV)	
JH0WJF	33,300	19	5	В	K7XQ	2,800	7	4	В	W7QX 29,400 21 14 E 176,400 63 28	Е
		18	4	D	N0KQY	2,500	5	5	В	JH3EAO 14,400 16 9 E WA9OUU (+WB8IFM, W8ULC, KA8ABR)	
NQ2O	4,200	6	5	В	N6ZE	2,000	5	4	В	72,000 36 20	E
		1	1	D	YO3DMU	1,600	4	4	В	Single Operator, 2304 MHz  HA5SHF (+HA5BMU, HA5BGL)	
Single	Operator, 1	144 MH-			EA1BFZ	1,200	4	3	В	ZS6AXT 10,000 10 10 F 16,500 15 11	E
				В	SM1MUT	900	3	3	В	Multioperator, Multiband F1OAT (+F5BQP, F6ABJ, F1HDI)	
W5UN SM5FRI	1,629,800 1 1,340,900	281 253	58 53	B B	K0EME(K0		3	3	B B	HB9Q (HB9CRQ, HB9DBM, HB9QQ, ops)	Е
VE3KH	710.400	253 148	48	В	PA3BUŤ	900 400	2	3	В	2,727,000 126 46 B <b>Multioperator, 5760 MHz</b>	
RU1AA	686.200	146	47	В	K5AM EA5FZ	400	2	2	В	80 30 D OK1KIR (0K1DAI, OK1DAK, ops)	
ISDLI	681,600	142	48	В	SMONKZ	400	2	2	В	64 25 E 100 1 1	Н
G3ZIG	580,500	135	43	В	SM7TJC	400	2	2	В		
	,				JF4TGO/8		2	2	В	<u> </u>	ī.

# Field Day 2001 Rules

- 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 2001 will be held June 23-24, 2001.
- 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 Field Day 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/non-club portable: Club groups (or a non-club 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, or use any structure installed permanently for Field Day use. Stations must operate under one call sign (except if a dedicated Novice/Technician HF 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 whom 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 (with HF privileges) operating position without changing its basic entry category. This station must be operated under a call sign issued to a Novice/Technician Plus operator and may only make contacts within the Novice/Technician HF subbands. It must abide by Novice/Technician power and mode restrictions. This station may only be operated by Novice/Technician 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/

- Technician (HF)" 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 non-club 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: Non-club 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 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/Technician (HF) 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 from which he participated for QSO credit using a different call sign.
- 6.2. A station used to contact one or more Field Day stations may not subsequently be used under any other call sign to participate in Field Day. Family stations are exempt provided the subsequent call sign 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.

- All voice contacts are equivalent.
- 6.5. All non-CW digital contacts are equivalent.
- 6.6. Cross-band contacts are not permitted.
- 6.7. The use of more than one transmitter at the same time on a single band-mode is prohibited. Exception: a dedicated Novice/Technician (HF) station may operate in any Novice/Technician (HF) subband.
  - 6.8. No repeater contacts are allowed.
- 6.9. 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/Technician (HF) 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. Public Location: 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. **Public Information Table**: 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. Submission of a visitor's log, copies of club handouts or photos are sufficient evidence for claiming this bonus.

7.3.5. Message Origination to Section Manager: 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 Handling: 10 points for each formal NTS style originated, relayed or received and delivered during the Field Day period, up to a maximum of 100 points (ten messages). 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. Alternate Power: 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 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. **W1AW Bulletin**: 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

# W1AW Field Day Bulletin Schedule

New for 2001—PSK31 Sunday bulletins!

Day	Mode	Pacific	Mountain	Central	Eastern
Friday	CW	5:00 PM	6:00 PM	7:00 PM	8:00 PM
•	RTTY	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
	RTTY	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
	PSK31	9:00 AM	10:00 AM	11:00 AM	12:00 Noon

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 out from Headquarters and will not be posted to Internet BBS sites.)

7.3.10. Non-Traditional Mode Demonstrations: A maximum of 300 bonus points (100 points for each demonstration up to three) 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.

7.3.10.1. A portable packet system may be included as one of the demonstration modes. This system must include a temporary, portable node separate from the existing packet infrastructure of your area.

7.3.11. Site Visitation. A 100-point bonus may be claimed if your Field Day site is visited by an elected government official or representative of an agency served by ARES in your local community (Red Cross, Salvation Army, local Emergency Management, law enforcement, etc) as the result of an invitation issued by your group.

#### 8. Reporting:

8.1. Entries must be postmarked or emailed by **July 24, 2001**. 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 re-

quired for submission. The club should maintain log files for one year in case they are requested by ARRL HQ.

# 8.2.1. Cabrillo format log files are not required for Field Day entries.

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 JPG/GIF image files of 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 2000 issue of *QST*) for additional rules.

9.3. Remember that the national simplex FM calling frequency of 146.52 MHz may not 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 4 units of postage to: Field Day Information Package, ARRL, 255 Main St, Newington, CT 06111;

9.4.2. By downloading from the Contest Branch home page at: www.arrl.org/contests/forms.

9.5. For additional Field Day information or questions contact: n1nd@arrl.org or telephone 860-594-0232.

# 2001 Field Day Pins and T-Shirts

ARRL is pleased to again make available the very popular **ARRL Field Day Pins**, with this year's official design. No minimum number of contacts to make. No score threshold to meet. Simply participate! These attractive pins feature the official ARRL Flag. Pins offered in previous years have completely sold out, so order early (**\$5 each**, postage paid).

Available for the first time in 2001 will be **ARRL Field Day T-Shirts**. The shirts also feature the official 2001 Field Day logo, and are a great way to get into the Field Day spirit. These high quality cotton t-shirts are available in sizes M-XXL (only **\$9.95** each plus shipping and handling. Single orders include \$4 for shipping and handling).

Clubs and groups: *Save* on shipping when you collect money from your members, and submit a single order for shirts with the quantity needed (US customers pay only \$10 shipping for orders over \$75). Order on-line at <a href="www.arrl.org/FieldDay">www.arrl.org/FieldDay</a> or phone the ARRL Publication Sales Department, toll-free, at 888-277-5289. You may also mail your order to: ARRL Publication Sales Dept, 225 Main St, Newington, CT 06111-1494.



# 2001 ARRL June VHF QSO Party

- 1. **Object**: To work as many amateur stations in as many different  $2^{\circ} \times 1^{\circ}$  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 9-11, 2000).
  - 3. Entry Categories:
    - 3.1. Single Operator.
      - 3.1.1. Low Power
    - 3.1.2. High Power
- 3.2 Single Operator Portable (See "General Rules for ARRL Contests above 50 MHz" page 96 in November 2000 *QST* for changes in this category.)
  - 3.3. Rover.
  - 3.4. Multioperator.
  - 3.5. Limited Multioperator.
- 4. Exchange: Grid-square locator (you can determine your grid square on line at www.arrl.org/locate/gridinfo.html).
- 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 902or 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  $2^{\circ} \times 1^{\circ}$  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. Handwritten paper logs or diskettes should be mailed to June VHF, ARRL, 225 Main St, Newington, CT 06111.
- 6.2. Entries that have been electronically generated must submit their log file in the Cabrillo file format. Paper printouts of electronic files are not acceptable substitutes.
- 6.3. Entries must be e-mailed or post-marked no later than July 11, 2001. 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  $(6, 2, 1^{1}/_{4}, \text{ etc})$  at any given time is permitted, regardless of mode.
- 7.3. Multioperator 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 Internet at the Contest Branch Web site: www.arrl.org/contests/forms.
- 7.4.2. Sending an SASE to June VHF Form Request, ARRL, 225 Main St, Newington, CT 06111.
- 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 Multioperator 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 Multioperator scorers.
- 8.6.5. Top 5 Limited Multioperator scorers.

#### 9. Other:

9.1. See "General Rules for All ARRL

Contests" page 94 and "General Rules for ARRL Contests on bands above 50 MHz (VHF)" page 96 in November 2000 *QST*.

9.2. For more information, queries or questions e-mail n1nd@arrl.org or call 860-594-0232.

# **STRAYS**

# WRIGHT BROTHERS CENTENNIAL SPECIAL EVENT E-MAIL REFLECTOR

♦ An e-mail reflector has been established to coordinate the activities of all Special Event stations that will be on the air to commemorate the 100th anniversary of the Wright brothers' first powered flight (December 17, 2003). This reflector to be used for correspondence only, no advertisements or "off topic" postings are permitted. To subscribe: Send an e-mail to: wrightbros@phx-az.com. Type subscribe on the "subject" line and leave the rest of the message blank.

If you have any questions, contact Doug Pelley, WB7TUJ, at wb7tuj@dapcom.com.

# **MEMORIES OF W9CIA**

♦ I am gathering QSL cards that belonged to my late father, Bill Fligel, W9CIA. If you have any W9CIA QSLs in your possession, please contact Ron Fligel at airronripsit@g2a.net.

# THE 50TH ANNIVERSARY OF THE VRZA

♦ This year the VRZA (Dutch Amateur Radio Society) celebrates its 50th anniversary. For this occasion a special award will be issued. To qualify for this award, you must contact at least four of the following special-event stations that who will be on the air throughout 2001: PI50VRZ/A, PI50CQP/A, PI50V, PI50R, PI50Z and PI50A.

The stations will be active on all bands and all modes. Send a log of the four stations you have worked, signed by two other amateurs and accompanied by \$5, to: Ben Horsthuis, PA0HOR, Fr Halsstraat 95, 3781 Ev Voorthuizen, Netherlands.

#### LOST PACIFIC CONTACTS

♦ During the '60s, when phone patches to and from the Pacific were popular, I worked quite a few stations among the various islands and nations. Unfortunately, I never sent QSL cards to the phone stations because I was more interested in my mixed DXCC at the time. Times have changed and I would like to bring those long-lost phone contacts into my DXCC total. I would appreciate a name and address for any of the following stations from that time period: KR6DI, KR6QF or KR6FB. I know that Okinawa has been deleted from the DXCC list, but the phone credit is important for my overall totals. Please e-mail Wayland, K4WS, at k4ws@arrl.net.

**Previous Strays** 

# **SECTION NEWS**

# The ARRL Field Organization Forum

DELAWARE: SM, Randall Carlson, WB0JJX—With the coming of nice weather, we once again are starting our rounds of the public service events, such as March of Dime walks, triathlons, crop walks. All three counties have a very active triatrions, crop walks. All three counters have a very active schedule of public service events scattered through out the year. The events are a really good way to put Amateur Radio in the public eye, and doing some good for the community as well. They are also excellent training tools for when the real emergencies come. Delaware has dodged several big bullets during the last couple of years in terms of weather emergencies. It's only a matter of time before we get hit again. The training that we obtained through these public service events will pay big dividends for when we are called upon to assist in a major emergency. Traffic (Feb) DTN QNI 160 QTC 11 in 20 sess. DEPN QNI 36 QTC 0 in 4 sess. SEN QNI 25 QTC 4 in 4 sess. K3JL 21, N3HMQ 5.

EASTERN PENNSYLVANIA: SM, Eric D. Olena, WB3FPL SEC: Michael O. Miguelez, N3IRN. ACC: Steve Maslin, N3ORH. OOC: Alan Maslin, N3EA. STM: Paul Craig, N3YSI. SGL: Allen Breiner, W3ZRQ. TC: Lawrence Thomas, AA3PX. SGL: Allen Breiner, W3ZRQ. TC: Lawrence Thomas, AA3PX. ASMs: Robert Josuweit, WA3PZO, Dave Heller, K3TX, George Law, N3KYZ, James E. Bear, WB3FQY, Harry Thomas, W3KOD. Apologies to J. Patrick Campbell, WA3UOE, David Payne, N3LOM, and Michael Warner, N3XPD. These three were just officially appointed as Official Emergency Stations in Lancaster County. The problem was they were supposed to have been appointed some time ago. Somewhere along the paper chain the appointments got overlooked. At least now the problem has been rectified. Their willingness to help is greatly appreciated by EC, WB3FQY as well as the rest of the E. Pa. Staff. Of particular note is the net sponsored by the South Mountain Repeater Association. The Capital Area Traffic Net York Counties. "The Illuminator" newsletter of the Carbon Amateur Radio Club reported in their March '01 issue that they have finished installing radio equipment at the Carbon County EOC. However, they are still looking for someone to be EC/RO. After listening to a few concerns expressed by some staff members and because I have always been involved in emergency communications I enrolled in and completed the ARRL Amateur Radio Emergency Communications Course. Although not without a few flaws, I found the course to be very good. The certificate and "not quite wallet size" ID card are well done Appreciation to the mentors for the course, especially Lee KE6EAQ who had to put up with my shenanigans. Lee, didn't say anything but after further research I discovered that a secretary is not included on the list to be taken along to an operretary is not included on the list to be taken along to an oper-ating location. Although radios are the main focus of our fabu-lous hobby as each day goes by we are all finding out how intertwined and necessary computers have become. Thank you to the Mid-Atlantic ARC and the Reading Radio Club for their on-line newsletters. After a long winter, I am looking forward to the warmer weather activities of Hamfests etc with a lot of eagerness. Having retired this past October, I was sure that the winter weather would be a good test. It was. I'm fine. Now the activities are starting, don't miss them. I am anxious to meet as many of you as possible. Tfc: N3YSI 394, W3IPX 268, meet as many of you as possible. Tfc: N3YSI 394, W3IPX 268, N3EFW 210, W3HK 196, W3NNL 91, K2BCL 78, N3SW 78, K3TX 63, W3TWV 50, W3JKX 49, W3UAQ 48, K83BBR 19, KA3LVP 17, KA3LVP 17, AD3X 15, KB3CEZ 14, NBJSO 12, K3ARR 8, KB3CKD 7, KB3CVO 6, N3AS 6, N3AO 5, W3TI 4, N3IRN 2, W3BNR 1, W3ROQ 1, N3ZXE 1. Net Reports: EPA 220, EPAETN 191, PTTN 75, FPN 25, D3ARES 21, LCARES 18, SEPPTN 7, MARCTN 4, and MCOES 4.

MARYLAND/DC: SM, Bill Howard, WB3V, 410-551-6775, MARYLAND/DC: SM, Bill Howard, WB3V, 410-551-6775, wb3v@arrl.org— MDC Section Web homepage http://users.erols.com/wb3v/mdc. AA EC N3QXW reports 40 members, 3 sessions of the AA ARES Net which meets on 147.805 with liaison to NCAC, MEPN, and BTN. N3QXW met with the AA Emergency Planning in Annapolis, MD. OES reports: N3QXW NU3D W3VVN. In conjunction with the January RACES COMEX, HC conducted an HF net on 3920 kHz with W3VK as NCS. HWI OCS from each jurisdiction were select to check in NCS. HWLOCs from each jurisdiction were asked to check in. In addition, our ECs and ROs were asked to send a piece of traffic to W3YVQ or WA1QAA and one piece of traffic to an EC traffic to W3YVQ or WA1QAA and one piece of traffic to an EC or RO in another county in MDC through their HF liaison stations. The following stations, representing the counties indicated participated: AA - N3ZOC; BC - N3WKE, N3ZNU; BA - N3ZKP; CA - KE3FL, W3VK; CE - W03F; CH - W1ZX, N3SBT; FC - NR9P; HC - W3CCI; MC - WA3YOO; NIH - K3YGG; PG - K3HU, KB3DVC, KK3F, KD3JA; SM - W5BTC; and WA - W3FZT. QTC on this net was 11. CH EC W3TOM reports 29 members, 4 sessions of the Charles County Amateur Radio Emergency Service Net which meets on 145.39 with liaison to MEPN, 1 drill, and 1 meeting. A presentation on CH Emergency Services PSAP operations (911 & Public Safety dispatch operations) by Chris Tompson, supervisor of the Charles County erations) by Chris Tompson, supervisor of the Charles County Emergency Services PSAP operations was made at the monthly ARES/RACES team meeting on 27 February. The CH ARES/ RACES Team Resources Manual was distributed to all team members during the monthly ARES/RACES team meeting. The team resource manual includes a collection of critical ARES/ RACES operation information. The manual will expand when new chapters are completed. The expansion of the manual will be a team effort. The intent is to create a living resources manual that will continue to grow as it is updated while providing a reference for team operation and training. PG EC WI3N reports 37 members, Jim reports anticipating having packet up and

operating. 73 from Bill WB3V - With the nets- Net/NM/QND/QTC/QNI: MSN/KC3Y/28/44/322, MEPN/N3WKE/28/67/532, MDD/WJ3K/54/240/624, MDD top brass: AA3SB 181, AA3GV MDI/WJ3K/54/240/624, MDI/ top brass: AA3SB 181, AA3GV 129, K3JL 117, BTN/AA3LN/28/39/408, Tfc: KK3F 3832, AA3SB 155, AA3GV 121, W3YVQ 97, N3DE 91, KJ3E 71, N3WKE 59, N3WK 46, KC3Y 43, W3CB 36, N3KGM 34, K3CSX 23, KO4A 17, W3VK 14, WA1CAA 14, N3ZKP 10, WA3GYW 6, KE3FL 0. PSHR: KK3F 208, W3YVQ 148, N3ZKP 141, W3VK 137, N3WKE 134, AA3SB 127, W3CB 122, N3WK 112, KJ3E 107, AA3GV 104, WA1QAA 101, K3CSX 97, KO4A 93, KE3FL 79. KC3Y 77

/9, KC3Y //.

MORTHERN NEW YORK: SM, Thomas A. Dick, KF2GC, http:
//www.northnet.org/nnyham & http://www.geocities.com/
nnyara, E-mail: kf2gc@arrl.org—ASMs: KD2AJ, WZ2T,
WB2KLD, N2ZMS, WA2RLW. ACC: W2ZT. BM: KA2JXI. OOC:
N2MX. PIC: N2SZK. SEC: WN2F. STM: N2ZGN. TC: N2JKG.
I was guest speaker in Feb at the OARC in Ogdensburg, NY.
I enjoyed meeting with many of the amateurs in St Lawrence
Co. St Lawrence Co next to the seaway is in a unique location
weather wise which gives us a heads up many times as what
to expect in other NNY Counties. These amateurs whose confined active particination in ABES & RACES as well as public tinued active participation in ARES & RACES as well as public service for the North Country is notable. Also, nice job TLARC on the 104th Winter Carnival's Special Event Station in Saranac Lake, NY. I really like my certificate hope you made the contact and have yours! The NNYARA - Lake Placid Hamfest Committee meeting is scheduled for 11 AM March 24th, at the Red Cross Building in Saranac Lake, NY. Chuck-KD2AJ says, Early Bird Tickets will be ready soon and distrib-uted to the NNY Clubs. A Special Event Station will be set up at the Horse Show Grounds at our Lake Placid Hamfest it will at the Horse Snow Grounds at our Lake Placid Hamlest it will be "N2Y," I have been advised. I want to especially thank Doc-W2IB and Walt-N2YMY for getting that for NNYARA. We look forward to a full summer of public service events including Ironman 2001 in Lake Placid on July 29th. Hope you can join us for the 1st Lake Placid Hamfest on October 13th, 2001 from 8 AM- 4 PM see our NNYARA Web site for more info: www.geocities.com/nnyara. 73, Thomas Dick, KF2GC.

SOUTHERN NEW JERSEY: SM, Jean Priestley, KA2YKN (@KZAA) e-mail ka2ykn@voicenet.com. ASM: WZBE K2WB WZOB N2OO N2YAJ. SEC: KC2GID. STM: K2UL. ACC. KB2ADL. SGL: W2CAM. OOC: K2PSC. TC: W2EKB. TS: WZPAU WB2MNF AA2BN KD4HZW WB3IJB WA2NBL N2ONX N2XFM. A new season of rain, lightning, tornados and hurri-canes will be with us. NOAA's WX Service program SKYWARN is an invaluable tool to warn people and save lives. SKYWARN needs all of us. It takes a few hours one night to be a weather spotter. Once trained as a spotter, it's important to use your spotter number and make the reports. Traffic Feb 2001: Net ONI NJM 114 WA2OPY; NJN (E) AG2P 187; NJN (L) 136 AG2R; NJPN 191 W2CC; NJSN 185 K2PB; JSARS 346 K2ATQ; SJTN 74 KB2RTZ; SJVN 279 WB2UVB SAR: K2UL 145, WA2CUW 128, AA2SV 75, KB2RTZ 52, K2UL-4 47, WB2UVB 35, WJ2F 19, W2AZ 9, N2VQA 9, N2WFN 6, WA2NDA 6, KA2CQX 4, KB2VYZ 4, KB2YJD 4, WZMC 4, N2ZMI KB2VSR KB2YBM KC2ETU 1 each, PSHR: K2UL 182, WB2JUW 182, KW2CJUW 108. potter number and make the reports. Traffic Feb 2001: Net WB2UVB 182, KB2RTZ 174, AA2SV 123, WA2CUW 108, KA2CQX 106, N2WFN 58, KA2YKN 51, N2VAQ 49, KB2YJD 28, N2HQL 20. Traffic handling isn't a contest but is rewarding and educational. Gains have been made in restoring some communications on the Battleship New Jersey but still a WIP.

WESTERN NEW YORK: SM, Scott Bauer, W2LC- WNY Hamfests: May 5, Owego Hamfest, Binghamton ARA, at Tioga County Marvin Park Fairgrounds; June 1,2,3 Rochester Fairgrounds; June 1,2,3 Nochestier Hamfest, ARRL Atlantic Division Convention, at Monroe County Fairgrounds, Route 15A and Calkins Rd; June 16, Cortland Hamfest, Skyline ARC, at Cortland County Fairgrounds. Welcome to new EC for Madison and Oneida counties, John, WB2UEC. Congratulations to Mark, KB2KOJ, on making PSHR. Congratulations to Pete, N2YJZ, the new ENY SM, well deserved! Thank you to Bob, WB2YQH, who has been producing the 599DX report for the past 7 years, for DXers all over the world. A hard job, done for the satisfaction of helping fellow Amateurs in search of that elusive DX. From all of us DXers in WNY, thank you Bob! Bob, WB2YQH, is a member of the WNYDXA in the Buffalo area, seek them out and stop by a meeting. A great group of guys, many of whom I have known for about 30 years now. Time sure flies by fast. Hamfest season is well underway, hope to see you there. Baseball season is underway as well. It just doesn't get any better than this! Batter up! 73 and good DX. Feb Net Summaries:

3									
Net	NM	Sess	QNI	QSP	Net	NM	Sess	QNI	QSP
BRVSN	N2OYQ	28	158	12	CHN	W2EAG	28	161	89
CNYTN	WA2PUU	J 28	278	52	EBN	WB2IJZ	20	378	0
ESS	WI2G	28	423	142	NYPHONE	N2LTC	28	263	388
NYPON	N2YJZ	28	403	103	NYS/E	WB2QIX	28	348	179
NYS/M	KA2GJV	28	188	49	NYSCN	W2MTA	4	18	1
NYSPTEN	WB3CUF	28	325	40	OARC	N2KPR	4	41	5
OCTEN/E	KA2ZNZ	28	1478	267	OCTEN/L	KA2ZNZ	28	649	234
STAR	N2NCB	28	234	26	STTHN	KC2AWA	8	41	3
TIGARDS	W2MTA	4	3	4	WDN/E	N2JRS	28	478	79
WDN/L	W2GUT	28	403	72	WDN/M	KB2VVD	28	441	67

Traffic (Feb 2001), \*indicates PSHR, #indicates BPL: N2LTC# Traffic (Feb 2001), "Indicates PSHH, #Indicates BPL: N2L 1.6#" 985, KA2ZNZ#" 567, W82LUH\* 375, KA2GJV\* 371, NN2H\* 267, W2MTA\* 246, WI2G\* 177, N2KPR\* 145, KA2DBD\* 134, KB2KOJ\* 134, WB2QIX\* 125, KG2D\* 80, W2LC\* 70, KC2EQT\* 69, KB2ETO\* 63, N2CCN\* 55, W2RH\* 54, W2GUT\* 53, KA2BCE\* 33, AF2K\* 31, KA2IWK\* 24, WA2UKX\* 24, WA2GUP\* 22. NY2V\* 21. W2PII\* 21. N2WDS\* 11. KB2WII\* 5. KG2HA\* 1. Digital: Stn Rx/Tx: KA2GJV 18/0, N2LTC 207/171 NY2V 0/0

NY2V 0/0.

WESTERN PENNSYLVANIA: SM, John Rodgers, N3MSE. ASM: N3MYZ. SEC: N3SRJ. ASM-ARES: WB3KGT. ASM-Packet: KE3ED. OOC: W3ZPI. PIC: W3CG. STM: N3WAV. TC:WR4W. DEC-SC: KD3OH. DEC-N1: N3QCR. DEC-N2: KA3UVC. DEC-S1: KA3HUK. DEC-S2: N3BZW. DEC-Rapid Response: N3HJY. DEC-OES: K3TB. It hardly seems possible but Field day is just around the corner. As I write this column Ineed to establish my travel schedule to visit the field day sibes around the section. Groups interseted in having me stop. around the section. Groups interested in having me stop by their site should contact me with directions to the location and a request for me to attend. I will do all that I can to accommodate the various activities. Field day is for all of us a wonderful opportunity to get on the air in a demonstration of our abilities for emergency communications. For most of us it is a fun event and an opportunity to introduce the public to Amateur Radio. I would urge the groups to contact scout agencies and invite those interested to attend the event. Several changes have been made in the rules for this year and I would suggest that you download the Field Day package for the ARRL Web page. I would also like to recommend that you take some time and visit the ARRL Web page at http://www.arrl.org and browse around for the wealth of information located there. Many of the manuals are available to download on the site. Club officers can download the club president's workbook there with great tips for club activities. This month's featured Web site belongs to The Beaver Valley Amateur Radio Association. The url is http://www.geocities.com/the\_bvara/. 73 de 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: KB9AlL. Macon Co. EC N9GRM held a weather spotter safety workshop at the Decatur airport in February. Guest speakers discussed using pagers for team activation, how workman's compensation applies to ESDA-registered volunteers, and tips on safe weather spot-ting. Fox River RL officers for 2001 are Pres K9FE, VP W9AX, Sec KB9LED, Trea N9YFC. Central DEC N9FNP reports the Central IL ARES net has been suspended until a better time and frequency is determined. The Six Meter Club of Chicago holds a roundtable activity net each Tuesday at 8 p.m. on 50.130 MHz USB. SMCC held their annual ham auction in February, and was making plans to help on the Hoops for Life charity basketball tournament. According to the St. Clair ARC newsletter, the club is making plans to provide assistance on the March of Dimes Walk America, and preparing for Field Day and a fox hunt. A Technician class is being planned by the club for early next year. The Rockford ARA offered two courses for early next year. The Hockford AHA offered two courses through the adult education program at Rock Valley College recently. The 2001 officers of STARS are Pres KB9RHL, VP WB9JGG, Sec KB9RGI, Trea WB9LRK. STARS is celebrating its 25th anniversary this year. Plans for Field Day are in full swing all across the section, and several clubs are giving this year's event a go for the first time in many years. If your club is participating in FD let the section manger know the location and you may get a visit during the event. Hamfesters RC has named W9CT as the Hamfester of the Year for 2000. The group held their annual white elephant sale in February. HRC member K9TCA and his XYL lost their home and belongings to fire, but they were not injured. The family has since relocated to Hazlecrest. The Schaumburg ARC has another busy year lined up with plans to help on the Hoffman Estates St. Patrick's Day Parade, MS Walk, Hike for Life, and other Public Service events. According to RACES News, K9LEE has been elected secretary and N9IHW was re-elected treasurer of Lake Co. RACES. The Illinois Valley ARC has been preparing to put a new two-meter repeater into service, replacing one damaged by lightning. IVARC has moved its meeting site to the UFCW by lightning. IVARC has moved its meeting site to the UFCW Local 431 union hall in Beardstown and meets on the second Friday of the month. The 2001 officers of the York RC are Pres KE9VC, VP WK9J, Sec W9EG, Trea K9BFU. Tfc: W9HLX 63, W8B9TVD 33, N9DT 16, W9FIF6, W49RUM 6. ISN Report from W89TVD QNI-200, QTC-96, Sessions-28. 9RN report de W9FC: traffic 282—sessions 56—time 410 min—average 5.03—rate.687—Illinois represented 95% by K9CNP KF9ME NS9F. W9VEY Memorial Net report de K9AXS 6 with 194 cherk-ins.

INDIANA: SM, Peggy Coulter, W9JUJ-ASM for Resources & Recruitment: W9IH. SEC: K9ZBM. ASEC: WA9ZCE. STM: W9FU. OOC: KC9V. SGL: K9JZZ. PIC: KB9LEI. TC: W9MWY. BM: KA9QWC. ACC: N9RG. Sympathy extended to the families and friends of Silent Keys: Feb 20, John E. Johnson, N9DVA, Elkhart and Feb 22, Robert G. Smith, K9RUD, Goodland. They will be missed. Congratulations to Nick Nickerson, K9NQW having been awarded the Grant Co ARC Operator of the Year for his time and service spent in supporting club activities. Congrats also to the Grant Co ARC for re-ceiving an award from the Co Commissioners for assisting them with the Co Wide Warning System during the year. The Hoosier Hills Ham Club presented awards to New Mamber of the Year Larry Hammersley, WA9FFZ; Members of the year to Jerry Kutche, N9LYA and Mike Wright, KF9NP; Elmer of the Year to Frank Tillett, AA9WR and the Vance Lcokenour Award

Continued on page 122.

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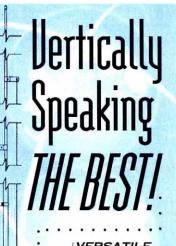
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to Keith Harris, N9KH. Congratulations to all the above. We want to wish Bruce Woodward, W9ZY (formerly W9UMH) a Get Well Wish. He is greatly missed on ITN. We need someone badly to fill in as net manager of ITN and also the WET net. If interested please contact Roger W9FU our STM. NMs ITN/W9ZY, QIN/K9PUI/KJ9J, ICN/K8LEN, VHF/W9FU.

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ICN	3705	2315	92	26	338	26
Hoosi	or VHE	note(2 note)	505	46	1206	11

D9RN total QTC 279 in 56 sessions IN represented by K9GDR, W9QPA, K9PUI, N9KNJ, W9UEM, KB9NPU, WAJWL and W9FU. 9RN total QTC 282 in 56 sessions IN represented by K09D, WB9OFG, K9PUI, WB9UVU and W9FC. Tic: W9FC 248, K09D 176, K9PUI 148, N9KNJ 81, WD9QPA 67, KB9NPU 50, W9JUJ 49, K9GBR 45, W9UEM 36, WB9OFG 34, WD9HII 31, KA9GWC 30, K8LEN 26, KA9EIV 25, W9BRW 20, K9DIY 13, WA9JWL 13, AB9AA 12, W9EHY 9, K9ZBM 8, WB9NCE 5, K9CUN 4, K9RPZ 4, AB9A 4, N9HZ 3.

WISCONSIN: SM, Don Michalski, W9IXG—SEC: WB9RQR. STM: K9LGU. ACC: K9FHI. SGL: AD9X. OOC: W9DGI. PIC: K9ZZ. TC: K9GDF. ASM: K9UTQ, W9RCW, W9CBE. BM: WB9NRK. With regret, I inform you the following Silent Keys: Bob King, W9QOQ. Bob was a member of Yellow Thunder ARC. Bill Kimble, W49QAY, age 73, recently passed away. Bill was a member of Watertown ARC, QCWA, and active on the section nets. W9DOQ. Staber Reese, age 90; Kenneth LeGros, K49DZT, 73; and Everett Duane Hanson, N9YBV, are Silent Keys. Congratulations to K9FHI, K9JPS, and WD9FLJ for receiving the ARRL PSHR certificatel Well done! Congratulations to Lynne, N8OSK, for 2000 M&M ARC Ham of the Year award! Her club cookies, alone, justify it! I enjoyed presenting Mike Anuta, W8HKY, with a special plaque from the ARRL in celebration of his 100th birthday! Also, Bob Baird, W9NN, recently celebrated his 95th birthday and 80 years as an amateur! Obviously, the hobby has been good to them and we wish Mike and Bob many more years of active operation. W9RCW has resigned as our OOC because of illness. Our prayers, best wishes, and deep appreciation for an outstanding job as our OCC go out to him. I have appointed Daniel Gomez-Ibanez, W9DGI, as our new OOC. 9RN report for February shows Wisconsin with 100 percent representation! I am very encouraged by the news I've been receiving from the clubs— many have started ham classes! Great! Jim Staatz, K69RA, assistant EC and member of ECARC, would like to remind all that less than 2% of hams are registered with their EC or participate in ARES and/or Skywarn. Protect our hobby by supporting public service communications. Sign up nowl 73, W9IXG. Tfc: W9IHW 661, W27V 654, W9YPY 488, K9GU 487, N9TYT 391, K9JPS 365, N9VE 327, KG9B 222, K9FHI 194, W9CGE 179, N9CK 132, K9JEU 113, N9BDL 98, AG9G 61, W9YCV 58, W9UW 51, KE9YU 49, N9KHD 43, WDFELJ 37, W9SHL 34, KB8ROB 33, K49FVX 32, AD9X 27, AA9BB 26, WB9ICH 18, N9JIY 12, W9ODV 8, W9RSX 5, W9PVD 3.

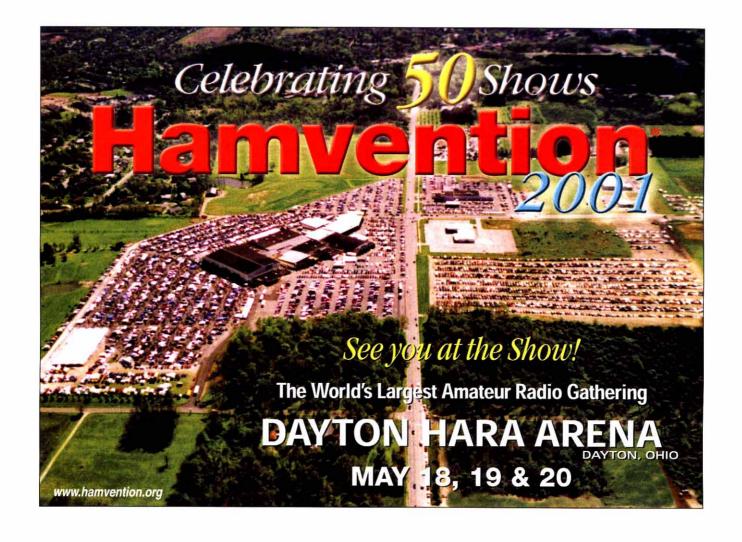
# DAKOTA DIVISION

MINNESOTA: SM, Randy Wendel, KM0D—I'm happy to report we have a new ARRL Affiliated Club Coordinator (ACC) who has volunteered. Please welcome Frank Karnauskas, NF0K, of Bloomington, MN, aboard. Franks' role as an ACC will be a contact point for all affiliated clubs needing assistance with club and ARRL-related business as well as helping other clubs become ARRL affiliated. THE FIRST THING I would like all club newsletter editors to do right now is put Frank on your mailing list to receive your club newsletter! Please e-mail Frank at nf0k@arrl.net or his mailing address is 9801 Little Road, Bloomington MN 55437. I would also like to see those who are willing to offer their availability to volunteer time as guest speakers at various radio club meetings to contact Frank and make him aware of your availability. I would like to see Frank be a contact-point for clubs seeking guest speakers or demonstrations. If you know of someone who is or potentially could be a guest speaker, please contact Frank. I am very interesting in the ACC playing a key role as a central point on behalf of all ARRL clubs in MN. I would like the ACC to help fill some of the holes that often keep clubs from moving ahead with various activities. By now, Frank will have introduced himself in the Minnesota Section eSignals electronic newsletter. Thanks, Frank, for volunteering! Thanks got John Robertsen, KAOOSC, of the Twin Cities, for his past involvement as ACC!

Net	Freq	Time	QNI/QTC/Sess	Mgr
MSPN/E	3860	5:30 P	607/197/28	W0WVO
MSPN/N	3860	12 P	412/96/28	WA0TFC
MSSN	3710	6 P	N/A	vacant
MSN/1	3605	6:30 P	254/107/28	K0WPK
MSN/2	3605	9:50 P	168/59/28	K0PIZ
PAW	3925	9A-5P	2960/107/88	KA0IZA

Tfc: WO0A, K0PIZ, KB0OHI, W0LAW, WA0TFC, KB0AII, W0HPD, W0GRW, W3FAF, KB0AIJ, KC0HAW, WD0GUF, K0PSH, KN9U, N0JP, WA0YSL, KD0CI.

NORTH DAKOTA: SM, Kent Olson, KAOLDG —Sad to report that WOGH is a Silent Key. John was very active for many years in Minot and his knowledge of electronics & CW was unexcelled. Many area hams received their license in test sessions given by him. Bismarck Hamfiest was a big success. It was good to see lots of hams from around the state. Congratulations to the new club officers in Fargo: KB7JVO, KGOFR, NOLG, KCODCF, WAOLIA & WOVET. Congrats also to Benson County ARC's new officers: KOUD and KBOACA. BCARC will be operating Field Day from Leeds this year. The FORX ARC is putting out their newsletter in a very nice .pdf format. Keep your SKYWARN kit handy as that season is upon us. Looking for folks to join the ND Section Team. All those interested, please check out the Section's web site at: http://home.earthlink.net/~qtipf16/. Jan Tfc: NORDJ 2. HF NM KEOXT reports Goose River Net, 8:30 AM Sunday 4/68/0; WX Net 8:30 AM Mont o Sat 59/1093/8; Data Net 6:30 PM daily 31/766/11.



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Tom (W6ORG) & Mary Ann (WB6YSS)

SOUTH DAKOTA: SM, R. L. Cory, W0YMB—Huron ARC is planning a special event station at the Laura Ingalls Wilder Pageant in Desmit in July. Details later. Hot Springs ARC held their annual Holiday Dinner on March 3. Ham windows were invited, On Feb17, Black Hills ABC tested eight person with 1 new Extra, 2 Generals, and 3 Techs. In the afternoon, they had their annual fundraising auction. Hams from 5 states attended. their annual fundraising auction. Hams from 5 states attended. In the evening, they finished the day with their annual Christmas Dinner. 57 people attended. The Dakota Chapter 102 QCWA Special Event station was a great success. President NUOP reports heavy mail requesting certificates. New Huron officers are President WAOTDK, VP KOOH, Sec-Treas WBOULX, Activities Mgr KIOBV. Testing dates at Huron are Apr 28 and Nov 3. LARK of Watertown Witter Earn Show. NOMEA has been reannual Watertown Winter Farm Show. NOMEA has been reappointed manager of LARKS two on the air nets for the coming year.

#### **DELTA DIVISION**

ARKANSAS: SM, Bob Ideker, WB5VUH—Back to B-A-S-I-C-S - Much to report this month. HB2314 was introduced regarding PRB-1; send e-mail to me for details. Russellville, Harrison, Ft Smith and Little Rock all had good hamfests & appreciate everyone's support for them. Takes a lot of coordination & work by all club members assisting (BASICS). Tnx to those who make hamfests available for all of us to attend. FD getting closer. Hope your club is preparing now. Week of FD will be declared Amateur Radio Week by Governor. Proclamations will be sent to each club to display at FD site. More info in next month's issue. (BASICS) There are so many opportunities for each of us to share our known or learned ham radio talents. Have you shared yours? Please. continue to be active & support local club activities. Section leadership appointments still in progress & hope to complete soon. Looking for lots of volun-teers to serve in section appointments. If interested, let me know; we need YOU. Our net totals for Feb included 85 sessions, over 2000 min. with 3219 check-ins & 179 pieces of traffic. Only one word describes it better - WOW! with individual totals including KC5TML 150, K7ZQR 55, W9YCE 46, N5QC 40, K5BOC 37, AB5AU 37, AD5BV 22, W5RXU 15, KC5VQW 13, KO5E 12, KA5MGL 8.

LOUISIANA: SM, Mickey Cox, K5MC - We need to urge our congressmen in Washington to support HR 817, the Amateur Radio Spectrum Protection Act of 2001, introduced on March 1 in the US House of Representatives. New officers for the Acadiana Amateur Radio Association are N5RLM, President; KN5GRK, Vice President; K5DPG, Secretary; and N5YCS, Treasurer. The Jefferson Amateur Radio Club's officers for 2001 are WB9VTN, President; KD5BPR, VP; AF4AN, Secretary; and W5RMX, Treasurer. Field Day is almost here! Clubs and other FD groups should note the changes concerning bonus points in this year's rules. To encourage more participa-tion and friendly competition between clubs in our section, we are pleased to announce the LA Section FD Awards Program. are pleased to announce the LA Section FD Awards Program. The ARRL-affiliated club with the highest total score, regardless of the number of transmitters or participants, will win the LA Section Top Club Plaque. Any ARRL-affiliated club in the 1A, 2A, or 3A category scoring in the top 5 nationally in its respective category will be awarded the LA Section FD Achievement Plaque. Thus, both large and small clubs have a chance at winning a plaque for their FD efforts. LCW set a new record with just over 4 messages handled per session in February. Tfc: WB5ZED 875 (BPL), K5MC 508 (BPL), W5CDX 193, K5IQZ 125, KM5YL 33, K5DPG 25, KG5GE 21. PSHR: K5MC 316, WB5ZED 233, K5IQZ 131, W5CDX 126, K5DPG 123, KM5YL 94, KG5GE 86. Net Reports: sessions/QNI/QTC. LTN: 28/361/110. LCW: 28/197/121.

MISSISSIPPI: SM, Malcolm Keown, W5XX—Section Web Page: www.arrlmiss.org. Web Master: K5IBM at K5ibm@arrl.net. ASM: N5EZX, W5EPW. ACC: N5JGK. SGL: AB5WF. STM: KJ5YY. TC: N5XXX. In mid February, severe thunderstorms and tornadoes were already raking the state. Make sure you are in range of a SKYWARN Net during these periods of inclement weather. Spotter reports are critically needed to secret the NWS in incurrence DEC NEGNT recepts that assist the NWS in issuing warnings. DEC NSZNT reports that the timely reporting of accurate severe weather information from SKYWARN stations to Scouting Officials prevented a major Boy Scout Camporee in Homochitto National Forest from being disbanded. The Laurel ARC celebrated its 25th Anniversary on February 24 by putting W5LAR on the air for the day. LARC members manning the station were KC5WGU, KM5NQ, N5PA, KC5YDR, KB5VLA, KB5IXI, and N5KKG. Over the same weekend the MDXA activated Dauphin Island (IOTA NA-213) using special event call W4D. With three transmitters going, they made over 4,000 QSOs. Good Show! Net Reports: sessions/QNI/QTC: MSPN 28/3308/81, MTN 28/109/64, MSN 28/ 1157/8, PBRA 27/734/9, Jackson Co ARES/RACES 28/351/8, MSSN 20/106/3, West Coast MS 2M Net 13/183/7, JARCEN 6/ 149/0, Attala Co ARES 5/51/9, Bluff City ARC Em Net 5/133/ 1, NW MS ARES 4/17/7, MCARA 4/54/0, LARC 4/84/0, Stone Co ARES 4/27/0, MBHN 4/41/0, MLEN 4/84/0. PSHR: KB5W 140, W5XX 103, KJ5YY 78. Tfc: KB5W 616 (BPL), W5LEW 25, KJ5YY 24, W5XX 7, KM5WN 6.

TENNESSEE: SM, O.D. Keaton, WA4GLS-ACC: WA4GLS. ASM: WB4DYJ. PIC: KE4CES. SEC: WD4JJ. STM: WA4HKU. TC: KB4LJV. Memphis/Shelby Co EMA, ARES/RACES OWSST volunteers for 1999-2000 recognizes the following hams for their part in that project. Project coordinator and net controller KE4GYR & his assistant KG4CMA. Other volunteers included AASGX, WMSQ, KG4IZZ, AB4NH, K4KTP, K4TTA, KA4BLL, KD4NOQ, KD4GTS, KD5ARO, KE4BUU, K64JFN, K74NDD, KF4PFY, K64HKE, K64GYY, KG4ILB, KG4IRF, KN4PM, N9SCJ, WA4OVO, WA6KOC, WB4ZXT, KE4OKL, AF4TY, AF4TW, KF4LUR, KE4UYU, KE4DXN, KD4TJO, KF4NDH, KF4ZGJ, WA4MJM & K4DIT, CARC club attendance started this year off with a bang. 60 plus in attendance at last meeting. Also, big plans are under way for the annual civic fundraisers coming up. RACK members always do a very good job working with local civic groups. Jan 27 was no exception when the following hams assisted the Strawberry Plains Marathon by furnishing communications: N4KNX, WI8X, KB4FZK, KD4F, ND4F, KD4YUZ, AF1P, KG4CFB & N4OQJ. Thanks to



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Lucile for e-mailing me the TCARC (west) newsletter. BSFARC is making big plans for club activities this year. Most TN club's newsletters contained some form of comment concerning the ARRL Board of Directors' decision to increase membership due, some pros, some cons. We all must remember that ARRL is the only protection we have against the increasing interested entities desiring our frequencies. This is not only dangerous to us in losing frequencies, but also our progress in development both in operations and technologies. Net Sess/QTC/QNI: TMPN 28/42/2580; TNCWN 23/52/228; TEMPN 20/37/776; TEPN 24/55/2564; TSCWN 20/40/165. DRN-5 rpt 56 sess, 388 msg, TN rep 46% by W4OGG and KE4GYR. Tfc: KE4GYR 56, WA4HKU 31, W4SYE 20, WD4JJ 7, WA4GLS 6, WA4GZZ 4.

#### **GREAT LAKES DIVISION**

KENTUCKY: SM, John D. Meyers, N4GNL—ASM: Bill Uschan, K4MIS. ASM: Jim Hicks, WB4CTX. ASM: Bob Drake, N4VGI. ASM Digital: Craig Still, N4COR. ASM Internet; Patrick Spencer, KD4PWL. TC: Joe Pollock, K4ULW. SEC: Ron Dodson, KA4MAP. PIC: Steve McCallum, W2ZBY. OOC: Bill Hillyerd, K4LRX. SGL: Bill Burger, WB4KY. A big thanks goes out to Bill Uschan, K4MIS, and his cabinet for a fine job done over the past four years. As the new administration comes in and the old goes ut. Bill bas willingly accepted a position on the new cabinet. out, Bill has willingly accepted a position on the new cabinet staff, and will be a great asset to it. There are still two positions that still need to be filled. They are Bulletin Manager and Affiliated Club Coordinator. Sure would be nice to see a couple of YLs step forward and take an active role in their section.

Net	QNI	QTC	Sess	NM
KRN	607	20	20	N4AFP
KTN-AM	1147	36	28	K4LID
KTN-PM	1223	23	28	KB4VKS
KSN	228	55	28	KO4OL
KYN	288	42	27	K4AVX
4DistARES	435	29	28	WA4RRR
CARN	412	27	28	AD4EI
Tfc: KO4OL	33, K4A	VX 48		

Tfc: KO4OL 33, K4AVX 48

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 (dcolangelor ameritech.net). SGL: Ed Hude, WA8QJE (edhude@juno.com).
TC: Dave Smith (DSmith@smithassoc.com). Youth Activities:
Steve Lendzion, KC8MQC (kc8mc@arrl.net). BM: Thomas Steve Lendzion, KC8MCQ (kc8mcq@arrl.net). BM: Thomas Durfee, Jr.,WI8W (wi8w@arrl.net). Congratulations to the Big Rapids Area Amateur Radio Assn. On being presented the "Club 2000 Award" by the ARRL Board. This club far exceeded the points of the second place club and their recognition was made possible by the hard work of the membership. I am proud of all the members and officers for this much deserved honor. Congratulation to the new officers of the Grand Rapids Ama-Congratulation to the new officers of the Grand Hapids Amateur Radio Assn., President, Phillip Mikula N8ITY; VP/Sec, Tom Hansen N8DGD; Treas, Graham Merrill KB8SEW; Directors, Steve Baker K8PZ, Ed Novakowski N8UXN, Sherrie Webb K8JEG, David DeVos KF8GU, Dennis Tanner KC8LZK, Trustee, Mike Bottema K8EX; Red Cross Liaison, Joe Bell WD8USA. Field Day (June 23, 24) will be upon us before we know it and it is the Operating Event of the Year. Let's try to be as diversified as we can be by having demonstrations of as many modes as possible, especially some of the digital modes as a special bonus is awarded for non-traditional modes this as a special bonus is awarded for non-fraditional modes this year. There are some new changes with many more bonus points available, so please read the rules for this year. Don't forget to get on your clubs activity rosters for Field Day. It's not too early to begin the final plans for the big weekend and let's remember to get those new members involved. While you're at it, why not invite some students from the local schools out to see Amateur Radio at its finest? It might also be a good opportunity to invite some of those science teachers out as well. We must remember that the future of Amateur Radio lies with our youth and we must give them a firm foundation to continue building it as a viable public service. Traffic reports for February 2001: K8GA 449, KB8ZYY 392, KA9EIZ 263, W8RTN 141, WX8Y 138, W8RF 92, AA8SN 54, AA8PI 51, K8LJG 50, WI8K 39, W8RNQ 37, K3UWO 34, K8UPE 28, K8JN 28, WA8DHB 21, K8ZJU 20, W8YIQ 17, N8EXV 15, KN8LD 13, K8AMR 13, N8TDE 8, N8UN 6, KI8GR 5, N8EXS 3. Deadline 5th of the month please. Please support the following Section Nets:

net	QIVI	QIC	Sess	NIVI	⊢req	ııme	Day
MITN	454	314	28	N8FPN	3.952	7 PM	Daily
UPN	1377	54	32	AA8SN	3.921	5 PM	Daily
						(N	oon Sun.)
GLETN	580	100	28	WB8ICN	3.932	8:30 PM	Daily
WSSBN	663	30	28	K8CPW	3.935	7 PM	Daily
D8 ARES	3 17	0	04	VE3EUI	3.932	7:30	PM Friday
MI-ARPS	C 80	2	4	W8FQT	3.932	5 PM	Sunday

OHIO: SM, Joe Phillips, K8QOE, Fairfield, (to contact me, see page 12)—Home brew rigs and antennas are nothing new but how about a home brew QSL card maker. Recently saw the one made in 1953 by Ray Lamb, W8LKX, of Cincinnati. He hand carved the printing plates out of linoleum not rubber as you might expect. Took many hours of intrinsic work, especially carving the Cincinnati sky line. Why do it? Well, quickly when you see display rows of QSL cards in any shack, where does your eye focus? On unusual DX countries and rustic looking your eye locus? On unusual DX countries and rusic looking cards I'll bet. It can't get more rustic than from Ray's home brew printing press. Agree?...Don't forget that Field Day Weekend is June 23-24. Time to get ready...The spring issue of the Ohio Section Journal is out, thanks to Ron Griffin, N8AEH, Findlay. Don't know what the OSJ is? Contact me immediately ...Newsletter editors - the 10th annual Ohio Section Newsletter Contest is on. Contact Scott Yonally, N8SY, Mansfield, the PIC for the rules and your entry...Many clubs throughout the Ohio have organized bus tours to Dayton Hamwention, May 18-20, but time for reservations is getting short. Check your local ham radio club

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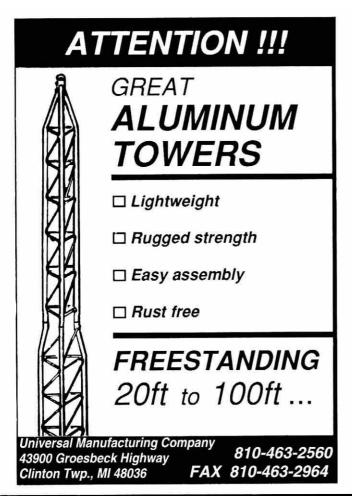
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for details...Dues increases take effect July 1. Renew now before then and save. The ARRL has 2, 3 and 5 year renewal plans...The ARRL's most popular service, after *QST*, is the new E-mail forwarding service. Any member can have the E-mail address of your call@arrl.net with the biggest advantage bring if you change Internet providers, you do not have to change your Internet address. Try it. It's free to members...Ohio's biggest public service event is the Great Ohio Bicycle Adventure (GOBA) June 17-23. Jeff Ferriell, K8ZDA, Columbus, the SGL, is the main GOBA communications link. Contact him if you wish to participate along the 350 mile route in the Southeast portion of the state. Beside serving the public, it sharpens our emergency skills...OHIO MAY HAMFEST is, of course, the biggie, Dayton Hamvention (18-19-20)...de K8QOE. Now for the February traffic reports.

Net	QNI	QTC	QTR	Sess	Time	Freq	NM
BN (E)	154	51	237	28	1845	3.577	WD8KFN
BN (L)	173	65	269	28	2200	3.577	NY8V
OSN	144	41	407	27	1810	3.708	WB8KQJ
OSSBN	2197	769	6708	84	1030, 1615,	3.9725	N8IO
					1845		

OH Section ARES

1700 Sn 3.875 WD8IHP

Tfc: N8IO 343, WB8KVM 275, N8IXF 262, WD8KFN 255, WB8SIQ 208, K8PJ N8BV 169, W8STX 165, N8OD 135, N8TNV 102, N8DD 101, KD9HB 99, WA8SSI 96, WA8EYQ 90, KA8CXG 87, K8QIP 79, N8IBR 72, WB8HHZ 58, KC8HJL 56, KA8VWE 55, WBPBX 52, NSYWX 48, KC8DWM 46, N8RRB 43, NSRG 42, KC8JKE 38, KX8B 36, KI8IM 36, N89CW 35, KA8FCC 35, KI8O 33, KC8HTP 29, W8RPS 29, NY8V 29, WD8KBW 28, N8GP 27, KD9K 26, WB8PMG 23, N8GOB 22, NBGP 11, KB8TIA 11, KC4IYD 17, KC8KYP 11, KB8TIA 11, KC4IYD 17, KC8KYP 11, KB8TIA 11, KC4IYD 17, KD8TYB 11, KB8TY 11, KCAIYD 10, KB8ESY 9, KB8SBK 9, N8WLE 7, W8VQV 6, KB8SIA 5, WB8IOW 4, K7WC 3. (Jan) KX8B 45.

#### **HUDSON DIVISION**

**EASTERN NEW YORK**: SM, Peter Cecere, N2YJZ—Thanks to everyone for all you words of encouragement. I look forward to the year ahead with all of you.

Net Reports

Net	QNI	QTC	QSF
AES	57	2	2
CDN	244	65	62
CGESN	39	2	2
ESS	423	142	142
HVN	528	103	102
SDN	398	64	64
00.1			
NYPHONE		No Report	
	403	No Report	103
NYPHONE		•	103 179
NYPHONE NYPON	403	114	
NYPHONE NYPON NYS/E	403 348	114 193	179
NYPHONE NYPON NYS/E NYS/M	403 348 188	114 193 53	179 49

Traffic: N2JBA 73, KC2DAA 72, N2YJZ 62, WB2ZCM 58, N2TWN 56, W2JHO 29, W2AKT 21, N2AWI 15, WA2YBM 12, K2AVV 5, WA2BSS 2, KL7JCQ 1, KC2BUV 1.

NEW YORK CITY / LONG ISLAND: SM, George Tranos, N2GA—ASM: KAZD, N1XL, K2YEW, W2FX, KB2SCS. SEC: KAZD. ACC: N2MUN, PIC-East: N2RBU, PIC-West: K2DO. TC: K2LJH. BM: W2IW. OOC: N1XL. STM: WA2YOW. Please support the NY State PRB-1 bill (Assembly Bill A-1565) by writing a letter or sending an e-mail to your Assemblyman asking them to support or cosponsor this bill. More info and sample letters are on both the NLI and Hudson Division Web sites. Field Day is next month - June 23 & 24. Clubs - let me know when and where you are setting up - e-mail me your plans! A monthly NLI Section e-happenings newsletter is being e-mailed to all ARRL members in the section who have subscribed to Division / Section bulletins. If you have not received this newsletter, go to the ARRL Web site (www.arrl.org) and update your profile. Check the box that indicates you want Division / Section bulletins. Please e-mail me with your club's information and I will get it in the newsletter! Public Service events: LI Marathon is May 6. Volunteer Exam sessions, club listings, upcoming events and more are available on the NLI Web site www.arrl.udson.org/nli. Report all changes to N2GA before the 12th of the month. Tfc: WB2GTG 578, N2AKZ 207, KB2KLH 98, W2RJL 90, WA2YOW 46, KC2FWD 29, KA2YDW 23.

NORTHERN NEW JERSEY: SM, Jeff Friedman, K3JF—The news this month is a little good and still a little bad. I have been told that the Senate has passed the License Plate Bill S-1341 on a 40 - 0 vote. This is great news. We are half way there. Thanks to Senator Bucco, he first hurdle is complete. Unfortunately we still have the Assembly to deal with and the Bill A-1593 still has not cleared the committee stage. Ray, Makul, K1XV, has made it easier for you to make your feelings known to the Committee. He has prepared a letter which shall be made available to all NNJ Hams at Hamfests and upon request through email. Please sign this letter and if you return it at the Hamfest we will mail it for you. Let's not let this opportunity to change the law pass us by! On another subject, you may know by now that the demands of my regular job have become too much for me to run for a second term of Office. I have notified the ARRL that I will not run for re-election. It has been a pleasure serving the Northern New Jersey Amateur Radio community. I have met wonderful people in my travels throughout the Section and hopefully have made some progress in moving the Section into the 21st Century. I would like to thank those who supported me throughout the last 2 1/2 years, especially those who worked hard in volunteering for the betterment of the Section. Hams such as Mike Hoeft-K2MPH SEC, Ray Makul-K1XV SGL, Marty Goldfarb-KB2JSG OOC, David Streubel-WB2FTX STM, David Popkin-W2CC NM and their entire teams. Obviously I cannot name everyone in this small space, but I do thank you all. I will finish my term of office and will still be available to try and complete the work our team started. 73, K3JF, Jeff.

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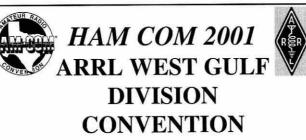
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#### MIDWEST DIVISION

IOWA: SM, Jim Lasley, NOJL—ASM: NOLDD—SEC: NAOR. ACC: NOIJP@KE0BX. BM: KOIIR@WOCXX. SGL: KOKD. STM: KB0RUU. I have noted that several clubs have postponed or canceled meetings in February due to the weather. I am also seeing that it is time for the annual storm spotter training. TSARCN has been awarded a Challenge Grant by the Iowa Farm Bureau Federation and the Howard County Farm Bureau for their SSTV work with the NWS. It is also time to start thinking about FD. I have seen a couple of comments. Let me know of your plans. They are looking for traffic help from the digital stations. If you can help, contact KB0RUU or WO0A, GRARC had a demo of PSK31 for a program. The League had a survey on the web asking who had tried PSK. About 40% had! Very sorry to note the loss this month of WA17RW and WN0EIO. www.scarc .networklowa.com is the story County club site. TSARC is having a day of emergency services classes on May 5. I'm seeing prep for FD and storm season. Let me know about yours. OARC is looking at updating their corporate papers. So they are trying to recruit an attorney! GRARC is planning some nice activities for the summer and fall. Newsletters were received from NIARC, TSARCN, GRARC, OARC, FMARC, DMRAA, DARC. 73 de NOJL. Traffic: KBORUU 254, WOSS 193, NOJL 40, WBOB 29.

KANSAS: SM, Orlan Cook, W0OYH, ASM/ACC/OCC: Robert Summers, KOBXF. SEC: Joseph Plankinton, WD0DMV. STM: Ron Cowan, KB0DTI. PIC: Scott Slocum, KC0DYA, and TC Frank Neal, N8FN. Congrats to Preston, W0WMR, for making BPL in Jan. He tells me he is going for the "Medallion." For more info see Mar QS 7 pg 97 lower right. Tom, W802NY, NM of our QRS Ks CW NTS net will retire Mar 31 after 14 years of great service to HR. Mike, K0PY, will be our new NM. TKS guys! A big TU to Ron, KB0DTI, who has kept our slow-speed net alive for many years. In the 70s & days of the novice license, we had a membership of over 100. Don't forget to mark your calendar for our ARRL State convention Aug 19 at Salina. Complete info in my free monthly enewsletter. To get on mail-Complete info in my free monthly enewsletter. To get on mailing send me UR email address to orlan@ swbell.net. Send me UR news. I also need SK obits clipped from newspapers for the QST SK column. www.colossus.org/kar/ Jan. Kansas Nets: sessions/QNI/QTC, KSBN 31/1378/91 KPN 22/342/33 KMWN 31/744/565 KWN 31/1153/759 CSTN 27/2187/ 90 QKS 60/321/144 WGS-SS 11/32/7 SEC 64/702/21 QNS KB0AM/, N0BTH, KC0CFL, KC0CIG, WD0DDG, WD0DVM, AAOIQ, WOPBV, KB0WEQ, Joseph WD0DW SEC. TEN 367 msgs 62 sessions Kansas 95% w/AA0FO, KX0I, NB0Z, W0WWR, WB0ZNY, W0SS/Mgr, BBS AA0HJ received 45 W1AW Bullers 344 Personal 0 NTS. Ks ffc W0WWB 570. WB0ZNY 88 tins 344 Personal 0 NTS. Ks tfc W0WWR 570, WB0ZNY 88 W0OYH 50, KB0ODT 39, NB0Z 20, N0RZ 16, W0FCL 10, OBS WA0DTH 12 and lots of room 4 UR report.

MISSOURI: SM, Dale Bagley, K0KY— The MO Section is proud that one of its affiliated clubs was judged tops in the first proud that one of its affiliated clubs was judged tops in the first annual Affiliated Club Competition. The Ozark Bible College ARC under the leadership of Bob Patterson, K5DZE, was selected as the outstanding School/College Radio Club for 2000. The members and leadership worked hard to develop a quality program. At the 2001 Ararat Shrine Hambash in Kansas City Vergil Eaton, K0IMP, was presented a certificate of merit for his years as Net Manager of the SSB MTN. The incoming SSB MTN Net Manager, Phil Urquiola, K0DAT, from Hallsville, MCA MIN Net Manager, Phil Urquiola, KUDAI, from Halisville, MO, was presented his appointment certificate. Cliff Ahrens, K0CA, reports that the Hannibal ARC and the Quincy ARC will join together to sponsor a special events station. The Cardiff Hill Lighthouse is located high on a bluff overlooking the Mississippi River in Hannibal, MO. The event will begin on August 4 and end on Aug 5. The special call being used for the Event is K0C. Emergency Coordinators Thad Huff, KC0AQG, for Shelby County and Rex Clark, K0VNL for Macon County, organized an exhibit for the Clarence Community Resources Fair. The exhibit for the Clarence Community Resources Fair. The Kimberling City ARC continued their efforts to support the Kimberling Area Library. The leaders of the project include Jim Stetson, N0IZJ, Harry Fink, N9MVY. Ed Eshers, KI0HQ, Dean Bickford, K0PHI, Connie Taylor, WD0CSY, and many others. Their efforts in assisting the Kimberling Area Library helped win Jim Davis, NQ0G, and his wife Betty the Ozark Mountain Country Couple of the year award presented by the OMC Business and Professional Women club. Net sess/QNI/QTC: WAARCI 4/73/1; MTN 28/469/59; Audrain ARES 5/44/0; NOATH rptr 4/71/0; Rollabillboard: 27/339/9; Macon Co ARES 4/38. Tfc: KG0IV 22, KE0K 21.

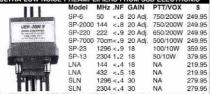
NEBRASKA: SM: Bill McCollum, KE0XQ—ASM: W0KVM, N0MT, WY0F, WB0ULH & WB0YWO. It is with deep regret to inform you that Myrtle Jones NO0A of Kimball became a Silent Key on February 25. Myrtle was a regular check in on the Nebraska Morning Phone Net. The founder of HyGain Elec-Neoraska Morning Priorie Net. The founder of Hydan Elec-tronics. Andy Adros, WOLTE, also became a Silent Key. Our deepest sympathies go out to their families. Net Reports: ENE ARES: QNI 301, QTC 4 & 28 sessions. Net 40M Net: QNI 573, QTC 11 & 28 sessions. NMPN: QNI 1662, QTC 14 & 28 ses-sions. Mid NE ARES 2M Net: QNI 311, QTC 3 & 28 sessions. NESN: ONI 1122, OTC 27 & 28 sessions. MARES: QNI 183, QTC 5 & 4 sessions. NCHN: QNI 260, QTC 7 & 27 sessions. Tfc: K0PTK 88, KE0XQ 16, W0RWA 14, KA0DBK 11, WY0F 8, KA0O 4, WC0O 2, W0EXK 2, W0UJI 2, KB0MTT 2.

#### **NEW ENGLAND DIVISION**

CONNECTICUT: SM, Betsey Doane, K1EIC—BM: KD1YV. OOC: W1GC. PIC: W1FXQ. SEC: WA1D. SGL: K1AH. STM: K1HEJ. TC: W1FAI. A big thank you to all ARES members who took the time to prepare and stand by during the March snow storms. Although shelters were not generally open throughout the State, I am very aware that many of our ops were standing by ready to activate if called upon. SKYWARN nets were acti-vated and NWS very much appreciated the efforts of spotters who reported accurate data and followed the defined criteria.

Some ops like your SM even volunteered to take on an NCS solt for the first time on a SKYWARN Net. Congrats to you all!

Thanks to your leaders-the cabinet, ECs DECs and net managers who continue to recruit and train. I continue to be proud of you all! Now that the better weather is here, clubs are busy planning their Spring activities. Greater Norwalk ARC will once



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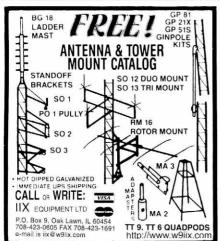
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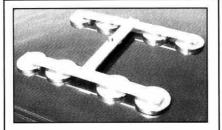
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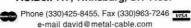
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again support the Bloomin' Metric Road Race; Shoreline is supporting the MS Walk-A-Thon; Middlesex ARS is considersupporting the MS Walk-A-1 non; Middlesex AHS is consider-ing a ham fest in the near future; Southington ARC is preparing for their April 1 ham fest; Natchaug ARC and NARL are each sponsoring ham fests in May and June respectively. Your SM is speaking at Fairfield ARA in April and KE1Al is conducting frequency measurement tests at the Candlewood ARA's April meeting. These are just some of the activities planned. Sure hope to see many of you! Net sess/QNI/OTC/NM: NVTN 26/140/65/KB1CTC; WESCON 28/287/67/KA1GWE; ECTN 28/271/167/WA4QXT. CPN 27/233/95/N1DIO. CN 19/64/28/N1AFH. Tfc: WA4QXT 305, KA1GWE 189, KB1CTC 123.

EASTERN MASSACHUSETTS: SM, Phil Temples, K9HI-ASMs: WAIECF, N16TB, WA1IDA, N1UGA. ACC: N1DHW.
BM: N1IST. OOC: K1LJN. PIC: N1PBA. SGL: K3HI. STM:
NZ1D. TC: N1UEC. (SEC: open) e-mail list: ema-arrl@qth.net,
web: http://www.qsl.net/ema-arrl. Hams heeded the call during March's Blizzard of '01 State and area EOCs were staffed, and RACES and MA VOAD were activated during the declared emergency. ARES teams and individual hams staffed Red Cross shelters, particularly in Barnstable and Provincetown. SKYWARN nets ran continuously on several repeaters in the section. Kudos to all those who served, or stood by ready to serve. Boston ARC is assisting BSA Minuteman Council of Greater Boston for JOTA in October. You think traffic handling is dead? Think again. What happens when everyone wants to use a cell phone or landline at the same time, as during the recent Seattle earthquake? Several clubs were active in the recent ARRL DX contest, including Sturdy Memorial Hospital ARC (W1SMH) and Harvard Wireless Club (W1AF). Acton-Boxboro ARC's recent Yankee Swap was well received, according to KA1MWP. Crocker Public Service Group is gearing up for the 2001 Walk for Hunger in Boston. OOC KTLJN offers this advice to repeater users who experience intentional interference: "Please get into the habit of ignoring whatever is happening by not responding. Don't be quick on the trigger. Think about your response before you reply. Also, making no response is a response. It will cause jammers to go away in frustration." Does your radio club have an official greeter at its meetings? The Southeastern MA ARA does. Billerica ARS featured a talk by KA1RV about Internet firewalls for home use. Framingham ARA and Wellesley ARS both had PSK31 presentations recently. Are you registered with the FCC's Universal Licensing System (ULS)? See http://www.arrl.org/fcc/uls101.html for details. Norwood ARC presented outgoing president W1MA with a mounted gavel award to honor his accomplishments during his long tenure in office. EMA-ARRL club Web site of the month: Pentucket ARC at http://www.k1kkm.org, maintained by N1QZN. On a personal note, I was privileged to instruct at the recent Handi-Ham radio camp in CA. I also copresented along with ARRL Hq staffer N1KB to the assembled staff and campers about the League and the field organization. Want to be Handi-Ham volunteer in your area? Visit their Web site at http://www.mtn.org/handiham. de K9HI. Tfc: KY1B 1022, KB1AJ 951, N1LKJ 844, KW1U 804, W2EAG 504, NZ1D 322, KD1LE 121, WA1FNM 93, K1SEC 81, K1BZD 75, N1AJJ 72, WA1LPM 72, N1LAH 64, KB1EB 30, NC1X 29, N1IST 26, N1TDF 10, WA1VRB 10, NK1L 2, N1ZFF 2.

MAINE: SM, Bill Woodhead, N1KAT—ASMs: WA1YNZ, KA1TKS. STM: N1JBD. BM: W1JTH. SGL: W1AO. ACC: KA1RFD. PIC: KD1OW. SEC: N1KGS. Asst. Dirs: W1KX, KA1TKS, K1NIT. Web Site: N1WFO. OOC: N1RY. Field Day just around the corner (It's March and the snow banks are 7 ft high, am really looking forward to summer.) And we'll once again have an opportunity to put ham radio in the spotlight for the public community to see and experience. Try operating from a mall. This has been going on for a number of years at from a mall. I his has been going on for a number of years at the Auburn Mall. I can tell you from personnel experience the number of curious visitors will amaze you. If not a mall, how about from a Red Cross Chapter? A good chance to try out some of that new radio equipment and get familiar with the staff. As section manager, one of the most fun things I do is stopping by Field Day sites to visit and see how resourceful you fellow hams can be when it comes to setting up your stations for this event. Please let me know where you will be setting up your operations, and I will trut be too by and early hellor and visit your operations, and I will try to stop by and say hello and visit for awhile. Good direction are a must. Remember sometimes you really can't get there from here. 73 Bill N1 KAT. Tfc: W1KX 202, W1QU 49, W1BLT 40, N1JBD 39, W1JX 34, KA1RFD 30, W1JTH 26, KA2ZKM 12.

NEW HAMPSHIRE: SM. Al Shuman, N1FIK (n1fik@arrl.org) Web site (www.nhradio.org). The first ARES activation of 2001 was a joint NH/VT search and rescue mission for a missing was a joint NH/VT search and rescue mission for a missing elderly woman which unfortunately ended in tragedy. NH Section Manager Cert. of Recognition were issued to 32 Amateurs from NH and VT. Recognized were: NSIEP, KA1LDS, KA1CRP, W1PID, WA1ZON, KB1FAE, KB1FDA, W1SVU, K1BBQ, N1SKZ, W1DEC, N1AHF, K1IB, K1ZS, K1CYJ, N1ZDR, N1NKC, NOJSR, N1AOK, N1MJD, N1HAC, KA1T, N3CLZ, N1NCT, WB1EAE, N1YMQ, K1DAN, N1JFI, N1ZIH, KE1IW, N1KDV, and AA1KI who also provided the list of naticipants. N1KDV, and AA1KL who also provided the list of participants. On 2/20 approximately. 15 hams including, members of NH-ARRL and NHOEM gave testimony before the NH House Transportation Committee in support of Amateur Specific Auto license plates. Our testimony was well received but the committee gave no indication how they would vote. A special NH Section Manager's Cert of Recognition was given to Dave Megin, KA1VJU, who has volunteered countless hours in support of the Lung Association by managing communications at numerous bike-a-thons over the years. Volunteerism dead? I don't think so! 73, Al, N1FIK, 487-3333. Net NM/Sess/QNI/ QTC: GSFM N1RCQ 27/173/34; GSPN WB1GXM 28/134/94 VTNH WA1JVV/28/127/92. Tfc: W1PEX 1034, WA1JVV 164 N1NH 62, W1ALE 51, WB1GXM 25, N1PCE 9, N1CPX 7,

RHODE ISLAND: SM, Armand Lambert, K1FLD— ASM: W1YRC. OOC: W1AOM. STM: KA1JXH. TC: N1DKF. PIC: WB1P. SEC: N1JMA. If you missed the March edition of the Section news, it is because my typo error sent it to the wrong e—mail address, however it is still available thanks to Bill WA1RI on the RI ARRL Web site: www.ri.arrl.org at the Section Manager corner./ Meanwhile the PVARC has teamed up with

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OSARG providing radio support for the Burrilville canoe race./ ARSNE, W1AQ is Celebrating 75 Years of being a Rhode Island Radio Club serving the Amateur and local community, a most hearty congratulations is in order here. W1AQ will also participate in helping the W1 QSL bureau sort out incoming QSL cards and are planning for a Foxhunt in the near future / June 2-3 will feature the American Diabetes Bike Run thru Narraganset and Connecticut. If you wish to volunteer, contact Bruce KC1US through http://cpsg.amateur-radio.net for more information./ The BVARC now has a new editor for it's newsletter the Messenger, Bill, WA1RI, has demonstrated continuing talent in this literary field./ The New England Division Cabinet is to convene in July and your suggestions are welcomed for discussion, you can e-mail them to me if your club officers cannot attend./ 73 till next time.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, WTUD, wTud@arrl.org—ASM: N1MAP. ASM (digital) KD1SM. STM: WTSV. SEC: K1VSG. OOC: WTTW. This month has seen a tremendous increase in the amount of traffic. Messages have been sent to newly licensed amateurs throughout the country welcoming them into our great hobby. There is only one problem. Apparently, the license examiners, FCC or data base does not demand telephone numbers. This increases the chance the traffic will not be delivered. Many of the new licensees are living with their parents and have no recognizable address or telephone number. If you originate a message, be sure that the phone number is correct. Ninety eight percent of our traffic is delivered to its final destination by telephone. This is another golden opportunity for the delivering station to introduce him/ herself and inform the new amateur of the local club and other activities in the area. Most newly licensed amateurs have a feeling that they are alone and isolated. Make them feel welcome. Our contest season is about over. The next big event will be Field Day, Make plans. There have been a few changes since last year. Tic. K1TMA 229, N1WAS207, N1RLX 22, W1BMK 13, KD1SM 6, N1YCW 6, N1RFQ 3, W1ZPB 61, W1UD 339.

#### NORTHWESTERN DIVISION

ALASKA: SM, Kent Petty, KL5T — Alaska PRB-1 Bill Introduced as SB 78. Contact your Senators and Legislatures to let them know you expect them to support this bill. Junior Iditarod Sled Dog Race communications supported by MatSu Amateur Radio Association. VHF voice and packet did the job well with many pieces of moral traffic passed to youth mushers at Yentna halfway point. Iditarod communications again supported by HAMS across the section. Race start, re-start, and trail comms helped ensure safety of nearly 70 mushers over 1,149 miles of wilderness trail. HF nets: Sniper's Net 3920 1800 AST, Bush Net 7093 2000 AST, Motley Group 3933 2100 AST, and Alaska Pacific Net 14292 M-F 0830 AST. ALL HAMS - Please report communication drills and exercises, emergency communication activations, and public service activities via our online interactive FSD-157 (Public Service Activity Report) form at http://www.qsl.net/aresalaska/fsd157/public\_service.html.

http://www.qsl.net/aresalaska/fsd157/public\_service.html.

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP—The big news this month is the 6.8 earthquake on Feb 28th in western WA. The quake was felt in some parts of eastern WA. The Spokane Co DEM was activated, and the ARES net had 9 stations activated and 20 more stations standing by. OES K7VOT maintained liaison with WSEN on 3987 kHz for direct communication with the state EOC. Five formal messages were sent, but Gordon Grove, WA7LNC, SEC, said that with most EWA counties there was little to do but to stand by. In Memoriam: Joe Gates, K7LHV, of Colville; Robert "Bob" Mackie, KC7IE, of Spokane; and Charles W. (Bill) Emshousen, MB7VCC, of Richland, became Silent Keys. 8 out of 10 OO stations reporting monitoring activity for February and 1 violation notice sent. 73, KA7CSP. Net Activity: WSN: ONI 727, to 288; Noontime Net: QNI 9137, tfc 348; WARTS: QNI 3269, tfc 80. Tfc: W7GB 183, K7GXZ 151, KA7EKL 117, K7BFL 44, KK7T 13. PSHR: W7GB 138, K7GXZ 118.

IDAHO: SM, M.P. Elliott, K7BOI — OOC: N7GHV. SEC: AA7VR. STM: W7GHT. The Idaho Tower bill (HO232) has cleared the House by a vote of 63 to 1 - next up the Senate vote. To read the bill, visit the Section Web site. Results next month. Received some club newsletters recently. The Sanka River club will host a hamfest on April 28th in Caldwell. The Eagle Rock club reports that Idaho Falls has a new antenna ordinance allowing towers up to 70 feet to be installed without governance. Voice of Idaho (Boise) reported on the successful ham program for local cancer kids. Please send a copy of your local newsletter so that we can recognize your efforts. 73, Mike, K7BOI. Tfc: W7GHT 139, KB7GZU 91, WB7VYH 55. PSHR: W7GHT 123, WB7VYH 104. Nets: FARM-28/2824/24/WWJH; NWTN-28/481/176/W6ZOH. http://id\_arrl.homestead .com/mainpage.html

MONTANA: SM, Darrell Thomas, N7KOR—Several hams from the Montana Section donatted many hours of their time at various checkpoints providing communication for the annual Race to the Sky Dog Sled Race. They are to be congratulated for a job well done. On February 24th approximately 75 amateurs gathered in Stevensville, MT, for what has become an annual local area Hamfest. Daytime Hamfest and swap table activity is followed by an evening of picking and grinning as attendees bring out their guitars, banjos and fiddles for an evening of fun and entertainment more those attending. Net/QNI/QTC/NM MSN 144/0 W7OW, MTN 2250/54 N7AIK, IMN 481/176 W6ZOH. PSHR: N7AIK 114.

W6ZOH. PSHB: N7AIK 114.

OREGON: SM, Bill Sawders, K7ZM—ASM: KK7CW. SEC: W87NML. STM: W7IZ. SGL: N7QQU. OOC: NB7J. ACC: K7SQ. Last year, the Oregon QSO Party was held in August. This year, it returns to its original weekend in May. Here are the complete details to this year's event: The Central Oregon DX Club will sponsor the 2001 Oregon QSO Party on Saturday, May 13th. The event begins at 1400Z, May 12th and ends at 0200Z May 13th. (For us in Oregon, the event runs Saturday, May 12th from 7 AM to 7 PM. Oregon stations work everyone. Others work Oregon stations only. Work stations once per band/mode, mobiles again as they cross county lines. Exchange RS (T) and Oregon county, state, province or DXCC country. Scoring: One point for SSB QSO. Two points for CW QSO. Oregon stations



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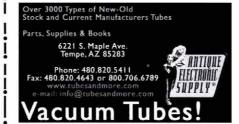
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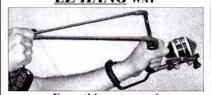
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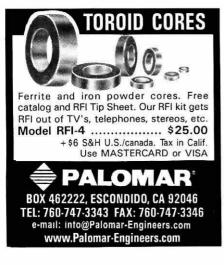
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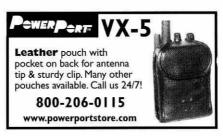
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multiply QSO points X Oregon counties worked, states, provinces, and DXCC countries. Others X Oregon counties worked (Max 36). Add 50 bonus points for working special call sign K7O, another 100 bonus points for working special call sign K7O, another 100 bonus points for working club station K7ZZS. Suggested frequencies: PHONE: 1.880 3.980 7.280 14.280 21.380 28.380. CW: 1.810 3.725 7.125 14.035 21.125 28.125 28.125 145.025 146.550. No repeater GSOs. Awards, logs by May 25 to Oregon QSO Party. C/O C.O.D.X.C. 19821 Ponderosa St Bend, OR 97702. Please join us in making this the BEST Oregon QSO Party, everl NTS traffic totals for February: N7DRP 246, N7YSS 164, KC7ZZB 72, KC7SRL 60, K7NLM 57, K6AGD 54, W7VSE 52, KC7SGM 34, KA7AID 21, KK1A 8.

WESTERN WASHINGTON: SM, Harry Lewis, W7JWJ—A whole lotta shaking goin' on. Western Washington area amateurs activated their stations within minutes of the earthquake of February 28. Debriefing told the story of those stations prepared versus those that were not. Are you ready for the big one? Do you have back up food and water supplies, flashlight batteries, and portable lights? Is Amateur Radio communications what it should be? Can we improve? Hopefully the big one will not provide the answer. This office is receiving even more reports of poor operating practice on area repeaters and this area is not alone. With enforcement directed now toward repeater operations ask yourself if you observe the rule of identification by saying, "This is" or "from" before giving your call or do you just give two calls jumbled together? Be forewarned. The Official Observers have noted in recent weeks ragchewing on busy frequencies with obscenities, racial slurs and animal sounds being transmitted, plus excessive hum, splatter and drifting signals. It is up to each and every one of us to try and maintain the prestige that being a licensed amateur entails and to improve our communications service. A reminder that repeater operations require control operators to monitor. Some OOs have spent over an hour a day these last few months. In February alone some 245 hours were spent by these volunteers who must on occasion send out an advisory notice, and in January over 300 hours, but these dedicated amateurs would much more enjoy sending out a congratulatory good operating letter. In the world of traffic handling competition is running high between K7DBU and W7BO. Why don't you visit a National Traffic System Net and send a message? One never knows when one may be expected to do just that, perhaps when the "big one" hits this area. In Whatcom County ARES/RACES members do some interesting training. Recently they gathered in the vicinity of Everson to observe dog team training and to participate. 73.

#### PACIFIC DIVISION

EAST BAY: SM: Andy Oppel, N6AJO—ASMs: NJ6T, KE6QJV. SEC: KE6NVU, DECs: KE6QJV/Alameda County, KO6JR/Contra Costa County, WA7IND/Napa County, K6HEW/Solano County, N6UOW/Training, W6CPO/Technical Services, KQ6TM/Section Plans and Administration. OOC: KD6FFN. STM: W6DOB. ACC: NJ6T. EB Web Page: http://www.pdarrl.org/ebsec/. Webmaster is KB6MP. CCCC mourned the loss of N6ILD and welcomed back members Kl6MG and N6CJ. SARS reported a grant for 2 new ATV units for RACES. ORCA installed a new Yagi 70 feet up at the Oakland OES/EOC... armchair copy they say! I enjoyed speaking at the Feb. EBARC meeting and meeting the members. VVRC had a talk on volunteer opportunities and has a search dog demo planned. MDARC recognized new ham KG6FID; upgrades of KE6BUR ME6DMI and KC6SOE to General; and upgrade of KE6BCE upgrade to Extra. February tfc: W6DOB 916, WB6UZX 56, KE6QR 16. PSHR: W6DOB. BPL: W6DOB. Ffc nets: NCN13630/7 PM; NCN2-Slow Session /3705/9 PM; NCN-VHF/145.217/330 PM; RN6/3655/7-45 PM 8-330 PM; PAN/3651/7052/8:30PM. Your check-ins are always welcome.

NEVADA: SM, Jan Welsh, NK7N—ASM: Dick, W6OLD. SEC: Paul, NN7B. Congratulations to Melissa Flanagan, Kr7AA, on your appointment as NV Affiliated Club Coordinator and it will be good to have you taking care of club needs throughout the state. Melissa's e-mail address is melissa @libelle.com. AB61, the antenna bill going through the NV Assembly, is up for a hearing Wednesday 14th at 8 AM. Thanks to those of you that have e-mailed, snail mailed and phoned or communicated in some fashion to those in a position to help our cause and to NV Assemblyman Bob Beers, WB7EHN, who has been very active in giving us info on how to approach the problem. NTTODs message handling exercise for NNARS sounds like it will be functional as well as informative with their inclusion of info on AB61. EC KB7REO conducted an ARES/RACES meeting here in S. NV Saturday, discussed the LITZ function and did traffic handling activities. Still no definite location for Field Day 2001 yet in the South. Wish we had more space to write about the excellent club newsletters but thanks to all. 73, Jan, NK7N. Tic: W7VPK 121, N7CPP 29, NV7YL 4, K7NHP 1.

PACIFIC: SM, Ron Phillips, AH6HN—It is with deep regret that I report the passing of Edmond "Lee" Breatchel, WH6AF. Lee was a member of BIARC plus numerous military organizations on the Big Island. He was very active and helpful to all. Dale, AH7D, reports for EARC check-ins is 141. Dean, KH6B, reports QRP Club at Hilo Jack in the Box attendance totals 215. Greg, WB6FZH, reports that the Koolau ARC will now provide Amateur Testing EVERY MONTH except December, after 2nd Saturday 9:30 AM meetings at Ho'omalahia Gardens Visitor Center in Kaneohe. Walt, AH6OZ, has agreed to be the Chair for the upcoming "Hawaii State Ham Convention" in October, with Kevin, AH6QU, of EARC as Vice Chair. BIARC had a great speaker this month from the Canada France Hawaii Telescope on top of Mauna Kea. Christian Veillet, FSIDM, gave a great presentation of the activities their group is doing. Christian will also be a guest speaker at the Hawaii Convention this October. Thanks for your support, Christian. The Hawaii DX Association (HDXA) now has one year under its belt and going strong. Membership is close to 100 from all over the world. Look for new and interesting challenges in the future. Thanks to all for your timely inputs.

SACRAMENTO VALLEY: SM, Jerry Boyd, K6BZ—Thanks to all who made EMCOMM 2001 a great success. It is clear from the interest and participation that this will continue to be an

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annual event. It is even possible that this will become a two-day, ARRL sanctioned, "Hamfest." Special thanks to SEC Dave Thorne, K6SOJ, for all of his work in organizing and planning Thorne, K6SOJ, for all of his work in organizing and planning the event. Speaking of EMCOMM, I had the opportunity of completing the ARRL's Emergency Communications continuing education course. It is well worth the time and effort no matter what your personal level of EMCOMM involvement is. I'm sorry for focusing so much on EMCOMM this month, but I must remind all amateurs in the Section that fire season is upon us already. A "below normal" snowpack this year (as of this writing) means potentially drier timber and wildlands. We know what that can mean in terms of large fires in the Sacraento Valley. Let's make sure our equipment and skills are mento Valley. Let's make sure our equipment and skills are ready when we are called out, as I'm sure we will be this season. A reminder to DXers that field DXCC card checking is a cost-effective alternative to sending cards to the League's DXCC desk. We currently have two DXCC card checkers in the Section, one north and one south. Refer to the ARRL Web site for specifics. As a follow-up to comments from several months ago about newly licensed amateurs needing to feel welcome at radio club events-they also need some "Elmering." There is a lot of experience out there in the field organization. Let's all do our best to share our expertise and help a new ham out. Finally, nice to see Pacific Division Director Jim Maxwell, W6CF, at a couple of recent events in the northern part of the Section. Until next month, 73 de K6BZ.

SAN FRANCISCO: SM, Len Gwinn, WA6KLK-ASM: KH6GJV. SEC: KE6EAQ. Sonoma Valley of the Moon swapfest on April 28. San Francisco Section Conference at Ferndale Humbolt County on June 23/24. From KF6SZA, Santa Rosa EC, some extra things for your "ready bag." First aid pages from an older phone book. Lots of information. Dust masks in case you get into high dust environment. Hemostats for holding wires to-gether for soldering or even to clamp an artery. Metalized blanket, light weight, will help keep you dry and warm if necessary when out in the field. Whistles for signaling sure help, as does ponchos to keep you dry in the rain or out of the wind. A ponchos to keep you dry in the rain or out of the wind. A leatherman tool really helps to work on anything that may need working on, and candles and matches. Sometimes you run out of batteries and the candle will really be a necessary to see. From WR6C, Benefits of growing older. You can eat dinner at four o'clock, Kidnappers are not very interested in you, and, your secrets are safe with your friends because they can not remember them either. Update your CPR and First Aid training now. KF6FBP SK. WB6NBE SK.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN-Hello all. I am pleased to announce that BARA (Bakersfield Amateur Radio Association) has applied for and been granted Special Service Club status. Congratulations to all of the members of BARA. Merced County ARES under the direction of EC Stephen Adams, AD6HP, entered into a close working rela-Stephen Adams, AD6HP, entered into a close working relationship with the Merced County Sheriffs Dept on Thursday, March 8, 2001. In a ceremony in Atwater, Sheriff Tom Sawyer swore in approximately twenty Merced County ARES members to assist with emergency communications recognizing amateur radios operators contributions to the community in times of need. I attended this ceremony in two capacities. One as Section Manager and the other as one being sworn in. It is not to be added to the community of the community not too early to start making plans for Field Day. There are some new rules this year which can be accessed at the ARRL Web site. Die hard Field Day operators like to set up on mountaintops and remote areas camping out but, this year I would like to suggest to clubs that perhaps two sites for each club be considered. The second site might be closer to home and in the public eye providing an opportunity for those whose work restricts their time to attend a Field Day event or who are not comfortable with camping out. In any event, have a great Field Day and I hope to talk to many of you on the air.

SANTA CLARA VALLEY: SM, Glenn Thomas, WB6W — SEC: KM6GE. BM: WB6MRQ. TC: WA6PWW. OOC: KB6FPW. SCV Homepage is http://www.pdarrl.org/scvsec - A source of FD bonus points is the SM message. The details are in the FD rules. After FD, I will list the calls and club names from all of the messages I actually receive in this column. Watch for it in August QST. The Foothill College Electronics Flea market will be meeting again on the 2nd Saturday of each month. Turn your junk into cash and vice versal The Foothill Amateur Radio Society (FARS) presents the "No [Morse] Code Technician Class" Amateur Radio license course on 6 evenings, starting April 26, from 7 PM - 10 PM at the Terman Library Conference Room, 661 Arastradero, Palo Alto, CA. Contact Rich Stiebel, 650-494-0128 or W6APZ@arrl.net OR see the FARS Web site http://www.fars.k6ya.org/classes.html. The Palo Alto Amateur Radio Association had a wonderful presentation on the history and current state of the 150' Stanford dish. PAARA meets on the first Friday at 7:30 PM in the Menlo Park Recreation Centhe first Friday at 7:30 PM in the Menio Park Hecreation Cen-ter, 700 Alma Street, Menio Park. The Lockheed-Martin ARC has a club net every Wednesday night at 8 PM local on the linked club repeaters, WA6GFY (224.28-100 Hz, 443.775+ 100 Hz, 1283.7- and 145.62 Simplex). The nets are simply to pass information of a formal or informal nature. For more info contact WB6PVU/Terry tnak@pacbell.net. The Garlic Valley ARC meets on the LAST Saturday of each month, at the Little House Restaurant in Gilroy on Monterey Avenue. The meeting follows breakfast at 8 AM. For information, contact Tony Armendariz, AD6ID, 408-683-2025, 73, Glenn, WB6W, Tfc: W6PRI (Feb) 1

#### **ROANOKE DIVISION**

NORTH CAROLINA: SM, John Covington, W4CC—SEC: KE4JHJ. STM: NOSU. BM: KD4YTU. TC: K4ITL. PIC: KN4AQ. OOC: W4ZRA. SGL: AB4W. ACC: vacant. http://www.ncarrl .org. The NC General Assembly is considering a bill to essentially restrict cellular telephone use in vehicles to hands-free use only. This proposal is directed at cellular telephone users but may have an impact on Amateur Radio and other services if the language of the bill is not changed. The bill is House Bill 62, introduced by Representative Mary McAllister of Cumberland County. The content and status of this bill is likely to change by the time you read this, but please stay informed. One way to do this is via e-mail. A new NC-ARRL e-mail reflector has been announced on our Web site. I hope you will take



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PCR-100-12 .01-1300MHz PC-controlled • AM/ FM/WFM • CTCSS • Ant .....Spec © \$199\*



# IC-2100H FM Transceiver

144MHz, 55w • PC ready • 14 channel DTMF • 113 alphanumeric memory channels Selectable squelch delay
 Optional HM-90A 



# IC-207H Dual Band Mobile

2m/440MHz FM . 50w/35w . Wideband receive • 182 memory channels • 9600 baud capability,PC ready . 50 frequency encode /decode • Backlit TTP mic.. Special \$29999



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#### HANDHELD COMM. RECEIVERS

R-3-26 (pictured) 0.5-2450MHz (cell blkd) • FM/WFM/AM/AMTV/ FM TV modes • 450 mem. • Alphanumeric • PC programmable • PL dec/scan • Audio/ video out .....Special © \$399\*\* R-10-05\* 0.5-1300MHz (cell blkd) • FM/WFM/AM/USB/LSB/ CW modes • 1000 mem. • 8 character alphanumeric LCD • 7 scan modes with priority
• Cloning .... Special © \$299° R-2-06\* .5-1300MHz • AM/FM/ WFM . With charger and battery ......Special © \$15499 \*FREE software from Icom thru 6/30/01



# IC-910H VHF/UHF Transceiver

144-148, 430-450, and (optional) 1240-1300 MHz • 99 memory channels, 1 call, 6 scan edges per band • Satellite mode operation support . 9600bps packet . 50 tone CTCSS · Auto repeater function ... \$149999

UX-910 10w, 1.2GHz module ..... \$49999



#### IC-T22A IC-T2H IC-T81A IC-Q7ABC IC-W32

IC-T22A 2m • 3w (5w @ 13.5V) • Small. easy to use . Alphanumeric display . Air band receive . 80 memories; 40 with alphanumeric display ...

IC-T2H 2m 6w • Wide band rcvr • 43 mem. 8 program. kevs
 8 AA batt Spec \$139<sup>99</sup>

IC-T7H 2m/440MHz . Dual bander at single bander size & price . Easy! Works one band at a time • 6w 2m/440MHz @ 13.5V • No function key and "intuitive" help function CTCSS encode/decode ... Special \$199°°

IC-Q7ABC 2m/440 • 300mw • wideband receive • 200 memories .... Special \$13499

IC-W32A 2m/440MHz dual bander . 3w, 5w w/BP-173 . Independent band controls Simultaneous receive • 200 mem. w/name capability . PC/radio-to-radio clone capabili-· Built-in enc/dec · Auto repeater Weather rcve capability .. Special \$269\*\*

IC-T81A Quad-band HT • 5w 6m/2m/440 MHz, 1w 1.2 GHz.....Special © \$27999

CS-T81 Windows software for T81A. \$1399

CSW-HH4 Windows software with cable for the T2H, T7H, W32A ..... \$5099

# Other ICOMs not Pictured

A-22 5w Navicom Air HT ...... AH-4 80-6m/120w/auto wire tuner ..... 319\*\* AT-180 Auto coax tuner HF + 6m ...... 49999 GP-270ML Fixed mount marine GPS ... 399\*\* IC-2GXAT/HP 7w 2m HT..... 24999 IC-4008A Family radio service HT .. 7999 24999 IC-M1V 5w waterproof marine HT ..... IC-M3A 5w VHF marine HT...... 15999 IC-M402W02 25w waterproof marine.. 21999 IC-M45AW 25w VHF marine xcvr ...... 17999

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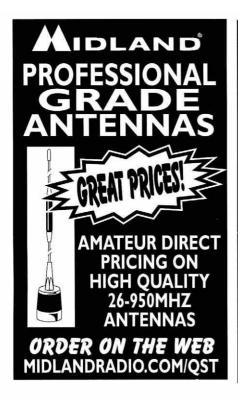
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time to subscribe, as we will use it to distribute bulletins about issues like House Bill 62 that really can't wait for Section News. We have improved the software to allow only plain text to flow through, which should correct some of the problems we had that were caused by viruses targeting Microsoft Outlook. The Central Carolina SKYWARN Conference in Raleigh on February 17th was a great success. I congratulate SKYWARN EC Thomas Babb, KF4JKQ, on his efforts to put this together. Bill Boyes, KB1G, is putting together a Triad SKYWARN conference scheduled for April 21. I hope a few of you see this column in time to make plans to attend. Great to see many of you at the Elkin and Charlotte hamfests. Hope to see you at the Durhamfest on May 26th. Feb Traffic: W4EAT 578, NC4ML 377, AB4E 258, KAIWW 202, KI4YV 169, W4IRE 140, KE4JHJ 138, AA4YW 98, AD4XV 62, W3HL 43, WA2EDN 42, KE4AHJ 10, NT4K 10, KT4CD 10, KB8VCZ 9, N8UTY 5. Addition to January Traffiic: K4IWW 117.

SOUTH CAROLINA: SM, Patricia M. Hensley, N4ROS — Dedication to a purpose is best exemplified by one's actions. Thirty-three amateur radio operators recently demonstrated their concern for SC by attending two one-day seminars conducted on successive weekends. These intensive sessions were sponsored by the ARRL and taught by K8AFP. The following individuals successfully passed Level 1 of the ARRL Amateur Radio Emergency Communications Course: NAADM, KF4AOT, N4BMW, AE4BX, KK4CD, WG4E, KC4ED, KG4FOZ, KG4FQG, KB4GYT, W4HEW, AF4JX, AF4LN, K4LXF, W4MUR, KO4MZ, WAANGY, KU4OC, WB4QHF, AE4RJ, K4HXC, N4RKG, N4ROS, KY4S, AE4TY, N4UFP, WB4UIV, AE4UX, AF4UZ, KC4YZJ, KU4YM, KF4YQF, KT4YW. Note that the annual pre-urricane emergency communications seminar will be held Saturday, June 2, in Columbia, SC. Please remember the Salkehatchie Tailgate Fest on April 28 and the Upstate Hamfest on May 5. The weekly SM Report is given every Wednesday at 1900 hours local on the SC SSB Net (3915 KHz). Any traffic can also be sent to me at that time. SC ARES/RACES net meets on the first and third Monday nights at 1800 hours local on 3993.5 kHz. Tfc: AF4QZ 106, KA4LRM 89, W4DRF 31, WD4BUH 20, K4BG/KG4FQG 16.

VIRGINIA: SM, Lynn Gahagan, AF4CD—ASM: KC4ASF. SEC, OOC: KR4UQ. STM: W4CAC. ASM/A: KE4MBX. ASM/B: W4TLM. ASM/C, TC: W4IN. ASM/D: KF4LGV. PIC: W2MG. Greetings again everyonel Jimmy, K4GV, our DEC for 14 reports that there are SKYWARN Classes being held in all areas of D14. The NWS in Morristown, TN, is trying to get as many spotters trained as possible for the upcoming spring storms. There have been quite a large number of people certified as Spotters. Recently 30 people were certified just in the Gate City session Jim sponsored. Morristown NWS serves the areas of district 14 as well as parts of TN, KY and NC. The "MARA/VARA Monitor" reports that Edwina Willis, KD4IDP, and Bow Owen, K4QKH, are SKs. Edwinia was most famous for her reliable attendance at all of the MARA Christmas Banquets and was well known for her sense of humor. Bow of Charlottesville, passed away the same weekend. Bow was active in radio operations on both sides of the Blue Ridge and was well known on the air. W4BOT our EC for Franklin Co D13 recommended that K1HEL be appointed to the position of OES. Richard's appointment has been approved. Congratulations K1HEL for volunteering to help out in this area. In District 1, NB3O reports that a new 10 meter district wide net has been established to aid in communicating within the five county jurisdiction. This net serves to link Virginia ARES/RACES members who would otherwise be cut off on VHF and UHF due to the mountainous terrain between counties in the northwest portion of the state. The net meets every Thursday at 2000 local time on or around 28.385MHz. All amateurs are welcome to check in. The Old Dominion Emergency Net schedule will be adding another session on or around 7243 kHz on the second Wednesday of every month starting at 1830 local time to suport daylight hour propagation. The regular sessions on 3947 kHz on the first and third Mondays at 1830 and the last Wednesday at 2045 local time remain unchanged. The 160 meter sessions will break for the summer and resume in October. DX ISI 73 d

WEST VIRGINIA: SM, O.N. (Olie) Rinehart, WD8V—STM: KC8CON. SEC: W8XF. ASEC: KA8ZOO. SGL: K8BS. TC: K8LG. OOC: N8OYY. ACC: WD8MKS. APRSC: W8XF. PIC: K8LG. OOC: N8OYY. ACC: WD8MKS. APRSC: W8XF. PIC: N8TMW. Hey time flies when you're getting old! Another month gone and we are back at keyboard. I see by the "Solid Copy", Monongalia Wireless, that the Special Olympics will be in Morgantown again in June, and Norene (fax 304-293-7257) and crew will sure be needing lots of assistance. I worked the Special Olympics when it was held in Huntington. I personally can tell you that it is a great public service and a rewarding experience you will never forget. Also note in the "Sine Waves," the Stonewall Jackson Amateur Radio Club that their training programs are going great and we can expect some new call signs for that area. Just finished with Charlotte and have the Charleston Hamfest next with the Beckley Hamfest the following weekend. So going to be quite a busy Hamfest season, hope to see you all on the circuit. Don't forget to check the new Field Day Rules on the Web site or in QST. 73. Tfc: KA8WNO 368, WD8DHC 213, W8YS 108, KC8CON 80, W8WWF 74, WD8V 68, WW8D 46, N8NMA 15, KC8OJN 11, N8FXH 10, N8BP 11. PSHR WD8V 219, W8YS 172, KC8CON 152, WD8DHC 128, KA8WNO 118, WW8D 79, N8NMA 30; WVFN 1161/186/28 KC8CON; WVMDN 746/38/28 WW8D

#### **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, K40CDN & Glenn Schultz, W0IJR. SGL: Mark Baker, KG0PA. TC: Bob Armstrong, AEOB. BM: Jerry Cassidy, N0MYY. Colorado Amateur Radio suffered a great loss when Joe White, K0CNV became a Silent Key on February



# FT-1000D Transceiver

tx: 160-10m rx: 100kHz-30MHz • 200w 100 mem.
 Dual receive
 Antenna tuner Dual bandpass filter • Temp. compensated crystal oscillator . 2.4kHz & 2kHz SSB filters, 500Hz CW crystal filter 6"h x 16"w Special @ \$379999 x 15"d 58 lbs FT-1000MP Advanced features • EDSP

Collins mech. filter.....Closeout \$219999 FT-1000MP MK V IDBT • VRF • Class A PA operation • 200W MOSFET final amp

• Integrated shuttle jog Spec © \$3099°°
FTV-1000 50MHz transverter for FT-1000MP MK V only...... \$89999



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HF & satellite • 100w HF/6m • 50w 2m/430 MHz . Crossband full duplex . Reg/reverse tracking . Satellite memory . DSP filters · Low noise VHF/UHF · Built-in preamp Shuttle jog • CW sidetone pitch control
 CTCSS/DCS enc/decode • Direct keypad entry • 1200/9600 bps Spec @ \$1499°



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# FT-100 Mini HF Transceiver

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FT-100D Above w/crystal filter, oscillator, CTCSS dec & spkr.....Special © \$99999 FT-100D/ATAS FT-100D & ATAS-100 motorized mobile ant. combo ... @ \$128998



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50/35w 2m/440 micro FM . Built-in CTCSS/ DCS enc/dec . Select. TX power . 186 mem. · Direct keypad freq. entry · DTMF · ADMS PC program. . Auto repeater shift . RF-lavel squelch . Program. front panel/mic key func. • 3.9"w x 1.2"h x 5.4"d.......Special \$379\*\*



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 RF squelch • 5.8"w x 1.9"h x 6.9"d \$449"9



# FT-8100R Dual Band Transceiver

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 . Special \$41999 5½"w x 1½"h x 6½"d



## FT-2600M 2m FM Transceiver

60w • 134-174MHz rcvr • 175 mem. • Built-in CTCSS/DCS enc/dec . Smart Search™ . Auto repeater shift . S-Meter squelch . Extensive menu . Key freq. entry from mic . 1200/9600 bps packet . Compact ......Special \$21999



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144-148MHz tx/137-174MHz rx • 50w • 1200/ 9600bps packet compatible • CTCSS enc/ decode • 130 mem. • 10 weather channels Special \$19999 Windows programm ......



FT-817 Backpack Transceiver
HF/VHF/UHF • 160-10M, 50MHz, 144MHz,
430-450MHz, Alaska emergency tx • 100kHz56MHz, 76-154MHz, 420-470MHz rx • 5/2.5/ 1.5/0.7w power output . DSP . USB/LSB/CW/ AM/FM/W-FM/AFSK/Packet/RTTY • Built-in CTCSS/DCS • 200 mem. • IF shift • Built-in noise blanker . VOX . Dual VFOs . Spectrum scope . SmartSearch auto load . ARTS · Auto repeater shift · Built-in CW keyer 5.31"w x 1.5"h x 6.5"d .......



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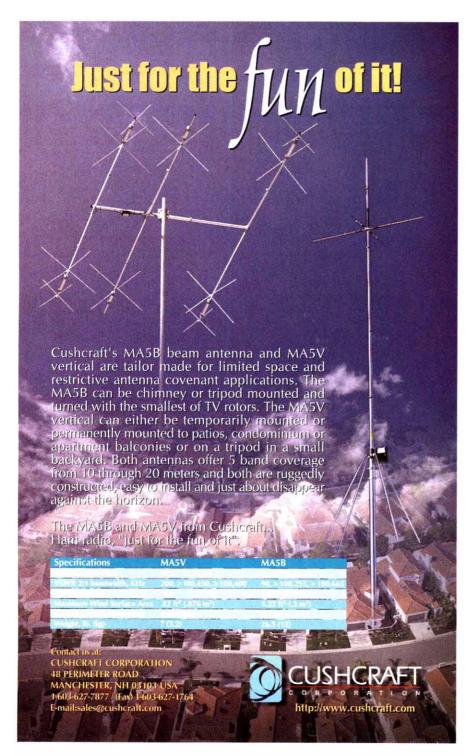
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Fuckmaster 6196 Jefferson Highway •Mineral, VA 23117 USA e-mail: info@buck.com 20, 2001. A long time fixture in Colorado, Joe was very active in emergency communications for over 30 years, served as a Red Cross communications for over 30 years, served as a Red Cross communicator and the Colorado State RACES officer. With a technical library to rival anyone, Joe could always be counted on to come up with an obscure technical manual or schematic and in the true spirit of Amateur Radio, Ioaned his materials free but for the price of return postage if you didn't want to drop by his shack. Our thoughts go out to his family. A final 73, Joe. You will be greatly missed. The ARA put on a good swap at Brighton: a good crowd and lots of vendors. Hope this is an indication that swapfests will be better attended then had been in 2000. 73, de NOWPA and de WBOTUB. I will not be running again for Colorado Section Manager and this will be my last term. Nominations are due in May and the new Section Manager takes office in October. 73, Tim. NTS 17c: KOTER 181, ADOA 129, WOZZS 82.CAWN: WOWPD 906, WOGGP 533, KOHBZ 472, WOLVI 425, WBOVET 388, K4ARM 381, NONMP 333, AAOZR 332, ABOPG 308, WBOTYT 225, WONCD 224, WDOCKP 174, KIOND 143, NODKK 82. WVN E 112/73/328 WSWWF; WVN L 95/41/28 WSWWF; SWOKTS, SWOKD 224, WDOCKP 174, KIOND 143, NODKK 82. WVN E 112/73/328 WSWWF; WVN L 95/41/28 WSWWF; WASSIN 86 WSUWY. WSWED 400, ACC: NSART. New Mexico Bordunner Net handled 118 msgs with 1367 checkins. New Mexico Breakfast Club handled 213 msgs with 362 checkins. Four Corners Net handled 25 msgs with 380 checkins. Four Corners Net handled 25 msgs with 380 checkins. Four Corners Net handled 25 msgs with 380 checkins. Four Corners Net handled 25 msgs with 380 checkins. Power Society of the supplied of

UTAH: SM, Mel Parkes, AC7CP—Well now that all the snow has gone, its time to be thinking about all those neat summer projects and events you have been waiting for! Get that new antenna project done or do the repair and maintenance now while the weather is good! In May, we have the annual Friendship Cruise on the Colorado and Green Rivers, if you have never attended let me know if you would like to help out or want more info. June, of course, is the ARRL Field Day. Make a commitment this year to participate even if you operate as a single station from your home. And finally, July is the Utah Hamfest. Register early to take advantage of the pre-registration and make your accommodation reservations now so you are not disappointed. Plan now to attend Utah Hamfest 2000 in July 13-15 at Ruby's Inn. For hamfest info and hotel or campsite reservations also see the Web site at http:\\www.utahhamfest.org. 73 de Mel, AC7CP.

WYOMING: SM Bob Williams, N7LKH— Inputs have been received from both the Gillette and the Rawlins clubs suggesting that there be a Wyoming QSO Party. The subject has been discussed on some of the nets. The time period suggested is sometime in late fall when propagation is well up. There is a fair amount of planning and coordination required to set this up. In OST, there are listed QSO Party plans/schedules for other organizations that could be used as a model. Some organization within the section should be named as the sponsor. The event is operated in the mode of a contest with criteria for scoring. We should plan to discuss this and get organized sometime during the Hamfest in May. Speaking of the Hamfest, this year it will have two things really new: first the Foxhunt and then the Home Brew contest. (In the case of the Home Brew, it is not to be liquid.) The Foxhunt will involve a forum followed later by an actual outside exercise. Tic: NNTA 291.

#### SOUTHEASTERN DIVISION

ALABAMA: SM, Bill Cleveland, KR4TZ — ASMs: W4XI WB4GM KB4KOY, SEC: W4NTI, STM: AC4CS. BM: KA4ZXL. OCC: WB4GM. SGL: KU4PY. ACC: KV4CX. TC: W4OZK. PIC: KA4MGE. The Birmingham ARC will have its hamfest on May 5 and 6 at the Zamora Temple. This year's hamfest will be the hamfest, contact Glenn Glass (KE4YZK) by phone at 205-681-5019 or by email at ke4yzk @bellsouth.net. You can also visit the BirminghAMFEST Web site at www.w4cue.com/fest.html. Please make plans to attend the ARRL Forum during the Birmingham Hamfest. In addition to covering some national ARRL topics, we'll continue with the Alabama Section's Emergency Plans. We'll also talk about net reports, and how to use the Alabama Section. Also, we'll talk about Field Day and begin plans for this year's Simulated Emergency Test. Speaking of Field Day, 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 email me a summary so that I can report them to the rest of the section. My e-mail address is kr4t2 @art.log. There is always something going on in our section, so please check out our Web site at www.kr4tz.org/al-arrl for more up-10-date news and information. God Bless & 73, Bill Cleveland, KR4TZ.

GEORGIA: SM: Sandy Donahue, W4RU—ASM/South Ga: Marshall Thigpen, W4IS. ASM/Legal: Jim Altman, W4UCK. Asst SM/IT: Mike Boatright, K04WX. SEC: Lowry Rouse, KM4Z. STM: Jim Hanna, AF4NS. SGL: Charles Griffin, W84UVW. BM: Eddie Kosobucki, K4JNL. ACC: Susan Swiderski, AF4FO. OOC: Mike Swiderski, K4HBI. TC: Fred Runkle, K4KAZ. PIC: Matt Cook, KG4CAA. Web site www.qsl.net/arrl-ga. My heartfelt thanks go out to those of you who sent cards and e-mails after the passing

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K2 160-10 m SSB/CW Transceiver: The K2's superior receive performance has made it a favorite for home station use (see QST review, March 2000). But its small size and low current drain make it an ideal portable station, especially when you add the internal ATU and internal 2.9-Ah battery. Starts at \$579. VISA

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Escuchas celebraron el GOTA en la Ciudad Deportiva Roberto Clemente. El PRARL operó la estación KP4ES por la cual las oniñas comunicaron con infinidad de países. Nuestras felicitaciones KP4WW operando en el ARRL-SSB Contest, logró 570,411 puntos en 10 mts. HP. NP3A operando NP3X logró 57,387 puntos en el ARRL-DX-CW en 80 mts. LP y 141,960 puntos en 10 mts. LP. Exhortamos a todos a participar en los concursos. El próximo mes termina la primera ronda de exámenes del ARRL/VEC en toda la isla. Fue exitosa y se examinó un promedio mucho mayor a cualquier otro ciclo. Ya examinio un promedio mucro mayor a cualquier of or cicio. Ya está programado el segundo ciclo que comienza el próximo mes. Ya está listo el primer seminario preparatorio para Observadores Oficiales ("OO") dentro del programa "Amateur Auxiliary". El mismo será por primera vez en la historia en español. La fecha y lugar se anunciará próximamente. Interesados comuníquense con el Section Manager por correo regular, teléfono o vía email a kp4pq@arrl.org. La FCC continúa la auditoria de sesiones de exámenes. Las mismas se extenderán por ahora hasta 1999. Hasta ahora nadie ha aprobado los re-exámenes exitosamente. SOUTHERN FLORIDA: SM, Phyllisan West, KA4FZI — Web page: http://www.sflarrl.org. Thanks to the Collier, Dade, Ft. Myers, Indian River, Orlando, South Brevard, Vero Beach, Wellington Clubs, and ECs for the newsletters and activity information. The South Brevard club has contacted REACT about joint working of public service events. Congrats to BEARS for the channel 13 TV publicity about COM II and the new 40-foot tower. SBARC's successful February event was the "Tiger Dash" for the Space Coast Runners Club. At their next meet-Dash for the Space Coast Hunner's Culto. At their next meeting, the Collier/Naples ARASWF will learn more about 2-meter DX by operating HSMS (High Speed Meteor Scatter) from Joe Goggin. (See Nov QST, p. 31) Dade County's Richard Vahan, N4PBF, became a Silent Key. He was truly an amazing man with high impact contributions to many organizations. One of his 3 published books involved working with Jacque Cousteau. He was especially active in the film industry. His ham radio activities included being Director of the South Florida FM Association, President of the Dade Radio Club of Miami, and

member of the Dade County Amateur Radio Public Service

of my Mother. It made a difficult time much easier. I apologize for missing the Dalton hamfest but her memorial service was that same weekend in Aiken, SC. The month of May brings us the Statesboro Hamfest May 19 at Ogeechee Tech. Two things make

this hamfest unique. Currently it is the only hamfest in Georgia that is south of I-20 and it is the same day as the Dayton Hamvention. So if you are skipping Dayton this year, head to Statesboro. I regret to note the passing of Wayne (Fuz) Tanner, W4IO, Ashburn, Ga. Fuz was well respected in the Coastal Plains

and Albany clubs, and he loved looking for grid squares on 6 meters. A team of RF sniffers led by OOC, K4HBI, DF'ed a paging system that had a spur causing interference on the 22/82 and 28/88 repeaters in Atlanta. The interference went away very quickly. Thanks Mike. I have received inquiries about lobbying

the state legislature to pass a state PRB-1 bill similar to the Federal PRB-1 bill that prevents governments from zoning antennas out of existence. My Asst SM/Legal, W4UCK, says that

tennas out of existence. My Asst SML/Egal, W4UCK, says tnat Georgia is the only state in the United States that prohibits the state legislature from any power of zoning matters. Only the 153 counties have that power. Unfortunately a state PRB-1 law in Georgia is not possible. 73, Sandy. Tfc Feb: AF4NS 255, WB4GGS 225, W4WXA 208, KE4R 123, K4BEH 92, K1FP 83

KG4FXG 71, K4WKT 69, KE4HHE 52, WU4C 47, W4AET 40,

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP-ACC:

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—ACC: WA4B. BM: N4GMU. OOC: KD4NLV. PIC: KF4HFC. SEC: WA4NDA. SGL: KC4N. STM: WX4H. TC: KO4TT. Packet: N4GMU. Our former SEC, George Thurston, W4MLE, is known as a pioneer in Florida broadcast journalism. The *Tallahassee Democrat* recently published an article on George as one of the pioneers of television reporting, said former Gov. Reubin Askew. "He was a role model of professionalism. He had an inpate sense of fairness even as he asked hiering questions."

innate sense of fairness even as he asked piercing questions." George, 75, is now ailing. Afflicted with tuberculosis as a teenager, he lost part of his lungs as a young man and suffered a curvature of the spine that gave him a distinctive tilted gait throughout his career. He endured heart bypass surgery five

years ago. He remains totally compos mentis. He recently completed a book about his great-grandfather, and continues to field questions about his specialties - amateur radio, broad-

casting, and North Florida Politics-from a comfortable chair in his home. George is unable to sit at his computer, but his wife

Maryjane checks his e-mail, and answers it for him. His address is w4mle@arrl.net, and gthurston@nettally.com. George enjoys hearing from his friends. I want to commend the Crown District issue of Balanced Modulator, W4IZ March-April issue

as it contains the Crown District ARES Plan. There should not

be an excuse or reason for not understanding the policies and procedures. Those of you needing to join or renew your mem-

bership in the League is now offered a five year membership plan. The fee is \$146, and for those 65 or older is \$122. This offer expires June 30, 2001. The month of February was a busy

one for me, as I was invited to speak at the Orlando Radio Club, and the Orlando HamCation. The Club meeting was well attended, and it was an honor for me, particular as several of the

NFL Staff are members of the Club. Ken Christenson, AF4ZI, is commended for his efforts involving the HamCation. The

Forum was somewhat different, as the various Staff presented topics of the area of their responsibility. Discussions on the role of the Districts and Section during disasters using the Northern Florida Section Emergency Plan as the guide of conducting operations. The FCC's Amateur Radio enforcement

ducting operations. The FCC's Amateur Radio enforcement effort, Special Counsel for Amateur Radio Enforcement Riley Hollingsworth, says "radio rage" could become a bigger danger to the future of Amateur Radio Interval Paragona to the future of Amateur Radio Interval Paragona to come back to aunt us if we don't just grow up. It will do the service in, if the ham community doesn't put a stopp to it." de 73 Rudy. Tfc: WX4H 1398, NR2F 389, KE4DNO 191, AF4PU 138, K8KV 102, K1JPG 91, WD4IIO 76, KB2EV 69, WB2FGL 60, KM4WC 51, N9MN 45, KB4DXN 44, KD4MH 40, KE4PRB 35, K4JTD 35, AB4PG 29, KF4WIJ 23, WX4H 22, KT4YM 17, MJAO 16, KB4CDR 15, WBAIGH 51, WDAGDB 14, KJ4HS 12.

N4JAQ 16, KB4CDR 15, W8IM 15, WD4GDB 14, KJ4HS 12, WA1VOD 12, WA4EYU 11 W4KIX 11, N4EC 9, WB9GIU 4.

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AF4PX 29, K4ZC 4

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# MFJ Speech Intelligibility Enhancer™ gave me back my Ham Radio hobby



"As I got older, my high frequency hearing loss was destroying my ham radio for me..."

 Martin F. Jue, K5FLU President and Founder MFJ Enterprises, Inc.

I know I'm not the only ham who can't understand

all the speech in a QSO caused by high frequency hearing loss. I developed a solution that I want to share with my fellow hams.

I almost gave up my ham radio hobby

I have been a passionate ham radio operator for over 40 years ever since I was a teenager. I loved every minute of it. Still do, but I almost had to give it up.

As I grew older (I'm 56 now) I found myself asking "What did you say?" so often it got downright embarrassing. I can hear pretty good most of the time. I just can't always understand what people are saying and my left ear is weaker than my right ear.

It got to where I was having trouble carrying on QSOs. I could hear, but I just couldn't quite make out all the words.

My hearing problem almost put a stop to my lifelong hobby.

There was no way I was going to give up ham radio . . .

#### Research showed me what to do

I searched the literature and spoke to hearing and speech experts.

According to their research on the intelligibility of speech in hearing English words:

1. The frequencies important for speech intelligibility are the consonant sounds from 500 to 4000 Hz. They contribute 83% of word intelligibility.

Frequencies from 500 to 1000 Hz contributes 35% of word intelligibility and 35% of sound energy.

Frequencies from 1000 to 4000 Hz contributes 48% of intelligibility but has only 4% of sound energy!

2. In contrast, frequencies from 125

to 500 Hz contributes 55% of sound energy

but only 4% to word intelligibility.

In other words, nearly half the speech intelligibility is contained in 1000 to 4000 Hz frequency range with only 4% of the speech sound energy.

On the other hand, the low frequencies 125 to 500 Hz have most of the speech energy but contribute very little to intelligibility.

## How I improved my ability to hear and understand OSOs

The research showed me what to do. First, drastically increase the speech energy above 500 Hz where 83% of intelligibility is concentrated.

**Second**, drastically reduce the speech energy below 500 Hz that contributes only 4% of intelligibility.

Amateur radio communications limit audio to about 300 to 2700 Hz.

I split the audio band into four overlapping octave ranges centered at 300, 600, 1200, 2400 Hz.

I could boost or cut each range by nearly 20 db to give me full control. This let me maximize speech intelligibility for most kinds of frequency loss.

My left ear is weaker than my right ear so I split the output audio into left and right channels with separate 2<sup>1</sup>/<sub>2</sub> watt amplifiers. A balance control lets me equalize the perceived loudness to each ear. Now both ears help in improving speech intelligibility!

#### I couldn't believe my ears!

I built one and hooked it to my rig.

I boosted the high frequencies, cut the low frequencies, set the volume and adjusted the balanced control so I could hear each side equally loud.

I couldn't believe my ears! Speech that I could hear but barely understand before was now highly understandable. I got my ham radio back!

With this concept, you'll understand QSOs better and enjoy ragchewing and contesting more, even if you don't have high frequency hearing loss.

It helped me so much I wanted to share this with my fellow hams

I developed this into an accessory that any ham can use.

I made it immune to RFI, added a front panel phone jack, on/off speaker switch, two selectable transceiver inputs, a bypass switch for in/out comparison and built it into 10Wx2½Hx6D inch aluminum enclosure. Needs 12 VDC.

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**Replace** your rig's audio section for superb audio. Eliminate hum, buzzes, poor frequency response, low audio power.

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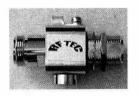
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Corps. He received awards for his support at the National Hurricane Center. He will be sorely missed by many. DX Club officers for the year include Pres. W2CQ, Vice Pres. W4/ YV5TDA, Sec. W4PJI, and Treas. K4WJ. We wish you all a successful year. Indian River reports that LISATS (Launch Information Service and Amateur Television System) made a big PR splash as they took to the causeway to introduce hundreds of people to ham radio. Lee Co enjoyed a week of great PR at the Thomas Edison Estate in Ft. Myers during the "Festival of Light." Hundreds of people came by, stopping to send radiograms or just watch the exciting HF Demo. N3PYQ, detailed the activation of Martin Co. ARES Saturday, March 3, in conjunction with a large fire in Southwestern Stuart. ARES opswere assigned to the EOC, Red Cross HQ, and a shelter as fifty homes were evacuated. David Smith, KE4UEI, made a big hit addressing classes at Murray Middle School on weather preparedness. Chris Hammock, KE4DUJ, EC of Osceola, reports that their emergency response team is growing and involved in Skywarn training. Palm Beach Co ARES (PBCARES) has added 5 members this month, is applying for ARRL Affiliation, and has procured a "club call sign," W4PBC. They are gearing up for the FAU Triathlon and March of dimes Walk-a-Thon in April. Kudos to Palm Beach's Ron Diego, W2DO, and Rick Watson, KF4FZN, of Cocoa Beach. Both were nominated for the ARRL Herb S. Brier Instructor of the Year Award. I'm puling for both of them! The Vero Beach group has been monitoring PRB-1 compliance as the Indian River board reviews their communication tower ordinance. No change at this time. Feb to by STM, Jan, KJAN: W7AMM 630, K4FQU 619, WASYND 591, KB4WBY 237, KA4FZI 198, WA4EIC 190, KC4ZHF 144, KD4GR 132, KJAN 98, KD4HGU 94, K34UOF 619, WASYND 591, KB4WBY 237, KA4FZI 198, WA4EIC 190, KG4ZHF 144, KG4GCH 24, W3JI 4, WA8EXA 2.

VIRGIN ISLANDS: SM, John Ellis NP2B, St. Croix— ASM: Drew, NP2E, St. Thomas. ASM: Mal, NP2L, St John, Sect. Internet Mgr. (SIM) Jeanette, NP2C, St. Croix. SEC: Duane, NP2CY, St. Thomas. PIC: Lou KV4JC, St. Croix. ACC: Debbie, NP2DJ, St. Thomas. NM, Bob, VP2VI/W0DX Tortola. Very sorry to report the passing of a good friend, active ham and expert sailor - Jerry Bourne, WB6RCN. St. Croix's triathlon is now a pre-qualifier for the "Ironman." The course is longer but more interesting. We will have a much more important role handling race communications since there are going to be a lot more contestants. St. Croix ARC getting active again, meetings quarterly on the days that exams are given. Check the 147.25 repeater for further information. Citing the service that hams have done for the marine community, the folks at Green Cay Marina are happy to provide St. Croix hams with a place to pick up their QSL cards. Go to the marina office, ask for the "QSL box" and your cards will be there, already sorted for you! If I do not already have your e-mail address, please send it to me, I am going to try and put out a monthly "e-letter". 73 all, John, NP2B.

WEST CENTRAL FLORIDA: SM, Dave Armbrust, AE4MR, ae4mr@arrl.org, http://www.wcfarrl.org—ASM: NA4AR. ASM Web: NAFK. ASM-Legal: K4LAW. BM: KE4WU. STM: AB4XK. SGL: KC4N. ACC: AC4MK. PIC: AB2V. SEC KD4E reports an increase of 69 ARES members for a new total of 403, 34 Nets, 17 Ops, 2 public service events and 896 total man hours for February. TC KT4WX reports the January-March 2001 issue of The Experimenter Newsletter has been published and is available on the Web page. AE4GB reports the Gulf Coast ARC is planning a fox hunt for March 10. N9AWP reports an Amateur Radio display and the County's 100' tower were setup at the Charlotte County Fair. Several new nets are underway on the K4WCF repeater system. The new net schedule is: WCF Nets: 7 PM 7:30 PM 8:30 PM 9 PM.

	0.00 0 .			
Monday	CW Net	-	Traffic	WCF Net
Tuesday	Traders	-	Traffic	Tech Net
Wednesday	Digital	-	Traffic	WCF Net
Thursday	SKYWARN	-	Traffic	YL Net
Friday	SSTV	-	Traffic	WCF Net
Saturday	_	-	Traffic	-
Sunday	_	WCF	Traffic	_

The K4WCF repeater frequencies are 145.430- MHz and 442.950+ MHz both with a 100 Hz tone. The Weekly WCF HF net will be at 8:30 PM on Sundays. February Net report and PSHR report is available on the Web page. Tfc: K4SCL 277, AB4KK 198, AD4IH 104, KT4PM 50, W4AUN 50, KF4KSN 33, K4RBR 28, KT4TD 19, AA4WJ 18, AE4MR 17, WB2LEZ 7, KF4OPT 3. 73, Dave, AE4MR.

#### SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford Hauser, KD6XH— By now you have heard of the ARRL dues increase. Yes, the ARRL board voted to increase dues to \$39.00 for regular membership and \$34.00 for seniors. This increase will take effect on 01 July 2001, so if you renew before this date you can get the old price. You can renew up to five (5) years at the old rate, but it must also be done prior to 01 July. Some more bad news. The Fort Tuthill hamfest, scheduled for 27-29 July, will cost you a dollar (\$1.00) entrance fee for the weekend. This move was necessary due to the increase cost of the grounds and rule change by the Coconino county board of Supervisors. Also the county campground in the back of the fairgrounds has removed the outside pay showers. The campground is in a remodeling mode so it will be about two (2) more years before this remodeling is complete. This effects only those people who are tent camping. The Spring Hamfest in Scottsdale came off without major problems. It rained on Friday night but when I arrived at 0630, the sky had broken olouds and no rain. The event was very well attended. The Arcadia High School ARC had a short QSO with the International space station on March 7th. This event was written up in the Arizona Republic. Robert St Clair, N7VVA, is now a silent key. Bob was very active as an EC for the Lake Havasu area and was an active participant/leader in the Solome flood recovery program last year. Our prayers go out to the family. The next hamfest is in Sierra Vista sponsored by the Cochise Amateur Radio Association on 05 May 2001. Talk-in will be on 146.76

# MFJ-989C Legal Limit Antenna Tuner MFJ uses super heavy duty components to make the world's finest legal limit tuner

MF.I uses super heavy duty components -- roller inductor, variable capacitors, antenna switch and balun -- to build the world's most popular high power antenna tuner.

The rugged world famous MFJ-989C handles 3 KW PEP SSB amplifier input power (1500 Watts PEP SSB output power). Covers 1.8 to 30 MHz, including MARS and WARC bands.

MFJ's AirCore™ roller inductor, new gear-driven turns counter and weighted spinner knob gives you exact inductance control for absolute minimum SWR.

cals, inverted vees, random wires, beams, mobile whips,



shortwave -- nearly any antenna. Use coax, random wire or balanced lines.

You get everything you've You can match dipoles, verti- ever wanted in a high power, full featured antenna tuner -- widest matching range, lighted Cross95 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 (103/4Wx41/2Hx15D in).



MF.J 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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## More hams use MF.I tuners than all other tuners in the world

#### MFJ-986 Two knob Differential-T™



MFJ-986 \$32995

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. 103/4Wx41/2Hx15 in.

#### MFJ-962D compact Tuner for Amps



MFJ-962D \$269°5 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 Ameritron's AL-811H! *AirCore*™ roller inductor, geardriven turns counter, pk/avg lighted Cross-Needle SWR/Wattmeter, antenna switch, balun, Lexan front, 1.8-30MHz. 103/4x41/2x107/8 in.

#### MFJ-969 300W Roller Inductor Tuner



MFI-969 Superb AirCore™ Roller \$199°5 Inductor tuning. Covers 6 Meters thru 160 Meters! 300 Watts PEP SSB. Active true peak reading lighted Cross-Needle SWR Wattmeter, ORM-Free PreTune™, antenna switch, dummy load, 4:1 balun, Lexan front panel. 31/2Hx101/2Wx91/2D inches.

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#### MFJ-941E super value Tuner

The most for your money! Handles 300 Watts PEP, covers 1.8-30 MHz, lighted Cross-Needle SWR/ MFJ-941E

Wattmeter, 8 position antenna switch, 4:1 balun, 1000 volt capacitors, Lexan front panel. Sleek 10<sup>1</sup>/<sub>2</sub>Wx2<sup>1</sup>/<sub>2</sub>Hx7D in.

#### MFJ-945E HF+6 Meter mobile Tuner

Extends your mobile antenna bandwidth so you don't have to stop, go outside and adjust your antenna. Tiny 8x2x6 in. Lighted Cross-Needle SWR/Wattmeter. Lamp and bypass switches. Covers 1.8-30 MHz and 6 Meters. 300 Watts PEP. MFJ-20, \$4.95, mobile mount.

#### MFJ-971 portable/QRP Tuner

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 6x61/2x21/2 inches.

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#### MFJ-906/903 6 Meter Tuners

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Handles 100 W FM, 200W SSB. MFJ-903, \$49.95, Like MFJ-906,

less SWR/Wattmeter, bypass switch. MFJ-921/924 VHF/UHF Tuners

MF.J-921 covers 2 Meters/220 MHz.

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MHz. SWR/Wattmeter. 8x21/2x3 inches. Simple 2-knob tuning for mobile or base

#### MFJ-922 144/440 MHz Tuner

Ultra tiny 4x2<sup>1</sup>/<sub>2</sub>x1<sup>1</sup>/<sub>4</sub> inch tuner covers VHF 136-175 MHz and UHF 420-460 MHz. SWR/ Wattmeter reads 60/150 Watts.



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(PL 162). The Arizona web site is alive and doing well. Tom Fagan, WB7NXH, has developed this web site for the Arizona section and is always providing new material and updating it every day. The address is "www.qsl.net\arrlaz\". At this time it has the recent club listings, hamfest information, the Arizona volunteer listings, and several links to other clubs and special web sites. As this web site progresses, we will add more items of interest, to include the list of volunteers. If you have questions or ideas on how to improve this Web site, contact Tom at wb7nxh@arrl.net or myself. The 2001 ARRL SW Convention will be in Riverside at the Holiday Inn. Starts reserving this time slot and make the necessary arrangements before you forget. just finished making my reservations at the hotel and sent in the convention necessary paperwork. If I am not at home when you call, please leave a message and I will return your call as soon as possible. 73, Clifford Hauser, KD6XH. ATEN 89 QNI; 49 QTC 28 Sess. Tfc: K7VVC 1022, W7EP90, WA4JCK 18, W7DQX 7.

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF – The regular meeting of the Los Angeles Area Council of Amateur Radio Clubs (LAACARC) was held on the first Tuesday of March at the Red Cross Center in downtown LA. Member clubs should assign a club delegate who will and can attend these important meetings. Club membership is only ten dollars per year. This is not very much for the benefits available; even for those families with eight or ten clubs assigned to family members. Spud, K6KH, now has a new vanity club call sign, for his railroad club. Now, Spud and the Tucker family have something in common. – Our ACC, Bill Leslie, WA6POK, has a large collection of ARRL tapes suitable for club programs. These tapes were purchased by the LAACARC, for member club use. Please give Bill a call or an e-mail. See our Web site at www.qsl.net/arrlsw/lax for Bill's information as well as other good general information. Many good reports are coming in about the ARRL headquarters web site. Our section Web site is linked to the Division web site and ARRL Headquarters. If is linked to the Division we site and AHAL Headquarters. If you can't find the information on any of our Web sites try www.google.com. It is really great, even for such things as specific ham radio questions or your family genealogy. You could be surprised at the information that they have and how fast their service provides answers. Archie, W6LPJ, has agreed to take pictures at the next meeting so your picture can be on the new LAACARC Web site. www.qsl.net/laacarc/. Our second language, CW, the universal one, is still alive and active, try it you might like it. VY 73 DE W6BF, Phineas.

ORANGE: SM, Joe Brown, W6UBQ, 909-687-8394. ASM Riv Co OHANGE: SM, Joe Brown, WSUBQ, 1997-887-8394. ASM HIV CO-Brett, 790-346-9291. ASM Orange Co: Art, W6XD, 714-556-4396. ASM SB Co: Jeff, KD6NXD 909-886-3453. Tfc: W6JPH 271, KC6SKK 266, W6QZ 127. Digital tite: W6QZ NTSBBS 281 PSHR: W6QZ 158, KC6SKK 140, W6JPH 130. SCN/V NM re-ports 20 sessions, ONI 138. QTC 99 avg time 17 mins. New ORS Arnold, K6IU. From the Circle City Communicator de Norman, KN6CV. Amateur community take note. Greetings fellow ama-reurs. As the threat of a California power blackout homes over us teurs. As the threat of a California power blackout looms over us. I wonder how many of us are prepared to support a major disas-ter. In the past when an emergency occurred, most of us relied on access to commercial power in addition to our main backup battery supply. But what happens to our emergency power sources when there is no commercial power? If we take steps now, we can ensure that we will be able to keep our stations up and running in the event of a major catastrophe during our watch. First, we can make sure our existing batteries are maintained and will perform when called upon. Solar panels, batteries and a controller will keep you running on a limited basis if the weather is favorable. Emergency power generators are a good source of alternate power, but how long has it been since the generator was started, and is there adequate fuel to run the generator for several days? Another thing we can do to stay on the air longer is to practice our emergency communications training skills. The factors that determine how long our batteries will support the operation are power and duration. So, if we remember to keep the power adjusted as low as possible to maintain communications and if we remember to keep our transmissions short, we will be able to stay on the air much longer.

SAN DIFGO: SM. Tuck Miller, NZ6T-619-475-7333, April showers bring May flowers, which brings.... June Field Day activities. Field Day, always the last full weekend of June falls on the weekend of June 23 and 24th. If you have never worked Field Day, you have no idea what you are missing. It is not supposed to be a contest, but rather an exercise in emergency preparedness. It is a time when club members get together, set up portable antennas, radios, generators, and stoves. Public service, how long has it been since you have volunteered some of your time, and maybe equipment for a public service activity?

In ARES, and I am sure RACES as well, we are always looking for folks to lend a hand, and help out. Ken, WA6BCC, has a large Special Olympic event coming up in June, which he will need about 25 operators on a Saturday. Please send him an e-mail to wa6bcc-1@juno.com and let him know you are interthon race called the Lost Boys. If you would like to help out on this one, you can send Walt an e-mail at wa6odq@arrl.net. Many thanks go out to George Roos, KO6BU. He is one person I know that reads this article every month. But to be serious, George recently resigned as chairman of SANDARC. George has been chairman for at least 6 years, if not more. George, we can not than you enough. New officers are Mike, N6OPH, as chair, Jack WB6AXW as Vice Chair, Frank WA6YWC as Secretary, and Joe, KM6EK, stays on as Treasurer. Sign up for the members only Web site for the League, and get a weekly newsletter from the SM. Traffic: KT6A 1354, KD6YJB 319, KF6YVQ 55, K06BU2, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KO6BU3, WA6IIK 1 BPL: KT6A 1354 PSHR: KT6A 142, KD6YJB 3 KD6Y KD6YJB 52, KO6BU 26.

SANTA BARBARA: SM, Robert Griffin, K6YR (k6yr@arrl.org or k6yr@arrl.net)—SEC: Jack Hunter, KD6HHG (kd6hhg@arrl.net). STM: Ed Shaw, KF6SHU (kf6shu@arrl.net). SGL: Paul Lonnquist, NS6V (paul@dock.net). C, Michael Atmore, KE6DKU (ke6dku@aol.com). OOC: Howard Coleman, N6VDV (N6VDV@arrl.net). PIC: Jeff Reinhardt, AA6JR (jreinh@ix.netcom.com). TC: Warren Glenn, KM6RZ (wglennrz@ix.netcom.com). ASMs: Ventura, Don Milbury, W6YN (w6yn@arrl.net); San Luis Obisipo, Bill Palmerston, K6BWJ, (bpalmers @fix.net) & for Internet, Jack Bankson, AD6AD (ad6ad@arrl.net); & DECs: Santa Barb-Dave Lamb, WA6BRW (wa6brw@ MFJ 1.8-170 MHz SWR Analyzer™ Reads complex impedance . . . Super easy-to-use

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arrl.net); SLO-Bill Peirce, KE6FKS (ke6fks@arrl.net) & Ven-Dave Gilmore, AA6VH (aa6vh@arrl .net). ARES leadership changes: Bob Alberti, W6TTX, as new No. SLO EC; Fred, N8SLP, as new No. SB EC. The Section has been privileged to have the volunteer services of of Mary, KF6BNC, and Bill, K6BWJ, as devoted ECs for these areas. Making plans for 2001 SW Div Conv, Sept 7-9 in Riverside, CA? Contact: w6ybs@arrl.net. FREE instant Section news updates? Join the SB Reflector! E-mail majordomo@qth.net the message subscribe arrisb. SB Sec Web: www.qsl.net/arrisb/. Join in our Section NTS 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) & 449.300-(131.8). That's 30! Rob, K6YR, Section Mgr.

#### WEST GULF DIVISION

NORTH TEXAS: SM, Larry Melby, KA5TXL—I would like to thank Don Mathis, KB5YAM, for his service as SM. He has been very helpful with the transition and will remain as a part of my staff. Bob Jones, W5BJ, and the folks out in Garland put on their 27th annual Skywarn school recently, and it was well on their 2/th annual Skywam school recently, and it was well attended by the local RACES/ARES folks. If you haven't been to one try to make one in your area. There will be one at HamCom again this year. One thing that every ham in Texas needs to do is check the status of three bills in the state legislator. They are HB 1148 (which places some difficult requirements on antenna installation and although we have been given assurances that there will be a wavier for hams. It is not in the bill yet) HB 1492 which would require all towers between 50 and 200 feet to be painted and install lights. And the last one HB 2722 would allow disabled hams to received disabled license plates with their call sign on them. Please check out www.capitol.state.tx.us and let your state legislators know how you feel on these issues. Tfc: KC5OZT 372, N5JZ 232, W5AYX 146, K5NHJ 93, KB5TCH 70, KC5VLW 62, WA5I 49, AC5Z 13, KD5HLV 5, N8QVT 1. 73 de KA5TXL

OKLAHOMA: SM, Charlie Calhoun, K5TTT—ASMs: N6CL, W6CL, W5ZTN. SEC: KA7GLA. ACC: KB5BOB. PIC: N7XYO. OOC: WB9VMY. SGL: W5NZS. STM: K5KXL. There's a new OUC: WB9VMY, SGL: WSNZS, STM: RSNXL. There's a new call above. I would like to let you know that Mark Conklin, N7XYO, has taken over the reigns as our PIC. Mark has gotten us some great publicity in the state since becoming a PIO. I would like to thank Tom Webb, WA9AFM, our former PIC, for his many years of service. Tom was an invaluable asset to us during many disasters, especially the OKC Bombing incident. Unfortunately his real job has required more of his time recently. The OKC Autopatch Assoc. and ARES provided communications for the inaugural Oklahoma City Memorial Marathon on April 29. the inaugural Oklahoma City Memorial Marathon on April 29. The Choctaw ARC recently conducted a foxhunt using GPS units. This was a training exercise put together by Dave Downing WD5G. 5 teams participated and had to proceed to four different locations using only map coordinates. Bill Crossland, N9SQV, reports that the event was a great success. I really enjoyed getting to see many of you in Elk City. I understand attendance was down unfortunately, but everyone attending had a good time. They also had VE testing available. Field Day is coming upon us quickly. Please send me your FD schedules as I am starting to put my trip together. Maybe I'll visit your site. Be sure to read the rules this year, bonus point scoring has changed abit. See if you can get a local government or agency official to visit your site for extra points. That's it for now. 73, Charlie. Tfc: KF5A 626, WB5NKD 443, WA5OUV 384, KK5GY 336, N5IKN 302, WB5NKC 232, KESJE 200, W5REC 25, K5KXL 130, KI5LQ 91, KM5VA 88, WA5IMO 54.

SOUTH TEXAS: SM, Ray Taylor, N5NAV—ASMs: KS5V, N5WSW, W5GKH, K5DG, NSLYG, WA5UZB, KK5CA, KSEJL, W5ZX, WA5TUM, KB5AWM, WA5JYK, K5PFE, K5PNV, and K5SBU. STM: W5GKH. SEC: W5ZX. ACC: N5WSW. TC: KJ5YN. BM: W5KLV. OOC: AK5Z. SGL: K5PNV. A lot has happened since my last SM News. We have been assured that HB-1148 and HB-1492 will exempt ham radio towers. Thanks to lim Haynip. David Woolweaver the SGL of South and North to Jim Haynie, David Woolweaver, the SGLs of South and North Texas, ARRL HQ, and all those that wrote letters. The SGLs are keeping a close eye on these bills to be sure the wording is added to exempt ham towers, if they should ever make it to committee. Should we need hams to represent us in the hearing, we should have plenty of notice. HB-2723 is also one we should stand behind. Basically it states that handicapped hams will be able to have their call sign on their license plate indicating they are handicapped. I noticed a lot of the new general class hams are using the older tube type rigs, like the Swans, Drakes, Tempo 1, and etc. Don't know if someone shared their older equipment with them or sold them at a price they could afford, what ever the case, if you shared with them and got them on the air, that's worth more than any amount of money, just for the satisfaction that you helped some get on the air for the first time. They will never forget. They will also learn there is more to operating than just pushing a button. Thanks to Tom Hadden and his club, they have been keeping me informed of their advancements in AMSAT. Very interesting. I had a long distance call from KD5MUI, a new ham, in response to my welcome to ham radio radiogram. He is interested in getting his general. He is very handicapped, but with the help of his wife he hopes to be on HF soon. Here is a chance for clubs to help he hopes to be on HF soon. Here is a chance for clubs to help get his antennas in the air. Thanks to W5SEG, W5TUK, and K0YNW for getting this message through. It seems that every time I write my SM News, we have bad weather. We've had some damage last night and this morning. I want to thank those who go to the weather station. Now is the time to get a 5-year membership in ARRL at a very reduced price before the cost goes up on July 1, 2001. Have a good May. Tic: W5SEG 2949, W5TUK 180, W5GKH 130, W5KLV 126, N5OUJ 96, K0YNW 88, N5NAV 87, W5ZX 83, W5ZIN 45, WSCU 34, KD5GM 16.

WEST TEXAS: SM, Clay Emert, K5TRW—Com provided by Big Bend & San Angelo ARCs using solar power repeater saved the day for 800+ riders registered for the 35-mile cross country bike race in the Big Bend. The medic's repeater was down due to ice storm. BBARC 20 & SAARC 14 ops. Camp HF station sent traffic to WG Dir. NSOK on 7290 net & NSDO worked over 50 countries in the ABPL CW DV sentent during over 1 Anglose Mapsh VE in the ARRL CW DX contest during event. Abilene's March VE Session yields 5 new hams and 1 upgrade. El Paso's Trans Mountain Challenge for Heart Assn. West TX Repeater Assn. supplied 28 operators for the 20K, 2000 percipient event

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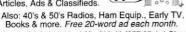
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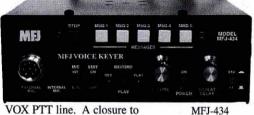
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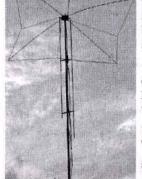
It's easy to tune because adjusting one band has minimum effect on the resonant frequencies of

Self-supporting and just 20 feet tall, the MFJ-1798 mounts easily from ground level to tower top -- small lots, backyards, apartments, condos, roofs, tower mounts.

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Separate full size quarter wave radiators are used on 20, 17, 15, 12, 10 and 2 Meters. On 6 Meters, the 17 Meter radiator becomes a 3/4 wave radiator.

The active radiator works as a stub to decouple everything



MFJ-1798

beyond it. In phase antenna current flows in all parallel

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on these low bands.

**Tuning** to your favorite part of these bands is simple and is done at the bottom of the antenna.

No Ground or Radials Needed

You don't need a ground or radials because an effective counterpoise that's 12 feet across gives you excellent ground isolation.

You can mount it from ground level to roof top and get awesome performance.

No Feedline Radiation to Waste Power

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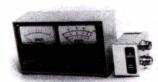
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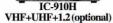




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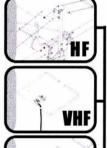
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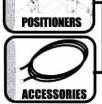
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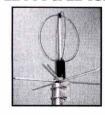






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R	RG8 MINI(X)95% BRAID UV RESISTANT JACKET 2.0dB/875 WATTS	3 @ 30MHz	.18/FT	.16/FT	.14/FT
R	RG58/U 95% BRAID UV RESISTANT JACKET 2.5dB/400 WATTS@ :	30MHz	.18/FT	.16/FT	.14/FT
R	RG58A/U STRD CENTER 95% TC BRD UV RESISTANT JKT 2.6dB/3	350 WATTS @ 30MHz	.19/FT	.17/FT	.15/FT
R	RG214/U STRD SC 2 95% BRD NC/DB/UV JKT 1.2dB/1800WATTS	@ 30MHz	.25FT/UP	1.75/F	Γ.
R	RG142/U SOLID SCCS 2-95% SILVER BRAIDS Teflor® JKT 8.2dB/1	100WATTS @ 400MHz	25FT/UP	1.75/FT	

COA	X (75 OHM GROUP)	100FT/UP	500FT	1000FT
RG11/U STRD BC (VP-66%) 95% BRAID NO	/DB/UV JKT 1.3dB/1000WATTS	.44/FT	.42/FT	.40/FT
RG6/U CATV FOAM 18GA CW FOIL + 60%	ALUM BRAID	.20/FT	.13/FT	.11/FT
RG6/U CATV FOAM 18GA CW FOIL QUAD	SHIELD	.25/FT	.18/FT	.16/FT

ROTOR & CONTROL CABLES	100FT/UP	500FT	1000FT
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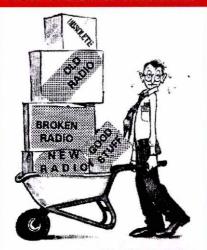






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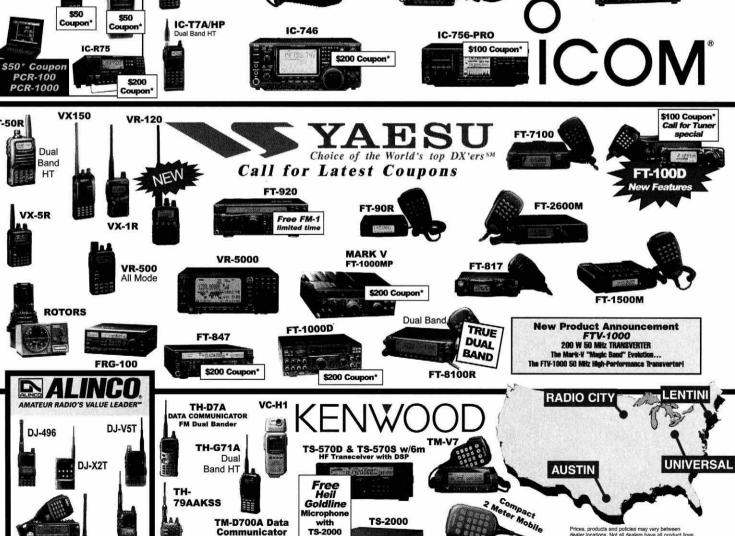
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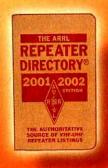
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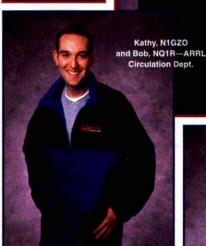
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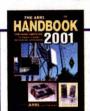
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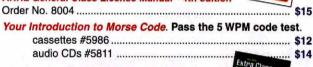
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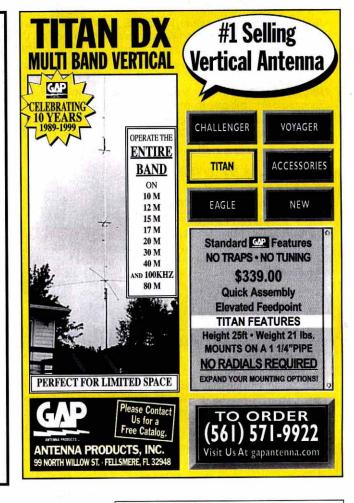
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Eagle DX	
Titan DX	\$329
Eagle/Titan Guy Kit	\$29
Voyager DX	\$409
Voyager Counterpoise	\$49
Voyager Guy Kit	\$45
Quicktilt Mount	\$75
Please Call for Delivery Inform	nation

#### **CUSHCRAFT ANTENNAS**

X7/X740	\$679/229
XM240	\$719
R6000/R8	\$319/469
A50-3S/5S/6S	\$95/159/259
AR2/ARX2B	
AR270/AR270B	\$85/99
ARX270N/ARX-450B	\$219/65
13B2/17B2	\$139/249
26B2	\$389
A270-6S/A270-10S	\$75/99
Please call for more Co	ushcraft items

M2 VHF/UHF ANTENNAS
144-148 MHz
2M4/2M7/2M9 \$89/109/119
2M12/2M5WL \$149/189
2M5-440XP, 2m/70cm \$159
420-450 MHz
440-470-5W/420-450-11 . \$129/89
432-9WL/432-13WL \$169/219
440-18/440-21ATV \$119/139
Satellite Antennas

#### 436CP30/436CP42UG .... \$219/259 M2 ANTENNAS

2MCP14/2MCP22...... \$169/219

50-54 MHz	
6M5X/6M7JHV	\$199/239
6M2WLC/6M2.5WLC	\$419/449
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-ple	ase cal

#### MFJ ANTENNAS

259B, Antenna Analyzer	\$219
269, Antenna Analyzer	
941E, 300W Antenna Tuner	\$109
945E, 300W Antenna Tuner	\$99
949E, 300W Antenna Tuner	\$139
969, 300W Antenna Tuner	\$169
986, 3kW Antenna Tuner	\$289
989C, 3 kW Antenna Tuner	\$309
1796, 40/20/15/10/6/2m Vert	\$189
1798, 80-2m Vertical	\$249
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#### LAKEVIEW HAMSTICKS

length, 2:1	typical	VSW	'R \$	24.95
All handle				
9112 12m	9120	20m	9175 .	75m
9110 10m	9117	17m	9140 .	40m
9106 6m	9115	15m	9130 .	30m

#### **HUSTLER ANTENNAS**

4BTV/5BTV/6BTV	\$149/189/209
G6-270R, 2m/70cm V	ertical \$169
G6-144B/G7-144B	\$129/179
<b>Hustler Resonators</b>	in stock-cal

#### **FORCE 12-MULTIBAND**

C3	10/12/15/17/20m, 7 el \$599
C3E	10/12/15/17/20m, 8 el \$649
C3S	10/12/15/17/20m, 6 el \$539
C3SS	10/12/15/17/20m, 6 el \$559
C4	10/12/15/17/20/40m, 8 el . \$759
C4S	10/12/15/17/20/40m, 7 el . \$679
C4SXL	10/12/15/17/20/40m, 8 el . \$979
	10/12/15/17/20/40m, 9 el \$1119
C19XR	10/15/20m, 11 el \$959
C31XR	10/15/20m, 14 el \$1299
Please	call for more Force 12 items

#### ROHN TOWER

25G/45G/55G	\$89/189/239
AS25G/AS455G	\$39/89
GA25GD/45/55	\$68/89/115
GAR30/GAS604	\$35/24
SB25G/45/55	\$39/89/109
TB3/TB4	\$85/99
HBX32/HBX40	\$349/439
HBX48/HBX56	\$589/699
HDBX40/HDBX48	\$549/699
BXB5/6/7-8	\$39/49/59/59
Please call for mo	

#### GLEN MARTIN ENGINEERING

Hazer Elevators for 25G	
H2, Aluminum Hazer, 12 sq ft \$3	59
H3, Aluminum Hazer, 8 sq ft \$2	
H4, HD Steel Hazer, 16 sq ft \$3	

M.	RT424, 4 Foot, 6 sq ft \$159	9
	RT832, 8 Foot, 8 sq ft \$229	g
ğ	RT936, 9 Foot, 18 sq ft \$389	8
	RT1832, 17 Foot, 12 sq ft \$499	
	Please call for Glen Martin info	c

#### COAX CABLE

RG-213/U, (#8267 Equiv.)	\$.36/ft
RG-8X, Mini RG-8 Foam	\$.19/ft
RG-213/U Jumpers Plea	ase Call
RG-8X Jumpers Plea	
Please call for more coax/con	nectors

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LMR-400 Ultraflex	\$.89/ft
LMR-600	\$1.19/ft
LMR600 Ultraflex	\$1.95/ft

M2 OR-2800PDC	\$1099
Yaesu G-450A	\$249
Yaesu G-800SA/DXA	. \$329/409
Yaesu G-1000DXA	\$499
Yaesu G-2800SDX	\$1089
Yaesu G-550/G-5500	. \$299/599

R61 (#20)/R62 (#18)	. \$.28/32
R81/R82	\$.25/.39
R83/R84	\$.52/.85

#### TRYLON "TITAN" TOWERS SELF-SUPPORTING STEEL TOWERS

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T200-72	72', 15 square feet \$1299
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T200-88	88', 15 square feet \$1769
T200-96	96', 15 square feet \$2049
T300-88	88', 22 square feet \$1989
T400-80	80', 34 square feet \$1939
T500-72	72', 45 square feet \$1879
T600-64	64', 60 square feet \$1799
Many mo	ore Trylon towers in stock!

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MA770/MA850	\$2359/3729
TMM433SS/HD	\$1139/1379
TMM541SS	\$1499
TX438/TX455	\$1069/1599
TX472/TX489	\$2649/4599
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Tower for your r	eeds. Shipped
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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'	\$869/1289
35-30'/40'	\$979/1509
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load capacity. P	lease call for more
Universal models. All are shipped	
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#### **TOWER HARDWARE**

3/8"EE / EJ Turnbuckle	\$11/12
1/2"x9"EE / EJ Tumbuckle	\$16/17
1/2"x12"EE / EJ Tumbuckle	\$18/19
3/16" / 1/4" Preformed Grips	\$5/6
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5 FTx .12" / .18"	\$45/75
10 FT x .12" / 10 FT x .18"	\$75/125
15 FT x .12" / 15 FT x .18"	\$105/175
20 FT x .12" / 20 FT x .18"	\$135/225
10 FT x '25" / 20 FT x 25"	\$175/335

#### PHILYSTRAN GUY CABLE

HPTG1200I \$.45/ft
HPTG2100I\$.59/ft
PLP2738 Big Grip (2100) \$6.00
HPTG40001 \$.89/ft
PLP2739 Big Grip (4000) \$8.50
HPTG6700I\$1.29/ft
PLP2755 Big Grip (6700) \$12.00
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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 .....lcom 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-756 PRO ..... 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 MARK-V ...... New!

Competition class HF transceiver with DSP, auto tuner, 200W output, and more!

Great competition class HF XCVR with dual RX, auto tuner, and 200W output.

#### FT-920 ..... Yaesu Special!

Nice all mode HF/6m transceiver with DSP, automatic tuner, and more.

#### Quadra System ... Lower Price!

Solid state 1 kW amplifier with auto tuner. No-tune HF and 6moperation!



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The Yaesu FT-847 is an all mode transceiver covering HF/6m/2m/70cm! The radio is perfect for satellite operation. Features digital signal processing, built-in RS-232 interface, built-in CTCSS tone encode/decode module, optional ATAS-100 mobile screwdriver type antenna, and more. Supplied with an up/down hand mic and DC power cord.

#### FT-840 ..... Great Low Price!

Great entry level HF XCVR featuring built-in CTCSS tone encode, noise blanker, IF shift, 100 memories and more. With hand mic and DC power cord.



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 ..... Great Low Price!

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.....lcom 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-910H ..... New, In Stock!

The IC-910H is a dual band 2m/70cm all mode XCVR with true dual band operation, featuring dual data jacks, optional 23cm band module, optional DSP, and more.



Ultracompact 2m/70cm mobile XCVR with removeable face, extended RX, and more.

#### FT-7100M..... New, Please Call!

Great 2m/70cm dual band mobile, 45/35 Watts, removable front panel, and more!

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Rugged 2m mobile with intermod free RX.



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Ultra-compact all mode XCVR for HF/6m/ 2m/70cm. Features DSP, CW keyer, tone encode/decode, 200 memories, VOX, and more. Supplied with a DTMF hand mic, power cord and mounting bracket.

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A truly tiny self-contained all mode HF/ 6m/2m/70cm QRP XCVR featuring DSP, tone encode/decode, 200 memories, VOX, and more! Supplied with a hand mic, DC power cord and duck antenna.



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Great 2m/70cm dual band mobile XCVR with CTCSS tone encode/decode, 182 memories, removable face, and more.

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Rugged 2m mobile XCVR at a great price.

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IC-R2	
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#### G-2800SDX ..... \$1089

Heavy duty antenna rotator handles 34 sq. ft. of antenna load, and features 450° rotation, preset and variable speed.

G-1000DXA	\$499
G-800SA/DXA	
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G-5500	
G-550	



#### VX-5R..... Now In Stock!

Tiny 6m/2m/70cm HT, with CTCSS tone encode/decode/scan, long life Lithium-Ion battery pack, extended RX, and more.

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AV-190 "	NG	M, III	OLUUK:

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# A New Dual-Band Engineering Milestone: Introducing the Dual Band Mobile for the 21st Century's Active Ham!

The Yaesu Engineering Team has done it again! The exciting new FT-7100M Dual Band Mobile brings you the ruggedness and operating ease of our single-band mobiles, and the convenience of remote-head mounting capability (optional YSK-7100 Separation Kit required), in an all-new 144/430 MHz Dual Band design!

Providing 50 Watts of power output on 2 meters, and 35 Watts on 70 cm, the FT-7100M has power to spare when you're in a fringe area. For repeater access or selective simplex calling, you get built-in encoder-decoder circuits providing 50 CTCSS tones and 104 DCS (Digital Code Squelch) codes. And the FT-7100M's huge 262-channel Memory System lets you store up to six Alpha-Numeric characters, for easy channel

Operation of the FT-7100M is simple and straightforward, with separate Volume and Squelch controls for each band during dual-band reception, and eight single-function front panel keys provide the easy feature access you need during mobile operation. What's more, you also get three user-definable keys on the microphone to use for important control functions.

Rugged, reliable, and versatile, the FT-7100M provides the highest cost-performance available among Dual Band FM Mobiles. See your Yaesu Dealer today for a test drive!

#### **FEATURES**

- Frequency Range: TX 144-148, 430-450 MHz RX 108-137 MHz (AM), 137-180 MHz, 320-480 MHz, 810-999.99 MHz (Cellular blocked)

  • VHF/UHF, VHF/VHF, and UHF/UHF Dual Receive
- operation\*
- Channel Steps: 5/10/12.5/15/20/25/50 kHz/step
- Power Output: 50 Watts (144 MHz)
   35 Watts (430 MHz)
   Power Amplifier Type: 2SK3478 Power MOS FET
- Efficient Cooling System: Direct-flow heat-sink and thermostatically-controlled fan
- 262 Memory Channels: 120 "regular" memories, 5 pairs of band limit memories, and one "HOME" channel on each band
- Alpha-Numeric Memory Labels: 6 Characters on lower display field, 5 Characters on upper
   Smart Search™ Automatic Memory Loading

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- 50 CTCSS Encode/Decode Tones
- 104 DCS Encode/Decode Codes
- CTCSS and DCS Search
   ARTS™ (Auto-Range
- Transponder System)
- **Automatic Repeater** Shift (ARS)

- DTMF Microphone (U.S. version): Includes 16-memory Auto-dialer, and Direct Frequency
- Band Scanning, Band-Limit Scanning, and Memory Scanning
- Three Priority Channel Modes: VFO, Memory, and Home Channel Priority
- RF Squelch: Opens at user-defined signal level
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- Automatic Power-Off (APO)
- 1200/9600 bps Packet Compatible
- Battery Voltage Meter

- Compact Size: 5.8" x 1.9" x 6.9" WHD
  Large (0.9" x 2.3") Liquid Crystal Display
  Cloning Capability: To other FT-7100M Transceivers
  Optional YSK-7100 Separation Kit

Simultaneous reception on two different Frequencies, in-band or Cross-Band. Cross-band Repeater Function not available.

- Optional CT-39A Packet Cable

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FT-7100M

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