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QST

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AMATEUR RADIO

April 2002

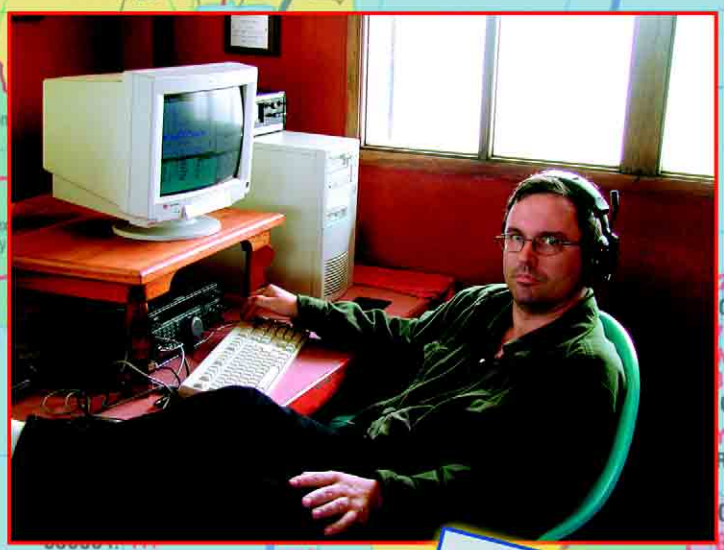
QST reviews

Alinco DJ-X2000 scanning receiver

A low-frequency "upconverter"

Amateur Radio and 9/11 —Update

Multiband HF loops



View of HC8N to the North

6-Meter DXing from the Galapagos

"The PCR1000 has something to intrigue and satisfy everyone. This is a fun product." – QST, 7/98

IC-PCR1000 The original black box

The IC-PCR1000 turns your PC into a Wide Band Receiver! Compatible with most PCs and laptops*, the 'PCR1000 connects externally— in minutes! Choose from three different onscreen interfaces tailored to suit your needs, whether beginner or pro.

- 100 kHz – 1.3 GHz†
- AM, FM, WFM, USB, LSB, CW
- Unlimited Memory Channels
- Real Time Band Scope
- IF Shift
- Noise Blanker
- Digital AFC
- Voice Scan Control ("VSC" when activated, stops only on modulated signals)
- Attenuator
- Tunable Bandpass Filters
- AGC Function
- S Meter Squelch
- CTCSS Tone Squelch
- Large Selection of Tuning Steps and Scans
- External Speaker Level Control
- Optional DSP

computer not included
**Windows 3.1/95 only*

IC-R75 Pull out the weak signals

The IC-R75 covers a wide frequency range allowing you to listen in to a world of information. With innovative features like twin passband tuning, synchronous AM detection, DSP capabilites, remote PC control and more. Shortwave listening is easier than ever. All this comes in a compact, lightweight package that can be conveniently used in your ham shack, den or car.

- 30 kHz - 60.0 MHz
- AM, FM, S-AM, USB, LSB, CW, RTTY
- 101 Alphanumeric Memory Channels
- Twin Passband Tuning (PBT)
- Commercial Grade
- Synchronous AM Detection (S-AM)
- Optional DSP with Auto Notch Filter
- Triple Conversion
- Up to Two Optional Filters
- Front Mounted Speaker
- Large Display
- Well Spaced Keys and Dials
- PC Remote Control with ICOM Software for Windows® (RSR75)

"A versatile HF/6-meter receiver that offers a good measure of performance in a compact package. All mode capability for the ham and utility listeners and synchronous AM for the SWLs should make the IC-R75 a popular choice for a wide variety of radio enthusiasts." – QST, 1/00

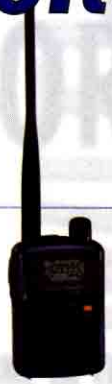
TUNE IN THE WORLD WITH ICOM

IC-R8500 The expert's choice

ICOM technology brings you super wide band, all mode coverage from HF to 2GHz, including shortwave and VHF/UHF, while maintaining a constant receive sensitivity. The IC-R8500 is not simply a scanner - it's a professional quality communications receiver with versatile features from high speed scanning to computer control.

- 100 kHz - 2.0 GHz†
- AM, FM, WFM, USB, LSB, CW
- 1000 Aphanumeric Memories
- Commercial Grade
- IF Shift
- Noise Blanker
- Audio Peak Filter (APF)
- Selectable AGC Time Constant
- Digital Direct Synthesis (DDS)
- RS-232C Port for PC Remote Control with ICOM Software for Windows®

"If you want a receiver that is both a superior world band radio and a solid scanner, the new ICOM IC-R8500 is the best choice."
– Passport to World Band Radio, 1998



IC-R2

Excellent audio, tiny package

The 'R2's compact size, only 2 1/4" wide by 3 3/8" high by 1" thick, allows you to have a "world of listening" in the palm of your hand. Large internal speaker delivers loud, clear audio - so you can hear everything.

- 500 kHz – 1.3 GHz†
- AM, FM, WFM
- 400 memory channels
- CTCSS Decode
- Easy Band Switching
- Priority Watch
- MIL SPEC 810C/D/E
- Weather Resistant
- Includes 2 AA Ni-Cds & Charger.

"The IC-R3 communications receiver is more than just another scanner. With live video reception of broadcast and amateur television, and short range RF based video systems, Icom has opened up a new frontier for the progressive wide spectrum scanner enthusiast."
– QST, 2/01

IC-R3

See & hear all the action

Wide tuning range allows you to see and hear the excitement behind the scenes. Large easy to read color display for frequency settings and video reception.

- 500 kHz – 2.45 GHz†
- AM, FM, WFM, AM-TV, FM-TV
- 450 Alphanumeric Memories
- CTCSS with Tone Scan
- 4 Level Attenuator
- Telescoping Antenna with BNC Connector
- 2" Color TFT Display with Video/Audio Output
- Lithium Ion Power

IC-R10

Advanced performance

With the 'R10 you can tune in the world where ever you go. With a Real-time bandscope and Voice Scan Control to make it easy to find all the action.

- 500 kHz – 1.3 GHz†
- AM, FM, WFM, USB, LSB, CW
- 1000 Alphanumeric Memories
- Attenuator
- Alphanumeric Backlit Display
- VSC (Voice Scan Control)
- 7 Different Scan Modes
- Beginner Mode
- Band Scope
- Includes AA Ni-Cds & Charger

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New IC-U8000

75W
OUTPUT POWER!

Power when you need it!

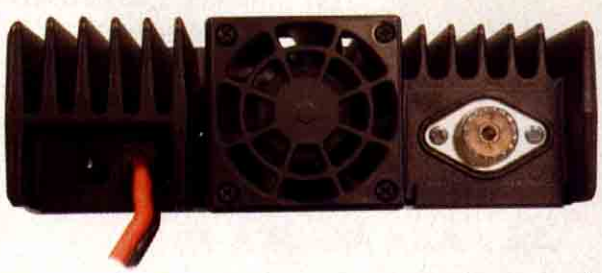
75 Watts of output power! With ICOM's new IC-V8000 you can reach that mountain top, punch through that urban canyon - talk and be heard further! The combination of the 'V8000's one piece die-cast aluminum chassis and 75W of transmit power gives you the most powerful 2M moble in its class. But thats not all. We've added features like Weather Alert and Weather Channel Scan (first time in an amateur radio); 207 Alphanumeric Memory Channels; Remote Control Mic; ICOM's exclusive DMS Scan System; and much more. Pick up a 'V8000 and let your signal be heard! Coming soon to your authorized ICOM dealer.

IC-U8000. Power to punch through.

2M • 75W • Weather Alert • CTCSS/DTCS • FM Narrow Mode • 207 Alphanumeric Memory Channels • Remote Control Mic • Dynamic Memory Scan • DTMF Encode • 10dB Squelch Attenuator • Priority Watch • Versatile Cloning • Front Firing Speaker • Rugged Construction

IC-U8000 Features

- **75W OF OUTPUT POWER.** The most powerful 2M mobile in its class. Your signal will get through!
- **WEATHER ALERT SCAN.** A first for amateur radio! The weather alert function keeps you informed of any weather emergencies, so you can respond fast.
- **CTCSS AND DTCS OPERATION STANDARD.** Get onto the repeater fast! 104x2 DTCS and 50 CTCSS codes gain you quick repeater access and eliminate unrelated chatter. With pocket beep and tone scan.
- **207 MEMORY CHANNELS.** A total of 207 alphanumeric memory channels including 1 call channel and 6 scan edges. Each memory channel stores 6 character name, tone frequency, skip info, and more.
- **HM-133V REMOTE CONTROL MICROPHONE.** Control everything from the palm of your hand! ICOM's exclusive "Hot Keys" lets you program the features that you use the most. Bigger backlit keys allow you to operate in low light conditions.
- **DYNAMIC MEMORY SCAN (DMS).** ICOM's exclusive DMS system gives you flexibility to customize and manage your memory banks like no other 2M mobile ever offered.
- **DTMF ENCODE AND OPTIONAL PAGER FUNCTION.** 10 DTMF memory channels with up to 24 digit DTMF codes can be used to control other equipment. Optional UT-108 DTMF decoder provides code squelch and pager functions.
- **VERSATILE CLONING.** Clone from transceiver to transceiver or PC to transceiver.
- **FRONT FIRING SPEAKER.** Front mounted speaker provides crisp, clear audio when on the move.



RUGGED CONSTRUCTION. The one piece die-cast aluminum chassis ensures reliable operation against shock and vibrations. A large cooling fan on the back keeps the internal components cool and allows you to operate in even the harshest environments.

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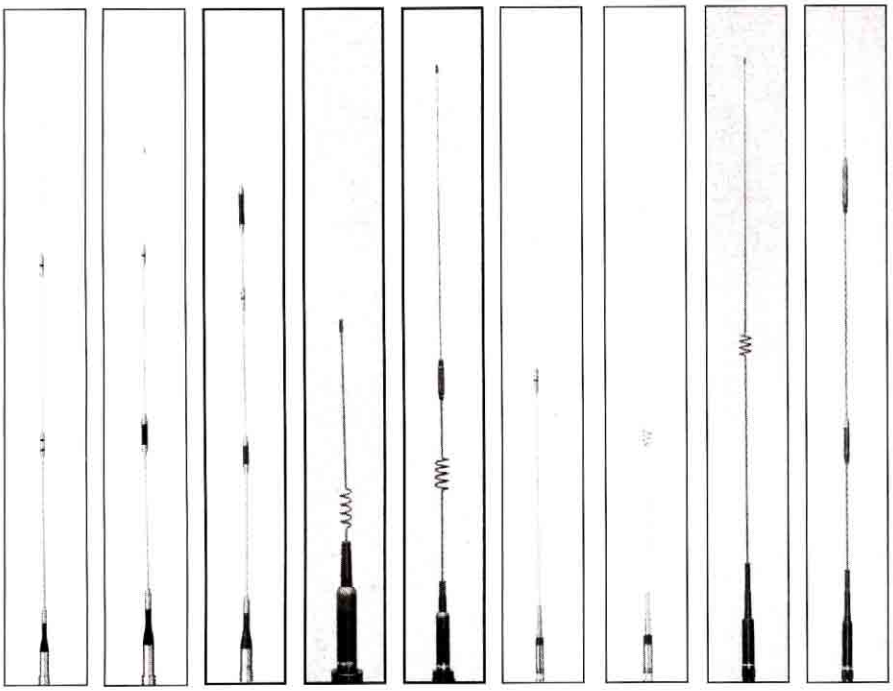


SG2000HD | SG7500A SG7500NMO | SG7900A | NR72BNMO | NR73BNMO | NR2C | NR770HA NR770HB | NR770HNMO NR770HBNMO | CR627B CR627BNMO

HV7A Mobile Antenna System

For New HF/VHF transceivers (Such as: IC706 series and FT100) NEW!

Optional Loading Coils

HVC7	40m
HVC14	20m
HVC18	17m
HVC21	15m

Recommended Antenna Mounts: K400C or K600M

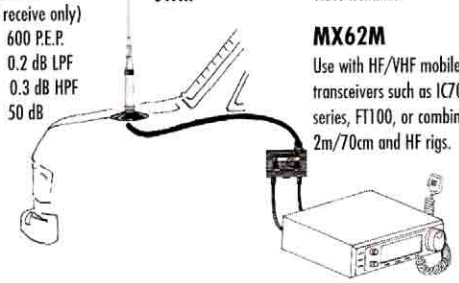
MX62M Duplexer

Specifications:
HF/6m & 2m/70cm bands
1.6-56 MHz LPF
76–470 MHz HPF
(76–120 receive only)

Watts:	600 P.E.P.
Loss:	0.2 dB LPF
	0.3 dB HPF
Isol.:	50 dB

The NEW HV7A has 5 band capability: 70cm, 2m, 6m, and 2 HF bands through use of loading coils. Foldover feature allows for easy access into low overhead buildings. Ideal for users of IC706 series and FT100 radios.

Bands Supplied:	10m/6m/2m/70cm
Opt. Loading Coils:	40m/20m/17m/15m
Power, P.E.P.:	HF 120w/VHF 200w
Mount Connection:	UHF
Length:	54"
SWR:	1.5:1 nominal



MX62M

Use with HF/VHF mobile transceivers such as IC706 series, FT100, or combine 2m/70cm and HF rigs.

SPECIAL FEATURES:

- Factory pre-tuned/no adjustment
- Highest Performance antennas
- NMO and UHF (PO) base styles
- 24 Kt gold plated connector pin
- No grounding required unless noted
- Fold-over feature on most models

FOLD-OVER

Patented One-Touch Fold-over Feature
(Not available on NR72BNMO, NR73BNMO, & NR770SA.)

MODEL	BAND (MHz)	WATTS	CONN.	HT. IN.	ELEMENT PHASING
NR72BNMO*[6]	2m/70cm	100	NMO	13.8	1/4λ, 1/2λ
NR73BNMO	2m/70cm	100	NMO	33.5	1/2λ, 1-5/8λ
NR770HA[7]	2m/70cm	200	UHF	40.2	1/2λ, 2-5/8λ
NR770HNMO[8]	2m/70cm	200	NMO	38.2	1/2λ, 2-5/8λ
NR770RA	2m/70cm	200	UHF	38.6	1/2λ, 2-5/8λ
SG7000A*[6]	2m/70cm	100	UHF	18.5	1/4λ, 6/8λ
SG7500A	2m/70cm	150	UHF	40.6	1/2λ, 2-5/8λ
SG7500NMO	2m/70cm	150	NMO	41.0	1/2λ, 2-5/8λ
SG7900A*	2m/70cm	150	UHF	62.2	7/8λ, 3-5/8λ

MODEL	BAND (MHz)	WATTS	CONN.	HT. IN.	ELEMENT PHASING
NR2C	2m	150	UHF	55.5	1/2λ+1/4λ
SG2000HD*	2m	250	UHF	62.6	1/2λ+3/8λ
SG6000NMO*[6,9]	6m	150	NMO	39	1/4λ
CR224A*[6]	2m/1-1/4m	150	UHF	68.5	7/8λ, 2-5/8λ
CR320A*[6]	2m/1-1/4m 70cm	200 100/200	UHF	37.4	1/4λ, 1/2λ 2-5/8λ
CR627B*[6,9]	6m/2m/	120	UHF	60	1/4λ, 1/2+1/4λ/
CR627BNMO*[6,9]	70cm	120	NMO	60	2-5/8λ

1/4λ rated in dBi.

* Not recommended for Magnet Mount
6 Grounding required.
7 NR770HB same specifications but in black finish.
8 NR770HBNMO same specifications but in black finish.
9 52-54MHz only

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News and Features

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QST Workbench

28

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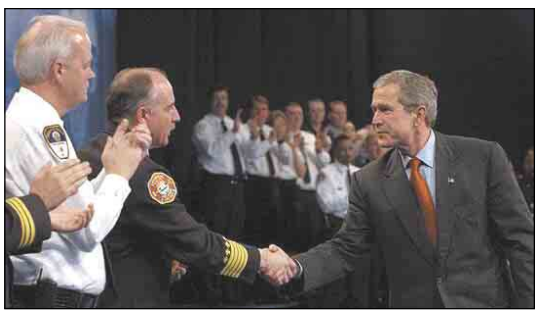

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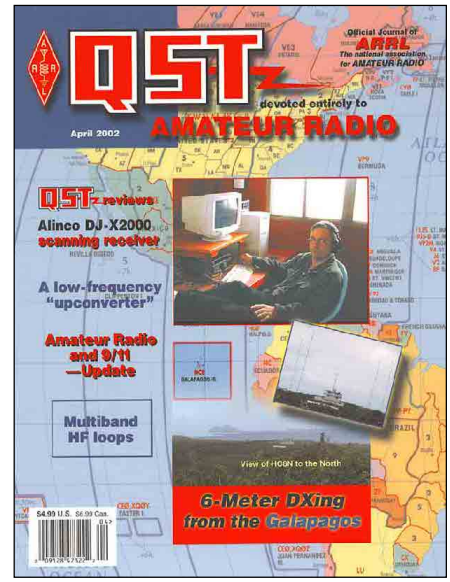
Operating

Departments



Our Cover:

It was quite a 6-meter season, and no one knows it better than the HC8N crew. Their 50-MHz effort from the Galapagos brought them more than 3000 QSOs in 11 days last November—with a 50-W transceiver. That's Trey Garlough, N5KO, at the HC8N 6-meter station. The article begins on page 51. There's more on the outstanding 6-meter season in "It Seems to Us" on page 9.

US & Possessions: Membership in the ARRL, including a one year subscription to *QST*, is available to individuals at $39. Age 65 and over, with proof of age, $34. Licensed radio amateurs age 21 and under and the eldest licensee in the household may qualify for the rate of $20. Life Membership, including a subscription to *QST* is available at $975.* Age 65 and over, $850.* Membership and *QST* cannot be separated. Fifty percent of dues is allocated to *QST*, the balance for membership. Subscription rate for libraries and institutions is $39 per year. Single copies $5.

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Back in 1973, Kenwood introduced the first affordable HF radio to the world, the legendary TS-520. Today 27 years later, the Kenwood TS-570DG HF and the TS-570SG with 6 Meters are by far the most popular HF and HF+6 transceivers on the market. The truth is that Kenwood has built and sold more HF Amateur radios than any other RF product manufacturer...ever! In 27 years, there have been several advancements in Amateur radio: solid state circuits, digital displays for quicker and more accurate tuning, built-in tuner, and Digital Signal Processing (DSP) for cleaner signals unheard of with the TS-520. Ask any experienced Ham which HF radios have the best audio...the answer has always been Kenwood! Whether a CW contester, DX chaser, or a new upgraded General Class Amateur, Kenwood has an HF radio for you. Don't be fooled by big boxes, high price tags, complex operation, and broken promises of performance.

Time marches on and your friends at Kenwood continue to build outstanding products with unparalleled performance and great value. It's not too late to own an "HF Legend," because we are still building them today.

TS-50S Compact Mobile

TS-870S 100% Digital IF DSP

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All hy-gain multi-band vertical antennas are entirely self supporting -- no guys required.

They offer remarkable DX performance with their extremely low angle of radiation and omnidirectional pattern.

All handle 1500 Watts PEP SSB, have low SWR, automatic bandswitching (except AV-18VS) and include a 12-inch heavy duty mast support bracket (except AV-18HT).

Heavy duty, slotted, tapered swaged, aircraft quality aluminum tubing with full circumference compression clamps is used for radiators. Includes all stainless steel hardware. Recessed SO-239 prevents moisture damage. Hy-gain verticals go up easily with just hand tools and their cost is surprisingly low. Two year limited warranty.

AV-18HT, $739.95. (10, 12, 15, 20, 40, 80 Meters, 160 Meters optional). 53 ft., 114 lbs. **Standing** 53 feet tall, the famous *Hy-Gain HyTower* is the world's best performing vertical! The AV-18HT features automatic band selection achieved through a unique stub-decoupling system which effectively isolates various sections of the antenna so that an electrical 1/4 wavelength (or odd multiple of a 1/4 wavelength) exists on all bands.

Approximately 250 kHz bandwidth at 2:1 VSWR on 80 Meters. With the addition of a base loading coil (LC-160Q, $99.95), it also provides exceptional 160 Meter performance.

The 24 foot tower is all rugged, hot-dip galvanized steel and all hardware is iridited for corrosion resistance. Special tilt-over hinged base for easy raising and lowering.

AV-14AVQ, $159.95. (10,15,20,40 Meters). 18 ft., 9 lbs. The Hy-Gain AV-14AVQ uses the same trap design as the famous Hy-Gain Thunderbird beams. Three separate air dielectric Hy-Q traps with oversize coils give superb stability and 1/4 wave resonance on all bands. Roof mount with Hy-Gain AV-14RMQ kit, $79.95.

AV-12AVQ, $114.95. (10, 15, 20 Meters). 13 ft., 9 lbs. The AV-12AVQ also uses Thunderbird beam design air dielectric traps for extremely Hy-Q performance. This is the way to go for inexpensive tri-band performance in limited space. Roof mount with AV-14RMQ kit, $79.95.

AV-18VS, $74.95. (10,12,15,17,20,30,40,80 Meters). 18 ft., 4 lbs. High quality construction and low cost make the AV-18VS an exceptional value. Easily tuned to any band by adjusting feed point at the base loading coil. Roof mount with Hy-Gain AV-14RMQ kit, $79.95.

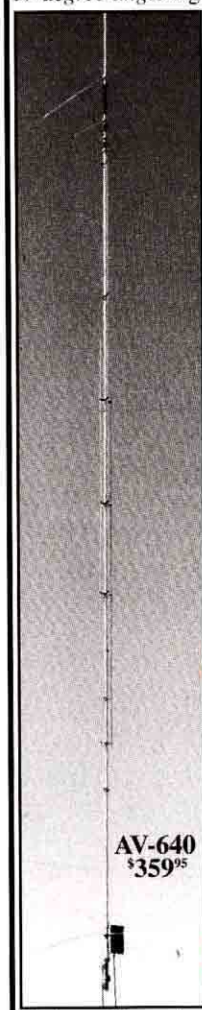
DX-88, $349.95. (10, 12, 15,17,20,30,40,80 Meters, 160 Meters optional). 25 ft., 18 lbs. All bands are *easily* tuned with the DX-88's *exclusive* adjustable capacitors. 80 and 40 Meters can even be tuned from the ground without having to lower the antenna. Super heavy-duty construction. DX-88 OPTIONS: 160 Meter add-on kit, KIT-160-88, $179.95. Ground Radial System, GRK-88, $81.95. Roof Radial System, RRK-88, $89.95.

DX-77A, $429.95. (10, 12, 15, 17, 20, 30, 40 Meters). 29 ft., 25 lbs. *No ground radials required!* Off-center-fed Windom has 55% greater bandwidth than competitive verticals. Heavy-duty tiltable base. Each band independently tunable.

Model #	Price	Bands	Max Power	Height	Weight	Wind Surv.	Rec. Mast
AV-18HT	$739.95	10,15,20,40,80	1500 W PEP	53 feet	114 pounds	75 MPH	------
AV-14AVQ	**$159.95**	**10,15,20,40**	**1500 W PEP**	**18 feet**	**9 pounds**	**80 MPH**	**1.5-1.625"**
AV-12AVQ	$114.95	10/15/20 M	1500 W PEP	13 feet	9 pounds	80 MPH	1.5-1.625"
AV-18VS	**$74.95**	**10 - 80 M**	**1500 W PEP**	**18 feet**	**4 pounds**	**80 MPH**	**1.5-1.625"**
DX-88	$349.95	10 - 40 M	1500 W PEP	25 feet	18 pounds	75 mph no guy	1.5-1.625"
DX-77A	**$429.95**	**10 - 80 M**	**1500 W PEP**	**29 feet**	**25 pounds**	**60 mph no guy**	**1.5-1.625"**

hy-gain® PATRIOT

Hy-Gain's new **PATRIOT** HF verticals are the best built, best performing and best priced multiband verticals available today. For exciting DX make full use of your sunspot cycle with the **PATRIOT's** *low 17 degree angle* signal.



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Effective counterpoise replaces radials and ground.

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High wind survival of 80 mph. Broadband matching unit made from all *Teflon®* insulated wire. Aircraft quality aluminum tubing, stainless steel hardware.

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Two year limited warranty. All replacement parts in stock.

AV-640, $359.95. (6,10,12, 15,17,20,30,40 Meters). 25.5 ft., 17.5 lbs. The AV-640 uses quarter wave stubs on 6, 10, 12 and 17 meters and efficient end loading coil and capacity hats on 15, 20, 30 and 40 meters -- no traps. Resonators are placed in parallel not in series. End loading of the lower HF bands allows efficient operation with a manageable antenna height.

AV-620, $269.95. (6,10,12,15,17,20 Meters). 22.5 ft., 10.5 lbs. The AV-620 covers all bands 6 through 20 Meters with no traps, no coils, no radials yielding an uncompromised signal across all bands.

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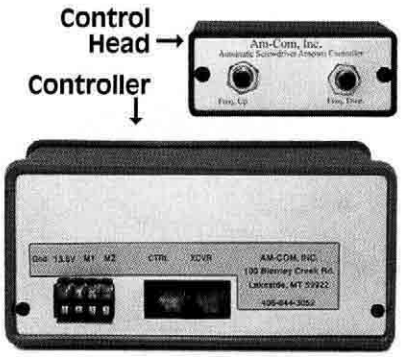

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"IT SEEMS TO US..."

A Season To Remember

This time last year the faithful denizens of the 50-MHz band were lamenting their ill fortune. Solar Cycle 23 had peaked, it appeared, without providing much in the way of 6-meter DX. There is no one who is more knowledgeable about propagation in this part of the radio spectrum than "World Above 50 MHz" columnist Emil Pocock, W3EP. In his May 2001 column Emil observed, "We have undoubtedly seen the best of Cycle 23 and must prepare for the slow cycle downward."

Sometimes it's good to be wrong. We now know that the 2001-2002 season was the most spectacular in the history of the 6-meter band. It is possible that more DX was worked on this band, by more amateurs, between mid-October and late January than had ever been worked before. Cycle 23 turned out to have a double peak in solar activity, and the second peak was worthy of Sir Edmund Hillary.

A purist might argue that conditions *have* been better in the past. The highest sunspot activity ever recorded was at the peak of Cycle 19 in the winter of 1957-58. Incredible DX was worked at that time by stations running a few watts of AM, with lower and smaller antennas than are common today. Cycle 20 was a bit of a bust, but the next two offered their share of ionospheric excitement. So, what was so special about what we just experienced?

Four things made this second peak of Cycle 23 uniquely memorable for amateurs who enjoy exploring the vagaries of ionospheric propagation. First, as noted earlier it was unexpected, like a victory by an underdog or sparkling sunshine when rain was predicted. We tend to savor life's pleasant surprises.

Second and more important, amateurs are permitted to operate on 6 meters in far more countries than in the past. The band dates only to the end of World War II, when the old 5-meter band was moved down by 6 MHz to accommodate the new demand for television channels. Amateur 50-MHz signals spanned the Atlantic as early as 1946 but the first contacts had to be crossband, with the Europeans transmitting on 10 meters and listening on 6, because 6 meters was in a European television channel. Eventually a few experimental licenses were issued and two-ways were accomplished in 1947, but they were few and far between. Amateurs on the Pacific side were more fortunate; 6 meters was widely available, albeit with some national restrictions in countries such as Australia and New Zealand. The first Worked All Continents awards were earned by Californians. More licenses were issued to European amateurs for the 1957-58 peak, but just a few countries were represented. This remained the situation through the 1979-81 peak, with crossband work still the rule rather than the exception.

Things began to change dramatically for the better for European amateurs in the 1980s. Despite the absence of an amateur 50-MHz allocation in the international Table of Frequency Allocations for ITU Region 1 (except in a few southern African countries), patient effort by our European colleagues working through the European Conference of Postal and Telecommunications Administrations (CEPT) has yielded what is known as a European Common Allocation (ECA) of 50-52 MHz on a secondary basis. This arrangement has been implemented by most European countries and is responsible for the happy state of affairs we now enjoy, with lots of activity whenever the band is open to Europe. Things may get even better. A footnote in the ECA Table reads, "CEPT administrations are urged to take all practical steps to clear the band 47-68 MHz of assignments to the broadcasting service." Eventually the only restrictions on amateur use of the 50-52 MHz band in Europe may be those necessary to protect military requirements.

The third contributor to the success of Cycle 23 is the widespread availability of good equipment. Multimode transceivers covering 6 meters used to be rare; now they are common. When word began to get around that 6 was open and it looked as if it would remain so for a while, literally thousands of amateurs who had never seriously considered using the band came out of the woodwork. They soon discovered that it was possible to work DX while using practically anything for an antenna. Sure, the greatest accomplishments tended to be made by the best equipped stations and the most experienced operators, but there was plenty to go around.

Finally, it helps that television interference is no longer the problem that it once was. Cable and satellite have greatly reduced the number of us who have to worry about interfering with the marginal signal our neighbors are receiving over the air from a distant Channel 2 TV transmitter. New interference challenges abound, but at least this one is generally under control.

As these words are being written in late February the excitement is dying down. There's still an occasional band opening, but nothing like we were seeing in November and December. Will we let the 6-meter band go back to sleep until Cycle 24? Shame on us if we do. The band can spring alive almost any time, but we'll never know it if no one is listening—or transmitting. Thanks go to the beacon operators as well as to the regulars who, between openings, keep 6 meters warm for the rest of us!

—David Sumner, K1ZZ

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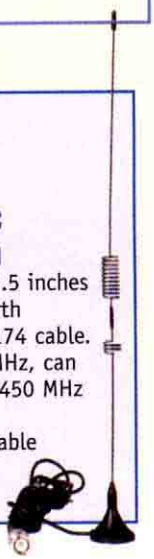

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Santa Clara Valley	Glenn Thomas, WB6W, 502 Walnut Dr, Milpitas, CA 95035-4133 (408-263-9450); **wb6w@arrl.org**

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Virginia	Carl Clements, W4CAC, 4405 Wake Forest Rd, Portsmouth, VA 23703 (757-484-0569); **w4cac@arrl.org**
West Virginia	Hal L. Turley, KC8FS, 657 Forest Circle, S Charleston, WV 25303 (304-744-5949); **kc8fs@arrl.org**

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Utah	Mel Parkes, AC7CP, 2166 E 2100 North, Layton, UT 84040 (801-547-1753); **ac7cp@arrl.org**
Wyoming	Robert Williams, N7LKH, PO Box 130, Wapiti, WY 82450 (307-527-7758); **n7lkh@arrl.org**

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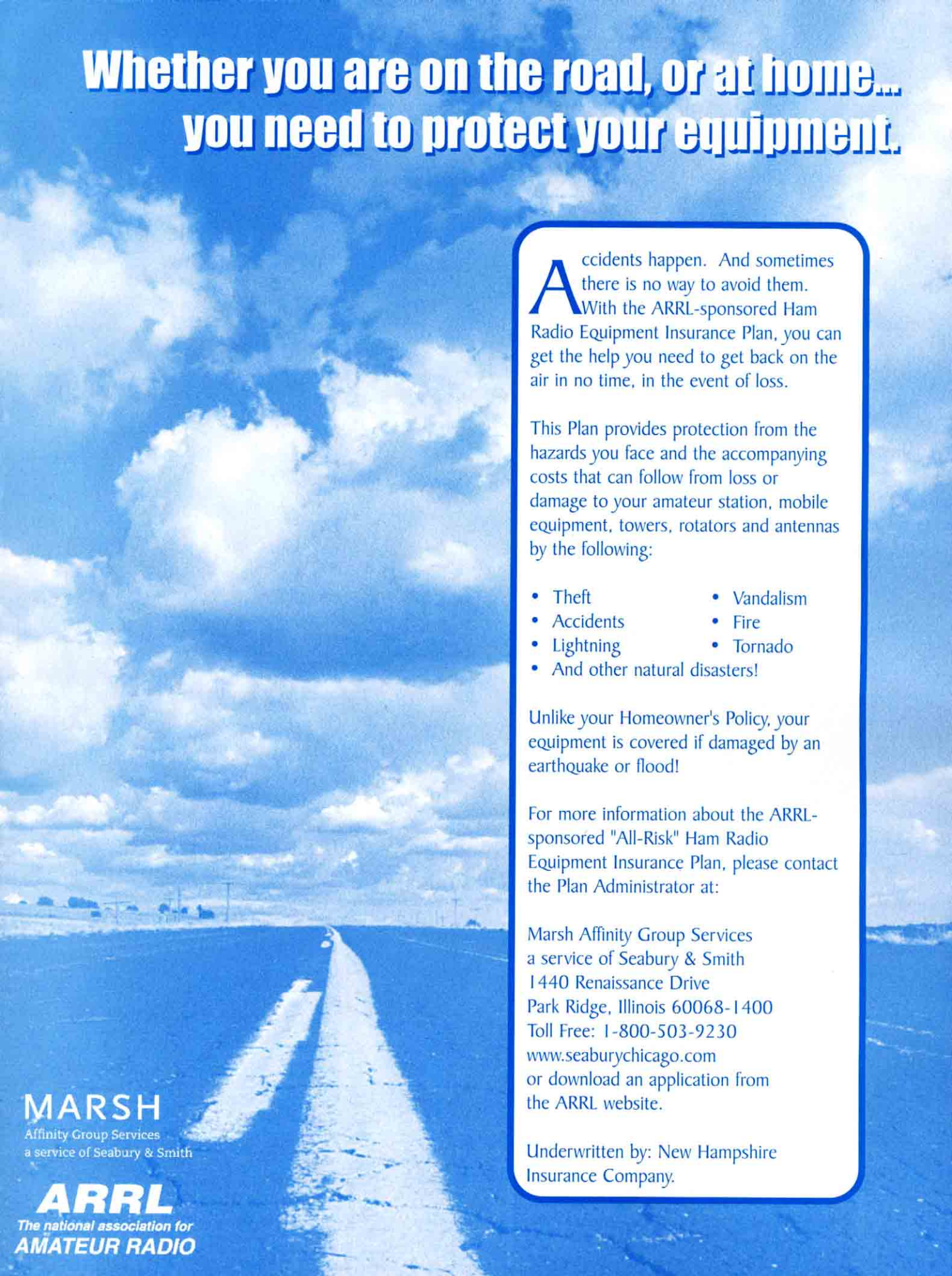

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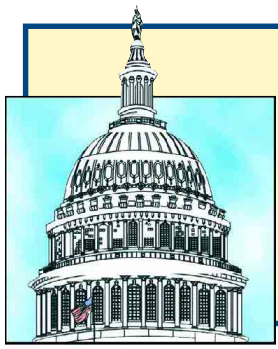

DC Currents

By Steve Mansfield, N1MZA
Manager, Legislative and Public Affairs

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

ARRL "Takes to the Hill" on CC&R Issue

Our steps full of pep and optimism, ARRL officers and professional staff headed toward Capitol Hill in Washington the last weekend of February and early into March. We were tracking that ever-elusive prey, a Congressional sponsor to introduce legislation correcting what many in the Amateur Radio community believe to be a gross inequity. That is to say, we sought legislation ordering the same "reasonable accommodation" standards imposed by PRB-1 on states and municipalities also to apply to homeowner's associations in developments where licensed Amateur Radio operators are thwarted when they seek to put up antennas and support structures on dwellings covered by private land use agreements (usually referred to as "CC&Rs," or "Covenants, Conditions and Restrictions").

What made this month-end trip much more interesting than many was the fact that our target appeared to be in sight: after almost a year of effort, we actually had a potential sponsor apparently ready to give us a hand. As we went to press actual introduction of the bill was still pending as Congressional staff did its usually fine-tooth comb legal review of the draft bill. So, common sense tells us not to announce anything until our sponsor has completed the paperwork, the bill has been introduced, and our sponsor is ready to "go public" on the news.

This is a particularly exciting story about our influential ARRL membership who seem to have made the bill possible, and about close timing, in which several other factors seemed poised to come together to breath life into the legislation so long sought after. Moreover, it comes quickly in the wake of the FCC's disappointing denial of the League's most recent application for review in the matter, which as much as *recommended* we take the issue to Congress instead.

By next issue of *QST*, we hope to be able to tell the full, exciting story and give you the bill name and number in "DC Currents," as well as to provide information on what you can do to help us if you wish. Keep your fingers crossed.

FCC Okays UWB Despite Opposition

"Ultrawideband technology," touted by its supporters as a method of transmitting narrow duration pulses to create "ultra" wide bandwidth signals, often over spectrum occupied by existing services without creating interference, has come a step closer to reality. A recent Report and Order from the FCC permits the marketing and operation of devices that utilize the new and untested technology. The decision was disclosed in FCC Report and Order 02-48.

Proposed devices on the drawing boards and testing benches include a range of imaging systems such as ground penetrating radar, through-wall imaging systems, medical systems, and surveillance systems. Also apparently under development are new vehicular radar systems and communication and measurement systems. Operation of ultrawideband will be restricted to frequencies above 3.1 GHz. Before the FCC's decision, deployment of ultrawideband devices was opposed by the Defense Department, airlines and cellular phone companies worried primarily about the effect of ultrawideband signals on the Global Positioning System (GPS). Under the new order, GPS seems unscathed.

ARRL, too, had joined forces with a powerful coalition of telecommunications organizations to try to convince the Commission to perform adequate testing for potential interference before approving ultrawideband (see July 2001 "DC Currents"), and to restrict devices to bands above 6 GHz. That coalition also sought to counter what was believed to be urging from a few members of Congress to hasten approval of ultrawideband.

"While we are disappointed that the FCC did not pay closer heed to the coalition's recommendation to keep UWB above 6 GHz," said ARRL's Technical Relations Manager Paul Rinaldo, "ARRL's original position was to *at leas*t restrict UWB to above 3.1 GHz (which agreed with an earlier NTIA position)."

While "bands above 3.1 GHz" may seem like pretty rarified spectrum, current Amateur Radio and Amateur Satellite Service bands between 3.1 and 6.0 GHz include 3.3-3.5 GHz and 5.65-5.925 GHz. These bands are shared with Government Radiolocation Services.

Since most uses of the ultrawideband concept have not yet been made fully public, ARRL is planning to evaluate what effect new devices using the technology could have on the amateur service as they are rolled out to market. According to Rinaldo, the coalition partners will be gathering evidence, and possibly field testing the devices as they become available.

"Tauzin Dingell"? What Was All the Fuss About?

♦ Can you say Enron? The House Energy and Commerce Committee's highly visible investigation of the Enron affair as the second year of the 107th Congress shifted into high gear has placed further hurdles in the path of much telecommunications legislation. Until then, the biggest cause celèbre was the so-called Tauzin-Dingell bill (see DC Currents, September, 2001) This legislation, dubbed "The Internet Freedom and Broadband Deployment Act of 2001," or HR 1542, was intended by its supporters to "deregulate" broadband services to help provide high speed data and internet access services. Expanding access to the internet has become dogma to many on The Hill, who see it as a key component in continued economic growth, particularly in small communities and rural areas.

The bill, said to be one of the most heavily lobbied pieces of telecommunications legislation ever, would prohibit the FCC and the states from regulating rates, charges, terms or conditions for various internet services. It also would prohibit the Commission from imposing fees upon such services. One of the most controversial (and complicated!) items was the prohibition for the FCC or any State from requiring an established local exchange carrier (i.e. phone company) to provide unbundled access to networks, and requiring local Internet service providers to provide such services.

The bill also contains a bewildering thicket of new antitrust provisions. It was supported by local Bell companies, and opposed by long-distance carriers. The Tauzin-Dingell bill had been reported out of committee (unfavorably) by year end 2001, but continues to generate debate (and Beltway news media advertising both *pro* and *con*).

Status on House and Senate Amateur Radio Spectrum Bills

♦ Despite ARRL's continued educating and cajoling on The Hill about the need for Amateur Radio spectrum, HR 817, which would ensure the availability of sufficient spectrum to Amateur Radio, continues to tread water with respect to gaining cosponsors. As we went to press, the bill had 47 cosponsors, up three from the start of the year. The Senate bill, S. 549, held steady with seven cosponsors. For information on the introduction of this legislation see September 2001 "DC Currents."

House Cosponsors (in addition to the original sponsor Rep Michael Bilirakis (R-FL-9th)

John E. Baldacci (D-ME-2nd)
Tammy Baldwin (D-WI-2nd)
David E. Bonior (D-MI-10th)
Roscoe G. Bartlett (R-MD-6th)
Rick Boucher (D-VA-9th)
Dan Burton (R-IN-6th)
Sherrod Brown (D-OH-13th)
Steve Buyer (R-IN-5th)
Sonny Callahan (R-AL-1st)
John Conyers, Jr. (D-MI-14th)
Nathan Deal (R-GA-9th)
Norman Dicks (D-WA-6th)
John T. Doolittle (R-CA-4th)
Sam Farr (D-CA-17th)
Bob Filner (D-CA-50th)
Paul E. Gillmor (R-OH-5th)
Virgil H. Goode, Jr. (I-VA-5th)
Tony Hall (D-OH-3rd)
Doc Hastings (R-WA-4th)
Baron P. Hill (D-In-9th)
John Hostetler (R-IN-8th)
Joe Hoeffel (D-PA-13th)
Johnny Isakson (R-GA-6th)
William L. Jenkins (R-TN-1st)
Walter B. Jones, Jr. (R-NC-3rd)
Ray LaHood (R-IL-18th)
Mike McIntyre (D-NC-7th)
Gary G. Miller (R-CA-41st)
Dennis Moore (D-KS-3rd)
Jerry Moran (R-KS-1st)
George R. Nethercutt, Jr.(R-WA-5th)
Anne Northrup (R-KY-3rd)
Collin C. Peterson DFL-MN-7th)
Deborah Pryce (R-OH-15th)
Ronnie Shows (D-MS-4th)
Fortney Pete Stark (D-CA-13th)
Charles W. Stenholm (D-TX-17th)
Ted Strickland (D-OH-6th)
Gene Taylor (D-MS-5th)
Lee Terry (R-NE-2nd)
Karen L. Thurman (D-FL-5th)
Patrick J. Tiberi (R-OH-12th)
Edolphus Towns (D-NY-10th)
Greg Walden (R-OR-2nd)
Dave Weldon (R-FL-15th)
Dave Whitfield (R-KY-1st)

Senate Cosponsors of S. 549, in addition to the original sponsor, Idaho Senator Michael Crapo, include:

Daniel K. Akaka (D-HI)
Susan M. Collins (R-ME)
Larry E. Craig (R-ID)
Jesse Helms (R-NC)
Bob Smith (R-NH)
Olympia J. Snowe (R-ME)
Thad Cochran (R-MS)

Media Hits

- The *Wilmington* (NC) *Morning Star* reported the success of Bill Morine, N2COP, in introducing Williston Middle School students to the fun of ham radio as part of ARRL's School Club Roundup. According to the account, Morine conducted a class on ham radio basics for the students before setting up and demonstrating how QSOs are made.
- The *Los Angeles Times* featured an article on how Los Altos Hills, California, has looked seriously to Amateur Radio as part of the solution to any potential large-scale outage of ordinary telephone, cellular phone or email services to residents. The article quotes Scott Overstreet, N6NXI, and Bill Walters, WA2IBM. Overstreet, who is chairman of the town's emergency communication committee explains his efforts to build local emergency nets in this small but extremely high tech Silicon Valley town.
- After September 11, Amateur Radio continues to earn the bulk of its news media coverage for its potential in emergency communication. One such story in the *Boston Globe* featured the ability of Joe Heck, K1LBG, of suburban Wrentham to get word into and out of the community in times of need. Also mentioned were Marc Stern, WA1R, of Framingham, Scott Ehrlich, WY1Z, of Waltham, Gerard Driscoll, NV1T, of Needham and Ann Weldon, KA1PON, of Marlborough.
- The installation of an Amateur Radio antenna on the living quarters of the International Space Station (ISS) received coverage on *CNN Headline News*, the front page of the *Wall Street Journal*, and the Associated Press Science feed where, presumably, it was widely redistributed. Hams mentioned were Carl Walz, KC5TIE, Yuri Onufrienko, RK3DUO and Dan Bursch, KD5PNU.

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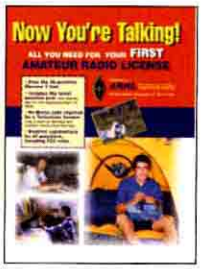

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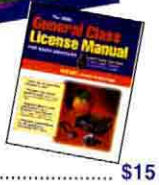

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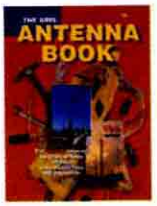

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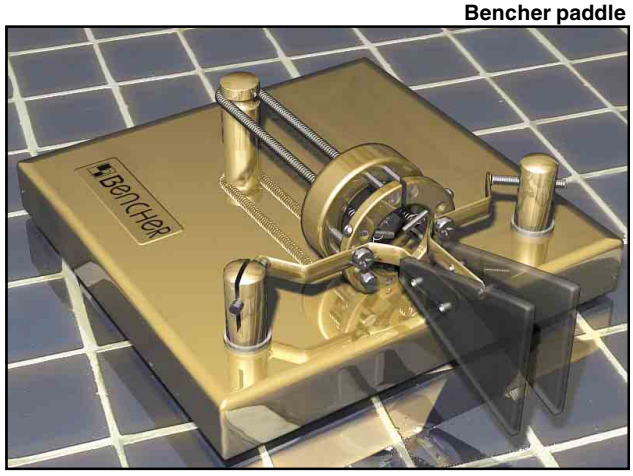
When is a photograph not a photograph?

3-500Z

Tuna Tin 2

Bencher paddle



6146

In a classic case of understatement, Roger McCarty, KD6CC, of Riverside, California, writes: "My son seems to have developed a knack for drawing pictures of ham radio related items. . ." We'll say!

Roger provided this background on his son Sean's talent for rendering computer-generated drawings: "Sean is 20 years old and is currently in college and looking to pursue a career in Graphic and/or Multimedia design. He has an interest in becoming a ham and is studying now for his ticket.

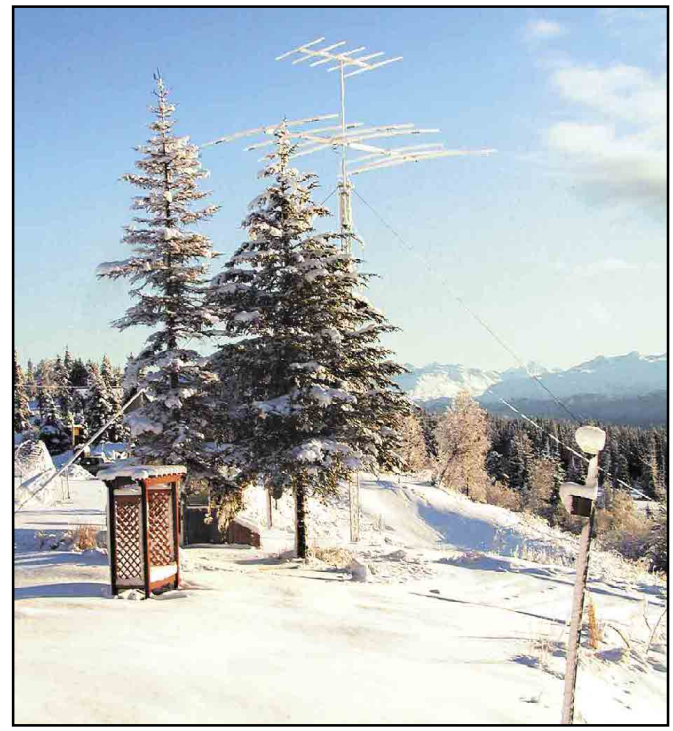
"Sean has demonstrated his artistic tendencies for most of his life. He's inherited a unique genetic combination; that is, the artistic talents from his mother and the technical, analytical tendencies of his father (I am an electronic technician)—a somewhat unusual left/right brain balance.

"As I was designing and building an audio amplifier using six 6550's as output tubes and two 6SN7's as drivers. I asked him to draw up a model with a tube layout so I could envision how it might look. One evening, as I passed by his room, I could see something he was working on that appeared to me to be a space station platform. I asked him, "Did you give up on the amplifier drawing?" He said, "No, I'm trying to get these tubes to look right," at which point he zoomed out for me to see the entire drawing. My jaw hit the floor. He was working on the plate structure of the 6550!

"When he completed this drawing, I asked him to try again so I could determine if it was a fluke or a passing interest on his part. I handed him an 807, then a 3-500Z, then the Bencher, then the Tuna Tin. It was not a fluke.

"The best part is that he enjoys doing it! The Tuna Tin took him about 16 to 20 hours to complete. As a father, and one who was quite concerned with the time his son was spending on computer games, I can tell you—this is a good thing!"

WL7M PHOTOS



WAS on 6, in 30 days—from KL7. Despite having 40 years of QSOs under his belt, Joe Hannigan, WL7M, of Fritz Creek, Alaska, is a self-described "relative neophyte" on the 6-meter band. He made his first 6-meter contact in June 2000, and as the propagation gods began to smile on the band, his state total climbed. October and November 2001 were the peak months, as he nabbed such plums as Florida and Hawaii. Finally, on December 10, he contacted Hank, W7YM, in Montana for state number 50. A check of his log found that he had worked all 50 states during the previous 30 days. And the DX poured in as well. For example, Joe reports, "The Galapagos Islands arrived courtesy of HC8N." [There's more on the HC8N 6-meter operation on page 51 of this issue.—Ed.]

On the left, WL7M at his station—100 W to a 5-element 6-meter Yagi. At the right, the WL7M antenna farm, as Joe writes, "reflecting the hazards of 'hoar frost' and icing Alaska hams must endure."

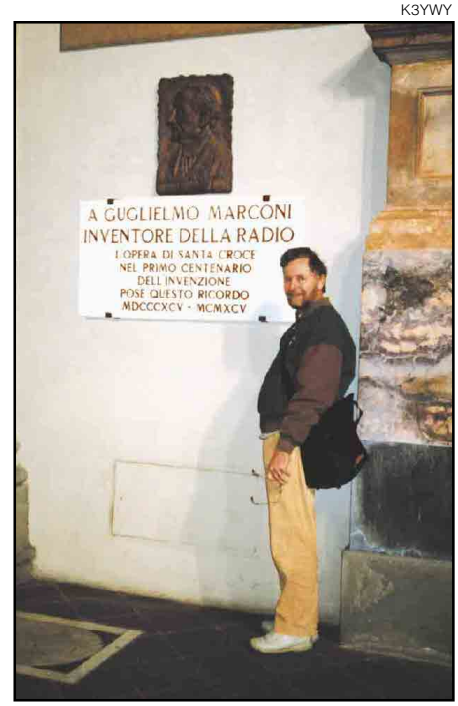
KC5EFM

Loop mobile: Under the broad New Mexico sky, Art Aragon, KC5EFM, of Albuquerque, flies the flag on his Screwdriver antenna. Just for good measure, his pickup sports M^2 loops for 6 and 2 meters, and 70 cm.

L1AR

Gravitational Gain experiment goes awry: Dr Beldar, L1AR, sent us this photo, apparently as a warning of how not to conduct a ham radio experiment. Although his work is continuing, he reports promising early results with what he calls Gravitational Gain—the signal enhancement that takes place when (yes!) RF energy flows downhill. The greater the vertical drop—what Dr Beldar terms the Gesund Height—the greater the amplification. Pushing the envelope one afternoon recently, the Gesund Height exceeded prudent levels, and the resultant RF caused a small conflagration in his yard.

K3YWY



Marconi memorial: Last December, on the 100th anniversary of Marconi's reception of transatlantic radio signals, Chuck Pearce, K3YWY, of Emmaus, Pennsylvania, visited the site of a plaque in Florence, Italy, that pays homage to the Father of Radio. Santa Croce Church also houses Galileo's tomb.

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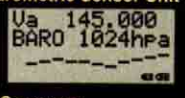

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VIRTUAL LARGER RIGS

♦ Mike Gruteke, K3BRJ, complains about how the small size of the control panel on his rig makes it difficult to operate the controls [Correspondence, March 2002]. As a 57 year old ham who is returning to the air after a 20 year pause, I too was amazed by how small and close together the controls on my IC-746 are. Also, for middle-aged eyes, the labels are getting too small to read comfortably.

But help is at hand, at least for some rigs, including mine. ICOM has a *Windows* remote control program for the IC-746, which puts *all* of the controls on your computer screen and makes them mouse activated. Of course, the display panel info is repeated on your screen so the rig itself can be out of sight. Nowadays most of us have a computer in the shack so we already have the equipment. In the particular case of the IC-746 software, you even get added features like analog (needle) meters and additional memory slots for each band. So when you are looking to buy a new rig, check out whether it has a "virtual" control panel. —*Patricia Wilson, WB8DXX, Ann Arbor, Michigan*

CW OPS ENJOY HAM RADIO

♦ When lowering the code speed requirement was proposed for Amateur Radio licensing I was extremely upset. I was admonishing the ARRL, FCC and any others proposing a slower code requirement.

Guess what—I have had a complete turnaround. I think the FCC should do away with the code requirement immediately. This is the best thing that could happen to a CW operator. Newly licensed hams would be using the other modes rather than CW. This would leave the CW operators with uncrowded frequencies. There are enough CW operators to last for many years, and there would be no problem finding someone to rag chew. One does not hear "the frequency has been in use for two hours," constant tuning, lackadaisical operating procedures and vulgar language in the CW mode. For the most part CW ops are courteous to each other and are willing to overlook the inconsistencies of operating on the bands. The CW portion of the bands are not very crowded most of the time—one can have a QSO without interruptions. Perhaps if hams become aware of how enjoyable it is to operate CW it will give them an incentive to learn Morse code. Let the sidebanders battle it out. We CW ops are enjoying the hobby.—*John Hall, W7CA, Lovell, Wyoming*

ENGRAVING GEAR

♦ In reply to "it's what's inside that counts" [Correspondence, February 2002] Dave, VE3BHZ, makes a good point: engraving your equipment with some sort of identifier is a wise thing to do. However, your Social Security Number (SSN) is not the thing to use. Once a criminal has your SSN, he is just one short step away from stealing your identity. The Federal Trade Commission (FTC) recently announced that identity theft was the top fraud complaint. Your SSN should be guarded and not given to anyone without a legitimate need for it. It would be much better to use your call sign or driver's license number to identify your equipment.—*James Shryne, N6DHZ, Whittier, California*

WARM RECEPTION

♦ I thought I would share my New Year's Day 2002 operating experiences in an attempt to educate recently licensed hams who may have received a chilly reception to the wonderful world of ham radio

I bought my 8-year-old daughter, Aliza, a copy *of Now You're Talking* for Christmas. We have done a few Kids' Day operating events together and she has recently expressed interest in maybe getting her own license. Her curiosity led her down to the shack this afternoon and she asked if we could make some contacts. We got on 10 meters in the Novice portion of the band and made several QSOs. The first was with Tex, a 101-year-old ham in West Texas who has been licensed for 71 years. We also spoke with Rick and Stewart from Texas, and Gene from Oklahoma. These gentlemen took time out from their operating to share their enthusiasm and encourage my daughter into the hobby that we all clearly love. They didn't just say hello; they asked her about her interests, they shared stories about their experiences, and left her with a warm feeling about the types of people she is likely to meet if she gets on HF. Maybe the coolest thing is that these hams kept calling us. I had answered Rick's CQ and the others called us, unsolicited, after each QSO ended. When Gene called us and I told him that we needed to QRT, he understood but said that he just wanted to offer a word of encouragement to Aliza as she embarked on that magical journey that we all know leads to a lifetime of opportunity and friendship.

I offer my sincerest thanks to W5BQU, KI5HC, KE5UT and N5CE for making my daughter's visit to my shack a memorable one. I also offer my own word of encouragement to all new hams: Don't give up if the repeaters let you down; take the extra step. Put in the energy and learn the Morse code—the operating privileges you earn will literally open the world to you. See you on the bands!—*Alan Kamman, W1SA, Lincoln, Vermont*

10 TIMES BETTER!

♦ Having been off the air for the last couple of years due mainly to both antennas having been destroyed by ice, I was anxious to get back on, at least modestly. Previously I had been almost exclusively a CW operator using mostly QRP, but was intrigued by the reports of the efficiency of PSK31 using simple rigs and antennas. A few weeks ago I fired up my old transceiver and rigged up two makeshift antennas—one, a low sloping 40 meter dipole, and the other, a Hamstick "dipole" for 10 meters up about 12 feet (two Hamsticks connected together as a dipole.) Running 20 to 40 W I was very pleased with the results. Nothing spectacular, but several long ragchews as far as Europe to the east and California to the west. Some modest DX including 4X, EA8 and IS0.

But yesterday, to my great surprise, I discovered that the power setting on my tuner was still in the low position from my old QRP operations. I double checked it carefully and sure enough I had been running 2 to 4 W for those first 30-plus PSK31 QSOs! I think I will now use the "real" 20-40 watts for a while to see what it feels like to be a big gun, but I also clearly see why there have been so many success stories of portable setups using QRP and small antennas on PSK31. Give

it a try. It is quick, easy, cheap (even if you have to get your hands on an old computer) and, best of all, it *works*!—*Lee Rosson, W5TEH, Newport, Rhode Island*

CC&Rs: YOUR RESULTS MAY VARY...

♦ The article by Brennan Price, N4QX, "A Tale of Two Preemption Policies" [March *QST*, page 90] was excellent and should be studied by any ham who owns a home or hopes to. But there are two additional matters which should be mentioned:

In some states it is not possible to negotiate a change to covenants, conditions and restrictions (CC&Rs) once a parcel from a development has been sold unless ALL of the owners of the prior sold parcels agree in writing. The theory is that each buyer has relied on the CC&Rs, and is entitled to the benefit of them. A "motivated seller" (the developer) may well agree to modify the wording of a deed to prompt a sale, but the modification would not be enforceable if it purports to affect rights already granted to the earlier purchasers. A proper title examination should reveal the existence of CC&Rs, but your attorney may not explain them to you, or even recognize that you are interested in them. Also, there may be conditions in documents other than formal CC&Rs. In some states a covenant, condition or restriction can be placed in *any* deed to the property. Even one many years old. Purchasers of real estate should affirmatively ask their attorney, in writing, for copies of any documents that contain limitations on how the property may be used. Once you have them, *read them*! If you have any hesitancy about meanings or effects, ask your attorney.

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FIELD DAY PROPOSAL

♦ Field Day is supposed to be a fun way to test our emergency communication abilities. Why not add a "class" for operations from existing Emergency Operating Centers (EOCs) at the courthouses and federal buildings around the country. (Permanently installed generators not required to run full time.) When the real thing happens and the cell phones die, the county emergency preparedness director will expect the 1955 vintage coax, antenna and rig to provide communications. Yearly organized operations in a competitive event will encourage the county to replace the tube type Collins or Heathkit vintage equipment with something that will be reliable and not require an operator over age 60 to know how to tune it up. Whether you agree or disagree, please contact your Section Manager.—*Pat Hamel, W5THT, Long Beach, Mississippi*

CW—A DIGITAL PROTOCOL

♦ The current Morse code discussion is not framed correctly. The Morse code is one of several digital protocols used in Amateur Radio. Each protocol must be viewed in the context of its effectiveness and efficiency as related to its intended use. Morse occupies an important place in the portfolio of protocols available to amateur communicators. Every day, the ARRL NTS functions effectively and efficiently with Morse and other digital protocols.

Protocols are as basic to communications skills as blocking and tackling are to football. The Morse code test is the only test of basic operating skills currently required of the radio amateur. If we trash the Morse requirement, what skills would we test? Keyboarding?

Amateur Radio's biggest problem is not the 5 WPM code test. Our biggest problem is that we can lose large chunks of spectrum to a bandwidth hungry industry. September 11 was a wake-up call for the nation, and it gives us a way to justify our spectrum by focusing our energy on public service. With this focus, we can justify our spectrum, our numbers will increase, and a 5 WPM Morse code test will not be a serious obstacle to people with a desire to become communicators in the public interest.—*Bob Beeman, K4BB, Roswell, Georgia* QST

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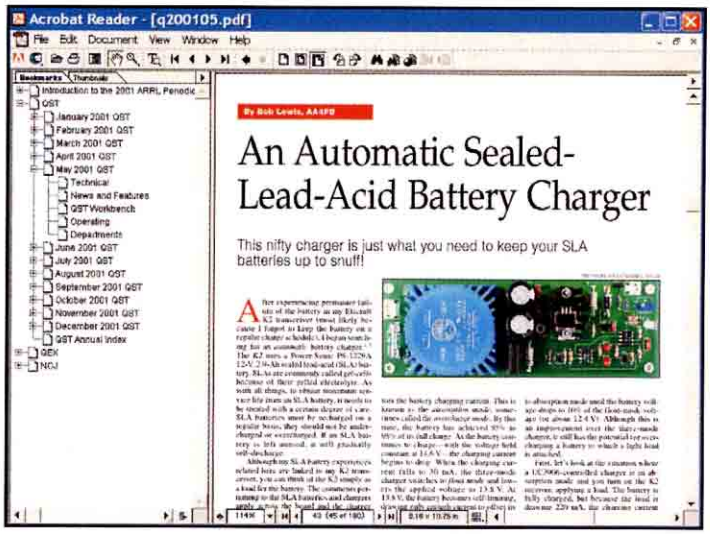

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Compiled and Edited by Rick Lindquist, N1RL

"A Dedication to Emergency Service"

9-11-01

As we reflect on the 6 months that have passed since the terrorist attacks, we'd like to share some personal recollections received from the amateur community since our report in the November 2001 issue.

WORLD TRADE CENTER NEW YORK CITY

SATERN's Volunteer Effort

The Salvation Army Team Emergency Radio Network (SATERN) Amateur Radio volunteer support effort in New York City ended October 18, according SATERN Amateur Radio Liaison Officer Jeff Schneller, N2HPO. The Salvation Army relief operation itself has continued, relying on NEXTEL and cellular telephone service.

Over some five weeks, several dozen Amateur Radio operators from the Greater New York City area and elsewhere assisted the Salvation Army. Ham radio primarily was used to provide logistical support for the organization's canteens and feeding centers. Schneller said hams volunteered from throughout the US, including New Hampshire, Ohio, North Carolina, Florida and Missouri. Offers of help came from England and Canada.

Among the later group of volunteers were Steve and Kim Merrill, KB1DIG and KB1GTR, from Dover, New Hampshire, who did an arduous but rewarding tour of duty October 7-18.

We arrived at Salvation Army Headquarters in Lower Manhattan on Sunday, October 7, at 4 PM—on Steve's Birthday. We walked into the building and went right to work. Jeff Schneller, N2HPO, from SATERN greeted us. We were introduced to everyone and received our IDs and special passes. There was a large amount of information to review. The emphasis was placed on the new role of providing logistical support, via Amateur Radio. The debriefings lasted till 10 PM. With Jeff's help we adjusted our radio equipment and were ready for work the next day.

Our shifts ranged from 14 hours a day during the first week we were there to around 10 hours a day the second week. We all set our own pace. Time went quickly.

RICHARD MCABEE, W4MTK

George Kay, KU4DE (left), and Richard McAbee, W4MTK, two South Carolina hams inside their communications van at the Brooklyn Navy Yard on September 13.

Kim spent the majority of the time at one of the canteens located at Ground Zero. She made sure that the personnel were well stocked with supplies. The orders were radioed to Headquarters via Gary Smith, the Salvation Army site coordinator. Kim utilized her Yaesu VX-5R hand-held with a 19-inch Comet whip antenna and a hand microphone attachment. This was ideal, because it enabled her to monitor radio operations and, between transmissions, to assist in various other duties. She served food to the many workers who came through the line, emptied trash cans and helped out in various other clean-up/maintenance duties. She very much enjoyed meeting the people and getting to know them.

At first, the RF interference around the WTC was terrible. Communication by 2 meters was difficult but manageable. NEXTEL and cell phones were subject to intermittent lockups or failures.

It was very spooky being there. There was so much devastation. Nothing we had read in the newspapers or seen on TV could have prepared us for the actual sight of all of this.

Steve spent most of his time driving all over Lower Manhattan. Our little Mitsubishi pickup truck was well-suited for the job. The mobile radio was the Yaesu FT-2500M along with a Larsen glass-mount antenna. Our truck was washed with fire hoses twice

JENNIFER WILLIAMS

Kim, KB1GTR, and Steve, KB1DIG, Merrill, of Dover, New Hampshire, were among the hams who arrived from all across the US to assist when the call for ham volunteers went out.

each time it drove out of the WTC disaster area. This was to remove some of the contamination from the tires and such.

Steve also used a Yaesu VX-5R for times when he was out of the vehicle. Steve transported people and supplies and was in constant contact with the control operator at Salvation Army Headquarters. We logged roughly 300 miles of travel in the time we spent there. Some of the time spent was just talking to people and cheering them up.

We lived a lifetime in a few short days in New York City and made friendships that will last a lifetime. SATERN is to be commended. They were more than nice to us. We felt like a part of a family!

SATERN's Schneller urged all Amateur Radio operators to prepare for the future by first getting acquainted with and joining their local ARES or SATERN teams, then by taking the ARRL Amateur Radio emergency communications courses, **www.arrl.org/cce**. More information about SATERN is available on the SATERN Web site, **www.satern.org**.

Eastern New York Hams Respond

Eastern New York Section Manager Pete Cecere, N2YJZ, said some 160 amateurs from the ARRL Eastern New York Section were among those responding to the New York City World Trade Center disaster. Volunteers worked via the Westchester Emergency Communications Association (WECA), which served as a staging point for all volunteers arriving from north of the city.

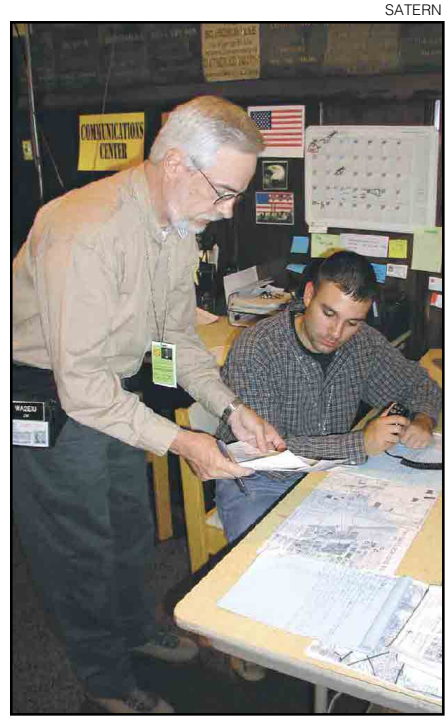
Under the direction of Eastern New York Section Emergency Coordinator Ken Akasofu, KL7JCQ, three District Emergency Coordinators—Joe Bruno, WB2VVS; Frank Stone, KB2YUR; and George Odom, KB2SIY—guided the process of grouping and funneling volunteers to the Westchester County staging area to await assignment.

"We're very fortunate to have so many hams in our section who have a tremendous amount of expertise and have demonstrated such a high level of dedication and professionalism," Akasofu said. "Their investment of time participating in public service events, local and section-level nets, SETs, and other training activities have really paid off."

Akasofu said the magnitude of the disaster even affected telephone service outside of the Greater New York City area for a time. "To get around this, we arranged for some of the Eastern New York Official Emergency Stations to be on standby," he said. "They were far enough away from the area so that their phone lines weren't affected, and they had the capability to reach the repeater used by the staging area in Westchester."

Cecere said Akasofu ended up putting in so much time volunteering that he got into a bit of hot water with his employer. "He told me that he was taking calls at work pertaining to the disaster, even during meetings," Cecere said. "Fortunately his company also realized that Ken had a big obligation to the community with his service in Amateur Radio."

SATERN



At the SATERN communications center, Jim Wingate, WA2EIU (standing), and Michael Gomez, N2WGC, review field reports from canteen and feeding locations before forwarding them to the Salvation Army logistical officer.

Ulster County ARES operated from September 11-16 from the Ulster Amateur Radio Club to pass traffic to the Westchester American Red Cross chapter and to monitor the ARC net on the Northeast Link repeater, reported Frank Stone, KB2YUR. Said Dutchess County EC Adam Nowik, KC2DAA, "It was amazing that we had 49 members respond, who took time off from work and refused to take breaks when we got busy."

Cecere said WECA deserves special mention for handling the staging of "all these great volunteers."

From Standby to Action

ARRL Life Member Douglas Bard, W2ING, lives in Newburgh, New York—some 60 miles up the Hudson River from Ground Zero. He was on stand-by duty with Orange County ARES/RACES Tuesday and Wednesday, September 11-12, when he learned of the critical need for amateurs to help the Salvation Army at its headquarters on 14th Street in Manhattan.

I received the call to assist on Friday. Fortunately my oldest daughter, Nancy, also came along to do the driving, while I handled communications and navigation via GPS. We arrived at the headquarters by 8 AM. We were soon dispatched as the only amateur mobile unit in Manhattan to cover the 13 mobile canteens.

Traffic was awful, and confusion was generally the rule, but everyone was quite courteous throughout the whole episode. In New York City? you ask. Yup!

We had a map of where the canteens were supposed to be located, but many had relocated slightly, and informing net control of these changes turned out to be one of our jobs.

We double and triple-parked. As soon as police saw our Salvation Army signs, barricades were removed, and we were able to get to some of the canteens more easily.

Friday, September 14, President Bush visited the WTC site. By this time we were on Canal Street and couldn't get to the canteens farther south until later. The whole area was in "lockdown." Police were everywhere. Many were volunteers who had just come to help, as did many EMTs and firefighters.

Residents of Greenwich Village—close to the disaster—had been evacuated from their buildings, as the structures were deemed unsafe. Several were trying to get escorted to pick up a few belongings but weren't allowed, due to the lockdown. Nevertheless we saw many residents taking food to the police, who had to stay in place.

We'd heard that a nearby telephone central office had been destroyed. Cables were being laid at street level. Most

cellular phones were useless.

We finally were able to move farther south on West Street, to get to the canteens closer to Ground Zero. Headquarters had lost contact and needed reports of canteen vehicle numbers, fuel supplies, locations, supplies needed. Pictures don't do justice to the scene. One look at the faces of the rescue workers told the story. Several wanted to talk. I listened.

We reached a point where it was easier to walk to three of the nearby canteens. One had too much soda; one not enough—so some trading was in order. There was a NYC prisoner van parked near the bridge in the background. The cop said he had a load of underwear and sweatshirts and asked if I could get them picked up, as he was not allowed to move. One of the Salvation Army cadets had just put in a call to net control for sweatshirts, so that van was cleaned out on the spot.

Net control called and told us to go home, as four amateurs were inbound. As I was reattaching one of the antennas a voice behind said, "If you weren't a ham I'd bust you!" It turned out to be a NYC cop, who said he had had a 440-MHz repeater on the WTC. A couple of blocks north, Nancy suggested we pick up three tired-looking guys walking out. As it turned out, they were off-duty Suffolk County police officers who had showed up to help. They talked about what they had experienced. As we went past the barricades, crowds of people were on the street corners holding candles and signs and cheering.

I can't say too much about the Salvation Army. These people are truly dedicated. Nancy and I will never forget that day in New York.

ARRL Special Service Club Responds

"WECA Operators Shine in the Gloom of WTC Disaster," proclaimed the October 2001 issue of *The WECAGRAM*, the newsletter of the Westchester Emergency Communications Association—an ARRL Special Service Club. "The hours of training, public-service events and drills WECA operators culminated in an overwhelming, well-organized response to the World Trade Center disaster on September 11 in New York City," the article read.

According to *The WECAGRAM*, WECA members who served as Amateur Radio Emergency Service (ARES) or Radio Amateur Civil Emergency Service (RACES) leaders also helped mobilize the Westchester chapter of the American Red Cross and the County Emergency Operations Center to provide key assistance to New York City counterparts. Nearly 50 WECA members contributed to the rescue and relief effort.

The WECAGRAM Editor Mike Arrow, K2NR, summarized his organization's experiences in "What WECA Did: A 911-Style Response to the 9/11 Emergency," excerpted here.

The news came to Tom Raffaelli, WB2NHC, at about 9 AM on September 11, 2001: a jet airliner had crashed into a tower of the World Trade Center. At that moment, Tom, the WECA emergency services director, assumed his alter ego as communications director of the Westchester County chapter of the American Red Cross and rushed to chapter headquarters in White Plains. On the way, he notified WECA member and ARRL Westchester County Emergency Coordinator Alan Crosswell, N2YGK. Joe Bruno, WB2VVS, a WECA member and the RACES coordinator for Westchester, also was mobilized early on.

Westchester County official Liam Murphy, deputy director of the county Office of Emergency Management activated RACES. A call for amateur volunteers was made via the WECA repeater on 147.060 MHz, which was activated as the Amateur Radio emergency network hub in Westchester.

The role of Amateur Radio became clear as landline and cellular telephone services rapidly overloaded with frantic calls from victims and escapees of the disaster and from worried family members. Even police and fire radio networks became swamped with calls. Amateur Radio became a vital means of communication.

For many of the critical early hours, Assistant EC Adam Epstein, N2DHH, served as the amateur network control operator at the EOC. But the New York City EOC already was in danger. The collapse of the twin 110-story towers rained down debris on the 40-story 7 World Trade Center, which subsequently collapsed—destroying the New York City EOC within. City officials fled to a remote temporary EOC.

Greater New York City Red Cross chapters mounted relief efforts to aid injured and displaced disaster victims. The Westchester County chapter was a vital part of this effort, and WECA members established a communications center at the chapter. Relief stations called "care centers" were quickly established to provide mental and physical first aid. Amateurs staffed centers in White Plains as well as Mount Vernon, New Rochelle and Yonkers.

WECA operators also joined New York City-based relief efforts that continued for weeks afterward. Hundreds of radio amateurs from many areas responded quickly, willingly and unselfishly to the call to aid the rescue and subsequent relief effort.

The Westchester ARES/RACES network operations closed down on September 22, followed on September 24 by the closing of their larger NYC counterpart operations. The club credited the success of its response to a "dedication to emergency service through programs of formal off-line training, on-the-job training at public service events and participation in emergency drills."

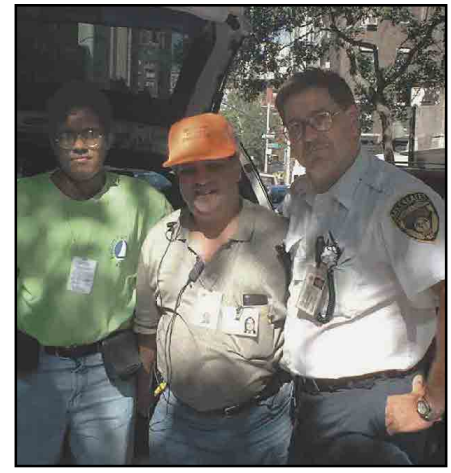
RACES Member Recalls "Distant Explosion"

As it did for most Americans, September 11, 2001, began routinely for RACES member Ryan Jairam, AB2MH, of Manhattan—except on that day, he did not have a radio or TV turned on. At around 9 AM and with his wife already out the door to work, he heard "a distant explosion" that shook his house—a "sonic boom" he thought at first. "Twenty minutes later my wife walked back into the house and told me that she had watched the second plane crash into the south tower," Jairam said.

He immediately checked into the "TAC-2" citywide RACES net and soon had his first assignment—to report to the Staten Island Ferry Terminal in St George and act as a communications shadow for one of the doctors. Hundreds of emergency workers—from medical to fire and police personnel—gathered there to act as triage units for anticipated casualties. Once it became apparent that no major casualties would be arriving, however, personnel were dispatched back to their respective home bases. Jairam spent more than a week volunteering.

Tuesday evening I was sent to the Red Cross shelter at Curtis High School, where 120 students from lower Manhattan schools had been evacuated. I was relieved at 9 o'clock the next morning and reported back at 10 that night. A mag

RYAN JAIRAM, AB2MH



Left to right: Ryan Jairam, AB2MH, Joe Lipton, N2IOZ, and Steven Greenbaum, WB2KDG take a break from their responsibilities in the aftermath of the World Trade Center attack.

mount antenna sitting on a window sill provided good communication with TAC 2.

Friday I reported to the Staten Island Red Cross Chapter headquarters on Richmond Avenue for a five-day tour. The chapter mission was to collect and distribute donated supplies. Many monetary contributions were also collected. With a mobile antenna and pie tin ground plane mounted on a metal fence outside of the building I was able to hit the TAC 2, TAC 10 and TAC 12 repeaters with no difficulty.

On Tuesday, New York City District Emergency Coordinator Charles Hargrove, N2NOV, called the Staten Island Red Cross Chapter and asked if I would volunteer for a "special assignment." Once we'd determined that a radio operator was no longer required there, we shut down the radio operation.

A disaster coordinator at the Red Cross had initiated an "outreach program." Instead of immediately setting up one or more service centers, the Red Cross would send six multi-disciplinary teams to various parts of the affected area to assess resident needs and provide whatever help they could. According to Assistant Director of Communications for the Red Cross Jay Ferron, N4GAA, the coordinator of the so-called Multi-Disciplinary Operational Teams (MDOT) did not want any ham operators to participate—a cell phone in each team member's hand would be adequate. Jay absolutely forbade the operation to continue without an Amateur Radio operator on each team, however. This proved to be an extremely wise decision.

Our mission was to canvass residential buildings in the affected area, going door to door if necessary, and start getting needed aid to residents.

Communication gear consisted of a cell phone for the radio operator, a wireless e-mail device called a Blackberry for the team leader, myself and one for each set of two volunteers—plus I had my dual-band H-T. Net control at Red Cross also had a Blackberry. The Blackberrys were provided by IBM, but we were on our own for training. As expected, cell service was extremely unreliable and became my last resort. I was on MDOT 1—the only team to enter Ground Zero. Our assigned location was the Gateway Plaza section of Battery Park City, one block from the south tower and filled with dust and debris. All of the buildings already had been evacuated and searched. Residents were given 15 minutes to return in small groups, gather any belongings they could and cart them away.

We had an hour, but it wasn't long enough. Even though only a handful of residents were coming through, most needed some assistance from the Red Cross—a place to stay, trauma counseling, etc. We were hard-pressed to make it back in time for the buses to return us to Brooklyn.

On Thursday, September 20, it rained! We were instructed to don Tyvek hazmat suits. Outfitted in these white suits combined with white hard hats we looked like a team of ghostbusters!

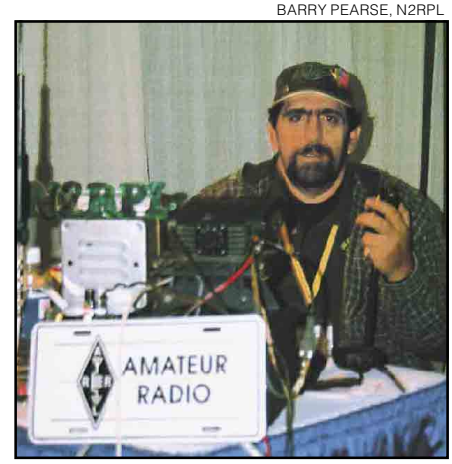
That day we were able to process many more clients. Needs varied from a place to sleep to prescriptions and lost wheelchairs.

As many of us learned, an amateur hand-held radio is not always so handy. Perhaps it would be good to require members of ARES/RACES to have a mobile radio and a magnetic antenna mount. In some locations, we needed an outdoor antenna. At Ground Zero, we found that an H-T with a gain antenna would work in most spots. The Blackberrys turned out to be a good way to network non-hams.

New Jersey Ham Assists at Ground Zero

Barry Pearse, N2RPL, of Perth Amboy, New Jersey, volunteered to help in the days following the WTC attack. Pearse reported for duty September 15 at Red Cross Headquarters after contacting ARRL Northern New Jersey SEC Steve Ostrove, K2SO.

BARRY PEARSE, N2RPL



Barry Pearse, N2RPL, rushed from his home in nearby New Jersey to assist at Red Cross Headquarters in lower Manhattan.

As I traveled through Staten Island, I could see where they were dumping the rubble from the World Trade Center and searching through it. As I got closer to New York City, it hit me as I looked at where the World Trade Center used to stand and only saw smoke rising above the skyline. Military aircraft were flying over Manhattan to protect against further attacks.

After arriving at Red Cross Headquarters and receiving my Ground Zero security pass and paperwork, I received my assignment. Then we were taken to our assigned positions, and the scene was more than words can describe. As we got closer, we were stopped at roadblocks for our security passes.

My job was to provide communication for the Red Cross personnel on location and to request supplies. Neither the cell phone nor the landline systems worked well. Our radio links were the first line of communication.

My first shift ended some 19 hours later. Most shifts were between 13 and 16 hours long. After my shift we were brought back to Red Cross Headquarters for a debriefing on what we saw.

During the remainder of my six days in New York City, I was posted to the temporary Office of Emergency Management site.

In all, I spent seven days handling communication. I was honored to have been able to serve in this way and to represent the American Radio Relay League, Amateur Radio Emergency Service, Radio Amateur Civil Emergency Service and Amateur Radio in this terrible event.

DOUGLAS BARD, W2ING

At the collection point for donated clothing, food and water for the rescue workers. The photographer reports: "Hundreds of people were donating so many items for the WTC workers that the fire captain shown in the photo quickly ran out of storage. We called in for three large trucks to clear the area."

AND AT THE PENTAGON. . .

The team managed by Virginia Amateur Radio Emergency Service to support the Salvation Army's disaster relief operation at the Pentagon stood down September 18. Virginia Section Emergency Coordinator Tom Gregory, N4NW, said the support provided at the Pentagon site as well as in New York City and Pennsylvania "clearly demonstrates the resolve and commitment by so many hams to meet the needs of our fellow Americans at this time of great tragedy."

Observations from the Pentagon Salvation Army Support Effort

ARRL member Paul Konigsburg, K3MZ, of Great Falls, Virginia was among those who turned out September 14-15 to support the Salvation Army communications effort.

As I rode in the Salvation Army van, I first saw the gouge in the Pentagon. It looked similar to what I had seen on TV. As we drove around the parking lot, I saw three dogs resting on the grass. To get badges many people were waiting in line staring at the hole in the side of the Pentagon 200 feet away. It smelled like a fire that had been recently put out. Several generators were running nearby, so the burned smell mixed with exhaust odor. Heavy machinery was moving in and out.

Police were there in many forms: FBI, NTSB, ATF, OSI and MP. The Secret Service was also there. Then there were rescue people and firefighters from the surrounding area. There must have been 600 rescue people on-site.

While I was in line, the three dogs headed into the breach with their handlers. Construction workers who could run the heavy machinery to remove the debris, truck drivers to haul the debris away, and others who could install temporary wood bracing to stabilize the building also milled about. Secretary of Defense Donald Rumsfeld came walking past, clasping his hands together and looking pleased at the level of support.

I finally get my badge and can help.

At least 2000 people worked this crash site, and they all needed to be fed. The Salvation Army set up four feeding centers—two outside and two inside the restricted area. The amateurs relayed information to and from the various canteens. Many messages were similar to "need 50 meals at site 1" or "need gasoline at site 2." My job was to shadow Capt Burton of the Salvation Army, who was making the rounds of all the sites. This was a controlled net, so all communications went through net control at a local Salvation Army site.

From a radio perspective, the area was very noisy. I saw the military had set up wireless communications, and from the size of their antenna, it looked like they were using a frequency somewhere between our 2 meters and our 70 cm. On the amateur frequencies, there were lots of beeps, squawks, chirps and other forms of radio interference, plus the audible noise from the generators. You needed an in-the-ear type speaker. Many messages had to be repeated.

There was a temporary chain link fence with black plastic on the chain. Capt Burton said that was where they placed the victims' bodies. I was glad it was covered up.

Some firefighters came by later in the evening and asked for some hot food. We put some trays together and then went into the restricted area. When you were in a cart or in a vehicle, dogs would sniff you for bombs. I asked a firefighter if there was any chance of finding people alive. He shook his head, no.

Most of the workers wore grim expressions mixed with a little exhaustion. I didn't see much hope on their faces. They were doing their jobs and were going to let the emotions have their time later.

As the warm day turned into a cool evening, calls on the radio changed to requests for sweatshirts, socks and underwear. A call came on the radio that Station 1 needed dog treats.

This was a day where I got to witness firsthand some of the worst of humanity. While destruction was horrendous, I thought to myself that, as bad as this was, New York City must be 20 times worse. I also got to see some of the best of humanity—people volunteering their time and special skills, people doing all they could to rescue their fellow man, people and corporations giving food and clothing.

I realized that these specialized rescue people need ordinary folks to feed them, clothe them and give them fresh batteries. I was glad to be a part. I was honored that I could help. And yes, the dogs got their treats.

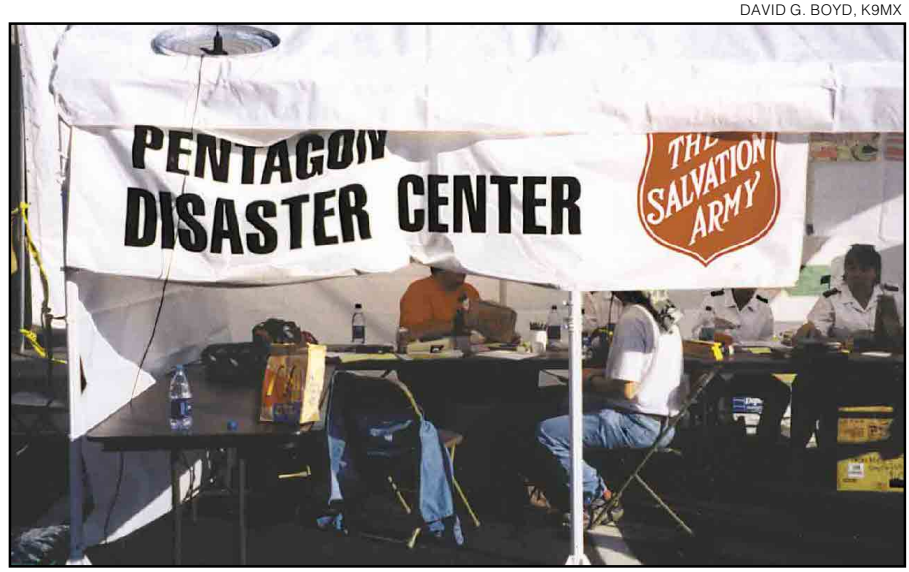
Observations from the Pentagon Red Cross Support Effort

Another amateur team consisting of members of the Vienna (Virginia) Wireless Society, the Arlington County Amateur Radio Club and other amateurs provided communication and technical support to the American Red Cross relief effort at the Pentagon site. Arlington County ARES Emergency Coordinator Alan Bosch, KO4ALA, said his team ran shifts from 8 AM through 1 AM each day. His report appeared in a September 16 special edition of the Montgomery County (Maryland) Amateur Radio Club *MARC Mini-News*.

At first we ran stations out of the Red Cross chapter house and in the Pentagon south parking lot, then added one at their operations base set up in a former Montgomery Ward store on US Route 50. Later, we went back to two sites—one at the Pentagon and one at the Montgomery Ward's location.

Things were pretty straightforward using our 145.47 repeater and the chapter station to anchor things, but we had to iron out antenna and equipment glitches at the Ward's station before we got running smoothly. I got the Red Cross to acquire half a dozen FRS (Family Radio Service) handhelds early on, which kept their on-site staff glued together until they got the higher-powered Vertex UHF business-band hand-helds

DAVID G. BOYD, K9MX



The net control station at the Pentagon, photographed just before photos were banned from the area. The partially hidden ham in the red shirt is Chris Hanslets, KA8UNO. The photographer, K9MX, whose day job is with the Justice Department, procured specialized cameras, robots and other high-tech equipment following the attack.

(donated by Vertex Standard), which relieved us of having to hunt down Red Cross personnel in an incredibly congested and chaotic area. One persistent occupational hazard was nearly getting run down by golf carts full of VIPs or supplies.

A real problem was the news helicopters—they were everywhere all the time the first few days, and they made hearing even nearby conversations challenging if not altogether impossible. My heartfelt advice to any ham working any emergency is to bring an earphone. Just don't leave home without it!

Another issue was security. On one shift the Red Cross transport vans could drive inside the perimeter to the activity center; on the next shift, they could not. One day drivers' licenses were sufficient ID; the next we had to have Red Cross event photo ID badges. Finally we were supposed to have little yellow dots on the badges to be permitted anywhere outside the ARC tent. That proved rather comical, because you could not see the dots from more than about 3 feet away.

From where we were on the ground, we could not see the impact zone directly. The odd thing was that, except for the smoke and fire early on and the cranes that appeared later, the building itself looked perfectly normal.

A memorable aspect of this effort was the North Carolina Baptist Convention Disaster Response's mass cooking operation. These wonderful people were at it 24 hours a day. In the afternoons the smell of chicken barbecuing on a grill several square yards in size suffused the area.

DOUGLAS BARD, W2ING

This billboard and others like it reflect the mood of the American people in the wake of the events of September 11.

WESTERN PENNSYLVANIA CRASH SITE

Amateurs provided communication support for investigators and outside relief agencies at the so-called "fourth crash site" in a rural part of Somerset County, Pennsylvania, where United Flight 93 went down after a heroic effort by passengers to keep the hijackers from using the aircraft to wreak further destruction.

Kevin Custer, W3KKC, arranged preliminary repeater communication into and out of the crash site to help the Red Cross, Salvation Army, Pennsylvania State Police, the FBI and other state and federal agencies. SATERN's Eric Hegerle, N3VOC, said his organization was able to take advantage of linked repeaters set up in the vicinity of the crash to keep in contact with the Salvation Army's Pittsburgh headquarters. Custer said communication was "basically nonexistent" because telephone and cellular systems were shut down or overloaded.

Somerset County RACES Radio Officer Jim Crowley, NJ3T, says he was at work when the plane crashed September 11. Crowley, who is also president of the Somerset County Amateur Radio Club, contacted Scott Zimmerman, N3XCC, who had already started an emergency net on the Somerset County Amateur Radio Club's 147.195 MHz repeater. Soon, Emergency Management Agency/911 Director Richard Lohr, N3VFG, had requested amateurs at the county EOC.

Crowley shared a summary of his report to Western Pennsylvania ARRL Section Manager John Rodgers, N3MSE, on the events of September 11-12, 2001:

Our RACES/ARES volunteers established preliminary communication between the EOC and the crash site EOC quickly and professionally. Volunteers were poised to help continue communication as needed.

Artis Kitchens, N3XGL, and Barry Shaffer, N3XDZ, took over the net from the EOC Amateur Radio station, while Scott, his wife, Elisha, KB9WCX, Kevin Custer, W3KKC, and his friend Dawn Mello traveled to the crash site to set up communications there. I joined Barry and Artis as soon as I got off work. A new ham in our area, Bill Smith, KB3GUN, also stopped by the EOC to offer his help.

Jack Humberson, N3SQH, chairman of disaster services for the Keystone Chapter of the American Red Cross was at the site and in touch with the EOC. Kevin assisted SATERN by linking the 145.39 repeater—which is close to the crash site—to the 146.835 repeater on Laurel Mountain in western Somerset county. Kevin informed me the 146.61 repeater in Pittsburgh also was linked to the 146.835 repeater.

The Red Cross and the Salvation Army—with help from numerous volunteers from Shanksville and surrounding communities—were working hard to feed the investigators and officials at the crash site.

Meanwhile, Richard Warren, WB3HGL, stayed in contact with the Western Area RACES Net on 75 meters and relayed information for the EOC. Many Amateur Radio organizations, clubs, RACES/ARES groups and individuals from the surrounding counties offered equipment and volunteers.

We learned that evening that the FBI was treating the crash site as a crime scene, and the agency had established its own communications for security purposes. Additionally, portable cell phone sites were erected. Roadblocks were set up around the area.

Due to the level of security, it was decided on September 12 to put RACES volunteers on high-alert stand-by status until further notice. We were asked to monitor the linked 147.195 and 146.625 repeaters for possible reactivation orders. Fred Maize, KM3M, who was handling RACES operations at the Pennsylvania Emergency Management Agency's Western Region headquarters in Indiana, Pennsylvania, told me he would continue to monitor our local repeater.

This particular emergency was much different from anything we were used to.

Everyone who responded should be proud to be a ham and proud to be an American! Our condolences and deepest sympathies go out to the families of those who died in the crash. We will never forget their bravery and ultimate sacrifice. We would also like to extend our thanks to all those hams from surrounding counties who offered their help. QST

Frank Gentges, K0BRA, and Steve Ratzlaff, AA7U

AMRAD Low Frequency Upconverter

Use your HF transceiver to eavesdrop on activity below 500 kHz with this easy construction project.

The AMRAD LF (low frequency) upconverter project was established to provide radio amateurs with a high-performance receiving converter that can be constructed with simple hand tools and a readily available set of PC boards. This LF converter can be used to convert the whole VLF/LF band up to a band in the range of 2 to 14 MHz so that these signals can be heard on common HF radios. (These same radios may have either low or no performance at the LF frequencies.) We think these objectives have been met.

Background

We considered two potential approaches. The first approach considered is the use of a double balanced mixer best represented by the excellent design by Doug DeMaw, W1FB and Jay Rusgrove, W1VD.[1] They implemented the DBM with discrete components. Tim Brannon, KF5CQ, using a commercial DBM module, refined this design.[2]

The other approach we considered uses a high-speed CMOS switch, such as the excellent design by Johan, SM6LKM (**home4.swipnet.se/~w-41522/lfconv/lfconv.html**). Johan found that by paralleling the CMOS switch sections on an inexpensive and readily available IC, the overall loss could be reduced. While both exhibited virtually equal good performance, we chose the CMOS switch approach for the AMRAD project.

There is a third approach that we did not breadboard. It uses a 1496 mixer chip. This approach was used by Sheets and Graf[3] and in the Palomar Engineers VLF converter.

In addition, we came up with a construction concept that provides the radio amateur considerable flexibility in the construction details, and we have created two modular blocks that can be used beyond application as a receiving converter. For example, by reconnecting the two blocks, the same blocks can be made into the heart of a *transmitting* converter. And by adding a DDS frequency synthesizer under computer control and an IF strip the blocks can be part of a sophisticated computerized LF receiver. By swapping a logarithmic amplifier in place of the IF strip you have the essential elements for an LF spectrum analyzer under computer control. With the addition of synchronous and asynchronous noise-blanker blocks to generate noise-blanking pulses, the receiving converter can be used as an LF noise blanker. In a simpler application, the LF lowpass filter module can be used to clean up the spurious response performance of an HF receiver/transceiver that tunes to the LF frequencies.

Low Pass Filter Design

We broke the LF upconverter into two functional blocks, a low pass filter and the upconverter itself. By splitting these two blocks apart we keep with the con-

[1]Notes appear on page 39.

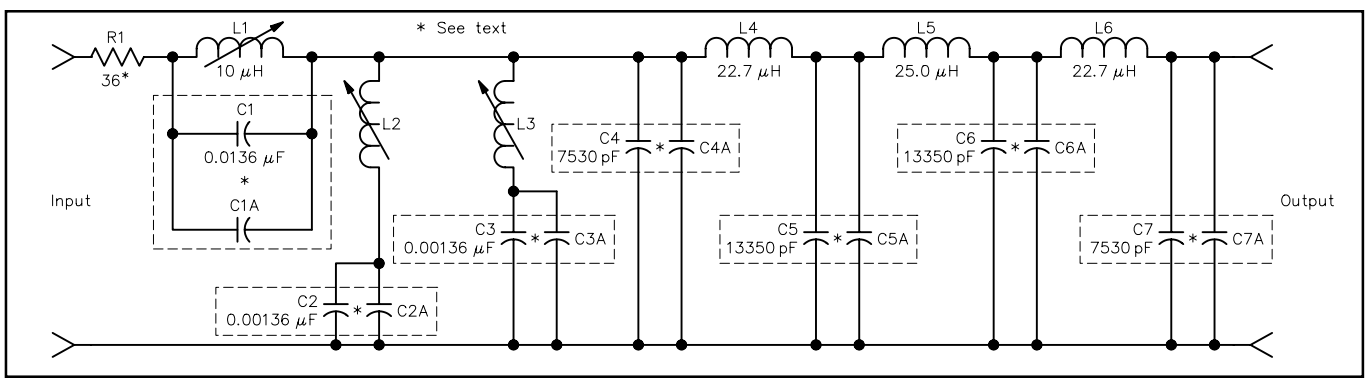


Figure 1—Low pass filter schematic diagram. DigiKey (tel 800-344-4539; www.digikey.com) part numbers shown in parentheses unless otherwise noted. See text on page 37 for an explanation of capacitance values.

C1, 1A, 4, 7—0.0068 µF, 2%, 50 V (P3682).
C2, 2A, 3, 3A, 4A, 7A—0.00068 µF, 50 V (P4580).
C5, C6—0.012 µF, 2%, 50 V (P4583).
C5A, C6A—0.0015 µF, 50 V (P4553).
L1—10 µH adjustable coil, Toko series 10EZ (TK1207).
L2, 3—100 µH adjustable coil, Toko series 10EZ (TK1219).
L4, 6—22.7 µH, 33 turns on Amidon T50-3 (gray) core. #30 wirewrap wire or #24-30 magnet wire (see text).
L5—25 µH, 35 turns wire on Amidon T50-3 (gray) core. #30 wirewrap wire or #24-30 magnet wire (see text).
R1—36 Ω, 1/4 W. Optional when used with AMRAD active antenna.

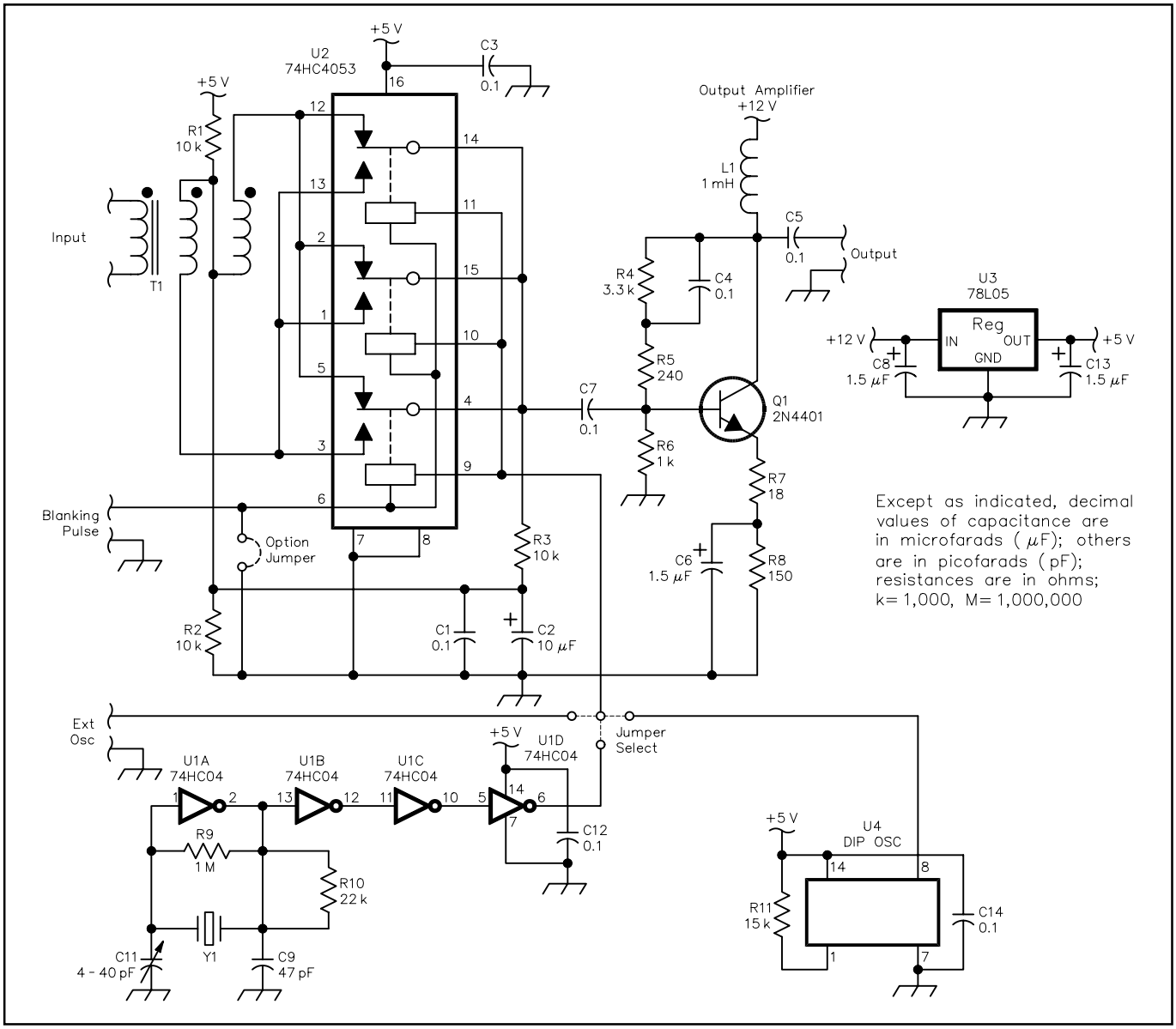


Figure 2—LF upconverter schematic diagram. DigiKey (tel 800-344-4539; www.digikey.com) part numbers shown in parentheses unless otherwise noted.

C1, 3, 4, 5, 7, 12, 14—0.1 µF, 50 V ceramic (P4924).
C2—10 µF, 6.3 V tantalum (P2013).
C6, C8, 13—1.5 µF, 25 V tantalum (P2044).
C9—47 pF, 50 V NP0 ceramic.
C10—Not used.
C11—1-40 pF ceramic trimmer (SG1037).
L1—1 mH, 20 turns #30 wire on Amidon FT-50-J core.
Q1—2N4401 transistor, TO-92 case (2N4401).
R1, 2, 3—10 kΩ, 1/4 W.
R4—3.3 kΩ, 1/4 W.
R5—240 Ω, 1/4 W.
R6—1 kΩ, 1/4 W.
R7—18 Ω, 1/4 W.
R8—150 Ω, 1/4 W.
R9—1 MΩ, 1/4 W.
R10—22 kΩ, 1/4 W.
R11—15 kΩ, 1/4 W.
T1—20 turns #30 wirw wrap trifilar on Amidon FT-50-J or FT-50-75 core.
U1—74HC04 (TC74HC04AP).
U2—74HC4053 (TC74HC4053AP).
U3—78L05 +5 V voltage regulator, TO-92 case (NJM78L05A).
U4—Alternate DIP oscillator. See text.
Y1—4.000 MHz crystal, 20-pF load (X006).

cept of modularity and the flexibility it will give us in the future.

The low pass filter (see Figure 1) is a combination of a set of tunable AM broadcast-band rejection filters and a 7-pole 0.1-dB ripple Chebyshev filter with a cutoff frequency of 500 kHz.[4]

The 500 kHz cutoff of the Chebyshev filter was chosen to provide good performance right up to the start of the AM broadcast band. The filter loss is moderately low between 500 and 530 kHz. The 500 kHz choice provides more attenuation into the band while still working up to 530 kHz. Some amateurs involved in LF work have been experimenting with FCC Part 15 transmissions between 490 and 530 kHz (called *MEDFers*), so this converter will provide an excellent receiving capability for these weak signals in addition to the normal LF range.

The tunable band-rejection filters provide a capability to reduce local strong AM broadcast signals to the point where they do not introduce overload or intermodulation products in the receiving frequency range. These notches may also be needed to reduce strong stations if the filter is used ahead of a noise blanker. The tunable rejection filters can be omitted from construction if no local AM broadcast stations will be a problem. The filter combination passes signals down to dc, so the upconverter module will receive signals at 10 kHz and below.

With the use of a well-designed PC board that is available, we are able to measure the LPF rejection in excess of 110 dB in most of the HF range.

Upconverter Design

We built breadboards of both a CMOS switch version and a DBM version. Testing for intermodulation and overload characteristics indicated about the same performance could be achieved with either approach.

Better performance is possible with a high level DBM converter. This approach would use a +27-dBm, 1/2-W, low-phase-noise carrier with a special high-level DBM module, such as the Mini-Circuits RAY-6U or SMC CVP-206. A good example of such a design is found in the front end of the Cubic R-3030 receiver. They use the SMC CVP-206 mixer driven by a 3-stage amplifier that boosts the local oscillator from 0 dBm to +27 dBm. For additional information on this high-dynamic-range design, you can obtain the manual courtesy of Cubic Communications. It can be downloaded from the AMRAD Web site at **www.amrad.org/projects/lf/rx**. This high-level approach, while enticing, was rejected for this project because it increased the cost and complexity without adding substantial benefit.

We decided to use the CMOS switch design because the CMOS switch IC is readily available for under $1 while the DBM module costs around $6 and is usually only available with order minimums of $50. An additional consideration is the 74HC4053 version of the CMOS switch IC. It has a chip enable line that can be used to create a noise-blanking gate.

We ended up with an upconverter block that uses a CMOS switch driven at the conversion frequency to modulate the incoming LF band up to the conversion frequency (see Figure 2). The conversion frequency can be provided on board the module from either a crystal oscillator based on a CMOS hex gate IC, a DIP oscillator module or it can be provided externally. An amplifier is provided on the output to compensate for the conversion loss so the overall input to output gain is near 0 dB.

We initially used a value of 51 Ω to terminate the CMOS switch at R3. It seemed obvious. Then we were surprised to find that after some testing to look into a diplexer design or alternate termination value, that a simple 10-kΩ resistor provided intermodulation performance as good as with the diplexer and 50 Ω. With the diplexer, the bandwidth was limited to about 300 kHz. We decided to eliminate the diplexer and instead use just the simple 10-kΩ resistor.

Oscillator

We tried out one of the new programmable IC oscillator modules. The attraction was the ability to order a 7 MHz oscillator for a very reasonable price. So, an Epson SG-8002 was ordered programmed to 7 MHz. While it provided a nice looking 7-MHz square wave, further analysis showed it had phase noise that would preclude its use. While suitable for a computer processor clock type application, it was not suitable for our application. This phase noise would create a noise profile around any signals coming into the upconverter so that a strong LF beacon, for example, would be surrounded by noise that would cover up any weak or only moderately strong signal.

A simple oscillator based on a feedback loop around a pair of 74HC04 hex inverter worked well and did not have the high phase noise of the programmable oscillator. The option for a simple fixed-frequency DIP oscillator is retained, but use of a programmable version is not advised.

Performance

The input low pass filter module provides for attenuation over 110 dB from 2 to 30 MHz. This will keep feedthrough of the HF receiving frequency down to a very low level so weak LF signals will not be interfered with by some strong HF signal on the same frequency. The HF receiver used should have strong rejection of HF signals through paths other than the antenna connector. Most modern amateur-grade HF receivers/transceivers have good performance in this respect, but some SWL HF receivers do not. Most SWL receivers may be used with caution and with the addition of filters and shielding in some cases.

Throughput gain is approximately 0 dB; with a 0-dBM input signal at LF, a 0-dBM output signal at HF will result. The third order intercept point is at +14 dBm. The 1 dB compression point is at +1 dBm.

Field Testing

Once we saw these performance test results, we were anxious to take the upconverter to our cottage on the Outer Banks of North Carolina. We lined up the upconverter with a JRC NRD-525 receiver against our Ten-Tec RX-320 modified for LF. The new upconverter and NRD-525 worked just as well as the RX-320 throughout the LF band. No birdies or spurious signals were heard. The upconverter was a pleasure to use. With the NRD-525 it was just like listening to HF signals.

Construction

You can build this LF upconverter using simple hand tools and the PC boards that are available from FAR Circuits.[5] The construction concept provides a lot of flexibility on how the assembled PC boards are mounted for use.

LPF

The low pass filter consists of two parts; the AM broadcast rejection filters and the Chebyshev low pass filter (see Figure 3).

The AM broadcast rejection filters are constructed with Toko tunable inductors (L1, L2 and L3). L1 is in a parallel tuned circuit with C1 to establish the first rejection frequency. C1A is provided on the PC board to fine-tune the frequency of L1 and C1. L2 and C2 form a series tuned circuit and L3 and C3 form a second series tuned circuit. With the values shown, all three circuits tune from about 530 kHz to 700 kHz. To reject stations above 700 kHz, use capacitors of lower value to enable the circuits to be tuned higher.

After construction, use an RF voltmeter or oscilloscope on the output of the filter while connecting an antenna to the input. L1 and L2 can be tuned to minimize the same frequency while L3 can be used to minimize another frequency. Alternatively, a receiver with an S meter can be tuned to the offending station and used with the filter connected to an antenna to adjust L1, L2 and L3 to minimize the signal strength.

L4, L5 and L6 are constructed using

The upconverter enclosure.

toroid cores wound with either #30 wire wrap wire or magnet wire. Slightly larger magnet wire may be used as long as the turns will fit on the toroid core. For example, the #30 wirewrap wire with its insulation has the same diameter of #25 magnet wire. #24 magnet wire may fit on the toroid core, but any larger wire is doubtful and larger wire will not improve the filter performance noticeably.

To get the most consistent response of the filter, the capacitors called out in the parts list are 2% accurate (C4, C5, C6, C7) and are paralleled with smaller capacitors (C4A, C5A, C6A, C7A) to get close to the specified value. Specific target values are shown on the schematic. The more commonly available 5% capacitors may be used, but performance around the lower end of the AM broadcast band may be more uncertain (although the stop-band performance in the HF band should be unaffected).

Note that the filter PC board will accommodate other parts values for other frequencies and applications. The section using L1, L2 and L3 may be omitted using a jumper wire instead. Likewise, other Toko inductor values may be used to reject LF nondirectional beacons or other signals in locations where they are strong enough to cause problems. Take notice that L1 is about 10% of the other two inductors. This provides similar rejection bandwidths for all sections.

Upconverter

The upconverter is built on a PC board (Figure 4) that includes the upconverter circuit, the output amplifier and the crystal oscillator. The upconverter circuit uses a wideband input transformer, which we have standardized on and it goes down to 10 kHz. The output of the CMOS switch is fed to the output amplifier, which makes up for gain loss and provides high impedance for the CMOS switch, while feeding a low impedance 50-Ω load. In our testing, we found that using a 2N4401 transistor gave a slight improvement in IMD performance over a 2N2222A or 2N3904. These may be substituted for only a slight loss in performance.

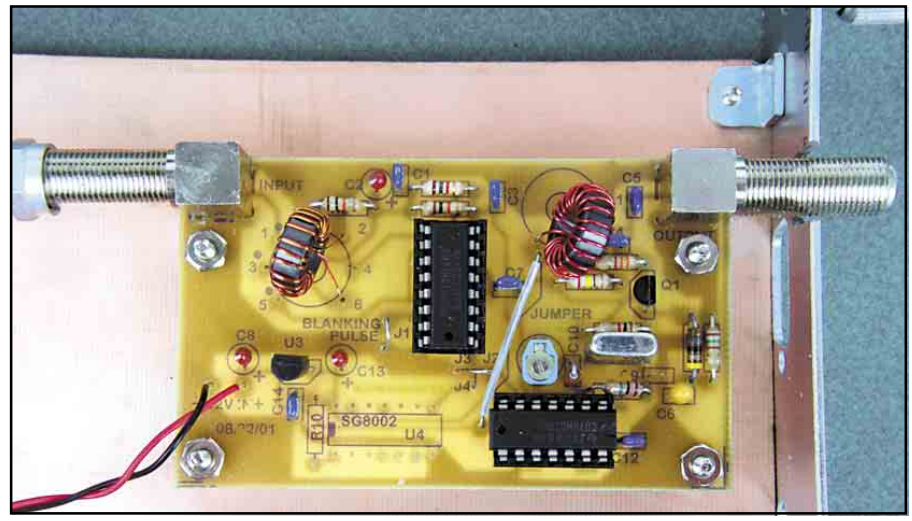


Figure 4—The upconverter.

The crystal oscillator provides the switching frequency to the CMOS switch. The crystal oscillator uses a 74HC04 hex buffer connected as an oscillator and buffer. This circuit has been tested at 4 and 7 MHz and has worked well with low phase noise, an important aspect for this application. Other frequencies can be used but may require some changes in C9, and C11.

We found slight variations in IMD performance among manufacturers of the CMOS switch. A demanding application might warrant trying different brands to select for the very best IMD performance.

Strapping Options

During construction, several straps must be put in for the LP filter and the upconverter to function. On the LP filter, an option is included to put a 36-Ω resistor in series with the input connector. When used with the AMRAD active antenna, this resistor will avoid having an out-of-band load with too low impedance, which would give rise to higher levels of intermodulation distortion.

If the notch filters are not desired, use a wire strap in place of L1. L2 and L3 can be eliminated.

On the upconverter board, a set of strapping options is provided to select the onboard oscillator or an external source. The external source should be a square wave with CMOS digital logic type levels of 0 and +5 V. Be careful not to use a sine wave signal generator that goes significantly below 0 V.

There is also a blanking pulse input to the upconverter that must be strapped to ground for the upconverter to work if the blanking signal is not used.

Power Supply

We use the same power supply design (see Figure 5) that was used for the AMRAD Active Antenna, but deleted the unused components, C2, L1 and T2. Adjust the VOLTAGE ADJUST potentiometer for an output voltage of 12 V.

A regulator onboard the upconverter board regulates the 12 V input down to +5 V for the integrated circuits.

Mounting

The PC boards provide a lot of flexibility for mounting and connections. We used 1/2-inch high aluminum 4-40 threaded standoffs to mount the boards

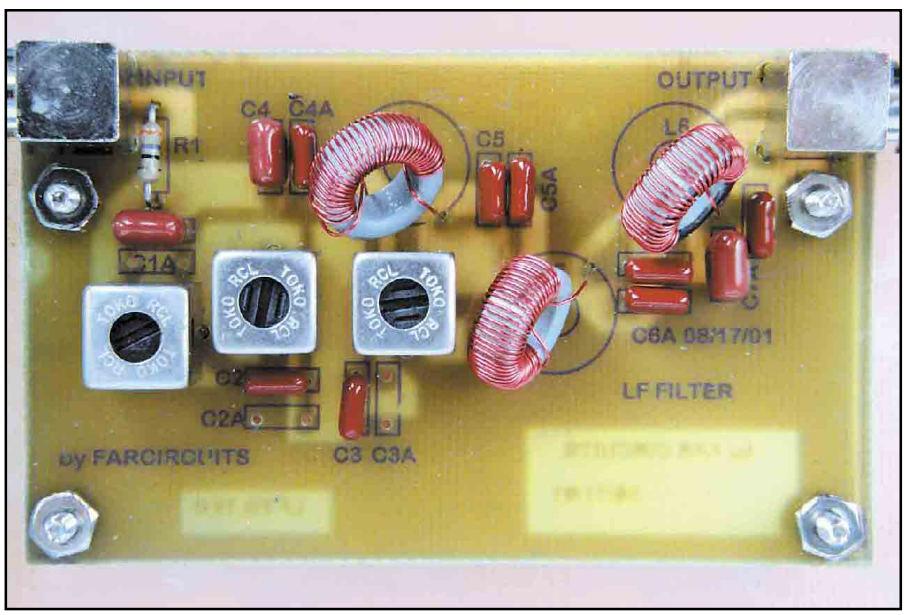


Figure 3—The low pass filter board.

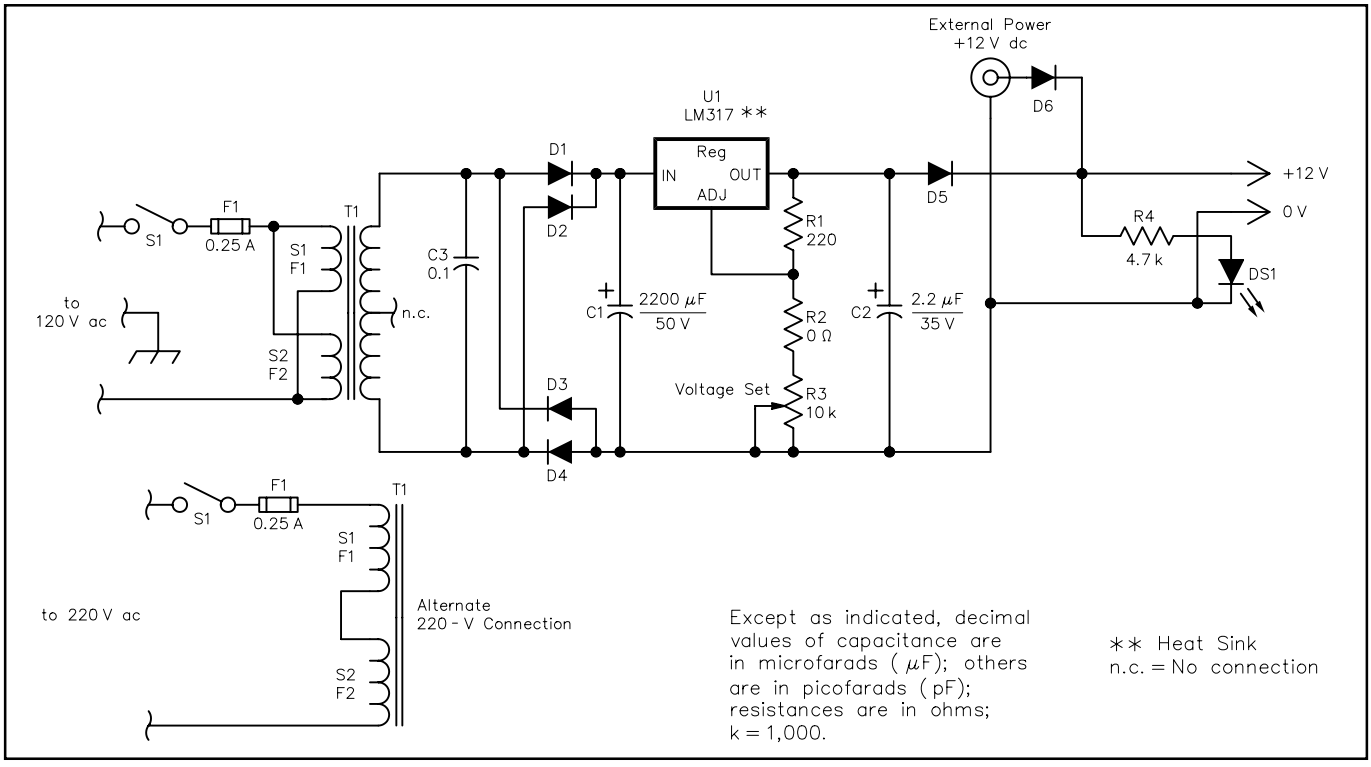


Figure 5—Power supply schematic diagram. RadioShack part numbers shown in parentheses.

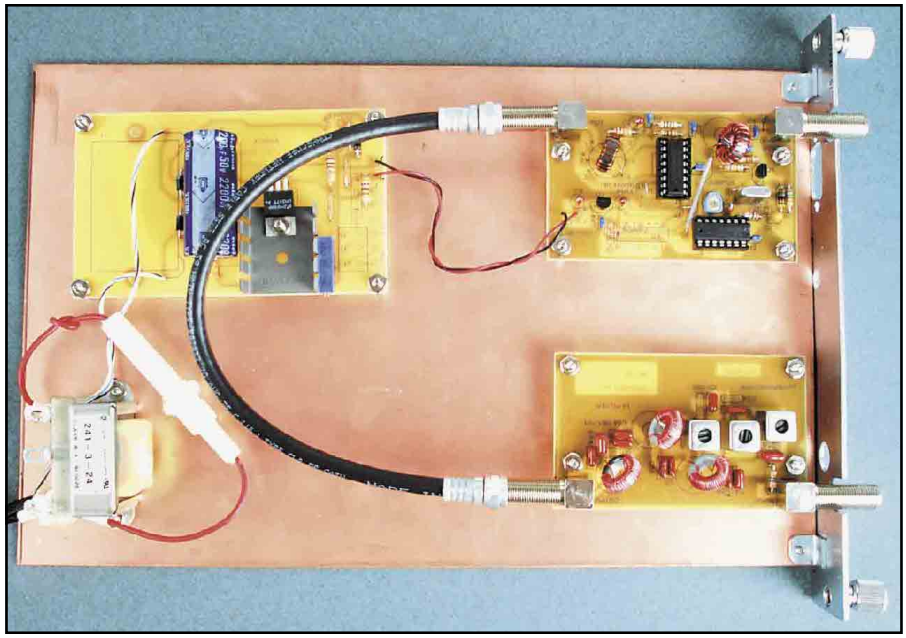
C1—2200 µF, 50 V (278-1048).
C2—2.2 µF, 35 V tantalum.
C3—0.1 µF, ceramic disk, 100 V.
D1-D6—1N4003, 200 PIV, 1 A (276-1102).
DS1—LED (276-307).
R1—220 Ω.
R2—0 Ω resistor or jumper wire.
R3—10 kΩ multiturn potentiometer (271-343).
R4—4.7 kΩ (271-1330).
S1—SPST toggle (275-634B).
T1—24-V transformer, split-bobbin design, Signal Transformer CL2-40-24.
U1—LM317 adjustable voltage regulator (276-1778).
Misc—Heat sink for U1 (276-1363).

on a scrap piece of PC board material. The grounds on the PC boards connect to an area under each mounting standoff. This provides for a redundant and low impedance ground for each PC board. The PC boards can be arranged to suit the needs for a project box. During construction, each PC board can be laid on the mounting surface and the mounting hole centers marked with a fine point marker.

We selected PC-mounting F connectors for the RF connections to the PC boards. Either straight or right-angle connectors can be used. These connectors were place in the corners, which allows right angle F connector to be turned 90° depending on application. PC-mounting F connectors are inexpensive and readily available from several sources. F connectors can be crimped on short pieces of coaxial cable to make up jumper cables.

We rejected BNC connectors due to expense and difficulty of making cables. We rejected RCA plugs because of connection reliability.

We mounted one of our LF upconverters in an old PC LAN box recovered from a dumpster and it looks quite attractive.



All three boards installed in the enclosure.

Operation

The LF Converter should be connected to a good LF antenna, like the AMRAD Active LF antenna,[6] and a good HF receiver. Select a conversion frequency in the LF converter that will provide convenient tuning on the HF receiver. A frequency of 4 MHz is particularly attractive because of the wide availability of 4-MHz crystals for computer use.

A 4-MHz conversion frequency provides the tuning range of 4 to 4.5 MHz, if your receiver covers this range. For example, if a conversion frequency of 4 MHz is used, the receiver can be tuned above 4 MHz *plus* the LF frequency. This would put 136 kHz at 4136 kHz on the dial. You can just ignore the "4" on the dial and directly read the LF frequency. If your re-

What about Phase Noise?

When you are using a mixer like the one in the LF upconverter, phase noise in the local oscillator will transfer to any signal that passes through the conversion process. If you are looking at only one signal in the band, the impact is limited. As more and more signals are added the impact can become significant. Here is how it happens.

If the phase noise is 100-kHz wide, each carrier in the conversion band has a noise skirt plus and minus 100 kHz of the carrier added to that carrier in the translated output. Thus, for this converter, a carrier at 100 kHz would have this noise skirt from 10 kHz (limited by the bottom response of the converter) to 200 kHz. A second carrier at 300 kHz would have a skirt from 200 kHz to 400 kHz. A third carrier at 500 kHz would have a skirt from 400 kHz to 600 kHz. Altogether, the presence of these three carriers creates noise artifacts across the entire range of the converter.

Tuning a receiver around the noisy oscillator we were testing, we found the noise skirt was only 30 dB down at 100 kHz away. With this much phase noise, the converter, with these three carriers, could only hear 48 dB below the strong carriers at best. Stations closer to the carriers would have been worse.

We plotted the noise curves in Figure A to show the difference between the simple crystal oscillator and the programmable oscillator. Note that the noise from the 74HCT04 oscillator is so low that we can only plot the measurement limits, not the actual noise. These numbers represent the noise with a 1 Hz bandwidth. With more normal bandwidths, like 300 Hz for example, the noise is 300 times or 24.2 dB higher. For a 3-kHz bandwidth, the noise is 3000 times or 34.8 dB higher. We must conclude these oscillators are unacceptable for RF work.

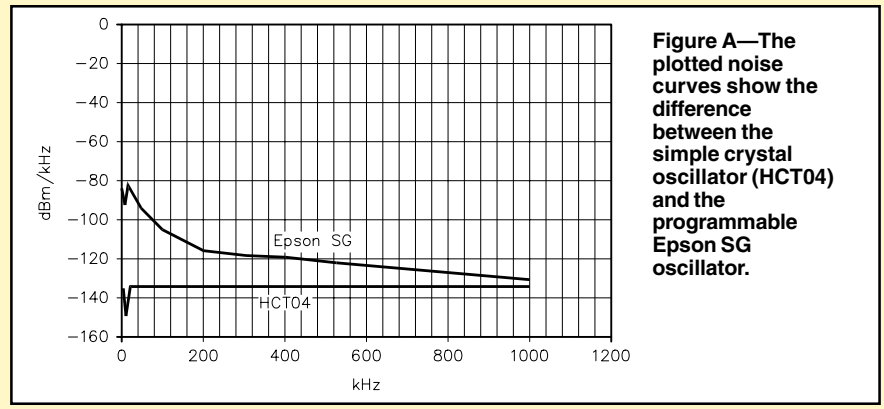


Figure A—The plotted noise curves show the difference between the simple crystal oscillator (HCT04) and the programmable Epson SG oscillator.

ceiver does not go above 4 MHz, you will get equal performance but the inconvenient mental arithmetic needed in tuning down from 4 to 3.5 MHz. Another option is 7 MHz, which is an excellent choice since it puts the LF radio amateur bands in the 40-meter band range. However, inexpensive crystals are not generally available for 7 MHz. They would have to be ordered as custom crystals. We did find B.G. Micro, a surplus source that has them in stock. You can telephone B. G. Micro at 800-276-2206, contact them by e-mail at **bgmicro@bgmicro.com** or see their site on the Web at **www.bgmicro.com**.

Variations on a Theme

Transverter

If the upconverter board is fed with a low-level HF signal source, such as from an SSB transceiver or transmitter, it will convert it down to LF if the input frequency is the same as would be used to receive LF. The LF filter should be moved from the upconverter input to the upconverter output. Here, the filter will remove the input frequency and provide a clean LF signal. While SSB voice would probably not be used much on LF, CW, FSK or PSK31 would be a good choice. If using a transmitter or transceiver for the input signal source, it should have a dummy load across the output and an attenuator to bring the signal level down to 0 dBm or lower.

Receiver/Spectrum Analyzer

A computer controlled synthesizer or a sweep generator can be substituted for the crystal oscillator in the upconverter module. The upconverter output can then be filtered and detected to create a spectrum analyzer or an LF receiver. AMRAD has a PC controlled DDS frequency synthesizer design now and we are looking to have it available before long.

Noise Gate

The upconverter can be used as an RF gate for a noise blanker. It can be gated when converting frequency, or the conversion frequency can be strapped to ground and it will pass LF straight through. The gating signal is CMOS digital logic levels with 0 V for the gate to pass LF through and +5 V to block the passage of LF. The switching time of the gate is under 100 nsec. AMRAD has a synchronous and asynchronous noise gate generator to drive this under design and construction. When not used, this noise gate line must be grounded for the upconverter to work.

Acknowledgments

Many people helped with this project as they did with the AMRAD LF active antenna. We continue to receive all sorts of help, suggestions and encouragement from the AMRAD crowd that gets together to eat tacos and talk Amateur Radio at 12:30 each Saturday at Tippy's Taco House in Merrifield, Virginia. We must credit Fred Reimers, KF9GX, and his fine printed-circuit layout effort that gave us over 110 dB of stop-band attenuation.

Notes

[1]Doug DeMaw, W1FB and Jay Rusgrove, WA1LNQ, "A High Performance Low-Frequency Converter," *QST,* June 1977, pp 23-26.

[2]Tim Brannon, KF5CQ, "A High-Performance Low Frequency Converter," **www.lwca.org/library/articles/kf5cq/lfconvtr.htm**.

[3]William Sheets and Rudolf F. Graf, "Build This Low Frequency Converter," *Radio Electronics*, September 1989, pp 47-50.

[4]*The ARRL Handbook for Radio Amateurs*, 2001, Table 16.2, Line N=7, RC= 15.087%.

[5]Power supply, upconverter and low-pass filter PC boards are available as a single package from FAR Circuits, 18N640 Field Ct, Dundee, IL 60118; tel 847-836-9148; **www.farcircuits.net**. $12 plus $1.50 shipping and handling. $3 additional charge for credit card purchases. Illinois residents add 6.5% sales tax.

[6]Frank Gentges, "The AMRAD Active LF Antenna," *QST*, September 2001, pp 31-37.

Frank Gentges, K0BRA was first licensed in 1956 as KN0BRA and then K0BRA. He upgraded to Amateur Extra in 1964. He was later licensed as W3FGL and as AK4R but chose to go back to his old call when the FCC opened up that opportunity. He became an associate member of ARRL in 1953 and became a full member in 1956. He graduated as an Electrical Engineer from Kansas State University in 1965. He went to work for Rixon Electronics and then the US Navy and retired from the Navy in 1987. He is now president of Metavox, developing new tactile technology for profoundly deaf infants. You can reach Frank at 9251 Wood Glade Dr, Great Falls, VA 22066; **fgentges@mindspring.com**.

Steve Ratzlaff, AA7U, was first licensed in 1975 as WB7THR. Steve's interests include LF, Natural Radio and electronics tinkering. Steve can be reached at **sratzlaf@flash.net**. QST

By James C. Garland, W8ZR

The EZ-Tuner

Part 1—Could this be one of the most versatile homebrew antenna tuners ever created? Let's take a closer look at this innovative design.

Although antenna tuners have always been important station accessories, their popularity has soared in recent years thanks to the development of automatic tuners. In fact, convenient, limited-range autotuners are now standard features of most HF transceivers and are a blessing for amateurs who live in antenna-restricted neighborhoods.

Unfortunately, amateurs who use linear amplifiers, who prefer antennas with open-wire feedlines, and who need to match a wide-range of VSWRs, have until now been stuck with decidedly not-so-convenient manual tuners. The EZ-Tuner is designed to meet their needs. It is just the ticket for contesters, DXers, vintage radio collectors with multiple stations, and lazybones like myself who want a hassle-free way to change bands and antennas.

The EZ-Tuner is an advanced, wide-range memory tuner that covers all the amateur bands from 1.8-30 MHz. The EZ-Tuner automatically tracks band-to-band frequency excursions, matches high or low antenna impedances up to at least a 16:1 VSWR, and handles the full power of a legal-limit amplifier. Furthermore, the EZ-Tuner is expandable, so that new features and software upgrades can be downloaded from the Internet and programmed into it through an ordinary serial port.

The EZ-Tuner is described in a three-part series. In this part, we take the mystery out of the versatile T-network (Figure 1A) and show how its most important properties can be distilled into two easy-to-use graphs. Armed with these graphs, we then walk through the design of the EZ-Tuner's matching network. Part 1 should be of interest to anyone who wants to learn about or build an antenna tuner.

Part 2 gets down to the nitty-gritty of the EZ-Tuner's design and circuitry. This part describes the RF matching network and also the microcontroller circuitry, which is based on the powerful new BASIC Stamp BS2sx. I'll also provide an overview of the software logic and tuner's operation and performance. Readers will be referred to a Web site where they can download complete circuit diagrams and software listings.

Part 3 discusses the EZ-Tuner's construction, with lots of practical details and homebrewer hints. Although the EZ-Tuner is an advanced project, intended for experienced builders (the EZ-Tuner is EZ to use, not EZ to build!), I'll show how it can be built as a stand-alone manual tuner. The manual version would be a good stopping point for those who lack the time or experience to tackle the full-blown automatic version, but who want a versatile, easy to adjust high power antenna tuner.

The Heritage of the Ultimate Transmatch

The quest for the ideal antenna tuner dates back to the early days of radio communication. The earliest tuners were often single-band breadboard contraptions with link-coupled inductors intended for end-fed wire antennas or open-wire transmission lines. The mid-'50s saw the development of general purpose, multiband desktop tuners, the best known being the

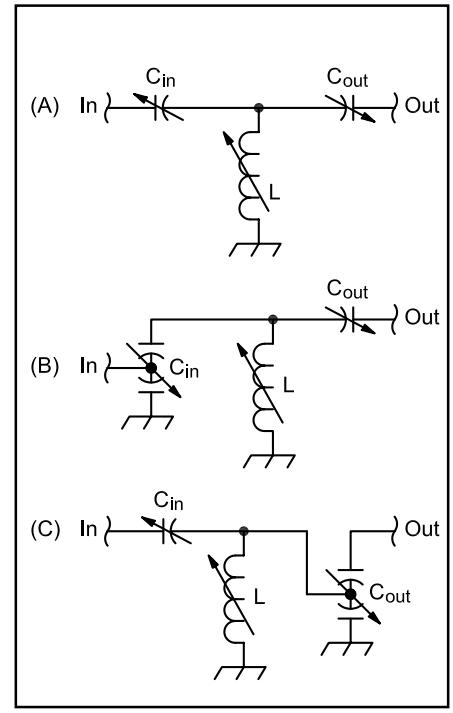


Figure 1—(A) basic T-network; (B) Ultimate Transmatch; (C) SPC tuner.

famous E.F. Johnson Matchbox, today greatly prized by collectors and still considered a top performer.

The ARRL technical staff has a long history of advancing the state of the art of antenna tuners. A case in point is the "Ultimate Transmatch," designed by the late Lew McCoy, W1ICP, and introduced to *QST* readers in July 1970. So-called because it could match the proverbial wet noodle, the Ultimate Transmatch was subsequently featured in *ARRL Handbooks* of the 1970s and over the years became a favorite of builders.

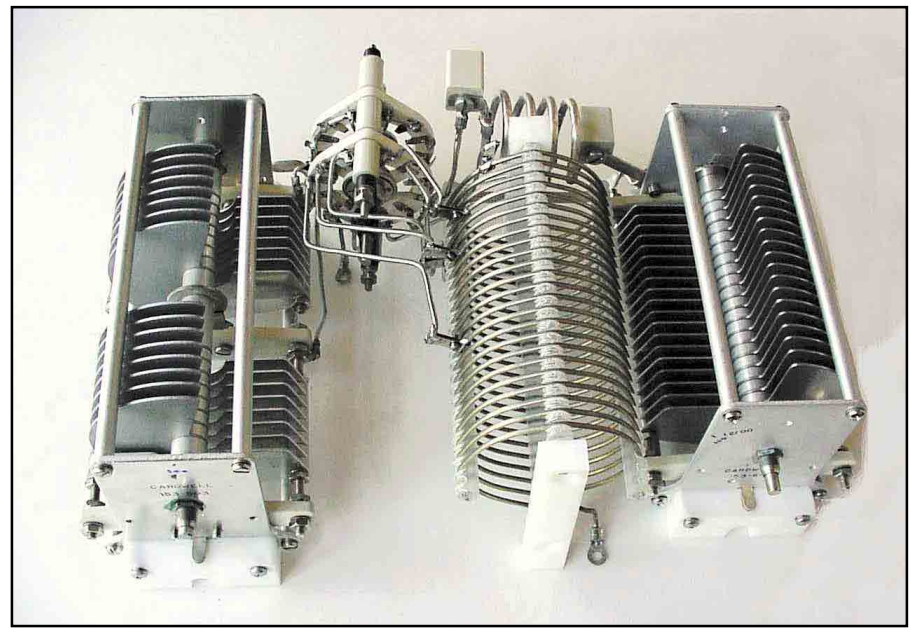
The Ultimate Transmatch was a variation of the simple T-network (Figures 1A and 1B), with the transmitter RF fed to the mid-point of a split-stator capacitor. Subsequent experimentation showed that the split-stator capacitor was unneeded, and in later designs it was replaced by an ordinary single-stator capacitor.

In the 1980s, *ARRL Handbooks* rolled out another variation of the T-match antenna tuner. Known as the "SPC" tuner (for series-parallel capacitance), this variation used a dual-section variable capacitor, one section of which was in series with the output, and the other in parallel with the inductor (Figure 1C). Initially, it seemed that the SPC tuner had great promise, notably good harmonic suppression and wide matching range, with modest-sized components. However, the SPC design was found to be excessively lossy, especially for low-impedance loads, and despite its advantages it was abandoned after a few years.

The 1990s saw significant advances in antenna tuner design. There were excellent theoretical treatments by Bill Sabin, W0IYH, and the development of sophisticated computer simulation programs by Dean Straw, N6BV, and others.[1] These programs made it possible for builders to estimate the matching range, internal losses, and peak RF voltages in their tuners before lifting a soldering iron. Furthermore, new diagnostic techniques also became available during the '90s, thanks primarily to Frank Witt, AI1H, and these techniques have allowed builders to evaluate the matching range and efficiency of their completed tuners.[2]

In spite of all this progress, the quest for the ideal antenna tuner continues. A *QST* review of several commercial, legal-limit antenna tuners[3] showed just how difficult it is to design an easy-to-use, low-loss tuner with a wide matching range. More than any other piece of amateur equipment, antenna tuners inevitably reflect frustrating trade-offs and compromises.

[1]Notes appear on page 43.



The major components of the EZ-Tuner's T-network. Construction details will appear in Parts 2 and 3 of this series of articles.

The T-Network and the Quest for the Ideal Antenna Tuner

Today, because of its impressive ability to match nearly any load, the basic T-network of Figure 1A remains the most popular choice for general-purpose high-power antenna tuners.[4] However, as many of us have learned to our dismay, the T-network tuner can be finicky, and if improperly adjusted has an unfortunate tendency to self-destruct. All too often, melted components, scorched capacitor plates and vaporized switch contacts are the price one pays for the T-network's wide tuning range.

The T-network's greatest strength is also its greatest weakness. Simply put, the T-network is hard to tune because it is so versatile. Consider, for instance, the typical T-network antenna tuner, consisting of two variable capacitors, a roller inductor, and a VSWR or reflected power meter. (Often, a 4:1 toroidal transformer is also added to the input or output for matching balanced transmission lines.)

What makes this tuner difficult to adjust is that, for almost any load, there is a wide range of settings that yields a 1:1 VSWR. Unfortunately, many of these settings can result in excessive internal heating or damaging peak voltages. Because the VSWR or reflected power meter doesn't differentiate between "good" and "bad" settings, the first sign of impending disaster is often a flashover, a burning smell or smoke. We know that somewhere, hidden in all those turns of the roller inductor, is just the right inductance needed for the perfect match. The rub is finding that one particular spot on the coil.

Roller tuners have other disadvantages. Cranking a turns counter dial is tedious, quality roller inductors don't come cheap, and the rolling contact is a source of heating and intermittent contact. Given their druthers, most amateurs would prefer the convenience of a tuner with a bandswitched fixed inductor…*if* they could be assured that they wouldn't pay too high a price in loss of efficiency and matching range.

The EZ-Tuner probably comes as close to satisfying this desire as is currently possible. The secret to its design lies the particular choices of inductances, selected out of the T-network's infinity of possibilities. So how do we make those choices?

Simplifying the T-Network

It is not generally known that the T-network's matching combinations fall into simple patterns. Figure 2 illustrates these patterns for the 160-meter amateur band for resistive loads varying between 3.125 Ω and 800 Ω.[5] These loads correspond to VSWRs ranging up to 16:1, and the curves assume losses typical for transmitting capacitors and inductors.

The axes of Figure 2 correspond to the values of C_{in} and C_{out} in the circuit of Figure 1A. Constant VSWR values (resistive load impedances) are shown as straight lines (except for some curvature at the highest impedances) which extrapolate to the origin. The 50 Ω line corresponds to a 1:1 VSWR and has a slope of one (45 degrees). Also shown in the figure are curves of constant inductance spanning the range from 8-26 µH. These curves,

in combination with the VSWR lines, show at a glance nearly the entire 1.8 MHz matching capability of the T-network for resistive loads.[6]

To illustrate how to use the figure, suppose we have a 14 µH inductor and we want to know what capacitances will be required to match a low-impedance 6.25 Ω load (8:1 VSWR) at 1.8 MHz. By noting where the 14 µH curve intersects the 6.25 Ω line, we see that values of C_{in} =160 pF and C_{out} =400 pF are required to give a match. If we specify any one of the values of the three network components, the figure tells us the remaining two values.

But what if want to know the matching values on a different band? It turns out that Figure 2 can give the matching range at any frequency by simply multiplying the frequency and dividing the capacitances and inductances by the same factor. For instance, we can translate our 1.8 MHz example to 28.8 MHz by dividing the results by 16, since 28.8 MHz/1.8 MHz = 16. Thus we find that L = 14 µH / 16 = 0.88 µH, C_{in} = 160 pF/16 = 10 pF, and C_{out} = 400 pF/16 = 25 pF. These values will match a 6.25 Ω load at 28.8 MHz.

Example: a 160-Meter Antenna Tuner

Now let us introduce some other design considerations with a practical example. Suppose we wish to build a 160-meter legal-limit antenna tuner that uses a fixed inductor and a bandswitch. We want to use as few taps as possible on the inductor and keep losses in the network components below about 25% (corresponding to a 1-dB loss). We have two variable capacitors, each tuning 36-496 pF and rated at 3.5 kV.[7] Our goal is to find the optimum inductances for our tuner.

To begin, we draw horizontal lines corresponding roughly to the minimum and maximum values of C_{in} on the vertical axis of Figure 2, and the corresponding (vertical) lines for C_{out} on the horizontal axis. These four lines intersect to form a rectangle, the interior of which defines the possible matching range of our hypothetical tuner. Since all of the inductance curves between 12 µH and 26 µH intersect all of the VSWR curves within this rectangle, we know that any inductance between 12 µH and 26 µH will provide a match to a 50-Ω transmitter.

Before we choose one of these inductances, however, we need to remember that Figure 2 says nothing about network losses. For this information, we turn to Figure 3, which plots the power loss in a T-network as a function of inductance. The power loss is shown as the percentage of transmitter power dissipated as heat in the network components. Each curve in Figure 3 corresponds to a different load, and the curves span the full range of low and high resistances, up to a 16:1 VSWR mismatch. For example, the figure tells us that a T-network matching a 6.25 Ω load with an L=14 µH inductance at 1.80 MHz will absorb about 23% of the transmitter power.

Note that the power loss percentages of Figure 3 depend on the properties of our actual inductor and capacitors. The percentages shown in the figure assume typical values for transmitting-type components: Q=200 for L, and Q= 1000 for C_{in} and C_{out}. (These are the default choices used in the simulation software *TLA*, which was used to generate the data on which these curves are based.) Most of this power loss occurs in the inductor, so if our analysis shows excessive loss, we can always compensate by using heavier wire or copper tubing.

Note also that the 1.80-MHz curves of Figure 3 can be scaled with frequency, just as we did for the curves of Figure 2. For instance, by multiplying the frequency and dividing the inductance by 16, we see that that at 28.8 MHz, a network with a 0.88 µH inductance will also dissipate 23% when matching 6.25 Ω.

As we inspect Figure 3, we see that for loads greater than 12.5 Ω any inductance in the range of 12-26 µH will result in power loss below 25%. However, low impedance loads below 12.5 Ω can create significant problems. In fact, we need an inductance of no more than 10 µH to hold the power loss below our 25% goal. Unfortunately, we have already learned from Figure 2 that an inductance of 12-26 µH is needed to provide a match. A 10 µH inductance will not let us match these small resistances, because our variable capacitors don't have enough maximum capacitance.

Fortunately, we can solve this quandary by using *two* values of inductance to cover the range, and by padding the output capacitor with a small fixed capacitor. Referring again to Figure 2, we see that if we pad the output capacitor with 100 pF, so that it tunes 136-592 pF, we can use a 10 µH inductance to match loads of 50 Ω and below. We can use a second inductance of, say, 20 µH to match loads greater than 50 Ω, and in both cases we will have held the power loss below our specified limit. We can cover the 160-meter band with only two positions on our inductor switch. Success!

Now we still haven't dealt with the

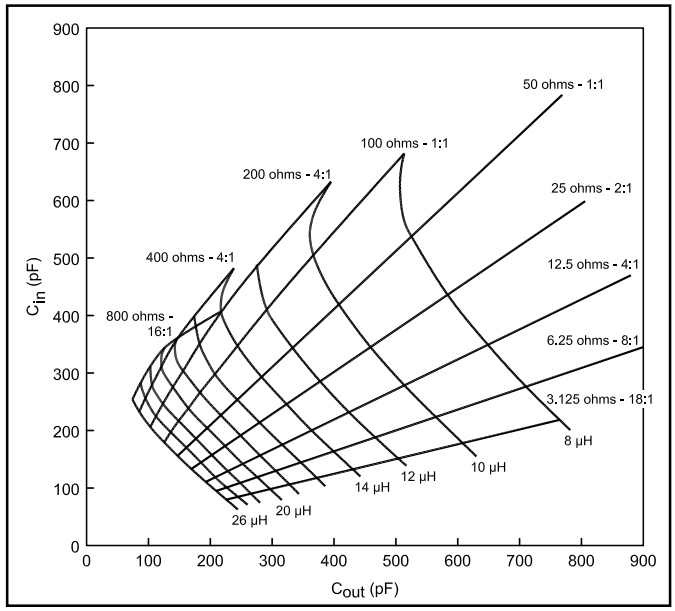


Figure 2—T-network constant VSWR curves at 1.8 MHz.

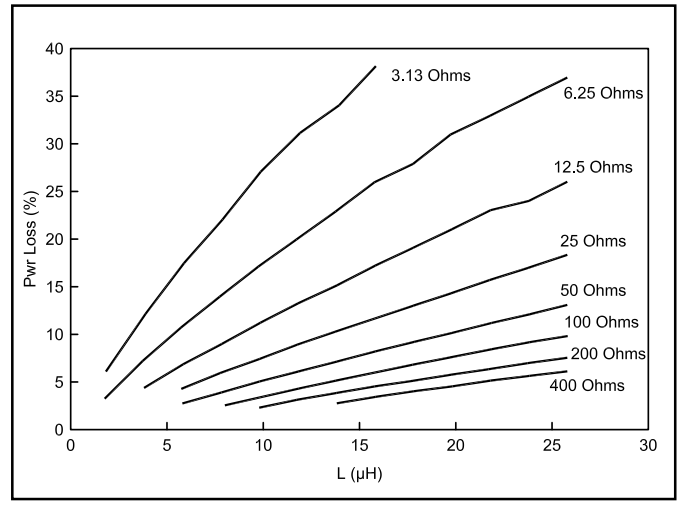


Figure 3—Power loss in the T-network at 1.8 MHz.

A front-panel LCD "turns counter" shows the capacitor and inductor settings, as well as the operating frequency.

problem of high peak voltages. Although it would not be difficult to draw a third figure that shows peak RF voltages in the T-network, we needn't bother. Instead, we will use the rule of thumb that peak voltages will be below 3.5 kV at the legal limit of 1500 W, so long as we design for network losses below about 25%.

EZ-Tuner Inductances

The 160-meter example illustrates the point that good T-network design involves the interplay between matching range and power loss. By extending these procedures to other bands, it is not hard to design a switched T-network antenna tuner that covers all nine amateur bands from 1.8-30 MHz. Because the majority of amateur bands are harmonically related, most inductance choices are used on several bands, thus minimizing the required number of switch contacts.

The design objective for the EZ-Tuner was to use no more than eleven inductance values to match up to a 16:1 VSWR on all nine HF bands, with no more than a 1-dB power loss and 1500 W power handling capability, while holding power loss to about 1 dB. (There are 11 positions on a 30 degree-indexed rotary switch.) Table 1 shows the selected values. The EZ-Tuner generally meets or exceeds these design goals. In fact, on most bands, it can match a 32:1 VSWR, and it also satisfactorily tunes the new 60-meter amateur band recently proposed by the ARRL. The capacitance ranges assumed in the computations are 19-402 pF for C_{in}, and 36-496 pF for C_{out}.

Parts 2 and 3 cover the construction of the EZ-Tuner and provide circuit description and additional information about matching performance. I will also give practical hints for accurately positioning the coil taps without special equipment. Stay tuned!

Table 1
EZ-Tuner Inductance Table

Tap No.	*Inductance (µH)*	*Amateur Bands (meters)*
1	0.3	10,12,15,17
2	0.4	10,12,15,17,20
3	0.7	15,17,20,30
4	1.0	17,20,30,40
5	1.3	20,30,40
6	1.7	30,40
7	2.4	30,40
8	3.1	40,80
9	4.6	80
10	10.0	80,160
11	20.5	160

Notes

[1]The program *TL* ("Transmission Line"), or its successors *TLA* ("Transmission Line—Advanced") and *TLW* (Transmission Line—*Windows*) are provided with recent editions of *The ARRL Antenna Book*.

[2]See "How to Evaluate your Antenna Tuner" (in two parts) by Frank Witt, AI1H, *QST*, April and May 1995.

[3]See *QST* Product Review, March 1997: "*QST* Compares: Four High-Power Antenna Tuners."

[4]For tuners dedicated to specific antennas, many amateurs swear by the simple L-network. However, the L-network cannot match both high and low-impedance loads without changing its configuration, and this shortcoming generally makes it unsuitable for a general-purpose antenna tuner.

[5]The program *TLA*, by Dean Straw, N6BV, was used to generate the data for Figures 2 and 3.

[6]Note that Figure 3 does not cover the extreme matching limits of the T-network. Instead it shows the practical range of importance to antenna tuner designers. Note also that the capacitance and inductance curves could be relabeled as reactances, rather than picofarads and microhenrys. Doing so would make the curves frequency-independent, but at a sacrifice in intuitiveness and usability.

[7]These are the ratings of the Cardwell-Johnson 153-6-1 capacitor.

James C. Garland, W8ZR, has been a licensed amateur for 47 years, having been first licensed in 1955 as WN0ZKE at age 12. In 1969, he operated in England as G5APG, and then moved to Ohio in 1970. Over the years, Jim has been interested in HF DXing and contesting, but his primary interest has been in homebrewing. He's built numerous rigs, amplifiers and other projects over the years. He also collects vintage rigs.

Professionally, he is president of Miami University in Oxford, Ohio, a position he has held for six years. (Miami University, as you might imagine, is the most ham-friendly university around!)

He has a PhD in solid state physics from Cornell University. His research area is experimental condensed matter physics, and he has published more than 100 technical articles in physics journals.

You can contact the author at 310 E High St, Oxford, OH 45056; **w8zr@arrl.net**.

NEW PRODUCTS

MFJ'S POCKET-SIZE CODE READER NEEDS NO CABLES

◊ If your Morse code is a bit on the rusty side, MFJ's new Model 461 mini code reader may be just the boost you need to smooth out the rough spots—and all without cumbersome power and audio cables. Simply place the compact reader near your receiver's speaker, wait until the "lock" LED flashes in sync with the received code

and watch the decoded copy scroll across the LCD. The device locks on and tracks code elements up to 99 words per minute.

The full-featured reader has four display modes, a two-line LCD that displays 32 characters (each ¼-inch high), a 140-character "instant replay" buffer and a received code speed display.

Prices: $79.95 (MFJ-461 Morse reader); $6.95 (MFJ-26B protective pouch); $14.95 (MFJ-5161 DB-9 serial cable); $5.95 (MFJ-5162 optional audio input cable). For more information, contact your favorite Amateur Radio products dealer or MFJ, 300 Industrial Park Rd, Starkville, MS 39759; tel 800-647-1800, fax 662-323-6551; **mfj@mfjenterprises.com**; **www.mfjenterprises.com**.

Next New Products

STRAYS

DON BOSTROM, N6IC

Becky Windsor displays a jacket with a plethora of patches from years of International DX Conventions. This year's event will be April 26-28 at the Holiday Inn Visalia, California. For more information, see www.qsl.net/visalia2002/index.html or contact Don Bostrom, N6IC, 4447 Atoll Ave, Sherman Oaks, CA 91423, n6ic@arrl.net.

RADIO-TELEGRAPHY BOOK

◊ *The Art and Skill of Radio-Telegraphy*, Third Revised Edition, by William G. Pierpont, N0HFF, has been published and printed by the Radio Amateur Educational Society (**www.raes.ab.ca/book.html**); edited by Dave Clarke, VE6LX.

The book focuses on how to go about learning Morse code and improving one's CW capability, as well as enjoying it in communicating. It covers the problems that many have run into, including the speed plateau, and tells how to overcome those problems. This book contains 34 chapters and an Appendix with information about many of the world's highest speed operators.

Next Strays

By Rick Rogers, KI8GX

A "One-Masted Sloop" for 40, 20, 15 and 10 Meters

What started off as a compromise replacement for a "monster loop" turned out much better than expected. This antenna may prove to be an exception to the rule that "you get what you pay for."

Over 33 years of hamming, one of my favorite activities is building and testing antennas. Of all the types of antennas tried, I get the best bang for the buck from simple, horizontal loops.

Designing the Loop

An interesting property of loop antennas is that they are harmonically resonant. As shown by Doug DeMaw, W1FB, a loop designed for 7.1 MHz will also resonate at 14.2 MHz, 21.3 MHz, 28.4 MHz, etc.[1] See Figure 1. The ability to operate on multiple bands without retuning and the multidirectional nature of their radiation patterns make horizontal loops especially useful for DX, contest, and net control applications where having to wait to rotate a beam can be a disadvantage. Another advantage of the loop antenna is that it tends to be quieter on receive than some other designs, such as Yagis or verticals.[2]

The best antenna I ever built was a 160-meter full-wave horizontal loop. Even though the antenna was only up about 35 feet, it did a pretty good job on 160, is spite of radiating most of its energy skyward. Where this antenna was really effective, though, was on its harmonics. An *EZNEC*[3] model of this antenna shows, for example, that at 10 meters, it radiates multiple low-angle lobes, some with gain figures of more than 13 dBi.

Of course, a monster like this had (note past tense!) its problems. It required 4 masts, 540 feet of wire and a big chunk of land. As the reader might guess, antennas that big suffer a lot from the wind, even if made out of relatively strong wire. Mine was made of 17 gauge aluminum fence wire but it seemed like I was always repairing damaged masts and broken wires. [Solid wire is more likely than stranded wire to break as a result of repeated flexing.—Ed.] After about six months of constant struggle against the elements, the antenna and three of its four supports succumbed to wind-driven hail.

After the storm, and several unsatisfying weeks trying to get by with a homebrew vertical, I thought to try something a little less ambitious. What I had in mind was a loop that would use only the single remaining support. A quick session with *EZNEC* showed that a sloping loop, 140 feet in circumference (a full wavelength on 40 meters), with the feed point elevated on a single 30-foot support should resonate on 40, 20, 15 and 10 meters. The antenna should also produce reasonable gain in multiple directions, especially at the shorter wavelengths (see Figure 2). This "one-masted sloop," a *sloping loop* supported and fed at the top corner, turns out to be a good performer and costs almost nothing.

Building the Loop

Construction couldn't be easier. First, buy or build a dipole center insulator with coaxial connector as described in *The ARRL Handbook for Radio Amateurs* (see

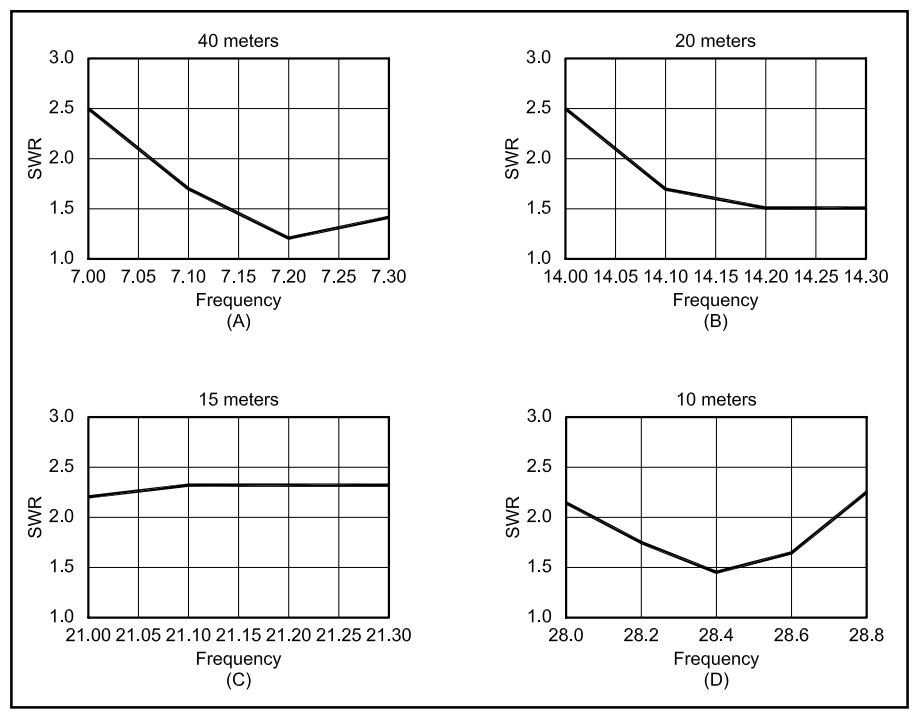


Figure 1—SWR vs. frequency plots for the 136-foot, 40 through 10-meter sloop. The SWR minimum for the four bands is easily adjusted by adding or deleting small lengths of wire from the loop.

[1]Notes appear on page 46.

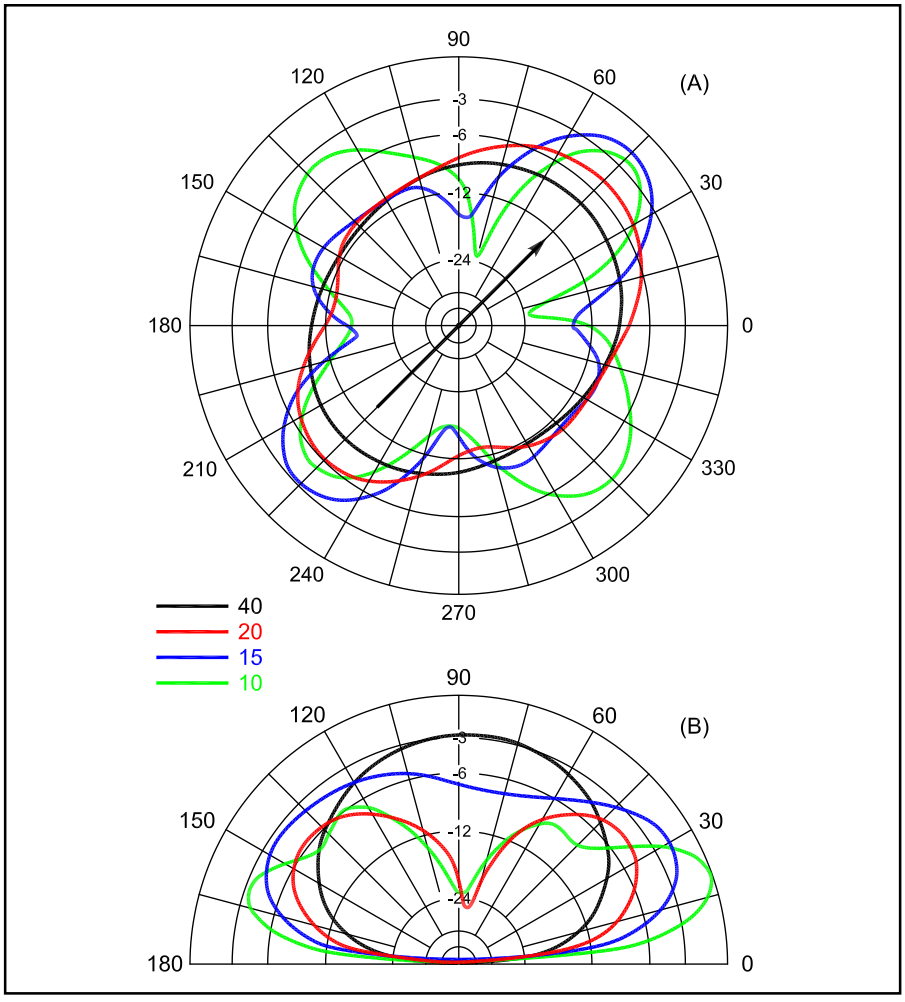


Figure 2—*EZNEC* study of the far field radiation patterns of the 40 through 10-meter "Sloop." The arrow indicates the direction of the slope. A is the azimuth plot at 30 degrees elevation. B shows the elevation plot along the axis of maximum gain, 45-225 degrees.

Figure 3).[4] Connect the opposite ends of the 140-foot wire to the center insulator. I prefer 14 gauge stranded and insulated wire because it is easy to work with. Tie 50-foot lengths of $^{3}/_{16}$-inch rope to the antenna at points 35 feet away from the center connector on each side. [You may wish to use a ceramic insulator at the side and bottom tie-line attachment points, particularly if high power will be used; see Figure 4.—Ed.] Connect 50-Ω coaxial cable such as RG-8 or RG-58 to the connector and raise the feed point to a height of 30 to 40 feet. Pull the side tie lines sideways and down until the upper half of the antenna forms a taut 90-degree angle and slopes at 30 to 45 degrees with respect to the ground (see Figure 3). Tie off these lines. Attach a short (2-3 foot) length of line to the bottom point of the loop and tie off the bottom of the loop to a stake or a fence post.

The loop will need to be pruned for the antenna to resonate at the desired frequencies. To do this without raising and lowering the antenna for each adjustment, remove lengths of wire at the bottom of the loop and then solder the ends back together. Shorten the loop a few inches at a time until the SWR approaches 1:1 at the desired 40-meter frequency. Adding wire will lower the resonant frequency on all bands.

In my case, a final length of 136 feet yielded SWR values lower than 3:1 over the entire 40, 20 and 15-meter bands. The loop also produced a 2:1 SWR over almost 1 MHz of the 10 meter band (see

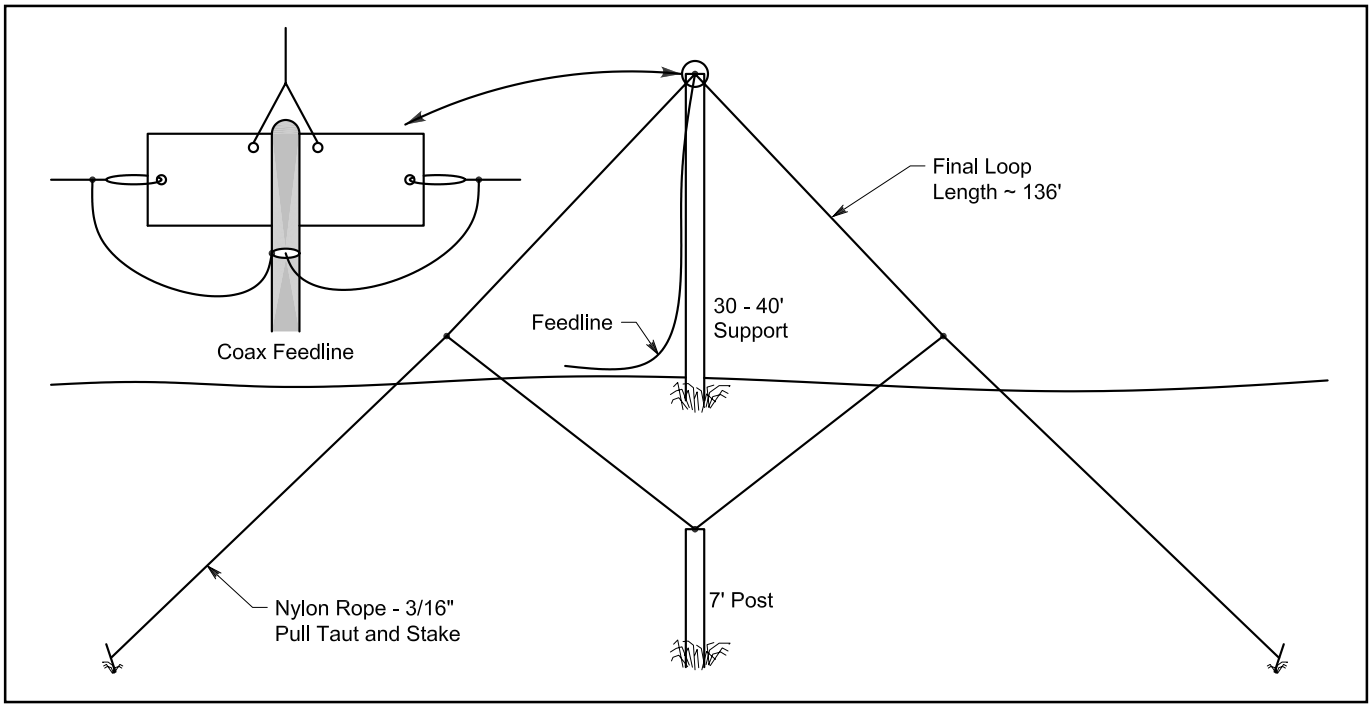


Figure 3—The vertical support of the Single-Masted Sloop can be a mast, tree, building, flagpole, and so on. The simplicity of the design and the multidirectional gain delivered at the harmonics make this antenna a good candidate for Field Day.

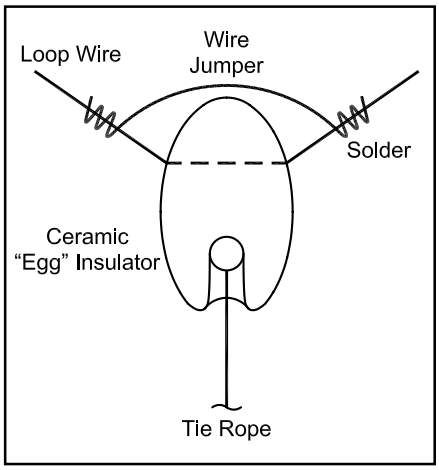


Figure 4—One simple method of attaching tie ropes to wire antennas.

Figure 1). Since I typically hang out in the phone sections of these bands, my antenna was tuned for the best match there. My old Kenwood TS-830 and ancient Hallicrafters HT-41 kilowatt amplifier—both with adjustable pi matching output networks—easily tune to this antenna at any frequency on all four bands. Most recently manufactured rigs can handle the 2 or 3:1 SWR at the band edges. [To lessen the SWR, particularly at higher frequencies, the loop can also be fed with open-wire line.—Ed.]

Results

The results with this antenna are gratifying, especially given that it can be built in a couple of hours from scrap wire and hardware, tunes easily, doesn't need to be elevated to great height and occupies a reasonable "footprint." Stations in Europe, Japan, South America and the Azores were worked with 100 W on 20, 15 and 10 meters within an hour or so of completion and with good signal reports. I tried the antenna on 40 meters during the November 2001 Sweepstakes to get some idea of its performance on that band. I was pleased to find that contacts could be made with the antenna on both coasts from central Ohio at midday in spite of *EZNEC* showing much of the energy on 40 meters radiates straight up (see Figure 2). The performance, simplicity and cost of this antenna suggest to me that this would be the antenna I would roll up and take along on that low-budget DXpedition to the Caribbean.

Notes

[1]Doug DeMaw, W1FB, "A Closer Look at Horizontal Loop Antennas," *QST*, May 1990, p 28.

[2]See Note 1.

[3]*EZNEC* 3.0 Antenna Design Software by Roy Lewallen, W7EL (**www.eznec.com/**; **w7el@eznec.com**).

[4]Chapter 20 ("Antennas and Projects") of any recent *ARRL Handbook* contains drawings that illustrate ways of attaching a center connector.

Rick Rogers, KI8GX, was first licensed as WN6HGY in 1968, followed by WA6EZT, N9COO and N7GEF. He is a professor of Neuroscience at Louisiana State University where he does research on, and teaches, neurophysiology and physiological instrumentation. A chance encounter with a neighborhood ham cleaning out his garage (SamWestfall, K6PHH) in 1967 started Rick, then 13 years old, on his career in ham radio and science. Ham radio provided an ideal entry point into neurophysiology since the principal elements of the nervous system neurons "talk" to each other using frequency modulated electrical pulses. The ARRL Handbook for Radio Amateurs *can be found on the bookshelves of quite a few neuroscientists, whether they are hams or not. You can reach the author at 9831 Bank St, Clinton, LA 70722;* **rogersrc@pbrc.edu**.

VHF/UHF CENTURY CLUB AWARDS

Compiled by Eileen Sapko
Awards Manager

The ARRL VUCC numbered certificate is awarded to amateurs who submit written confirmation for contacts with the minimum number of Maidenhead grid locators (indicated in italics) for each band listing. The numbers preceeding call signs indicate total grid locators claimed. The numbers following the call signs indicate claimed endorsement levels. The totals shown are for credits given from December 8, 2001 to February 11, 2002.

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50 MHz
100

1185	W9CSY
1186	Void
1187	K6YK
1188	K0DLW
1189	PY5IP
1190	VE2VLJ
1191	K1NU
1192	KJ6CA
1193	KB8GC
1194	K6CF
1195	N8YV
1196	KD5GJR
1197	KE6TVM
1198	SM3GBA
1199	KC8KSK
1200	WB6YIY
1201	WM3O
1202	W4KVS
1203	W4PRZ
G8BQX	500
OK1MP	350
VE6NTT	300
VE7VDX	200
K0CS	450
K0DI	150
NE0P	225
WA0FQK	175
KA0JGH	600
K1BD	125
K1SIX	850
WB1FLD	250
NJ2F	400
W2BZY	525
KB2TGU	350
N3RN	200
W3HHN	375
W4GLV	400
KE4HOA	200
N4MM	750
W4UDH	675
KE5K	200
W5OZI	900
AA5XE	600
WD5K	900
K5TN	500
N6JV	425
KC6ZWT	125
W6OMF	275
WX7M	375
WO9S	225

144 MHz
100

597	NL7CO
W6OMF	125

432 MHz
50

G4RGK	190

902 MHz
25

32	N2BJ

2.3 GHz
10

66	N2BJ

10 GHz
5

117	N0UGY
118	KH6/WA0QII
AA5C	35

24 GHz
5

13	N0UGY

Satellite
100

113	KB9RCA
KK5DO	650
W5ADC	250
K5OE	625
N5AFV	325
K9HF	300

NEW PRODUCTS

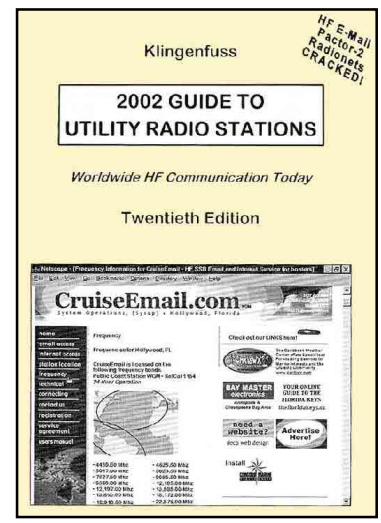
THE IXTH 10P60 P-CHANNEL POWER MOSFET

◊ Power semiconductor specialist IXYS announces its new P-channel Enhancement Mode Avalanche Rated Power MOSFET, the IXTH 10P60. The device has a continuous drain current rating of 10 A, a V_{ds} rating of 600 V and an "on state" resistance of 1.15 ohms. The fast-switching MOSFET is packaged in a rugged TO-247 housing and has a power rating of 300 W at 25° C.

Price: $10.10 in quantities of 1000. For more information, contact IXYS at 3540 Bassett St, Santa Clara, CA 95054; tel 408-982-0700, fax 408-496-0670; **www.ixys.net**.

KLINGENFUSS FREQUENCY GUIDES FOR 2002

◊ Veteran short-wave frequency sleuth Joerg Klingenfuss has released the 2002 versions of his venerable broadcast and utility station frequency guides—in book form and on CD-ROM. The 2002 volumes include *The 2002 Shortwave Frequency Guide*, *The 2002 Guide to Utility Radio Stations* and *The 2002 Super Frequency List* on CD-ROM (the CD now runs on every version of *Windows* from 3.1 through XP and includes detailed clandestine, domestic and international broadcasting schedules).



Also included this year is support for the Wavecom Digital Data Decoder card and details on how to listen in on the newest, most secretive shortwave digital modes—including commercial HF e-mail!

Relied on by professional and hobbyist listeners for years, Klingenfuss publications are known for their thoroughness and accuracy. For detailed content descriptions and color screen shots, see **www.klingenfuss.org**. The *Shortwave Frequency Guide* (order no. 8663-$34.95 plus shipping) and *Super Frequency List* (order no. 8671—$24.95 plus shipping) are available from ARRL Headquarters, tel (toll-free) 888-277-5289; **www.arrl.org/shop/**.

Previous • Next New Products

By Kirk A. Kleinschmidt, NT0Z

A Balanced, Everyday Approach to All-Band Bliss

Feed lines, antenna tuners, baluns, RFI, computer noise and all-band antennas—now there's a snake pit of potential conflict. After years of experimentation, the author has found the path to multiband nirvana.

For most of us, the Holy Grail of ham radio is antenna performance. It's often the key element in determining ham radio success and operating enjoyment. You can get by with a second-rate transceiver, a deep gravelly voice and even a severe lack of good looks and charm, but if you have an underperforming antenna, ham radio isn't nearly the fun it could be.

You've undoubtedly looked with longing, as I have, at magazine pictures that show fabulous contest "superstation" antenna farms, the few fortunate hams who have 350-foot towers festooned with big Yagis (or a smattering of 200-footers), the Northern California ham who has a dozen full-size rhombics strung between the tops of giant Sequoias, and so on.

After imagining an antenna system that qualifies as a navigation hazard, most of us will scale things down to the real matter at hand—how to put up an affordable, easy-to-build multiband antenna that works great and fits on an average-size lot. We're back to the search for the Holy Grail.

Horizontal Loop Antennas

What, you were expecting dipoles?

Although dipole antennas in all of their various shapes and configurations perform well, in my experience the *best* all-around multiband antenna is the horizontal loop. It's efficient, omnidirectional over most "real ground," it's quiet, it operates well on *all* HF frequencies above its design frequency (and even those below, as we'll see later), it fits on most lots and, contrary to tradition and many official-looking radiation pattern plots that can be found in various antenna manuals—can be an *outstanding* antenna for domestic *and DX* contacts alike.

As a kid I made my share of vertical loops/quads from bamboo poles and copper wire, but I didn't think about horizontal loops until I read Dave Fischer, W7FB's life-changing article, "The Loop Skywire," in the November 1985 issue of *QST* (back when Dave signed W0MHS). Shown in Figure 1, the loop is simply a full-wavelength of wire cut for the lowest band of interest. Feed it with coax or ladder line (feed lines are discussed in detail later).

I had previously used quad loops and dipoles (G5RV-type and conventional). Sure, they *worked*—and they still do—but I had always thought something was lacking, and I had a secret hunch about the Loop Skywire.

Now, Fischer's First Rule of horizontal loop construction is to enclose as much area as possible within the confines of the loop. A circular loop is ideal, but a square loop is much more practical and doesn't suffer performance-wise. My lot could only accommodate a triangular "loop," which is pretty much the geometric limit of what you can get away with. If you make the loop any more elongated or constricted, it loses its "loop-like" qualities.

Although my most recent loop could have been cut for 40 meters, my property and available skyhooks could contain a larger antenna (which should work better, especially on the low bands). It wasn't the 272 feet required for an 80-meter loop, but something in between. That's how I discovered another rule of thumb for building modern-day horizontal loops: Put up the largest possible horizontal loop your situation allows and forget about pruning it to resonance. The antenna tuner, which you'll need anyway for multiband operation, will take care of things.

Strung about 45 feet above the ground, I knew from past experience that my loop would be an excellent performer. Fed with 50 feet of RG-8 and my trusty old antenna tuner, the loop worked very well on 40 meters and up. As before, however, 80 and 160 were adequate, but just barely.

RFI was a big headache on the higher bands. In fact, 15 meters was almost impossible. Even at 5 W power levels, every key-down zapped the TV screen and all of the stereo and computer audio circuits in my office/shack. I had converted the garage to an office, and my shack is on the west wall. Just outside the wall is the base of my tower, which supports the feed point of the horizontal loop. Although the antenna itself is at least 50 feet from all of the PCs and consumer electronics, the feed line was in close proximity. The crud generated by three or four computers was also a headache and wiped out large chunks of the bands.

RFI

Despite the RFI and computer noise, I was pleased with the performance of the big loop.

I tried all of the standard RFI-fighting techniques. I made sure I had a good, short, low-impedance connection to an earth ground at my operating position. I installed ferrite cores and clamp-on chokes on seemingly endless numbers of audio and

Electronic Article References

If you're an ARRL Member, point your Web browser to the links below to access Adobe PDF versions of the articles I've referenced in the test.

- The Loop Skywire: **www.arrl.org/members-only/tis/info/pdf/8511020.pdf**
- A *Balanced* Balanced Antenna Tuner: **www.arrl.org/members-only/tis/info/pdf/9002028.pdf**
- The Lure of the Ladder Line: **www.arrl.org/tis/info/pdf/9312070.pdf**
- Home-brew Your Own Inductors: **www.arrl.org/members-only/tis/info/pdf/0107066.pdf**

video cables. I installed ac line filters and connected some sensitive gear to the ac mains via an uninterruptible power supply, complete with RFI filtering, surge suppression and line conditioning.

I picked up a copy of *The ARRL RFI Book*, which is handy to have even if you're not besieged. I read up on common-mode interference, front-end overload, nonlinear rectification and even interference that's re-radiated by other affected components.

I disconnected dozens of speaker wires, audio and video leads, and coaxial TV cables. Is the RFI getting in through *this* wire or is it through *that* one? It was test, test, test—back and forth.

In the end, all of that poking and prodding made the RFI situation quite a bit better on all of the bands except 15 meters, which was still unusable.

Still, life was pretty good on 40, 30, 20 and 10 meters, and I was working lots of juicy DX and enjoying solid stateside ragchews.

Climbing the Ladder Line of Success

At this point I was feeding my loop through a standard antenna tuner and a 50-foot length of coax. I knew about open-wire line, TV twinlead and ladder line, but I'd never used the stuff to feed an antenna. Then I got wind of Steve Ford, WB8IMY's, excellent and eye-opening introduction to multiband antennas fed with 450-Ω ladder line. The article is "The Lure of the Ladder Line," from the December 1993 issue of *QST*. It's also available to ARRL members in PDF format from *ARRLWeb* (**www.arrl.org/**).

Steve tells us how he dramatically improved the performance of his multiband dipole, formerly fed with coax and a tuner, by replacing the feed line with 450-Ω ladder line (see Figure 2). There it was in black and white: A key piece of antenna system wisdom that I'd been lacking for years.

In that article I discovered that the loss figures commonly attributed to coaxial cables of various sizes and compositions *are only accurate under low-SWR conditions*. As shown in Table 1, when the SWR on the coaxial feed line between your antenna tuner and your antenna's feed point is high—as it usually is when feeding antennas on frequencies at which they're not resonant—the signal losses in the coax can be staggering.

No wonder my antenna worked great at the design frequency and on all higher HF bands, but fell off on 80 and 160 meters. On those bands, even a 40-meter full-wave loop is physically small *and* the high SWR on the line between the tuner and the antenna wasted most of the power.

But look at the loss figures for the ladder line. They are a lot better, especially on the lower bands.

Baluns and Conventional Antenna Tuners

Unfortunately, using open-wire feed lines isn't always as easy as simply swapping one cable type for another. Coaxial cables are unbalanced (which can make them vulnerable to common-mode RFI), and conventional antenna tuners are designed to handle them, so when they're matching coaxial cable loads, everything works out fine as long as the impedance at the tuner end of the feed line isn't too extreme.

Ladder-line and open-wire line are intended for balanced operation where equivalent currents flow through each of the two wires that make up the feed line. To accommodate balanced feed lines, conventional tuners almost always use a balun transformer at the tuner output to make the transition from balanced line to an unbalanced tuner network.

In a perfect world, this works pretty well and users can conveniently feed unbalanced and balanced loads without needing separate tuners. The problems arise when we consider how difficult it is to make a single balun that works well over a wide range of frequencies and power levels. In short, it's easy to build a tuner-output balun that works well on a single band or on a few adjacent bands, but when it

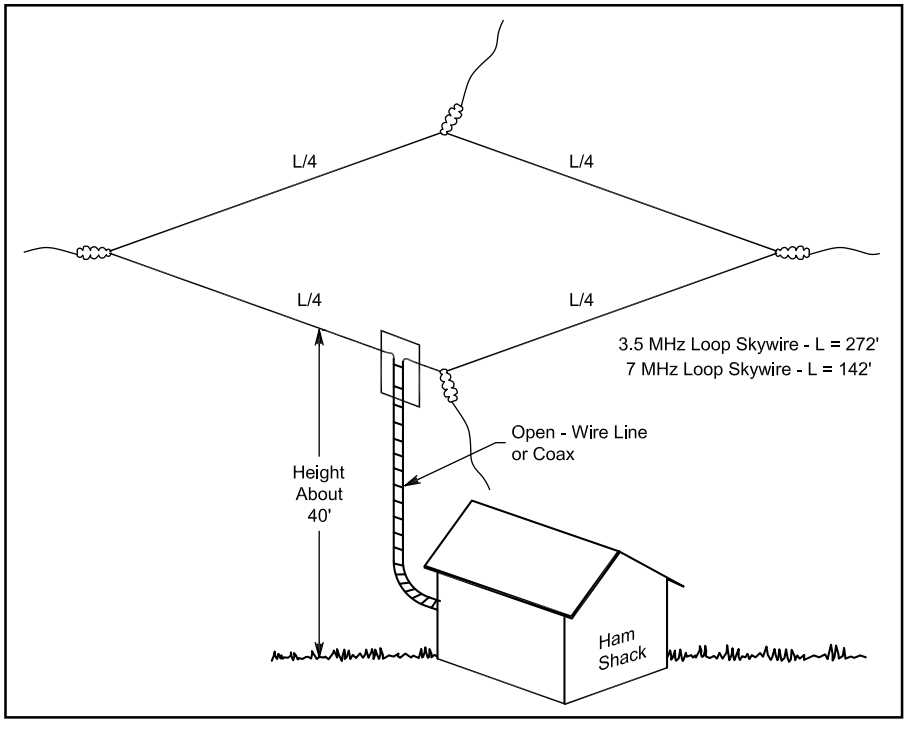


Figure 1—Put up the largest horizontal loop your lot can support while keeping the "loop" as square as possible. Don't worry about perfect symmetry. For size reference, values are shown for 80 and 40 meters. See the text for additional information.

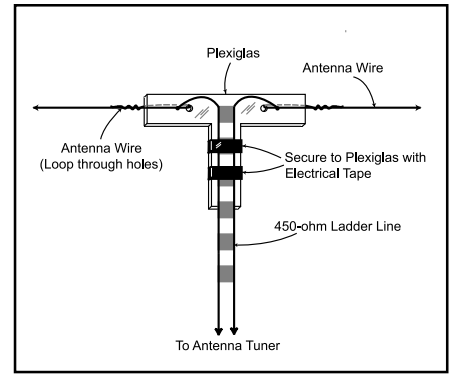


Figure 2—A dipole formerly fed with coax now has a ladder line feed.

Table 1

Loss Comparisons for Belden 8214 Coaxial Cable and 450-Ohm Ladder Line

Cable length: 50 feet.
Antenna: 66-foot dipole at 30 feet.
Calculated by Dean Straw, N6BV, Senior Assistant Technical Editor.

Freq	*Loss (dB)*	
(MHz)	*8214*	*Ladder Line*
1.9	26.9	8.82
3.8	13.7	1.37
7.15	0.19	0.07
10.14	2.85	0.07
14.27	5.30	0.15
18.14	6.96	0.31
21.40	0.78	0.12
24.90	3.94	0.13
28.50	5.69	0.18

comes to a single dc-to-daylight tuner-output balun, things often don't work so well.

Also, because of where the balun resides in the tuner/antenna circuit, output-style baluns are often subject to extreme RF voltages, which can cause arcing, sparking, burning and other undesirable behavior. Output-style baluns also tend to have a tough time staying electrically balanced over a wide frequency range.

All of these factors combine to decrease the tuner's efficiency and increase power losses in the tuner and balun that are *in addition* to the losses of the feed line. Of course, all antenna tuners have some loss, and that loss tends to vary by frequency and load impedance. Matching extreme impedances usually means more loss.

Steve experienced this when feeding his 40-meter dipole with ladder line on 80 and 160 meters (extreme impedances for a 40-meter dipole). At anything more than just a few watts, his tuner would arc, snap, sizzle and pop. To operate on those bands he could run QRP or switch to an expensive megapower tuner.

After a quick trip to the Twin Cities to fetch some ladder line, I dropped the feed point, made the switch to ladder line and hooked everything up to my time-tested—conventional—antenna tuner, making sure I connected the jumper wire that brought the output balun into the circuit.

With high hopes, I keyed the rig and, as usual, the impressive audio thumps and TV screen blackouts began. I still felt the lure of the ladder line, and I was now making easy contacts on 80 and 160 meters—electrically goofy feed line and all. I was gaining ground, but because of the RFI, etc, operating wasn't convenient.

Autocoupler to the Rescue

The next remedy I tried didn't cure all ills, but it became a piece of "can't do without" gear. In preparation for portable operation at the lake, I acquired an SGC SG-231 autocoupler, a computerized, automatic supertuner that can match practically any load from 160 through 6 meters in the blink of an eye.

The SG-231 has no controls and is designed to be mounted outdoors, even in harsh environments. You supply the dc power to operate the innards and some RF from your rig and the '231 does the rest. Simply key the mike on whatever frequency and the autocoupler matches the load in a jiffy, remembering the tuning solution so when you return to a nearby frequency, the tuner matches the load in about a quarter of a second—fast.

This amazing piece of hardware, called an autocoupler by the manufacturer, is designed to be *mounted at the feed point of the antenna*. When mounted in that fashion, the SG-231 matches the antenna to the 50-Ω impedance of the coax that runs from your rig to the tuner/feed point. Because the SWR on the cable between the tuner and the radio is low (matched), SWR losses are minimal and essentially of no concern.

The big problem for me was, I couldn't use the autocoupler at the lake if it was hanging 50 feet up in the air, precariously attached to my loop. And, even though it's designed for such service, I couldn't get myself to mount the coupler outside, exposed to the elements and those nasty Minnesota winters.

So, I snooped around on the Internet and saw that some ops were using their SGC tuners to feed balanced lines in a conventional sense (tuner in the shack, feeding a multiband antenna via 450-Ω ladder line).

I quickly connected the SG-231 to my rig and to my ladder line, fired it up and watched the magic happen with my own eyes. The autocoupler easily matched everything from 160 through 6 meters with the exception of a small chunk of 80 meters where the impedance at the shack end of the ladder line was probably weird.

I enjoyed using this arrangement for several years. It matched my loop, which is probably resonant at 5 MHz or so, in a snap, and RFI on 80 and 160 meters was pretty much eliminated. The 231 added tremendous convenience to the loop's superb performance.

The Final Balancing Act

Clearly, the horizontal loop, the ladder line and the autocoupler were working famously. I probably would have put up with the RFI/noise problems for a good long while if I hadn't run across a discussion during one of my late-night jaunts on 75 meters.

The guys in this roundtable were talking about how they'd built *balanced antenna tuners to feed their big horizontal loops with ladder line*. I knew I'd feel right at home chatting with these guys. They were spread out from the Carolinas to Arizona, and they were booming in on their own horizontal loop antennas. The guy from Carolina was running a kW and he sounded like a shortwave broadcast station.

The gist of our conversation centered around building a simplified version of the balanced antenna tuner detailed in, "A *Balanced* Balanced Antenna Tuner," by Rich Measures, AG6K, in the February 1990 issue of *QST* (available to ARRL members in PDF format from *ARRLWeb*.

The tuner uses a balanced L network instead of the conventional pi network employed by almost every commercial antenna tuner in service today (see Figure 3). The balanced L network can directly feed 450-Ω balanced lines while maintaining a high degree of electrical balance on each leg of the ladder line. It's this balance, I learned, that's critical in keeping the ladder line from radiating RF.

And instead of being at the tuner output, the balun is placed at the tuner's input, where baluns really do work over wide frequency ranges and where RF voltages and RF losses are minimal.

So what's the catch? Well, although the balanced L network could hardly be simpler, Rich's version requires two matched roller inductors, which are difficult to find and somewhat expensive, and a turns-counting dial.

Still, it was clear from reading Rich's article that using a balanced tuner with the balun on the input was the *proper* way of doing things for antennas fed with ladder line. So, I decided to build one and see for myself.

Thankfully, I had two brand-new roller inductors on hand. I'd purchased them

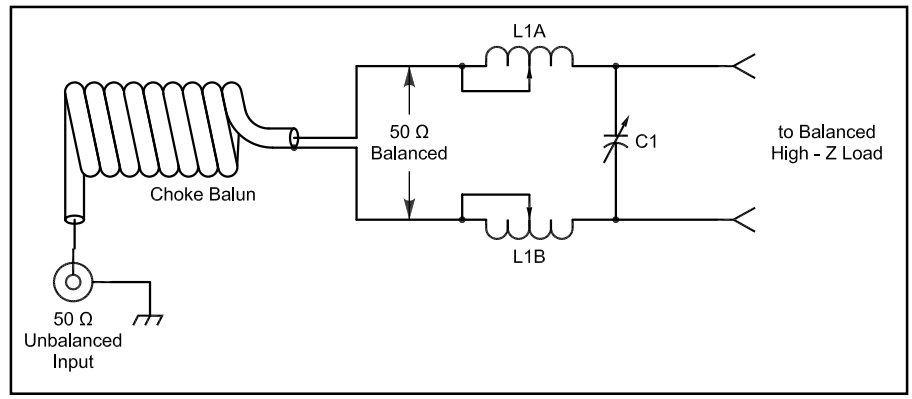


Figure 3—A simplified schematic of the balanced tuner as originally presented by Rich Measures, AG6K. The home-brew coaxial balun is on the input side of the network, which consists of two roller inductors that are adjusted in sync and a single variable capacitor. The capacitor, usually on the output side of the coils, can be moved to the input side to match some lower-impedance loads. Some builders use fixed, tapped inductors to save money. See the text and the References sidebar for more information.

from MFJ several years ago when I was planning to build a pair of conventional antenna tuners. I also had a turns-counting dial I'd purchased almost 20 years earlier. The capacitor was a junkbox transmitting unit. The only parts I had to purchase were the sprockets (¼-inch shaft size) and the toothed belt required to turn each roller inductor in sync. These cost only a few dollars from McMaster-Carr (**www.mcmaster.com**).

Building this tuner seemed like carpentry, with a little radio thrown in for good Measures (pun intended). The tuner is built on a piece of plywood with a wooden (or other non-conducting) front panel because the capacitor and inductor shafts are hot with RF. Building on metal would have required stand-off insulators and a lot of tedious wrangling. With wood it's a no brainer.

The only accommodation I made in my prototype is the use of banana posts and jacks to let me occasionally switch the capacitor from the output side of the coils to the input side to match balanced loads that are less than 50 Ω (most are greater than 50 Ω).

The thing went together in a couple of hours, and once I synchronized the roller inductors I replaced the autocoupler with the balanced tuner. Figure 4 shows the completed tuner in all its glory.

Ahhh. The tuning was smoooooth, with no sharp, hard-to-find dips. It was also convenient because it had only two controls instead of the usual three. I methodically tuned up and down the bands with a 5-W signal and was pleased to notice that every spot on every band tuned up without a hassle, except for part of 75 meters—the same part that the SGC autocoupler didn't like.

The other thing I almost forgot to notice was that—as if by divine decree—there was no more RFI. Anywhere. On any band. At any power output from 5 to 100 W. Not even the faintest of audio thumps could be heard in any of the many electronic goodies just three feet away from the tuner and the stub of ladder line that pokes through the wall.

But there's more. The computer noise was reduced by a good 80%. Now I could operate anywhere. The noise pickup problem that I'd made incremental progress on over the past few years was now virtually eliminated, and what remained was barely noticeable. I rushed to get on the air.

Because I was familiar with how well the horizontal loop works as a DX antenna, I wanted to really push the new setup to the edge. I tuned up on 30 meters with about 1.5 W showing on the QRP wattmeter. As I tuned to the low edge of the band I heard a nasty pileup. Underneath it all (and a few kHz down the band) was 5U1A—a DXpedition to Niger, as I learned later. After re-remembering how to operate split, I jumped into the fray. It took me about 15 minutes to work through the pileup, but at that relatively low power level I was more than pleased (as I was the next night when I worked V51AS in Namibia on the same band).

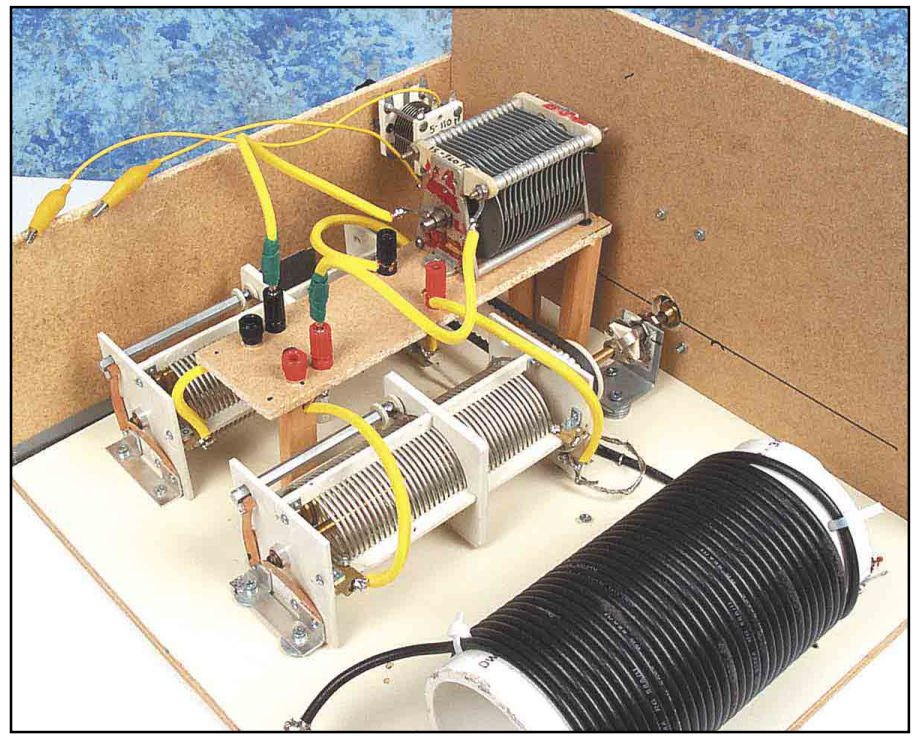


Figure 4—The parts layout of the author's balanced tuner. At the right is an easy-to-build, 160-10 meter coax balun. At the center is a pair of roller inductors and the front-panel tuning capacitor. The larger banana jacks allow the tuning capacitor to be switched from the input to the output side of the coils. The smaller banana jacks are for connecting the feed line. The smaller variable capacitor was added to facilitate testing. See the text and References sidebar for more information).

After using the prototype tuner for a while I discovered a couple of minor things I need to iron out. The first is the funky part of 80 meters, which I hope to fix by lengthening the feed line. The second involves the wide tuning range I'm asking the L-network to accommodate.

Using the first capacitor I tried (a 15 to 300 pF unit) I can easily tune the bands from 160 through 20 meters, but there's apparently too much stray capacitance to match things on the higher bands. When I substitute a smaller capacitor I can tune 40 through 10, but not 80 and 160.

I think my eventual solution is to use the smaller capacitor and switch a fixed-value capacitor in parallel as needed, or to use the larger unit and switch a fixed C in series. My short-term solution, however, is to mount two tuning caps on the front panel and use their respective banana plugs to switch them in and out as necessary. Oh, the joys of breadboard construction.

The Path to Your Bliss

So, what have I/we learned so far?

(1) Horizontal loops are fabulous—if not the best—all-band non-resonant antennas. They noticeably outperform dipoles when used at frequencies above resonance and they're easier to match there as well (impedance wise). They're efficient, quiet and forgiving.

(2) As long as in-shack RFI and computer noise aren't part of your equation you can happily feed the loop with coax via a standard antenna tuner for use on the band of resonance and all HF bands above the fundamental frequency.

(3) If you want to operate your loop on bands below its fundamental frequency, you'll probably want to replace the coax with ladder line to minimize SWR losses in the feed line.

(4) In doing so you may discover firsthand that most conventional tuners don't work very well when feeding balanced lines, and that most tuner-output baluns don't keep things balanced over a wide range of frequencies.

If it isn't obvious by now, I'd like to offer my heartfelt thanks to Dave Fischer, W7FB; Steve Ford, WB8IMY; Rich Measures, AG6K, and the loopy guys on 75 meters.

You can reach the author at 16928 Grove St, Little Falls, MN 56345; **kirk@cloudnet.com**.

By H. Ward Silver, N0AX

CQ 6 Meters from the Galapagos

With solar activity making a surprise rebound from what appeared to be the "back porch" of Cycle 23, 6 meters has become the star attraction in the DXing world. If you think it's fun working 6 these days from home, it's even better from a rare DX location!

BOB WILSON, N6TV

The Expedition

In November of 2001, I was fortunate to be part of a top-notch crew of operators making our way to the Galapagos Island of San Cristobal for the CQWW CW contest. Our goal was to compete for first place in the multi-multi category. Several of us arrived well before the contest to do antenna work, perform the inevitable repairs—and to get on the air as much as possible on all bands.

In the group were several 6-meter enthusiasts, including Trey, N5KO, and Jon, N0JK. Our local host, Don Guido Rosillo, HC8GR is a regular presence on the band and maintains a beacon station, HC8GR/B on 50.035 MHz (Figure 2). Over the preceding months, the openings on 6 meters had been the stuff of legend, with incredibly long-haul propagation enabling QSOs between stations over unexpected paths many thousands of miles long. These included groundbreaking US West Coast/European openings in June. All this served to heighten our anticipation, and we were not to be disappointed.

The early group, led by N5KO, arrived on the 17th and began opening shipping cases and running wires outside in the blowing mist. November is rainy season in the Galapagos and those desert photos usually associated with the land of iguanas and tortoises were months away. The HC8GR beacon was running along, but there was basically no activity—until the morning of the 18th.

The Openings

Around 7 AM local time (1300Z), Trey's cell phone began to ring. We were hoping that it would be the airlines reporting success in locating some lost

BOB WILSON, N6TV

Figure 1—The house and part of the antenna farm at HC8N.

DAVE PASCOE, KM3T

Figure 2—The HC8GR/B beacon and Yagi antennas.

Why Has 6 Been So Good?

There were two major causes for the great 6 meter conditions at HC8N—an encore by the solar cycle and *winter anomaly* of the F2 layer.

Conventional wisdom was that the current Solar Cycle 23 "peaked" sometime in the summer of 2000. NASA predicted a steep decline in solar flux. The prospects for worldwide DX on 6 in the fall of 2001 was considered by many experts to be low. But solar activity began a surprising reversal during the summer of 2001 and high solar flux numbers were reported, as shown in Figure A. High solar flux is necessary to produce enough ions in the F layer to support "skip" at 6 meters.

Even with the high solar flux in July and August, few 6-m F2 openings were reported in North America. Daytime F-layer ion loss is highest in the summer. The loss of ions outpaces their production. During the winter months, changes in ionospheric molecular chemistry decrease the rate of ion loss. The net daytime F-layer ion density—and thus the MUF—is higher during winter. This is known as the *winter anomaly*. When the daily solar flux remained in the 200 range in November, the stage was set for great 6-meter DX at HC8N.

It became clear by November that Cycle 23 would have a "double peak" as the solar flux remained high. There were almost daily 6-meter openings from North America to Europe, Africa, South America, Oceania and Asia. On the morning of October 18, N0KQY and N0JK in Kansas worked Japan longpath on 6! But on November 16, the solar flux dropped below 200 and would remain there until the 28th. It seemed like bad news for the 6-meter ops at HC8N.

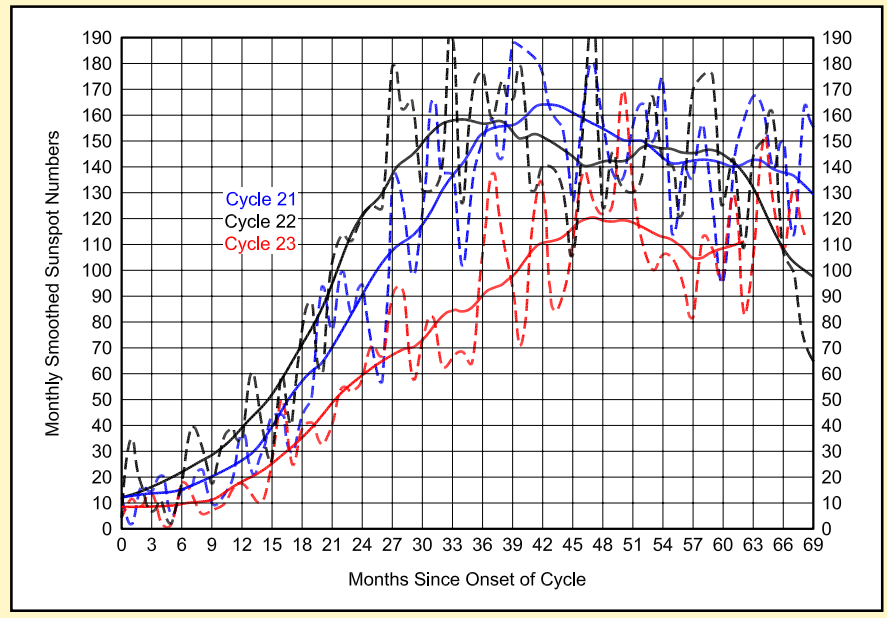


Figure A—A comparison of the SSN for solar cycles 21, 22 and the current cycle 23 on a month-by-month basis starting at the cycle's minimum. (From www.dxlc.com/solar/cyclcomp.html; adapted with permission).

Extreme ultraviolet radiation ionizes the F layer. Scientists are unable to measure EUV accurately, and use the 10.7 cm radio emissions from the sun as a "proxy" for it. Under quiet solar conditions the 10.7 cm solar flux and EUV correlate well. During periods of high activity, they don't. Researchers have found "*virtually no day-to-day correlation* between the 10-cm fluctuations and the expected MUFs."[1] The sun was very active while we were at HC8N, with a major solar storm November 24. The lower flux numbers didn't matter. The solar storm disrupted the HF bands causing major headaches for contest ops in the CQWW CW contest, but boosted the MUF on north-south paths. The 6-meter band was wide open at HC8N!—*Jon Jones, N0JK*

[1]J. R. Kennedy, "50 MHz F2 Propagation Mechanisms," *Proceedings of the 34th Conference of the Central States VHF Society* (July 2000).

DAVE PASCOE, KM3T

Figure 3—The HC8N Team, minus KM3T.

luggage, but it was much better news. An operator from Holland was calling to report that the HC8 beacon was being heard in Western Europe and could we please get on the air. I'm not sure the phone handset had cooled before N5KO was calling "CQ 6" on the TS-690. What happened then was the best European opening ever experienced in HC8—European calls filled the log for the next three hours! Signal strengths on the 18th were not strong—S5 or less—but the band was quiet and the copy was quite good. When the sun had set in Europe and the opening had passed by 1700Z, there were big smiles all round. Of course, the question was then, "What else is out there?"

We worked US and other North American stations sporadically over the next few hours and it wasn't clear that anything else extraordinary was going to occur. Around

DAVE PASCOE, KM3T

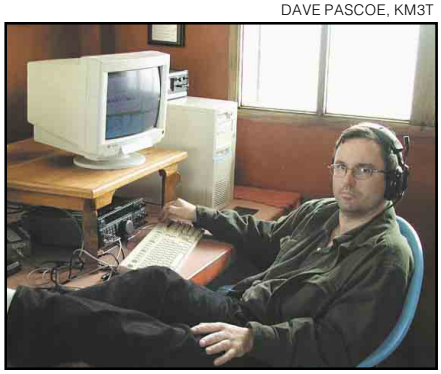


Figure 4—N5KO and the HC8N 6-meter rig.

Table 1
Total 6-meter QSOs after Duplicates: 2625 (November 18-27, 2001)

CW		*SSB*	
North America	667	North America	1057
South America	4	South America	25
Europe	232	Europe	39
Asia	547	Asia	425
Africa	1	Africa	4
Oceania	2	Oceania	8
Total CW	1453	Total SSB	1558

TOM FRENAYE, K1KI

Figure 5—The HC8N antenna at the house.

2300Z, however, JA stations started answering our CQs. First one, then two, then quickly building up to a torrent of callers as news of the opening spread across Japan. This opening, which produced S9+ signals, lasted over an hour and produced well over 100 QSOs as N5KO and KM3T worked through the pileup. Needless to say, dinnertime conversation revolved around these 6-meter events whether they would be repeated.

The answer came quickly the following morning with another post-sunrise opening to Europe that extended all the way east into Zone 16 with a QSO to UY1HY in Ukraine. That afternoon found the JAs alerted and waiting after their sunrise. This pileup was even deeper than the preceding day's. By the time the band closed, we had hundreds of QSOs—99% handing out a New One to the Magic Band Deserving. While the 19th had the strongest openings, the pattern repeated all week—morning to Europe around 1300Z, then to North America and on around to Japan after 2200Z.

N0JK and the later group appeared that afternoon and kept the action going up until contest time. N0JK was also our 160-meter man and took advantage of his off time during the daylight hours to keep the 6-meter equipment going, even during the contest. Jon worked VR2XMT Saturday afternoon, the first Hong Kong to Galapagos 6-meter QSO—a path of more than 10,000 miles.

The Equipment

So what was making all the racket from HC8? Surely there was a big amp and stacked, long-boom Yagis way up high. Wrong! This is one of the great attractions of the Magic Band—very modest equipment can give excellent results. Figure 2 shows both the M^2 7-element Yagi used for all QSOs and the HC8GR beacon antenna. The Yagi is 18 meters off the ground, which slopes away to the north.

Inside the shack, a single TS-690 putting out about 50 W was responsible for radio duty. Figure 4 shows chief op N5KO running a European pileup on CW. While we certainly could have opened the band earlier and closed it later with an amplifier, we worked everything we could hear for the entire time we were on San Cristobal.

A QSO with HC8 did not require that the caller had a huge station, either. We worked many mobile and QRP stations. Antenna systems ranged from moon-bounce-quality down to dipoles and whips. When 6 is open, it's *open*! "Remember the Golden Rule of the 6 meter DXer—be in the right place at the right time."—*Ken, G4IGO*. It doesn't matter what equipment you have if you're not on the air. Conversely, even the little pistols will make QSOs if they're on the air when the band is open.

Wrapping It Up

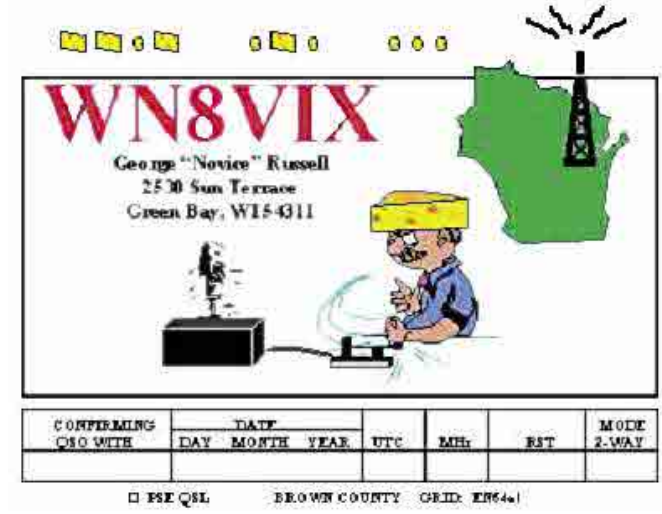
After the CQWW CW contest came to a close and the equipment was packed, we checked the log totals to find over 3000 pre-duping QSOs in the log. (See Table 1.) This was an achievement we could never have envisioned at the outset. The primary purpose of the trip was the contest, so the excellent results on 6 were a delightful surprise. The HC8N QSL manager, Derek, AA5BT, has been clearing his schedule in anticipation of an onslaught of 6-meter QSLs.

As of this writing (December 2001), Cycle 23 has done an about-face and the Smoothed Sunspot Numbers (SSN) total is climbing once again. If solar flux stays above 200 and the ionosphere stays calm, cool and collected, VHF DXers can look forward to many more excellent long-haul openings. Get on and add your own success stories to what will surely be remembered as an outstanding 6-meter season.

Ward Silver, N0AX, is an electrical engineer, teacher and author, first licensed in 1972. His main ham interests are contesting, DXing, emergency preparedness and enthusiastically describing the magic of radio. He has compiled the Test Your Knowledge quizzes for QST *since April 1995. You can reach the author at 22916 – 107th Ave SW, Vashon, WA 98070,* **n0ax@arrl.org**.

By George Russell, WN8VIX

Straight Key Night: A New Beginning



While sitting in the shack, reading about Straight Key Night in the December 2000 issue of *QST*, I looked up on the shelf where my key had lain unused for about a year since I had reacquired my Novice license. I couldn't help but reflect back to Field Day where the code just seemed to dance all around you. It was artistry in motion: the CW operators worked the radio dial in one hand and lightly touched the paddles with the other, copying and sending code at speeds of which I could only dream. Oh, how I wanted to be able to do that.

I reached up to the shelf and pulled down my Vibroplex Straight Key Deluxe. It was a special gift to myself after getting my ticket once again. I bought a straight key because I didn't know anything about electronic keyers. I blew off the dust, looked at it for a couple of minutes, pumped the handle a few times and said to myself, "I can do this."

Excited about participating in the big event, I thought I'd better practice a little just to make sure I could still copy and send at 5 WPM. About a week before SKN I hit the airwaves. While I had upgraded my ticket to General, I thought it best if I stayed in the Novice portion of the bands so as not to upset some of the more experienced; however, there was nobody there. I moved to the General portion and heard a few QSOs, but they were just too fast for me. Perhaps if I moved back to the Novice bands and sent CQ, I would find someone like me who was just starting out and waiting for the right opportunity. I got only a few return calls from some slow operators who were sending me those 2-minute dits and never gave their call sign, so I moved on. As it turned out, I wasn't able to log any QSOs before SKN was upon me. I would end up going into SKN with anticipation of my first CW QSO in over 30 years.

"Enough Listening; Time to Get Serious"

It was 0000Z, Straight Key Night; I started roaming the 40-meter band. I heard a possible candidate, but he didn't hear me. Perhaps I didn't have my gear set up right. I checked my equipment and went through my owner's manual—all was as it should be. The night was progressing, but I wasn't. The XYL came down to the shack and said, "The ball is getting ready to drop over Times Square. Do you want to come and watch it?" Well, perhaps the break would do me good. It wasn't long before I was back downstairs getting ready to try my hand at pumping out CQ again. Well, the year 2000 came to a close in Green Bay, Wisconsin and I felt a little empty that I hadn't had my first CW QSO yet—and I was six hours into the event. But that was enough for me for the night. Perhaps in the morning things would be different. Besides, a CW QSO would be a pretty exciting way to start the New Year.

It was 1100Z, New Year's Day, and activity on the bands seemed pretty light. I did run across one QSO and was impressed at the fist action of WB9UGX. Not too fast that I couldn't pick out some of the conversation, and he had a nice steady rhythm and excellent tone. Okay, enough listening; I need to get serious. It was 1200Z, halfway into the event. I decided to take up position at 7.103 MHz, and my call of CQ hit the airwaves.

Then, at 1201Z, I heard my call letters for the first time in over 30 years come back to me in CW. What a hoot! I was so nervous; it seemed like an hour had passed before I could get it together to get back to N0IHC. But he waited for me. The cool air downstairs in the shack quickly turned into a sauna. My hands were so wet with sweat it was a wonder I didn't short out the key or electrocute myself. We exchanged "SKNs," names and QTHs and then just started getting into our conversation. I told him that he was my first CW contact and he was telling me how some hams can get a little rude with us slow guys—and then the band folded on us. I wouldn't even get the honor to end my first contact properly, to pound out "73" and thank him for taking the time to answer my call. Nonetheless, I was "keyed up" (sorry about that!). I got a cup of coffee and thought I would sit down at the computer and pass along the exciting news via e-mail to my "Elmer in absentia," Dave Tillotson, AC4RZ.

Before I could finish that note, however, I received a message from N0IHC. I thought it was real nice of Kurt to take the time to tell me how it was when he was a Novice and starting out. He reminded me that, "The only thing that can increase speed is to operate CW

continually. Repetition increases your ability to recognize characters without counting the dots and dashes." Kurt also advised me to hang in there as there were many others out there like him who value new CW operators and will take time with you on the air.

Having Fun

I did want to progress in this wonderful mode and experience firsthand a piece of yesteryear, a piece I was willing to just let sit on the shelf and only dream about. I can't help but wonder, however, how many others are out there waiting for the same opportunity to come their way, someone to take the time with you on the air.

There are others out there like Kurt. At 1815Z, I would qualify for my ARRL Rag Chewer's Certificate on my second QSO with KE6OIO—a QSO that lasted nearly an hour and 15 minutes. Ann didn't mind the snail's pace as she told me that she used to be there once herself. Wow, what excitement! Wow, what tension! Wow, how sore my arm was—it's not easy pumping iron, but it sure is fun. Straight Key Night was nearing its close. I would give the call once again and sure enough KA1SAW was listening. The band would do us in after a short exchange. But what a way to close the event—three QSOs that spanned the country.

It doesn't matter who you are, what class of license you have or at what speed you can send and receive code—there is plenty of band space that we can all share and have fun with as long as we respect each other while we do it. Since Straight Key Night last year, I have joined FISTS (the International Morse Preservation Society; **www.fists.org**) and practice CW with my neighbor, Bob Steele, AB9BS. Code doesn't come easy for me and I haven't broken 10 WPM yet. But, that doesn't bother me because I'm having fun anyway. As Kurt told me, there are others out there who will take the time to talk with you.

If you've been letting that key gather dust on the shelf, dust it off and stop in for some fun on Straight Key Night this coming New Year's Eve. I'll be there, in the Novice portion of the bands, calling CQ and listening.

Thanks, ARRL, for sponsoring Straight Key Night and encouraging me—and others—to reach into the past and have some fun!

The author's interest in radio began when he was a teenager, and he obtained his Novice license in 1969. With down time caused by a less-than-perfect signal and a tour of Army duty during the Vietnam Era, he was not able to upgrade before his 1-year Novice license expired. He sat on the sidelines and did some SWLing for over 35 years. Hearing the FCC rules were about to change, he got his Novice license just before new Novice licenses were discontinued. This time, it didn't take him long to upgrade to General and then Extra. CW and PSK31 are his favorite modes. He writes: "It's amazing what I've missed over the 35 years I sat on the sidelines listening." You can reach George "Novice" Russell, WN8VIX, at 2530 Sun Terr, Green Bay, WI 54311; **wn8vix@arrl.net**. QST

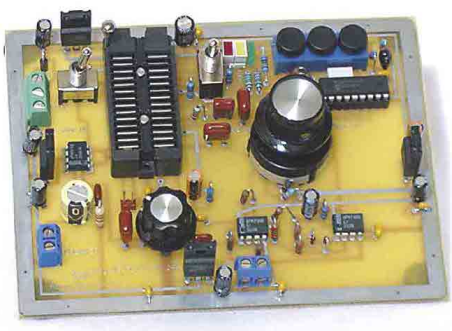
NEW PRODUCTS

TDL'S MODEL 803 PROGRAMMER FOR ISD25-SERIES RECORD-PLAYBACK CHIPS

◊ TDL Technology's Model 803 programmer/test board speeds development of circuits and devices based on ISD25-series record/playback IC chips manufactured by Information Storage Devices Inc.

The board features a PIC microprocessor, auto-record mode (handy for working with PC sound cards), an on-board amplifier, full manual controls and more. The test board has an input impedance of 100,000 ohms, handles input signals of up to 50 mV P-P and puts out up to 200 mW of audio.

Price: $97. For more information or to download the Model 803's user manual in PDF format, contact TDL Technology, 5260 Cochise Tr, Las Cruces, NM 88012; tel 505-382-3173, fax 505-382-8810; **www.zianet.com/tdl**.



FINGER TIP TAPPER IAMBIC KEY

◊ The Finger Tip Tapper is a flat and flexible business-card size key that allows the user to send CW by tapping out Morse code with a light touch. It has a magnetic base and tactile contacts with 3.5 mm stereo plug. The Tapper comes in a variety of colors, and is personalized with call sign and first name. $29 delivered to USA/Canada; DX stations add $5. For more information, contact Jim Panzitta, N2CAU, tel 609-771-8182; **www.fingertiptapper.com**; **sales@fingertiptapper.com**. QST

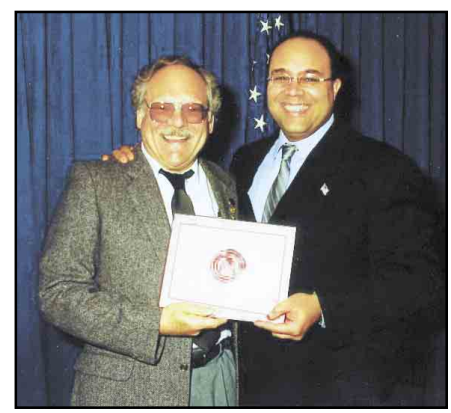
Previous • Next New Products

STRAYS

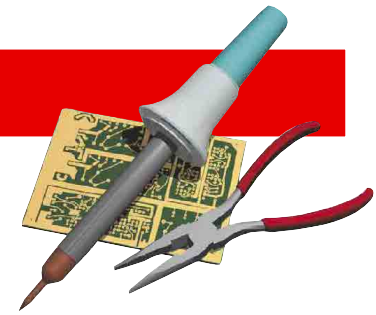
SPRING LITES QSO PARTY

◊ The Amateur Radio Lighthouse Society announces its second annual ARLHS Spring Lites QSO Party, 0001 UTC March 29, 2002, through 2359 UTC April 7, 2002 with activity taking place on 160, 80, 40, 20, 15 and 10 meters; SSB, CW and digital. Awards and certificates are available. Complete details are on the ARLHS Web site at **www.waterw.com/~weidner/arlhs/index.html**. The purposes of the QSO party are to promote public awareness of ham radio and lighthouses; to contribute to the recognition that lighthouses, lightships and their keepers deserve; to foster camaraderie within the ham fraternity; and to provide fellowship among the members of the Amateur Radio Lighthouse Society.

Previous • Next Strays



Last November, FCC Chairman Michael Powell presented a 40 Years of Government Service Certificate and pin to Gary Hendrickson, W3DTN of Severn, Maryland. Gary is currently the senior technician in the FCC Office of Engineering Technology. His past government service has included 12 years with NASA at the Goddard Space Flight Center. He joined the FCC in 1973.



The Doctor is IN

Q Jim Johnston, K0FNR, of Arvada, Colorado, writes: Is there any compilation of corrections to schematics published in *QST*—it would be handy to have some sort of reference so any corrections could be easily researched before a project is started (e.g., R10 should have been 10k not 10).

A If you go to the TIS Web Page (**www.arrl.org/tis/**), you will find that among all the useful information gathered there, is the *ARRL Periodicals Index Search* in the section available to members. This database contains the *QST* index from 1915 to the present and the *QEX* index from 1981 to the present. For *QST* issues from 1970 to the present, and some selected articles back to 1922 (when construction articles featuring tubes began in earnest), key words that help identify the article have been added. By entering key words (ANTENNA) or combinations (CONSTRUCTION ANTENNA VERTICAL HF) into the **Title words:** field, you will find all relevant technical articles and in fact create entire bibliographies on a particular subject.

Now, what does all this have to do with corrections? Well, Feedback items (corrections) in the database have the same title as the original article, and have been given the same key words. So if you search and find the article, any corrections will be listed right along with it. Or, simply search for the key word FEEDBACK.

Q Chuck, KD7MDA, of Tucson, Arizona, writes: I have just purchased a G5RV dipole antenna and am going to attach the center of it to my tower for an inverted V. How far away should the center be from metal tower for the standoff? Or does it really matter?

A It is probably a good idea to keep the antenna wire itself at least a few inches from the tower. While *EZNEC* doesn't predict much interaction between a horizontal wire and a vertical tower, you don't want to risk any arcing or sparking between the antenna and the tower. You should ideally keep the ladder-line at least 2 to 3 times the line spacing from the tower (about 6 inches for common window ladder-line). So in your case, keep the center of the G5RV about 6 to 8 inches away from the tower, or at least run the ladder line directly away from the tower, then down the tower with the required spacing.

You can compromise a bit with smaller spacing, but the fields near the ladder line are pretty high and you might couple some of the energy into the tower. If the feed line is not symmetrical with respect to any nearby conductor, one of the two conductors may couple into that nearby conductor, causing the currents on both wires to be unequal. This would result in a bit of radiation from the feed line. One trick to minimize this effect is to put a few twists into the feed line, minimizing the effect of that imbalance on the feed line currents.

The coaxial cable used with a G5RV antenna can be any distance from the tower—even electrically connected to it.

Q Bob Evinger, WD9EKA/AAR5MG (Army MARS operator), of Marhsall, Illinois, writes: I have an Alinco DJ-V5. While changing the battery packs, I noticed a sticker that I had not seen before. It puzzles me and seems to contradict what I thought were the rules concerning type acceptance. Inside on the back plate is the standard Part 15 device warning that claims this radio is covered under Part 15 and must not cause harmful interference. What gives? I have never seen this on any of my other commercial ham gear.

A The FCC's regulations require that most intentional radiators—translation: transmitters—be *Certificated* before they can be marketed in the US. This provision does not apply to Amateur Radio transmitters, except for linear power amplifiers that operate on 6 meters and below. However, other portions of the rules require that some receivers also be Certificated or authorized under a Declaration of Conformity, another FCC authorization procedure. The various FCC authorizations, mostly found in Part 15, are a very interesting set of regulations, with many subtleties and nuances.

Many of the devices must have some sort of label, which is what you read on your Alinco. The provision that the device not cause harmful interference applies only to the operation of the receiver. The transmitter is governed by Part 97, which stipulates absolute maximum spurious emissions levels and a requirement that spurious emissions that are below those levels not cause interference to authorized radio services.

For information about the Part 15 rules, see **www.arrl.org/tis/info/part15.html**.

Q Martin Feigert, AC8CW, of Findlay, Ohio, writes: I have a rooftop mag mount antenna on top of a 2002 Ford Explorer Sport. It has RG-58 type coax and I can't seem to run it into the car without letting water in when it rains. I've tried every nook and cranny I can think of. I currently have it going into the car through the rear quarter window down along the rear part that opens up—the windows open by swinging outward about an inch with a latch that fastens and unfastens the window. This seemed to be the best choice as there is no wind noise so I thought I had finally found the best entrance point, because the cable was not being pinched and didn't seem to be crushing the weather seal around the window.

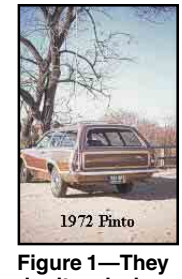


Figure 1—They don't make 'em like this anymore!

After the first rain there was water on the inside of the vehicle on the passenger armrest for the rear seat—just enough to be a nuisance. I think the water is following the cable down inside. Is there something I can spray on the weather seal to help or can you suggest another entrance point for the cable? Should I put it all the way around the seal or just where the coax runs across it?

A As it happens, I had a similar arrangement in my 1972 Pinto Wagon (Figure 1) and sealed it with "Windshield Sealer." It comes in a tube (about $5) and is sold in most auto supply stores or departments. Of course it follows that there is a "Family Law":

that window must never be opened. If the kids forget, just reseal it.The soft rubber did a good job of keeping the water out the rest of the way. I opened the window, held the coax in place, blopped the goo on, pushed the window closed, went inside and closed the latch. As I recall, I just put it a couple of inches on either side of the coax. That did it, neat as a pin.

I also use the same stuff to seal my home antenna connections and entry point. See Figure 2.

Figure 2—Windshield sealer can be used to waterproof the entry point for the coax into your home. It will also work for mobile installations.

Q Willie, AG4HY, of Adrian, Georgia, writes: What is wrong with traps, as in a dipole? I received two new catalogs and there is a discussion of traps, but I'm still not clear about them. One of the catalogs says that "traps have a narrow bandwidth, and it doesn't make sense to use only part of the wire length." Saw some other discussion on this and the party answering said "If you don't mind slightly less bandwidth and a shorter antenna, then there's nothing wrong with traps." One of the catalogs is for the "Carolina windom."

A I agree; traps can be a reasonable choice in antenna design. Of course, traps can be somewhat lossy, and antenna manufacturers that don't use them in their designs have every right to tout their wares. If you want a somewhat shorter antenna and don't want to use an antenna tuner, however, you can easily use a trap design.

In fact, there are sometimes good reasons *not* to want to use all of the wire in an antenna. If, for example, you use an 80-meter half-wave antenna on 10 meters, either a center-fed dipole with ladder line and a tuner, or an off-center-fed design such as the windom variant you mention, you will get a pattern on 10 meters like the one shown in Figure 3. If you used traps, the effective radiating part of the antenna on 10 meters would be shorter, so you would get a typical dipole pattern, such as the one shown in Figure 4. On 10 meters, only the inner part of the antenna would radiate. On the lower band, the entire antenna would be active.

While the more complex pattern does have gain on 10 meters, the gain may or may not be in the direction you want to communicate. It is also possible that your favorite direction may be in one of the nulls. This is not necessarily bad, just something you want to consider as you select your antenna.

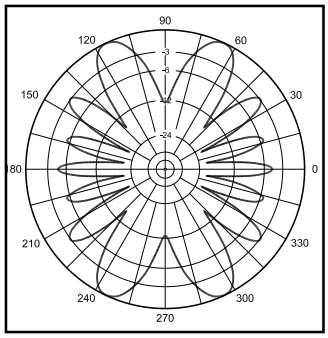


Figure 3—If you use an 80-meter wire antenna on 10 meters, the antenna pattern will look something like this.

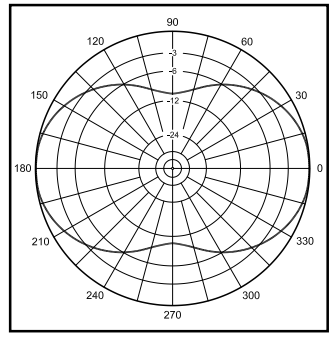


Figure 4—If you added traps to your 80-meter antenna, the pattern would look like this on 10 meters.

Now, traps do tend to act like inductors when used below their resonant frequency, so a multi-band antenna with lots of traps will be somewhat shorter on 80 meters than a full-size antenna. This would result in the SWR bandwidth of the antenna being somewhat more narrow than a full-size antenna would be.

Like most antenna designs, from trap dipoles to off-center-fed windoms, compromise is part of the design trade-off. The nice thing about antennas, though, is that it is relatively easy to try a new antenna type, just to experience for yourself what those trade-offs mean to your station operation.

For more information on trap antennas, see the article, "Multiband Dipoles Compared," by Mike Gruber, WA1SVF (now W1MG), *QST*, November 1996; **www.arrl.org/tis/info/pdf/9611073.pdf**.

Q Rick, W0PC, of O'Fallon, Missouri, writes: My question is about handling Doppler shift on satellites. I used to work satellites up through OSCAR 7. I'm trying to get back into it but find some things different. I notice that QSOs just let their Doppler shift go and don't make uplink changes to maintain the same downlink frequency. I thought you should always maintain the downlink so as not to drift into another QSO in progress.

A Actually, either tuning method can now be used. Given today's current crop of satellites, it's just as easy to maintain a standard uplink frequency, and adjust the downlink frequency accordingly. This method is used at W1AW for most birds.

While some may argue the point about tuning either uplink or downlink frequency, I personally feel it's now on a case-by-case basis. For example, a number of birds have downlinks in the 70 cm (and higher) range. Doppler shift is more critical here than, say, 2 meters. (And of course, Doppler shift "worsens" the higher in frequency you go.)

As for unintentionally QRMing another QSO: Although it happens, it doesn't appear to be too much of a problem. After all, Doppler is affecting everyone, at different levels. In other words—short of the satellite being directly overhead and stationary—every user is adjusting for Doppler.

On 2 meters, you may have to tune 4 kHz or so total during a good pass if you wish to maintain a stable uplink. However, you'll still find the downlink (70 cm, for example) shifts so much faster and greater in frequency that it would have been just as easy to tune the downlink. This is not too much of a problem if your radio has full Doppler correction (FDC) capabilities—but that is another subject!

Doppler shift is such a broad topic that I would be doing it an injustice if I tried to give a comprehensive answer here. If you're looking to get back into satellites, may I suggest our publication *The Radio Amateur's Satellite Handbook* (ARRL order no. 6583). It contains the latest information on satellite operations, including information on some of the newer equipment available.

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/. Add your comments: "The Doctor is On-line" at www.arrl.org/members-only/qst/doctor/. QST

STRAYS

QST congratulates . . .

◊ William R. Keltner, WA5VVA, of Harlingen, Texas, who won a prize in a statewide newspaper competition sponsored by the *Houston Chronicle*. Bill is news editor with *La Feria News*.

Electric Radio Antenna Tuning Meter

The Antenna Tuning Meter from Electric Radio is one of those devices that has the potential to make life on the air a bit more pleasant for everyone. After all, who hasn't experienced the pain of finding oneself on the National Tune-Up Frequency? You know what frequency I mean. It's the frequency at which your radio is tuned at the very moment when another ham decides it's time to tweak his or her antenna tuner on the air. *Every* frequency is the National Tune-Up Frequency, or so it would seem.

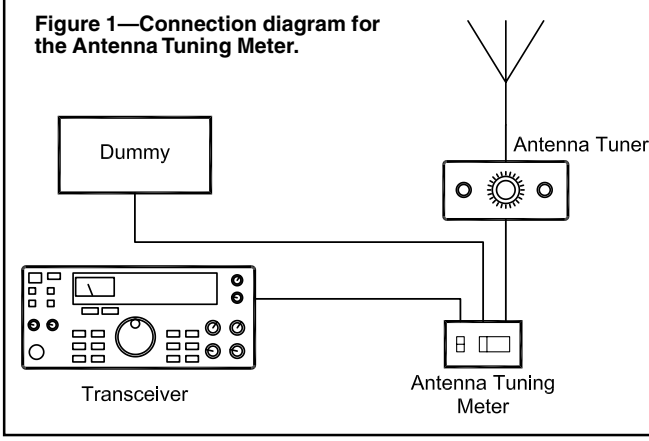
Besides generating ill will and bad karma, blatant on-the-air tuning isn't particularly gentle to your transceiver. This is especially true if you are running a vintage rig with tube finals. One answer for the considerate operator may be the Antenna Tuning Meter.

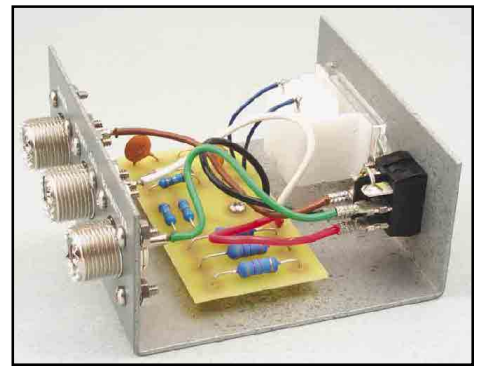
Built Like a Battleship

The Antenna Tuning Meter is blessed with a level of craftsmanship and durability that is rare among Amateur Radio products today. The housing is heavy-gauge aluminum; you could probably drive a truck over the Antenna Tuning Meter without denting it. Better still, this little unit is RF tight, which is good considering its purpose.

The front of the Antenna Tuning Meter is plain and functional.

Figure 1—Connection diagram for the Antenna Tuning Meter.





An interior view of the Antenna Tuning Meter reveals a clean, uncluttered layout.

There is a thin "null meter" and a rocker switch labeled TUNE and OPERATE. The rear panel sports three SO-239 coaxial connectors labeled DUMMY LOAD, TRANSMITTER and TUNER.

Using the Meter

Connecting the Antenna Tuner Meter is straightforward (see Figure 1). One cable attaches to the dummy load of your choice; the other coax goes to your transceiver and the remaining cable connects to your antenna system via your tuner.

Toggle the TUNE/OPERATE switch to the TUNE position. Now the dummy load is connected to your radio. Place your rig in transmit (either key-down CW, AM or FM—any mode that will give you a stable output) and increase power until you see a $^1/_3$ scale reading on the null meter. Now simply adjust your antenna tuner for a zero (or as close as you can get to it) reading on the null meter.

The nifty aspect of all this is that you are setting up your antenna tuner for the best match to your radio without polluting the airwaves. For example, if you use 100 W to obtain a usable indication on the null meter for tuning purposes, the Antenna Tuning Meter is actually radiating only *25 mW* to the antenna tuner. The Antenna Tuning Meter only samples a tiny amount of RF to do its job; the rest is dissipated in your dummy load. Chances are you'll be able to drive the null meter to $^1/_3$ scale with much less power, so the amount radiated to the antenna will be reduced even further. QRPp operators will tell you that you can still be heard with milliwatts of power, and this is true, but tuning your antenna system with the Antenna Tuner Meter is much better than blasting the band with 100 W.

When you've finished tuning, switch the Antenna Tuning Meter to the OPERATE position and you're good to go—as long as your maximum power does not exceed 100 W. You may see some meter indication when operating (I did), but that is due to stray RF pickup within the meter itself.

Conclusion

If you use a manual antenna tuner and you want to keep a low profile while tuning your antenna system on the air, the Antenna Tuning Meter is worth considering. Your fellow hams will thank you—and so will your radio.

Manufacturer: Electric Radio, 14643 County Rd G, Cortez, CO 81321-9575; tel 970-564-9185; **er@frontier.net**. *$49.95 plus $4.95 shipping and handling.*

Steve Ford, WB8IMY ♦ *QST* Editor

By Bob Radmore, N2PWP

A Lightning Detector for the Shack

A loud crash of thunder from outside the shack alerts you that there is an electrical storm nearby. You rush to disconnect and ground the antennas and disconnect power from those expensive radios. Maybe you had heard some atmospherics on the bands but did not realize the storm was this close. You were lucky—this time.

This relatively simple lightning detector will let you know when a storm is approaching. There are some good reasons to consider building this project. This device will give you plenty of warning and may just save your equipment from damage. If you were operating from an emergency site or in the open, it might just prevent damage and injury from a lightning strike

Igor! Come quick! A storm approaches!

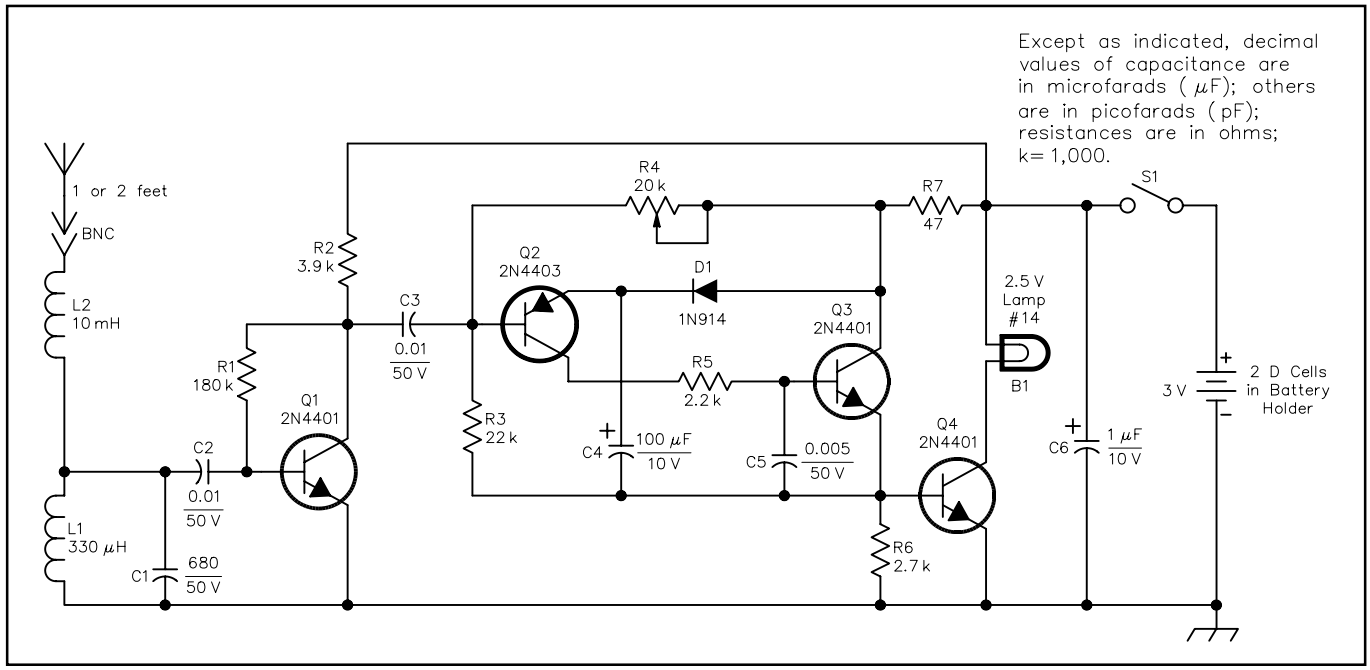


Figure 1—The schematic diagram for the lightning detector. All fixed resistors are either 1/8 or 1/4 W. Parts numbers in parentheses are Mouser (Mouser Electronics, 2401 Hwy 287 N, Mansfield, TX 76063-4827; tel 800-346-6873, 817-483-4422; fax 817-483-0931; www.mouser.com/); RS = RadioShack.

B1—#14 lamp, RS 272-1132.
C1—680 pF, 50 V capacitor (23PS168).
C2, 3—0.01 μF, 50 V capacitor.
C4—100 μF, 10 V electrolytic.
C5—0.005 μF, 50-V capacitor.
C6—1-μF, 10-V electrolytic capacitor.
D1—1N914 diode.
L1—330 μH choke (434-22-331).
L2—10 mH choke (434-1120-104k).
Q1, 3, 4—2N4401 transistor.
Q2—2N4403 transistor.
R1—180 kΩ resistor.
R2—3.9 kΩ resistor.
R3—22 kΩ resistor.
R4—20 kΩ potentiometer (72-T18-20kΩ).
R5—2.2 kΩ resistor.
R6—2.7 kΩ resistor.
R7—47 Ω resistor.
S1—SPST toggle switch.
ANT—34-inch, 6 section telescope (430-1415).
Battery holder—RS 270-386.
BNC-F—Chassis-mount BNC connector (530-CP-1094U).
BNC-M—BNC plug for RG-58 cable (171-9313).
Enc—Bud CU2106B enclosure.
LH—Lamp holder, RS 272-357.
PC board—Available from FAR Circuits (see Note 1). Alternate PC board for point to point wiring RS 276-149.

that would spoil the day. Carry this detector with you whenever you operate portable.

Hams know that static and atmospherics on the lower bands precede electrical storms. This detector listens down around 300 kHz for those disturbances. When static is detected a light flashes, alerting you to a disturbance.

The Project

This project packages a very simple and easily built circuit into (and onto) an enclosure containing the circuit board, batteries, antenna and light. Why, you ask, the old-fashioned lamp holder? Because it was available and seemed to fit the project. Use whatever you think would look good on your version.

A circuit board may be purchased from FAR Circuits to simplify construction.[1] As shown in Figure 2, it may also be built using a RadioShack project board and wired point to point. A full-size circuit board layout is available for those who wish to etch their own.[2] The parts list in the Figure 1 caption gives sources for all the important parts.

Circuit Description

This detector is actually a 300 kHz fixed-tuned radio receiver. Lightning static is most pronounced down in this frequency spectrum and other services are not likely to interfere. The 10 mH choke in series with the antenna helps to tune the short antenna for the much longer wavelength desired. The 330 µH choke and 680 pF capacitor form a tuned circuit at 300 kHz, and the 0.01 µF capacitor couples this tuned circuit into the base of the first transistor amplifier. The amplified radio signal on the collector is coupled into the base of the second transistor, which is part of a lamp flasher circuit. The flasher is biased such that it doesn't flash (by careful adjustment of the potentiometer) until a static burst pulls the base of the 2N4403 down. Positive feedback causes the flasher to quickly turn full on until the 100 µF capacitor discharges giving a good lamp flash. The circuit quickly resets by charging the 100 µF capacitor through the 1N914 diode.

Construction

Either 1/8 W or 1/4 W resistors may be used, although only 1/8 W resistors will fit the FAR Circuits board or the ARRL board template spacing. Pay particular attention to the orientation of C4 and C6, making sure the + lead of the capacitor matches up with the + marking on the board. Leave short wires for the +, circuit ground, lamp and antenna connections. Solder the black, –, connection from the battery holder directly to the PC board.

Lay out and drill the holes on the top of the enclosure. A drilling pattern is included with the available template package. Mount the switch and the female BNC connector.

Check both contact sides of the battery holder for projecting metal edges from the staking of the rivets. Press any projecting metal down. Then cover those areas with ordinary plastic electrical tape. This is to prevent the rivets from contacting the cover when it is installed. Solder the red wire from the battery holder to the switch.

Temporarily insulate the area where the PC board will mount, using tape or a piece of a file card. Lay the board in place and connect the antenna and the + wire to the switch. Run the two lamp wires through the 3/16-inch hole where the lamp socket will mount and connect under the nuts beneath the lamp base. Mount the lamp base using 6-32×½-inch flat head screws and nuts. Put a solder lug under the nut nearest the rear of the enclosure and connect the ground wire.

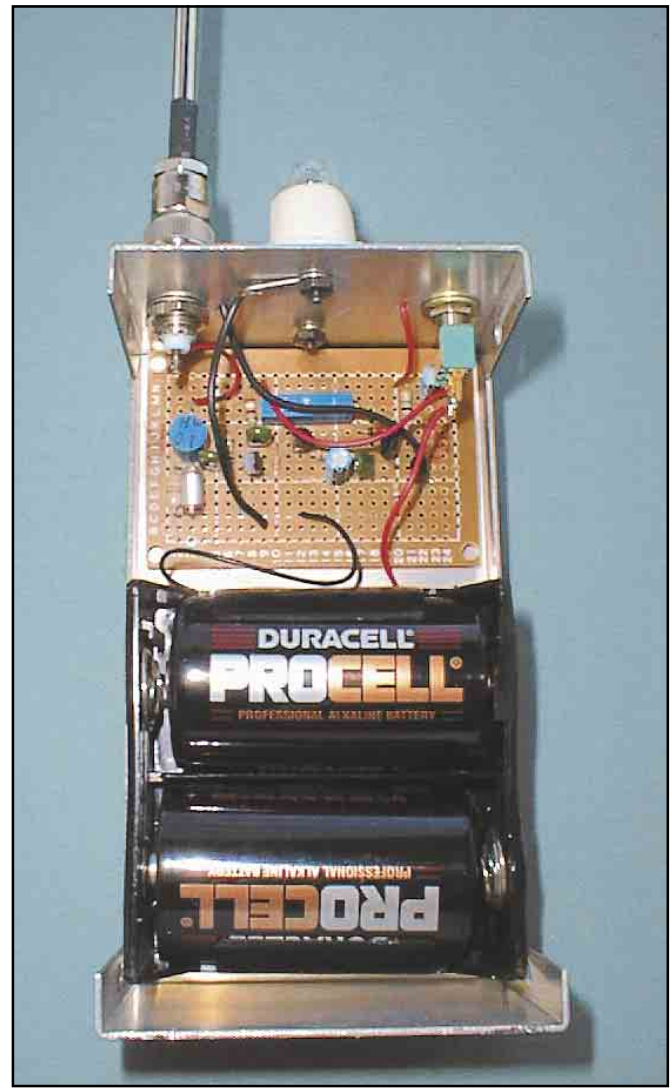


Figure 2—The detector is packaged in a Bud 3"×2"×5¼" enclosure. On the top are a power switch, lamp and a telescoping antenna. It is powered by two D cells. Current draw is under 0.5 mA, so the batteries will last months if the device is left on. A commercial PC board is available; see Note 1.

Construct the antenna using the recommended Mouser telescoping antenna. Remove the screw holding the swivel base and discard both the screw and base. Cut the lug off the bottom of the antenna and file smooth. Carefully drill a very very small hole in the antenna base as near to center as possible. Solder a piece of resistor lead, or other small solid wire, into the hole just drilled. Slip a 1½-inch long piece of shrink wrap tubing over the antenna rod, at the bottom, and shrink for a good tight fit. Drill through the BNC clamping nut using an "F" size drill to fit the shrink tubing. Test fit the BNC center pin, without soldering, until the connector assembles properly. Then solder the pin and assemble the connector with the rubber clamping rings for a tight fit. Check with an ohmmeter to ensure that the antenna rod is not grounded to the connector shell.

Testing

Install the #14 bulb in the lampholder. Attach and extend the antenna. Install the batteries. Turn on the switch. If the lamp does not flash, adjust potentiometer R4 until the lamp flashes occasionally, then back off to a point where it just stops flashing.

[1]Notes appear on page 61.

Check the Lightning Detector using an ordinary piezo ignited gas grill lighter. We are only interested in the spark created by the lighter; it is not necessary to have the butane reservoir filled. The Lightning Detector lamp should flash for every spark created by the lighter. You should be able to trigger the detector from 3 to 4 feet away.

Completion

Once the Lightning Detector has been tested, mounting the PC board and the battery holder will finish it. These are mounted using Velcro tape. Remove the temporary insulation material used during testing. You may have Velcro tape on hand if there's a sewing kit in your house. If not, it is available at sewing centers and even at RadioShack. Trim any projecting wires on the solder side of the PC board. Apply two strips to the back of the battery holder and one strip on the solder side of the PC board. Leaving the mating tape in place, adhere the PC board and battery holder as shown in Figure 2.

The cover is rather a tight fit. If the dimples at the battery end of the cover interfere with its installation, file them down until the cover snaps easily into place. There is no need to use the screws furnished with the enclosure.

A small hole drilled in the side of the cover will allow adjustment of sensitivity without opening the enclosure.

When turned "on" the Lightning Detector draws less than 0.5 mA so it may be left on during storm periods without significantly draining the batteries.

Alternate Construction

For those wishing to etch their own circuit board, a full size pattern is available.[2] Others may wish to use a RadioShack 276-149 experimenter's board. The parts layout included with the template package can be placed over the board to locate the proper holes. Component leads can then be bent to form the conductors on the "solder" side of the board. Bare solid wire can be used for the longer runs. Trim the length of the board so that the cover misses the board ends when it is installed.

Instead of using a BNC connector and telescoping antenna, install a banana plug receptacle in place of the female BNC. Solder a 24 to 30-inch piece of $^{1}/_{16}$-inch or $^{3}/_{32}$-inch brass brazing rod to a banana plug. Cement a small bead to the cut end of the rod to protect your eyes.

Acknowledgment

Charles Wenzel of Wenzel Associates designed the circuitry used in this detector. His circuitry may be viewed at **www.techlib.com/** under Electronics/Lightning Detectors. Mr Wenzel has kindly agreed to the use of his circuitry for this published construction project.

Notes

[1]FAR Circuits, 18N640 Field Ct, Dundee, IL 60118-9269; tel 847-836-9148 (voice and fax); **www.farcircuits.net**. Price: $4.50, plus $1.50 shipping for up to four boards. VISA and MasterCard accepted with $3 service charge. Specify the RADMORE APRIL 2002 QST LIGHTNING DETECTOR CIRCUIT BOARD.

[2]A PC board template package is available from ARRL Headquarters for $2 for members and $4 for nonmembers. Send your request to ARRL Technical Secretary, 225 Main St, Newington, CT 06111-1494. Specify the RADMORE APRIL 2002 QST TEMPLATE PACKAGE. The template package is also on *ARRLWeb* (**www.arrl.org/files/qst/qst-binaries/**).

Box 312
Olcott, NY 14126
n2pwp@arrl.net

QST

NEW PRODUCTS

PATHFINDER DIGITAL AUTOMATIC ANTENNA TUNER

♢ Alpha Delta Communications has announced their new PathFINDER Digital Automatic Antenna Tuner with digital readout. The PathFINDER provides continuous coverage tuning from 1.8 through 30 MHz plus 6 meters. It runs under microprocessor control with an average tuning time of 3 to 4 seconds. The digital readout is a precision multifunction bargraph/numerical display that simultaneously displays RF watts (5-200 W—peak and average), VSWR and all tuner functions. Front panel pushbutton switched outputs for coax, long wire or balanced line antennas (using a custom designed built-in balun). The PathFINDER offers a 10:1 SWR tuning range on HF and 3:1 on 6 meters. It will match coax outputs from 6 through 800 Ω and long wire/balanced outputs from 24 through 3200 Ω (HF). The PathFINDER is rated at 200 W on HF and 100 W on 6 meters at a 50% duty cycle. Alpha Delta Communications, PO Box 620, Manchester, KY 40962; 606-598-4413; 888-302-8777 (orders only); **www.alphadeltacom.com**. $399.95 plus $8 shipping and handling for direct US orders.

USB RELAY MODULE FROM J-WORKS

♢ J-Works, a developer of PC- and USB-based monitor, control and test instrumentation, is now shipping its Model JSB-218 USB Relay Module. This device adds four user-programmable relays to any PC that supports USB. Similarly, programmers can control the relays by using any language that supports USB (sample applications are provided).

Plug-in style terminal block connectors allow quick connections to three contacts per relay. Each relay is rated for at 2 A (30 V dc) and 1 A (120 V ac). The handy USB modules replace internal plug-in cards for test, measurement and control applications.

Prices start at $50. For more information, contact J-Works, 12328 Gladstone Ave, Unit 1, Sylmar, CA 91342; tel 818-361-0787, fax 818-270-2413; **sales@j-works.com**; **www.j-works.com**. QST

Previous • Next New Products

The ARRL Outgoing QSL Service

Note: The ARRL QSL Service can not be used to exchange QSL cards within the 48 contiguous states.

How To Use The ARRL Outgoing QSL Service

(1) Presort your DX QSLs alphabetically by parent call-sign prefix (AP, C6, CE, DL, ES, EZ, F, G, JA, LY, PY, UN, YL, 5N, 9Y and so on). Note that some countries have a parent prefix and use additional prefixes, ie, G (parent prefix) = M, 2E, 2I, 2M, 2W and so on. When sorting countries that have multiple prefixes, keep that country's prefixes grouped together in your alphabetical stack. Addresses are not required. *Do not* separate the country prefixes by use of paper clips, rubber bands, slips of paper or envelopes.

(2) Enclose proof of current ARRL membership. This can be in the form of a photocopy of the white address label from your current copy of *QST*. You can also write on a slip of paper the information from the label, and use that as proof of membership. A copy of your current membership card is also acceptable.

(3) Members (including foreign, QSL Managers, or managers for DXpeditions) should enclose payment of $4 for the first 1/2 pound of cards or portion thereof—approximately 75 cards weigh 1/2 pound. $8 for one pound, the fee rate then increases at the rate of $4 for each additional 1/2 pound (i.e. a package containing 1 1/2 pounds of cards should include the fee of $12 and so on). A package of only 10 cards or fewer sent in a *single* shipment costs only $1. Please pay by check (or money order) and write your call sign on the check. Send "green stamps" (cash) at your own risk. *Do not* send postage stamps or IRCs. (*DXCC credit cannot be used towards the QSL Service fee*.)

(4) Include only the cards, proof of membership, and fee in the package. Wrap the package securely and address it to the ARRL Outgoing QSL Service, 225 Main St, Newington, CT 06111-1494.

(5) Family members may also use the service by enclosing their QSLs with those of the primary member. Include the appropriate fee with each individual's cards and indicate "family membership" on the primary member's proof of membership.

(6) Visually impaired members who do not receive *QST* need only include the appropriate fee along with a note indicating the cards are from a blind member.

(7) ARRL affiliated-club stations may use the service when submitting club QSLs by indicating the club name. Club secretaries should check affiliation papers to ensure that affiliation is current. In addition to sending club station QSLs through this service, affiliated clubs may also "pool" their members' individual QSL cards to effect an even greater savings. Each club member using this service must also be a League member. Cards should be sorted "en masse" by prefix, and proof of membership enclosed for each ARRL member.

Recommended QSL Card Dimensions

The efficient operation of the worldwide system of QSL Bureaus requires that cards be easy to handle and sort. Cards of unusual dimensions, either much larger or much smaller than normal, slow the work of the Bureaus, most of which is done by unpaid volunteers. A review of the cards received by the ARRL Outgoing QSL Service indicates that most fall in the following range: Height = 2 3/4 to 4 1/4 inches (70 to 110 mm), Width = 4 3/4 to 6 1/4 inches (120 to 160 mm). Cards in this range can be easily sorted, stacked and packaged. Cards outside this range create problems; in particular, the larger cards often cannot be handled without folding or otherwise damaging them. In the interest of efficient operation of the worldwide QSL Bureau system, it is recommended that cards entering the system be limited to the range of dimensions given. (Note: IARU Region 2 has suggested the following dimensions as optimum: Height 3 1/2 inches [90 mm], Width 5 1/2 inches [140 mm].)

Countries Not Served By The Outgoing QSL Service

Approximately 260 DXCC countries are served by the ARRL Outgoing QSL Service, as detailed in the ARRL DXCC List. This includes nearly every active country. As noted previously, cards are forwarded from the ARRL Outgoing Service to a counterpart Bureau in each of these countries. In some cases, there is no Incoming Bureau in a particular country and cards therefore cannot be forwarded. However, QSL cards can be forwarded to a QSL manager, eg, ZB2FX via (G3RFX). The ARRL Outgoing Service cannot forward cards to the following countries:

A3	Tonga
A5	Bhutan
A6	United Arab Emirates
D2	Angola
J5	Guinea-Bissau
KG4 ×2	Guantanamo Bay
KH0	Mariana Is.
KH1	Baker and Howland Is.
KH4	Midway I.
KH5	Palmyra and Jarvis Is.
KH7K	Kure I.
KH8	American Samoa
KH9	Wake I.
KP1	Navassa I.
KP5	Desecheo I.
P5	North Korea
S7	Seychelles
S0	Western Sahara
SU	Egypt
T2	Tuvalu
T3	Kiribati
T5	Somalia
T8	Palau
TJ	Cameroon
TL	Central African Republic
TN	Congo
TT	Chad
TY	Benin
V6	Micronesia
VP2E	Anguilla
VP2M	Montserrat
XU	Kampuchea
XW	Laos
XZ (1Z)	Myanmar (Burma)
YA	Afghanistan
ZD9	Tristan da Cunha
ZK1	North & South Cook
3C0	Pagalu I.
3C	Equatorial Guinea
3W, XV	Vietnam
3X	Guinea
5A	Libya
5R	Madagascar
5T	Mauritania
5U	Niger
5V	Togo
7O, 4W	Yemen
7P	Lesotho
7Q	Malawi
8Q	Maldives
9N	Nepal
9U	Burundi
9X	Rwanda

Countries that currently restrict the forwarding of QSL cards to anyone other than members of that country's national society include the following:

Monaco	Germany	Japan
France	Poland	Portugal
Morocco	Zambia	

Additional information:

- We no longer hold cards for countries with no Incoming Bureau. Only cards indicating a QSL manager for a station in these particular countries will be forwarded.
- When sending cards to *Foreign QSL Managers*, make sure to sort these cards using the Manager's call sign, rather than the station's call sign.
- SWL cards can be forwarded through the QSL Service.
- The Outgoing QSL Service **cannot** forward stamps, IRCs or "green stamps" (cash) to the foreign QSL bureaus.

Please direct any questions or comments to the ARRL Outgoing QSL Service, 225 Main St, Newington, CT 06111-1494. Inquiries via e-mail may be sent to: **buro@arrl.org**.

HINTS & KINKS

A DX-BEACON CLOCK

◊ This homebrew beacon clock enables one to track the 18 NCDXF beacon transmissions.[1, 2] Driven by a 1/3-RPM clock motor,[3] it presents a realistic view of what's going on with each of the 18 NCDXF beacons on all five HF DX bands. It takes 180 seconds to complete one full rotation of the clock face.

I have seen computer programs that are intended to serve this same purpose, but the screen characters were too small to read unless I wanted to sit in front of the monitor all day long! The clock described here is large enough to be viewed from anywhere in the room!

Figure 1 shows the 8-inch clock face.[4] Each of the 18 segments spans 10 seconds. My friends and I find this far easier to follow than the minispreadsheets often used for this purpose. The clock is useful when CW beacon signals are fluttery or otherwise too distorted to be discerned. While I have no trouble copying the beacons' CW IDs, those who do also find it a fascinating appliance to have around the shack. Nonham visitors to the shack seem to enjoy it, as well. It is an excellent advertisement for ham radio and might even be a good club project.

The clock can also be helpful when a beacon is *not* coming through. When a particular time slot passes the band of interest and nothing is heard, one can be reasonably certain that propagation on that band is poor to nonexistent. Either that or the beacon is inoperative!

Construction

The largest component of the beacon clock is its "face plate." Mine is a 12×12×0.048-inch double-sided printed-circuit board. Almost any other thin, rigid material would do as well. A 1 1/8-inch diameter hole in the exact center of the board accommodates the dial drive coupler. Any hole size that will pass the drive coupling would be acceptable.

The rotating dial is eight inches in diameter and made from PC-board material. Secure the dial and faceplate escutcheons onto their respective surfaces with glue or another method of your choice.

A 120-V SPST ON-OFF switch was installed on the faceplate to facilitate synchronization of the clock with WWV. An optional 100-Ω, 5-W resistor was connected in series with the motor to reduce motor heating. The resistor reduces the motor-terminal voltage to 115 V.

Orient the motor on the rear of the faceplate and align it with the center hole (see Figure 2). Mark the two motor-mount holes. Using a #33 bit, drill two holes. Assemble the motor to the faceplate using two #4-40×1-inch screws, spacers and hex nuts.

The coupler axle I used is made from 1/4-inch-diameter phenolic rod. Brass is a suitable substitute. The motor shaft fits into the coupler's hole, where a setscrew secures it. (Commercially manufactured 1/8-to-1/4-inch-diameter shaft adapters are occasionally available at larger hardware stores. If you can find one, use it!)

The dial hub was salvaged from a discarded volume-control bushing for a 1/4-inch-diameter shaft. After drilling a suitable mounting hole, the bushing was secured to the dial with the hex nut taken from the same control. The phenolic rod was

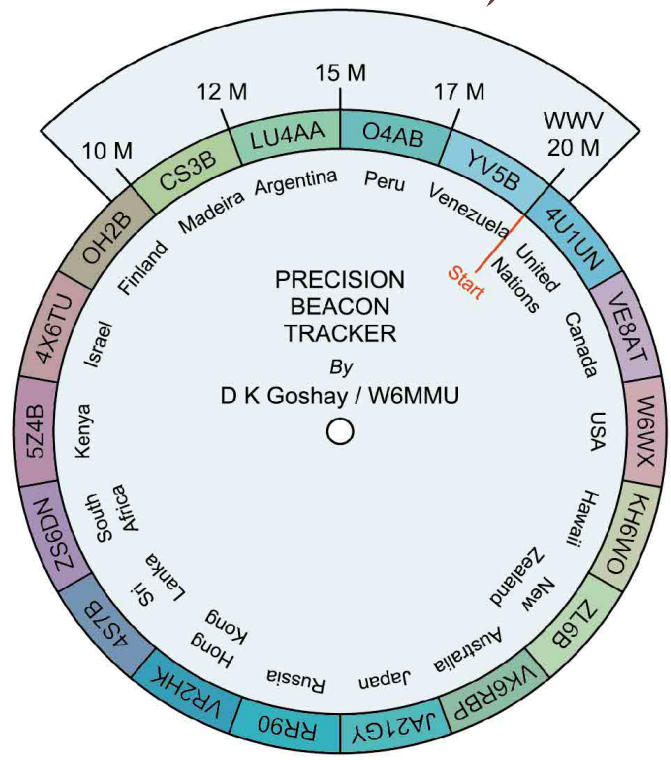


Figure 1—The DX Beacon clock face (see Note 4).

Table 1—Parts List

Crouzet 1/3-RPM synchronous motor (see Note 3)
12×12×0.048-inch PC board.
8-inch-diameter PC board
Phenolic or brass rod, 1/4-inch diam 1-inch long
Dial escutcheon
Dial hub, salvage hardware from a potentiometer
Faceplate escutcheon
two #4-40 screws, 1-inch long
two #4-40 hex nuts
two 1/2-inch-long motor standoff spacers
one #4-40 setscrew
SPST mini switch
120-V line cord
one 100-Ω 5-W ceramic resistor (optional)

[1]J. G. Troster, W6ISQ, and R. S. Fabry, N6EK, "The NCDXF/IARU International Beacon Project," *QST*, Sep 1997, p 48.

[2]For a history of the NCDXF beacons, visit **www.ncdxf.org**.

[3]1/3-RPM synchronous clock motors are available from McMaster Carr, PO Box 4355, Chicago, IL 60680-4355, Sales, tel 630-833-0300, fax 630-834-9427; e-mail **chi.sales@mcmaster.com**; **www.mcmaster.com/**. Order #6502k999 pear-shaped synchronous ac gear motor, standard torque, 115 V ac, 1/3 rpm, 9 in/lb torque, counterclockwise rotation, flatted shaft. Delivery on this item is 35 business days. You may refer to quote number 27974 when placing your order. They were $41.95 each at the time of publication. You can visit the manufacturer's Web site at **www.crouzet.com**.

[4]If you want to build the clock, take Figure 1 to a copy center and have them make an enlarged color copy to fit your clock face. You can also download this image from *ARRLWeb* **www.arrl.org/files/qst-binaries/**. Look for 02HK04Fig1.zip.

Bob Schetgen, KU7G ♦ Senior Assistant Technical Editor

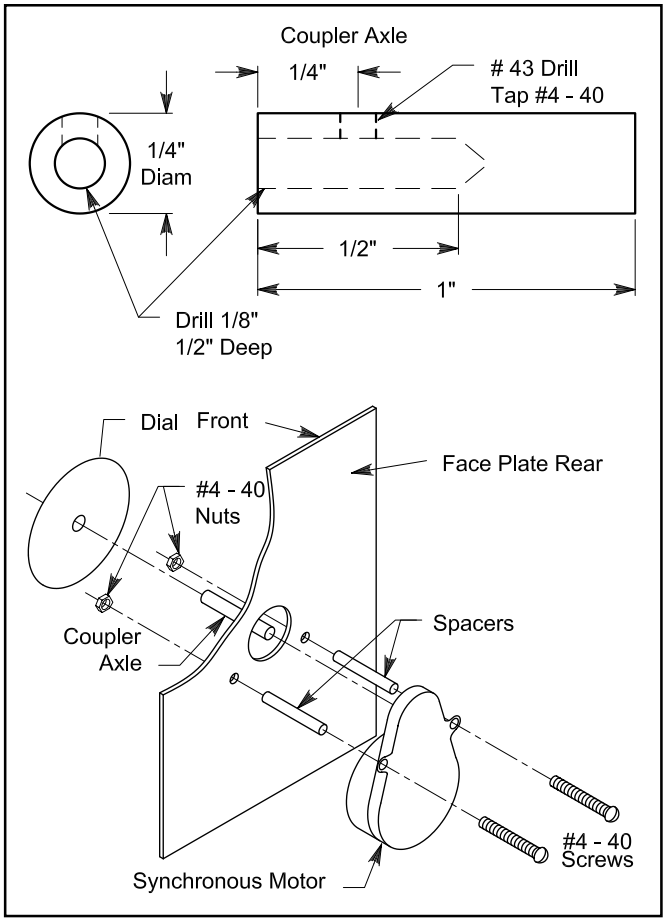


Figure 2—Mechanical details of the DX Beacon clock.

slightly larger than 1/4-inch—just enough to fit snugly into the hub. Had this not fit so conveniently, the bushing could have been secured with cyanoacrylate (CA) adhesive.

I fashioned a pair of wooden feet to support the clock in an upright position on the operating table. You may prefer to mount yours in a picture frame and hang it on the wall.

Operation

Plug the line cord into a 120-V, 60-Hz outlet. With the SPDT switch set ON, allow the red START line on the dial to rotate to the WWV mark on the faceplate. Then switch the motor off. Tune in WWV or WWVH at 5, 10 or 15 MHz. Wait for a minute that is evenly divisible by three: 0, 3, 6, 9, 12, etc. At the sound of the beep, switch the motor ON. I prefer to start the motor slightly prior to the beep, then observe synchronization on successive minutes. If the clock appears to be slightly ahead of WWV, switch the motor off and on quickly, thereby introducing a time-lag increment to bring clock into precise synchrony.

All electric power grids lag behind during heavy load periods and catch up during light load periods. Thus, it is normal for any ac-powered clock to gain and lose up to five seconds on a given day. When this happens, the power grid nearly always corrects itself within several hours. If one can't live with that, the clock must be occasionally reset. Even if it is never reset, the clock will remain within about plus-minus five seconds indefinitely. I have rarely seen the power grid off by as much as one-half of a 10-second beacon period.

My thanks to Ken Bates, KF5WD, who took the Figure 1 photo and gave valuable assistance in designing and producing the dial face.—*Don Goshay PE, W6MMU, Rte 1 Box 1107, Golden, MO 65658;* **w6mmu@mo-net.com**

USE KENWOOD TS-570 OPTIONAL FILTERS FOR PSK31

◊ I have owned a Kenwood TS-570 for about four years and am generally pleased with it. I recently started using it on PSK-31 and soon discovered a problem with this usage. PSK-31 operation requires that the TS-570 be in SSB mode. The default IF filter for this mode has a 6-dB bandwidth of 2.2 kHz. This bandwidth is large enough to simultaneously include a substantial number of PSK signals. I found that if I was working a weaker station and a stronger station suddenly started transmitting on a nearby frequency, the weaker station would, in many cases, completely disappear from my *Hamscope* Version 1.4 waterfall display. After some puzzlement, I realized that this occurred because the stronger station "pumped" the receiver's AGC line and the resulting reduction in receiver gain equally affected both the strong interfering station and the weaker station I was working.

The solution is, of course, to filter out the stronger station. Unfortunately, the DSP filters included in the TS-570 are located in the audio section, after the AGC voltage is derived, so they are no help for this problem.

My TS-570 is equipped with an optional 500-Hz CW filter. Since this filter is located in the IF section of the receiver, it could, in principle, filter out interfering PSK stations. Unfortunately, the TS-570 is programmed so that this filter can only be used in CW mode, which means it is of no use for PSK reception in SSB mode. While looking at some material on the Web recently, I learned that certain older ICOM radios could be "tricked" to overcome a similar problem. I decided to try the same trick on my TS-570.

You tell the TS-570 what kind of optional filter is installed using Menu 46, which is accessed through the MENU key on the front panel. I selected Menu 46 and set the IF Filter Bandwidth to 1800 Hz rather than the true value of 500 Hz. I then found that in SSB mode, I could press the front panel FILTER button and select between wide and narrow filters, whereas previously I could only select the wide filter. The effect of selecting the narrow filter is dramatically evident on my waterfall display, where now only signals (or noise) in a 500-Hz bandwidth show. Furthermore, I discovered that this 500-Hz wide band could be moved around horizontally on the waterfall display by adjusting the IF SHIFT control on the front panel.

Now, I start in "wide" filter mode. Once I select an operating frequency and interference is a problem, I select the narrow filter and adjust the IF SHIFT control to place the filter over the signal I want. This removes as many interfering signals as possible. Using the approach, I am able to make and maintain more contacts with weak stations than before.

Kenwood produces an optional 270-Hz CW filter for the TS-570, which would presumably be even more effective for this application than the 500-Hz filter I own.—*Bill Kaune, W7IEQ, 111 Piper Ct, Richland, WA 99352;* **w7ieq@arrl.net**

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 **h&k@arrl.org**. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing an item, please send the author(s) a copy of your comments. QST

Alinco DJ-X2000 Wide Range Scanning Receiver

Reviewed by Brennan Price, N4QX
Field and Regulatory Correspondent

It's often useful to have a second receiver available to supplement your primary amateur transceiver, and this is never more evident than when you're out in the great outdoors and relying on expendable power sources. The battery capacity of your transceiver could then be conserved, as you can switch that radio off while not actively engaged in two-way communications.

Even without the need to maximize your capabilities to communicate on the ham bands, though, the tremendous variety of radio listening possibilities delivered by a wide range receiver has an allure all its own. Lately, an impressive amount of frequency agility and an ever-increasing number of novel features have been finding their way into easily transportable packages.

Quite a Handful

Alinco's DJ-X2000 wide range handheld communications receiver certainly covers a mind-boggling swath of the RF spectrum—from 100 kHz up to about 2150 MHz—in all of the common modes. (Some 800 MHz frequencies and images of these frequencies are blocked in US versions.) The unit is compact; with its rubber duck antenna attached it could easily pass for one of Alinco's current VHF/UHF handheld transceivers.

I suppose it's understandable that many knowledgeable radio enthusiasts view a radio such as this with a fair amount of skepticism. Most wouldn't believe a handheld communications receiver would be capable of providing an acceptable level of performance over such a broad frequency range. I must admit that I began this evaluation with just such preconceptions.

A Quick Starter—Right Out of the Box

The DJ-X2000 was apparently engineered with ease-of-operation in mind. I charged up the included EBP-37N NiCd battery pack, attached the antenna, pressed the big orange power button and was greeted by a sign-on routine that began with a preset (but user re-programmable) message. This was followed by a series of beeps, and then twin VFO displays popped up on the screen. Intuitively, I punched in 1-4-5-.-4-5-ENT, and was immediately rewarded with the morning chatter of local hams on the W1AW repeater. I was up and running with no "manual" intervention!

Next, I decided to explore some non-ham frequencies. I keyed in 1-.-0-8-ENT (1080 kHz) at just the right instant to catch the top-of-the-hour Morse code "V" time signal of Hartford's WTIC-AM. After listening to the news—and finding myself fairly impressed with the quality of the audio delivered by this small radio—I hit 9-5-.-7-ENT and landed on Shakira's "Whenever, Wherever" program on WKSS-FM. Hmmm, this sounded tinny (and anyone who's even casually familiar with the work of this female radio host will know that "tinny" does not describe her melodic vocal presentation). I dug up the lightweight stereo headphones that came with my portable CD player and plugged them into the 'X2000's external speaker jack. The sound quality through those was markedly better—and in *stereo*! A while later, while exploring the menus, I ran across a selection that allows you to set the reception tone to "high" or "low." Wide FM sounds *much* better in the low tone setting.

I found basic operation of the DJ-X2000 remarkably easy. To access any frequency in its range directly, you simply key in the digits and push ENT. Tuning can also be accomplished by twisting a top-mounted encoder knob or by manipulating an UP/DOWN toggle switch on the left side panel.

The volume and squelch are digitally controlled. A SQL/VOL toggle switch is positioned near the top of the left side panel. Pressing it near the SQL legend briefly brings up a numeric indication of the current setting—"S16," for example. The UP/DOWN toggle or the encoder dial can then be used to adjust the squelch threshold. Setting the volume is similar—just press the toggle near the VOL legend and then use either one of those same controls to adjust the audio output level. The volume level is graphically depicted by a bargraph scale near the left edge of the display window and, as is the case with the squelch, briefly appears in the display as a numeric value—"V22," for example. There are 32 available settings for each of these, so there's sufficient resolution to set just the right amount of volume or squelch.

As delivered, the mode and tuning step size are automatically switched to settings appropriate for the range of frequencies that you're tuning. The AM, LSB, USB, CW or the narrow or wide FM modes and the step size can also be manually selected. There are an amazing *23* available choices for the tuning step size and—in the unlikely event that none of those fit your particular requirements—you can even make up one of your own! The minimum tuning step size is 50 Hz; the maximum is 500 kHz. While in the VFO mode, a 1-MHz step rate can be

Bottom Line

The Alinco DJ-X2000 is a feature-packed multimode "dc-to-daylight" communications receiver in a remarkably easy-to-tote package.

Joe Bottiglieri, AA1GW ♦ Assistant Technical Editor

Table 1
Alinco DJ-X2000, serial number T000617

Manufacturer's Claimed Specifications	Measured in the ARRL Lab
Frequency coverage: 0.1-824; 849-870; 894-1432 MHz; 1504-2150 MHz.	As specified.[1]
Modes of operation: FM, WFM, AM, SSB, CW.	As specified.
Power requirements: 0.15 A at 10-16 V dc with external source, 0.3 A at 4.8-7.2 V dc (with battery packs).	0.27 A (maximum volume, no signal), tested at 6.0 V dc.
Size (HWD): 5.9×2.2×1.1 inches; weight: 11.3 ounces.	
CW/SSB sensitivity (10 dB S/N): 0.1-5 MHz, 0.6 μV; 5-900 MHz, 0.5 μV; 900-2150 MHz, 1 μV.	Noise floor (MDS): 1.0 MHz, –125 dBm; 3.5 MHz, –126 dBm; 14 MHz, –134 dBm; 50 MHz, –135 dBm; 144 MHz, –131 dBm; 222 MHz, –132 dBm; 432 MHz, –127 dBm; 902 MHz, –118 dBm; 1240 MHz, –111 dBm; 2150 MHz, –95 dBm.
AM sensitivity (10 dB S/N): 0.1-5 MHz, 1.5 μV; 5-900 MHz, 1.0 μV.	AM test signal modulated 30% with a 1-kHz tone, 10 dB (S+N)/N: 1.0 MHz, 1.1 μV; 3.8 MHz, 0.85 μV; 53 MHz, 0.38 μV; 120 MHz, 0.51 μV; 146 MHz, 0.61 μV; 440 MHz, 0.88 μV.
FM narrow sensitivity (12 dB SINAD): 5-900 MHz, 0.5 μV; 900-2150 MHz, 2 μV.	FM narrow, 12 dB SINAD: 29 MHz, 0.16 μV; 52 MHz, 0.16 μV; 146 MHz, 0.25 μV; 222 MHz, 0.23 μV; 440 MHz, 0.37 μV; 906 MHz, 1.2 μV; 1296 MHz, 2.8 μV.
FM wide sensitivity (12 dB SINAD): 5-900 MHz, 2.0 μV (stereo reception); 900-2150 MHz, 4.0 μV.	FM wide, 12 dB SINAD: 100 MHz, 1.6 μV.
Blocking dynamic range: Not specified.	CW mode: 3.8 MHz, 70 dB; 14 MHz, 71 dB; 50 MHz, 74 dB; 144 MHz, 72 dB; 222 MHz, 81 dB; 432 MHz, 88 dB; 902 MHz, 57 dB*.
Two-tone, third-order IMD dynamic range: Not specified.	CW mode dynamic range and third-order intercept point: *Frequency (MHz)* / *Dynamic Range (dB)* / *Intercept Point[2] (dBm)* 3.8 / 41* / –64 14 / 43* / –69 50 / 43* / –70 144 / 43* / –66 432 / 43* / –62 902 / 57* / –33
Second-order intercept point: Not specified.	–1.8 dBm.
FM adjacent channel rejection: Not specified.	20-kHz channel spacing: 29 MHz, 35 dB; 52 MHz, 35 dB; 146 MHz, 35 dB; 440 MHz, 36 dB; 906 MHz, 42 dB.
FM two-tone, third-order IMD dynamic range: Not specified.	20-kHz channel spacing: 29 MHz, 35 dB*; 52 MHz, 35 dB*; 146 MHz, 35 dB*; 440 MHz, 36 dB*; 906 MHz, 42 dB*; 10-MHz channel spacing: 52 MHz, 64 dB; 146 MHz, 76 dB; 440 MHz, 67 dB.
Squelch sensitivity (threshold): Not specified.	At threshold: SSB, 14 MHz, 0.09 μV; FM, 29 MHz, 0.09 μV; 52 MHz, 0.10 μV; 146 MHz, 0.12 μV; 440 MHz, 0.40 μV; 906 MHz, 1.5 μV.
Audio output: 0.1 W into 8 Ω at 10% THD (at internal speaker terminals).	0.09 W into 8 Ω (maximum output at external speaker jack).
IF/audio response: Not specified.	Range at –6 dB points, (bandwidth): CW: 269-4071 Hz (3802 Hz); USB: 269-4061 Hz (3792 Hz); LSB: 270-4060 Hz (3790 Hz); AM: 228-2650 Hz (2422 Hz).
Spurious and image rejection: Not specified.	IF rejection: HF, 62 dB; VHF, 69 dB; UHF, 74 dB; Image rejection: HF, 58 dB; VHF, 71 dB; UHF, 14 dB.

Except as noted, all dynamic range measurements were taken using the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value indicated.
[1]Sensitivity degrades below 500 kHz and above 2000 MHz.
[2]Third-order intercept points were determined using noise floor reference.

temporarily enabled for more rapid frequency excursions.

The radio employs an extensive system of menus and submenus for controlling nearly every operation. In the case of mode selection, for example, changing the setting begins with a touch of the F (function) key, followed by a press of the MODE/1 key. A line-item list of available choices pops up on the screen (the six modes and the "auto" setting, in this instance). Selecting the mode is then just a simple matter of turning the encoder or rocking the UP/DOWN toggle until an arrow cursor is positioned next to the desired choice. The new setting is established with a press of the TF/ENT key. If a selected parameter requires further refinement, the key press brings up a submenu.

The DJ-X2000's menu control con-

figuration reminds me of the dropdown toolbar menus used in most *Windows*-based computer software.

But Does It Scan?

And *how*, it does! The 86-page *Instruction Manual* extensively documents three distinct scanning types: "Dual VFO," "Memory" and "Scan Programming." The scan resume condition can be set to "Busy," "Stop" or "Timer," and the pause duration in the Timer mode can be varied from 1 to 12 seconds. The scan rate seems to be somewhere in the neighborhood of 30 channels per second. The scan does hang for a fraction of a second when moving between bands.

With 2000 standard memories (50 banks of 40 channels each), I've got to believe that the DJ-X2000 provides enough memory capacity to satisfy all but the most fanatic of scanning enthusiasts. For me to fully describe the wide variety of scanning and memory management features provided in this receiver would be a daunting task. Alinco seems to have all of the bases covered—and then some!

I found the procedure for programming the DJ-X2000's standard memories somewhat confusing. You begin by entering the VFO mode and setting the desired frequency, mode and step size. (CTCSS tone and attenuator settings can also be stored.) Next, you select a specific bank (A through E), bank number (0 through 9), and then a memory channel (0 through 39) within that bank. At that point, you press the TF/ENT key. You'll be prompted to enter an alphanumeric memory name up to 8 characters long. The characters are selected using the encoder, and then entered—or deleted—with the UP/DOWN toggle switch. Upper and lower case letters, numbers and an extensive collection of symbols are available. Once you've completed that step, a press of the TF/ENT key stores the information and returns the radio to the VFO mode. Gaining proficiency with this procedure took patience and practice. The trickiest part for me was accessing the desired bank and channel. Thankfully, *Windows* programming software for this receiver is available free-of-charge on the Alinco Web site. An optional PC interface cable—the ERW-4C—is required, however.

US versions of the DJ-X2000 come pre-programmed with a few popular short-wave broadcast, HF utility, military, commercial and public safety frequencies. Memories can be scanned, banks can be linked for multiple bank scanning and specific memory channels can be locked out of a scan. You can even program in a frequency or group of frequencies that you want excluded from VFO or Scan Programming scans.

In addition to the standard memories, the DJ-X2000 also has 20 separate Scan Programming (PMS) banks. Each of these can be set up with a lower frequency limit, an upper frequency limit, a mode type, a tuning step size and an alphanumeric title. US versions come with a few of these programmed, as well. You'll find a sampling of popular US "service" frequency ranges, including Citizens Band, FM broadcast, AM aircraft, UHF military aircraft, NOAA Weather Radio, public safety, police/fire, ambulance/hospital, Family Radio Service, medical, federal and seven VHF and UHF ranges commonly assigned to police agencies. The PMS banks, as is the case with the standard memory banks, can be "linked" for multi-bank scanning.

It's important to point out that all of the sample frequencies that are programmed into this receiver at the factory—standard and PMS—are "volatile." A complete microprocessor reset will permanently clear them (…and yes, I did find this out the hard way). Fortunately, a "Clone" feature is included. I was able to convince a local Alinco distributor to allow me to clone our unit with his display model. (A cable with $^3/_{32}$-inch male mono phone plugs on each end is all that's required.) Lesson learned: If you like the collection of preloaded frequencies, limit any microprocessor resets to "SYSTEM" resets; a "FULL" reset will wipe the memory slate clean.

An "Auto memory write" feature is available in the PMS mode. This system will scan through the range of one of the PMS banks and automatically store active frequencies into a pre-selected standard memory bank. This is an ideal way to find activity rapidly when in new, unfamiliar territory. Of course, further listening or later research will be required to determine whether the collection of frequencies that the system gathered contains any interesting "hits."

A "Priority channel" feature is also included. When this system is activated, a specified memory will be automatically checked for activity at a regular time interval. A menu setting allows you to vary the check interval between 1 and 20 seconds.

The DJ-X2000 offers tone squelch and can scan for the tone in use on signals it receives. Thirty-eight CTCSS tones are supported. An innovative aspect of this particular system is that it can be set up as a *reverse* tone squelch. In this mode, the receiver will squelch any signal it receives that includes the tone that it's set up for, and let all other signals through. Digital code squelch (DCS) and trunked radio system tracking capabilities are not included.

Listen Up!

I was genuinely surprised to be able to receive a decent number of HF amateur and MF short-wave broadcast signals using just the included rubber duck, but—as you might expect—it's not exactly a killer antenna for HF use. My ability to receive signals in this range improved significantly when I attached a $^1/_4$-λ 2-meter antenna to the BNC antenna connector. I found that the best antenna for short-wave and HF listening turned out to be a few feet of hookup wire (I soldered some light gauge insulated wire to the center pin of a male BNC connector). Outdoor ham antennas—even short dipoles—seemed to deliver far too much signal for this rig, and invariably resulted in overload. This was the case even with the radio's two-stage attenuator set to the "high" setting (attenuation is approximately 20 dB in high and 10 dB in low). The Alinco-supplied rubber duck antenna seemed to work just fine for VHF, UHF and casual low frequency listening, and even worked okay for pulling in nearby AM broadcast stations.

Overall, I was reasonably satisfied with the performance of this receiver throughout its range, but you should use the numbers in our Lab data table to help you set your own expectations. Sensitivity measurements in all of the available modes (we typically check these at points in or around the ham bands, at 1.0 MHz for the AM mode and 100 MHz for wide FM) are actually pretty decent. The majority of the sensitivity numbers posted by the DJ-X2000 meet or surpass even some of those we've observed on recently reviewed fixed-station wide range communications receivers.

The ability to handle weak signals in the presence of stronger signals, however, is not one of the DJ-X2000's strong suits. The CW mode two-tone, third-order IMD dynamic range figures (we measure these on the ham bands) are nearly all down in the low 40s. For casual short-wave and HF utility listeners, this might not be a major concern, as genuinely "crowded" band conditions—such as those we often experience in the ham bands—are not nearly as common.

Folks intending to put this unit to work for monitoring local VHF and UHF frequencies will want to peruse the FM two-tone, third-order IMD dynamic range figures. The 10-MHz offset numbers are actually not too bad—they're within the range of what we've encountered on some of the multi-band FM handheld transceiv-

ers we've reviewed. The close-in (20-kHz offset) FM 2T3O numbers and the FM adjacent channel rejection—both mostly down in the mid-30 dB range—point to potential for trouble, though. This radio runs into difficulty rejecting interference when in the presence of strong signals on a neighboring frequency or frequencies (think "urban RF environments"). The two-stage attenuator can often be helpful in these situations.

An Orchestra of Bells and Whistles

So far, we've considered the DJ-X2000's abilities—and limitations—as a conventional communications receiver. But what sets any product apart from its peers are its "extras"—those bells and whistles that help it transcend mere usefulness and elevate it into the realm of neatness, or even coolness. Alinco has made an obvious effort to pack the DJ-X2000 with a whole slew of unexpected features, and several of them qualify as neat or cool.

Perhaps the one I consider most welcome is a handy front-panel button labeled HELP. This feature provides abridged—but sufficient—on-board text assistance that will guide you through the majority of programming operations. This is terrific for those who need to reprogram the radio when out in the field—or for those who have temporarily misplaced the printed instructions (as many of us are occasionally wont to do).

A very nicely implemented feature that's available in the VFO mode is the "Channel Scope," which will generate a plot of the relative signal strength over a portion of spectrum and display it on the LCD screen. A press of the SRCH button on the left side panel of the radio brings up the dot-matrix scope display. While the scope field is small—only about $^{3}/_{4} \times {}^{1}/_{8}$-inch—it's made up of over 300 dots. The scope image it renders looks great and the feature is very useful for spotting nearby band activity.

When you activate the Channel Scope, the receiver audio will mute for a second or so as a sweep routine samples the signal strength at each tuning step increment in the range. The scope can be set up to display either 7 or 40 steps, and is centered on the receive frequency. The system can be programmed to make a single sweep, to repeat the sweep automatically every 10 seconds or to sweep continuously. The continuous mode mutes the receive audio. Tuning the VFO when in the automatic or single sweep modes will mute the audio for a fraction of a second on each frequency step.

Are you monitoring an interesting or suspicious communication and don't happen to have a tape recorder handy? The DJ-X2000 can digitally record audio for later playback. The recording can be paused and restarted as desired and can store up to 160 seconds of audio. I played with this feature extensively and found the recordings to be universally clean, crisp and ready for transfer to more permanent storage media. Unlike some digital recording systems I've encountered, the recording is retained when the power is shut off. You can even activate a built-in microphone for non-radio audio recording.

Want to estimate the radiation pattern of an antenna? A simple field-strength measurement feature is included. In the "Meter display mode," the rate of a beeping sound and a seven-step S-meter provide an indication of the relative signal strength. In the "Set level mode," a buzzer will sound if the field strength exceeds a preset value. The meter is not calibrated and the sensitivity varies with respect to frequency, but this feature could be useful for making casual assessments of a radiation pattern.

The DJ-X2000 can be set up to tune instantly to strong near-field signals, and can pull double duty as a frequency counter. This "Flash tune" feature can be utilized in one of two ways: The received audio from a nearby signal can be played over the speaker, or the frequency of that signal can be displayed. It works in the range from 50 to 1300 MHz, and may be useful to experimenters and homebrewers for radio tune-up and calibration purposes. Alinco is to be commended for incorporating some useful test equipment into this receiver.

The *Instruction Manual* makes reference to the detection of "bugs" as the intended application for a few of this radio's extras. The rate of occurrence of such references might prompt the reader to wonder whether the product is targeted at people in the security trades (or those with unhealthy levels of paranoia, perhaps). Nevertheless, a "Transweeper" feature does, indeed, detect low-power wireless microphone devices within about a 5-meter range of the radio.

Activating Transweeper causes the DJ-X2000 to emit an audio beeping sound. If a nearby transmitter picks this sound up on its microphone and transmits it over the air—and if the receiver is tuned to that transmitter's frequency—DJ-X2000 will use the time delay between the RF and audio information to "range" the distance between itself and the "bug." A notable limitation is that a specific frequency, a range of frequencies or a collection of likely frequencies must be determined in advance. (The Flash tune frequency counter feature might be useful for making this determination.) A scale in the display provides an approximation of the distance (from 1 to 5 meters) and arrow indicators show whether the distance to the target is increasing or decreasing. I experimented with this using my H-T. While this could very well be a useful feature, my results were inconsistent. As is clearly stated in the *Instruction Manual*, room acoustics and variations in the mike/receiver orientation can confuse this ranging system. But it was entertaining to play with!

With some calculation, you can program a time at which the radio will turn either on or off. While the manual titles the section that describes this feature "Setting the clock," the DJ-X2000 doesn't include a conventional time-of-day clock. The user can program the radio to turn on or off from 30 minutes to 24 hours (in 30-minute increments) after the feature is enabled. This is an either/or proposition, though. Let's suppose you wanted the radio to turn on at 8 AM, and that you were setting up the feature at 11 PM. You would set the on timer to 09:00, as that corresponds to the length of time from when you are activating the feature to when you want the radio to switch on. While this feature could allow you to use the radio as an alarm clock, for catching a scheduled transmission or for shutting off the radio after you've fallen asleep, it's not nearly as handy as it could be. A conventional time-of-day clock, with the on-off times settable as times-of-day, would be much more useful—and more convenient to set up.

A "Sound pickup" feature allows you to use the built-in microphone, along with a connected earphone, to put the DJ-X2000 to work as a sound amplification device. The built-in microphone is sufficiently sensitive, but this feature would be even more useful if the rig had an external microphone input jack. You could then plug in a directional mike—perhaps one mounted on a parabolic dish—to enhance your long-range eavesdropping capabilities.

How it Handles

Control of the basic functions quickly became routine. While many may still prefer that volume, squelch and tuning be handled by dedicated rotary controls, it is becoming increasingly common for these to be relegated to a single knob and/or pushbuttons. The volume and squelch control arrangement on this receiver is one of the best digital implementations I've encountered.

All of the buttons are rubber-coated and easy on the fingers. The front keys do not resist very much when pressed, however. I found it easy to activate them unintentionally while handling the

radio. I made ample use of the keypad lock feature. Overall, though, I was quite satisfied with the ergonomic layout and operational feel of the DJ-X2000.

Those in the market for a handheld "dc-to-daylight" communications receiver are sure to find the DJ-X2000's masterful blend of novel features and adequate performance tough to resist.

Manufacturer: Alinco Inc, Shin Dai Building 8F, 1-2-6 Doujimahama, Kita-ku, Osaka 530-0004 Japan. Alinco's US distributor is ATOC Amateur Distributing LLC, 23 S High St, Covington, OH 45318; 937-473-2840; fax 937-473-2862; alinco@alinco.com; www.alinco.com.

Manufacturer's suggested retail price, $835. Typical current street price, $500. List prices of selected optional accessories, ERW-4C PC interface cable, $39.95; EDC-36 filtered automotive dc power cord, $24.95; EDH-16 dry cell battery case, $12.95. QST

Going Once, Going Twice . . .

Solicitation for Product Review Equipment Bids

[In order to present the most objective reviews, ARRL purchases equipment off the shelf from dealers. ARRL receives no remuneration from anyone involved with the sale or manufacture of items presented in the Product Review, Short Takes or New Products columns.—*Ed.*]

The ARRL-purchased equipment listed below is for sale to the highest bidder. Prices quoted are minimum acceptable bids, and are discounted from the purchase prices. All equipment is sold without warranty.

ICOM IC-756PROII HF/6-meter transceiver, serial number 01164 (see "Product Review," Feb 2002 *QST*). Minimum bid: $1990.

ICOM IC-R3 communications receiver, serial number 01372 (see "Product Review," Feb 2001 *QST*). Minimum bid: $275.

Kantronics KAM XL multimode communications processor (see "Short Takes," Mar 2002 *QST*). Minimum bid: $265.

Kenwood TH-F6A triband FM handheld transceiver, serial number 30500061 (see "Product Review," Dec 2001 *QST*). Minimum bid: $260.

Ranger RCI-5054DX 6-meter mobile transceiver, serial number TIY00796 (see "Product Review," Mar 2002 *QST*). Minimum bid: $195.

WiNRADiO WR-1550i computer-based communications receiver, serial number 107620 (see "Product Review," Jan 2002 *QST*). Minimum bid: $365.

Yaesu FTV-1000 6-meter transverter for the FT-1000MP, serial number 10040047 (see "Product Review," Feb 2002 *QST*). Minimum bid: $595.

Yaesu MARK-V FT-1000MP HF transceiver with YF-115C 500-Hz CW filter, serial number 0F020049 (see "Product Review," Nov 2000 *QST*). Minimum bid: $2080.

Yaesu VL-1000 Quadra HF/6-meter linear amplifier, serial number 0K220026 (see "Product Review," Jan 2002 *QST*). Minimum bid: $2650.

Yaesu VR-5000 communications receiver, serial number 0K030164 (see "Product Review," Jun 2001 *QST*). Minimum bid: $500.

Sealed bids must be submitted by mail and must be postmarked on or before June 1, 2002. Bids postmarked after the closing date will not be considered. Bids will be opened seven days after the closing postmark date. In the case of equal high bids, the high bid bearing the earliest postmark will be declared the successful bidder.

In your bid, clearly identify the item you are bidding on, using the manu-facturer's name and model number, or other identification number, if specified. Each item requires a separate bid and envelope. Shipping charges will be paid by ARRL. Please include a daytime telephone number. The successful bidder will be advised by telephone or by mail. Once notified, confirmation from the successful bidder of intent to purchase the item must be made within two weeks. No response within this period will be interpreted as an indication of the winning bidder's refusal to complete the transaction. The next highest bidder will then have the option of purchasing the item. No other notifications will be made, and no information will be given to anyone other than successful bidders regarding the final price or the identity of the successful bidder. If you include a self-addressed, stamped postcard with your bid and you are not the high bidder on that item, we will return the postcard to you when the unit has been shipped to the successful bidder.

Please send bids to Bob Boucher, Product Review Bids, ARRL, 225 Main St, Newington, CT 06111-1494.

STRAYS

◊ Thanks to the hard work of several Michigan ARRL officials, the state is now sporting a new Amateur Radio license plate. Shown at the January ceremony in the office of Secretary of State Candice S. Miller are (left to right): Ed Hude, WA8QJE, State Government Liaison; Sandy Mondro, KG8HM, ACC; John Lewandowski, WD8R, EC Macomb County; Secretary Miller; Section Manager Richard Mondro, W8FQT, and the plate's designer, Randy Love, WF5X, Assistant Emergency Coordinator Oakland County. While they were there, the hams took the opportunity to discuss Amateur Radio involvement with government agencies and public service. At the right are the original design and the new one that shows the Mackinac Bridge.

Previous • Next Strays

JAMES MCRAY

GEORGE RACE, WB8BGY

TECHNICAL CORRESPONDENCE

UNEXPECTED LONG-TERM RESISTANCE INCREASES IN RESISTORS

By Aaron D. Karty, KD4BYW, 8709 Southern Pines Ct, Vienna, VA 22182; **karty@jboxford.com**

◊ This paper is the result of measuring some old carbon-composition resistors I found in my father's workshop. I discovered that many of these resistors had increased in resistance although they had never been used and had been stored continuously at room temperature and humidity.

The conventional wisdom about resistors says that they do not fail unless something else fails first and causes a current overload. Carbon-composition resistors were the most popular type from before WW2 until the 1970s, when a gradual shift to thin-film resistors began (see Figures 1 and 2). Many hams who still use older electronic equipment have observed that carbon-composition resistors seem to increase in resistance beyond their tolerances. Carbon-composition resistors do, in fact, undergo increases in resistance over time, probably as a result of absorbing ambient humidity. However, this change can be partially reversed or even prevented.

Carbon-composition resistors are a combination of finely ground (powdered) carbon and a powdered insulating material held together in a resin binder and pressed into a cylindrical shape. Resistance is determined by the ratio of carbon to insulating material, with lower ratios, having greater resistance.

To test the hypothesis that many carbon-composition resistors increase in resistance over time, three different sample groups of $^1/_2$-W carbon-composition resistors were measured with an ohmmeter. All were unused and had been continuously stored for many years at room temperature and humidity. The first sample consists of 73 similar resistors, all approximately 45 years old. The second sample is 82 mixed resistors, most about 30 years old. The third sample is 57 resistors, all at least 15 years old. Tables showing the original and current resistance for each resistor were compiled and analyzed statistically.[1] The analysis shows that many of the resistors have increased in resistance.

[1]For those interested in details of the study, the tables are contained in three *Excel* worksheet files. You can download them from *ARRLWeb* at **www.arrl.org/files/qst-binaries/**. Look for 02TC04.zip.

The resistance increase was most likely caused by the insulating material inside the resistor absorbing water from the air and swelling slightly. This swelling prevented some of the carbon particles from making good contact with each other, thus increasing resistance.

I attempted to partially reverse the process by evaporating the moisture. A 1600-Ω resistor that had increased (by 155%) to 4090 Ω was loosely wrapped inside aluminum foil and heated at a constant below-boiling temperature (approximately 85°C) above the pilot light of a gas range. Over a period of two weeks, the resistor was removed from the aluminum foil once a day to measure its resistance. Resistance went down steadily, although much more rapidly at the beginning. Each day's reading was plotted on a graph (Figure 3). After 12 days, resistance measured 1880 Ω, only 17% above the resistor's nominal (original) value. In this way, the old resistor was partially "rejuvenated." For the next month, the resistor was left at room temperature. Daily measurements showed that resistance gradually increased to 2310 Ω (44% above its nominal value) as the resistor reabsorbed moisture from the air. Most of this increase occurred during the first week.

This test was repeated with another resistor that had increased from its nominal value of 820 Ω to 2220 Ω (171%). After slightly over one week of heating, resistance measured 1370 Ω (67% above its nominal value). Daily measurements of the two resistors show similar curves characterized by rapid decreases in resistance the first three days, with slower continuous decreases thereafter (Figure 3). From this, I conclude that a minimum of three days of heating is necessary to remove most of the moisture.

Although both resistors were partially

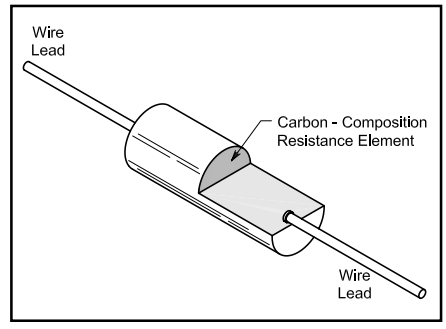


Figure 1—Cut-away view of a carbon-composition resistor.

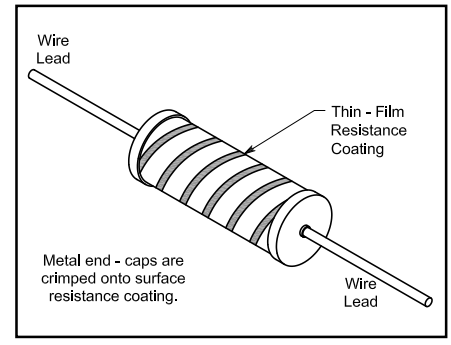


Figure 2—A view of a thin-film resistor.

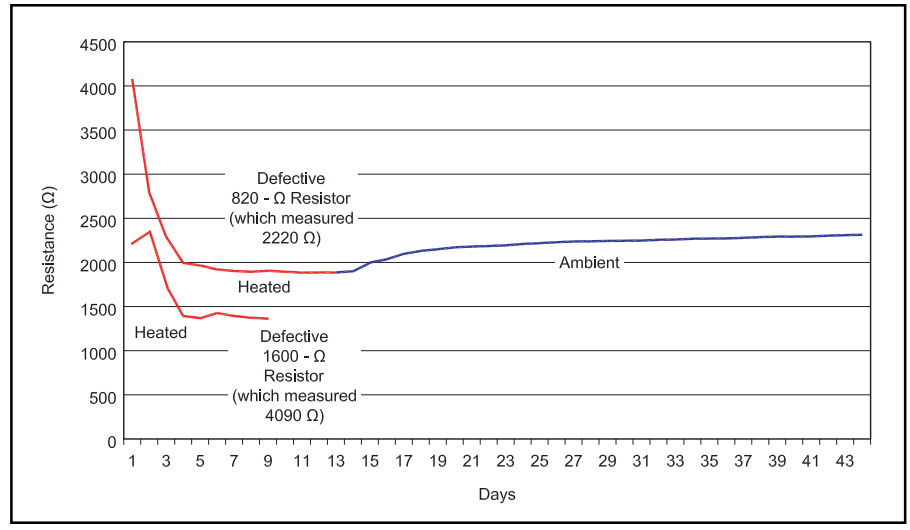


Figure 3—Daily resistance measurements. A defective 1600-Ω resistor (which measured 4090 Ω) heated for 12 days, followed by 31 days at ambient temperature (upper line) and defective 820-Ω resistor (which measured 2220 Ω) heated for eight days (lower line).

Bob Schetgen, KU7G ♦ Senior Assistant Technical Editor

restored by heating, they are still defective and could not be used in most circuits.

Resistance increases less when resistors are installed in operating electronics equipment, because the heat generated during operation drives off moisture. By using the equipment frequently, the resistors remain warm and dry, thus preventing them from deteriorating.

While reference books state that resistors in circuits, exposed to heat over long periods, may increase in resistance, none discuss the possibility of increased resistance in *unused* resistors. To the contrary, they typically state "Resistors keep their characteristics almost indefinitely when not used. Without any current in a circuit to heat the resistor, it has practically no change with age. The shelf life of resistors is usually no problem, therefore." [2]

This paper, however, verifies statistically what hams who repair older electronics equipment have observed: carbon-composition resistors can, over time, significantly increase in resistance.

The analysis also indicates that, in addition to the typical increase in resistance over time, a few resistors can also be expected to show increases large enough to make them statistical "outliers." In contrast, none of the resistors showed any tendency to be outliers as the result of a large decrease in resistance. This suggests that the deterioration process occurs gradually, reaching a point where the process then accelerates catastrophically. The present data, however, is insufficient to support a detailed investigation of this possibility.

Acknowledgment

Thanks to my dad, N5SK, a packrat that kept resistors for 45 years.

RE: GET ON 222 MHZ WITH A TEN-TEC 1210 TRANSVERTER!

By Alan Bloom, N1AL, 1578 Los Alamos Rd, Santa Rosa, CA 95409-3308; **alanb@cds1.net**

◊ I was interested to see the article in the May '01 *QST* that described how to modify a commercial 144 MHz to 28 MHz transverter to cover the 222-MHz band instead.[3] However the schematic left me puzzled. Clearly the 64.666 MHz local oscillator must be tripled to achieve the correct frequency coverage (3 × 64.666 + 28 = 222 MHz), yet it is followed by a frequency doubler.

A push-push frequency doubler uses two transistors with the inputs fed out of phase and the outputs connected in parallel (in phase). It suppresses all odd-order harmonics, which makes output filtering easier because the fourth harmonic is the closest spurious frequency. If the circuit is perfectly balanced, there are theoretically no odd-order (third, fifth, etc) harmonics at all.

The original Ten-Tec design used that property to good advantage since a frequency doubler is what is wanted for a 144-MHz transverter. However the doubler circuit does just the opposite of what you want for a tripler. I don't doubt that it was possible to get the prototype to work because a practical circuit is rarely balanced perfectly. Apparently, enough third-harmonic energy got through to meet the design goals. However, another unit might perform very differently, depending on how well balanced that particular doubler circuit happens to be.

It would be interesting to try modifying the circuit to intentionally unbalance the doubler, perhaps by removing one of the transistors (Q4 or Q5). I suspect the LO tuning would be less sensitive and more repeatable; the output spectrum would probably be improved as well.

K4EJQ Responds

By "Bunky" Botts, K4EJQ, 220 Hillsboro Rd, Blountville, TN 37617-5418; **bunkybotts@juno.com**

Al, you are among several "eagle-eyed" technical folks that noticed the doubler being used as a tripler in that LO chain. Keep in mind the idea was to return the unit to 144-MHz operation, if the user wanted, with a minimum of time and effort. We wanted to keep the circuit changes to a bare minimum for that reason.

For the utmost efficiency, your ideas would be useful I'm sure. However we have converted several of these units so far, and there have been no problems in getting the LOs to work.

In fact, I am using a modified 1210 on 432 and 903 MHz using the very same scheme as in the basic 1210 modified for 222 MHz. I have more than enough driving power for the mixer stage using the original 1210's LO doubler as a tripler, which in turn drives another multiplier stage to bring the LO up to the required frequency.

I modified a 1210 for 28 to 50-MHz operation and used your idea of upsetting the phase or balance of the doubler to use it as a buffer amplifier instead of a multiplier—it works great. Thanks for dropping me the note.

N1AL

My suggestion was to unbalance the doubler by removing one of the transistors. It would be easy to re-install the transistor if desired, and it requires no PC board changes.

I guess it just grates against my nature to use a circuit designed to suppress odd-order harmonics as a tripler. Nonetheless, as the Vice-President of Engineering at Drake used to say when I worked there, "Good enough is better than perfect."

I can't help but think that unbalancing the tripler would make it work better. Instead of the third harmonic being *x* dB below the second and fourth harmonics, it would be of comparable amplitude. That should make for a cleaner output spectrum.

The sidebar in the article said the two main spurs were at 194 MHz and 260 MHz. The 194-MHz spur sounds like LO feedthrough, but the 260-MHz spur is probably the fourth harmonic of the LO multiplier (4 × 64.666 = 258.666 MHz). Unbalancing the multiplier should reduce that one.

The 194-MHz spur might benefit from better mixer balance. The *QST* schematic doesn't show what the IF input to the mixer looks like, but perhaps adding a small trimmer capacitor from one side of the mixer transformer input to ground might allow nulling out the 194-MHz spur.

K4EJQ

As readers will remember, there were spurs that exceed FCC Standards, and a filter was recommended to bring the modified transverter into compliance. Since the article was published, I have found a cost-effective filter on the surplus market. Although it's larger than the transverter itself, the F-197/U twin-cavity band-pass filter, which was part of the surplus TRC-24 radio system, appears to take care of the close-in spurs nicely. It is easily tuned via its two calibrated knobs. These units are available from Fair Radio Sales of Lima, Ohio.[4]

[2]B. Grob, *Basic Electronics,* 6th edition (New York: McGraw-Hill, 1989).

[3]J. G. "Bunky" Botts, K4EJQ, "Get on 222 MHz with a Ten-Tec 1210 Transverter!" *QST*, May 2001, pp 28-33.

[4]Fair Radio Sales, 1016 E. Eureka, PO Box 1105, Lima, OH 45802; tel 419-227-6573, 419-223-2196, fax 419-227-1313. The filters appear on page 30 of Fair Radio catalog "00" and on the Web at **www.fairradio.com/filter.htm**.

Technical Correspondence 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.

Letters to this column may be sent to "Attn: Technical Correspondence" at ARRL Headquarters (see page 10), or via e-mail to **tc@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. The publishers of *QST* assume no responsibility for statements made herein by correspondents.

President Bush Addresses Florida ARES Net

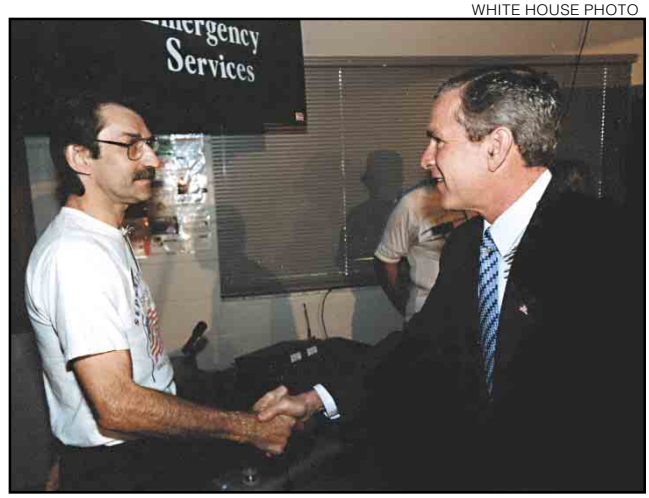
President George W. Bush spoke via Amateur Radio January 31 to members of the Northern Florida Amateur Radio Emergency Service Net (NFAN). The president was in Florida to spotlight five volunteer groups—among them the Volusia County Amateur Radio Emergency Service (ARES)—for their value to the new Office of Homeland Security.

"I want to thank all the volunteers who help make sure that Florida is prepared for any kind of emergency," the president said in part, after checking in around 9:15 AM to a regular ARES net session. "I want to thank you all for helping your communities be prepared."

Northern Florida ARRL Section Manager Rudy Hubbard, WA4PUP, said Bush spoke from a portable station set up at a Daytona Beach fire station. Hubbard said that when Bush's visit was announced, Volusia County's emergency manager got in touch with the county's ARES Emergency Coordinator Joette Barnett, KG4HPN. She, in turn, contacted John Schmidt, AF4PU, and Clifford Fraser, KE4HIY. They arranged to have the station ready as a demonstration of Amateur Radio's role in emergency preparedness and in the hope that Bush would be willing to take a few minutes to address the 75-meter net. NFAN meets daily at 9 AM. Hearing the president check into the net was a pleasant surprise, Hubbard said.

I want to thank you all for helping your communities be prepared. —Pres George W. Bush

WHITE HOUSE PHOTO



President Bush shakes hands with John Schmidt, AF4PU, who helped set up the ham station the president used to speak to a Northern Florida ARES net on 75 meters.

ARRL President Jim Haynie, W5JBP, said he was "extremely gratified" that President Bush recognized the valuable service Amateur Radio operators provide in times of emergencies. "I know that all hams in the United States stand ready to do their part in America's Homeland Security Program," Haynie commented. Haynie has said that defining Amateur Radio's role in homeland security would top his list of initiatives for his second term.

Hubbard said a copy of proposed expanded Amateur Radio (PRB-1) antenna legislation was given to the President and to the president's brother, Florida Gov Jeb Bush, for possible introduction in next year's Florida legislative session. "We Amateur Radio operators will volunteer however we're needed, and maybe it will be seen that we can greatly help the nation if we have the antennas we need," Hubbard commented. The proposed bill would seek to extend Florida's PRB-1 law to include private deed covenants, conditions and restrictions.

The Daytona Beach event marked a rare appearance on ham radio by a sitting president. Then-President Gerald Ford spoke via a ham radio satellite hookup in 1976 at the opening of the Air & Space Museum in Washington, DC.

Text of President George W. Bush's Remarks via Amateur Radio

I want to thank all the volunteers who help make sure that Florida is prepared for any kind of emergency. I also want to assure you that your federal government is doing everything we can to make sure that there is *not* an emergency—starting with unleashing the mighty US military overseas to bring the evil ones to justice. But should there be a need for a response, I want to thank you all for helping your communities be prepared. And finally, I just wanted to tell you—we're lucky to be Americans and may God continue to bless this great land of ours. Thank you very much.

ARRL Asks FCC to Drop RFID Rules Proposed for 425-435 MHz

The ARRL says the FCC "cannot legally proceed with the rules proposed for unlicensed RFID tags at 433 MHz," and it's asked the Commission to not adopt them.

The League filed comments February 12 as part of its continued opposition to what it called "this ill-conceived proposal" of SAVI Technology to deploy unlicensed transient RF identification devices between 425 and 435 MHz at much higher field strengths and duty cycles than Part 15 rules now permit for such devices. The FCC appears inclined to agree with SAVI's proposal, but FCC staff members have told the ARRL that it's not a "done deal."

SAVI "wants to have its cake and eat it too."

"The level of interference from the devices permitted under the proposed rule is intolerable," the ARRL argued, citing its own interference study. The League reiterated its stance that the Communi-

Rick Lindquist, N1RL ♦ Senior News Editor

cations Act of 1934 "is devoid of any authority to allow unlicensed devices with substantial interference potential; such devices must be licensed."

SAVI, the ARRL argues in its comments, "wants to have its cake and eat it too" by getting high power levels and lengthy duty cycles operating on a band heavily used by a licensed radio service that uses sensitive receivers "and all of the above on an unlicensed basis."

RFIDs are used for what's called "asset tracking." Among other applications, RFID tags could be used to track and inventory parcel shipments and vehicles. Taking issue with an FCC claim that RFIDs typically would operate in commercial zones with few hams, the League said that "ubiquitous, itinerant" RFID systems are bound to operate in the vicinity of amateur operations.

The ARRL said the FCC's inclination to go along with SAVI Technology's proposal "eviscerates the periodic radiator rules, is vague and overbroad," and would permit digital RFIDs to operate "at unsuitable power levels and duty cycles." The result would be unacceptable interference that would "preclude or repeatedly disrupt amateur operation," the ARRL said.

ARRL officials met in January with FCC staff members as part of the League's effort to stave off the 70-cm band threat. ARRL General Counsel Chris Imlay, W3KD, said the League contingent told the FCC that 425 to 435 MHz was the worst possible band for the RFIDs SAVI has proposed, and its choice lacks any technical basis. The ARRL expanded on that theme in its formal comments.

"The price of the tags is a problem for SAVI, and the choice of frequency band is related only to the cost of components," the ARRL said. The ARRL said SAVI chose 433.9 MHz as an operating frequency because of the availability of relatively cheap components in Europe, where the 433.05-434.79 MHz band is available for industrial, scientific and medical uses in at least 10 countries. "The frequency choice has absolutely no technical justification whatsoever, and any contention by SAVI to the contrary is a misrepresentation." the ARRL said.

The ARRL pointed out that deploying the proposed RFID tags elsewhere would make much better sense than 70 cm. "SAVI should seriously consider the frequencies around 868 or 915 MHz, which apparently stand at least some reasonable chance of global standardization," the ARRL advised. "No other RFID manufacturer of which ARRL is aware after diligent research is advocating use of the 433 MHz band."

The RFID rules proposed in response to SAVI's *Petition for Rule Making* last year "are flawed from their inception and should not be adopted under any circumstances," the League concluded. The ARRL has said it will "do whatever it takes" to keep the FCC from permitting the RFID tags on 70 cm. That could include further direct appeals to FCC staffers, Imlay has said.

The FCC included the Part 15 RFID proposals within a larger proceeding, ET-01-278, that's aimed primarily at reviewing and updating portions of its Part 2, 15 and 18 rules.

INCUMBENT VIRGINIA SECTION MANAGER WINS IN HIGH-PROFILE ELECTION

Incumbent Virginia Section Manager Carl A. Clements, W4CAC, was elected to a full term in his own right after beating back a challenge from former Virginia SM Lynn Gahagan, AF4CD, 976 to 779 votes. In the Pacific Section, Bob Schneider, AH6J, outpolled John D. Peters, K1ER, 137 to 112. Votes were counted February 19 at ARRL Headquarters.

The Virginia race attracted a greater than usual level of attention and number of votes cast by ARRL members. Gahagan, who was first elected in April 1998, was effectively removed from office last year after the ARRL Executive Committee declared the office vacant. Clements was named to fill the declared vacancy.

The EC's action followed efforts by ARRL First Vice President Joel Harrison, W5ZN, to "review concerns" directly with Gahagan. Subsequently, at the direction of the EC, ARRL Executive Vice President David Sumner, K1ZZ, wrote Gahagan setting out five points that had to be addressed and resolved "with regard to the administration of the ARRL emergency communications program" in Virginia. After considering Gahagan's reply, the EC met in a teleconference and vacated the position.

At its January meeting, the ARRL Board of Directors revised rules to—among other changes—require anyone removed by action of the Executive Committee to get that committee's consent to be eligible to run again. The Board also gave the EC the power to cancel any field organization appointment "whenever it appears to be in the best interest of the ARRL to do so." Rules in place for this election cycle did not prevent Gahagan from running again, however.

In the Pacific Section, Schneider, an ARRL Life Member from Keaau, Hawaii, and a former SM, replaces Ron Phillips, AH6HN, who decided not to run for a third term.

Incumbent SMs returned to office without opposition were Pete Cecere, N2YJZ, Eastern New York; Eric Olena, WB3FPL, Eastern Pennsylvania; Mickey Cox, K5MC, Louisiana; John Covington, W4CC, North Carolina, and Kent Tiburski, K6FQ, San Diego. Tiburski had been serving out the unexpired term of former SM Tuck Miller, NZ6T, elected last fall as Southwestern Division Vice Director.

Two-year terms for all successful candidates began April 1.

ISS GETS TWO NEW AMATEUR RADIO ANTENNAS

Amateur Radio on the International Space Station gained two new antennas in January, including one for HF—although there's no HF gear aboard the ISS as yet. A VHF-UHF antenna and an HF antenna—two of four slated for installation aboard the *Zvezda* Service Module—were put into place during separate spacewalks—or EVAs—conducted by members of the all-ham Expedition 4 crew of Commander Yuri Onufrienko, RK3DUO, Dan Bursch, KD5PNU, and Carl Walz, KC5TIE. The Expedition 4 team is the first ISS crew comprised of radio amateurs.

"It was beautiful to watch," ARISS Board Chairman Frank Bauer, KA3HDO, told ARRL after the first antenna was installed January 14 on *Zvezda*, the crew's living quarters. "It went like clockwork, everything deploying just as it was supposed to."

Bauer said the installation of the new antennas on *Zvezda* paves the way for two separate ham stations aboard Space Station Alpha and will allow the crew to set up ham radio equipment in their living quarters. The ARISS initial ham station gear—single-band hand-held transceivers for 2 meters and 70 cm—was installed in the *Zarya* Functional Cargo Block because that module went into space first.

"The *Zarya* location worked well," Bauer said, "but this new setup is much more comfortable and convenient and should allow for more contact between the crew and Amateur Radio oper-

NASA

The all-ham Expedition 4 crew: (L-R), astronaut Dan Bursch, KD5PNU, Mission Commander Yuri Onufrienko, RK3DUO, and astronaut Carl Walz, KC5TIE, in the Destiny laboratory of the ISS.

ators and schools on Earth."

Both antennas are flexible-tape designs. The HF antenna, installed January 25, is 2.5 meters (8.2 feet) long. Bauer has said he thinks it will definitely work on 10 meters and speculated that it might work on 15 or 20 too. Bauer added that he did not know when HF gear might be made available for use by a future crew.

NA1SS currently uses antennas that were installed to aid docking operations and EVAs. The new VHF-UHF and HF antennas are among the first designed for and dedicated specifically to support ARISS operations.

Bauer credited Lou McFadin, W5DID; Mark Steiner, K3MS; Ken Nichols, KD3VK; and Mark Clausen with providing support for the antenna installation from the NASA Goddard/ISS Ham-Goddard Control Center. He said Carolynn Conley, KD5JSO, provided antenna installation support at NASA's Johnson Space Center Mission Control Center.

"Congratulations, team, on a job well done," he said. "We have taken our ideas, concepts and vision and transformed them into reality." ARISS ARRL representative Rosalie White, K1STO, said she, too, was pleased to see this phase of the project coming together.

On January 16, Walz handled the initial ARISS school contact for the Expedition 4 crew. He fielded questions from 13 elementary school students at St Clare School in Waveland, Mississippi, as crowd of about 200 students and 50 parents looked on.

"These students are going to have a very slow time of landing back on Planet Earth, and the parents are still on Cloud Nine!" Teacher Mary Bartholomew commented afterwards.

As the contact began, ARISS mentor and control operator Tim Bosma, W6ISS, relayed congratulations to Walz from Bauer for the successful installation of the new VHF-UHF ham antenna earlier that week.

Walz told the students that ham radio was one of the ways that he communicated with family and friends while on board the space station (an onboard e-mail system and a telephone are others). The new VHF-UHF antenna was not used for the January 16 contact, however.

For more information, visit the ARISS Web site, **ariss.gsfc.nasa.gov**.

FCC News

GOOD NEWS, BAD NEWS ABOUT ARCHIVED LICENSING RECORDS

The ARRL has obtained some updated information regarding which amateur licensing records the FCC has and does not have. Such records can be valuable to prove prior exam element credit. The FCC has *no* archive license records before 1966. Some older data that apparently had been committed to microfilm or microfiche are no longer usable or accessible. Records from 1966 to 1975 are on microfiche, and the FCC can review these *by call sign only*. Records of licenses expiring from 1975 to 1994 are on microfiche, and the FCC can review these by call sign or by licensee name. Records of licenses expiring from 1994 to the present are all electronic and available.

The *Callbook* began including license class in its listings starting with the fall 1968 edition, and *Callbook* listings may be accepted for prior examination element credit in accordance with FCC rules (eg, anyone who once held a Novice ticket can get credit for Element 1—Morse code). Those needing proof of license class between 1966 and the fall of 1968 but don't know the call sign may wish to contact the FCC's records contractor, QUALEX , which charges a fee for searches. Contact QUALEX at 202-863-2893; **qualexint@aol.com**, or FCC Reference Information Center, The Portals 2, 445 12th St SW, Room CY-A257, Washington DC 20554. Otherwise, applicants may be able to obtain a free FCC-issued verification letter for license data between fall 1968 and the present, if they don't have access to a *Callbook* of the relevant era. Contact FCC, Wireless Telecommunications Bureau, 1270 Fairfield Rd, Gettysburg, PA 17325.

FCC AFFIRMS $10,000 FINE IN AMATEUR-BAND PIRATE CASE

The FCC has fined a Texas man $10,000 for transmitting without a license on an Amateur Radio band. Following a *Notice of Apparent Liability* issued in September, the FCC affirmed the $10,000 fine in a December 26 *Forfeiture Order* to David Edwin Merrell of Wichita Falls. The FCC said Merrell did not respond to the *NAL*.

In its earlier *NAL*, the FCC said it was acting on "numerous complaints" from the amateur community that an unidentified station operating on 7235 and 7238 kHz was causing "intentional interference to authorized communications." The FCC's High Frequency Direction Finding network determined that the signal was located in the Wichita Falls area. Last June, agents in the FCC's Dallas office monitored an unidentified station on 7220 kHz and determined that the transmission was coming from Merrell's residence. "The station did not identify and transmitted only one-way broadcasts," the FCC said.

During as station inspection, Merrell "admitted to the transmissions and stated that he did not have a station operator license," the FCC said. Unconfirmed reports to the FCC indicate that Merrell may have continued to occasionally transmit on 40 meters following the FCC visit.

FCC NIXES FRS CALLING CHANNEL PROPOSAL

The FCC has turned down a petition to establish Family Radio Service channel 1 (462.5625 MHz) as a national calling channel. The petition was filed by Alan Dixon, N3HOE, and Robert K. Leef, KB6DON. In a six-page *Order*, the FCC December 5, pointed out—among other things—that FRS Rule 3 already requires FRS users to give priority to emergency communications concerning the immediate safety of life or the immediate pro-

ARRL Announces "Big Project" Logo Winner, Unveils New Design

A design by an Illinois amateur—Chris Cieslak, KC9L, of Melrose Park—has been selected as the official logo for the ARRL Education Project, "The Big Project." ARRL Amateur Radio Education Project Coordinator Jerry Hill, KH6HU, said Cieslak's design best depicted the integration of education and technology—the foundation of The Big Project.

"In the center, the shaking hands represent the partnership between Amateur Radio and education," Hill said. "The continents represent the global reach of Amateur Radio, the ones and zeros and circuitry represent technology."

"The Big Project" winning logo design by Chris Cieslak, KC9L.

ARRL Central Division Director Dick Isely, W9GIG (right), presents Chris Cieslak, KC9L, with a certificate January 27 in Chicago.

A ham since 1992 and an ARRL member, Cieslak says he does some design work for Web and print but mostly writes for a living. "I've been doing design for about seven years and am self-taught," he said. His amateur interests include homebrewing and kit building, as well as HF mobile and amateur television (ATV).

ARRL Central Division Director Dick Isely, W9GIG, presented Cieslak with a certificate January 27 during the Wheaton Community Radio Amateurs Hamfest in Chicago. Cieslak is the WCRA's current vice president.

tection of property on any of the 14 FRS channels. "The current rules, therefore, already provide that emergency communications have priority over ordinary communications," Kathleen O'Brien Ham, deputy chief of the Wireless Telecommunications Bureau, wrote on behalf of the Commission. The FCC *Order* said a national calling channel was not necessary, given that FRS is intended only for short-range communication over distances of a half mile or less. The FCC also said it did not want to burden the FRS with additional technical or operational rules.—*FCC*

Amateur Enforcement

♦ **FCC modifies sanction in California repeater case:** The FCC has reduced a sanction imposed last year against a California amateur who had been banned from using repeaters on the 144, 222, or 440-MHz bands for three years. The case involved allegations that Ted R. Sorensen III, KC6PQW, of Agoura Hills, California, and Gregory S. Cook, ex-KC6USO, of Chico, California, had conspired in making late-night one-way transmissions on the W6NUT 147.435 MHz repeater that originated from Sorensen's station. Last March the FCC accepted Cook's voluntarily surrendered license.

Although he did not dispute the allegations, Sorensen got a lawyer and protested his lengthy banishment. In his initial response to the FCC, Sorensen offered to accept a suspension from talking on the W6NUT repeater for a year "as fair punishment." After reviewing Sorensen's case, the FCC decided to accept that less-stringent settlement of the case, rather than get involved in a hearing. Because Sorensen already has been off the repeater for more than two months, the prohibition expires next September 15. An FCC review into the operation of the W6NUT repeater continues.

♦ **Former Ohio ham sentenced in police radio jamming case:** Kenneth Kelly, ex-WT2FBI, has been sentenced to five years probation after pleading guilty of attempted disrupting public service—a fifth-degree felony in Ohio. FCC Special Counsel for Amateur Radio Enforcement Riley Hollingsworth says Kelly did not appear by October 30 for requested retesting, and his license was canceled. Kelly had been indicted on a felony charge of disrupting public service by allegedly jamming and talking on the Middletown, Ohio, police radio system in July. He had been held in the Butler County jail pending sentencing.—*Ernie Howard, W8EH; FCC*

SECTION MANAGER ELECTION NOTICE

To all ARRL members in the Connecticut, Idaho, Minnesota, North Dakota, Ohio, Oklahoma, Southern Florida, Western New York, Puerto Rico and Virgin Islands sections. You are hereby solicited for nominating petitions pursuant to an election for Section Manager (SM). Incumbents are listed on page 12 of this issue.

To be valid, a petition must contain the signatures of five or more full ARRL members residing in the section concerned. Photocopied signatures are *not* acceptable. No petition is valid without at least five signatures, and it is advisable to have a few more than five signatures on each petition. Petition forms (FSD-129) are available on request from ARRL Headquarters but are not required. We suggest the following format:

(Place and Date)

Field & Educational Services Manager,
ARRL
225 Main St
Newington, CT 06111

We, the undersigned full members of the _____ ARRL section of the _____ division, hereby nominate _____ as candidate for Section Manager for this section for the next two-year term of office.

(Signature___ Call Sign___ City__ ZIP__)

Any candidate for the office of Section Manager must be a resident of the section, a licensed amateur of Technician class or higher and a full member of the League for a continuous term of at least two years immediately preceding receipt of a petition for nomination. Petitions must be received at Headquarters by 4 PM Eastern Time on June 7, 2002. Whenever more than one member is nominated in a single section, ballots will be mailed from Headquarters on or before July 1, 2002, to full members of record as of June 7, 2002, which is the closing date for nominations. Returns will be counted August 20, 2002. Section Managers elected as a result of the above procedure will take office October 1, 2002.

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, 2002. If *no* petitions are received from a section by the specified closing date, such section will be resolicited in the October 2002 *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*

Since no petitions were received for the South Dakota Section Manager elections by the deadline of December 7, 2001, nominating petitions are herein resolicited. See above for details on how to nominate. QST

World Amateur Radio Day Celebrates Amateurs' Continuing Innovation in Communication Technology

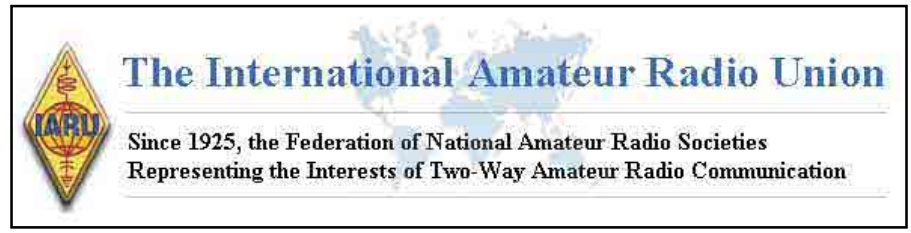
Amid the much-publicized commercial successes and failures in the telecommunications industry it is easy to overlook the fact that radio amateurs continue to be an important source of innovation in communication technology.

A century has passed since Marconi spanned the Atlantic and excited the imaginations of the first generation of amateur wireless experimenters. Amateurs were the first to discover and to exploit the remarkable properties of the ionosphere that permit worldwide communication with less power than it takes to illuminate a light bulb. They were the first to make widespread use of single-sideband voice communication to conserve power and precious radio spectrum. Amateurs applied microprocessors to data communication, popularizing packet radio and developing protocols that are now in widespread use in public safety and other services.

As we enter radio's second century, amateurs continue to lead the way in numerous areas.

Digital HF Radio: Radio amateurs are the leading developers of new digital techniques for high-frequency (HF) data and text communication. For example, PacTOR combines the strengths of packet radio and the mode known commercially as SITOR to offer reliable and essentially error-free data communication. Disaster relief agencies have adopted it for use from remote locations where no telecommunications infrastructure is available. PSK31 is a user-friendly mode that provides live keyboard communication at low transmitter power levels when error correction is not required. An implementation of PSK31 using computer sound cards has made this the most popular digital mode for radio amateurs in less than two years. Other developers, building on the success of PSK31, are using sound cards to explore a wide range of other digital modes tailored for the challenging HF environment.

Software Defined Radios: Perhaps the outstanding example of a DSP radio designed for experimental use is the DSP-10, a transceiver for the 144-MHz amateur band designed by Bob Larkin, W7PUA, of Corvallis, Oregon. Working with Mr Larkin, a team of amateur software developers is refining a family of programs tailored to explore a wide range of VHF, UHF, and microwave propagation media, including moonbounce (Earth-Moon-Earth) and extended-range tropospheric scatter.



A Brief History of World Amateur Radio Day

The theme of this year's World Amateur Radio Day celebrates amateurs' continuing innovation in communication technology. In 1981 the International Amateur Radio Union (IARU) approved the proposal of the Liga de Amadores Brasileiros de Radio Emissao, the IARU member-society for Brazil, that April 18 be designated World Radio Amateurs Day. In 1984, Fred Johnson, ZL2AMJ, of the New Zealand Association of Radio Transmitters (NZART) started the ball moving towards actually celebrating and promoting this event. In an April 1984 *QST* editorial by Dave Sumner, K1ZZ, in which Fred is quoted with his NZART concept for World Amateur Radio Day: "This is not a contest, but an activity in which every radio amateur can take part and should be encouraged to do so. The idea is to recognize the founding of the International Amateur Radio Union on April 18, 1925 by doing something you have not done before, sometime between 1200 UTC on April 17 and 1200 on April 19 each year. These dates and times represent the start and finish of April 18 at the International Date Line, and are chosen to show the unification of all radio amateurs by observing the same period for this global activity." In 1994 the IARU Administrative Council established the third Saturday in September as World Amateur Radio Day, to begin the following year, with a theme for each observance to be determined by the Administrative Council. In 1997 it was agreed that the date would revert to April 18 beginning in 2000, the 75th anniversary of the founding of the IARU.

These are but examples of what is happening in the 21st Century Amateur Radio Service.

The IARU is the worldwide federation of national Amateur Radio organizations representing radio amateurs in 153 countries. It is a Sector Member of the International Telecommunication Union and is the recognized representative of the Amateur and Amateur-Satellite Services at the ITU.

Briefs

Radio Amateurs of Canada 2002 convention set: Radio Amateurs of Canada (RAC) will hold its second national convention July 26-28, 2002, in Vernon, British Columbia. The North Okanagan Radio Amateur Club of Vernon and the Orchard City Amateur Radio Club of Kelowna are hosts. For more information, visit the official RAC 2002 convention Web site, www.rac2002.org.

New Zealand simplifies amateur licensing: International Amateur Radio Union Region 3 Chairman Fred Johnson, ZL2AMJ, reports that New Zealand has streamlined the route to obtain an Amateur Radio license. New Zealand now offers just two license classes, Limited and General. The Novice and the Novice/Limited licenses no longer are issued, although holders may retain them and continue to operate; some also may be eligible for an almost-instant upgrade. The New Zealand Association of Radio Transmitters (NZART) administers the volunteer examination program there, and examinations are supervised by examiners from NZART branches. The examination paper has 60 multiple-choice questions drawn from a 600-question public domain question bank. Tests are computer-generated. Of the 600 questions, 70 are devoted to regulations, 20 to the frequency allocations and 10 to Q signals. "The remaining 500 are about electronics, radio communications and operating," Johnson said. Candidates get two hours to answer the 60 questions and must answer 40 questions correctly to pass. "A candidate with a successful examination result can apply for a Limited grade license for operation on all amateur bands above 30 MHz with full privileges," Johnson explained. The Morse code speed to qualify for the General-grade license has been lowered to 5 WPM. The General License provides access to all Amateur Radio bands with full privileges. A *Study Guide*—containing details on the new licensing arrangements plus a promotional slide-show describing Amateur Radio—has been developed to help candidates to prepare for the examination. The guide and full information on the New Zealand licensing system is available via the NZART Web site, www.nzart.org.nz/nzart. QST

A New Season for Public Service Honor Roll

Starting May 1, 2002, a new season for the Public Service Honor Roll (PSHR) begins! It has been eleven years since the qualification criteria were last revised. The idea behind updating the PSHR program was initiated largely by the comments and opinions of Amateur Radio operators who are active in all areas of public service communications.

Under the guidance of the ARRL Volunteer Resources Committee, a study was conducted and a survey was taken (see the March 2001 Public Service column, p 96). Many ideas and suggestions that covered everything from generalities to specifics about the program were received and incorporated into the thought and discussion process.

An ongoing challenge with PSHR is how to effectively balance the many different facets of Amateur Radio public service communications. It seemed that areas such as traffic handling, net operations, on-the-scene emergency response, public safety and support communications all needed to be covered. Leadership and management roles within Amateur Radio public service communications and the ARRL Field Organization also needed recognition. The assignment of point values was a delicate task, too. The resulting criteria attempt to present a balanced program without being too complicated. The 70 point threshold for monthly qualification has not changed.

What does it all Mean?

1. Participation in a public service net—1 point; maximum 40.

A public service net is one that is regularly scheduled and handles Amateur Radio formal messages. Here are examples of public service nets: Local and section nets that are affiliated with the National Traffic System (NTS); NTS region, NTS area, and independent nets that handle traffic; ARES, RACES, SKYWARN nets that meet on a regular basis; net sessions that are activated during emergencies and threats of potential emergencies; public service and safety nets; nets that are established for training radio amateurs in public service and emergency communications.

2. Handling formal messages (radiograms) via any mode—1 point for each message handled; maximum 40.

A "handled" message is defined as a message that is originated or sent or received or delivered. PSHR will follow the same method as Brass Pounders' League to count an individual operator's traffic total (also known as station activity report) to reach the figure for the new PSHR Category 2.

Here is a reference from the *Public Service Communications Manual* on how to count messages. [Section 2, NTS Chapter 10.2]

Originated—One point for each message from a third party for sending via your station. This "extra" credit is given for an off-the-air function because of the value of contact with the general public.

Sent—Every message sent over the air from your station to another amateur receives a point in this category. Thus, a message that is eligible for an Originated point as above receives another point when it is sent on the air.

Likewise, a message that is received on the air conveys a Sent point when it is relayed to another station. A message that you initiate yourself, while it gets no Originated point, gets a Sent point when cleared. All Sent points require on-the-air sending.

Received—A message received over the air gets a Received point, whether received for relaying (sending) or for delivery to the addressee. Any message received which is not eligible for a Delivery point (such as one addressed to yourself) is nevertheless eligible for a Received point.

Delivered—The act of delivery of a message to a third party receives a point in this category, in addition to a Received point. This is strictly an off-the-air function and must be coupled with receipt of the message at your station. Thus you can't get a Delivered point unless you first get a Received point.

3. Serving in an ARRL-sponsored volunteer position: ARRL Field Organization appointee or Section Manager, NTS Net Manager, TCC Director, TCC member, NTS official or appointee above the Section level—10 points for each position; maximum 30.

ARRL Field Organization appointees (in alphabetical order) include the following: Assistant Section Managers, District Emergency Coordinators, Emergency Coordinators, Local Government Liaisons, Net Managers, Official Bulletin Stations, Official Emergency Stations, Official Observers, Official Observer Coordinators, Official Relay Stations, Public Information Coordinators, Public Information Officers, Section Emergency Coordinators, Section Managers, Section Traffic Managers, State Government Liaisons, Technical Specialists.

The Section Manager is the ARRL-member elected League official in the section. NTS Net Managers would include the following nets: NTS Region and NTS Area. TCC (Transcontinental Corps) Director is in charge of organizing his/her TCC membership roster of operators that comprise the corps. TCC members are those operators that are assigned to relay traffic from one NTS area to another, conducting liaison with NTS nets to do so. NTS official or appointee above the Section level includes NTS Area Staff Chairs, NTS Area Digital Coordinators and NTS Digital Stations.

More information about the structure of the NTS and the positions and nets that are mentioned in this article may be found in the ARRL's *Public Service Communications Manual*. See *ARRLWeb* at **www.arrl.org/FandES/field/pscm/**

4. Participation in scheduled, short-term public service events such as walk-a-thons, bike-a-thons, parades, simulated emergency tests and related practice events. This includes off-the-air meetings and coordi-

EMCOMM 2002

The Third Annual "EMergency COMMunications EXPO"—EMCOMM 2002—will be held in Palo Cedro, California (near Redding) April 20-21. It is sponsored by the ARRL Sacramento Valley Section ARES in cooperation with the California Office of Emergency Service, the American Red Cross, the National Weather Services and other public safety agencies.

It will feature classes, workshops and seminars. Some of the topics will be "The History and Role of Volunteer Organizations in America," The WTC Disaster...a report by those "who were there," "Back to Basics," Traffic Handling Workshop, Incident Command System, ARES Leadership Seminar, American Red Cross course, "Introduction to Disaster Services," and a NWS SKYWARN WX Spotter class. A Special event station, W6E, will also be on the air.

For more information or to register, visit **www.emcomm2002.net/**.

Steve Ewald, WV1X ♦ Public Service Specialist

nation efforts with related emergency groups and served agencies—5 points per hour (or any portion thereof) of time spent in either coordinating and/or operating in the public service event; no limit.

This category recognizes the value of public safety communication events that Amateur Radio is often called to participate in. Simulated emergency tests, exercises, and drills are covered by this category. Points are gained by the amount of time that an Amateur Radio operator spends directly involved in operating the event. This also recognizes the value of off-the-air time it takes to meet with the organization or public service agency to plan and coordinate Amateur Radio involvement.

5. Participation in an unplanned emergency response when the Amateur Radio operator is on the scene. This also includes unplanned incident requests by public or served agencies for Amateur Radio participation—5 points per hour (or any portion thereof) of time spent directly involved in the emergency operation; no limit.

This category recognizes an Amateur Radio operator who is directly involved in an actual emergency operation. This includes the operator who is on the scene or out in the field, in the shelter, at the emergency operations center, at the hospital, or other served agency's headquarters or their temporary command center.

The second sentence of Category 5 invites the Amateur Radio operator who is an active participant in an unplanned incident—or in other words, an emergency operation— to take credit for his/her participation even though he/she is not physically at the emergency scene.

The intent behind Category 5 is to also include the Amateur Radio operators—like net controllers, net operation and other radio amateurs that support communications in unplanned incidents—that are not actually on the emergency scene or at the shelter, etc, but are spending time and efforts for supporting the same emergency communication efforts.

6. Providing and maintaining a) an automated digital system that handles ARRL radiogram-formatted messages; b) a Web page e-mail list server oriented toward Amateur Radio public service—10 points per item.

The portion, "a," is a carry-over from the previous PSHR criteria as this sub category recognizes the efforts it takes to provide and maintain an automated digital system (like a packet bulletin board or a PACTOR system) that handles ARRL radiogram-formatted messages.

The portion "b," is a new item. Since the last time PSHR criteria were revised, newer technologies like Web pages and e-mail list servers have become popular and effective ways to communicate news and information to the community of radio amateurs that are involved in emergency and public service communication operations and preparedness.

Starting May 1, 2002

If you qualify for PSHR during a given month, send your results to either your Section Traffic Manager or Section Manager.

Field Organization Reports

Compiled by Linda Mullally, KB1HSV

Public Service Honor Roll
January 2002

This listing is to recognize amateurs whose public service performance during the month indicated qualifies for 70 or more total points in the following 8 categories (as reported to their Section Managers). Please note the maximum points for each category:
1) Checking into a public service net, using any mode, 1 point each; maximum 60.
2) Performing as Net Control Station (NCS) for a public service net, using any mode, 3 points each; maximum 24.
3) Performing assigned liaison between public service nets, 3 points each; maximum 24.
4) Delivering a formal message to a third party, 1 point each; no limit.
5) Originating a formal message from a third party, 1 point each; no limit.
6) Serving as an ARRL field appointee or Section Manager, 10 points each appointment; maximum 30.
7) Participating in a communications network for a public service event, 10 points each event; no limit.
8) Providing and maintaining an automated digital system that handles ARRL radiogram-formatted messages; 30 points. Stations that qualify for PSHR 12 consecutive months, or 18 out of a 24-month period, will be awarded a certificate from HQ on written notification of qualifying months to the Public Service Branch at HQ.

1015
NM1K
372
K9JPS
353
AC4CS
279
W9RCW
271
W7TVA
269
N9VE
229
KK3F
226
WA9VND
216
WA5OUV
210
KB2VRO
209
K8GA
208
WB5ZED
204
W5ZX
200
KB2RTZ
199
K8PJ
198
N5IKN
197
W6DOB
196
N2LTC
193
AC5XK
W4ZJY
190
WB2GTG
189
KK1A
187
KA4FZI
186
N8IO
182
KW1U
179
W1GMF
177
W6IVV
175
WX8Y
173
AG4DL
K4IWW
171
W0WWR
170
N2RPI
W4EAT
169
K4RBR
KA2GJV
168
K6YR
167
KA2ZNZ
166
WN0Y
W5RDM
164
K4RLD
163
N1LKJ
162
W6QZ
K2UL
158
AA3SB
K5UPN
N2OPJ
N9KNJ
156
WB2UVB
155
NR2F
154
N5OUJ
N2AKZ
153
K5NHJ
K0IBS
152
K4SCL
WB2ZCM
151
WB2FGL
W0OYH
150
K2CSS
149
N2JBA
KC2DAA
148
W3YVQ
N2GJ
N2CCN
N2YJZ
K9FHI
N7YSS
147
WA5I
W3BBQ
WA4DO
146
AF4QZ
K0PY
KC4ZHF
145
AF4NS
143
N8BV
142
W8YS
W5GKH
KG4FXG
WD9FLJ
KE4JHJ
141
K2BCL
W2MTA
140
KF5A
KB2KLH
W0LAW
KD4GR
KE4PAP
WA4QXT
139
KF4WIJ
W7ZIW
KC5OZT
N9BDL
WA1FNM
138
WX4H
K2VX
KX0N
N2KPR
W4DGH
N0SU
136
WD9F
NC4ML
134
N5NAV
133
AA8SN
KA1GWE
132
KM5YL
N5JCG
131
WW8D
WA0TFC
130
K5MXQ
KB5TCH
W9CBE
KG4HDT
KC7SRL
129
N3RB
WD8DHC
KB8NDS
WB2LEZ
KC2EOT
NN2H
WI2G
W1PEX
K5IQZ
NZ1D
128
W7GB
KB0RUU
VE3EUI
WB2QIX
W9GB
N4TAB
K5VV
127
K8AE
KA4LRM
W9YCV
W1ALE
126
N2BVM
125
WB5NKD
KC8CON
K4BEH
124
AA2SV
N8JAT
123
K1FP
W4WXA
AD4XV
122
AA8PI
KB0DTI
KI4YV
121
WB4GGS
N2WDS
K5DPG
120
W7GHT
W7QM
N7DRP
119
N3WK
KE4WBI
N9TVT
118
K7GXZ
N3ZKP
N9MN
KA8WNO
WA8DHB
KA4UIV
W4AUN
N8DD
KF6OIF
K4WKT
KA2DBD
W2LC
K7GXZ
W4CKS
K3SS
W5PY
K5MC
KD1LE
117
AB4XK
KB2ETO
116
N3SW
KF4KSN
N8OD
KA4HHE
115
KJ2N
WD9HII
WA2YBM
114
K2PB
WA2YL
K9LGU
KV4AN
AC7DD
113
K8VFZ
KG2HA
112
K8KV
KG2D
AG9G
111
W2MTO
K2DBK
W3OKN
KA2BCE
KC2HUV
KG4OTL
110
WD0GUF
NB4K
KB5WY
109
KF4OPT
K2DN
W4VLL
108
KM5VA
KJ7SI
KC6NBI
WA2YOW
KB2JOJ
K2YS
107
WA1QAA
WA2GUP
106
N3WKE
N5SIG
KE4UOF
KG4CHW
105
WB7VYH
WA8SSI
WB0TAQ
104
W6JPH
AB2IZ
WB4BIK
KC2HUZ
WA4EIC
W4CC
103
KO4OL
102
WA7UVX
101
AF2K
KA2IWK
N2RTF
WA1JVV
100
W3CB
AA3GV
KC8HTP
K4YVX
99
K4JPG
98
N2WGF
97
WA2CUW
WB4PAM
W4NTI
KC7SGM
96
KC2ANN
KA2CQX
94
WA9JWL
WB2IJH
93
K8ZJU
N1IST
91
W8IVF
KA2YKN
KA0DBK
K4BG
90
KK5GY
W2CC
W3BL
W0FCL
88
N2AVY
87
KG9B
86
K6IUI
W2PII
WA4CSQ
85
K3CSX
KU6Z
N8PAM
WA2EDN
84
WB9GIU
W7DPW
WB4ZNB
NC1X
83
W9RSX
82
K4FQU
K1TSV
81
KB2YJD
80
KC3Y
KG4QIP
N4FNT
79
KE4DNO
KE2SX
WB4UHC
78
KA1VED
77
KJ5YY
76
KC6SKK
N8EXV
AA4YW
WA5KQU
75
WB9OFG
74
W8IM
N8NMA
W4CAC
W5XX
73
N0JL
W2GUT
71
WJ2F
N3WAV
W7EP
70
KE3FL
N2VQA
W7VSE

The following stations qualified for PSHR points during December, 2001, but were not previously recognized in this column: WB5ZED 248, K5VV 128 WA5KQU 98, W5XX 82, KJ5YY, AK6DV 71. Call sign correction: In December 2001, WD4GDB qualified for 115 points.

Section Traffic Manager Reports
January 2002

The following ARRL Section Traffic Managers reported: AK, AL, AR, AZ, CO, CT, ENY, EPA, EWA, GA, IA, ID, IL, IN, KS, KY, LA, MDC, MI, MN, MO, MS, NC, NFL, NH, NLI, NNJ, NNY, NTX, OH, OK, OR, ORG, SB, SFL, SC, SD, SNJ, STX, TN, VA, VT, WA, WCF, WI, WMA, WNY, WPA, WV, WWA, WY.

Section Emergency Coordinator Reports
January 2002

The following ARRL Section Emergency Coordinators reported: AK, AR, AZ, CT, EWA, IN, KS, KY, LA, NFL, NLI, MDC, MI, MN, MO, OH, SD, SFL, STX, SV, TN, WCF, WMA, WNY, WV.

Brass Pounders League
January 2002

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	35	2572	2506	66	5179
NM1K	913	249	1113	10	2285
W1GMF	0	475	1715	31	2221
N2LTC	0	976	977	28	1981
KF5A	9	800	808	0	1616
WX4H	0	502	618	4	1184
W0WWR	0	188	747	13	948
WB5ZED	20	459	342	20	841
WB2GTG	61	291	461	11	824
W1PEX	0	20	780	15	815
N5IKN	0	354	179	185	728
W9IHW	0	368	45	280	693
K9JPS	0	315	34	295	657
W4EAT	0	329	316	2	647
KA5KLU	0	249	305	22	576
K2BCL	3	270	238	38	549
K5UPN	19	287	229	1	536
KA2ZNZ	18	247	246	11	522
W6DOB	0	159	310	49	518
W9YPY	0	223	291	0	514
W3BBQ	13	242	245	10	510
WB2IJH	0	255	250	0	505
WA9VND	31	291	163	17	501

BPL for 100 or more originations plus deliveries: WB8SIW 167, K8LJG 103, K8PJ 105, W9RCW 218, N9VE 191, K9GU 188. K2BCL also qualified for BPL in Dec with 566 points.

YL NEWS

Many things have changed for women over the past 40 years, but one thing has not. Whether it's 1962 or 2002, women enjoy getting together with each other, especially when they have something in common. This August 2-4, YLs from across the United States and overseas will set their sights for Cleveland, Ohio to do just that at the 2002 YLRL Convention.

Why go to a convention when you could just as easily chat on HF, the telephone or via e-mail? After all, we're hams!

Cheryl Muhr, N0WBV, of Littleton, Colorado, went to her first YL convention in 1999 held on the Queen Mary in Long Beach, California. "I enjoy the forums and love hearing how everyone got into Amateur Radio. I also appreciate the fact that it is an international event and that there are many OMs supporting YLs in the hobby," she said. "It is also a place to meet the people I've talked to on the air and find new ways to interest women in ham radio." Cheryl is active in contests and is the 10th District Chairwoman for the YLRL.

YLRL International Conventions have been held every two to four years in various areas of the country and are hosted by a local YL club. The first Convention was held in Santa Monica, California in June of 1955 and was attended by over 75 YLs. Subsequent events were held in Illinois (1957), Ohio (1964—celebrating the 25th Anniversary of the YLRL and hosted by the Buckeye Belles), Massachusetts (1960), Colorado (1968), Nevada (1985), Hawaii (1989), Kansas (1993), California (1955 and 1999) and New York (1996). This year's event at the Clarion Hotel in Middleburg Heights, Ohio (a suburb of Cleveland) is being hosted by two well-known YL groups, the Buckeye Belles and Chix On Six, and Two YL clubs of Ohio.

One way to describe a YLRL Convention is to call it a "mini-Dayton Hamvention for YLs." This year the clubs have put together an impressive lineup of events, starting off Thursday night with a forum on the basics of kit building and some informal get-togethers. Friday there will be a special tour of the NASA Glenn Research Center given by one of YLs who works there (Nancy, KC4IYD), a lunch cruise and a visit to some local attractions (Rock and Roll Hall of Fame, Science Museum, USS Cod and Mather, etc). That evening several YLs who have been on recent DXpeditions will give a multimedia presentation and discuss their personal experiences. Saturday there will be a luncheon/meeting for YLs only (with special tours planned for the OMs) and throughout the day there will be a hospitality suite open with a TV/VCR for videos, a Special Event Station and other activities. In the evening there will be a banquet featuring ARRL Great Lakes Division Director George Race,

From the left: Lisa Zwack, WA2NFY; Betty Marsh, KL7FJW, and Ann Santos, WA1S, get together with one of the foreign YLs at the 1999 YLRL International Convention.

Cheryl, N0WBV (center, front), gets ready for the obligatory group photo and the 1999 YLRL International Convention on the *Queen Mary* in Long Beach, California.

At the YL luncheon at the 1999 YLRL International Convention the YLs admire one of the table decorations—a handmade cross-stitch planter commemorating the event.

Diane P. Ortiz, K2DO ♦ PO Box 296, Bellport, NY 11713 ♦ k2do@arrl.org

YLs enjoy one of the many forums at the 1999 YLRL International Convention.

WB8BGY, and keynote speaker ARRL Second Vice President Kay Craigie, WT3P. On Sunday, a special presentation and farewell brunch will mark the end of the convention.

Getting together with old friends and making new ones is the reason most YLs attend. Many women have been coming to these conventions for 10 years or more. Some attend similar types of events held around the world. For most, the YLRL International Convention is a unique opportunity to share experiences, learn about other cultures, find out what YL groups and nets are forming and what's going on in the YL community. Listening, learning, sharing and having fun are the priorities.

One special part of a YL convention is the exchange of small gifts as a token of friendship. I found out about this by accident at a convention I attended a few years ago hosted by CLARA, the Canadian Ladies Amateur Radio Association. YLs kept giving me all kinds of gifts—pens in holders with "YL" in needlepoint, homemade jellies, pins, an exotic fan from a Japanese YL, a beautifully decorated Ukrainian egg, a mini-jar of maple syrup, a keychain in the shape of Florida—all with either a QSL or "eyelash" card attached with the giver's name and call. I wondered what was going on. They explained that it's just another way the YLs wanted to say "33" to each other by exchanging something personal that was made by them or representative of their country or state.

With over 150 YLs expected at the YLRL International Convention, the Belles and Chix have been working hard and are looking forward to a very successful event. For Convention information and registration contact 2002 YLRL Convention Chairman Nancy Rabel Hall, KC4IYD, at **KC4IYD@arrl.net** or fill out the registration, at **www.qsl.net/ylrl/conventions.html**. They will also have convention information at the YLRL booth at the Dayton Hamvention. Don't miss the YLRL forum at the Hamvention—Friday, May 17 in the Hara Arena Room 3 from 1:45 to 2:45 PM.

Hope to CU there!—*33, Diane, K2DO*

What is the YLRL?

YLRL CONVENTION OHIO 2002 HOSTED BY THE BUCKEYE BELLES

Organized in 1939, YLRL (Young Ladies' Radio League) is a nonprofit organization of women Amateur Radio licensees. With a membership of approximately 1100, it is international in scope with about 200 of those members who are DX YLs.

The YLRL exists to encourage and assist YLs throughout the world to enter into the Amateur Radio Service. You are always welcome in any YLRL activity. Come on in—the YLs are anxious to meet you!

YLRL sponsors and otherwise carries out programs to promote YL interest, appreciation and understanding of radio communications and electronics. Through these programs, it encourages YLs to advance and improve their skills as Amateur Radio operators.

YLRL offers YLs the opportunity to host foreign YLs during their visits to the United States and to sponsor their participation in YLRL activities.

YL nets are fun. Among the larger nationwide nets are YL Open House, Wednesdays, 1900 UTC (1800 spring and summer) on 14.288 MHz; YL Tangle Net, Thursdays, 1800 UTC on 14.298 MHz; and YL Roses Net, Mondays, 1800 UTC on 28.433. Of course, these frequencies are approximate. Tune around the band and you will hear YLs chatting away. If you miss the call for your area, break in between transmissions and don't give up if you're not heard the first time. Nets provide the easiest way for you to meet other YLs and give you a chance to qualify for the various YL awards.

YLRL encourages Amateur Radio competition between YLs by offering certificates, trophies, etc, for demonstrated excellence in such operating competitions. All the dates and rules are published in *YL Harmonics*. Following is a list of our contests, giving the length of the contest and the months in which they are usually held:

YL/OM—24 hours—February
DX YL to North American YL—24 hours—April
Howdy Days—24 hours—September
YL Anniversary Party—24 hours—October

The YLRL offers a program of specialized service to blind YLs through the Tape Topics program. *YL Harmonics* is sent to visually impaired members upon request. For more information, contact the Tape Topic Librarians.—*from the YLRL Web site*

THE WORLD ABOVE 50 MHZ

Four Microwave Records in 2001

New North American distance records were set at 10, 47, 241 and 322 GHz during the past year, each of which marked extraordinary technical accomplishments. A previously overlooked 10-GHz rain-scatter record has also been included. As distances on the VHF bands for all but the tropospheric propagation modes approach their natural limits, it can be expected that most of the significant advances in the future will be made at UHF and higher.

The 1283-km QSO made this past September on 10 GHz between Clint Walker, W1LP/mm, and veteran microwaver Frank Kelly, WB6CWN, extended the reach of 10-GHz tropospheric ducting by more than 150 km. The ultimate limit to 10-GHz paths is quite unknown, but it could easily be several times that distance. Clint makes regular voyages along the Pacific Coast, so in the near future, it is possible that he could be on one end of further incremental 10-GHz distance records. Then again, a pair of stations could simply make the big jump between Hawaii and California most anytime. There is also still plenty of room for extending the overland 10-GHz record, currently at 1124 km, or for establishing an initial mark over the Gulf of Mexico, Caribbean or Atlantic.

Bill Seabreeze, W3IY, and Bernie Keiser, W4SW, completed a traditional mountaintop-to-mountaintop contact over a 174-km path on 47 GHz on a cool dry day in November. (Apologies to both for muddled names and calls in the original February announcement.) They used 20 to 30-mW transmitters, an achievement in itself at these frequencies. Future expectations for higher power and more-sensitive receivers may aid in extending this impressive 47-GHz record, especially in overcoming attenuation due to water vapor.

The 241-GHz and 322-GHz marks set by Brian Justin (WA1ZMS operating W2SZ/4) and Gordon Howell, WA4RTS, in December were more significant as accomplishments in equipment design and fabrication than as simple distance records, primarily because these were also the first contacts ever made at such high frequencies. As experimentation continues at these incredibly high frequencies, distances are certain to be extended many times.

Please send claims for distance records on any band directly to The World Above 50 MHz (w3ep@arrl.org) for posting on the ARRL World Above 50 MHz Web site and for annual publication in April *QST*. Thanks to Al Ward, W5LUA, for assistance in keeping track of records during the past few years. He would like to continue receiving news of distance records for publications of the North Texas Microwave Society, as would the editors of other VHF/UHF/microwave newsletters and magazines.

ON THE BANDS

Six-meters continued to provide fast-paced excitement through January. Six-meter operators reported several weak auroras and at least one sporadic-E opening (they were not going to miss much in January). Nonetheless, the Quadrantids attracted scant attention and an unexpectedly strong ducting event in the eastern half of the country went almost unnoticed.

Expectations for a general transatlantic opening on Sunday morning of the VHF contest (January 20) fizzled. Several stations in the Northeast worked a handful of the best equipped western Europeans. Only W1XX/1 (FN51), set up overlooking the Atlantic on Cape Cod, reported more than a dozen European grids. A two-hour transcontinental opening Sunday afternoon provided avid contesters in the Northeast and along the West Coast with as many as 100 additional 6-meter QSOs and two dozen or so added grid multipliers. Those in the Pacific Northwest also worked Japanese on both afternoons. During the contest weekend, propagation conditions on the higher bands throughout most of the country were at least normal for January.

The review of the month's activities are based on more than 200 individual e-mail, postal and telephone messages (including the extensive reports from WB2AMU, W5OZI, K7ICW, W7KNT, N0JK, N0LL and YV4DDK), a daily journal from G4UPS, the Web-based OH2AQ cluster and the UKSMG Announcement Page. As valuable as each report is, it is impossible to mention every contribution individually in the selective summaries that follow. Dates and times are all UTC.

This Month

April 1	Eastern Tennessee DX Association (ETDXA) 144-MHz Sprint
April 9	ETDXA 222-MHz Sprint
April 17	ETDXA 432-MHz Sprint
April 21	Very Good EME Conditions
April 20-21	European Worldwide EME Contest (144 MHz, 1.3, 10 GHz)
April 26-27	Southeastern VHF Society Conference (Oak Ridge, Tennessee)
April 26-28	SETI Technical Symposium (College of New Jersey, Trenton)

Six Meter DX

It seemed as though 6-meter DXers all across the US and Canada were fixated on transatlantic paths in January. Indeed, it had become nearly routine for Europeans to work stations all over the eastern half of the US, at least from Minnesota through Kansas and Oklahoma to Texas, and on several occasions even further. Many US stations in the center of the nation used the favorable conditions to add to their own country totals, even if only one totally new country was worked from the US. That was Russian station RU4CE, who called K1TOL on CW on January 22 at 1338 and then worked W1JJM on SSB a few minutes later.

Many others were glad just to have the chance at European contacts. The report from John Adams, W4PRZ (EM93), in South Carolina was typical of many received during the month. He completed 18 QSOs with ON, DL, PA, F, LA, OZ and G calls in a 45-minute period on the morning of January 17. Such experiences were repeated countless times across the country, as the band opened to Europe from somewhere in the US every day of the month. Others have been successful even with less than optimal stations. Paul MacPhee, KB1FLS (FN42), worked 28 European grids and 32 DXCC entities using a 100-foot wire loop hung from the rafters of his attic. An ICOM AH4, also placed in the attic, provides a good match for his IC 706-II. All of his QSOs have been on SSB. Paul says the loop loads up well on all bands down to 80 meters.

Operators scattered across the Great Plains, who have not been able to make it across the Atlantic every day like those on the East Coast, perhaps made the greatest strides in adding to their DXCC totals. One noticeable effect is that a number of stations west of the Mississippi have entered the ranks of the DXCC leaders. An informal tally as of January 31 (though incomplete) shows the growing geographic diversity of the DX leaders.

VE1YX (NB) and K1TOL (ME) have worked at least 160 entities, with K1SIX (NH), W1JJM (RI), K5CM (OK) and K2ZD (NJ) not far behind with at least 150 each. There is a growing crowd with at least 140 tallied, including W5OZI (TX), W5EU (TX), N5KW (OK), W3VZ (MD), K2MUB (NY), W4DR (VA), AE4RO (FL), K1HTV (MD), K1SG (MA) and W3EP (CT). A number of other prairie and western stations have at least 130, including N0LL (KS), K5AM (NM), K5SW (OK) and WD5K (TX).

Clearly, the Northeast does not have a monopoly on DX. Furthermore, the prospects for stations elsewhere may be even brighter in the coming months as F-layer propagation is likely to favor the southern third of the nation through the spring season. Several stations in the center of the county will probably move up among the DXCC leaders before Cycle 23 conditions decline.

Unusual Transatlantic Contacts

Of all the exciting openings that took place

Emil Pocock, W3EP ♦ Box 100, Lebanon, CT 06249 (Voice 860-642-4347, fax 860-594-0259) ♦ w3ep@arrl.org

Claimed North American Distance Records as of February 1, 2002

*Mode**	*Distance (km)*	*Stations (grid locators)*		*Date*
144 MHz				
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 (EM15dp)	VE1ALQ (FN65nh)	1999 Nov 8
Meteors	3154	K5UR (EM35wa)	KP4EKG (FK68vg)	1985 Dec 13
Sporadic E	3635	WA7GSK (DN13so)	W4FF (EL96am)	1998 May 29
TE	6328	KP4EOR (FK78aj)	LU5DJZ (GF11lu)	1978 Feb 12
Tropo (A)	2365	W1JSM (FN43nc)	VP5D (FL31ut)	1988 May 10
Tropo (C)	2714	WB4MJE (EL94hq)	VE1KG (FN84cm)	1994 Nov 5
Tropo (P)	4333	KH6HME (BK29go)	W7FI (CN87ws)	1995 Jul 1
222 MHz				
Aurora	2088	WB5LUA (EM13qc)	WC2K (FM29pt)	1989 Mar 13
Meteors	2102	W7XU/0 (EN13lm)	K1WHS (FN34mj)	1998 Aug 13
Sporadic E	2195	W6QIW (DM04ck)	W5UWB (EL17ax)	2000 Feb 14
TE	5905	KP4EOR (FK78aj)	LU7DJZ (GF05rj)	1983 Mar 9
Tropo (A)	1854	WA4LOX (EL87sk)	WP4O (FK68km)	1998 Feb 26
Tropo (C)	2167	W5UWB (EL17ax)	K2YAZ/8 (EN74ax)	1998 Oct 11
Tropo (P)	4142	KH6HME (BK29go)	XE2/N6XQ (DL29cx)	1989 Jul 15
432 MHz				
Aurora	1902	WB5LUA (EM13qc)	W3IP (FM19pd)	1986 Feb 8
Meteors	2040	N6RMJ (DM14cp)	W7XU/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 (EL09ru)	K0VXM (EL98pj)	1998 May 22
Tropo (P)	4061	KH6HME (BK29go)	N6XQ (DM12jr)	1994 Jul 13
1296 MHz				
Tropo (C)	2071	KD5RO (EM13pa)	WB3CZG (FN21ax)	1986 Nov 29
Tropo (P)	4142	KH6HME (BK29go)	XE2/N6XQ (DL29cx)	1989 Jul 15
2304 MHz				
Tropo (C)	1553	K5VH (EM00xe)	KB4DFO (EL89xc)	2000 Jan 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DM03tr)	1994 Jul 14
3456 MHz				
Tropo (C)	1352	WB5LUA (EM13qc)	WA0BWE (EN34lx)	1995 Jul 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DM03tr)	1991 Jul 28
5760 MHz				
Tropo (C)	1187	WB5LUA (EM13qc)	W9ZIH (EN51nv)	1994 Nov 12
Tropo (P)	3973	KH6HME (BK29go)	N6CA (DM03tr)	1991 Jul 29
10 GHz				
Rain Scatter	733	WB9SNR(EN62ac)	W2DRZ(FN02la)	1997 Aug 16
Tropo (C)	1124	XE2/N6XQ (DL27qo)	WB6CWN (CM96qi)	1994 Aug 25
Tropo (P)	1283	W1LP/mm (DL34ja)	WB6CWN (DM04ig)	2001 Sept 20
24 GHz				
Tropo (C)	375	K6GZA/6 (CM97hm)	AD6FP/6 (DM04ms)	2000 Sept 16
47 GHz				
Tropo (C)	174	W3IY/3 (FN10ff)	W4SW/4 (FM08us)	2001 Nov 14
75 GHz				
Tropo (C)	145	W0EOM/6 (CM88wj)	KF6KVG/6 (CM97bc)	2001 Feb 1
120 GHz				
Tropo (C)	11.7	KF6KVG/6 (CM87uk)	W0EOM/6 (CM87wj)	1999 Oct 19
142 GHz				
Tropo (C)	61.6	W2SZ/4 (FM07fm)	WA4RTS/4 (FM08ib)	2001 Jan 1
241 GHz	1.1	W2SZ/4 (FM07ji)	WA4RTS/4 (FM07ji)	2001 Dec 15
Micrometer Radio†				
322 GHz	0.05	W2SZ/4 (FM07ji)	WA4RTS/4 (FM07ji)	2001 Dec 15
Light†				
678 THz	248	WA7LYI/7 (DM34tf)	KY7B/7 (DM42ok)	1991 Jun 8

†*Frequency bands* include **Micrometer Radio** (300 to 3000 GHz) and **Light** (3 to 30,000 THz), which are outside the regulated radio frequency spectrum.

*Propagation modes are tropospheric scatter, refraction and ducting (including line-of-sight paths), divided into in three categories: **Tropo (A)**, tropospheric modes across the Atlantic, Caribbean, and Gulf of Mexico; **Tropo (C)**, tropospheric modes across continental North America; **Tropo (P)**, tropospheric modes across the Pacific; **Aurora**, auroral back scatter; **Auroral E**; **Sporadic E**; **FAI**, E-layer field-aligned irregularities; **IFS**, ionospheric forward scatter; **Meteors**, meteor scatter; **TE**, transequatorial F-layer field-aligned irregularities; and **Rain scatter**, precipitation scatter. Distances are based on the centers of six-place grid locators, as calculated by *BD*, the W9IP bearing and distance program. Short-distance calculations at 120 GHz and higher may use other more precise methods. North American distance records must include at least one station located on land in North America or on an island rising from the continental shelf.

during the month, those of January 2 through 8 were probably the most unusual. Late-afternoon contacts on these days took place over exceptionally long northerly paths, many of which crossed the auroral zone or exhibited other unusual characteristics such as strong auroral backscatter components. Stations throughout the Pacific Northwest contacted LA, SM, OH and ES stations on several afternoons, while JW5RIA, JX7DFA and OX stations worked over a wide area of the US.

On January 2 after 1830, alert 6-meter operators in the Northeast found CT, EH, F, I and 9H stations on the band. This was unusually late in the day for such contacts. Then around 2045, stations in the Pacific Northwest suddenly discovered Scandinavians. W7KNT (MT) logged ES1AJ along with a page full of LA, SM and OH calls; VE7SL and W7KQU (OR) worked OH and SM, while NN7J (OR) nabbed OH. Colorado stations N0VSB, K0JY and K0EU all worked SM, but most astonishingly, Californian N6JV (CM98) worked OH7PI, and K7RR (CM95) nabbed SM3JLA by the time the excitement quieted down by 2200.

The next day transatlantic paths again opened just prior to 1900, as CT, EH and F stations along with ZB2EO and CN8LI worked all along the East Coast and later into the Midwest. VE5UF reported OX, SM, GW and EH about the same time, but there was no repeat of the contacts into the Pacific Northwest.

W2DRZ (NY) reported strong signals from OX, JW, LA, OH, ES, SP and UR late in the afternoon of January 4, at least as late as 2000. Beginning around 1745, OX3FV and OX3HI worked over a wide area of the Midwest as far as N0VSB (CO), W7KNT (MT) and VA6DX. JW5RIA covered nearly as wide an area, and JX7DFA was also spotted in the Midwest. LA5QFA was into MN, IL, MO, KS and CO after 1900. EH8BPX delighted a large contingent of eager VE7 and W7 stations in WA, OR, ID and MT. After 2030, KL7s saturated the East Coast and Midwest.

Nothing like this was reported on January 5, but on the 6th, stations throughout the Northeast worked OX3SA, OX3DB, OX3OX and OX3HI beginning around 1700—all very loud. Some W1-area stations reported SM and JW with auroral-sounding signals. After 1920 propagation shifted westward. Then the same Northeastern stations worked as many as a dozen different Alaskans, all booming in like the Greenlanders. VE7DXG spotted OH7PI at 2100, but no other extraordinary contacts were reported.

Conditions on January 7 were perhaps the most unusual of this series. After 1645, N1RZ (ME) and others in the Northeast began hearing OH1XT, SM3JGG and other LA, SM and OH stations with auroral-like signals. K1SIX worked ES1CW at 1750, and OY9JD also worked widely throughout the Northeast also with an auroral-like tone. Conditions at W3EP (CT) were quite strange between 1700 and 1810. I could hear several weak auroral LA, SM and OH stations while pointed around 30° or 40° (slightly north of the direct path) along with the auroral signals of N1RZ, K1SIX and K1TOL to the north of me. I worked in succession OY9JD, W1IPL/7 (WY), OZ4VV and KM0T (IA) all with strong auroral buzz and all while pointing northeast. When I tried turning the beam westward to see if W1IPL/7 would peak in that direction, his signal dropped into the noise.

The conditions during early January were

odd, especially as the K index was generally low throughout the period and there were no indicators of disturbed geomagnetic conditions. Normal F-layer paths can certainly account for all of the contacts up to January 7. The slight auroral note or flutter some of the stations in the Pacific Northwest reported seemed similar to descriptions of transpolar contacts on the HF bands.

The opening on January 7 was a different matter. The contacts that day might most easily be explained as one or two ordinary F-layer hops scattered back from the normal auroral zone. Signals from the Scandinavian stations probably scattered directly from the aurora on their northern horizon into a favorable F-layer region to their west. Signals from US stations, including those from Wyoming and Iowa made one or two ordinary F-layer hops to reach the auroral zone, where signals were scattered directly across Scandinavia and also back toward North America via the F-layer.

Finally, former-black-hole contact of the month goes to W1IPL/7 (WY) who worked S58J on January 26 via normal F-layer propagation. You can be sure there was celebration in Slovenia and Wyoming! This was no fluke contact. K0GU (CO) logged a page full of OX, GM, GI, PA, DL, OE, SM, S5, 9A and YU contacts on the same day and reported that other Colorado stations were in on the action. Oh yes, S58J also nabbed W0BJ (NE), W7CI (AZ) and many others west of the Big Muddy.

Caribbean and South America

Activity from the Caribbean, Central America and parts of South America remained at high levels. Nearly every area of the US and adjacent Canada had multiple opportunities to make contacts into this area of the world, often with exceedingly loud signals. Jon Jones, N0JK (EM17), for example, logged FM5AD, HR1RMG, J79UF (VE5UF operating), P43JB, P49MR (VE3MR operating), TI5KD/7 and TG9NX among many others from his modest Kansas station. Also active in January and not previously noted were 8P9AY, C6AGN, FM5WD, HP2CWB, J28EX, NP3S, PJ2BR, PZ5RA, VP2VI, VP5VAC and VP5JM.

Many of these same stations had excellent conditions into Europe as well. John Walker, WZ8D, put C6AIE into the logs of more than 400 European stations as far east as SP, OH, ES, LY, YL, Z3 and LZ—the latter two likely Bahamian firsts on 6 meters. John also worked NL7Z, probably the first Alaska-Bahamas contact on the band.

Julio Medina, WP4LNY, reports that he, WP4N, WP4U and WP4KJJ also completed contacts with NL7Z on January 4 between 2350 and 2358, probably the first ever 6-meter QSOs between Alaska and Puerto Rico. This was the 50th state for WP4LNY, who thus may be able to claim the first 6-meter WAS from the island commonwealth. HP2CWB worked KL7NO about the same time. Congratulations to all.

Transcontinental and Across the Pacific

Afternoon openings from coast-to-coast and from Alaska to the lower 48 states were common but not so numerous as during December. Opportunities to work Japan, primarily from the western half of the US and Canada, were evident on at least a half-dozen days. Several new Pacific-area stations joined V73AT and several Hawaiians in making contacts across the US, but the best propagation across the Pacific will probably take place from March through May.

JA1VOK reported that JH6VXP worked ZF1DC at 0022 on January 1, and K2RTH/4 logged 19 JAs during the same opening, but Japanese operators heard nothing east of the Appalachians during the month. Several stations felt fortunate to work HL1LTC near the end of the opening to Japan on January 2-3, including W7KQU (OR), W7KNT (MT) and N7IJ (ID). W5OZI also made it with the Korean station around 0045 on January 24 for a new country.

On January 7 and 11, KH2K /AH0 and KH0/JK7TKE (both in the Marianas) worked Minnesotans W0BV, W0XV and K0SQ. NH6FP/KH4 (Midway) worked K4RX (FL) on the 10th and N0JK (KS) on the 12th. Despite the apparently favorable conditions, there were few other reports of activity from the Pacific.

K6LMN Escapes from a Black Hole

There is more than one way to work your first European countries, even if you do think you live in a black hole. Roger Wagner (K6LMN) had been frustrated by the lack of European DX from his home in Los Angeles (DM04). He decided to take an IC-706 II and a mag-mount vertical on his short vacation to sunny south Florida to find out how the East Coast operators really do it. On his first morning, Roger hooked up the rig and attached the antenna to his rental car while still in the motel parking lot. "Whammo!" Roger wrote, "There were Europeans from 50.090 to 50.250 MHz some as loud as 59-plus. "Was I dreaming?"

Apparently not. From the motel parking lot, he ran G, LA, ON, PA, OZ and other calls on SSB before his wife insisted they get rolling. The next morning was more of the same from the motel lot, despite noise from adjacent high-voltage transmission lines. Into the log went SM, OK, DL, SP, GM and others. Although the VHF contest was rather slow from the Florida keys, Roger did add UR5TW to newly acquired list of European countries after the contest weekend.

KG0VL Revels in the Subarctic

Sane people and most 6-meter operators would probably agree that northern Manitoba in the dead of winter is a bleak place akin to a black hole, but that is where Jeff Leer, (KG0VL) set up 50 and 144-MHz stations and companion beacons for three weeks of auroral studies. He had little intention of working Europeans via direct F-layer propagation, but Jeff could not help giving out grid EO36 to several dozen GM, GI, GW and F stations he found on the band.

Jeff also heard K1MUB, K1SIX, K3KYR, W3EP, N1RZ and others on many mornings calling CQ Europe with strong auroral distortion. Despite repeated attempts, none of these stations ever came back to him! Something similar happened in the afternoons while pointed west. He heard N0VSB in Colorado calling CQ Japan with strong auroral distortion for example, but Jeff could not get his attention.

Despite these highly unusual observations, Jeff thought the biggest event of his trip was the nightly reception of 49.750 MHz television video from Siberia via aurora or auroral E, usually lasting from 0230 to 0600 or later. In the same time frame, Jeff was able to chat with Alaskans with strong aurora and auroral-E signals on 50 MHz and on at least one occasion with VE8WD/m.

Everything Else

What a surprise it was to learn that while nearly all the DX attention has been focused on 6 meters in January, WP4LNY made nearly nightly 2-meter QSOs with CX9AF, PY3SOL, LU5JT, LW9EVS, CX9DH, PY3DU and others on 144.3 MHz, mostly between 2300 and 0200. These astonishing 4000 to 5000 km contacts must almost certainly be via F-layer transequatorial field-aligned irregularities (TE), although past experience has suggested the optimal seasons are around the spring and fall equinoxes not in the dead of winter.

Arliss Thomson, W7XU/0 in South Dakota, provided the only report of activity during the short-lived daylight Quadrantid meteor shower on January 3. Arliss completed 2-meter contacts with WA7GSK and KR8L in Idaho and W7NBH in Washington using the digital WSJT mode and with K5QE in Texas via SSB. He also completed a 222-MHz SSB contact with KB5GY in New Mexico for a new state.

Dan Pruski, KA3SDP (FN00), caught an unusual midwinter tropospheric duct from his western Pennsylvania location during the warm spell of January 27. That morning he hooked up with KB5HFM (EL59) on the Gulf Coast on 144, 222 and 432-MHz SSB. Signals were strong for more than two hours. Dan failed to get the attention of W5VAS (EM40) on 144 and 432 MHz but did connect with W4HP (EM75) on 432 MHz.

VHF/UHF/MICROWAVE NEWS

European Worldwide EME Contest

REF (the French Amateur Radio association) and *DUBUS* sponsor the 2002 European Worldwide EME Contest over two weekends in March and April. The 432-MHz and 2.3 to 5.7-GHz event takes place over the 48 hours of March 23-24. The second weekend April 20-21 features 144 MHz, 1.3 GHz and 10 GHz. Review the complete rules and previous year's results at **www.marsport.demon.co.uk/eme.htm**.

East Tennessee DX Association VHF/UHF Sprints

The ETDXA sponsors a series of VHF-UHF sprints on various evenings throughout April. See the April/May, VHF Spring Sprints section of Contest Corral in this issue for details.

Southeastern VHF Society Conference

The Sixth Annual Conference of the SEVHFS takes place over the weekend of April 26-27 at the Garden Plaza Hotel, Oak Ridge, Tennessee. It features the usual array of technical presentations, antenna-gain and preamplifier-noise-figure measurements, flea-market awards and banquet speakers. For detailed information, check the society's Web site at **www.svhfs.org**.

MORE FEEDBACK

Just to set the records straight W7KNT worked OH1XT on January 11 (not OX1HT as listed in Table 2 of last month's column). UK9AA is in Uzbekistan, of course, not Kazakhstan as suggested near the end of page 96 in February's column.

QRP Power Vintage QRP

This column is dedicated to all those QRPers who have accepted the challenge to build and operate vintage tube-type QRP gear.

Homebrew Vintage QRP

Building a vintage QRP station from scratch is not all that difficult. At first blush it would seem that parts for a vacuum tube station would be next to impossible to find. Not so. Antique Wireless Supply[1] is an outstanding source of tubes, transformers, high voltage capacitors, and many of the components needed to build a vintage rig. Old—*really old*—tubes can be obtained from Vacuum Tubes, Inc.[2]

Simple circuitry is the order of the day. A one-tube oscillator is all that is needed, in most cases, to qualify as a QRP transmitter. A 3A5 tube connected as a Pierce oscillator using 120-130 V dc on the plates will put out around 3 W. Couple this to an antenna and you are on the air with vintage QRP. Construction techniques can vary from fancy breadboards to aluminum/steel chassis.

Where do you find these old circuits? Simple tube-type transmitter and receiver circuits abound in old ARRL publications. The 1954 edition of *How to Become a Radio Amateur,* has a nice little beginner's station featuring a single tube regenerative receive, and matching one tube transmitter, with an RF output of 3 W. Editions of the *ARRL Handbook* from the '40s through the '60s all have simple transmitter and receiver projects. Let's not forget the *QST* CD collection available from the ARRL. Many great articles on vacuum tube gear and construction techniques have appeared between the covers of *QST* since 1915.

Vintage QRP Show & Tell

What follows is a photo gallery showcasing some of the vintage QRP rigs. All these rigs work and are in regular use by their owner/builders. Keep in mind that, for the most part, these rigs are homebrew. The folks who submitted these photos are to be commended for their dedication to the craft and their outstanding workmanship.

Figure 1—Vintage shack from W3KC.

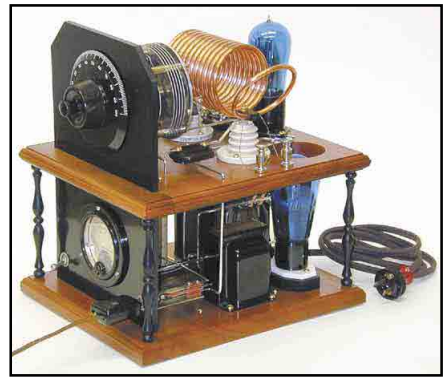


Figure 2—W9QZ two-tube Hartley with Arcuturus tubes.

Charles Kadesch, W3KC, who lives in Kensington, Maryland, has a great-looking vintage QRP shack (Figure 1). Left to right: Hammarlund HQ-129X receiver, National NC-101X receiver (the ham-bands only version of the National HRO), and finally a Meissner Signal Shifter EX (a 6V6 driving an 807) with an output of 5 W. Take special note of the Johnson mini-matchbox, the Vibroplex "bug" and the high impedance headphones. This is vintage QRP in *style*!

Rick Weber, W9QZ, who lives in Indianapolis, Indiana, is a true artisan and craftsman. Describing his homebrew vintage QRP creations in two words: Unbelievably beautiful. Space does not permit including photos of his 1929 Hartley oscillator using a '45 tube for 3 W output or his 1929 regenerative receiver (from an old *ARRL Handbook*) using almost all original electronic parts from the 1929 era. Figure 2 shows an absolutely gorgeous Hartley transmitter using two blue Archturus tubes from the 1920s. Finally, for those Doubting Thomases out there, Rick decided to build a "Junk Yard Wars" version of a one-tube Hartley transmitter. The only manufactured part on this transmitter is the vacuum tube. *Everything* else is homebrew: the caps are from sections of a soda can, flattened with a dielectric material between the "plates," the tank coil is made from copper tubing, the "tuning cap" is made from a piece of copper pipe as the stator, and a movable (slideable) rotor is comprised of a cinnamon tin. *Yes*, it works! See Figure 3.

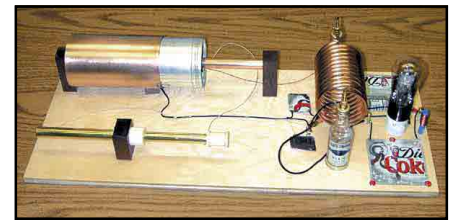


Figure 3—Junkyard Wars Hartley.

Figure 4—Tube version of Tuna Tin II by WD8DAS.

In an attempt to go "back to the past," Steve Johnston, WD8DAS, from Boise, Idaho, "retros" the W1FB Tuna Tin II transmitter (Figure 4). Steve built this two-tube version using a 6C4 as an oscillator and a 5763 as a PA. The rig will work on 80/40/20 meters with a maximum output of 8 W! Note the venerable J-37 key. What a combination!

I sincerely hope that this column will stimulate some of you to embark upon building a vintage QRP station. I still have a stack of digital pictures of homebrew vintage rigs, so we'll definitely be back to this topic in the future. QST

[1]Antique Wireless Supply, 6221 S Maple Ave, Tempe, AZ 85283, tel 480-820-5411; fax 480-820-4643; www.tubesandmore.com.

[2]Vacuum Tubes, Inc, 3246 Floridale Ln, Cincinnati, OH 45239-3855, voice/fax 513-738-8823; www.vacuumtubesinc.com.

Rich Arland, K7SZ ♦ 25 Amherst Ave, Wilkes Barre, PA 18702 ♦ k7sz@arrl.org

DXpeditions and Manners

Over the past few months the behavior in the pileups has really gotten out of hand. I am not the only one who has noticed this outbreak of rude behavior over the air. I have spoken with several other DX editors here in the US and they too have noticed. As I have said before, every once in a while as the DX editors, we have to get the soapbox out and it seems time to do it again. I know that we cannot fix all of the problems; however, if each of us here in the US does our part two things will happen. It will be easier to work the DX faster and the rest of the world will see the difference. Currently the JAs are the most disciplined group of DXers on the planet. Some of that is their culture. Wouldn't it be great to be the model DX country? I challenge each of you to help make that dream a reality so that other countries will look to the US as the leading DXers. To our readers outside of the US, I challenge each of you to do the same for your countrymen.

The following e-mail is just one of many I recently received from our readers. "Hello, Bernie, I wasn't sure which department to send my comments to, and I'm sure you've heard this many many times before, so here it goes again. This weekend while trying to work VP8 (South Sandwich Island) it was impossible because of all the QRM. It's amazing how many radio police we have, but not once did I hear the police ID either. If just one of these people could figure out that if they would keep quiet it would mean at least one less voice would be heard, and if they all figured it out there would be a lot less interference on the frequency.

"It's still beyond me why any one would want to interfere with some of us wanting to work a new country. Is it that they already have it and they don't want any one else to have it? Or could it be that they don't have the patience or mental capacity to work them and they figure if they can't have them no one will? Personally, I think some folks are just jerks and will go to any length to prove it.

"It's a shame that someone would go to the trouble to earn their license and then go to the expense of setting up a station just so they could hinder someone else enjoying theirs.

"I've heard this mess on all the DXpeditions for the 10 years I've been a ham, so the argument that it's a result of the license restructuring and the 'No Code Extras' (No such thing) is nonsense. There are as many bad operators among the "Old Timers" (there is such a thing) as there are among the newcomers."

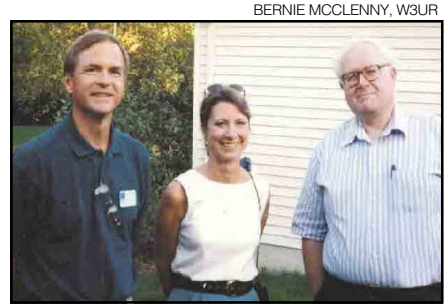
Back To Basics

It's not only the newer operators who have been guilty. Nor is it happening on 20 meters or just on SSB. I know some of the old timers are saying "This isn't for me" or "I won't read this month's column." I would ask each of you to continue reading, as some of you need a reminder while the others who are not guilty need to help out. Also I would ask each club, whether DX, Contest or otherwise, to go over the basics of working DX with their membership. Also club newsletter editors: please go over these basics.

You've probably heard this a million times but the number one thing is to **LISTEN, LISTEN, LISTEN!** It's impossible to communicate if you do not listen. This is the most important thing you can do. If you can't hear the DX station by all means you should not be calling him! When the DX station calls for "Three Quebec" no one else should be calling except "Three Quebec." I am amazed at the number of people who continuously call no matter what the DX station says. This is happening on CW, RTTY and SSB. This is rude and unacceptable behavior. Whether you run QRP or the full legal limit you should not call unless the DX station says your complete call or partial call. If it's a partial call it should be very close, if not exact. More than one letter or number off more than likely is someone else!

What should be done with those who call out of turn? Never ever confront the person on the air. It is not the place and can only escalate the problem. If the person is a club member talk about it at the next club meeting or hamfest. You can call them on the phone or write them an e-mail or letter. Just don't do it on the air. Don't be afraid to face this issue. If we let this type of behavior continue the situation is only going to get worse. We must not tolerate this as normal.

BERNIE MCCLENNY, W3UR



That's Charlanne Tippett in between veteran DXers Bill Tippett, W4ZV (left), and Fred Laun, K3ZO. These guys are role models on the air!

Split

Many DXpeditions operate split frequency. The DX transmits on one frequency (i.e. 14195) and listens on another frequency, sometimes a range (i.e., 14200-14210). Before you start to call the station **LISTEN** for a minute or two. Find out the key things you need to know in order to work the DX station as fast as possible. You need to know the DX station's call sign. Don't depend on the packet spot! You need to know where they are listening and who is the DX station working. Never, under any circumstance, talk on the DX station's transmit frequency. Why? Because you could potentially interrupt someone else's QSO! What do you do when someone calls, talks or acts like a policeman on top of the DX station? Right—you do nothing! Don't tell that person anything. You will only make the situation worse. The person calling or talking on the wrong VFO will eventually figure it out or stop. No matter how great the temptation is, do not transmit on the DX frequency. Don't get involved on the air.

Call Areas

Occasionally DX stations will work by call areas. Sometimes by numbers, continent or other areas. It's the DX station's responsibility to figure out how he is going to do this, if he thinks it is necessary. He's the boss—follow his rules. When the DX station says "QRZ number 4" only stations who have a 4 in their call sign should be calling. Don't sign portable 4 unless you are really portable. There are a few out there who have moved all across the country in just a few minutes. Stay in your call areas.

Packet Spots

PacketCluster is a nice tool for the DXer, if used correctly. But remember if you can find the DX before it's spotted on the cluster you'll be able to work the DX a lot faster. Just because someone spotted a call on a frequency it does not mean that is the call sign. You need to confirm that that is the call sign. And that does not mean work the station and give him a report and then ask,

Bernie McClenny, W3UR ♦ 3025 Hobbs Rd, Glenwood, MD 21738-9728 ♦ w3ur@arrl.org

"What is your call sign?" If you don't know his call sign you shouldn't be calling the DX station! Oh and don't ask on the frequency, "What is his call?" This is unacceptable behavior. Real DXers know who they are working.

DXers' Golden Rule

Everyone has heard of the Golden Rule. No, not the one that says "He who has the gold rules!" The Golden Rule is "Do unto others as you would have them do unto you." The DXer's Golden Rule is "Do unto DXers as you would have them do unto you." Or in other words DXers need to treat other DXers only in ways that DXers are willing to be treated in the same exact situation.

DX Ragchewing

I recently received an e-mail from one of our readers asking, "How and where can the person who likes DX find the opportunity to actually talk to DX stations, get to know the operators as people, learn about their countries, etc? While a pileup certainly generates those competitive juices, it sure is not an environment to encourage an extensive exchange of information. While the obvious answer is to go to those DX countries and visit the ops in person, this is certainly not in the realm of affordability for most of us. So, what suggestions would you have for those of us who not only want to bag the rare ones but establish more lasting relationships with our fellow hams across the world?"

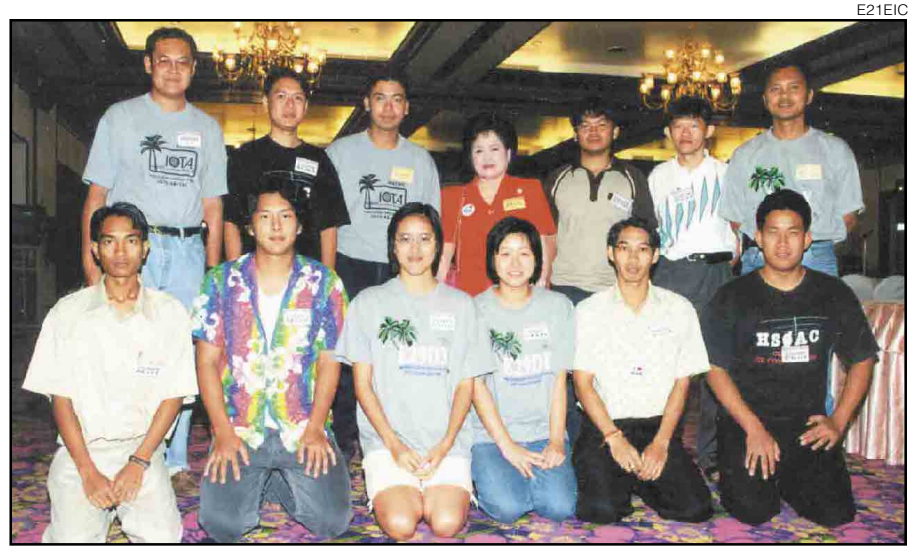
Obviously during a DXpedition or large pileup on a rare DX station it wouldn't be prudent to do this. Probably the best way is to call for a certain area of the world, when you know conditions favor that area. From here in the mid-Atlantic area I enjoy working Asia and the Middle East, as they are far away and somewhat rare. Once you've established the right time and what area you are looking for, find a clear frequency. Try calling CQ DX Asia somewhere away from the main DX calling frequencies (i.e., 14195, 21295, etc.). Typically DX stations that answer CQs don't want big pileups or to have a ragchew. Once you've gotten a unique station to call you give them the basics and ask if they have some time for a ragchew. From there you are on your own, but respect their time available. This can be a very enjoyable DX experience!

DX NEWS FROM AROUND THE GLOBE

9Q—Democratic Republic of Congo

Patrick, F6BLQ/9Q1A, says to look for some contest activity during the CQ WPX SSB Contest at the end of March. More than likely it will be the ARAC club station 9Q0AR. For the record the Democratic Republic of Congo was Zaire until 1997. This should not be confused with Congo (TN).

E21EIC



Here are some of the movers and shakers of the Thailand DX Association (HSDXA), formerly known as Thailand Group 1996. Standing (l-r) Cy, HS0GBI; Kai, E20JTW; Champ, E21EIC; Mayuree, HS1YL; Son, HS6NDK; Paul, E20GJW and Winit, HS1CKC. Sitting (l-r) Not, E20RRW; Mon, E20MFO; Gorn, E20REX; Jib, HS2ZIU; Yod, HS0XNO and Phot, E20GMY. Check out their Web page at www.qsl.net/tg1996.

C5—The Gambia

Jan, PA9JJ, reports he will be staying in the Senagambia Hotel in Kololi, The Gambia from April 15-29. He has requested the call C56JJ and will concentrate on 40 and 80 meters, mostly SSB, but will also operate on other bands and some CW. There will be no RTTY or Topband activity. He will be using an FT-100 with 100 watts and a multi-band dipole. Logs will be available on his Web page after the operation at www.qsl.net/pa9jj/. QSL via PA9JJ with green stamp.

EP—Iran

Stig, LA7JO, has been operating from the EP3PTT club station December 2001 to February 2002 and has now obtained his own call sign, EP3UN. He's expected to be here until late June 2002. Stig plans to operate on as many bands as possible with his new call sign. QSL via LA7JO.

International DX Convention 2002

The 53rd annual International DX Convention will be held in Visalia, California, April 26-28, 2002. This year the Southern California DX Club will be the host. This DX gathering is the largest DX gathering in the world in a remote central California city. For complete details check out their Web site at www.qsl.net/visalia2002/. Becky, N3OSH, and I look forward to seeing everyone who attends.

VK9—Mellish Reef

The multi-national DXpedition to Mellish Reef is expected to take place April 12-22, 2002. They will have five stations operating on all bands from 6 to 160 meters (including 30, 17 and 12) on CW, SSB and some RTTY. 6 meters has a dedicated station and operator. The international team of operators include G4EDG, JH7OHF, JJ1LIB, JP1TRJ, K3NA, VK4DH, VK4GL, VK4WR, VK4APG and ZL4PO. The group would like to acknowledge Yaesu, The Chiltern DX Club, 5 Star DXers Association, BT Exact Technologies and PCA.AA in helping activate Mellish Reef. Visit the VK9ML Web site at www.qsl.net/vk9ml/2002/.

ZS—South Africa

The Midlands Amateur Radio Club will be operating another in the series of special event stations during the weekend of the 3-5 May 2002 to commemorate the roles played by the British, Boers and brave Zulus during the Anglo Boer SA War of 1899-1902. Two separate stations will be operating (mainly on phone) as ZS100ABW from Lancaster Hill, Vryheid in KwaZulu Natal, South Africa from approximately 1600Z on Friday and closing down early on Sunday morning when a Remembrance service will be held in recognition of those who lost their lives in the Battle of Holkrans. The preferred bands will be 40 and 20 meters with 80 meters during the evenings depending on prevailing conditions. All contacts will be acknowledged with our attractive QSL card. Please QSL either via the Bureau or to Midlands Amateur Radio Club, PO Box 100220, Scottsville, 3209, South Africa direct. They shall also be operating a final station from Spioenkop—scene of one of the bloodiest battles fought to relieve Ladysmith—on May 31. Any queries can be directed to Willie Axford, ZS5WI, by email to zs5wi@iafrica.com or by telephone to 035-4744667. Alternatively, you can write to either Errol Wilson or the Chairman at the above address. For more information of an historical nature, e-mail Sean Friend at seanfriend@dorea.co.za.

WRAP UP

This concludes this month's column. Once again I would ask each of you to do your part to follow the basics in the pileups, encourage others to do the same and teach the new DXers. If we don't the current trend will become the norm or get worse! Thanks this month go to F6BLQ/9Q1A, PA9JJ, Southern California DX Club, VK4APG, ZS5WI. Don't forget to send any pictures, DX news or newsletters to your editor. Will I see you at Visalia? Until next month, see you in the pileups!—*Bernie, W3UR* QST

COMING CONVENTIONS

NORTH CAROLINA STATE CONVENTION

April 14, Raleigh

The North Carolina State Convention (RARSFest 2002), sponsored by the Raleigh ARS, will be held at the North Carolina State Fairgrounds Jim Graham Building, 1025 Blue Ridge Blvd; I-440, Hillsborough St Exit, go W. Doors are open 8 AM to 4 PM. Features include huge electronics flea market, dealer booths (Chuck Littlewood, K4HF, 919-872-6555, **k4hf@arrl.net**), vendors, forums (ARRL, PSK-31, MARS, ARES/NTS, QRP, FCC with Riley Hollingsworth), VE sessions (walk-in registration 10 AM, meeting room No 2, must show picture ID to register; Charlie Brown, W4VFJ, 919-556-8551, **w4vfj@aol.com**), hospitality supper (Saturday eve, 7-8 PM, in large meeting room inside hamfest building), QSL card checking, contests (homebrew, QLF, QBH), Wouff Hong ceremony, RV parking ($15 per night), free parking. Talk-in on 146.64. Admission is $5 in advance, $6 at the door, under 13 free. Tables are $14 each in advance (by Apr 6), $15 each after Apr 6 (8-ft with 2 chairs); ac power $15 per connection (bring your own extension cords). Contact Jeff Wittich, AC4ZO, 211 Dundalk Way, Cary, NC 27511; 919-362-4787; **ac4zo@arrl.net**; **www.rars.org/hamfest**.

EMCOMM CONVENTION

April 20-21, Palo Cedro, CA

EMCOMM 2002 (3rd Annual Emergency Communications Convention), sponsored by the Sacramento Valley Section, will be held at Bishop Quinn High School, 21893 Old 44 Dr, 9 miles E of Redding; Hwy 44 E from I-5 to Deschutes Rd, go N 1 mile to Old 44, go W 1 block. Doors are open Saturday 8 AM to 5 PM, Sunday 8 AM to noon. Features include large displays of public safety EMCOMM equipment, vendors, classes and seminars, VE sessions, Special Event Station, overnight parking for self-contained RVs, B-B-Q (Saturday eve, $10 per person), refreshments. Talk-in on 145.45, 146.64. Admission is $10 (good both days). Contact Jerry Boyd, K6BZ, Box 252, Igo, CA 96047; 530-396-2256; **k6bz@arrl.org**; or write EMCOMM 2002, Box 99, Macdoel, CA 96058 (include SASE for reply); **www.emcomm2002.net/**.

SOUTHEASTERN VHF CONFERENCE

April 26-27, Oak Ridge, TN

The Southeastern VHF Conference, sponsored by the Southeastern VHF Society, will be held at the Garden Plaza Hotel, 215 S Illinois Ave. Doors are open Friday 8 AM to 9 PM, Saturday 8 AM to 5:30 PM. Features include technical presentations, conference proceedings, antenna measurements, noise figure measurements, auction, flea market, vendor displays, exhibits, annual business meeting, QSL card checking, banquet (Saturday, 7 PM; $35). Conference fee is $40. Tables are $5 (Friday night flea market). Contact Greg Robinson, KB4NVD, 208 Dogwood Acres, Hampton, TN 37658; 423-725-2149; **rover@wireco.net**; **www.svhfs.org/**.

INTERNATIONAL DX CONVENTION

April 26-28, Visalia, CA

The International DX Convention, sponsored by the Southern California DX Club, will be held at the Holiday Inn Plaza, 9000 W Airport Dr; located at the intersection of State Hwys 99 and 198. Features include vendors (Herb Rosenberg, KG6OK, **kg6ok@pacbell.net**), exhibitors, DX forums and programs, technical talks, hosted cocktail party, banquet (Saturday eve) and breakfast (Sunday morning) with major DXpedition speakers. Admission is $60 in advance, $65 at the door. Contact Don Bostrom, N6IC, 4447 Atoll Ave, Sherman Oaks, CA 91423; 818-784-2590; **n6ic@arrl.net**; **www.qsl.net/visalia2002**.

March 22-23
Nebraska State, Norfolk*

March 29-30
Maine State, Lewiston*

April 6-7
Maryland State, Timonium*
Washington State, Yakima*

May 24-26
Wyoming State, Casper

May 31-June 2
Atlantic Division, Rochester (Henrietta), NY
Northwestern Division, Seaside, OR

June 7-8
Tennessee Section, Knoxville
West Gulf Division, Arlington, TX

June 8
Eastern Pennsylvania Section, Bloomsburg

***See March *QST* for details.**

SETI CONVENTION

April 26-28, Ewing (Trenton), NJ

The SETI Convention (2nd Annual Technical Symposium and Annual Membership Meeting), sponsored by the SETI League, will be held at The College of New Jersey, 2000 Pennington Rd. Doors are open Friday noon to Sunday 1 PM. Features include technical programs, hospitality suite, committee meetings, awards banquet with keynote speaker (Saturday eve, 6-10 PM, Campus Center), volunteer coordinator's breakfast. Admission is $40 in advance (by Mar 31) and $50 at the door for SETI League members; $90 in advance (by Mar 31) and $100 at the door for non-members. Contact Dr H. Paul Shuch, N6TX, 121 Florence Dr, Cogan Station, PA 17728; 570-494-2299; **n6tx@setileague.org**; **www.setileague.org/seticon/meet2002.htm**.

DELAWARE STATE CONVENTION

April 28, New Castle

The Delaware State Convention, sponsored by the Penn-Del ARC, will be held at the Nur Temple on Rte 13 (N Dupont Hwy), ¼ mile N of the intersection of Rtes 13 and 40. Doors are open for setup 6 AM; public 8 AM to 1 PM. Features include vendors, tailgating ($10 per space; first-come, first-served basis), certified SKYWARN spotter training class, VE sessions, ARRL and club leaders forum, refreshments. Talk-in on 146.955, 224.22. Admission is $5, under 12 free. Tables are $15 (with electricity), $12 (without electricity), includes vendor admission ticket; by reservation only (send payment to Penn-Del Hamfest 2002, Box 1964, Boothwyn, PA 19061). Contact Hal Frantz, KA3TWG, 302-793-1080; **hfrantz@snip.net**; **www.high-tech-services.com/penndel**.

MISSOURI STATE CONVENTION

May 4, Lebanon

The Missouri State Convention, sponsored by the Lebanon ARC, will be held at the Cowan Civic Center, 500 E Elm St. Doors are open for setup Friday 3-9 PM and Saturday 6-8 AM; public Saturday 8 AM to 4 PM. Features include huge indoor flea market, commercial vendors, forums (ARRL; DX with ARRL Membership Services Manager Wayne Mills, N7NG; FCC; QRP; SKYWARN/NWS), VE sessions (preregistration required; Bob Sharp, K0YS, 417-345-8299, **bflobo@netscape.net**), QSL card checking, free cookout (Friday eve, May 3, for each table vendor and 1 guest), banquet. Talk-in on 145.47. Admission is $5, 16 and under free. Tables are $10 each with additional tables $1 each if reserved in advance. Contact Bill Wheeler, K0DEW, 500 E Elm St, Lebanon, MO 65536; 417-532-4642; **keccc@llion.org**; **members.socket.net/~wb9m/Publish**.

Attention Hamfest and Convention Sponsors:

ARRL HQ maintains a date register of scheduled events that may assist you in picking a suitable date for your event. You're encouraged to register your event with HQ as far in advance as your planning permits. Hamfest and convention approval procedures for ARRL sanction are separate and distinct from the date register. Registering dates with ARRL HQ doesn't constitute League sanction, nor does it guarantee there will not be a conflict with another established event in the same area.

We at ARRL HQ are not able to approve dates for sanctioned hamfests and conventions. For hamfests, this must be done by your division director. For conventions, approval must be made by your director and by the executive committee. Application forms can be obtained by writing to or calling the ARRL convention program manager, tel 860-594-0262. **Note:** Sponsors of large gatherings should check with League HQ for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL HQ for up to two years in advance. QST

STRAYS

CALL FOR PAPERS—DIGITAL COMMUNICATIONS CONFERENCE 2002

◊ Technical papers are solicited for presentation at the 21st Annual ARRL and TAPR Digital Communications Conference to be held September 13-15, 2002 in Denver, Colorado, and publication in the Conference Proceedings. The Conference location is the Denver Marriott Southeast Hotel, 6363 E. Hampden Ave, Denver, CO 80222. Annual conference proceedings are published by the ARRL. Presentation at the conference is not required for publication. Submission of papers is due by August 5, 2002. Conference registration details and updates are available on the Web at **www.tapr.org/dcc**.

The ARRL and TAPR Digital Communications Conference is an international forum for radio amateurs to meet, publish their work, and present new ideas and techniques. Presenters and attendees will have the opportunity to exchange ideas and learn about recent hardware and software advances, theories, experimental results, and practical applications. E-mail your paper in electronic format to Maty Weinberg at ARRL HQ at **maty@arrl.org**.

Previous • Next Strays

Gail Iannone ♦ Convention Program Manager

HAMFEST CALENDAR

Attention: The deadline for receipt of items for this column is the **1st of the second month preceding publication date**. For example, your information must arrive at HQ by **April 1** to be listed in the **June** 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.)

Alabama (Birmingham)—May 4-5. Glenn Glass, KE4YZK, 205-681-5019.

†**Arizona (Phoenix)—Apr 13**, 6 AM to 2 PM. *Spr:* Arizona ARC. DeVry Technical Institute, S parking lot, 2149 W Dunlap Ave; I-10 to I-17 N, exit Dunlap Ave, go E on Dunlap for ½ mile, follow signs to hamfest parking on right. Commercial vendors, tailgating ($5 per space), refreshments. *TI:* 147.28. *Adm:* $1. George Cooney, KQ7C, 21 E Colter St, Phoenix, AZ 85012; 602-274-6212; **georgie@aztec.asu.edu**.

†**Arizona (Sierra Vista)—May 4**, 6 AM to 1 PM. *Spr:* Cochise ARA. Green Acres, 2756 Moson Rd; from the intersection of Fry Blvd and State Hwys 90 and 92 (at the Target store), go E on Hwy 90 (an extension of Fry Blvd), 4 miles to Moson Rd, go S (right) on Moson Rd for 2 miles, Antenna Farm on right. Tailgating ($5 per space), VE sessions (10 AM; Licenses or Upgrades), free parking, refreshments. *TI:* 146.76 (162.2 Hz). *Adm:* Free. Tables: $7. Bill McNab, N7BIL, 11047 E Cascabel Pass, Palominas, AZ 85615; 520-336-5216; **mcnab@c2i2.com**; or Larry Warren, KF7TJ, 520-803-1453; **www.qsl.net/k7rdg**.

†**Arkansas (Little Rock)—Apr 26-27**; Friday 4-8 PM, Saturday 8 AM to 4 PM. *Sprs:* Arkansas Radio Emergency Service and several other central Arkansas clubs. Little Rock Expo Center, Exit 126 off I-30 in SW Little Rock, near the Pulaski County line. Flea market, computer and equipment dealers, vendors, tailgating ($15 per space), special exhibits and displays, forums, technical table (test your own equipment), contests, foxhunts, ARES/RACES, VE sessions, handicapped accessible. *TI:* 145.13. *Adm:* $5. Tables: $30 (dealers), $20 (flea market). Jim Blackmon, K5VZ, 1008 Pine St, Arkadelphia, AR 71923-4919; 870-246-6734 or 870-246-7833; fax 870-246-6736; **k5vz@ezclick.net**; **www.aristotle.net/~hamfest/**.

California (Palo Cedro)—Apr 20-21, EMCOMM Convention. See "Coming Conventions."

†**California (Sonoma)—Apr 27**; set up 7 AM; public 8 AM to noon. *Spr:* Valley of the Moon ARC. Sonoma Valley Veteran's Memorial Building, 126 First St W, 1 block N of the central Sonoma Plaza, Hwy 12. Indoor and outdoor electronics swapmeet ($10 per space; no charge for Amateur Radio organizations for informational tables and displays), VE sessions (walk-ins, register 9 AM, exams 10 AM, all license elements), forums, operating QRP station, AMSAT, display of homebuilt equipment, beginner's DF transmitter hunt, ULS registration, full breakfast (8-10 AM, $5). *TI:* 145.35 (88.5 Hz). *Adm:* Free. Darrel Jones, WD6BOR, 358 Patten St, Sonoma, CA 95476; 707-996-4494.

California (Visalia)—Apr 26-28, International DX Convention. See "Coming Conventions."

†**Connecticut (Southington)—Apr 14**; set up 6:30 AM; public 9 AM to 1 PM (Early Bird Special: doors open at 8:30 AM and admission is $10 until 9 AM). *Spr:* Southington ARA. Southington High School, Pleasant St; I-84, Exit 32, go S on Rte 10 for 1 mile, take left onto Flanders St, go ½ mile to Pleasant St on right. Flea market, vendors, meetings (annual spring ARES, CT Spectrum Management Assn), VE sessions (all classes; must pre-register, no walk-ins), refreshments. *TI:* 145.49, 147.345, 224.8, 444.25 (77 Hz). *Adm:* $5, under 12 free. Tables: 6-ft, advance $12, door $15 (½ off if you bring your own table). Make checks payable to SARA and send with SASE to Chet Bacon, KA1ILH, c/o SARA, Box 873, Southington, CT 06489; 860-628-9346; **ka1ilh@chetbacon.com**; **www.chetbacon.com/sara.htm**.

†**Connecticut (Waterford)—Apr 6**, 8 AM to 5 PM. *Spr:* RAS of Norwich. Senior Center; Rte 395 S to Exit 77, turn left, Senior Center on right. Auction, handicapped accessible. *TI:* 146.97 (156.7 Hz), 146.73 (156.7 Hz). *Adm:* Free. Tables: Free. Bruce Adams, KA1ZMZ, 291 N Wawecus Hill Rd, Norwich, CT 06360; 860-886-1837; **badams01@aol.com**; **www.rason.org**.

Delaware (New Castle)—Apr 28, Delaware State Convention. See "Coming Conventions."

Florida (Coral Gables)—Apr 20. Bill Moore, WA4TEJ, 305-264-4465.

Florida (Gainesville)—Apr 27. Ken Hall, KE4SLK, 352-332-3749.

†**Florida (Tampa)—Apr 20**; set up 7 AM; public 8 AM to 1 PM. *Spr:* Tampa ARC. Clubhouse and grounds, 7801 N 22nd St; I-275 to Sligh Ave Exit, E to 22nd St, turn N (left) at light to Clubhouse at end of street. Tailgating ($3 with admission), refreshments. *TI:* 147.105 (103.5 Hz). *Adm:* $2. Tables: $15. Biff Craine, K4LAW, 13515 Greenleaf Dr, Tampa, FL 33613; 813-265-4812; **k4law@arrl.net**; **www.hamclub.org**.

†**Georgia (Calhoun)—Apr 27**, 8 AM to 2 PM. *Spr:* Cherokee Capital ARS. Sugar Valley Community Center, Hwy 136; from I-75 take Exit 320, travel 4.2 miles W to Hill City Rd, turn left, go 1.3 miles, turn left, travel .9 miles to site. Tailgating, VE sessions, refreshments. *TI:* 145.23, 146.745. *Adm:* $5. Tables: $5. Felton Floyd, AF4DN, 1054 Mountain Loop Rd NW, Sugar Valley, GA 30746; 706-629-0369; **af4dn@arrl.net**; **www.qsl.net/k4woc**.

†**Idaho (Caldwell)—Apr 27**, 9 AM to 2 PM. *Spr:* Snake River ARC. Vallivue Middle School, 16358 S 10th Ave; Exit 26 from I-84 to S 10th Ave, turn S (toward city center), stay on S 10th for approximately 3.5 miles, School on left before traffic signal on Hwy 55. Seminars, VE sessions, RV parking, free parking. *TI:* 147.2. *Adm:* $2. Tables: advance $8, door $10. Don Ingram, KK7VM, 18262 Friends Rd, Caldwell, ID 83607; 208-459-2459; **kk7vm@qwest.net**.

†**Illinois (Arthur)—Apr 28**, 8 AM to noon. *Spr:* Moultrie ARK. Moultrie/Douglas County Fairgrounds, SE edge of Arthur, just off Rte 133, behind High School. 40th Annual Hamfest. *TI:* 146.655, 444.275. *Adm:* $5, under 14 free. Tables: 8-ft $10 (paid in advance). Ralph Zancha, WC9V, c/o MARK, Box 91, Lovington, IL 61937; 217-543-2178 (days) or 217-873-5287 (eves); **rzancha@one-eleven.net**.

†**Illinois (Sandwich)—May 5**; set up 6 AM; public 8 AM to 1 PM. *Spr:* Kishwaukee ARC. Sandwich Fairgrounds, just N of Rte 34 intersection of Suydam and Gletty Rds. Flea market, commercial vendors, free tailgating, overnight camping (electric hookup $15), refreshments. *TI:* 146.73, 146.52. *Adm:* advance $5 (double stub), door $6 (single stub). Tables: 8-ft $10. Make checks payable to KARC and send with SASE by Apr 20 to KARC, Box 371, DeKalb, IL 60115; or contact Bob Yurs, W9ICU, 815-895-3310 or 815-895-5049; **bob@w9icu.com**; **www.w9icu.com/flyer.html**.

†**Kentucky (Louisa)—May 4**. *Spr:* Big Sandy ARC. Louisa Middle School, Bulldog Ln; turn off US 23 onto Rte 32 then right on Rte 2565, go 1 mile to Rte 644, at flashing light turn right onto Bulldog Ln, across from Three Rivers Hospital. VE sessions. *TI:* 147.39 (127.3 Hz). *Adm:* $4. Tables: $4. Fred Jones, WA4SWF, 511 N Lackey Ave, Louisa, KY 41230; 606-638-9049; **wa4swf@arrl.net**; **www.bsarc.org**.

†**Maine (South Portland)—Apr 20**; set up Friday 6-9 PM, Saturday 6-8 AM; public 8 AM to noon. *Spr:* Portland Amateur Wireless Assn. Stewart Morrill American Legion Hall, Post 35, 413 Broadway; from Maine Tpk, Exit 7, turn N on Main St (US Rte 1), at Cash Corner turn right on Broadway, continue to site. Electronics flea market, dealers, consignment table, limited tailgating ($5 per space), auction (noon), handicapped accessible, free parking, refreshments. *TI:* 147.09 (100 Hz). *Adm:* $5. Tables: advance $8 (until Apr 19), door $10; upstairs advance $5 (until Apr 19), door $7. Bryce Rumery, K1GAX, 75 Ocean House Rd, Cape Elizabeth, ME 04107; 207-799-1116; **k1gax@arrl.net**; **www.digilogic.com/pawabra/pawa/pawa.htm**.

†**Maryland (Grasonville)—May 4**; set up 6 AM; public 8 AM to noon. *Sprs:* Kent Island and Anne Arundel ARCs. VFW Post, VFW Ave; E on US 50 to Kent Island, Exit 43B to VFW Ave; W on US 50 to Kent Island, Exit 44 to VFW Ave. Free tailgating, QLF contest, refreshments. *TI:* 146.94 (107.2 Hz), 147.105. *Adm:* $5. Tables: 1 free, multiples $5. Ray Allen, W2KBR, 8303 Grainfield Rd, Severn, MD 21144; 410-969-8042; **w2kbr@toad.net**; **www.smart.net/~n3szw/aarc.html**.

†**Michigan (Cadillac)—May 4**, 8 AM to 1 PM. *Spr:* Wexaukee ARC. Cadillac Jr High School, 800 Chestnut St; US 131 to Exit 177, Mitchell St to Pine St, turn W, continue ½ mile to School. Meetings, VE sessions, QCWA Luncheon. *TI:* 146.98. *Adm:* $5. Tables: $8 (8-ft). Bob Bednarick, WD8RZL, 7458 W Lake Mitchell Dr, Cadillac, MI 49601; 231-775-0085; **wd8rzl@arrl.net**.

†**Minnesota (St Paul)—Apr 13**, 8 AM to 2 PM. *Spr:* Robbinsdale ARC. Concordia University, 235 Hamline Ave; I-94 to Snelling Ave, S to Concordia Ave, E to Hamline Ave. Indoor flea market, commercial vendors, electronics, computers, club tables, VE sessions (9 AM). *TI:* 147.15. *Adm:* advance $5.50, door $7. Tables: advance $20 (by Mar 29), $30 (after Mar 29, subject to availability). Jerry Dorf, N0FWG, Box 22613, Robbinsdale, MN 55422; 763-537-1722; **k0ltc@visi.com**; **www.visi.com/~k0ltc**.

†**Missouri (Joplin)—Apr 13**; set up Friday 6-10 PM, Saturday 6-8 AM; public 8 AM to 3 PM. *Spr:* Joplin ARC. John Q. Hammons Trade Center, 3615 Range Line Rd; from I-44, Exit 8-B (Business US 71), right at first traffic light (36th St), go ¼ mile E, next door to Holiday Inn. Commercial vendors, dealers, VE sessions (register at 9:30 AM; testing at 10 AM sharp), forums, banquet (6 PM, Holiday Inn, $15; special guest Bill Pasternak, WA6ITF, The Voice of Newsline), free parking. *TI:* 147.21. *Adm:* advance $5, door $6, under 12 free. Tables: private $10, commercial $20. Make checks payable to Joplin ARC and send with SASE by Apr 6 to Ray Brown, KB0STN, c/o JARC, Box 2983, Joplin, MO 64803-2983; 417-781-4967; **raybrown@ipa.net** or **jjohnannes@joplin.com**; **www.joplin-arc.org**.

†**Missouri (Kansas City)—Apr 27**; set up 6 AM; public 8 AM to 2 PM. *Spr:* Ararat AR Shrine Club.

†ARRL Hamfest

Gail Iannone ♦ Convention Program Manager

Ararat Temple, 5100 Ararat Dr; take I-435 S from I-70 to Eastwood Tfwy Exit, go W to Ararat Dr. Commercial vendors, seminars, VE sessions, free parking. *TI:* 145.13. *Adm:* advance 3 for $5, door $3 each. Tables: $15 each (includes 3 admission tickets). Ray Pautz, N0RP, 13 SE 125th Rd, Warrensburg, MO 64093; 660-747-5002; **pautzrk@sprintmail.com**; **www.homestead.com/dowdy/hambash2000.html**.

Missouri (Lebanon)—May 3-4, Missouri State Convention. See "Coming Conventions."

New Hampshire (Hopkinton)—May 3-4. Joe Demaso, K1RQG, 207-469-3492. (HOSS-TRADERS)

New Jersey (Edison/Trenton)—May 4-5. Marin Light, **marinlight@earthlink.net**. (TCF)

New Jersey (Ewing/Trenton)—Apr 26-28, SETI Convention. See "Coming Conventions."

†**New Jersey (West Orange)—Apr 13**, 8:30 AM to 1 PM. *Spr:* Roseland ARC (IRAC). West Orange High School, 600 Pleasant Valley Way; from N and S take Garden State Parkway to I-280, Exit 7; turn right, 2 lights to High School on right. Commercial vendors, VE sessions, free parking, refreshments. *TI:* 146.415 + 1 MHz (85.4 Hz), 447.875 (156.7 Hz). *Adm:* $5. Tables: advance $15 (first table), $12 (each additional table); door $20 (first table), $15 (each additional table). Harvey Moskowitz, W2YWC, 7 Burlington Rd, Livingston, NJ 07039; 973-994-0637; **harvmosk@aol.com**.

†**New York (Newark)—Apr 13**; set up 7 AM; public 8 AM. *Spr:* Drumlins ARC. Marble Town Firehall; from Rte 31 go S on Rte 88 for 1 mile to Silverhill Rd, turn left, go 1 mile to hamfest. Commercial vendors, electronics, computers, VE sessions (held at the State EMO, Rte 31; registration 9-9:30 AM, testing begins 9:30 AM; walk-ins accepted), refreshments. *TI:* 146.745. *Adm:* $5. Tables: $3 each. Irv Walter, WA2SOK, 57-2881 Macedon Ctr Rd, Palmyra, NY 14522; 315-597-2192; **wa2sok@rochester.rr.com**; **www.drumlinsarc.com**.

†**New York (Owego)—May 4**, 8 AM to 2 PM. *Spr:* Binghamton ARA. Marvin Park, Rte 17C; 1 mile W of Owego. Flea market, vendors, VE sessions. *TI:* 146.73. *Adm:* $5. Tables: $10 (indoor table); $2 (flea market parking). Bill Coleman, N2BC, 513 Ridge Rd, Vestal, NY 13850; 607-748-5232; **n2bc@arrl.net**; **www.wtsn.binghamton.edu/bara**.

†**New York (Poughkeepsie)—Apr 21**; set up 6 AM; public 8 AM. *Spr:* Mt Beacon ARC. John Jay High School, Rte 52 (Fishkill); Exit 15 off I-84, turn right (N) on Lime Kiln Rd, left onto Rte 52, school is on left after passing Hudson Valley Research Park. Large indoor and outdoor location, giant electronics flea market, tailgating ($6 per spot), VE sessions, refreshments. *TI:* 146.97 (100 Hz). *Adm:* $5. Tables: advance $10, door $12 (discount offer: bring your own tables and get 2 indoor spots for $6). Ken Akasofu, KL7JCQ, 8C Hudson Harbor Dr, Poughkeepsie, NY 12601; 845-485-9617; **kl7jcq@arrl.net**; **www.qsl.net/mbarc**.

†**North Carolina (Morganton)—Apr 20**, 8 AM to 4 PM. *Spr:* Catawba Valley Hamfest Committee. Burke County Fairgrounds, Hwy 181 N; I-40, Exit 100, turn left on Jamestown Rd, make left at intersection of Hardee's and Bo Jangles, take right at next light at K-mart. Catawba Valley Hamfest and Computer Fair, flea market, dealers (Larry Withrow, AF4HX, 828-652-4195; **af4hx@worldnet.att.net**), forums (SKYWARN/NWS), special guest Riley Hollingsworth, VE sessions (9 AM), refreshments. *TI:* 147.15, 146.745. *Adm:* advance $4, door $5 (Don Beam, KK4NI, 828-652-3102; **dbeam@wnclink.com**). Tables: $10 (outdoor flea market space free). Tom Taylor, KC4QPR, Box 8003, Morganton, NC 28680-8003; 828-433-6205 or 828-205-8335; **kc4qpr@vistatech.net**; **cvhamfest.linuxham.org**.

North Carolina (Raleigh)—Apr 14, North Carolina State Convention. See "Coming Conventions."

†**Ohio (Athens)—Apr 28**; set up 7 AM; public 8 AM to 1 PM. *Spr:* Athens County ARA. Athens Community Recreation Center, 733 E State St; US 33 or 50, Exit E State St, hamfest at 2nd light. Free outdoor paved flea market, indoor exhibits, computer equipment, handicapped accessible, acres of parking, refreshments. *TI:* 145.15. *Adm:* $5, spouses free. Tables: advance $8 (if at least 1 week in advance), door $10 (John Cornwell, NC8V, 15100 E Scatter Ridge Rd, Athens, OH 45701; 740-593-6474; **jcornwell@eurekanet.com**). Carl Denbow, KA8JXG, 17 Coventry Ln, Athens, OH 45701-3718; 740-592-2133; **ka8jxg@callsign.net**; **www.seorf.ohiou.edu/xx150**.

†**Ohio (Canfield)—Apr 28**; set up 6:30 AM; public 8 AM to 2 PM. *Spr:* Twenty Over Nine RC. Mahoning County Career and Technical Center (formery JVS), 7300 N Palmyra Rd; 2 miles W of Square in Canfield, on US Rte 224. Flea market, dealers, ARRL activities, VE sessions (10 AM), handicapped accessible, free parking, refreshments. *TI:* 147.315, 443.225. *Adm:* $5, under 12 free with adult admission. Tables: 8-ft $10 (first-come, first-served). Don Stoddard, N8LNE, 55 S Whitney Ave, Youngstown, OH 44509; 330-793-7072; **N8LNE1@neo.rr.com** or **n8lne@arrl.net**.

†**Ohio (Coalton)—Apr 20**, 8 AM to 1 PM. *Spr:* Jackson County ARC. James H. Rhodes Community Center, located on State Rte 93 between Jackson and Wellston; from US 35, go N on SR 93 for 4 miles to Coalton, building on right as you go into town. Hamfest/Radio/Computer Show, flea market, vendors, VE sessions (10 AM, all classes of license, walk-ins welcomed), auction (following hamfest, for any items not sold), handicapped accessible, refreshments. *TI:* 146.79, 146.895. *Adm:* $5. Tables: $5 (first-come, first-served basis; electricity available for a donation to Coalton Volunteer Fire Dept). Edgar Dempsey, KD8XL, 110 Morton St, Jackson, OH 45640-1335; 740-286-3239; **kd8xl@ohiohills.com**.

Ohio (Garfield Heights)—Apr 13. Laura Lonczak, 216-663-3258.

Oregon (Eugene)—Apr 27. Mike Abrams, KC7ZFP, 541-461-2683.

†**Pennsylvania (Washington)—Apr 28**; set up 6:30 AM; public 8 AM to 1 PM. *Spr:* WACOM. Washington County Fairgrounds, N Main St; Rte 79 S from Pittsburgh to Meadow Lands Exit, right to light, left to next light, right to stop sign, right to Fairgrounds. Tailgating (free), vendors, VE sessions (10 AM). *TI:* 145.49. *Adm:* $3. Tables: first table free, additional tables $5 each. Jim Burtoft, KC3HW, 71 Beagle Club Rd, Washington, PA 15301; 724-228-0546; **jbur@mlynk.com**.

†**Pennsylvania (Wrightstown/Bucks County)—May 5**, 6 AM to 1 PM. *Spr:* Warminster ARC. Middletown Grange Fairgrounds, Penns Park Rd; vicinity of Rtes 413 and 232, 25 miles N of Philadelphia. Tailgating ($10), 60 indoor spaces with electricity, VE sessions, equipment check-out table, free parking, refreshments. *TI:* 147.09, 146.52. *Adm:* $5. Tables: $15. Bill Strunk, K3ZMA, 2 South Valley View Rd, Line Lexington, PA 18932; 215-822-0749; **k3zma@aol.com**; **www.k3dn.org**.

†**Pennsylvania (York)—Apr 21**; set up 6 AM; public 8 AM to 3 PM. *Spr:* York Hamfest Foundation. York County School of Technology, 2179 S Queen St; Exit 16B from I-83 N or Exit 16A from I-83 S; S on State Rte 74, 500 yards to Pauline Dr, left on Pauline Dr for 100 feet. Vendors, exhibits, group meetings, VE sessions (1 PM, **w3axc@peoplepc.com**). *TI:* 147.33, 146.52. *Adm:* $5, nonham spouse and under 16 free. Tables: advance $15 (for first table), $12 (for each additional); door $20 each (Barry Anderson, K3SUI, **banderso@eni.net**). John Shaffer, W3SST, 2596 Church Rd, York, PA 17404; 717-764-8193; **w3sst@yorkhamfest.org**; **www.yorkhamfest.org**.

Quebec (LaSalle/Montreal)—Apr 13. James Hay, VE2VE, 514-697-7205.

†**South Carolina (Greenville)—May 4**, 8 AM to 3 PM. *Spr:* Blue Ridge ARS. Piedmont Interstate Fairgrounds, 275 Bishop St (Spartanburg); 3 miles S of Business I-85 Exit 4 (Hearon Circle). Large outdoor tailgating area, indoor exhibitors, RV camping (Friday night), VE sessions (noon, off site), refreshments. *TI:* 146.61. *Adm:* advance $4, door $5. Tables: $11, electricity $5, chairs $1. Bob Watson, W4RGW, 501 Ferguson St, Clinton, SC 29325; 864-833-2204; **w4rgw@arrl.net** or **hamfest@brars.org**; **www.brars.org**.

†**South Carolina (Windsor)—Apr 27**, 8 AM to 1 PM. *Spr:* Salkehatchie ARS. Windsor Community Center; take Hwy 78 to Windsor, turn left at Masonic Lodge, go ½ mile, turn right, follow signs. Tailgating, VE sessions, refreshments. *TI:* 147.03. *Adm:* Free. Tables: $5 (per tailgater). Adam Hoffman, AF4QZ, Box 93, Bamberg, SC 29003-0093; 803-245-4673; **af4qz@arrl.net**; **www.qsl.net/kf4cvo**.

Tennessee (Oak Ridge)—Apr 26-27, Southeastern VHF Conference. See "Coming Conventions."

†**Texas (Abilene)—May 4-5**; Saturday 8 AM to 5 PM, Sunday 9 AM to 2 PM. *Spr:* Key City ARC. Abilene Civic Center, 1100 N 6th St; I-20 to Pine St Exit, S on Pine to the intersection of Pine and N 6th, Civic Center on NW corner. Commercial dealers, forums (ARRL, MARS), test bench, VE sessions, T-hunts, limited RV parking ($5 per night), handicapped accessible, free parking, refreshments. *TI:* 146.76. *Adm:* advance $7 (must be received by Apr 29), door $8. Tables: $7. Peg Richard, KA4UPA, 1442 Lakeside Dr, Abilene, TX 79602; 915-672-8889; **ka4upa@arrl.net**; **www.qsl.net/kcarc/hamfest.html**.

†**Texas (Belton/Temple)—Apr 13**, 7 AM to 3 PM. *Spr:* Temple ARC. Bell County Expo Center, 301 W Loop 121; from I-35 take Exit 292, go W on Loop 121 for approximately ¼ mile to the Expo Center on left. Swapfest, commercial vendors, dealers, computers, electronics, communications gear and accessories, huge tailgate area, RV camping, handicapped accessible. *TI:* 146.82 (123 Hz). *Adm:* $1. Tables: $10 (non-commercial). Mike LeFan, WA5EQQ, Box 4511, Temple, TX 76505; 254-773-3590; **hamexpo@tarc.org** or **wa5eqq@arrl.net**; **www.tarc.org**.

†**Virginia (Chesapeake)—Apr 20**; set up 7-9 AM; public 9 AM to 3 PM. *Spr:* Chesapeake AR Service. Hickory Ruritan Club, 2746 S Battlefield Blvd (Hwy 168 S); from I-64 take Exit 291B to Rte 168 S towards Nags Head (this is the 168 Bypass), take 2nd Hillcrest Pkwy Exit ramp, follow Hillcrest to 168 Business S, Club is approximately 2 miles on right. Amateur Radio and Electronics Flea Market, tailgating, refreshments. *TI:* 146.82. *Adm:* $6 (includes 1 flea market space until full). Tables: limited (late comers bring your own). Ruth Bigio, KB4LIF, c/o CARS SpringFest, Box 6867, Chesapeake, VA 23323-6867; 757-436-9354; **ruthis23505@yahoo.com**; **www.qsl.net/cars**.

Wisconsin (Cedarburg)—May 4. Gene Szudrowitz, KB9VJP, 262-377-6792.

Wisconsin (Milwaukee)—Apr 5-6. Ray Grenier, K9KHW, 414-358-0333. (AES Superfest)

†**Wisconsin (Stoughton/Madison)—Apr 14**, 8 AM. *Spr:* Madison Area Repeater Assn. Mandt Community Center, Stoughton Jr Fairgrounds, S 4th St; enter Stoughton on Hwy 51 (Main St), turn S on 4th St, cross bridge, Mandt Park is on left. VE sessions, free parking. *TI:* 147.15. *Adm:* advance $4, door $5. Tables: advance $12, within 3 weeks of event $16, door $20. Paul Toussaint, N9VWH, c/o MARA Swapfest, Box 8890, Madison, WI 53708-8890; 608-245-8890; **n9vwh@arrl.net**; **www.qsl.net/mara/**.

Attention All Hamfest Committees!

Get official ARRL sanction for your event and receive special benefits such as donated ARRL publications, handouts, and other support.

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The National NC-81X

When I was 14 my mother had a small soda and hot dog stand at a local lake. That summer I made almost 60 dollars working in the store and renting old automobile inner-tubes at 10 cents a half hour to the kids that swam there. That was big money for a kid back in 1955. It was a good summer.

Entering high school that fall and finding they had a ham radio club, I joined. One of the members, a senior, was already a general class ham and had his old receiver for sale. It was a National NC-81X. He wanted $35. Since my mother was helping me save for college, I had my work cut out for me getting the money from her. Luckily my father intervened and I bought my first receiver.

What a wonderful receiver for a Novice back then. It was a ham band only receiver that covered 160, 80, 40, 20 and 10 meters. It had over ½ inch spread on the dial in the 80-meter novice band, and a similar amount on 40.

I first put it to work copying the ARRL code practice on W1AW every other night. Before long I was up to 7 wpm and was ready for my test. I learned to use the Crystal filter to remove the QRM that always seemed to be close to the W1AW frequency.

On the other nights, I would listen to the local hams on 160 AM phone. I heard about antennas, electronics, building equipment and I absorbed the proper ham radio operating procedures from them. Later one of them would give me my Novice exam.

Rare today, the 1937 NC-81X and the NC-80X, its general coverage twin, still make good CW and AM receivers. My original was traded away to a friend when I found a newer receiver in 1956. Since the mid-1990s I searched for several years before finding the replacement I now have. Robert Enemark, W1EC, a well-known collector in Massachusetts had restored it. I'm grateful he sold it to me when he was thinning out his collection.

These two receivers were designed to be less expensive but still work well like the rest of the National line. To accomplish this National's designer, James Millen, eliminated the expensive "HRO" type dial, the big plug-in coils, the S meter and the power transformer. These sets were ac-dc powered, and designed to run at a lower B+ voltage.

Millen also designed a new "slide-rule" type dial with a dual vernier reduction drive knob, which provided a 55 to 1 reduction over any narrow band of frequencies with an automatic shift to 11 to 1 reduction for rapid moving of the pointer to another section of the dial. This was quite an innovation. It made fine-tuning a snap.

The large plug-in coils were replaced with a sliding coil tray, under the receiver. This provided a high quality plug-in type of coil system for less money.

The big addition to this receiver was a new Crystal filter designed to cover a range of selectivity from 300 Hz to 7 kHz and to work with a higher intermediate frequency of 1560 kHz, instead of the normal 456 kHz.

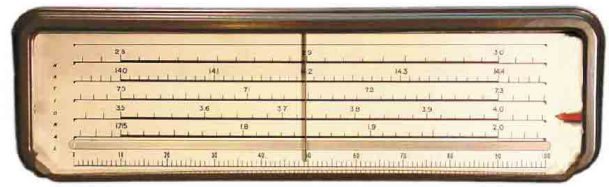
I found that the combination of the reduction dial and the sharp crystal filter allowed me to really separate the CW signals. My early Novice days and hundreds of QSOs were most enjoyable with this receiver.

If you find one of these ac-dc sets, it is well worth bringing home. It seems the dial escutcheon is usually broken because someone lifted it wrong. There are no replacements for them, so you'll have to glue the pieces back together. Try to get the original speaker, too. The radio will not run without it, as the transformer is mounted within the speaker box.

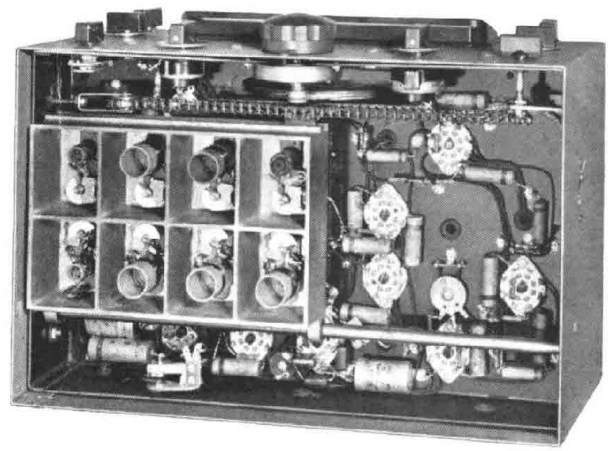
I'm still looking for your vintage station photos for my Old Radio Profile. Send them to my address below, or my e-mail address.

I'll see you at the hamfests. Look for my call letters on my hat and say hello.
—*K2TQN* QST

The replicated 1956 station of KN2TQN. The transmitter is from ARRL's *How to Become a Radio Amateur*. It was built by Ray Morgenweck, K2QQF.



The NC81-X dial showing about ½ inch on the old 80-meter Novice band, 3700-3750 kHz. With the 55:1 reduction dial it really separated the stations.



Bottom view of the NC-80X, with RF coil shield removed. As shown, the broadcast coils are plugged in.

John Dilks, K2TQN ♦ 125 Warf Road, Egg Harbor Township, NJ 08234-8501 ♦ k2tqn@arrl.org

SILENT KEYS

It is with deep regret that we record the passing of these amateurs:

W1BDU, Boardman H. Chace, Winthrop, MA
*W1CJK, William F. Werenski, Holyoke, MA
W1CN, Bonnie F. Lufkin, Orrington, ME
KB1COR, Wayne S. Randall, East Lebanon, ME
K1FLD, Armand E. Lambert, Woonsocket, RI
WA1GKL, William C. Holst, Alexander, ME
WB1HLT, Perley J. Barrow, Houlton, ME
ex-W1HMT, Irving P. Gray, Essex, MA
KA1HUE, Sarkis L. Ahlijian, Auburn, ME
KD1JA, Donald E. Reed, Norwell, MA
N1JWM, Cheryl D. Galuza, Brunswick, ME
W1LJA, Clarence R. Capman, Poultney, VT
N1RQH, Michael W. Daniels, Peabody, MA
N1RSY, John F. Rosati, Athol, MA
K1SYZ, Conrad E. Parker, Brunswick, ME
W1TFV, Wendell D. Perry, Southwest Harbor, ME
W1UH, Dennis L. Snyder, Alexander, ME
ex-AK1W, Minot Hubbell, Blue Hill, ME
N1XKX, Fayette H. Keith, Mattawamkeag, ME
*K1ZIT, Lawrence W. Allen, Eliot, ME
*WA2CHM, Horst W. Eigen, Hawthorne, NJ
W2DOG, Frank A. Zappia, Colonia, NJ
W2GHV, George J. Apfel, Port Saint Lucie, FL
K2OLG, Joseph M. Gumino, Melbourne, FL
K2PJB, Donal J. O'Buckley, Horseheads, NY
K2PT, Harold E. Taylor, Cinnaminson, NJ
*WA2QHL, William T. James, River Edge, NJ
WB2RJO, Henry C. Povall, Pleasantville, NY
NG2S, Charles C. Porch, Moorestown, NJ
WB2WRX, Robert E. Beach, Schenectady, NY
W2YMK, George F. Warne, Plainfield, NJ
WA2YNO, Jude T. Bradley, Newton, NJ
N3JWC, Stanley E. Caldeira, Chestertown, MD
W3QDY, Howard C. Lorah, Boyertown, PA
AF3V, W. H. Bollinger, Washington, DC
N3YSI, Paul N. Craig, Jr., Quakertown, PA
N4AJW, Walter J. Stein, Deerfield Beach, FL
*K4AL, Charles D. Larus, Richmond, VA
W4FGQ, Loy W. Watts, Fort Oglethorpe, GA
W4HZN, Thomas F. Bratton, Winchester, KY
K4IN, Leon C. Balch, Chattanooga, TN
N4ITM, Jasper W. Hogan, Caneyville, KY
*W4JT, John P. Kingman, Fairfax, VA
KF4KQN, Robert R. Bedwell, Madisonville, KY
K4KRV, Louis D. Tate, Cumming, GA
WD4KYD, Ted James, Georgetown, KY
KF4QDH, E. Darnell Ball, Cumberland, KY
KM4R, Marion O. York, Soddy Daisy, TN
KB4SUR, Donald R. Bush, Winchester, KY
W4TDD, Rex E. Johnson, Baxter, KY
W4UAR, Jerry B. Henson, Anniston, AL
WA4UYM, R. D. Noel, Oxford, NC
K4VG, R. J. Schmidt, Punta Gorda, FL
WA4WMM, Stanley Flora, Maysville, KY
K4YDE, Herbert R. King, Jacksonville, FL
W4ZDA, Ruth C. Gardner, Ashland, KY
KD5BDV, Ruth M. Bort, Albuquerque, NM
N5HKG, Sam Armijo, Socorro, NM
W5ITL, Joseph P. Brown, Mcdonough, GA
N5LAF, Welton R. Baxter, Wichita Falls, TX
WB5LCR, J. L. Lindley, Tahoka, TX
WA5LGM, Chris T. Hanger, Austin, TX
W5NWO, E. W. Johnson, Marietta, GA
WA5OJZ, Jack McCann, West Columbia, TX
K5REV, Carol M. Miller, Dallas, TX
W5RPW, Henry C. Smith, Nacogdoches, TX
WA5UJG, Ernest L. Jones, Enid, OK
WB5YBD, Donald D. Enterline, Belen, NM
W6CUB, David K. Bradley, Freedom, CA
N6DRU, Chester B. Almond, Harrah, OK
WB6FNT, T. J. Cantrell, Auburn, CA
W6GEC, Alfred R. Davis, Sacramento, CA
W6HDA, Raymond H. Varney, Artois, CA
W6KU, Robert Huff, Modesto, CA
N6LO, Bert Seiver, Las Vegas, NV
KD6MTE, Samuel D. Cranke, Santa Cruz, CA
KG6O, W. B. Thompson, Redondo Beach, CA
W6RGI, Allen B. Taylor, Fallbrook, CA
WB6WOU, Salvador H. Dippollet, Clovis, CA
WA6ZFK, Norman O. Davis, Oroville, CA
KA7DHC, Gudrun M. Morgan, Tacoma, WA
K7HNT, Ronald R. Moore, Moses Lake, WA
W7IAC, Edward C. Martin, Kalispell, MT
N7JG, Jimmie F. Glasscock, Williams, AZ
KA7LWM, Anthony Griesler, Puyallup, WA
*KB7QZK, Duane C. Ballew, Gig Harbor, WA
W7RK, Edward B. Haas, Port Townsend, WA
W7SY, Nelson L. Raymond, Green Valley, AZ
KD7ZS, Alfred R. Divan, Peoria, AZ
KE8AY, Bill W. Ivey, Parkersburg, WV
KS8B, Jerome Maslowski, Grand Ledge, MI
W8CJJ, George R. Carter, Duncan, SC
K8DQ, Cornelius Booker, Charleston, WV
N8MFV, Frank A. Walters, Dunbar, WV
*WD8MOD, Robert L. Willison, Big Rapids, MI
K9BEH, William K. Kern, Bedford, IN
**W9BZU, Charles H. Scholten, Manitowoc, WI
N9CSG, Virginia L. Hewitt, Appleton, WI
WA9FEF, Ted Jordan, South Elgin, IL
WB9FMD, John E. Temple, Cary, IL
W9GHA, Robert J. Bontempo, Fort Wayne, IN
W9IMA, Alva L. Perry, New Castle, IN
WB9JJP, Thomas Stecker, Oostburg, WI
K9OUP, John W. Lantz, Richmond, IN
WB9WOK, David M. Kadinger, Crawfordsville, IN
KC9XR, Carlos M. Watson, Terre Haute, IN
*K9ZZ, James L. Romelfanger, Baraboo, WI
AA0BB, Eldon J. Jameson, Wallace, SD
KC0GPW, Charles M. Horn, Salina, KS
WB0RHR, Melvin Hyatt, Prairie Village, KS
KA0SZK, Charles F. Formaker, Waterloo, IA
VE3GRF, Glen R. Frederick, Essex, ON, Canada

*Life Member, ARRL
**Charter Life Member, ARRL
‡Call sign has been re-issued through the vanity call sign program.

Note: Silent Key reports must confirm the death by one of the following means: a letter or note from a family member, a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address and call sign. Allow several months for the listing to appear in this column.

Many hams remember a Silent Key with a memorial contribution to the ARRL Foundation. If you wish to make a contribution in a friend or relative's memory, you can designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund, or the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation Inc, 225 Main St, Newington, CT 06111. QST

Kathy Capodicasa, N1GZO ♦ Silent Key Administrator

NEW PRODUCTS

PROFESSIONAL AUDIO TOOLS FROM NTI

◊ New from broadcast and telecommunication veteran NTI are three high-performance audio tools. The Digilyzer DL1 is a comprehensive palmtop tool for analyzing virtually any digital audio signal (SP/DIF, TOS-link, ADAT and more) at sampling rates of up to 96 kHz).

The self-powered MiniSPL microphone measures sound pressure levels in accordance to a variety of standards and filters, and can interface with NTI spectrum analyzers to display data plots, if needed.

The RT-2M Multi-Tone Broadcast Line Analyzer allows techs to test and control transmission quality while on-air. The unit generates a short (160 to 190 ms) multi-tone audio burst that can be used as a time tone or inserted into the program. After analyzing the burst, the RT-2m provides performance plots of distortion, noise, crosstalk, stereo separation and more. For more information on NTI's entire product line, see www.nt-instruments.com.

THE ZAP CHECKER

◊ The Alan Broadband Company announces the Zap Checker—a high-quality, handheld RF field-strength detector. The usable bandwidth of the Zap Checker extends from 10 MHz to more than 4.5 GHz. It is sensitive enough to detect RF from cellular phones and covert "bugs" at more than 20 feet, transmissions from "sealed" microwave ovens at more than 40 feet and from VHF and UHF transceivers at more than 80 feet. The detection of transmitted signals by the Zap Checker is limited by the background level of radiated signals—usually determined by baseline FM and TV transmissions in the area.

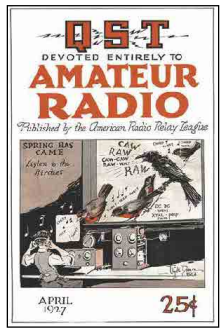
Hams can use the Zap Checker to tune up low-power QRP transmitters and determine antenna radiation patterns from a distance, to measure RFI signals and pinpoint RF leakage in cables and to locate hidden transmitters during fox hunting. A manually adjustable sensitivity control adjusts the gain over a 20-dB range. The Zap Checker displays relative signal strength either by an analog meter or by illumination of colored LEDs.

The Zap Checker operates for more than 80 hours on two AA alkaline batteries and weighs less than 5 ounces. For more information contact the Alan Broadband Company, 93 Arch St, Redwood City, CA 94062; tel 888-369-9627; www.zapchecker.com. $89 including shipping and handling in the US. California residents add 8% sales tax.

Previous New Products QST

75, 50 AND 25 YEARS AGO

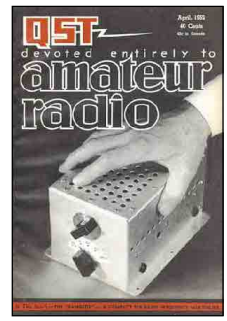
April 1927



◊ Clyde Darr, 8ZZ's, cover art proclaims that "Spring has came." The editorial happily reports that the new radio law has finally been passed by the Senate, and explains some of the details, including the formation of the Federal Radio Commission. The editorial also points out radio-regulation problems yet to be solved.

William Rados goes back to basics, with "Radio Translated for the Experimenter." In "A 15-Meter Commercial Station—2XS," hams are asked to send in signal reports. John Clayton, former Assistant Technical Editor for *QST*, and now the Secretary of the Institute of Radio Engineers, writes an article on "The Institute of Radio Engineers." Harold Westman, the new Assistant Technical Editor, describes "A Traffic Tuner," using a variable capacitor of smaller than normal value to "spread the band" out. Capt. A. C. Stanford of the US Army Signal Corps, details "The Purposes of the Army-Amateur Affiliation." The entire text of "The New Radio Law" is reprinted, to help the amateur understand it. Now that hams are routinely making international contacts, they want to know "How Far Is It?," and C. C. Knight tells us how to calculate DX path lengths. "The Most Useful Meter," by R. F. Shea, explains to the reader how to build a vacuum tube voltmeter. George Taylor tells how to build "A Ten-Cent 'Bug' Key."

April 1952



◊ The cover photo shows Don Mix's latest project, described in this issue. The editorial presents the results of a survey of new Novice licensees, to give other hams an idea of their interests.

A full-page ad opposite the table of contents shows the FB new Collins KW-1, a kilowatt CW/AM transmitter mounted in a six-foot rack. "The 'Bandbox'—A Single-Control Frequency-Multiplier Unit," by Don Mix, W1TS, is a compact multiplier unit that provides multiplication to all HF bands from an 80-meter input. Brooks Short, W9DPI, tells about "Automotive Radio Noise Elimination." John Avery, W1IYI, built "An Elevator Mast" to lower his beam antenna to ground level for maintenance. Ed Tilton, W1HDQ, lures new hams to 145 and 220 Mc. with "A V.H.F. Transmitter for the Novice or Technician." George Hanchett, W2YM, and Ken Bucklin, W2CDP, combine a 50-kc. Q-5er, an audio limiter, a sharp-peak audio amplifier, and a crystal calibrator in one unit, in "A Four-Purpose Communication-Receiver Auxiliary." Bob Ehrlich, W2NJR; Dick Wells, W2ORX; and Ralph Preston, W2BWN, describe the mass-production methods used by the Livingston Radio Club to build many copies of "A Compact Portable 2-Meter Emergency Station" for Civil Defense communication. William Walker, W3NUG, tells "How a C.W. Traffic Net Operates."

April 1977

◊ The cover photo shows a view of some of Murphy's Marauders and their Field Day antennas, noting that this is a special issue of *QST* on antennas. The editorial addresses "The FCC Dilemma" of having a budget that's too small to cope with its assigned tasks.

Wayne Overbeck, K6YNB, presents the hot scoop on "The VHF Quagi." Lew McCoy, W1ICP, lays out "Some Basic Antenna Information." Beam-steering of antennas is explained in "Broadband, Steerable Phased Array," by Dick Fenwick, K5RR, and R. R. Schell. A. E. Collins, K6VV, describes "A Multiband Vertical Radiator." George Smith, W4AEO, thinks big with "Quad Log-Periodic Fixed-Beam Antennas." John Bingham, W7WKR, tells of modifying a Heathkit SB-102 for 6 meters, to sweep the band for signals, in "Sweep 6 Meters and Really Clean Up!" Roger Sparks, W7WKB, tells how he used capacitive tuning with his quad, in "Build This C-T Quad Beam for Reduced Size." Dick Lodwig, W2KK, points out that "The Inverted-L Antenna" is a good antenna for hams with space restrictions. W. B. Freely, K6HMS, describes "A Two-Meter J Antenna." Ron Gorski, W9KYZ, discusses "Efficient Short Radiators." In "Demise of the Computer Kid," L. Foord, VE3FLE, looks into the future, seeing problems with the ultimate automated amateur station.

QST

Al Brogdon, W1AB ♦ Contributing Editor

W1AW Schedule

PACIFIC	MTN	CENT	EAST	MON	TUE	WED	THU	FRI
6 AM	7 AM	8 AM	9 AM		FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
7 AM-1 PM	8 AM-2 PM	9 AM-3 PM	10 AM-4 PM	VISITING OPERATOR TIME (12 PM-1 PM CLOSED FOR LUNCH)				
1 PM	2 PM	3 PM	4 PM	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
2 PM	3 PM	4 PM	5 PM	CODE BULLETIN				
3 PM	4 PM	5 PM	6 PM	TELEPRINTER BULLETIN				
4 PM	5 PM	6 PM	7 PM	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
5 PM	6 PM	7 PM	8 PM	CODE BULLETIN				
6 PM	7 PM	8 PM	9 PM	TELEPRINTER BULLETIN				
6^{45} PM	7^{45} PM	8^{45} PM	9^{45} PM	VOICE BULLETIN				
7 PM	8 PM	9 PM	10 PM	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
8 PM	9 PM	10 PM	11 PM	CODE BULLETIN				

W1AW's schedule is at the same local time throughout the year. The schedule according to your local time will change if your local time does not have seasonal adjustments that are made at the same time as North American time changes between standard time and daylight time. From the first Sunday in April to the last Sunday in October, UTC = Eastern Time + 4 hours. For the rest of the year, UTC = Eastern Time + 5 hours.

♦ **Morse code transmissions:**
Frequencies are 1.818, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675 and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 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. See "Contest Corral" in this issue. At the beginning of each code practice session, the schedule for the next qualifying run is presented. Underline one minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any) and complete mailing address. Send a 9×12-inch SASE for a certificate, or a business-size SASE for an endorsement.

♦ **Teleprinter transmissions:**
Frequencies are 3.625, 7.095, 14.095, 18.1025, 21.095, 28.095 and 147.555 MHz. Bulletins are sent at 45.45-baud Baudot and 100-baud AMTOR, FEC Mode B. 110-baud ASCII will be sent only as time allows.

On Tuesdays and Fridays at 6:30 PM Eastern Time, Keplerian elements for many amateur satellites are sent on the regular teleprinter frequencies.

♦ **Voice transmissions:**
Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59 and 147.555 MHz.

♦ **Miscellanea:**
On Fridays, UTC, a DX bulletin replaces the regular bulletins.

W1AW is open to visitors from 10 AM until noon and from 1 PM until 3:45 PM on Monday through Friday. FCC licensed amateurs may operate the station during that time. Be sure to bring your current FCC amateur license or a photocopy.

In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

Headquarters and W1AW are closed on New Year's Day, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving and the following Friday, and Christmas Day. In 2002, Headquarters and W1AW will also be closed on July 5.

QST

CONTEST CORRAL

Feedback

The codes for Single Operator Low Power and Single Operator High Power were inadvertently switched in the **2001 June VHF QSO Party** results. A revised article with the corrected scores is linked from the ARRL Contest Branch home page at **www.arrl.org/contests/results/2001/June2001.pdf**. All awards will be determined by the corrected categories.

In the body of the **2001 ARRL 10 GHz and Up Contest**, the QSO total of **WA6CDR** should have been reported as 135 instead of 206. It appears correctly in the box and line scores. While included properly in the scoring, four stations that were not listed in the results actually completed QSOs on the 47 GHz band (best band DX in parentheses): **WW2R/5** (110), **KA1OJ** (48), **NE8I** (16) and **WB8TGY** (3). The call of **KR7O** was incorrectly reported as K7RO.

In the **September VHF QSO Party**, the entry of **WB2AMU** in the NLI section should be listed as Single Operator Portable.

In the **2001 IARU HF World Championships**, **UA9CDV's** log listed him as CW-only but was in fact a Mixed Mode entry. His reclassification moves **VA3UZ@VE3OI** into 10th place World in the CW-Only category. In the W/VE Top Ten Box, **W4PA** should be listed as the op at **WX0B** instead of N4AF.

W1AW Qualifying Runs are 9 AM EST Thursday, April 4 and 4 PM Friday, April 19. The K6YR West Coast Qualifying Run will be at 9 PM PST Wednesday, April 10. Check the W1AW Schedule for details.

Abbreviations: SO—Single-Op; M2—Multiop 2 Transmitters; MO—Multi-Op; MS—Multi-Op, Single Transmitter; MM—Multi-Op, Multiple Transmitters; AB—All Band; SB—Single Band; SPC—State/Province/DXCC Entity; HP—High Power; LP—Low Power; Entity—DXCC Entity.

No contest activity on 30, 17, 12 meters. Refer to the contest Web sites for information about awards. Publication deadline for Contest Corral listings is two months prior to publication.

March 29-April 7

Spring Lites QSO Party—all modes—sponsored by the Amateur Radio Lighthouse Society from 0001Z Mar 29 through 2359Z Apr 7. Frequencies: CW—1830, 3530, 7030, 14030, 21030, 28030 kHz; SSB—1970, 3970, 7270, 14270, 21370, 28370 kHz. Exchange: ARLHS member/lighthouse number or year first licensed, name, and SPC. Score: 1 pt/QSO except 2 pts for ARLHS member, 3 pts for ARLHS lighthouse. For more information—**www.waterw.com/~weidner/arlhs/index.html.** Logs must be mailed by Apr 30 to Lee Graves, WA7OBH, 4341 SE Satinleaf Pl, Stuart, FL 34997.

April/May

VHF Spring Sprints—CW/SSB—sponsored by the Eastern Tennessee DX Association as follows: 50 MHz—2300Z May 11 through 0300Z May 12; 144 MHz 7-11 PM local time, 1 Apr; 222 MHz—7-11 PM Apr 9; 432 MHz—7-11 PM Apr 17; Microwave—902 MHz and higher—6 AM-1 PM May 4. Fixed and Rover categories. Exchange is Grid Square only, count 1 pt per QSO. Score is QSO Points × Grid Squares, score each sprint separately. Rovers and Microwave sprints total all points and all grids worked from each grid. For more information—**www.etdxa.org/vhf.htm**. Logs must be emailed or postmarked within 4 weeks of the contest to **springsprints@etdxa.org** or Jeff J Baker, 8218 Foxworth Tr, Powell, TN 37849 USA.

April 6-7

Missouri QSO Party—CW/SSB—sponsored by the Boeing Employees Amateur Radio Society of St Louis (BEARS) from 1800Z Apr 6 to 0500Z Apr 7, and 1800Z Apr 7 to 2400Z Apr 7. Frequencies: CW—40 kHz from band edge and 1810 kHz; Phone—1850, 3980, 7280, 14280, 21380, 28310 kHz, work MO stations once per band and mode. Categories: Fixed and MO mobile/portable. Exchange: RST, serial number, and MO county or ARRL/RAC Section. QSO Points: CW—2 pts, Phone 1 pt. Score: MO stations—QSO Points × Sections + MO counties + MO zones; non-MO stations—QSO Points × MO counties + MO zones. Multipliers count once only, see web site for MO zone info. QSOs with W0MA count additional 100 points. For more information—**www.qsl.net/w0ma.** Logs must be emailed or postmarked by May 4 to **n0aj@worldnet.att.net** or James L. Kinser, N0AJ, 2147 Encino Dr, Florissant, MO 63031-7627.

MARAC County Hunters Contest—SSB—sponsored by The Mobile Amateur Radio Awards Club from 0000Z Apr 6 to 2400Z April 7. Frequencies: 3880, 7240, 14275, 21340, 28340 kHz. Work fixed stations once/band and mobiles once for each county and band. Exchange: RST and county or SPC. County line QSOs count as one QSO but separate multipliers. QSO points: Fixed stations in NA—1 pt, Mobile/Portable—15 pts, DX—5 pts, one station must be in a US county. Score is QSO pts × US counties (count only once). Mobile/Portables sum score from each state. For more information **www.countyhunter.com**. Logs must be postmarked by 10 May to (US logs) Duane Traver, WV2B, 99 Oregon Hill Rd, Lisle, NY 13797-1002 or (non US logs) Scott Nichols, VE1OP, 387 Rudderham Rd, Point Edward, NS B2A 4V6, Canada.

EA RTTY Contest—sponsored by the Unión de Radioaficianados Españoles (URE) from 1600Z Apr 6 to 1600Z Apr 7. Frequencies: 10, 15, 20, 40 and 80 meters, according to IARU band plan; SOAB, SOSB, MOAB, SWL categories. Exchange: RST and serial number or EA Province. QSO points: 10-20 meters: own continent—1 pt, different cont—2 pts; 40-80 meters: own cont—3 pts, diff cont—6 pts. Score is QSO points × (DXCC entities + EA provinces + W/VE/JA/VK call areas) counted once per band. If operating portable, sign /call area. Logs must be emailed as ASCII text or Cabrillo format or postmarked by May 10 to **ea1mv@retemail.es** or Antonio Alcolado, EA1MV, PO Box 240, E-09400 Aranda de Duero (Burgos), Spain.

46th Annual QCWA QSO Party—CW/Digital/SSB—sponsored by the Quarter Century Wireless Association from 1900Z Apr 6 through 1900Z April 7. Frequencies: CW—1.910, 3.540, 7.035, 14.040, 21.050, 28.050 MHz; Phone—1.910, 3.890, 7.244, 14.262, 21.365, 28.325 MHz plus all VHF/UHF bands, no crossband or repeater QSOs. 15 QSOs with each station maximum and only one QSO with stations in home QCWA chapter. Exchange: Last two digits of year licensed and QCWA chapter or SPC. QSO Points: Phone—1 pt, CW/Digital—2 pts. Score: QSO Points × QCWA chapters + SPC counted once per band. W2MM counts as a 3-point multiplier on each band. For information and log sheets, send SASE to QCWA HQ, 159 East 16th Ave, Eugene OR 97401-4017. Send logs to W0HXL, Dick Newsome, 2924 North 48th St, Omaha, NE 68104-3726.

April 13-14

QRP ARCI Spring QSO Party—CW—sponsored by the QRP ARCI, from 1200Z Apr 13 through 2400Z Apr 14. (See Oct 2001 *QST*, p 103 for Fall QSO Party information.)

April 20-21

Michigan QSO Party—CW/SSB—sponsored by the Mad River Radio Club, from 1600Z Apr 20 through 0400Z Apr 21, no time limit. Bands: 80-10M; frequencies: CW—45 kHz from band edge, Phone—3850, 7225, 14250, 21300, 28450 kHz. Work stations once per band and mode, MI-to-MI QSOs allowed, mobiles and portables can be worked from each county. Categories: SO, MO, and Mobile. Exchange: serial number and MI county or SPC. QSO Points: CW—2 pts, Phone—1 pt. Multipliers for MI stations are states, provinces and MI counties; multipliers for non-MI stations are MI counties. Multipliers count once per mode. Score: QSO points × multipliers. For more information—**www.mrrc.net**. Logs must be emailed or postmarked within 30 days of the contest to **mqp@contesting.com** or to Mad River Radio Club, c/o Dave Pruett, 2727 Harris Rd, Ypsilanti, MI 48198.

TARA PSK31 Rumble—sponsored by Troy ARA, 0000Z—2400Z, April 20. Frequencies: 80,40,20, 15,10,6 meters, work stations once per band. Categories: Club Challenge (see Web site), Normal (100 W), Great (20 W), Super (5 W), Novice, SWL. Exchange: Name and SPC. Score: QSOs × (W + VE + JA + VK call areas + 1 point per entity). Multipliers count once per band. For more information—**www.qsl.net/wm2u/rumble.html** or **www.n2ty.org.** Logs must be received by 18 May via the contest Web site or email to **wm2u@n2ty.org**.

Holyland DX Contest—CW/SSB—sponsored by the Israel Amateur Radio Club from 0000Z to 2359Z Apr 20. Frequencies: 1.8-28 MHz according to IARU Region I band plan, work Israeli stations once per band and mode. Categories: SO (Mixed Mode, CW, SSB), MS, MM, SWL. Exchange RST and serial number or Israel district. QSO Points: 1.8 or 3.5 MHz—2 pts; other bands 1 pt. Score: QSO Points × districts counted once per band. For more information—**hamradio.iarc.org/contests/holy2002rules.html**. Logs must be emailed or postmarked by 31 May to **4Z4KX@ iarc.org** or to Contest Manager 4Z4KX, Israel Amateur Radio Club, Box 17600, Tel Aviv, 61176.

April 27-28

Florida QSO Party—sponsored by the Florida Contest Group from 1600Z April 27-0159Z April 28 and 1200Z-2159Z April 28, no time limit, work FL stations. Frequencies: CW—35 kHz from band edges (Novices/Technicians—10 kHz from segment edge), Phone—7.260, 14.260, 21.335, and 28.485 MHz, no 160, 80, VHF/UHF. Categories: SO, MS, MM (one signal per band), Mobile, Novice/Technician, School Club, all categories can enter as HP/LP (150 W)/QRP (5 W) and Mixed Mode/CW/SSB. Exchange: RST and FL county or SPC. QSO Points: CW—2 pts, SSB—1 pt. Score: FL stations—QSO points × SPC (W/VE/KH6/KL7 do not count as DXCC entities) × power multiplier; non-FL stations—QSO points × FL counties × power multiplier. All multipliers count once per mode. Power multiplier—HP ×1, LP ×2, QRP ×3. For more information—**www.qsl.net/fqp**. Logs must be sent by May 28 as email to **FLQSOParty@aol.com** in ASCII text or in Cabrillo format or by post to Florida QSO Party, c/o Ron Wetjen, WD4AHZ, 5362 Castleman Dr, Sarasota, FL 34232.

Nebraska QSO Party—CW/SSB—sponsored by the Heartland DX Association 1700Z Apr 27 through 1700Z Apr 28. Frequencies: 160, 80, 40, 20, 15, 10, 6 and 2 meters; CW—1.805 MHz and 35 kHz up from band edge; Phone—1.915, 3.865, 7.265, 14.265, 21.365, 28.465, 146.460 MHz; Novices/Technicians—10 kHz from band edge and 28.465 MHz. Categories: SO, MS, Mobile. Work stations once per band/mode and NE mobile stations can be worked again in each county. County lines count as one QSO. Exchange: RST and NE county or SPC. QSO Points: CW—2 pts, Phone—1 pt. Score is QSO Points × SPC for NE stations or NE counties (multipliers count once only) × Power Multiplier (QRP ×3, 150 W ×2, HP ×1). For more information—**www.qsl.net/hdxa**. Logs must be emailed or postmarked by 31 May to **hdxa@qsl.net** as ASCII text or to Nebraska QSO Party, PO Box 375, Elkhorn, NE 68022-0375.

H. Ward Silver, N0AX ♦ 22916 107th Ave SW, Vashon, WA 98070 ♦ n0ax@arrl.org

SPECIAL EVENTS

Port St Lucie, FL: Port St Lucie Amateur Radio Association, K4PSL. 1500Z **Apr 1** to 2100Z **Apr 30**. Commemorating the discovery of Florida by Ponce de Leon in 1513. 28.310 21.350 14.250 14.030. Certificate. Dr Maurice I. Sasson, W2JAJ, 8598 Florence Dr, Port St Lucie, FL 34952.

Caldwell, NJ: West Essex ARC, W2EF. 1400Z to 2200Z **Apr 6**. Operating from President Grover Cleveland's birthplace. 28.350 21.330 14.250 7.250. Certificate. West Essex ARC, PO Box 54, Essex Fells, NJ 07021.

Marathon, NY: Skyline Amateur Radio Club, K2IWR. 0400Z **Apr 6** to 1100Z **Apr 7**. Celebrating the history of maple syrup production in central New York state. 14.300. Certificate. Skyline ARC, PO Box 5241, Cortland, NY 13045.

Timonium, MD: Baltimore Amateur Radio Club, W3FT. 1300Z **Apr 6** to 1700Z **Apr 7**. 31st Annual Greater Baltimore Hamboree & Computerfest. 147.55 28.415 14.260 7.230. Certificate. BARC c/o Awards Mgr, PO Box 120, Reisterstown, MD 21136.

Harrisburg, PA: Harrisburg Amateur Radio Club, W3UU. 1300Z **Apr 6** to 0200Z **Apr 8**. Celebrating the 100th anniversary of the world's longest masonry railroad bridge. 28.450 21.350 14.260 7.250. QSL. C. T. Greiner, 403 Allendale Way, Camp Hill, PA 17011.

Casper, WY: Casper Amateur Radio Club, N7NPC. 0000Z **Apr 12** to 0000Z **Apr 13**. Boy Scout-O-Rama, Casper Wyoming Council. 28.380 14.239 7.225 3.900. Certificate. Dr J. L. Martin, N7NPC, 1441 Ivy Ln, Casper, WY 82609. Special certificates and QSL upon request.

Del Mar, CA: Desert Pacific Council of Boy Scouts of America, WB6BSA. 1700Z to 2359Z **Apr 13**. Operating from the Del Mar Scout Fair "Merit Badge Midway" to help Boy Scouts earn radio merit badges. 28.390 21.360 14.290 7.270. QSL. Scout Ham Radio, Desert Pacific Council, BSA, 1207 Upas St, San Diego, CA 92103.

Emmett, ID: Voice of Idaho, W7BOI. 1600Z to 2400Z **Apr 13**. Celebrating the annual Willow Creek Challenge BSA. 28.385 14.239 7.225. Certificate. Richard Dees, 2265 W Sandalwood Dr, Meridian, ID 83642. Frequencies are in order of use depending on conditions starting with 10 meters.

Hawthorne, NJ: Bergen Amateur Radio Association, KO2FB. 1300Z to 2100Z **Apr 13**. Hawthorne Schools Cel-Earth-Bration. 28.335 21.335 14.235 7.235. Certificate. Fred Buchner, 202 Tenth Ave, Hawthorne, NJ 07506.

New York City, NY: Monster Island Amateur Radio Society, K2G. 0000Z **Apr 13** to 2400Z **Apr 14**. Commemorating the 40th anniversary of the debuts of Gorath and King Kong vs Godzilla. 28.440 21.240 14.340 7.240. QSL. Barry A. Schwartz, N2SHP, 72-22 153rd St #2H, Flushing, NY 11367-2642.

Vieques, PR: Cadena El Conquistador, Inc, NP3P. 1600Z **Apr 13** to 1600Z **Apr 14**. Celebrating the Cultural Festival at Fort Count Mirasol. 80-40 m—28.350 21.350 14.300. Certificate. Cadena El Conquistador, Inc, NP3P, PO Box 161, Fajardo, PR 00738-0161.

Godalming, Surrey, UK: Titanic Wireless Commemorative Group, GB90MGY. 0930Z **Apr 13** to 0647Z **Apr 15**. Commemorating the 90th anniversary of the Titanic disaster. CW only, HF bands 80-10 m (including 30, 17 and 12). QSLs for every contact will automatically be sent via the bureau. QSL claims, if desired, to GB90MGY via the bureau. Visit **www.gdrs.net/titanic** for more information.

Jefferson City, MO: Mid-MO ARC, K0C. 0000Z **Apr 19** to 0000Z **Apr 22**. Honoring Earth Day, from the front lawn of the Missouri Sate Capitol. SSB 28.480 21.340 14.340 CW 28.060 21.060 14.060. QSL. Tom Hammond, N0SS, 5417 Scruggs Stn Rd, Lohman, MO 65053. Main operating time, 1500Z to 2200Z on Apr 20. Updates at **www.mmccs.com/mmarc**.

Dallas, GA: Paulding & Douglas County Amateur Radio Clubs, W4SCR. 1200Z to 2300Z **Apr 20**. Promoting awareness of the Silver Comet Trail recreation area. 28.460 21.370 14.270 7.240. QSL. SCARS, PO Box 6481, Douglasville, GA 30154.

Lexington, KY: Bluegrass Amateur Radio Society, KG4LDL. 1500Z to 2200Z **Apr 20**. Scout World 2002—Boy Scout event at Kentucky Horse Park. 28.400 21.350 14.300 7.250. Certificate. Lou Berry, 160 W Tiverton Way, Lexington, KY 40503-4468.

Piscataway, NJ: Piscataway Amateur Radio Club, K2VOA. 0000Z to 2400Z **Apr 20**. Voice of America relay station WB0U. 28.345 21.345 14.245 7.245. Certificate. Bill Toth, W2BT, 6 Rivercrest Dr, Piscataway, NJ 08854.

Palo Cedro, CA: EMCOMM 2002, W6E. 1900Z **Apr 20** to 1900Z **Apr 21**. Emergency Communications Conference. 21.390 14.250 7.232 3.987. QSL. EMCOMM 2002, POB 99, Macdoel, CA 96058. Go to **www.emcomm2002.net** for more information.

Waco, TX: Heart Of Texas DX Society, W5DXS. 1500Z **Apr 20** to 2400Z **Apr 27**. Celebrating the 75th Anniversary of the State Bird. 28.475 21.375 14.275 7.275. QSL. HOTDXS, Larry Merritt, KC5BFM, PO Box 3501, Waco, TX 76707-0501. Visit **www.geocities.com/w5dxs** for more information.

Paducah, KY: Paducah Amateur Radio Association, W4NJA. 1400Z to 2200Z **Apr 27**. American Quilter's Society Annual Quilt Show. 28.400 14.265. QSL. Bruce Huyck, 243 Japonica Dr, Paducah, KY 42003.

Wall, NJ: Ocean Monmouth Amateur Radio Club, N2MO. 0000Z to 2400Z **Apr 27**. Official Marconi Day Station. 28.380 21.260 14.270 3.890, CW-SSB HF General bands. QSL. OMARC, PO BOX 267, Oakhurst, NJ 07755.

Manitowoc, WI: Mancorad Radio Club, W9DK. 1400Z **Apr 27** to 2200Z **Apr 28**. WWII USS *COBIA* Sub Memorial Radio Reactivation. 28.343 21.343 14.243 7.243. QSL. Fred Neuenfeldt, W6BSF, 4932 S 10th St, Manitowoc, WI 54220.

Nutley, NJ: Robert D. Grant United Labor Amateur Radio Association, N2UL. 1300Z **Apr 27** to 2300Z **Apr 28**. "CQ Scout Invitational Camporee" at Great Adventure NJ. 28.420 21.375 14.260. Certificate. RDGULARA c/o WA2VJA, 112 Prospect St, Nutley, NJ 07110-0716. Camp theme "United We Stand."

Roanoke, VA: Roanoke Valley Amateur Radio Club, W4CA. 1300Z **Apr 27** to 2300Z **Apr 28**. Red, White and Blue Roanoke Star for the victims of 9/11. 28.460 21.360 14.260 7.260. QSL. Ray Crampton, 1670 Catawba Rd, Troutville, VA 24175.

Mt Clemens, MI: Utica Shelby Emergency Communications Association, W8A. 1200Z to 1800Z **Apr 28**. March of Dimes Walk America Walkathon. 28.465 14.260 7.260. Certificate. USECA, 45061 Grant Park, Utica, MI 48317-5522.

Wells County, IN: Grant County Amateur Radio Club, W9EBN. 1700Z to 2200Z **Apr 28**. McNutt United Methodist Church Ham Sunday Fellowship Event. 146.79 28.410 14.230 7.295. Certificate. L. B. Nickerson, K9NQW, 517 N Hendricks Ave, Marion, IN 46952.

Certificates and QSL cards: To obtain a certificate from any of the special-event stations offering them, send your QSO information along with a 9×12 inch self-addressed, stamped envelope to the address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, you must be an Amateur Radio club, and use the ARRL Special Events Listing Form. Copies of this form are available via Internet (**info@arrl.org**), or for an SASE (send to Special Requests, ARRL, 225 Main St, Newington, CT 06111, and write "Special Events Form" in the lower left-hand corner). You can also submit your special event information on-line at **www.arrl.org/contests/spevform.html**. Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; that is, a special event listing for **Jun** *QST* would have to be received by **April 1**. Submissions may be mailed (Attn: Maty Weinberg), faxed (860-594-0259) or e-mailed (**events@arrl.org**) to ARRL HQ. QST

STRAYS

50th ANNUAL OMIK CONVENTION

◊ OMIK Amateur Radio Association, the largest minority ham radio organization in the United States, will hold its 50th annual meeting and convention July 17-20, 2002 in Dayton, Ohio. Black Amateur Radio operators, many of whom had learned or honed their communications skills in World War II, founded OMIK in 1952.

Since its inception, OMIK has grown to more than 400 members in the US and several countries. The organization has expanded its purposes to include promoting fellowship among persons interested in the advancement of Amateur Radio, communications, and electronics; expanding and upgrading the numbers of trained amateur radio operators; making use of Amateur Radio operators' ability to provide public service; serving as a national organization for a network of local Amateur Radio clubs; and encouraging and motivating youths to aspire to higher goals. During the September 11 crisis, OMIK members coordinated a net to handle traffic into and out of the affected areas.

The 2002 convention will feature technical sessions on Amateur Radio topics by Clifford Peoples, KE8QR and Wallace Wright, AD8N, VEC examinations, tours of the Dayton area, and a special program honoring the organization's past presidents. The highlight of the Saturday night banquet will be the awarding of several scholarships to help students pursue higher education in communications and technical fields.

For information contact Moody T. Law, convention chair, at **wq6i@earthlink.net**. Also see the OMIK Web site at **webusers.anet-stl.com/~ka0etf/omik.htm**.

Previous • Next Strays

Maty Weinberg, KB1EIB ♦ Special Events Coordinator

By Dan Henderson, N1ND

Straight Key Night 2002

New Year's Day is a time for tradition. Those raised in the southern US view New Year's Day as a time for a great meal. A feast of black-eyed peas, collard greens, corn bread and a roasted pork loin equates to good luck. A friend from New York says you should burn a bayberry candle all day long, also for luck. First Night celebrations across the world hold to a tradition of great entertainment as well as a fireworks gala at midnight. Thousands line the streets of Times Square to watch the Waterford crystal ball drop to usher in another year. Whether standing at the foot of Big Ben in Westminster as it chimes the midnight hour or viewing a laser show at the Eiffel Tower, you sense New Year's is one of the most tradition-filled times of the year.

On January 1, 2002, several hundred amateurs from across the globe took part in another tradition—ARRL Straight Key Night. A total of 169 logs were submitted by the participants in this year's event. A review of those logs showed contacts made with hams in all 50 US states, many Canadian provinces and several DXCC entities. The allure of SKN continues to be that the contacts are "old time" radio style. You kick back, relax and spend time talking with your fellow participants (instead of the rapid-fire contest style exchanges that are so common). Several participants noted that aside from the keys being used, many participants transform SKN into a "vintage gear" event. The soapbox comments below will give you a good sampling of SKN at its best.

One participant claimed QSOs with others spanning a total of 79 years He worked 12-year-old W2AU as well as VE4JN, a full 91 years young. Numerous participants noted that SKN is a most popular affair for them. Be it the Smith family (W5KL, W4YE and W4AGI), who make this an annual event, or one of the numerous first-time participants, SKN has special magic and traditions that appeal to young and old, male and female, newcomers and old-timers. Congratulations to the participants in SKN 2002. Why not consider joining them January 1 for SKN 2003? Who knows—maybe it will become a new tradition in your household.

Participants: AB7YB, AB8FJ, AD6YU, AE6C, AF8A, AI2Q, K1FP, K1RV, K1ZDI, K2GBH, K2IUC, K2NPN, K2NV, K3LN, K3PX, K4BKD, K4BYF, K4CHE, K4FS, K4KSR, K4ME, K4TP, K5IQ, K5XK, K6ETM, K6IX, K6KRD, K6PBQ, K6TEM, K7EA, K7TFW, K7ZYV, K8AAX, K8PUJ, K8QLM, K8SB, K9KEU, K9KVY, K9LCK, KA1BNO, KA3AVB, KA3YNV, KA5BOU, KB0CRG, KB1DSB, KB2QIU, KB5NJD, KB8SCI, KB8TXZ, KB9BVN, KB9UWR, KC2EQA, KC2HRP, KC0IEM, KD1XU, KD7MJV, KE6QR, KF3DC, KG2OR, KG6TH, KH6GJV, KJ6CA, KK5FX, KN2GSJ, KN6YD, KO0Z, KQ5U, KS6CW, KT5X, KU4BT, K0ADL, K0CDJ, K0LMD, N1RL, N2KZ, N3BF, N3MVX, N3RY, N5AF, N5BF/6, N5OHL, N5PV, N6ZFO, N8AA, N8KC, N9BOR, N9EXY, N9KO, N9PLK, N9WAT, ND2T, NF6R, NJ3K, NM0L, NN7A, NT2W, NU7T, ON6ZJ, W1KR, W1RO/7, W1YT, W2AU, W2LID, W2LYH, W2VMX, W2VTV, W2ZR, W3CEI, W3DF, W3IZ, W3MGL, W3TZW, W3UHP, W4AGI, W4YE, W5AI, W5ETK, W5KL, W5KP, W5RZ, W5USM, W5XW, W6LFB, W6PRI, W6TUR, W7BMI, W7IZE, W7KTY, W7LBV, W7TVI, W7YS, W8FDV, W8JNO, W8JZI, W9FCC, W9ISC, W9ZC, WA1ABI, WA1CFX, WA1UMA, WA2DAX, WA2QQF, WA3GQU, WA4EUL, WA4PSO, WA6RND, WA7CS, WA7GSN, WA8WV, WA9FFZ, WA9PWP, WA9QWX, WB3GCK, WB5LLI, WB6IYM, WB8CFO, WB9CIS, WB9HFK, WB0B, WD4CBZ, WH7E, WN2A, WN8FTC, WN8VIX, WN9U, WO3B, WP4LNY, WR1C, W0TUP

SKN Accomplishments

Best Fist	*Votes*
W5KL	5
K6KPH	3

Most Interesting QSO	
W2ZM	4
W2LYH	3
K6KPH	3

Most QSOs Completed	
WP4LNY	37
K3PX	28
K6PBQ	26
W8FDV	26

Soapbox

In 1974 my Dad gave me this Speed-X key that was discarded from the Navy Radio School, Bainbridge Naval Training Center, MD. I had never mounted it to a board and BOY that sure made a difference (KA3YNV)… This was the 25th anniversary of my first QSO with NN7A. We met on New Year's Eve 1977 and found we were both in Flagstaff. We still try to work each other every SKN (W7YS)…Best fist was 88-year-old W5KL—flawless, smooth and easy to copy (W4YE)… Pounding away on the old Navy Flameproof brought me back to my early days as a Novice in 1960 (W2ZR)… To dedicate this SKN to our military in the war zones, I operated a Navy Winslow-Electronics straight key from the USS Mississenawa mounted on a WW2 radio console off the USS Bunker Hill (W1RO/7)… The 1917 Vibroplex Blue Racer I was using had a unique shaped frame called a "cloverleaf." While talking to WD9FLJ, I discovered he was using a similar model from 1919. KE5C joined in with his 1923 Blue Racer, later followed by N6WU with another 1917 model. We had a real "four-leaf clover"—a neat symbol for the New Year (KT5X)… A straight key is all I use and it continues to be fun (WA9FFZ)… After SKN I drifted off to sleep with the same satisfaction I felt when as a Novice I made my very first QSO with a Johnson Viking II and a Hallicrafters SX-111 (KO0Z)… Was fun to work W2ZM who was running a 1929 Hartley oscillator that sounded SO cool. (NT2W)… As I do every SKN, I pulled out the old key (late 1800s vintage). Something to be said for pounding some really old brass for this event (N3MVX)… I've tried plenty of other modes, but I always seem to drift back to CW, that most elemental of amateur modes (N8KC)… Marconi would be proud of us all (AD6YU)… The QSO with my two sons (W4YE and W4AGI) is always a highlight and this year W4COW joined in (W5KL)… I received a "Titanic" key for Christmas, so I had to try it out (W3MGL)… The QSO with W2LYH was great fun. She is a retired radioman from the Navy, as is her husband. Being retired Navy myself, we had a great time sharing "sea stories" (KN2GSJ)… Had a great time, but my fist doesn't get better with age. Worked W2AU—12 years old and had the best fist of anyone I worked (K4BYF)… In the midst of a substantial pileup, hats off to Brian, 9J2BO, for taking time to have a good old fashioned QSO with people using a straight key (KB5NJD)… Band conditions were excellent and the number of SKN participants was much greater than I have heard in years (W7TVI)… Been off the air for quite a few years. Got back on just in time for SKN (KB0CRG)… The excitement of a return to my radio roots is a major motivating factor for this event (WA1CFX)… I think there are two categories of CW ops—old and VERY old (K2GBH)… I had forgotten how much FUN we can have. It felt like I had slipped through a time warp (K1RV)… Made my first ever 80-meter QSO with WA0KZL (WN8VIX)… It is surprising how many QRP enthusiasts I worked during SKN 2002 (WN9U)… Made a few Qs until I discovered my old Globe Scout had a nice little chirp. I will get the chirp out before next year! (W7KTY)… Although I have been a ham for 30 years, this was my first SKN. I had a blast (WB6IYM)… I think I surprised a few operators when I told them I was running 3 watts into my rainspout (WB3GCK)… Still a fun event with lots of fun. In recent years, it's also becoming "Antique Rig Night" (NN7A)… Special Thanks to W8DAN for the patience while my 7 year old granddaughter Shelby sent her name over the air (WB0B)… Thank you, Old-Timers, who admonished us novices years ago to: "Listen before you transmit." That truth still holds today (K9LCK)… I used a G4ZPY key—the finest CW key that I have ever used in 45 years of ham radio (K0LMD)… I only made 9 contacts but had LOTS of fun. I am 12 years old and have been a ham for 1 year now. I look forward to many more SKNs in years to come (W2AU)… It seems to me the old WW2 J-38 key was the most popular during this event (K3PX)… It is my favorite event of the ham year (K7TFW)… This was a special night because it was in 1952—50 years ago—that I started transmitting as a Novice (W8JZI)… Though I have been using paddles for the past four months, the feel and control of a straight key truly involves the operator in the process (KC2EQA)… SKN is like Christmas eve Mass. You see a lot of people you usually don't see but all are united and participating because of a passionate belief (N2KZ)… QST

2002 IARU HF World Championship Rules

1. Eligibility: All licensed amateurs worldwide.

2. Object: To contact as many other amateurs, especially IARU member society HQ stations, around the world as possible using the 160, 80, 40, 20, 15 and 10 meter bands.

3. Date and Contest Period: The second full weekend of July**, beginning 1200 UTC Saturday and ending 1200 UTC Sunday (July 13-14, 2002)**. Both Single and Multi operator stations may operate the entire 24-hour period.

4. Entry Categories:

4.1 Single Operator

4.1.1. Categories

4.1.1.1. Phone only

4.1.1.2. CW only

4.1.1.3. Mixed mode

4.1.2. One person performs all operating and logging functions.

4.1.3. Use of spotting nets or packet is not permitted.

4.1.4. All operators must observe the Amateur Radio regulations of their country at all times.

4.1.5. Single operator stations are allowed only one transmitted signal at any given time.

4.2. Multi Operator, Single Transmitter, Mixed Mode only

4.2.1. Must remain on a band and mode for at least 10 minutes before changing bands or modes.

4.2.2. Only one transmitted signal is allowed at any given time.

4.2.2.1. Exception: Only IARU member society HQ stations may operate simultaneously on more than one band, with one transmitter on each band and mode.

4.2.2.2. Only one HQ station call sign per member society per frequency band is permitted.

4.2.3. All operators must observe the amateur radio regulations of their country at all times.

5. Contest Exchange:

5.1. IARU member society HQ stations send signal report and official IARU member society abbreviation. IARU International Secretariat club station NU1AW counts as a HQ station. Members of the IARU Administrative Council and the three IARU regional Executive committees send "AC," "R1,""R2," and "R3" as appropriate.

5.2. All others send signal report and ITU zone.

5.3 A complete exchange must be logged for each valid QSO.

6. Valid Contact:

6.1. The same station may be worked once per mode per band for QSO credit.

6.1.1. Mixed-mode entries may work a station once per mode per band.

6.2. A station may only be worked for credit in the portion of the band that is generally accepted for the mode used.

6.2.1. On any band, a station may be worked once on phone (in the phone segment) and once on CW (in the CW segment).

6.2.2. Cross mode, cross band and repeater contacts are not valid QSOs.

6.3 Where contest-preferred segments are incorporated into regional band plans, participants must observe them.

6.4 The use of non-amateur radio means of communications (e.g. telephone or the Internet) for the purpose of soliciting a contact (or contacts) during the contest period is inconsistent with the spirit and intent of these rules.

6.5 Use of self-spotting techniques on packet or other mediums are inconsistent with the spirit and intent of these rules.

7. QSO Points:

7.1. Contacts within your own ITU zone, as well as QSOs with any IARU-member society HQ stations, count one point.

7.1.1**.** Contacts with a station in the same ITU zone but on a different continent count one point.

7.2. Contacts within your continent (but different ITU zone) count three points.

7.3. Contacts with a different continent and IARU zone count five points.

8. Multipliers: The total number of ITU zones plus IARU member society HQ stations worked on each band (not mode.) IARU officials represent a maximum of four multipliers per band (AC, R1, R2 and R3).

8.1. IARU member society HQ stations and officials do not count for zone multipliers.

8.2. To qualify as the special multiplier, Administrative Council and Regional Executive Committee stations may only be operated by the individual licensees as single operators.

9. Scoring: The total number of QSO points times the total number of multipliers worked.

10. Reporting:

10.1. Entries must be postmarked or emailed no later than 30 days after the end of the contest **(August 13, 2002).** No late entries can be accepted. Entries that are received after mid-October 2002, even if mailed in time, may not be received in time to be included in the official results.

10.2**. Electronic entries must conform to the Cabrillo file format.**

10.2.1. **The Cabrillo file format and specifications may be found at www.kkn.net/~trey/cabrillo/ or in the November 1999 issue of *QST*.**

10.2.2. Any entry which has been generated using a computer (either during the contest or after the contest) must be submitted either as an attachment to an email or on a 3.5-inch diskette.

10.2.3. Electronic files must use the entrant's call sign as the file name.

10.2.4. The log file must be a chronological list of QSOs as made not separated by band or mode**.**

10.2.5. Entries sent as attachments to email must be sent to **IARUHF@iaru.org**.

10.2.5.1. Email entries must include the call sign used during the contest on the SUBJECT line of the email.

10.2.6. Entries sent on diskette should be mailed to: IARU HF Championship, IARU International Secretariat, Box 310905, Newington, CT 06111-0905 USA.

10.2.6.1. Diskettes must be clearly labeled with the station call sign, contest name, entry class and date.

10.3. Paper logs must be in chronological order, not separated by bands, and clearly indicate for each contact: band, mode, date, time (in UTC) call signs, complete exchanges sent and received, multipliers and QSO points.

10.3.1. Multipliers should be marked in the paper log only the first time they are worked on each band.

10.3.2. Paper logs with more than 500 QSOs must include dupe sheets (an alpha-numeric list of all call signs worked, broken down by band and mode).

10.3.3. All contacts in paper logs must be in chronological order, not separated by bands.

10.3.4. Paper logs must be mailed to IARU International Secretariat, Box 310905, Newington, CT 06111-0905, USA and postmarked no later than August 13, 2002.

10.4. All paper entries must include an official summary sheet or reasonable facsimile thereof with complete contest information.

11. Awards:

11.1. A certificate will be awarded to the high scoring entry in each category in each ARRL Section, each ITU zone and each DXCC entity.

11.2. A certificate will be awarded to the high scoring IARU member society HQ station.

11.3. Achievement level awards will be issued to those making at least 250 QSOs or having a multiplier total of 50 or more.

11.4 Additional awards may be made at the discretion of each country's IARU member society.

12. Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, by the regulations of his/her licensing authority, and by the decisions of the ARRL Awards Committee, acting for the IARU International Secretariat.

13. Disqualification: Any entry may be disqualified if the overall score is reduced by more than 2%. Score reductions do not include correction of arithmetic errors. Any entry may be disqualified if more than 2% of duplicate QSOs are left in the log and claimed for credit. **A three-QSO reduction will be assessed for each duplicate QSO found during log checking or for miscopied call signs in paper logs. For electronic logs, a one-QSO penalty will be assessed for a miscopied call sign or a duplicate QSO claimed for QSO credit.**

14. For contest information, contact **n1nd@iaru.org** or IARU HF Contest Information, PO Box 310905, Newington, CT 06111-0905, USA.

14.1. Contest forms may be downloaded at: **www.iaru.org/contest.html**.

Note: You can find a list of entity prefixes with continent and ITU zone at **www.arrl.org/contests/**. QST

STRAYS

N3FJP'S IARU HF CONTEST LOG

♢ *IARU HF Contest Log* is a *Windows*-based logging program that is easy to use, checks for duplicates (including partials), lists multipliers by band, lists all contacts, provides a country look-up function, displays the continent worked, beam heading and distance from your QTH, writes Cabrillo file format for log submission, sends CW via your COM port and voice via your sound card, and provides many current statistics. For more information, visit **www.n3fjp.com/** to download a free trial.

Previous Strays

SECTION NEWS

The ARRL Field Organization Forum

ATLANTIC DIVISION

DELAWARE: SM, Randall Carlson, WB0JJX—As many of you have read, the Board of Directors is considering moving the content of the section news pages and contests line item scores to the ARRL Web pages. The issue will be decided at the July ARRL board meeting. If you feel strongly about this one way or the other please let your division director know. In anticipation of this the ARRL web site has some new features for ARRL members that I think are very worthwhile regardless of the final board decision. The first is that the Delaware section now has a page on the ARRL Web site. It is a place I can expand on what appears in these pages. The second is a Section alert page; this lets you now something is up in the section, when you enter ARRL Web site. The third is an e-mail distribution list based on the e-mail address that you provide when signing up for ARRL Web. There is an option in the member profile that you must check to receive these e-mails. (or to opt out). I plan to start making use of these features over the next few months, so I encourage all ARRL members who have access to sign up, if you have not done so. Traffic (Jan) DTN QNI 171 QTC 18 in 23sess. DEPN QNI 34 QTC 1 in 4 sess. K3JL 44.

EASTERN PENNSYLVANIA: SM, Eric D. Olena, WB3FPL—SEC: Michael O. Miguelez, N3IRN. ACC: Steve Maslin, N3ORH. BM: Fredric Serota, K3BHX. OOC: Alan Maslin, N3EA. PIC: Robert Josuweit, WA3PZO. STM: Vacant. SGL: Allen Breiner, W3ZRQ. TC: Lawrence Thomas, AA3PX. ASMs: Robert Josuweit, WA3PZO, Pietro DeVolpi, K3PD. L. James Biddle W3DCL, George Law, N3KYZ, Vincent Banville, WB3YGA. DXCC Card Checker E. Pa.: Glenn Kurzenknabe, K3SWZ. Congratulations to the Hams from Carbon and Lehigh Counties for a job well done. The two RACES groups led by James Kelly, KA3UQP, in Carbon County and Jeff Kelly, N3MFT, in Lehigh County were activated after a fire broke out at the Cedarbrook County Home. Over two dozen Hams were dispatched to various locations. The groups were active for over twenty-four hours and some were reactivated a couple of days later to assist in coordinating the return of the patients to the facility. This is another example of the outstanding work performed by many Hams across the country. The fine example of emergency communications by the Hams in Carbon and Lehigh should help serve as a wake-up call to those counties that do not have and organized ARES/RACES group in place. Another wake-up call has already been issued in another matter. It is quite evident from recent events that the "Section News" and more importantly contest results will soon no longer be printed in *QST*. This information will be available on the ARRL Web site. Each of the ARRL Affiliated Clubs should have at least one Official Bulletin Station (OBS) within their membership. The traditional function of the OBS is described as copy up-to-the-minute news from W1AW and retransmit them locally for the benefit of amateurs in a particular coverage area who may not be equipped to receive the information directly. Certainly this should be expanded to cover Internet information as well. The day may come when all amateurs have Internet capabilities but we certainly are far from that point now. In addition to one or more Official Bulletin Stations each of the Affiliated Clubs should make sure that they also have other members who serve as Public Information Officer, (PIO); Local Government Liaison (LGL); Technical Specialist, (TS) and Official Emergency Station, (OES). Word from Fred Serota, K3BHX, is that PRB-1 for PA ready to be submitted to the legislature. Tfc: K2BCL 549, N3EFW 173, N3SW 116, W3NNL 63, N3AO 59, W3HK 53, KB3CEZ 42, W3JKX 39, W3TWV 39, KB3CVO 14, W3ZQN 12, KA3LVP 12, KB3BBR 11, N8JSO 10, W3BNR 6, KB3DDL 6, K3ARR 5, N3AS 4, KB3CKD 3, N3KYZ 2. Net Reports: EPA 130, EPAEPTN 110, PTTN 73, SEPPTN 28, PFN 25, D3ARES 13, MARCTN 12, CATN 8, D4ARES 5, MCOES 3.

MARYLAND/DC: SM, Tom Abernethy, W3TOM, 301-292-6263-w3tom@arrl.org—ASM/RACES, Al Nollmeyer, W3YVQ (w3yvq@arrl.net). SEC: Mike Carr, WA1QAA (bamcc@erols.com) 410-799-0403. MDC Section WebPages: *http://www.qsl.net/w3tom/*. Please pass along important Amateur Radio information and events to your Section Manager for reporting to ARRL HQ, inclusion in *QST* MDC Section News, and display on the Section Web page. Mark your calendar for the ARRL Maryland State Convention April 6 & 7, 2002 at the Maryland State Fairgrounds in Timonium, MD sponsored by the Baltimore ARC. Forums throughout both days are a highlight of this outstanding event. Check out the excellent forum schedule and plan to attend the forums of your choice while enjoying the Hamboree. (http://www.gbhc.org/) ANAR EC N3SEO reports one Public Service Event training session, BSA Klondike Derby, & operations during a Snow Emergency. Newly appointed ANAR AECs include AA3XY & N3WOF. CALV EC N3QHC reports distributing the CAL ARES/RACES Operation Information Binder to members. CHAR EC/RO KA3GRW reports stations N2OMC, KE3RE, W3TOM & KA3GRW participated in RACES COMMEX. NTS Training during weekly net, stations participating included N2OMC, W7UH, AA3WS, N3YRZ, & KA3GRW. HOWA RO WA1QAA reports K3EF and he updated the HOWA ARES/RACES roster and call-up tree, copies distributed to members. PRGE EC/RO WI3N reports PG ARES training public service event, a 10/20 mile run through the Beltsville Agricultural Center, Maryland, with a net control and nine operators posted around the course to advise on the safety of runners. SEC WA1QAA reports conducting FRED NTS training class. Attendees included NR9P, N3VNG, KA3OTR, N2CSQ, N3YMY, N3FVF, KE3VIN, N3TCR, KB3FIO, WB3KDS, N3HTA, & N8AAY. 73, Tom. With the nets Net/NM/QND/QTC/QNI: MSN/KC3Y/31/62/407, MEPN/N3WKE/32/70/552, MDD/WJ3K/60/167/655, MDD top brass: K3JL 168 AA3SB 156, AA3GV 128, BTN/AA3LN/31/49/377, Tfc: KK3F 5179, WB4FDT 164, W3YVQ 147, AA3GV 128, AA3SB 125, N3WK 53, N3KGM 40, N3WKE 39, K3CSX33, N3DE 29, KJ3E 29, W3CB 24, KC3Y 21, WA1QAA 14, N3YUG 13, N3ZKP 10, N3OR 7, WA3GYW 5, KE3FL 0, (Dec) WB4FDT 145. PSHR: KK3F 229, AA3SB 158, W3YVQ 148, N3WK 119, N3ZKP 118, WA1QAA 107, N3WKE 106, W3CB 100, AA3GV 100, K3CSX 85, KC3Y 80, KE3FL 70.

NORTHERN NEW YORK: SM, Thomas A. Dick, KF2GC — http://www.northnet.org/nnyham. Email: kf2gc@arrl.org. ASMs: KB2KLD, WZ2T, N2ZMS, WA2RLW. ACC: WA2JPM. BM: KA2JXI. OOC: N2MX. PIC: N2SZK. SEC: WN2F. STM: N2ZGN. TC: N2JKG. The Schoharie County Amateur Radio Assoc. (WA2ZWM) and the Cotton Hill VHF Group (WB2UEE) will be running a license class starting 8 April 2002. The class will follow "Now You're Talking". Mainly for entry level but will also offer CW instruction. Dates are 8, 15, 29 of April 6, 13, 20, 27 of May 3, 10, 17 of June with VE Session on the June 24th. "Practical Application Session" is 22-23 June. Info-from WB2KLD at 827 4800, wb2kld@arrl.net or valosin@midtel.net Nice job W2TLR-TLARC & all operators on the W2C winter carnival special event station! I have heard many good comments on how you made Unity in the Mountains a reality during the 105th Saranac Lake Winter Carnival. The TLARC float & CVARC mobile command bus were highlights for all amateurs. Another example of the commitment that many hams have to their communities. April makes me think ahead to Field Day 2002, I would like to encourage all our NNY clubs to get members involved with field day activities this year and publicize them extensively. Let's get more people involved locally than ever before, and bring someone new to Field Day 2002 so they to can share in the hobby & fun. Our first NNYARA mtg. & Hamfest planning committee meeting will be held this April to prepare for the "Lake Placid Hamfest 2002. This event will be held at the Lake Placid I Love NY Horse Show Grounds on Oct 12, 2002.

SOUTHERN NEW JERSEY: SM, Jean Priestley, KA2YKN (@K2AA) email ka2ykn@voicenet.com— ASM: W2BE K2WB W2OB N2OO N2YAJ N2XYZ SEC: KC2GID STM: K2UL. ACC: KB2ADL SGL: W2CAM. OOC: K2PSC. TC: W2EKB. TS: W2PAU. WB2MNF AA2BN KD4HZW WB3IJB WA2NBL N2QNX N2XFM JSARS Hamfest 2002, August 11, 2002. Bayville Firehouse. INFO: Ed-WA2NDA at wa2nda@ aol.com or 609-971-2792. Don't wait to establish your FRN number. It's needed to submit on-line or by paper. For help call CORES Help Desk at 877-480-3201 or e-mail to cores@fcc.gov. Battleship New Jersey has memberships available to families and individuals. Encampments to start soon. Toll free: 866-877-6262 www.battleshipnewjersey.org A GREAT PART OF HISTORY. Traffic report January QNI rpt: NJM 48 WA2OPY NJPN 218 W2CC NJSN 191 K2PB NJN (E) 233 & NJN (L) 172 AG2R. CMCNTS 60, KB2YJD JSARS 350, K2ATQ SJTN 61, KB2RTZ. SJVN WB2UVB no rpt . Tfc: K2UL 77, AA2SV 75, WA2CUW 59, WB2UVB 56, KB2RTZ 39, K2UL-4 33, N2VQA 22, WJ2F 17, KB2VYZ 8, N2WFN 6, KA2CQX 5, N2HQL 2, KB2YBM, KB2VSR, KC2ETU 1. PSHR: KB2RTZ 200, K2UL 162, WB2UVB 156, AA2SV 124, WA2CUW 97, KA2CQX 96, KA2YKN 91, KB2YJD 81, WJ2F 71, N2VQA 70, N2HQL 60, N2WFN 45, W2MC 16. WB2UVB wins K2SE Memorial VHF Traffic Handlers Award. NTS needs YOU as part of the solution.

WESTERN NEW YORK: SM, Scott Bauer, W2LC— Congratulations and welcome to Jason, KC2HUZ, and Mike, KB2CCD, each qualifying for their first PSHR. These two guys are active on the Central New York Traffic Net (CNYTN, 9:15PM, 147.30) and the Oneida County Traffic and Emergency Net (OCTEN, 6:30 PM, 145.45 & 9:30 PM, 145.17). Thanks to Jim, KA2IWK, a new Net Manager, for taking over the morning session of the Western District Net (WDN, 146.64), meeting Sat and Sun mornings. The Liverpool Amateur Repeater Club (LARC) recently had an auction which netted several hundred dollars for the club treasury with the help of some donated antique equipment that the club members refurbished. FB (fine business) pictures from the Radio Association of WNY (RAWNY) "Youth Night" in their bulletin. A fine turnout including Cub and Boy Scouts. Please mark down May 31, June 1, 2, 2002, on your calendar for the Rochester Hamfest, and ARRL Atlantic Division Convention, at the Monroe County Fairgrounds, Route 15A and Calkins Rd, sponsored by the Rochester Amateur Radio Association (RARA). I will be urging all ARRL WNY section officials to attend. Plan on stopping by the ARRL booth and ARRL forum to say hello to both the WNY Section Leadership and the Atlantic Division leadership. A great group of section managers attend from other division sections too. Be sure to bring your questions for all of us! Congratulations to Ed, KC2BEO, for being the "Technology Educator of the Year" in Ontario, Seneca, Wayne and Yates counties. Ed is the technology supervisor for Newark HS. Great job Ed! Hamfests: April 13, Drumlins ARC, Marbletown Fire Hall, Silver Hill Rd., Newark NY; May 4, Owego Hamfest by the Binghamton ARA. Net Summaries (Jan 2002): Net Manager (Sessions) QNI QSP. Sessions in () if less than 31. BRVSN N2OYQ 162 0; CNYTN WA2PUU 375 81; ESS WI2G 461 163; NYPHONE N2LTC 310 557; NYPON N2YJZ 457 292; NYS/E WB2QIX 388 251; NYS/L W2YGW 278 249; NYS/M KA2GJV 173 53; NYSCN W2MTA (4) 15 2; NYSPTEN WB3CUF 391 54; OARCN N2KPR (5) 41 6; OCTEN/E KA2ZNZ 1527 280; OCTEN/L KA2ZNZ 598 265; OMEN N2UC (1) 21 1; STAR N2NCB 313 28; TIGARDS W2MTA (4) 23 1; WDN/E N2JRS 532 107; WDN/L W2GUT 456 52; WDN/M KA2IWK (8) 112 12. Traffic (Jan 2002), * for PSHR, # for BPL: N2LTC#* 1981, KA2ZNZ#* 522, WB2IJH#* 505, KA2GJV* 442, NN2H* 298, W2MTA* 279, WI2G* 227, WB2QIX* 160, KB2KOJ* 152, N2KPR* 109, KB2CCD* 104, N2CCN* 84, W2LC* 80, KC2HUZ* 71, KG2D* 68, KC2EOT* 64, W2PII* 64, AF2K* 53, KB2ETO* 48, KA2DBD* 46, W2GUT* 39, KA2BCE* 38, K2DN* 27, WA2GUP* 25, KA2IWK* 24, N2WDS* 18, W2RH 14, N2ZWO* 12, KG2HA* 1. Digital, Rx/Tx: KA2GJV 15/1, N2LTC 698/436.

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: N3YEA, DEC-SO: KD3OH. DEC-N1: KB3A. DEC-N2: KA3UVC. DEC-S1: KA3HUK. DEC-S2: (vacant) DEC-Rapid Response: N3ZZI. DEC-OES: K3TB. Many of you are aware that the Board of Directors is considering the elimination of the contest line scores and the section news from *QST*. There are many reasons for this move and one of which is due to the increasing financial cost of producing the additional pages in the magazine. These segments would be moved to the ARRL Web site. A benefit would be that the space would be much greater and allow for more information to be distributed. I would appreciate hearing from anyone that has comments on this issue by April 15th so that I can present your ideas or concerns at the Atlantic Division cabinet meeting in at the end of April. As I write this, I know many of you will be preparing for Field Day activities. There have been some changes in the rules for this year so be sure to get the complete revised rules for Field Day 2002 at the ARRL Web site. While you are at the Web site be sure to look at this year's Field Day pin and t-shirt. Be sure to order yours early as they sale quickly. I would like to remind everyone that if you change your e-mail service to be sure to visit the ARRL Web site and change the information on your member page. We will be starting to send electronic newsletters out to the members that have subscribed for section news and need updated contact information. Clubs that would like their activities listed should send them to me. Contact information is on page 12 of each issue of *QST*. Help is needed in many areas for the delivering of messages, so please consider joining a traffic net. The section net is on 3983 kHz every evening at 6 PM. 73 de John Rodgers, N3MSE, WPA-SM n3mse@arrl.org.

CENTRAL DIVISION

ILLINOIS: SM, Bruce Boston, KD9UL—SEC: W9QBH. ACC: N9KP. STM: K9CN. PIC: N9EWA. OOC: KB9FBI. DEC-Central: N9FNP. DEC-S/W KB9AIL. According to The Races News there will be a one-day "ham cram" course for the Technician license on Saturday, May 4, at Harper College in Palatine. To register, call the college at 847-925-6300. Kishwaukee ARC will hold a hamfest on May 5 in Sandwich. The club has also started an Internet bulletin board at CommunityZero. AA9NK was recently elected to the Lake County RACES board of directors. RACES Member K9QED was featured in the Sun-Times for his work with the National Weather Service. The Schaumburg ARC has named K9AND as their Member of the Year. Until recently, he served as the SARC Public Events Coordinator. The Fox River Radio League held its annual recognition banquet on January 19. The 2002 officers of the FRRL are: Pres K9FE, VP W9AX, Sec AB9CH, Co-Treasurers KD9KN and KA9OBH. The Peoria Area ARC is considering a change to their scholarship, allowing an award of $1,000. The club is also preparing a silent auction to dispose of equipment that is no longer needed. PAARC officers for 2002 are: Pres KB9NW, VP KB9TLF, Sec K9DRF, Trea K9QZ. The Hamfesters RC held its annual White Elephant Sale on February 1. The Kankakee ARS held its annual banquet on January 12. Over 47 members and guests attended the Western Illinois ARC annual dinner in Quincy. The new treasurer of the Suburban Technical ARS is KB9WWS. The Sangamon Valley RC held its annual post-holiday party on January 19. The Starved Rock RC holds a net each Wednesday at 7 PM on 147.120 MHz. Members of the club have been working with the Illinois Veterans Home in LaSalle to introduce the residents to Amateur Radio. According to Halo, the newsletter of the Six Meter Club of Chicago, there is an informal Slow Scan TV net each Wednesday on 144.360 MHz around 7 PM. A six-meter roundtable takes place every Tuesday on 50.130 MHz USB at 8 PM. Tfc (Dec) WA9APQ 4. (Jan) NS9F 72, WD9F 67, NN9M 60, KD9YV 52, WB9TVD 36, NC9T 22, W9HLX 21, W9FIF 12, N9PLM 8, WA9RUM 7. ISN report de WB9TVD: QNI-248, QTC-105, sessions-31. 9RN report for cycles 1 & 2, 01/02, Sessions-62, Traffic-273, Avg./session-4 40, checkins-671, IL. Represented 91% by NN9M, W9HLX, KD9YV, KA9IMX, N9PLM. Ninth region C4 report for Jan, traffic 197, sessions 61, time 345, average 3.22, rate .571, percent rep 90%, QNI ILN K9CNP NS9F WD9F. W9VEY Memorial Net report de K9AXS 7 with 179 check-ins.

INDIANA: SM, Peggy Coulter, W9JUJ—SEC: K9ZBM. ASEC: WA9ZCE. STM: WA9JWL. OOC: AA9WD. SGL: K9JZZ. PIC: KB9LEI. TC: W9MWY. BM: KA9QWC. ACC: N9RG. Sympathy extended to the families and friends of Silent Keys: 1/7, Leland R. Penticuff, K9LHF, New Castle; 1/14, Thomas F. Wendt, W9MRE, Fremont; 1/14, David A. Moody, KD8NY, West Terre Haute; 1/18, Fredrick N. Gresso, W9JTC, Warsaw; 1/31, Dwight D. Valentine, W9EJJ, Darlington; and 2/6, Charles D. Rudicel, KB9OMC, Marion. They will be missed. There was a group of members of the Flying Pigs QRP Club International who competed in the annual "Freeze Your Buns off" winter field day activities sponsored by the Arizona ScQRPions. The team this year was KB9BVN, WV9N, W8DIZ, WB8ABE and WB6JBM. Lowest temp recorded during the 8 hours of operation was 27 F with steady 10 to 15 mph wind all day. Best DX was Rumi in Lithuania and Czech Republic. The

Continued on page 104.

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- 6M, 2M, & 70CM @ 5W
- 1.2 GHz @ 1W
- AM, FM, WFM
- 124 alphnumeric memories
- CTCSS encode/decode w/tone scan
- RIT and VXO for 1200 MHz
- Auto repeater

IC-V8000 2M Mobile Transceiver

- 75 watts
- ICOM DMS scanning
- CTCSS/DCS encode/decode w/tone scan
- Weather alert
- Weather channel scan
- 200 alphanumeric memories
- Backlit remote control mic

IC-756PROII All Mode Transceiver

- 160-6M @ 100W
- 32 bit IF DSP
- Enhanced 5 inch color TFT w/spectrum scope
- Selectable IF filter shapes for SSB & CW
- Enhanced Rx performance
- SSB/CW Syncronous tuning
- Multiple DSP controlled AGC loops
- Advanced CW functions
- 101 alphnumeric memories

IC-T7H 6W, Dual Band Transceiver

Dual Bands at a Single Band Price!

- 2M/70CM
- 70 alphnumeric memories
- 6W output
- CTCSS encode/decode w/tone scan
- Auto repeater
- Easy operation!
- Mil spec 810, C/D/E*1

IC-Q7A Dual Band Transceiver

- 2M/70CM
- Wide band receiver - 30 to 1300 MHz**
- 200 alphnumeric memories
- Auto repeater
- Includes AA Ni-Cad's & charger
- CTCSS encode/decode w/tone scan
- Mil spec 810, C/D/E*1

IC-2800H Dual Band Mobile

Mounting Kit Included

- 2M/70CM
- Dual band scopes
- 3" color TFT disp
- NTSC video input
- CTCSS encode/decode w/tone scan
- Selectable RF attenuator
- 232 alphnumeric memories
- Auto repeater

IC-746PRO All Mode 160M-2M

- 10-2M @ 100W
- 32 bit IF-DSP+ 24 bit AD/DA converter
- Selectable IF filter shapes for SSB & CW
- 102 alphnumeric memories

IC-V8 2M Transceiver

Commercial Grade Rugged

- 5.5W output
- 107 alphnumeric memories
- Customizable keys
- Auto repeater
- PC Programmable
- CTCSS encode/decode w/tone scan
- Drop-in trickle charger included

IC-2100H 2M Mobile Transceiver

- Cool dual display
- 50 watts
- CTCSS encode/decode w/tone scan
- Backlit remote control mic
- Mil spec 810, C/D/E*1
- Auto repeater
- 113 alphnumeric memories

IC-207H Dual Band Mobile

- 45W VHF (2M), 35W UHF (70CM)
- AM aircraft RX
- 182 memories
- CTCSS encode/decode w/tone scan
- Remote head capable
- Auto repeater

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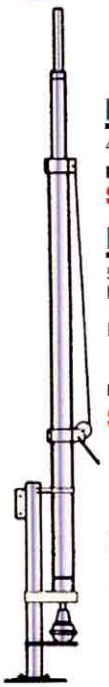

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TS-870S


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TS-2000

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team made about 75 contacts. Congratulations to David Pifer, N9YNF, Vigo County EC. He has completed all three of the ARRL's Emergency Communications Courses that are available via the Internet. He is also preparing to teach the ARRL course "Introduction to Emergency Communications" locally in the Terre Haute area. News was very scarce this month. Maybe it's the unusual weather we have been having. NM's ITN/WA9JWL, QIN/K9PUI/KJ9J, ICN/K8LEN, VHF/WA9JWL.

Net	*Freq*	*Time/Daily/UTC*	*QNI*	*QTC*	*QTR*	*Sess*
ITN	3910	1330/2130/2300	2822	151	1589	82
QIN	3656	1430/0000	216	109	945	56
ICN	3705	2315	35	13	215	35
Hoosier VHF nets (11 nets)			761	17	1209	50

D9RN total QTC 273 in 62 sessions IN represented 100 % by WA9ZCE, WA9JWL, KB9NPU, K9QDR, K9PUI, WB9QPA, W9FU, K9GBR, KE9AK, and N9KNJ. 9RN total. QTC 197 in 61 sessions IN represented by K9PUI, KO9D, WB9OFG, WB9UYU and W9FC. Tfc: W9FC 219, K9PUI 123, KO9D 118, WA9JWL 117, N9KNJ 82, WA9QCF 63, WD9HII 38, W9JUJ 35, KB9NPU 34, KA9QWC 25, WB9QPA 25, KA9EIV 25, WB9OFG 24, K9GBR 17, W9UEM 11, W9BRW 11, K9RPZ 10, K9ZBM 10, W9EHY 10, K9DIY 7, AB9AA 6, K9CUN 4, WB9NCE 3.

WISCONSIN: SM, Don Michalski, W9IXG—BWN 3985 0500-0715 W9RCW. BEN 3985 1200 KE9VU. WSBN 3985 1715-1800 K9FHI. WNN 3723 1800 KB9ROB. WSSN 3645 1830 N9BDL. WIN-E 3662 1900 WB9ICH. WIN-L 3662 2200 W9UW. With regret, I inform you that W9OMO, Ervin Busse, 90, is a SK. He was a member of the Manitowoc ARC. I've added to the section Web-site, www.w9ixg.eboard.com, a new note for interesting organizations for you or your club to tour. Please take advantage of these free tours! Also, added the schedule for the 2002 Storm Spotter Training Classes. Visit the site! The Sullivan Weather Amateur Radio Association (SWARA) is looking for new members! If people are interested in operating at the Milwaukee- Sullivan Forecast Office of the National Weather Service, please contact Tom, KA9EWJ, EC. tjkuch@execpc.com. Congratulations to Jeffrey Rymer, N9PQU, for being selected as 2001 M&M Club Ham of the Year! QRP DXCC? Jim Mans, AA9PB did it. He bagged 50 DXCC countries in 2 days & CW DXCC in 1 month on 5 watts! Congratulations to Judy Holtzman, W9GMH. She finally achieved her goal of becoming an Extra after over 20 attempts! Never give up on your dream! The section news is now available on the Web. Go to www.arrl.org/sect/WI for this news and lots more current information! January 9RN report indicates Wisconsin with 100% representation on the nets. 73, Don, W9IXG. Tfc: W9IHW 693, K9JPS 657, W9YPY 514, W9RCW 474, N9VE 414, K9GU 406, W9CBE 132, K9LGU 104, N9BDL 91, N9KHD 80, K9FHI 68, AG9G 64, N9CK 60, KG9B 52, KE9VU 52, W9YCV 51, WA7UVX 43, KB9ROB 36, W9UW 33, W9BHL 33, AA9BB 28, WB9ICH 19, W9RSX 12, WD9FLJ 12, N9JIY 8, K9UTQ 6, W9PVD 1.

DAKOTA DIVISION

MINNESOTA: SM, Randy Wendel, KMØD—Web site: http://www.arrl.org/sections. ARRL Minnesota Section Noon Phone net is now at noon rather than 12:05 effective Jan 2002.

Net	*Freq*	*Time*	*QNI/QTC/Sess*	*Mgr*
MSPN/E	3860	5:30 P	959/141/31	KXØN
MSPN/N	3860	12 P	447/63/31	WAØTFC
MSSN	3710	6 P	N/A	vacant
MSN/1	3605	6:30 P	319/110/31	KØWPK
MSN/2	3605	9:50 P	147/26/29	vacant
PAW	3925	9A-5P	3395/105/100	KAØIZA

Station Activity Reports/PSHR's: WAØTFC, WØLAW, KBØOHI, KXØN, KCØHAW, KØWPK, WØHPD, KØPSH, KN9U, WDØGUF, NØJP, WAØYSL, KØIKO.

NORTH DAKOTA: SM, Kent Olson, KAØLDG —Field Day is right around the corner, so it's time to start preparing. I hope to visit some of the sites this year. Our condolences go out to the family of Fred Passbrig, WØJMW, who passed away in December. Good luck to all those who are taking license classes in Bismarck and Fargo. Congratulations to Curt Freeman, KCØJVJ, as he assumes the role of President of the Theodore Roosevelt Amateur Radio Club in Dickinson. The Dickinson bunch has put up a new repeater at Sentinel Butte (443.675+). Check in to the Section's Nets as well as the Tenth Region Net if you can. Sometimes traffic needs to be passed, and ND has not been represented very well. Section Web site now has a self-paced Technician course on it. This will allow those desiring to get licensed but cannot attend a formal class, another method to help get their ticket. Section's Web site at: http://home.earthlink.net/~qtipf16/. HF NM KEØXT reports Goose River Net, 4/61/0; WX Net 54/1030/20; Data Net 30/788/13.

SOUTH DAKOTA: SM, R.L. Cory, WØYMB—The South Dakota School of Mines ARC has been reactivated and is reported they have about 16 members. LARK at Watertown will be at the Watertown Winter Farm Show—an annual event—held in February. The Novice Net Manger, NØMEA, reported 63 check ins in December with 5 sessions. They meet 7 PM Sunday evening on 3700. The Watertown Club will have the Little House on the Prairie Special Event Station this year. Huron ARC did it last year. They also have a 10 KW generator and are working on obtaining a trailer for it. They also have a 2-meter packet station that was set up at Emergency Management Center by KB8HMR and W6IVV. KØCX at Rapid City has reported some really nice contacts on 6 meters. Traffic reported for January was 363. PSHR for January was W6IVV 177, and WNØY 166.

DELTA DIVISION

ARKANSAS: SM, Bob Ideker, WB5VUH— This month's article is devoted to the Arkansas clubs & their memberships that offer the rest of us the opportunity to have fun at their hamfests. It's a lot of preparation time & effort by a group of dedicated hams. Without their hard work, countless times of having to make timely decisions & behind the scenes work that makes it look so professional, its results could be disastrous. Chairs this year include: Russellville, Margaret Alexander, KC5MCS; Harrison, Bill Carlton, KD5HBM; Fort Smith, Mark Clayton, WB5ONE & Art Sellers, W5UOS; & Little Rock, Jim Blackmon, K5VZ. Every one of the hamfests this year is ARRL sanctioned. Pse be sure to find them at their hamfest & thank them for what they have been willing to do for us. Go beyond them to also thank anyone you see working the desk at the entrance, someone getting you a refreshments, someone setting up rooms for forums, someone directing the traffic for flea market tables, someone running electric cords across the room for your needs, something you seldom might see or think about but what about the crew that has to help shutdown & clean up the facility. Without saying, thank anyone else you might expect who helped. Let's encourage them to know the effort was well worth their ideas & efforts. It is truly through teamwork that made them successful. Congratulations to each club. Traffic reports for Jan. include: K5BOC 62, WA5KQ 28, K7ZQR 26, WB5HIL 19, W9YCE 16, W5RXU 13, KO5E 12, KA5MGL 7. See details on Web site: http://www.all-arkansas-hams.org/Traffic Net Information.htm.

LOUISIANA: SM, Mickey Cox, K5MC—What belongs in *QST*? Be sure to read K1ZZ' s "It Seems to Us." column on page 9 in March 2002 *QST*. As Sumner reports, the ARRL Board of Directors will decide in July whether to eliminate Section News and contest line scores from *QST* and place these items on the Internet. Although K5UR, Delta Division Director, is not in favor of removing Section News, it appears that many other directors are leaning strongly at this time to eliminating both of these items from *QST*. If you think as I do that both of these items should remain in *QST*, now's the time to speak up! In addition, encourage your fellow ARRL members around the country to tell their directors to oppose any such attempts. Many thanks to W5PY for joining our section's leadership team as Assistant Section Manager. Mike's focus as the ASM will be to help recruit more new hams to join the League. KD5OEA and KD5BPW are new OES appointees. New officers for the Twin City Hams ARC are KM5YL, President; KD5KZZ, Vice President; WM5LA, Secretary/Treasurer; AC5VN, Director; and KM5QF, Director. New PSHR criteria will go into effect starting May 1 that will better recognize the public service efforts of ARES volunteers while continuing to acknowledge the efforts of our traffic handlers. Read the Public Service column in this issue for details. Tfc: K5IQZ 150, K5MC 110, KM5YL 58, W4DLZ 44, W5PY 28, K5DPG 15. PSHR: KM5YL 132, K5IQZ 129, K5DPG 121, W5PY 118, K5MC 118. Net Reports: sessions/QNI/QTC. LTN: 31/417/78. LCW: 31/215/75.

MISSISSIPPI: SM, Malcolm Keown, W5XX—Mississippi Section Web Page at arrlmiss@org. Web Master K5IBM at k5ibm@arrl.net. STM: KJ5YY. NM: WJ5K, KB5W, N5YNY, KM5UH, WB5ZED. The Jackson Amateur Radio Club (JARC) completed another successful Capital City Hamfest and ARRL Section Convention in Jackson on February 1- 2, 2002. Over 1100 visitors viewed the displays of 12 dealers and 75 flea market vendors with 165 tables of goodies. The 2002 Hamfest was dedicated to the memory of Joe P. "Brownie" Brown, W5ITL, who became a Silent Key in December 2001. Brownie was a longtime active member of the JARC. Our special guest from ARRL headquarters was Martin Cook, N1FOC, manager of the outgoing QSL Bureau. Hamfest Chairman AB5WF thanks all who helped make the event successful particularly committee chairmen KC5ZJE, KD5FUY, KC5FAD, W5LEW, KM5WN, KB5KKI, KM5GE, W5GEJ, and AC5SU. The Tupelo ARC has really hit pay dirt. They have been given use of the old Terminal Building at the Tupelo Airport. This includes an 80-foot platform tower, a meeting room, and three other rooms for station set ups! New officers for the Hattiesburg ARC are AC5E Pres, W4KGJ VP, N5MZ Sec, and KD5XG Trea. For the SW MS ARC KD5DHP Pres, N5ZNT VP, KB5WPR, Trea, and WB5ASP Prog Chm: and for the Lowndes Co ARC KC5OJR, Pres, KD5FUR, VP, KD5HVF, Sec, and W5BJM, Trea. Check out the QNI (below) of the MSPN for January. WOW! Regret to report the passing N5VMW of Columbia and K5BWW of Grenada. DEC/EC Reports: NN5AF, KD5CKP, KD5GWM, AC5SU, KB5ZEA, N5ZNT. LGL Report: AK5J. OO Report: AC5SU. PIO Report: W5KWB. TS Report: AC5GX. Net Reports: sessions/QNI/QTC: MSPN 31/4200/61, MTN 31/114/51, MSN 31/1279/14, PBRA 31/797/5, Jackson Co ARES/RACES 31/418/15, MSSN 21/75/1, WCMS ARES 13/129/7, LARC-Jones Co ARES 5/72/0, MCARA 5/63/0, Attala Co ARES 5/56/1, NW MS ARES 5/34/0, Lowndes Co ARES 5/52/0, SW MS ARES 5/63/0, MLEN 5/81/0, MAEN 5/91/0, JARCEN 4/78/0, MBHN 4/40/0, Bluff City Em Net 4/89/2, Central Miss SKYWARN 1/40/0. PSHR: WB5ZED 208, N5JCG 132, K5VV 128, KJ5YY 77, W5XX 74. Traffic: WB5ZED 841 (BPL), K5VV 84, N5JCG 38, KJ5YY 22, W5LEW 21, W5XX 4.

TENNESSEE: SM, Terry Cox, KB4KA—ACC: KB4KA. ASM: K4DIT & K4PZT. SEC: KB4G. STM: KR4TT. TC: KB4LJV. OOC: KE4KMG. SGL: KC4POI. PIC: N4WSM. January 2002 has brought a lot of change in the Tennessee Section! O.D. Keaton and most of the folks who have been our leaders for the past 10 years have opted for a well earned "retirement". We all owe a big "Thank You" to WA4GLS, Milo-WB4DYJ, Jim-WD4JJ and Wylodean-WA4HKU. We appreciate James-KB4LJV for staying on for another two years as TC. If you have Internet access please check out www.tnarrl.org, our new section Web page. If the news isn't found in *QST* it will be on the Web page where we have unlimited space. Take advantage of the Certification & Continuing Education courses offered by the ARRL. There are three ARES courses offered at $40 ea. and so far Barbara-KE4BUU, JD-K4USN, Dan-AA4HV, Ham-W4GMM & Greg-N4WSM have completed EC001, Michael-KM4H, Vollie-W4TDB & Peter-KG4ALY have comp. 001 & 002 while Sheila-KB4G has completed all three! Details are found at www.arrl.org/cce/. If you don't have Internet access ask KB4G or KB4KA for additional info. The Lakeway ARC hamfest at Morristown Jan.5th was a resounding success! The SCARA hamfest Jan. 19th in Gallatin was also well attended, especially by the Section leadership, with six of the nine cabinet members present. Weather related activities played a big part in January in the Section, with flood being the primary concern. Section personnel worked with the Memphis, Nashville and Morristown NWS offices to assist our citizens. More than 100 additional hams were involved in these activities in some capacity in the Central Tennessee area. The TN Contest Group got good news in January-the ARRL BOD voted to allow a "section" variant to the 175 mile radius rule for club participation. This allows the possibility for all Tennesseans to participate together in ARRL

contests. The Dec/Jan issue of METERS announced ND4F moving up to District EC and K4HSM taking over as the Knox County EC. DRN-5 rpt. Sess 62, Msg 687, TN rep 84% by KE4GYR,WA4FNY,W4OGG,WB4JGK & WA4LGH. Tfc: KE4GYR 67, WA4HKU 34, KB4KA 29, N4PU 20, K4QQ 13, WB4DYJ 13, WA4GLS 11.

GREAT LAKES DIVISION

KENTUCKY: SM. John D. Meyers, NB4K: ASMs N4VGI, KJ4W, WB4CTX, WA4SWF, KD4PWL. STM: K4LID. TC: KD4IXQ. SEC: KA4MAP. PIC: W2ZBY. OOC: K4LRX. SGL: WB4KY. ACC: KE4MZP and Silent Key Administrator K4LID. Silent Keys for January: Ernie Ball, KF4QDH, Stanley Flora WA4WMM, and Billie Nielsen, K0QHF. Lincoln Trail ARC (Elizabethtown) hamfest April 6, James R Prichard Community Center, contact person e-mail: N4TFK@QSL.NET. The Big Sandy ARC hamfest is May 4, held at the Louisa Middle School, contact person e-mail: wa4swf@arrl.net. The Ky QSO party has been revived by the Bullitt ARS club, all are invited to participate on July 6 between 1600 and 0400 Z info and rules can be found at *http://www.qsl.net/ky4ky/kyqsopartyrules.html.*

Net	*Sess*	*QTC*	*QNI*	*NM*
KEN	4	6	81	KA4MAP
WARN	4	2	93	KA4MAP
7.DARN	5	5	6	WD8JAW
NKEN	5	6	42	WD8JAW
9RN Cy 1, 2	62	273	671	KF4UBX
TSTMN	31	33	456	KB8GWL
KYN	30	40	319	K4AVX
WTEPN	5	1	52	KO4OL
KSN	31	26	227	KO4OL
KTN	62	71	2013	KB4VKS.

Tfc: K4MHL 10, K4DZM 12, K4UNW 10, NB4K 14,K4TXJ 4 WD8JAW 44, K4AVX 40, KO4OL 44, WB4ZDU 10. PSHR: NB4K 110, KO4OL 103.

MICHIGAN: SM, Dick Mondro, W8FQT— I would like to thank the Oakland County Amateur Radio Society (OCARS) for having me out to their February Meeting. What a wonderful audience! Sandy and I were made to feel welcome by "Feedline" Editor Bill Jones N8KF and President Bill Wallace KC8JAY and the members of this very active club. Congratulations go out this month to the newly elected officers of the Cascades Amateur Radio Association. They are President James Baker N8RWK,VP Marvin Fischer KC8ALB, Secretary Daniel Astleford WA8EAN, Treasurer Lee VanAlstine KA8VMJ, Activities Chairman Dennis Byrne KC8IJZ and Trustee Harlan Cooley N8RDP. We also offer congratulations to the new officers of the Genesee County Radio Club, President Terry Pender KB8ZB, Treasurer Verle Winningham K8VW, and Secretary John Kroll K8LJG. Our Section Emergency Coordinator (SEC) Ray DeVlieg KB8VNI has announced several new appointments in the ARES Groups as follows: Larry St. George KC8RVI as Emergency Coordinator (EC) of Clinton County, Samuel Nabkey K8SN as EC of Kent County, Bruce Wagner N8LYL as EC of Gladwin County, Lowell Sheely KC8JJT of Jonesville as Official Emergency Station (OES), James Duram K8COP of Whitehall as OES and Harlan L. Cooley N8RDP of Jackson as OES (Harlan also serves as EC of Jackson County). Thanks to all of you for accepting these very important Field Organization Appointments. These appointments require dedication to public service and I congratulate each of you for your contribution of time and effort. Take a look at our new Michigan Section Website at www.arrl.org/sections/MI.html. 73, Dick. Tfc reports for January 2002: N8EIZ 336, KB8ZYY 319, K8GA 292, WB8SIW 245, K8LJG 225, K8AE 155, W8RTN 155, WX8Y 149, AA8PI 141, WR8F 100, VE3EUI 83, W8RNQ 72, AA8SN 62, K8ZJU 57, K8UPE 36, K8YB 31, KB8GT 31, WA8DHB 29, K8AMR 28, WB8RCR 28, N8UN 26, W8YIQ 24, N8JAT 23, KA8DDQ 23, KI8GR 15, NX8S 14, W8WOJ 12, K8FE 10, KA8LAR 10, N8EXV 9, W8ZNH 8, W8NGO 3. Deadline 5th of the month. Please support the following Section Nets:

Net	*QNI*	*QTC*	*Sess*	*Net Mngr.*	*Freq.*	*Time*	*Day*
QMN	814	337	77	WB8SIW	3.663	6:30&10 PM	Daily
MITN	561	349	31	N8FPN	3.952	7 PM	Daily
GLETN	667	109	31	VE3SCY	3.932	8:30 PM	Daily
UPN	1255	47	35	AA8SN	3.921	5 PM	Daily (Noon Sun.)
WSSBN	944	37	31	K8CPW	3.935	7 PM	Daily
SEMTN	290	290	70	WI8K	145.330	10:15 PM	Daily
MACS	271	72	29	W8RNQ	3.953	11 PM	Daily (1 PM Sun.)
VHF	537	00	78	KB8ZYY	Various		
MI-ARPSC	64	3	4	W8FQT	3.932	5 PM	Sunday (Alt. 7.232)

OHIO: SM: Joe Phillips, K8QOE, Fairfield, (to contact me, see page 12 or check out the Section Web Page at www.arrl.org/sections/OH.html.) For club presidents and newsletter editors, here are a couple of neat ideas to increase participation. From Lake ErieARA editor, Bryan Torok, N8OOF, Cleveland, comes the offer he makes to his membership to submit ANY ham radio photos, film or digital, to him for publication in "SPIRIT OF '76 & '88" newsletter. Any film costs involved? Send to Bryan and the club. Quick way to get your photo and name in the newsletter and top notch idea for getting more members to participate in the club. Then there is the idea of Ken Massie, WN8F, Irontown, for awarding co-editor status (your actual name and call in the masthead) for the newsletter, HELLO RADIO, for members of ARES, Lawrence County, who have written articles in three consecutive issues. He will name you EX-co-editor, (again in the masthead) if you then miss 3 issues...In case you wanted to know, Robert High, KA8IAF, Rockford, points out that Ohio, with 30,200 licensed amateur radio operators, is the fourth most in the US behind California, Texas, Florida and New York (which barely beats us by less than 2,000). However as a Section, The Ohio Section is the ARRL's biggest cause those other states have 2 or more (CA has 9) sections...ASM Mary Carpenter, N8OAM reports that in 2001, Central OhioARES of Franklin County donated 6,079.5 hours in public service which equates to a $60,795 value at a dollar per hour. Equipment usage amounted to $611,400 (at the same $1 per hour) or a total of $672,195 value to Franklin County. Anyone else top this?... Let's not forget June Field Day is just around the corner and

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100W 160-10M. Auto antenna tuner. DSP Filter.

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GP-9 2M/70Cm CA-2X4MAX **$179.95**

GP-15 52/146/446 MHz **$149.95**

CX-333 146/222/446 MHz Base Repeater **$169.95**

B-10 144/440 MHz Mobile Antenna **$39.95**

B-20 144/440 MHz Mobile Antenna **$49.95**

SBB1 144/440 MHz Mobile Antenna **$39.95**

SBB2 144/440 MHz Mobile Antenna **$39.95**

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EX-107RB 144/440 MHz 29" Antenna **$52.95**

AH-510RSMA 6M/2M/440 MHz Telescoping SMA **$59.95**

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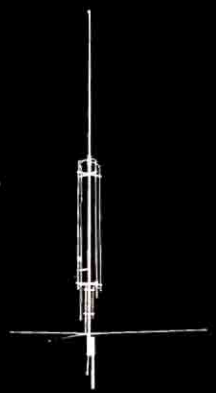
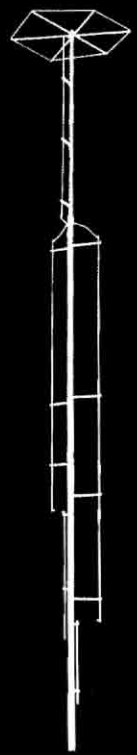
GAP: THE PERFECT ANTENNA

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



Eagle DX

Challenger DX



Voyager DX

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

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

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

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

The secret is out and people in the know say:

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

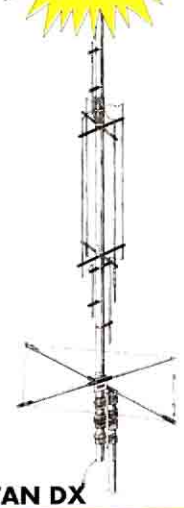
73–"This is a real DX antenna, much quieter than other verticals."

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

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

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

Celebrating 10 Years 1989-1999



TITAN DX

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

MODEL	BANDS OF OPERATION											HT	WT	MOUNT	COUNTER-POISE	COST
	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m					
Challenger DX	■	■	■	■	■		■		■	■		31.5'	21 lbs	Drop In Ground Mount	3 Wires @ 25'	$299
Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	$309
Titan DX			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	$339
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	$419

GAP

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proper planning means now...OHIO SECTION CONGRATS: (A) To Rob McPherson, N8OMW, Hamilton, and the Butler CountyVHF Assn, for completing the well stock ham shack at the D. Russell Lee Vocational School in Butler County; (B) To John Lehman, K8PJ, Columbus, for receiving the COTN, N8IBS Memorial Merit Award; (C) To all Ohio VECs who steadily day-by-day keep ham radio active by upgrading hams or making new ones and getting almost no thanks from anyone for their efforts..OHIO SECTION APRIL HAMFESTS: (13) Hamfest and Computer Show at Garfield Hts, (20) Jackson County ARC at Coalton; (28) Athens County ARA at Athens and (28) 20/9 ARC at Canfield....de K8QOE. Traffic reports (Jan):

Net	QNI	QTC	QTR	Sess	Time	Freq	NM
BN (E)	156	61	256	31	1845	3.577	WD8KFN
BN (L)	192	89	276	31	2200	3.577	NY8V
OSN	125	43	430	31	1810	3.708	WB8KQJ
OSSBN	2341	852	2315	93	1030, 1615, 1845	3.9725	N8IO.

Tfc: N8IXF 353, N8IO 339, K8PJ 267, N8BV 211, WD8KFN 190, KD8HB 178, W8STX 160, N8IBR 133, N8RRB 117, WA8SSI 117, WA8EYQ 112, WB8SIQ 111, N8OD 103, AB8KB 98, N8VWE 97, N8DD 93, N8TNV 88, KC8DWM 86, KC8FCC 77, KB8SBK 77, W8PBX 72, W8RPS 70, W8RG 65, N8CW 62, KC8HTP 58, KI8IM 53, N8GP 52, W8QIW 47, NS8C 42, WB8HHZ 41, NY8V 38, N8YWX 36, WD8KBW 33, K8CAV 27, W8BO 25, KB8ESY 21, KC8KYP 21, KC8PDY 13, KC4IYD 16, N8WLE 16, K3RC 14, K8QIP 11, KC8RXL 7, N8RAK 6, KB8DUX 5, WB8IOW 3.

HUDSON DIVISION

EASTERN NEW YORK: SM: Pete Cecere, N2YJZ— STM: Jim Peterson, K2CSS. SEC: Ken Akasofu, KL7JCQ. ACC: Sylvia Stone, K2SLY. SGL: Herb Sweet, K2GBH. PIC: John Farina, WA2QCY. BM: Ed Rubin, N2JBA. OOC: Hal Post, AK2E. TC: Rudy Dehn W2JVF. ASM: Tom Raffaelli, WB2NHC. ASM: Bob Chamberlain, N2KBC. ASM: Andrew Schmidt, N2FTR. ASM: Richard Sandell, WK6R. ASM: Phil Bradway, KB2HQ. See you at the Mt. Beacon ARC Hamfest! Looking forward to seeing many friends, and looking for some good deals. Let me know what ideas you might have to improve the section and amateur radio. You have a staff of many working hard to make Eastern New York even better. 73 de Pete N2YJZ n2yjz@arrl.org. January - PSHR: WB2ZCM 152, K2CSS 150, N2JBA 149, KC2DAA 149, N2YJZ 148, WA2YBM 115, K2YS 108, KC2HUV 111, N2RTF 101. Station Traffic: K2YS 139, N2YJZ 131, K2CSS 110, KC2DAA 88, N2JBA 60, WA2ZCM 58, N2TWN 42, WA2BSS 37, W2AKT 28, KC2HUV 28, N2RTF 20, K2AVV 19, WA2YBM 11, KC2BUW 2, N2AWI 2, KL7JCQ 1. Net Reports: QNI/QTC+QSP AES 43/8 CDN 237/117. ESS 461/326, HVN 768/234, SDN 420/157, NYPHONE 310/1121, NYPON 457/588, NYS/E 388/526, NYS/M 173/114, NYS/L 278/539, NYSPTEN 391/108, CHN 165/70.

NEW YORK CITY / LONG ISLAND: SM, George Tranos, N2GA—ASM: KA2D, N1XL, K2YEW, W2FX, KB2SCS. SEC: KA2D. ACC: N2MUN. PIC: K2DO. TC: K2LJH. BM: W2IW. OOC: N1XL. STM: WA2YOW. SGL: N2GA. The ARRL Board, at its January meeting, agreed to defer their decision until July on whether to eliminate Section News from *QST*. You still have a chance to make your feelings known on this issue - contact Hudson Division Director Frank Fallon, N2FF. SEC Tom KA2D reports that he moderated the HRU 2002 ARES forum with Charles Hargrove, N2NOV, as the featured speaker. Mark, KC2ENI, put together a very informative Power Point presentation. Jeff N2HPO of SATERN was also a guest speaker. The forum was well attended and the Q&A was excellent. Tom has been invited as the keynote speaker at "Communications Academy 2002" in Seattle, WA. Communications Academy 2002 is a training workshop for volunteer emergency communications. Their URL is http://academy2002.org. ARES will be supporting the March of Dimes Superwalk on Apr. 28 in Long Beach and Glen Cove - contact Nassau DEC George WA2WKV to help out. STM Charlie WA2YOW reports Bill, WB2GTG, has made the BPL again this month - congratulations! BM Mike Christopher reports increased airing of ARRL bulletins on area repeaters. Congratulations to Mike on his recent marriage to Linda KC2IVP. The new officers for 2002 of the Order of Boiled Owls Contest and DX Club are: President - Tony N2UN, VP - Les W2LK, Secretary - Dennis K2SX, Treasurer - Andy K2LE. KCRC has moved their meeting night to the Third Wed. of the month at Floyd Bennett Field, Brooklyn at 8 PM. The 2002 officers for The Nassau Amateur Radio Club are: President - Phil N2LVG, VP - Dave W2UQ, Secretary - Jim W2KFV, Treasurer - Herb N2XXP. Please e-mail me with your club's information and I will get it in my monthly newsletter and on the Web. Volunteer Exam sessions, club listings, upcoming events and more are available on the NLI Web site - www.hudson.arrl/nli. Tfc: WB2GTG 824, N2AKZ 225, WA2YOW 151, KB2KLH 115, K2GCE 46, KA2YDW 40, N2WGF 38, N2AVY 37. KE2SX 32, KA2UEC 30, AB2IZ 16, WA2VZK 14, N2TEE 6.

NORTHERN NEW JERSEY: SM, Bill Hudzik-W2UDT—ASM: K2WJ. STM:WB2FTX. ACC: N3RB. SEC:K2SO. OOC: K2ZD. SGL: K1VX. Web page:www.arrlhudson.org/nnj. Hamfest season is in full swing! Please support the various NNJ clubs who put on these events. It takes lots of work and effort to make the hamfests happen. Several clubs provide other activities such as VE sessions and short seminars not just tailgating. You may be surprised that a hamfest can be a learning experience. It's encouraging to hear clubs, like Tri Country RA, are starting Elmering programs to help new hams. Other clubs have started up test equipment pools or, such as BARA, video lending libraries. These activities go a long way to encourage and attract membership. NNJ lost two active hams recently; WA2QHL and WA2YNO. They will be missed by their many friends. The 10-70 RA has their new 2M and 440 repeaters up and running. Congrats to my neighbor N2DZW who upgraded to Extra and then got his initals on a new vanity call: W2PES! The HF bands and even 50 MHz have been producing outstanding DX. If you have not done so, subscribe to our W2 QSL Bureau which is run by the North Jersey DX Assn. Many new DXers are losing out on QSL cards by not having their calls on file with the QSL Bureau. Visit the NJDXA Web site at: njdxa.org for an explanation on how the bureau works. My thanks to the NNJ clubs who have put me on their newsletter mailing list. Check the section web page for up-

dates on new call letter license plate forms. The DMV may have new ones by the time this is in print. Please continue to support our Section traffic nets. 73, Bill Hudzik, W2UDT.

Net	Sess	QNI	QTC	QSP
NJM	12	48	20	16
NJPN	35	218	56	45
NJSN	31	191	21	19
NJN/E	31	233	106	82
NJN/L	31	172	61	57
CJTN	31	262	53	42
NJVN/E	31	509	73	70
NJVN/L	31	481	44	43

Tfc: W2MTO 121, K2VX 65, N2OPJ 58, KB2VRO 53, N2GJ 50, KJ2N 48, N2RPI 37, N2BVM 35, K2PB 23, KC2ANN 23, K2DBK 22, N3RB 22, W2CC 17.

MIDWEST DIVISION

IOWA: SM, Jim Lasley, N0JL—ASM: N0LDD. SEC: NA0R. BM: K0IIR @ W0CXX. SGL: K0KD. Well, the time has come for me to consider what to use for on the Web. I have access to more space and therefore can use more schtufff. (technical term of art) I know that it will evolve and the actual content should be not only more, but better and much more current. Getting there may be painful for all of us. SWIARC had their repeater working correctly again. Coverage is back to normal. KC0ECI has a new repeater on 444.025 near Red Oak. I see that last fall SWIARC had a presentation on the OO program presented by KE0XQ and WB0CMC. I understand K0JGH has a new rig and N0SM is building TWO 20-meter transmitters AND a 20-meter transceiver all QRP. All but six of the GRARC have paid 2K2 dues! Good effort! They are also having a Tech class and some are learning CW. Great again. TSARC did elections the easy way. They kept the same ol' bunch! Iowa was 92% DTRN with WA0AUX, W0FNN, WA0KLD, and KB0RUU. We were also 100% to TEN cycle 4 with WB0B, N0JL, N0SM, W0SS, and W0YLS. Keep it up! N0XWI received the Win Mager award from DMRAA. Congratulations, Ron! DRAC does exams on odd numbered months. Newsletters were received from OARC, SWIARC, CVARC, GRARC, TSARC, DMRAA, DRAC. Traffic: W0SS 177, KB0RUU 168, WB0B 37, N0JL 20. 73 de N0JL.

KANSAS: SM, Orlan Cook, W0OYH—ASM/ACC/OCC: Robert Summers, K0BXF. SEC: Joseph Plankinton, WD0DMV. STM: Ron Cowan, KB0DTI. PIC: Scott Slocum, KC0DYA TC: Rick Carver, WA0KS. SGL: Steve Hamilton. Congrats to Preston, W0WWR, for the 948 points BPL. He makes BPL often meaning handling 500 messages or more per month. This news column is being moved to the ARRL Web pages as I mentioned last month. This one will be printed in *QST*. In the next few days I will attempt to load it on the Web, so look for it. I will be able to edit or update it any time I want. Pse welcome KC0GDV, Jim McCarthy, to our ranks as EC to Jefferson Co. KC0KLC, Mike, EC of McPherson Co. KB0DTI, Ron, our STM, now also EC of Linn and Bourbon Co. KI0BK, Jim, has joined us as TS. KC0IDI, Reid, is our latest ORS. N0OU, Gary, TS, has become a SK. Once agn, I want to take this space to thank all of you for being there for your communities via ham radio. Dec. Kansas Nets: sessions/QNI/QTC, KSBN 31/1183/78 KPN 23/341/41 KMWN 31/681/507 KWN 31/1007/669 CSTN 26/2036/ 132 QKS 59/234/91 QKS-SS 11/33/6 SEC55/675/15QNS KB0AMY KC0AUH N0BTH K0BXF KC0CIG WD0DDG AA0IQ W0NXS KB0WEQ KB0ZWK WD0DMV Joseph SEC. TEN Ks 98% 62/QNI/251 AA0FO K0PY W0WWR NB0Z W0SS/Mgr. TRN 62/636/299 Ks 90.4% with KB0AMY W0FE KC0IDI N0KJ AA0OM W0WWR. Ks tfc: W0WWR 948, K0PY 83, KB0DTI 59, NB0Z 59, N0ENO 21, N0RZ 19, W0OYH 17, W0FCL 17, N0ZIZ 7, KC0GL 5. This space reserved for URS.

MISSOURI: SM, Dale Bagley, K0KY—ASM: John Seals, WR0R. ASM: Bill Coby, KB0MWG. ASM: Larry Ballew, AB0HP. ACC: Keith Haye, WE0G. OOC: Mike Musick, N0QBF. STM: Charles Boyd, KE0K. SEC: Patrick Boyle, K0JPB. BM: Brian Smith, KI0MB. ATTENTION ARRL MO SECTION MEMBERS: The ARRL Board of Directors are considering a proposal to move the Section News, Contest Line Scores and net reports from *QST* to the ARRL Web site and will vote on the proposal in July. If you approve of the move or if you object to the proposed actions of the BOD, please send a QSL card to Wade Walstrom, W0EJ, address and e-mail on page 10 of *QST*. Please let your opinions be know prior to the July decision if you care about this issue. In the March Section News, I made a typo and didn't correctly identify Gene Bess, KC0IUO as the DEC for District I. Sorry for the error on my part. Patrick Boyle announced that Mark Carpenter, N0ZOF, of New London, MO, will be the EC for Ralls and Marion County. Dean Bickford, K0PHI, of Kimberling City, MO, has been appointed as an Official Relay Station. Glad to have the new appointees on board. The Joplin Hamfest will be April 13th and on April 27th the Ararat Shrine Hamfest will be held in Kansas City. Hope to see a great turnout of Amateurs at these event. At the State Emergency Management Agency Communications Conference at the Lake of the Ozarks, Patrick Boyle presented a certificate of merit to Greg Hibbard, W0ENW, for 20 years as EC for Pettis County. Kurt Bleich, KB0HNR, DEC for Dist. F presented a program on the statewide 6 meter / 2 meter packet system and 75 meter ARES net. There were a large number of EC and DEC from all areas of the Section at the meeting. An ice storm left a path of destruction across Missouri in February from Kansas City to Hannibal, MO. Many ARES operators pitched in to help in the effort to provide needed communications. Patrick Boyle, K0JPB, SEC provided ARRL HQ with the information that was made into an interesting article on the ARRL Web site Feb 6 Net/Sess/QNI/QTC/NM: WAARCI 4/96/0/N0VJ; Sullivan ARC 4/47/4/KB0ROX; Audrain ARC/5/67/2/WB0SEN; MTN 31/599/86/K0DAT; Jackson Co ARES 4/47/0 K0UAA; Rolla Billboard 30/506/18/ NA0V. Tfc: KE0K 7.

NEBRASKA: SM, Bill McCollum, KE0XQ—ASM: W0KVM, N0MT, WY0F, WB0ULH & WB0YWO. Congratulations are in order for Bob Rudd, W0EUT of Omaha. Bob celebrated his 93rd on February 3. Bob is also celebrating his 75th anniversary as a licensed Amateur Radio Operator. On Sunday January 20, my wife (KB0FSI) and I attended the annual dinner meeting of the Plattsmouth Amateur Radio Club. Despite cold weather and 9 inches of snow several days earlier, I attended the Kearney Hamfest on February 2nd. I would estimate there were 200 in attendance. A big "Thank You" goes out to the Midway Amateur Radio Club for sponsoring this event. Net Reports: NESN, QNI 1004, QTC 8 & 31 sessions. NCHN QNI 244, QTC 6 & 30 sessions. MIDNE 2m ARES, QNI344, QTC 16 & 31 sessions. MARES, QNI 177, QTC 2 & 4 sessions. NMPN, QNI 1789, QTC 34 & 31 sessions. NPPARC, QNI 20, QTC 2 & 3 sessions. NE40, QNI 490, QTC 6 & 28 sessions. Tfc: K0PTK 97, KE0XQ 18, WY0F 8, WA0ZCM 4, WA0ZCN 4, W0UJI 4, KA0DOC 4, W0DED 2, W0EXK 2, KA0O 2, AB0NN 2, KA0DBK 2. PSHR: KC0HOX 32, KA0DBK 91, KB0YTM 15.

NEW ENGLAND DIVISION

CONNECTICUT: SM, Betsey Doane, K1EIC—ASMs: KZ1Z, NK1J, K1STM. BM: KD1YV. OOC: W1GC. PIC: W1FXQ. SEC: KB1CTC. SGL: W1UTQ. STM: K1HEJ. TC: W1FAI. April 14 is the date of the Southington Hamfest so mark your calendars now—looking forward to seeing you there! A new Digital Amateur Radio Emergency net (DAREN) has been started by David, N1YVV, using PSK31 for starters. If interested, contact N1YVV n1yvv@hotmail.com. Don't miss current news shown on the CT Section area on the ARRL Web Page. Bulletin Manager Jim, KD1YV, and I try to update it weekly. Congrats to Michelle, N1PNT, on a very fine article published recently in the Danbury Times about her work in Amateur Radio. Michelle is a former Hiram Percy Maxim Award winner. Ham ops interested in emergency communications in the Lower Nauguatuck Valley met for the first meeting at the Strand Theater Seymour. Approximately 35 were in attendance. Speakers included DEC Howie, W1HO, SM Betsey, K1EIC, SEC Mike, KB1CTC, ADEC Bob, N1RKZ, and ADEC Barb, K1EIR. A new ARES net called VARES will be held on Monday's at 7:30 PM alternately on the 146.985 and 145.19 repeaters. Members of NARL are also starting an ARES net Monday's 8:00 PM on the 145.45 repeater. The TIPS (Training Information and Public Service Net) meets statewide Tuesday evenings 7:30 PM on various linked repeaters. Contact net manager Ken, KB1EPU, kb1epu@arrl.net for information. At this writing, the Section cabinet plans to get together for a general meeting in March. Congrats to Dan, KY1F, on his new home in Marlborough—welcome back on the nets Dan! Four CT clubs were represented at the New England Div Cabinet Meeting: ICRC, NEWS, Candlewood ARA and the Bears of Manchester. Great to see you all there! Net/sess/QNI/QTC/NM: NVTN 30/241/46/KB1CTC; WESCON 31/293/79/KA1GWE; ECTN 31/322/210/WA4QXT; CN 30/103/57/N1AEH; CPN 31/252/94/N1DIO; BOMN 25/189/200 NM1K. Tfc: NM1K 2285, KB1CTC 373, WA4QXT 346, KA1VED 234, K1UQE 187, KA1GWE 143.

EASTERN MASSACHUSETTS –SM, Phil Temples, K9HI—ASMs: WA1ECF, N1GTB, WA1IDA, N1UGA, AA1MO. ACC: N1DHW. BM: N1IST. OOC: K1LJN. PIC: N1PBA. SEC: W1MPN. SGL: K3HI. STM: NZ1D. TC: N1UEC. e-mail list: ema-arrl@mailman.qth.net, web: http://www.qsl.net/ema-arrl. The recent EMA ARES Emergency Communications workshop in Peabody was well-received by all. Stay tuned for future EMA workshops. At this writing a state-wide Simulated Emergency Test involving ARES, RACES and SKYWARN is scheduled for March 23. WF1F is currently experimenting with NetMeeting software. He plans to establish an audio/video link to the International Space Station later this year! Patriot DX Assoc. showed the FO0AAA DXpedition video at a recent meeting. Sturdy Memorial Hospital ARC is QRV for the ARRL DX contest. There's plenty of activity each weekend at the USS Salem ARC shack. This SM visited the Northeastern Univ. Wireless Club. Their 145.31 MHz, PL 123.0 Hz repeater has returned to the airwaves. NUWC also sports a live Web cam and short wave audio feed at http://piro.dnsq.org. As of this writing, Billerica ARS is sponsoring a License-in-a-Day course. Has everyone seen the new EMA Section link on the ARRL web home page? Kudos to Southeastern MA ARA for agreeing to host the next CEMARC meeting. KB5TBB is the new trustee of Sturdy Memorial Hospital ARC's 147.195 MHz repeater. K1VR presented at YCCC about techniques for dealing with housing developments that have covenants and restrictions. You know that spring can't be too far away when talk turns to Hoss Traders. SEC W1MPN spoke at a recent Cape Ann ARA meeting. Falmouth ARA is hosting a License-in-a-Weekend class. It carries one CEU credit! See http://www.falara.org for details. Did you ever wonder why club members become ex-club members? Billerica ARS is conducting outreach to its "fallen angels," also known as "club members who have fallen into the noise floor." Cape Cod ARES will soon hold follow up training with the Martha's Vineyard ARES, reports DEC WQ1O. Boston ARC is looking into providing emergency communications support at area hospitals. Final plans are being made for the introduction of a New England-wide QSO Party. Thanks to K1KI helping to make NEQP a reality. 73 de K9HI. Tfc: W1GMF 2221, KW1U 781, NG1A 713, N1LKJ 511, N1AJJ 101, K1BZD 73, WA1FNM 71, N1TPU 64, K1SEC 62, WA1LPM 59, KD1LE 55, NZ1D 52, KB1EB 43, N1IST 40, NC1X 28, KB1CVH 11.

MAINE: SM, Bill Woodhead, N1KAT— ASMs: WA1YNZ, KA1TKS. STM: N1JBD. BM: W1JTH. SGL: W1AO. ACC: KA1RFD. OOC: N1RY. PIC: KD1OW. SEC: N1KGS. Asst. Dirs: KA1TKS, K1NIT. Web Site: N1WFO. During the later part of Jan. through the middle of Feb., if you were wondering if your SM abandoned you; fear not - for it was a long-overdue vacation. At the same time, I was upgrading my Internet provider with a faster, broad band service. So for the time being, I recommend you to use my N1KAT@arrl.org e-mail address. This is a reflector service offered to all League members. With this service, you can keep your e-mail address the same, should you change providers and e-mail address. Also, I would like to apologize for any lost e-mails that were sent or not responded to in a timely fashion. Next time I wander down to Paradise, I will be sure to bring a lap top, so I won't be so delinquent. I was able to check into the New England Party Line Net at 7 am on 14.293 MHz and find out why the snowbirds migrate south. It's a great way to keep in touch with our seasonal southern Ham family. Also, I would like to let 90% of the Seagull Net members know that they were 55 to 57 in EL97vd. I would like to say congratulations to Phil, N1IFP, on having his school in Sydney on the air as part of the School Roundup. Hopefully, this will result in a new source of young voices on the air. It was a pleasure to work his students on 28 MHz. 73, Bill, N1KAT.

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NEW HAMPSHIRE: SM, Al Shuman, N1FIK (n1fik@arrl.org) (www.nhradio.org)— The beginning each month's report will start with the number of new hams. For Feb it was just "12". The results of the NH QSO Party will be available on the NH site by the end of April. By the time this column appears in QST it will have been announced that the NEW ENGLAND QSO PARTY is a reality to be held the first week-end in May. Contest information including rules are available through a link to the NH web page. The ARRL Board of Directors decided to put off the vote regarding the removal of the SM's columns until the July meeting. For those of you who are web enabled, HQ has dedicated space on the League Web site for SM notifications and alerts. For those who are interested in past New Hampshire SM columns I have established "1993 to present" archives on the NH Web site. It is our intent to eventually show all NH SM columns going back to the start of the League. NH-ARES continues to grow with 35 new registrations. If you are interested in ARES contact Gary at n3clz@arrl.net – 73, Al, N1FIK. Net: NM/Sess/QNI/QTC/ Time: GSFM N1RCQ/31/196/26/289. Tfc: W1PEX 815, N1NH 115, WA1JVV 72, W1ALE 50, K1TSV 36, WB1GXM 29.

RHODE ISLAND: SM, Bob Beaudet, W1YRC—ASM/ACC: Bill Whetstone, WA1RI. My first order of business as your new SM was to examine our appointees and make changes and additions where needed. As I'm writing this, the process is well underway with your OOC, W1AOM; your TC, K1DFT, a brand new Tech Specialist, W1TKO, and your SEC, N1JMA re-certified and running hard. By the time you read this, I plan to have the full team together and functioning to serve you. Please give them all your help because they can't be successful without it. BVARC hosted the Rigblaster folks at its January meeting and Fidelity Club hosted them at its February meeting. Looks like there will be more PSK31 activity in RI! The '76 group kicked off the new year with a great dinner meeting at one of WA1RI's favorite restaurants. PVARC honored one of its West Warwick locals, W1JUN, upon his being licensed since 1935 and is still quite active on the air. WOW! Div. Director, K1KI, and yours truly provided a handsome certificate to Al at the February meeting. Congratulations! Check out the new and improving RI Web site at www.arrl.org and click on Rhode Island section for current local news. Give me digital pictures of your club events and I'll put them up on the RI Web site for all to see. Are you supporting one of our clubs with your dues and time? They provide an easy and low cost way to answer questions, get technical help and share thoughts concerning current Amateur Radio issues. RI has several great clubs. Please join one of them. 73 and thanks for your support, Bob, W1YRC.

VERMONT: SM, Bob DeVarney, WE1U—ASM: N1RJF, N1PDL, W1AD, KD1R. BM: WA1SQO. OOC: W1MP. SGL: WB1AJG. STM: KB1DSB. TC: W1SJ. ARRL VT Section Web page:www.arrl.org/sections/VT.html. Nets and traffic submitted by STM KB1DSB. Net/sess/QNI/QTC/NM: VT YL Net 4/ 31/KA1LDS; GMN 26/717/N1HXC; VTNH 31/163/WA1JVV; VPEN 4/24/WA1DLA; VPTN 31/278/27/KB1DSB; CVTN 21/ 106/11/KB1DSB. Tfc: KB1DSB154, W1RFP 52.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, W1UD, w1ud@arrl.org – ASM: N1MAP. ASM (digital) KD1SM. STM: W1SJV. SEC: K1VSG. OOC: WT1W. After reading "Intermod" again and getting an e-mail from WA1HHN, MTARA is not linking to the NOBARC repeater on Mt Greylock. Too bad, as this would have made an ideal situation for coverage during a wide-scale emergency. As it stands now, considering "9-11," section coverage will have to be on the HF bands. Maybe one day something could be donewith Mt Wachusett. Then, by linking Mt Greylock and Mt Wachusett we would have Eastern and Western Mass. Coverage. An ideal situation. Plans are underway in all the clubs for Field Day. Jerry, AA2T, with photos by KD1SM in the MARA newsletter, showed the new Leominster Emergency Management building complete with offices and a 100-ft tower. It looks very efficient. Under the able guidance of Tom, N1MUV, a 10-meter net on 28.375 +/- is being held each Monday evening at 7:30 PM. All are welcome to participate. The BSO Venture Crew 510 spent a weekend in Whittingham VT operating in the VHF contest and the North American DX Party. Tfc: K1TMA 183, N1WAS 154, N1LRX 17, KD1SM 13, W1UD 315.

NORTHWESTERN DIVISION

ALASKA: SM, David Stevens, KL7EB—Alaska has a Web page at www.arrl.org/sections/AK.html. Check it out for the latest news. AL7N, Ed Trump, is ACWN net manager (Alaska CW Net). Anchorage ARC with Jim Wiley, KL7CC, has nearly completed building their communication control vehicle. The 30-foot plus motor home now has seven different radio station with HF, VHF, UHF, packet and satellite. Thanks goes to Linda Mullen, AD4BL, Junior Yukon Quest; Cliff Cullings, AL7P, Deb Treb, WL7CRG, and many others for the Yukon Quest. Thanks to John Lynn, KL7CY, Richard Block, KL7RLB, and Anchorage ARES for the Iditarod Dog Sled Race. Snipers 3920 at 1800; Bush Net 7093 at 2000; Motley Group 3933 at 2100; and Alaska Pacific Net M-F 14.292 at 0830.

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP—President Bush's January "State Of The Union" speech opened the door wide for Amateur Radio and MARS to become an integral part of the proposed "Freedom Corp". Contact NW Division Director Milnes or ARRL President Haynie and urge your support of this recognition. Congratulations to Kenneth Casey, KL7GCH, of Spokane for 75 years' lifetime membership in QCWA. In Memoriam: Silent Keys George Claussen, N7GC, was a huge supporter and participant in the Spokane ARES for many years; Darrell "Arkie" Langston, W7NVB, of Spokane was an active ham and a good musician who will be missed; Rebecca Sue Collins, KC7ZXH, of Yakima was active in Search and Rescue. Net Activity for January: WSN: QNI 785, Tfc 171; Noontime Net: QNI 8969, TFC 321; WARTS: QNI 3848, Tfc 114. Tfc: K7BFL 100, K7GXZ 69, KA7EKL 63, W7GB 52, KK7T 18, PSHR: W7GB 128, K7GXZ 118.

IDAHO: SM, John Cline, K7BDS – ASM: K7FR, K6ZVA, KJ7TH, KB7TYA. OOC: W7ZU. SEC: AA7VR. STM: W7GHT. TC: N7ZFE. Great News! More and more ARRL members are stepping forward to fill ARRL positions and to take an active role in Idaho ham radio. The Treasure Valley ARES Breakfast has been changed to the third Saturday instead of the second Saturday as reported last month. Please check my Web at idahohamradio.com for further information. Pocatello will hold ARRL VE Exams on the 2nd Thursday of the month in March, May, September and November, 6 PM at the ISU Vo-Tech Building. Congratulations to new Extra Class licensees including KD6GCL. Tfc: W7GHT 193, KB7GZU 60, WB7VYH 50, W6ZOH-32. PSHR: W7GHT 120, WB7VYH 105. Nets: FARM-31/ 3379/31/W7WJH; NWTN 31/1379/57/ KC7RNT; IDACD 23/504/15/WB7VYH; IMN 31/568/ 96/W6ZOH.

MONTANA: SM, Darrell Thomas, N7KOR—Congratulations to Bernard Miller, N7YY, of Warden MT, on his selection as Ham Of The Year in the Yellowstone Radio Club, Billings MT. The Hellgate Amateur Radio Club in Missoula provided 14 Radio operators to provide communications and act as site managers during Missoula's First Night Celebration on New Years Eve. A reminder to all that Montana has two nets you are welcome to participate in. The Montana Traffic Net Meets daily at 0030 UTC on 3880. The Montana Section Net meets every Sunday at 0800 local time also on 3880. Two very nice web pages for you to check out are the Montana Traffic Net Web at http://www.geocities.com/montana_traffic_net/ mtn.html the other one is the Glacier Waterton Hamfest Page with information, registration forms and pictures for the upcoming event in July. Check it out at www.gwhamfest.org. Net QNI/QTC/NM MSN 134/1 W7OW, MTN 2341/34 KD7HWV, IMN 568/96 W6ZOH.

OREGON: SM, Bill Sawders, K7ZM—ASM: KK7CW. SEC: WB7NML. STM: W7IZ. SGL: N7QQU. OOC: NB7J. STC: N7LA. ACC: K7SQ. Many of you who have computers and visit the ARRL Web site know the ARRL is/was planning to vote on eliminating the "Section News" and "Contest Results" from your monthly *QST*. This has also been splattered all over various "ham radio" chat rooms. The reason is simple: With the average age of Amateur Radio Operators approaching 60, with the growing number of life-members, as well as other increasing costs' (which we're all familiar with), the ARRL needs to cut-costs. One of the ways is to eliminate pages from your monthly *QST*, and use the ARRL Web sight to pass along other League news and happenings. Those of you who are League members, and have computers, receive this "April QST Section News" in early February. There are nearly 1,000 of you, and I would like to hear "how you feel" about this, so I can pass this information to our ARRL Northwest Director, Greg Milnes, W7OZ. Please e-mail me YOUR thoughts. MY thoughts on this? I receive, in addition to *QST*, *World Radio* and *CQ Magazine*. I find it very difficult to read all three each month. Why not make *QST* a "bi-monthly", increase it's size, lower the annual dues, and use the Internet for updates, as well? That way, I can read and enjoy all three Amateur Radio magazines, and still get "up to the minutes news and information" on the ARRL Web site. My thoughts aren't that important. Yours are. Let me know how you feel, and keep in touch. NTS traffic totals for January: KK1A 104, W7IZ 104, N7DRP 89, N7YSS 77, KC7SRL 63, AC7DD 53, W7VSE 22.

WESTERN WASHINGTON: SM, Harry Lewis, W7JWJ— EC Matt, KC7UHN reports through SEC N7NVP that his team assisted the Alzheimers Society of Washington with communications during a 5K run. After the District meeting in Jan., Jim Pace, K7CEX (DEC Dist. 4) taught an "Effective Traffic Handling" class for 20 members, Dist. 4 has tied all their EOCs and the State EOC together with a packet via the SEA node on 145.01 MHz. Pacific Co. hosted a training session on ELT and EPIRB searches. Hams from several counties attended including Randy, NU7D and Butch, KD7DCM who provided instruction on the topic. Clark Co. is implementing a monthly exercise designed to ensure their packet operators maintain proficiency. 13 members provided communications at the Clark Jazz Festival. The operators all wore their orange vests which contributed to the perception of increased security for both the participants and the attendees. So, what is your group doing to increase its visibility? Have you done anything to prepare for the added responsibilities of homeland security? 73 Ed, N7NVP——STM Pati, W7ZIW reports a total of 100 or more originations and deliveries, Jerry, W7TVA with 133. The January traffic totals for individual Amateurs: N7AJ 110, K7DBU 351, W7QM 253, W7DPW 10, KJ7SI 31, W7ZIW61, Active Stations meeting the Public Service Honor Roll requirements in January were: W7DPW, W7QM, KJ7SI, and W7ZIW. The Puget Sound Traffic System Reports a QNI of 31,QTC 2, Sessions 29, Mgr KA7TTY —de Pati, W7ZIW. Our OOC Renee, AA7KE, reports activity now by a compliment of 9 Official Observers and they are: W7BO, W7XC, N6DCD, AA7KE, KG7U, W7POE, W7LEO, KK7JA. One out of band report was given and several good operator reports. K7BDU reports that RN7 Cycle 2 report shows operation on 7238 kHz with 62 sessions reported in January. 274 pieces of traffic was handled with an average per session of 4.4. NCS and liaison stations are: N7DRP, K7NLM, AA7OX, KD7ME, W7QM, K7PMB and KYYH. The traffic net summary show the Noontime NM W7KVA QNI 8969; Washington Amateur Radio Traffic System (WARTS) Mgr W7GB QNI 3848; Clark County ARES and Info Net CCain Mgr N7DP QNI 112; Washington State Net (SSN) Mgr WS7ZIW QNI 215; West Coast Net (WCN) QNI 215; Northwest SSB Net Mgr W7LQV. Kudos on the changes to the PSHR whence ARES gets the credit due. Meeting the PSHR requirements in January last month KA7TTY and N7YSS. A Technician weekend class is scheduled for April 27-28. Contact W7QGP@aol.com . Also visit: http://www.arrl.org/sect/wwa

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. The Alameda ARC had 37 attend the inaugural meeting. CCCC welcomed KE6RS as a life member. ROVARC welcomed 3 new members. SARS mourns the loss of W6FSJ and K6TRX. MDARC congratulates WA6ZAP for his upgrade to Extra. Joe Lee introduced ORCA to the NTS at their January meeting. MDARC mourns the loss of long time member KM6RM. ACSCT congratulates WS6V (ex-KF6ZBH) on upgrading to Extra. Jan tfc: W6DOB 518, WB6UZX 39, AK6DV 39, KE6QR 8. PSHR: W6DOB. BPL: W6DOB. Tfc nets: NCN1/3630/7 PM; NCN2-Slow Session/3705/ 9 PM; NCN-VHF/145.21/7:30 PM; RN6/3655/7:45 PM & 9:30 PM; PAN/3651/7052/8:30 PM. Your check-ins are always welcome.

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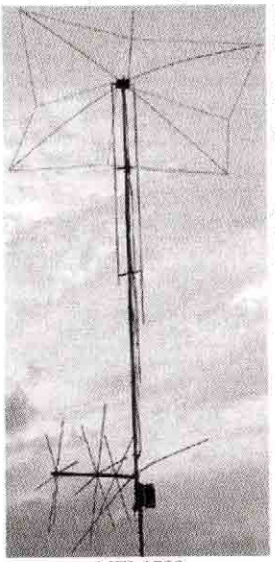

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Fast/slow tune buttons and built-in two range Cross-Needle SWR/Wattmeter lets you quickly tune to your exact frequency.

All welded construction, no mechanical joints, welded butterfly capacitor with no rotating contacts, large 1.050 inch diameter round radiator -- not a lossy thin flat-strip -- *gives you highest possible efficiency.*

Each plate in MFJ's tuning capacitor is welded for low loss and polished to prevent high voltage arcing, welded to the radiator, has nylon bearing, anti-backlash mechanism, limit switches, continuous no-step DC motor -- gives smooth precision tuning.

Heavy duty thick ABS plastic housing has ultraviolet inhibitor protection.

NEW! **MFJ-1788, $429.95.** Same as MFJ-1786 but covers 40 Meters-15 Meters continuous. Includes super remote control.

MFJ-1782, $339.95. Like MFJ-1786 but control has only fast/slow tune buttons.

MFJ-1780, $249.95. *Box Fan* Portable Loop is about the same size (2x2 foot) as a box fan, complete with handle. Covers 14-30 MHz. Control has fast/slow tunes.

MFJ Portable Antenna

MFJ-1621 **$89.95** Ship Code A

MFJ-1621 lets you operate in most any electrically free area -- apartment, campsite, hotel, the beach, etc. DXCC, WAZ, WAC, WAS have been won with MFJ-1621! Work 40, 30, 20, 17, 15, 12 and 10 Meters with a telescopic whip that extends to 54 inches. Mounted on a sturdy 6x3x6 inch cabinet. Built-in antenna tuner, field strength meter, and 50 feet of RG-58 coax cable. Handles 200 Watts.

MFJ's G5RV Antenna

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Covers all bands, 160-10 Meters with antenna tuner. 102 feet long, shorter than 80 Meter dipole. Use as inverted vee or sloper to be more compact. Use on 160 Meters as Marconi with tuner and ground. Handles full legal limit power. Add coax feedline and some rope or other nonconductor and you're *on the air!*

MFJ halfwave vertical

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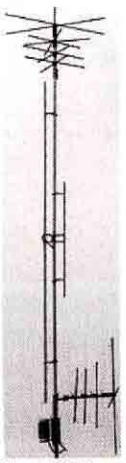

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NEVADA: SM, Jan Welsh, NK7N—ASM: Dick Flanagan, W6OLD. SEC: Paul Cavnar, NN7B. ACC: Melissa Flanagan, KK7AA. Congratulations to new appointee's here in South. NV-District III, DEC Glenn Hale-KB7REO, OBS Bill Starkey-KC7JLS and Clark County EC Charlie Kunz-AA5QJ. Thanks a lot, guys! We couldn't do it without you. I would appreciate all NV appointee's taking a minute to send your up-to-date e-mail and snail mail addresses and phone nos. It is surprising how often e-mail addresses change, and don't forget to let me know if you've upgraded your license or changed your call sign, and if you've completed any of the ARRL EmComm courses, too please. Jim Myers, K7ICB, became a Silent Key earlier this month. He will be missed by family and friends. Glad to hear the Douglas County proposed antenna ordinance was modified and hope it gets through the planning commission. I'll be following it in the CVRC newsletter Carson Currents. Don't forget Nevada 2002 QSO party, May 11- 12 starting 0000Z, 6-160 m, SSB-CW-RTTY sponsored by FARS/nw7o@juno.com. Hope to see you at some of the spring activities. 73, Jan. nk7n@aol.com.

PACIFIC: SM, Ron Phillips, AH6HN—With the holiday season concluded, many of the ham clubs have a new set of officers. BIARC has Bob Schneider, AH6J, as President, Dave Broyles, KH7SO, V-Pres, Barbara Manuson, N7UQX, Sec. and Barbara Darling, NH7FY, as Treasurer. Other reports are still coming in. Dean Manley, KH6B, reports the "Tuna Tin 2," a transistorized transmitter described in the May 1976 *QST* has been with the HI QRP Club since January 10. KH6B has been operating the rig on daily schedules on 7041 kHz. Most reports were 589 and 599 for the 0.5 Watt signal. AK7D, Portland, OR, gave a 319 report at 2,564 miles distance. Also, the famous unit has been on display daily in Hilo. All this was possible by Ed Hare, W1RFI, ARRL Headquarters. Don, NH6WW, and Dean, KH6B, operating QRP at a Hawaiian field location, are pictured on the cover the October 2001 issue of the QRP Quarterly, Journal of QRP Amateur Radio Club International. Lee Wical, KH6BZF, reports that the Oahu group will not hold a ham convention this year due to plans for a special ham conference to be held on the Big Island. Warren Munro, KH6WM, is planning a ham swap meet on Oahu in April. The last one that Warren held was a major success. Good luck, Warren. Hope to see you there. January has been a month of unfavorable weather for the entire state of Hawaii. Mauna Kea remains snow capped with the workers donned in parka's. Thanks to all for your contributions for this months report. Aloha and 73.

SACRAMENTO VALLEY: SM, Jerry Boyd, K6BZ—Congrats to Kay, KF6IZU, on becoming the "official" newsletter editor for River City ARCS. On a recent trip (1400+ miles) I decided to listen/talk exclusively on 146.52 to see what the activity level might be. I was very pleasantly surprised to find quite a bit of activity, including two different very wide coverage remote bases. In several cases, .52 was being used to give weather and road condition reports. Last call for EMCOMM 2002. It is being held later this month near Redding. For info contact K6SOJ@arrl.net. Good article on packet through satellites in the North Hills Radio Club newsletter. A thanks to our Division Director Jim Maxwell, W6CF, for his on-going support of the Sections in his Division. It is appreciated. If you have some thoughts either way about the possibility of Section News being removed from *QST* and posted solely on the worldwide web please let me know ASAP K6BZ@arrl.org. Our Section will still maintain its own Web site and not move everything to the one the ARRL maintains...both pages are worth checking each month. Congrats to KG6FRX on being elected President of the El Dorado County ARC. This is not an April Fool's joke, but fire season is not that far off. It is time to make sure your SOP's, radio gear, and personal survival/safety gear are in order. The call to assist will come in the not-too-distant future. Until next month, 73 de K6BZ.

SAN FRANCISCO: SM, Len Gwinn, WA6KLK—ASM: KH6GJV. SEC: KE6EAQ. Section news is very quiet for the month of January. Clubs are planning the spring/summer events at this time. Humboldt County will again host the San Francisco Section Convention in late June. It will NOT be on Field Day this year, so come on up to the beautiful redwood coast. SCRA is working on their new mobile communications van and will have it ready for the summer events. Any donations of equipment are appreciated. Del Norte County hams have remodeled their meeting room, and it is really well done. Marin and San Francisco hams have been busy with getting speakers lined up for the new year, and updating equipment. Lake county hams are working with the different agencies towards emergency preparation, as is Mendocino County. More involvement is needed by your local clubs. Be a "doer", not just be entertained!! It is possible in a couple of months that the Section News and all contest information will be removed from *QST* and placed on the Internet in a cost saving move. If this is not agreeable to you, e-mail your Pacific Division Director and Headquarters. This will also entail the removal of 16 or more pages of *QST* a month!! Remember EMCOMM meeting near Redding in April. An excellent emergency forum and discussion.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN — The Section News in *QST* is an endangered species. In July, the Board of Directors will likely decide to move the Section News and contest results to the Section Web site. The move is expected to save approximately one hundred thousand dollars per year. The question is: Do you want the Section News and contest results to be relegated to the Internet? The real decision is yours, but you must e-mail or write your Division Director. Jim Maxwell may be e-mailed at w6cf@arrl.org to make him aware of your feelings. Send him a message either way and cc me please. January NCN report for KB6QIB is as follows: Rcv'd 8 Sent 8, DLD 1 Total 26X 1- 60 2 -9 3-1 6- 10 Total 80 X 73 K6RAU PSHR (1) 8 (2) 0 (6) 20 Ttl 28.

SANTA CLARA VALLEY: SM, Glenn Thomas, WB6W – SEC: KQ6FM. PIC: K6ALZ. BM: WB6MRQ. TC: WA6PWW. OOC: KB6FPW. SCV Homepage is http://www.pdarrl.org/scvsec. Info on license exam sessions is also available on the SCV homepage. As some of you have noticed, the section news in now available on the Web at http://www.arrl.org/sections/index.html?sect=scv. I also will have a calendar of club meetings and other events of interest in the section. I will have a short description of club programs - but only if I know what they are! (hint hint) It will be updated pretty the same time that the news goes to HQ for *QST*. Thus, on the Web you'll see the news almost as soon as it's reported. Or, you can wait a month for *QST*! We have restarted the Section Manager's net. This net provides a place to meet weekly with the SM for news and discussion. The net is held every Tuesday at 2100L on K1YJ/R 440.1/100 and is linked to WB6ADZ/R 146.115+ and W6ASH/R 145.27-. Other systems are welcome to link as well. The ARES/RACES weekly training net is also coming back on line. The net is held every Tuesday at 2030L (just prior to the SM Net) on K1YJ/R 440.1/100 and is linked to WB6ADZ/R 146.115+ and W6ASH/R 145.27-. Other systems are welcome to link as well. This net will occasionally extend into the SM net time, so the SM net will occasionally start late, after the training net is complete. Kudus to DEC Larry Carr KE6AGJ for organizing this. We have a new ARRL affiliated club in the section, the Milpitas Amateur Radio and Electronics Society (MARES). They are currently sponsoring a license class, from zero to general, Thursday nights at the Milpitas Senior Center. Welcome aboard! We are happy to announce the appointment of a new Emergency Coordinator to and for the city of Marina. He is Tom Cardinalli, KF6OZK. He can be reached via e-mail kf6ozk@ectar.org. There has been increasing activity on HF bands using the ALE protocol. There was an ALE test in late December. Stations heard on ALE include KM6AB, WA6VVC, WA6UBE, and WA7HL. Anyone who is interested in this HF digital mode can find more information http://groups.yahoo.com/group/hflink for more information. Cupertino Amateur Radio Emergency Service (CARES) heard from Shane Snyder of the National Weather Service Monterey about NWS, how they prepare for and respond to emergencies. Cupertino EC Jim Oberhofe KN6PE is doing an excellent job.- See you next month! 73 de Glenn, WB6W

ROANOKE DIVISION

NORTH CAROLINA: SM, John Covington, W4CC —SEC: KE4JHJ. STM: N0SU. BM: KD4YTU. TC: K4ITL. PIC: KN4AQ. OOC: W4ZRA. SGL: AB4W. ACC: vacant. http://www.ncarrl.org. Field Day will soon be upon us. Some changes this year will make things very interesting. Among other things, all of Region 2 (essentially North and South America) will be invited to participate. This should make things especially exciting for newcomers to ham radio as it may give them their first chance to work some DX. Field Day should be an exciting opportunity to do several things: introduce the public to Amateur Radio, give newcomers an opportunity to work HF, evaluate our equipment and our ability to respond quickly. There are many scenarios you can follow that will be both fun and educational. Try something new this year. I've often wanted to see someone try to set up the most minimal FD HF station. How small can we make it and still make practical QSOs? How quickly can we deploy it? The QSO points are nice, but the things we learn from FD are the most valuable points of all. If you set up in a public place, please designate someone to greet the public as they come by to observe. If all of your operators are preoccupied with keeping the station on the air, these people will keep on walking, and will miss the point. Sad to report that Wayne, K4MOB, is a Silent Key. He will be greatly missed. Hamfests: Raleigh April 14, Catawba Valley/Morganton April 20. Jan. traffic: W4EAT 647 (BPL), K4IWW 251, NC4ML 245, K4RLD 152, W4IRE 99, KI4YV 92, AA4YW 69, KE4JHJ 68, W3HL 63, WA2EDN 53, AD4XV 47, W4CC 41, KE4AHC 34, N0SU 34, KG4HDT 30, W4FAL 27, N4TAB 27, WA4SRD 22, K4WKT 21, N4NTO 20, NT4K 14, WD4LSS 12, KB8VCZ 12, W4EHF 9, AE4HJ 8, WD4MRD 6, KB5WY 3, KE4YMA 3. Dec.: KE4AHC 35.

SOUTH CAROLINA: SM, Patricia Hensley, N4ROS —Unfortunately, current events have forced us to exercise a vigilance and concern for our safety to which we have been unaccustomed. The term for this increased awareness has been called Homeland Security by our President. One of the essential elements to support Homeland Security will be the effective utilization of a valuable national resource: Amateur Radio. Without efficient communications there will be no coordination of the support functions for Homeland defense/security. Amateur Radio communications is considered so important that ARRL President Jim Haynie was invited to participate in a national Homeland Security working group involving many government agencies. A similar type of working group has already met in South Carolina. Planning is currently being conducted for the utilization of amateur radio to support statewide agencies and organizations at many different levels. We have been tasked to provide communications support because of the existing trained volunteers who have committed themselves to this purpose by attending ARRL Emergency Communications training courses and other seminars. Although we have a trained cadre of approximately 100 volunteers, our resources would be depleted by a major catastrophe. Therefore, an opportunity now exists for you to directly contribute to the Homeland Security efforts in South Carolina. I encourage you to participate in the many formal training sessions to be offered through our ARRL resources in South Carolina. Tfc: AF4QZ 249, KA4LRM 105, KA4UIV 93, K4JMV 38, K3LM 24, K4JIF 20, WD4BUH 16, K4BG 15, WB4PCS 7. PSHR: AF4QZ 146, KA4LRM 127, KA4UIV 118, K4BG 91. SEC: 303.

VIRGINIA: SM, Carl Clements, W4CAC—ASM: W4PW. SEC: N4NW. STM: N1SN. PIC: W4PW. ACC: W4IM. OOC: W4NEZ. TC: W4RAH. Spring not only brings us new flowers on our trees and plants, it also brings us new criteria for the Public Service Honor Roll (PSHR). These criteria will go into effect on May 1st. This means that the PSHR reports you file in June (for May) will be using the new criteria. The details can be found on our web page at www.arrlva.org or at www.arrl.org. The NTS in the Section suffered a great loss in January. Casey, K4MTX, became a Silent Key on January 14th. Casey was a regular on the traffic nets and handled a lot of traffic as well as many net control duties and liaisons between nets. He will be truly missed by all his friends in the Amateur Radio world. The Vienna Hamfest was held on March 3rd. I hope that you attended if at all possible. If you are in or near the Tidewater area on April 20th, the Chesapeake Amateur Radio Service (CARS) will be holding their Springfest on that day. See www.qsl.net/cars/index.htm for details. The QCWA Chapter #202 met in Roanoke on January 12th. K4WFO gave an excellent presentation on FCC registration. New officers were elected. The new officers are: W4YE, President, W2CP VP and K4BSF Secty/Treas. Two significant QCWA awards

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Eavesdrop on interesting Morse code QSOs from hams all over the world. It's a universal language that's understood the world over.

Automatic Speed Tracking

MFJ *AutoTrak*™ automatically locks on, tracks and displays CW speed up to 99 Words-Per-Minute.

Simply place your MFJ-461 close to your receiver speaker until the lock LED flashes in time with the CW.

Four Display Modes

1. Bottom line scrolls and fills with text, then that entire line is displayed on top line until bottom line refills -- makes reading text extra easy! Automatically displays speed in WPM.

2. Same as **1**, without speed display -- gives you maximum text display.

3. Top line scrolls, bottom line displays speed in Words-Per-Minute.

4. Both top and bottom lines scroll.

Two-line LCD display has 32 large 1/4 inch high-contrast characters.

MFJ Instant Replay

The last 140 characters can be instantly replayed. This lets you re-read or check your copy if you're copying along side the MFJ-461.

High Performance Modem

Consistently get solid copy from MFJ's high performance *PLL (phase-lock loop)* modem. Digs out weak signals. Even tracks slightly drifting signals.

Of course, nothing can clean up and copy a sloppy fist, especially weak signals with lots of QRM/QRN.

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The MFJ-461's serial port lets you display CW text full screen on a bright computer monitor -- just use your computer serial port and terminal program.

More Features

When it's too noisy for its microphone pickup, you can connect the MFJ-461 to your receiver with a cable.

Battery saving feature puts MFJ-461 to sleep during periods of inactivity. It wakes up and decodes when it hears CW.

Uses 9 Volt battery (not included).

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Fits in your shirt pocket with room to spare - smaller than a pack of cigarettes. Tiny 2¹/₄x3¹/₄x1 in. 5¹/₂ ounces.

No Instruction Manual needed!

Super easy-to-use! Just turn it on -- it starts copying instantly!

Accessories

MFJ-26B, $4.95. Soft leather protective pouch. Clear plastic overlay for display, push button opening, strong, pocket/belt clip secures MFJ-461.

MFJ-5161, $14.95. MFJ-461 to computer serial port cable (DB-9).

MFJ-5162, $5.95. Receiver cable connects MFJ-461 to your radio's external speaker 3.5 mm jack.

MFJ *Pocket* Morse Tutor

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Learn Morse code anywhere with this tiny *MFJ Pocket-sized Morse Code Tutor*™! Practice copying letters, numbers, prosigns, punctuations or any combination or words or QSOs. Follows ARRL/VEC format. Start at zero code speed and end up as a high speed *CW Pro!* LCD, built-in speaker.

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MFJ-557 Deluxe Code Practice Oscillator has a Morse key and oscillator unit mounted together on a heavy steel base -- stays put on your table! Portable. 9-Volt battery or 110 VAC with MFJ-1312, $14.95. Earphone jack, tone and volume controls, speaker. Adjustable key. Sturdy. 8¹/₂x2¹/₄x3¹/₄ in.

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Built-in Iambic Paddle. Thumbwheel speed control. Adjustable weight. Adjustable sidetone with speaker. Iambic modes A or B. Fully automatic or semi-auto "bug" mode. Reversable paddle. Tune mode. RF-proof. Battery Saver. Tiny 2¹/₄x3¹/₄x1 in.

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MFJ-561, $19.95. 1³/₄Wx1³/₄Dx³/₄H in. *Formed* phosphorous bronze spring paddle, stainless steel base. 4 ft. cord, 3.5 mm plug.

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were presented: 50 years of continuous licensing: W8HGH – Robert Dixon of Bedford and a 70 year award to: John Bush, W4FOD, of Lynchburg. Congratulations to both! If your club or group is sponsoring a training class, or a hamfest, or anything that the other members in the section would like to hear about, please send it to me and also to Pat Wilson (w4pw@arrl.net) and we will put it in the Section News and on our Web page. Remember, you are the ARRL! 73 de Carl, W4CAC. Tfc: W3BBQ 510, WA4DOX 214, K0IBS 174, K4YVX 170, KE4PAP 102, KG4OTL 92, N4ABM 81, WB4ZNB 64, KV4AN 57, W4VLL 49, K3SS 40, K5SFM 33, WB4UHC 14, KU4MF 13, N3FDR 13, W4YE 10, W4CAC 10, KB4CAU 7, W4JLS 6, W4MWC 4, N4FNT 2, K4JN 2.

WEST VIRGINIA: SM, Hal Turley, KC8FS— ASM: W8YS. ASM: KB8NDS. SEC: W8XF. STM: KC8CON. SGL: K8BS. OOC: N8OYY. TC: W8DL. W.Va. Section website at www.qsl.net/wvarrl As I write this, the W.Va. House of Delegates has passed H.B. 4335 introduced by Kan. Co. Delegate Sharon Spencer, KC8KVF. It now goes to the Senate. By the time you read this, I hope this legislation is awaiting Gov. Wise's signature. Sharon has worked hard on this bill and deserves our thanks, regardless of the outcome. And we can be proud of the fact that hams from all corners of the state have participated in this process contacting legislators and garnering support. It has been a concerted effort and perhaps more than the legislation itself, this process has served to introduce our hobby to key decision-makers in Charleston letting them know what we have to offer by way of our dedicated and valuable public service. CU at the Charleston Hamfest on March 16th. 73 de Hal. Tfc (Jan.) KA8WNO 418, W8YS 192, WD8DHC 164, N8NMA 81, WW8D 54, KC8CON 53, WW8F 39, W8JWX 19, N8FXH 18, KB8NDS 17. PSHR: W8YS 142, WW8D 131, WD8DHC 129, KB8NDS 129, KC8CON 125, KA8WNO 118, W8IVF 91, N8NMA 74. WVMDN 823/30/467 WW8D; WVN(E) 137/97/294 N8NMA; WVN(L) 129/44/255 N8NMA; WVFN 1230/181/954 KC8CON; MSEN 79/01/80 N8TMW; BDARC (2mtr) 293/1/477, EPTN (2mtr) 33/2/95, PARA (2mtr) 52/7/97.

ROCKY MOUNTAIN DIVISION

COLORADO: SM, Jeff Ryan, N0WPA— ASM: Tim Armagost, WB0TUB. ASM: Jerry VerDuft, AD0A. SEC: Mike Morgan, N5LPZ. STM: Mike Stansberry, K0TER. ACC: Ron Deutsch, NK0P. PIC: Erik Dyce, W0ERX. OOC: Karen Schultz, KA0CDN & Glenn Schultz, W0IJR. SGL: Mark Baker, KG0PA. TC: Bob Armstrong, AE0B. BM: Jerry Cassidy, N0MYY. Last month I wrote that a decision about removing this column and contest line scores from *QST* would be made by the directors on January 18th. The meeting took place and the directors decided to postpone any decision until their July meeting. As I mentioned last month, if you have an opinion on the subject of removing these items from the magazine please let me know. Contact info is on page 12. There's been great movement on putting together an organization to put on a ham convention in Colorado in the year 2003. An organizational meeting was held in January, and a follow-up on February 9 in Castle Rock. The organization will be called HAMCON Colorado and its delegates are representatives of twelve ARRL affiliated clubs from the Section. Ex-officio directors include Jerry VerDuft, AD0A (Chairman), Walt Stinson, W0CP and myself. Directors elected from the delegates include Bud Saum, K0GS from the CCARC; Judy Hilton, KC0HVD from Park County RC; and Bill Leahy, K0MP from the Mile High DX Assn. Congrats to the directors and thanks for volunteering to make a Colorado and Rocky Mountain convention a reality. See our Web page at www.arrl.org/sections and click on Colorado. If you have items you'd like me to post on this page, e-mail them to me. If you have items for this column, let me know that as well. 73, de N0WPA. NTS Traffic: AD0A 203, K0EZ 154, K0TER 149, WB0TAQ 78, N0BN 40. CAWN: W0WPD 910, K4ARM 661, K0HBZ 598, W0GGP 574, AA0ZR 467, KI0ND 387, WB0TYT 377, N0NMP 284, WD0CKP 237, W0LVI 222, AB0PG 208, W0NCD 193, WB0VET 163.

NEW MEXICO: SM, Joe Knight, W5PDY—ASM; K5BIS, N5ART & KM5FT, SEC; K6YEJ, STM; N7IOM. NMs: WA5UNO & W5UWY. TC: W8GY. ACC: N5ART. Efforts to get the New Mexico PRB-1 Legislation voted on this session are still moving forward with AC5ZO leading the way. The Bill received a "Do Pass" recommendation from the NM State House Committee and is scheduled for a NM State Senate hearing soon, but time is running out. We are hoping for the best. The ARRL Board is considering a proposal to move the Section News, Contest Line Scores, net and traffic reports from *QST* to the ARRL Web Site, and will vote on that proposal in the July Board Meeting! If you approve of the move, or if you object to the actions of the Board, please advise our Division Director, W0CP, and myself by snail mail or e-mail of your feelings prior to the July Board meeting. Glad to report that the Pecos Valley ARC is pushing to reestablish the old NMMI Radio Club from 1924 that had the call "5ABV"! We all wish them the best! Excellent Newsletters from about 12 Clubs around the State. Will try to get some detail in the next Section News! Very sorry to report the passing of W7DFW and KB5AED. They will certainly be missed. 73, W5PDY.

UTAH: SM, Mel Parkes, AC7CP—Some Contest News: The old NAQP CW UT record posted on the NCJ Web page shows: NG7M Jan 1999 168000 points. In Jan 2002 our Utah contesters did great: Jim Lawrence (W7CT) 1023Q 247M Score 252681 Hours: 10 Rate: 102.3 Jack Reed (WA7LNW) 810Q 212M Score 171720 Hours: 9:53 Rate: 82.0. Dave Fischer (KD7AEE) 766 Q 233M Score 178478 Hours: 6:39 Rate: 115.0 Special congratulations to Jim, W7CT, for a great CW contest performance and a record that will stand for a while, and to Jon Utley K7CO who exceeded the old NAQP SSB Utah record with a new score of 344760 making 1352 Q and 255 M in 10 hours running from W7CT. This is a top ten score in NAQP, and one not often made from Utah! The above hams belong to the Utah Contest Club and the Utah Dixie DX Contest Club. Anyone interested in contesting can e-mail The Utah Contest Club at nc7j@arrl.net. On a final note we were saddened to hear about Rod Taylor, K7DJB, becoming a SK our thoughts go out to his family. 73 de Mel – AC7CP.

WYOMING: SM, Bob Williams, N7LKH— Summer approaches and again we are asked by Amber Travsky to provide communications for the Tour de Wyoming bike ride. This year it will be from 21-26 July. The route will cover a 400 mile loop from Worland to Worland. Day 1 Worland to Greybull, day 2 Greybull to Dayton, day 3 Dayton to Buffalo, day 4 Buffalo to Buffalo via Kaycee, day 5 Buffalo to Tensleep and day 6 Tensleep to Worland. It is hoped that both the Tri Counties and Sheridan clubs will be able to take the lead in rounding up the necessary com support with help from wherever. We will discuss the activity at the hamfest and show maps of the specific routes to be followed together with location of the overnight camp sites. That will be the time to identify who will be the com participants. In past years it has been a fun experience and should be again. It should be remembered that this is the kind of public service we provide in order to practice the emergency communications we perform in order to justify our ham frequencies. Nets Sess/QTC/QNI: Wyoming Cowboy 23/0/963; Jackalope Net 0/548/4; HERC 0/103/4; Pony Express Net 4/1/214.

SOUTHEASTERN DIVISION

ALABAMA: SM, Bill Cleveland, KR4TZ – ASMs: W4XI, KB4KOY. STM: W4ZJY. SEC: W4NTI. SGL: KU4PY. ACC: KV4CX. TC: W4OZK. I would like to welcome David Knight, W4ZJY, as our new Section Traffic Manager. He is the net manager of the Alabama Section Net, and he's been active passing traffic for as long as I can remember. He brings a wealth of experience to the position, and I look forward to working with him. So join me in thanking him for volunteering to help the Alabama Section. Effective immediately, send all your end of the month reports to David Knight, W4ZJY, and Bill Cleveland, KR4TZ. This will be the last month for calculating your Public Service Honor Roll (PSHR) under the old criteria. Starting May 1, you will need to start using the new PSHR criteria as announced in the *QST* and our Section Web site (www.kr4tz.org/al-arrl). Reports turned in during the first week of May (for April's totals) will still be under the OLD criteria, you will turn in your first report using the new criteria at the end of May and beginning of June, for May's Totals. Please pardon the confusion while we make the transition to the new criteria. News from STM: Chris Sells AC4CS was appointed Net Manager for the Alabama Day Net. Statistics for Regional Nets: RN5 Representation 98.4% by W4CKS, W4ZJY, WA4PIZ, KC4VNO, W4QAT, K4VIZ, AC4CS. DRN5 Representation 95.0% by WB4GM, WA4MTG, KD4CQJ, AC4CS, K4JOE, KC4VNO, W4CKS, NA4AL. Finally, if you would like to use CW, please check out the Alabama Training Net on 3714 kHz daily at 6:00 PM and the Alabama Section Net on 3575 kHz daily at 7:00 PM and again at 10:00 PM. CW is alive and well in Alabama, and I hope you will take advantage of our CW nets. 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-to-date news and information. God bless & 73, Bill Cleveland, KR4TZ.

GEORGIA: SM, Susan Swiderski, AF4FO—ASM/ South GA: Marshall Thigpen, W4IS. ASM/Legal: Jim Altman, W4UCK. ASM/Web and SEC: Mike Boatright, KO4WX. STM: Jim Hanna, AF4NS. SGL: Charles Griffin, WB4UVW. BM: Eddie Kosobucki, K4JNL. ACC: Mary Ahls, W4NZJ. OOC: Mike Swiderski, K4HBI. TC: Fred Runkle, K4KAZ. PIC: Matt Cook, KG4CAA. State Web site: www.qsl.net/arrl-ga. Have you been getting our new section newsletter via email? (A "members only" perk... just indicate that you want to receive the section and division bulletins, and you'll start getting it) Or, check it out on our state Web site. You'll get lots more fun details about what's going on around the state. And didja know? Webmaster guru Mike Boatright, KO4WX, is also our new SEC, as of mid-January. Truly a man for all seasons... thanks, Mike! Upcoming events: the Statesboro hamfest and the Georgia Cracker Net picnic on the 13th (can't do 'em both, darn it!); the US DFing Championships in Pine Mt. the following weekend (see the cover story Mar. *QST* for details); and the Calhoun hamfest on the 27th. Do you read the section news in *QST* every month? Do you care if it's moved from the magazine to the Web site? How about contest results? Do you care if most of them are booted to the Web, too? These are some of the cost-cutting measures being considered by the BOD... decisions to be made at the July meeting. If you object to these changes, send me a QSL card or email so I can pass your concerns on to Director Frank Butler. Sadly, 2 SKs to report: James Bowman, W4BLC, and Dick Spears, WA4CQA. Condolences to their families and friends. Until next time, take care of yourselves. And each other. 73, Susan Jan. QTC: W4WXA 270, AF4NS 157, WB4GGS 131, KG4FXG 86, K1FP 84, K4BEH 76, KA4HHE 61, WB4BIK 34, W4WKT 31, K4BAI 11, K4ZC 8, K4JNL 8.

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—Senior Staff ARRL Officials not included. Last months' *QST* Section Activity Column contained info that the Board of Directors were thinking about eliminating the Activity Column. The Board at the Dallas meeting decided to put off the decision until next July. Any thoughts you have on retaining or eliminating the Activity Column should be sent to the Southeastern Division Director, Frank Butler, W4RH. The highlight of the month during January was having the President of the United States check-in on the Northern Florida Section ARES Net on January 31, 2002. The President's remarks can be found on the ARRL Web page, and the Northern Florida Section Web at Headquarters. I have written both the Governor and the President expressing appreciation on behalf of the Section for their addressing HAMS while in Florida. There was a meeting in Miami during the Hamfest wherein several officials met to discuss the proposed Antenna Bill. Minor changes have been made or suggested which should be finalized at the Orlando HamCation. At this time, I see no reason for it not being finalized. Needless to say, a lot of effort has been given to this project, and it is my opinion we should not wait any longer to get a bill into the present Legislative Session. Both the President and Governor are pushing Homeland Defense, and this is an election year, why not and advantage of the timing. The ARRL Headquarters now has a Web page for each Section. The Northern Florida Section now has a Web page and the url is www.tbcar.com/nfares/. The Webmaster is trying to have it completed by the end of February. This column will be uploaded at the time it is sent to Hdqrs, which is approximately two months earlier. Any clubs, or Senior Staff can provide me with info and I will forward it to the Webmaster. de 73 Rudy. Tfc: WX4H 1184, KE4DNO 488, NR2F 236, KF4WIJ 196, AG4DL 161, WD4GDB 149, WB2FGL 140, KE4PRB 139, K8KV 131, K4JPG 104, N9MN 99, W4KIX 60, AF4PU 58, AB4PG 40, K4JTD 33, WA1VOP 23, W8IM 20, WB8MER 12, WX4J 12, KJ4HS 10, WD4ILF 9, WB9GIU 6, K4KAM 6, W4CFH 4, WB2IMO 1.

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PUERTO RICO: SM, Víctor Madera, KP4PQ — Estamos en comunicación con la Oficina de Manejo de Emergencias y la Cruz Roja conversando sobre el uso efectivo del programa ARES en emergencias futuras y la posibilidad de certificar a los operadores mediante el programa "ARECC" que auspicia el ARRL. Tan pronto se llegue a un acuerdo lo haremos público. La Junta de Directores del ARRL estarán considerando una propuesta para remover del QST las secciones de "Noticias de las Secciones", "Información sobre Concursos", "Informes de tráfico y redes" y publicarlas solamente en las páginas del WEB. Esta propuesta se llevará a votación durante el próximo mes de julio. Si usted está de acuerdo o se opone, déjemelo saber por correo al PO Box 191917, San Juan, PR 00919 o usando la página "Soundboard" del Section Manager en http://prarl.org/secmgr.html. Me interesa saber el sentir de todos ustedes antes de junio para llevarla a los Directores. Se acerca la fecha para publicar el "Repeater Directory", si usted es "trustee" de un repetidor comuníquele con tiempo cualquier cambio al PR/VI VFC. Felicitamos a WP4AOH, su YL y a todos los radioaficionados que le ayudaron en la celebración del"GOTA" (Girls-on-the-Air) que se celebró en el Concilio de Niñas Escuchas en San Juan, PR. Estamos en contacto con la Guardia Nacional de Puerto Rico, están interesados en conseguir radioaficionados que interesen participar en su programa de Comunicaciones de Emergencia. Para detalles comuníquense con el Section Manager vía email a kp4pq@arrl.org .

SOUTHERN FLORIDA: SM, Phyllisan West, KA4FZI—SEC: KD4GR. STM: WA2YL. ACC/TC: WA4AW. PIC: W4STB. OOC: K4GP. BM: KC4ZHF. SGL: KC4N. DEC/ASM: N4LEM, K9SHT, AA4BN, W4SS. Web Page: http://www.sflarrl.org. Evelyn Gauzens, W4WYR, was unanimously voted an Honorary VP of ARRL at the January Board Meeting. She received her special badge at the Miami Hamboree. We also witnessed the presentation of the Intl. Humanitarian Award to Jim Hirschman. Kudos to the Miami-Dade ARC, with Miss Evelyn at the helm, for another successful Hamboree. Manny, W4SS, legendary SEC of SFL for over 20 years, retired from his appointment for health reasons. He is now Emergency Communication Consultant and takes over Jim's DEC appointment. Manny is highly respected and well known in emergency management circles throughout the state. He managed ham emer. comm. when Hurricane Andrew wiped out Homestead. He has always held SFL accountable to high standards of preparedness and response. Jim, KD4GR, has worked with Manny and is now SEC. He's active with CATs and displayed his 50 pound, 70 cm rptr in Miami. He is active in SETs throughout the section. Another appointment is that of Jeff, WA4AW, to TC. AROUND THE SECTION: Brevard County operators provided health and welfare comm. for the Harold Tucker Memorial 50K foot race. Six members of the CATS team from Central Brevard went to the State EOC to receive a briefing on State EOC comm. capabilities. This month they will be a part of the St. Lucie Nuclear Power Plant exercise. Broward County's last packet BBS (N4HHP) has closed operations with thanks to Robin Terrill for his dedication and years of BBS service to the county. Lee County hams will operate a special event station at the Edison/Ford Estate the week of Edison's birthday. The station will be set up at one of the homes and a message center at the ticket complex. Martin County SKYWARN was activated for a FPL Nuclear power Plant Practice Drill Jan 23. Osceola sent volunteers to work at the Orlando hamfest this year. WA1ZVA is their new net control officer. N4QPM in Palm Beach spoke at a full council Cub Scout meeting in Jupiter. More than 130 scouts listened attentively and asked good questions. Dave's new ham class has the Dir. of Emer. Mgmt. as one of his students. Wellington club volunteers are working on a museum project restoring vintage radios. St Lucie's AA4PN reports that they will participate with local county agencies in the FP&L Nuclear power plant drill this month. Wayne, KA1VRF, was appointed Skywarn Coordinator for the county. AA4CZ has started a new club in the county. January SARs by WA2YL: WA9VND 501, KA4FZI 366, KD4GR 162, KC4ZHF 109, KD4HGU 75, AA4BN 72, KG4QIP 61, WA2YL 61, KE4WBI 58, KG4MLD 56, K4VMC (club) 46, KG4MLC 43, KE4UOF 40, K4FQU 40, WB4PAM 34, WA4CSQ 31, KT4XK 29, WA4EIC 29, KG4ILJ 29, KG4CHW 21, K4OVC 9, AF4NR 9, W6VIF 8, WA4GUK 6, W3JI 5. 73, Phyllisan West, KA4FZI, SM SFL.

VIRGIN ISLANDS: SM, John Ellis, NP2B, St. Croix, ASM: Ron KP2N, 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. The ARRL Board of Directors are considering a proposal to move the Section News and contest line scores from *QST* to the ARRL Web site and will vote on that proposal in July. If you approve of the move or if you object to the actions of the BOD, please send an e-mail or snail mail letter/card to me, letting me know your feelings. Section ARRL members need to let their feelings be known prior to the July decision. KV4JC's beam fell apart in some high winds, but fortunately we found all the pieces and it's back up again! Repeaters 146.63 St. John, 146.81, St. Thomas, 147.25 St. Croix. Section Web site is www.viaccess.net/~jellis. John, NP2B.

WEST CENTRAL FLORIDA: SM, Dave Armbrust, AE4MR ae4mr@arrl.org http://www.wcfarrl.org—ASM: NA4AR, ASM-Web: N4PK, ASM-Legal: K4LAW, SEC: KD4E. TC: KT4WX. BM: KE4WU. STM: AB4XK. OOC: W4ABC. SGL: KC4N. ACC: AC4MK. PIC: WX1JAD. NA4AR reports the Gulf Beaches Marathon was a hug success with 112 operators from 6 counties. Over 1,100 man-hours were logged. Three repeater and three communication trailers were used as well. Feb 23, 2002 is the first anniversary of the K4WCF repeater system. We are celebrating the anniversary with the WCF Radio Check. Bring your radio to Sebring, New Port Richey, Port Charlotte or the TARCfest Hamfests for a FREE analysis of your radio. Hamfests: Sebring Feb 16, Zephyrhills Feb 24, New Port Richey Mar 2, Port Charlotte Mar 9, Tampa TARCfest Apr 20. SEC KD4E reports an increase of 86 ARES members with a new total of 532. In Jan there were 31 ARES Nets. 5 public service events, 13 drills and 0 emergency for a total of 18 ops. The total man hours reported is 830.5 hours. ECs reporting: KB0EVM, KN4YT, KT4WX, W4CBS, KC4QCN, AC4MK, AE4GB, AI4ET, K4FB and WD4AHZ. Upcoming ARES activities. Charlotte: Fair Feb 15 to 24. April 12, 13, 14 International Air Show. Hardee: Pioneer Day Parade. Highlands: SET planned for early March. STM AB4XK reports Jan Net Report:

Net/NM	*QNI*	*QTC*	*Bulls*	*QND*	*Sess*
AIN/WA4ATF	82	5	6	119	4
PIN ARES/WB2LEZ	79	1	8	200	8
POK ARES/KD4EFM	62	0	0	100	4
SPARC/KF4FCW	621	35	0	1214	31
TURTLE/KT4TD	362	72	0	435	30
EAGLE/KT4PM	302	50	0	557	31

Jan PSHR: K4RBR 169, K4SCL 152, WB2LEZ 129, W4AUN 118, AB4XK 117, KF4KSN 116, KF4OPT 109, W3BL 90. SAR: K4SCL 240, AB4XK 138, KF4OPT 68, K4RBR 34, KT4TD 26, W4AUN 23, KF4KSN 13, WB2LEZ 12, KD4EFM 11, KG4OMN 3, KG4FCD 1. 73, Dave AE4MR.

SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford Hauser, KD6XH—This is the month for the annual DeVry Hamfest on 13 April at the DeVry College in Phoenix on Dunlap Blvd, about one (1) mile east of I-17. The Arizona Amateur Radio Association sponsors this hamfest and it is ARRL sanctioned. Hope to see you there. We have over 50 different Amateur Radio clubs here in Arizona: From Bullhead City to Sierra Vista, to Yuma, to Holbrook. In Lake Havasu, we have the famous London Bridge and also the London Bridge Amateur Radio Association. This club has been around for many years and is very active in public service events and Field Day. They meet every 3rd Tuesday at the Yacht Club, 631 London Bridge Road at 7:00 PM. This year's president is Glenn Day, N6TFE, and he can be reached by e-mail at n6tfe@ctaz.com. When you are in the area stop by and visit there club meeting or just say hello to the many members who monitor the club repeater, 146.610 (-) (PL 162.2). The ARCA Web site has been changed to "www.arca-az.org/arca". Take time to visit their Web site and get to know this organization and the officers. ARCA is an organization that represents or 25 of the state Amateur Radio clubs here in Arizona. They do a lot more than just put on the Fort Tuthill Hamfest. Don't forget to checkout our state Web site at www.qsl.net/arrlaz. This site has all the latest information and links to the many clubs here in Arizona, throughout the country, and has a listing for the entire state ARRL volunteer's. We have several state and local nets that are used to sharpen our skills so in the event of an emergency we are prepared. Let us take the time to check in to these many public service nets. An example of our public service is the MS society fund raising event "Climb A Mountain" here in Tucson. Over 15 amateur radio operators helped with this event with Roger Schroeder, WB7DIW, as the coordinator. Start making the necessary arrangements for Fort Tuthill (motel room, selling spot, etc.). Contact them at www.arca-az.org/arca. In May, CARA will have its Hamfest on May 6th in Sierra Vista. 73, Clifford Hauser, KD6XH. Net: ATEN 1174 QNI, 30 QTC, 31 ses. Tfc: W7EP 39, K7PF 31, W7DQS 6.

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF — One of our most prolific writers, engineer, and our OOC, W6UPN, Joe, has topped the list again with his humor and sensitivity. Driving the interstate, a woman was observed to be putting on her "eye-liner" and driving in an unsafe manner. Ham Smith was so scared that he dropped his electric shaver, which knocked the donut out of his other hand. In all the confusion of trying to straighten out the car, he knocked the cell phone away from his other ear; then, it fell into his coffee. The coffee cup was held between his legs but most importantly this action DISCONNECTED HIS IMPORTANT CALL THAT WAS IN PROGRESS. It is assumed that this priority call contained a relayed message to W1RFI, Ed Hare at ARRL HQ, asking about automotive interference and safety when using cell phones. Maybe next month we will learn the answer to this on going saga about safely maneuvering the LA freeways. Edgar Brown, N6OU, our Technical Coordinator informs me that if you want action on the subject of "telephone interference" and you can't get it locally, just write a good technical letter to the PUC, like he did. Contact Edgar if you need technical assistance or if you need your DX cards checked. Edgar will help you take care of your problems with dignity and dispatch. One local susceptibility problem has been reported with the "Nutone Corporation's," fancy door chimes. Ed Hare advised us that a company document is available with recommended filtering fixes. Ed also recommended the *ARRL RFI Book*. Please check out our Web site on the Internet. www.qsl.net/arrlsw/lax. Vy 73, Phineas, W6BF.

ORANGE: SM Joe Brown, W6UBQ, 909-687-8394— ASM: Riv. Co., Brett, N6NLN, 760-346-9291. ASM: Org. Co. Art, W6XD, 714-556-4396. ASM: SB Co. Jeff, W6JJR, 909-886-3453. From the Circle City Communicator: Join the ARRL 150,000 other smart hams have! OCRACES visual communications committee was invited to participate in the Jan 30 exercise. Both ATV and SSTV were used to send video to two locations. April, WA6OPS, EC for the HDSC Orange Co, announced top operators during the year 2001. A point system verifies the disaster dozen: Dennis, WA6NIA, Cheryl, KD6MWZ, Ken, WA6KOS, Keith, KG6CGT, Tom, WB2LRH. Tom, KD6HWD, Clay, KE6TZR, Paul, K6MHD, David KF6NVJ, Jon, W6UFS, Jay, W6JAY, Richard, WA6NOI. From the Modulator. It is Field Day Kick Off time. Early planning should be on the way. People are needed to make this event a success. Go to your ARC Field Day meeting and have fun. Join in. Are you receiving the SW Division Communicator? To sign up, go to the ARRL Web, www.arrl.org. Log onto Members Only area and select member data page. At the bottom of your page, modify your e-mail notification options to receive the division/section notices. From the Squelch, K5SCW and KA6G have started a Morse code (CW) practice net on 7028 on Monday, Wednesday, Thursday nights at 7 PM. CW weekdays at 7138 at 11 AM. This is followed by a discussion net (SSB) at 111:30 AM on 7294 kHz. STM report for Dec 2001: KC6SKK 270, W6QZ 147, K6IUI 139, W6JPH 114, W6QZ Packet NTS BBS QTC 252. Jan 2002: K6IUI 112, W6QZ 107, KC6SKK 106, W6JPH 63. W6QZ BBS 100. SCN/V W6JPH reports 23 net session. QTC 71, QNI 145.

SAN DIEGO: SM, Kent Tiburski, K6FQ, k6fq@arrl.org 619-575-1964— This year has started off slow but things are picking up. As I write this, ARES and RACES have been activated to assist with the fire in Fallbrook. The fire started early in the morning and quickly spread due to the intense Santa Ana winds in excess of 50mph. Our hams quickly mobilized to provide damage assessment, man shelters and assist the Red Cross with communications. So far over 1000 acres have

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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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Two knob tuning (differential capacitor and *AirCore*™ roller inductor) makes tuning foolproof and easier than ever. Gives minimum SWR at only one setting. Handles 3 KW PEP SSB amplifier input power (1.5 KW output). Gear-driven turns counter, lighted peak/average Cross-Needle SWR/Wattmeter, antenna switch, balun. 1.8 to 30 MHz. 10¾Wx4½Hx15 in.

MFJ-962D *compact* Tuner for Amps

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A few more dollars steps you up to a KW tuner for an amp later. Handles 1.5 KW PEP SSB amplifier input power (800W output). Ideal for Ameritron's AL-811H! *AirCore*™ roller inductor, gear-driven turns counter, pk/avg lighted Cross-Needle SWR/Wattmeter, antenna switch, balun, Lexan front, 1.8-30MHz. 10¾x4½x10⅞ in.

MFJ-969 300W *Roller Inductor* Tuner

MFJ-969 **$199.95**

Superb *AirCore*™ Roller Inductor tuning. Covers *6 Meters* thru 160 Meters! 300 Watts PEP SSB. *Active* true peak reading lighted Cross-Needle SWR Wattmeter, *QRM-Free PreTune*™, antenna switch, dummy load, 4:1 balun, Lexan front panel. 3½Hx10½Wx9½D inches.

MFJ-949E *deluxe* 300 Watt Tuner

MFJ-949E **$149.95**

More hams use MFJ-949s than any other antenna tuner in the world! Handles 300 Watts. Full 1.8 to 30 MHz coverage, 48 position *Precision48*™ inductor, 1000 Volt tuning capacitors, *full size* peak/average lighted Cross-Needle SWR/Wattmeter, 8 position antenna switch, dummy load, *QRM-Free PreTune*™, scratch proof Lexan front panel. 3½Hx10⅝Wx7D inches. **MFJ-948, $129.95.** Economy version of MFJ-949E, less dummy load, Lexan front panel.

MFJ-941E *super value* Tuner

MFJ-941E **$129.95**

The most for your money! Handles 300 Watts PEP, covers 1.8-30 MHz, *lighted* Cross-Needle SWR/Wattmeter, 8 position antenna switch, 4:1 balun, 1000 volt capacitors, Lexan front panel. Sleek 10½Wx2½Hx7D in.

MFJ-945E HF+6 Meter *mobile* Tuner

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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

MFJ-971 **$99.95**

Tunes coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle Meter. SWR, 30/300 or 6 Watt QRP ranges. Matches popular MFJ transceivers. Tiny 6x6½x2½ inches.

MFJ-901B *smallest* Versa Tuner

MFJ-901B **$79.95**

MFJ's smallest (5x2x6 in.) and most affordable wide range 200 Watt PEP Versa tuner. Covers 1.8 to 30 MHz. Great for matching solid state rigs to linear amps.

MFJ-16010 *random* wire Tuner

MFJ-16010 **$49.95**

Operate all bands anywhere with MFJ's reversible L-network. Turns random wire into powerful transmitting antenna. 1.8-30 MHz. 200 Watts PEP. Tiny 2x3x4 in.

MFJ-906/903 *6 Meter* Tuners

MFJ-906 **$79.95**

MFJ-906 has lighted Cross-Needle SWR/wattmeter, bypass switch. Handles 100 W FM, 200W SSB. **MFJ-903, $49.95**, Like MFJ-906, less SWR/Wattmeter, bypass switch.

MFJ-921/924 *VHF/UHF* Tuners

MFJ-921 or MFJ-924 **$69.95**

MFJ-921 covers 2 Meters/220 MHz. **MFJ-924** covers 440 MHz. SWR/Wattmeter. 8x2½x3 inches. Simple 2-knob tuning for mobile or base.

MFJ-922 144/440 MHz Tuner

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Ultra tiny 4x2½x1¼ inch tuner covers VHF 136-175 MHz and UHF 420-460 MHz. SWR/Wattmeter reads 60/150 Watts.

MFJ-931 *artificial* RF Ground

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Creates artificial RF ground. Also electrically places a far away RF ground directly at your rig by tuning out reactance of connecting wire. Eliminates RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding. **MFJ-934, $169.95**, Artificial ground/300 Watt Tuner/Cross-Needle SWR/Wattmeter.

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burned. Congratulations to George Grant, K3EJ, in his acceptance as the new PIO. George is uniquely qualified for the job and we welcome him aboard. We welcome the Coronado Emergency Radio Operators (CERO) as the newest ARRL affiliated club. They are a great group of folks and very motivated. On February 9th we had an excellent group at the ARES breakfast meeting. They get bigger and better every month. Thanks to all that attend, lets keep it up! In works are a speakers bureau and equipment pool for the section. If you have ideas and announcements, feel free to call or email me and I'll spread the word. If you have Internet, the ARRL now provides us with Web space for section news at: www.arrl.org/sections/?sect. SDG 73. STM: Sessions:13, Total checkins: 106, Total Traffic: 27, PSHR Totals: N6TEP 49, KD6YJB 32, KC6NXZ (STM) 34, K6DAY 26, K6CD 36. 73, Kent, K6FQ.

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). ACC: Michael Atmore, KE6DKU (ke6dku@aol.com). OOC: Howard Coleman, N6VDV (N6VDV@arrl.net). PIC: Jeff Reinhardt, AA6JR, (jreinh@ix.netcom.com). TC (position is vacant); ASMs: Ventura, Don Milbury, W6YN (w6yn@arrl.net); Santa Barbara, Marvin Johnston, KE6HTS (ke6hts@sbarc.org); San Luis Obisipo, Bill Palmerston, K6BWJ, (bpalmers@fix.net) & for Internet, Jack Bankson, AD6AD (ad6ad@arrl.net); & DECs: Santa Barbara, (wa6brw@arrl.net); SLO-Bill Peirce, KE6FKS (ke6fks@arrl.net) & Ven-Dave Gilmore, AA6VH (aa6vh@arrl.net). "Section News" may move to the ARRL Web only. Do you care? Club leaders: I encourage you to contact our ACC, Mike Atmore (KE6DKU), or ASM Don Milbury, W6YN, to get involved with the Section Club Council. ASM, Marvin, KE6HTS, is Section Point-of-Contact for JOTA planning & activities: KE6HTS@sbarc.org for info! FREE instant Section news updates? Join the SB Reflector! e-mail majordomo@qth.net the message subscribe arrlsb. SB Sec Web: www.qsl.net/arrlsb/.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 in memory of N6PKK, SK. Rob, K6YR.

WEST GULF DIVISION

NORTH TEXAS: SM, Larry Melby, KA5TXL—STM: Carolyn, KC5OZT. SEC: Bill, K5MWC. ACC/OOC: John, WN5PFI. SGL: Tom, N5GAR—April is now upon us and that means several things. 1) Spring storm season is rapidly approaching so make preparations and be ready to respond if you are called upon to assist in storm spotting or emergency communications. That also means that it is Hamfest time and the two biggest ones in the section are coming up The Spring edition of Belton will be April 13. Check them out at www.tarc.org and the planning is going for the 2002 edition of HamCom. HamCom will be two days only this year—Friday and Saturday, June 7 & 8,and you can check them out at www. hamcom.org. And speaking of Web sites you can now go to the League Web site and check out the latest in North Texas Section news. I am trying to make it to as many of the clubs this year as possible and it would help if your clubs would send me copies of your newsletters either via email at ka5txl@arrl.org or by snail mail. See page 12 for my address. 73 de KA5TXL. Tfc: January—K5UPN 536, K5MXQ 265, KC5OZT 143, KB5TCH 76, W5RDM 57, K5NHJ 55, WA5I 51, N8QVT 1.

OKLAHOMA: SM, Charlie Calhoun, K5TTT—ASM: AB5JY, W6CL, N6CL. ACC: KB5BOB. OOC: WB9VMY. PIC: N7XYO. SEC: KA7GLA. SGL: N5NZS. STM: K5KXL. TC: KB5RV. ARRL Oklahoma Section Web Page: http://www.arrl.org/sections/OK.html. Tfc: KF5A 1616, N5IKN 728, WA5OUV 287, K5KXL 225, KM5VA 154, KK5GY 110, WA5IMO 97, KI5LQ 83.

SOUTH TEXAS: SM, Ray Taylor, N5NAV—ASMs :KS5V, N5WSW, W5GKH, K5DG, N5LYG, WA5UZB, KK5CA, K5EJL, W5ZX, WA5TUM, KB5AWM, WA5JYK, K5PFE, K5PNV, W5JAM. STM: W5GKH. SEC: W5ZX, ACC: N5WSW. TC: KJ5YN. BM: W5KLV. OOC: W5JAM. SGL: K5PNV. PIC: KD5HOP. I want to apologize to W8AHU for using his call sign in the SM News for December issue of *QST*. It should have been K8AHU who was the only one on the Island at the time of the bridge disaster in the Valley. K8AHU is in a wheel chair and never left his post for over 48 hours maintaining communications to and from the mainland. I wonder what the April joke will be in this issue of *QST*. I hope the April showers won't be too severe. We're already running test for the Hurricane season. The team effort displayed during these emergencies train you for anything that might confront us in the event we are needed in the Homeland Defense. I hope everyone has had a chance to check the South Texas Web page on the ARRL Web page. Please let me know what you think. One of the main things that I would like to know is how many of you read the SM news on the ARRL Web. We would like to know how many liked or disliked this idea. One advantage I can see is that if you have something you would like to relate to the whole group we will have the space to present it. It can't be done in our limited space in *QST*. I would like to see both, with a summary in *QST* and the whole story on the web. I want to congratulate KK5CA for the great progress in the advancement of ARES in the Houston area. We have passed over some of the great problems we had had due to the hard work of KK5CA. Thanks again Jerry. I have seen a real increase of check ins to the Texas ARES NET every Monday night at 7:30 on 3873. I hope all of you have a great April. God Bless America. Tfc: KA5KLU 576, W5GKH 204, W5KLV 196, KC5XK 187, W5ZX 87, N5OUJ 82, N5SIG 51, K0YNW 44, N5NAV 41, W5ZIN 32.

WEST TEXAS: SM, Lee Kitchens, N5YBW—Congratulations to N5UQF, Clinton, on re-election as President of the Lubbock ARC. Congratulations are also in order to Barbara, KM5VM, on her election as president of the Bib Bend ARC in Alpine. She took office at their annual banquet that I was able to attend. Many thanks to Bill, KE5OG, for making all the arrangements and the donation of some door prizes. They have an impressive group for a small town. Their 30 members are all listed on a published telephone tree, which they use when there is a need to call out the group. They do an interesting thing at some of their meetings. Have you ever heard of CW BINGO? It seems that members of the club are well versed in CW as far as the letters B, I, N, G, and O as well at the numbers from 0 to 9. Now all they have to work on is the other 21 letters of the alphabet. Amarillo and San Angelo are next on the list of clubs to be visited. Don't forget Hamfest in Arlington and the hamfest of all hamfest in Dayton not too far away.

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Power your HF transceiver, 2 meter/440 MHz mobile/base and accessories with these new 25 or 45 Amp MFJ MightyLite™ Switching Power Supplies!

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MFJ's new adjustable voltage switching power supplies do it all! Power your HF or 2M/440 MHz radio and accessories.

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MFJ's 25 Amp *MightyLite*™ weighs just 3.7 lbs. -- that's *5 times lighter* than an equivalent conventional power supply. MFJ's 45 Amp is even more dramatic -- *8 times lighter* and weighs just 5.5 pounds!

No RF hash!

These babies are clean . . . Your buddies won't hear *any* RF hash on your signal! *None* in your receiver either!

Some competing switching power supplies generate objectionable RF hash in your transmitted and received signal.

These super clean MFJ *MightyLites*™ meet all FCC Class B regulations.

Low Ripple . . . Highly Regulated

Less than 35 mV peak-to-peak ripple under 25 or 45 amp full load. Load regulation is better than 1.5% under full load.

Fully Protected

You won't burn up our power supplies!

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MFJ-4225MV
25 Amp
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MFJ-4245MV
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They are fully protected with Over Voltage and Over Current protection circuits.

Worldwide Versatility

MFJ *MightyLites*™ can be used anywhere in the world! They have switchable AC input voltage and work from 85 to 135 VAC or 170 to 260 VAC. Replaceable fuse.

MightyLites™ *. . . Mighty Features*

Front-panel control lets you vary output from 9 to 15 Volts DC.

Front-panel has easy access five-way binding posts for heavy duty use and cigarette lighter socket for mobile accessories. MFJ-4245MV has two sets of quick-connects on the rear for accessories.

Brightly illuminated 3 inch meters let you monitor load voltage and current.

A whisper quiet internal fan efficiently cools your power supply for long life.

Two models to choose from . . .

MFJ-4225MV, $149.95. 25 Amps maximum or 22 Amps continuous. Weighs 3.7 pounds. Measures 5¾Wx4½Hx6D in.

MFJ-4245MV, $199.95. 45 Amps maximum or 40 Amps continuous. Weighs 5.5 pounds. Measures 7½Wx4¾Hx9D in.

NEW! 25 Amp *MightyLite*™

MFJ-4125
25 Amp
$109.95
plus s&h

Super light, super compact switching power supply delivers 25 Amps maximum/ 22 Amps continuous at 13.8 Volts DC. Low ripple, highly regulated. *No RF Hash!* Five-way binding posts for high current. Quick connects for accessories. Over voltage/current protection. 110 or 220 VAC operation. Meets FCC Class B regs. 3.5 lbs. 5½Wx2½Hx10¾D in.

MFJ 35/30 Amp Adjustable Regulated DC Power Supply

Massive 19.2 pound transformer . . . No RF hash . . . Adjustable 1 to 14 VDC . . .

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$149.95
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MFJ's heavy duty conventional power supply is excellent for powering HF or 2 Meter/440 MHz transceiver/accessories.

A massive 19.2 pound transformer makes this power supply super heavy duty! It delivers 35 amps maximum and 30 amps continuous without even flexing its muscles. Plugs into any 110 VAC wall outlet.

It's highly regulated with load regulation better than 1%. Ripple voltage is less than 30 mV. *No RF hash* -- it's super clean!

Fully protected -- has over voltage protection, fold back short circuit protection and over-temperature protection.

You get front panel adjustable voltage from 1 to 14 VDC with a convenient detent set at 13.8 VDC. A pair of front-panel meters let you monitor voltage and current.

Three sets of output terminals include a pair of heavy duty five-way binding posts for HF/VHF radios, two pairs of quick-connects for accessories and a covered cigarette lighter socket for mobile accessories.

A front-panel fuse holder makes fuse replacement easy. Whisper quiet fan speed increases as load current increases -- keeps components cool. 9½Wx6Hx9¾D inches.

MFJ *High Current* Multiple DC Power Outlets

Power two HF/VHF transceivers and six or more accessories from your 12 VDC power supply

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$74.95
plus s&h

MFJ-1116
$49.95
plus s&h

MFJ-1112
$34.95
plus s&h

New!
MFJ-1117
$54.95

MFJ-1118, $74.95. This is MFJ's most versatile and highest current *Deluxe Multiple DC Power Outlet*. Lets you power two HF and/or VHF transceivers and six or more accessories from your transceiver's main 12 VDC supply.

Two pairs of super heavy duty 30 amp 5-way binding posts connect your transceivers. Each pair is fused and RF bypassed. Handles 35 Amps total.Six pairs of heavy duty, RF bypassed 5-way binding posts let you power your accessories. They handle 15 Amps total, are protected by a master fuse and have an ON/OFF switch with "ON" LED indicator.

Built-in 0-25 VDC voltmeter. Six feet super heavy duty eight gauge color-coded cable with ring tongue terminals. Binding posts are spaced for standard dual banana plugs. Heavy duty aluminum construction. 12½x2¾x2½ in.

MFJ-1116, $49.95. Similar to MFJ-1118. No 30 amp posts. Has "ON" LED and 0-25 VDC voltmeter. 15 amps total.

MFJ-1112, $34.95. Similar to MFJ-1116. No on/off switch, LED, meter, fuse.

NEW! MFJ-1117, $54.95. For powering four HF /VHF radios (two at 35 Amps each and two at 35 Amps combined) simultaneously. Tiny 8x2x3 inches.

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High Power Amps
144mhz 400watts
220mhz 225watts
440mhz 185watts

Model	Pin (W)	Pout (W)	Ic (A)	Gain/NF (dB)(dB)	(+13.8V) Type	$ Price
50 MHz						
0503G	1-5	10-50	6	15/0.7	LPA	208
0508G	1	170	28	15/0.7	Standard	367
0510G	10	170	25	15/0.7	Standard	319
0550G	5-10	375	59	15/0.7	HPA	524
0552G	20-25	375	54	15/0.7	HPA	486
144 MHz						
1403G	1-5	10-50	6	15/0.7	LPA	163
1405G	1-2	100	14	15/0.7	Standard	295
1410G	5-10	160-200	28	15/0.7	Standard	328
1412G	25-45	160-200	22	15/0.7	Standard	286
1450G	5-10	350+	56	15/0.7	HPA	572
1452G	10-25	350+	52	15/0.7	HPA	525
220 MHz						
2203G	1-5	8-35	5	14/0.8	LPA	168
2210G	5-10	130	20	14/0.8	Standard	346
2212G	25-45	130	16	14/0.8	Standard	316
2250G	5-10	225	40	14/0.8	HPA	579
2252G	10-25	225	36	14/0.8	HPA	537
2254	75	225	32		HPA	494
440MHz						
4405G	1-5	15-50	9	12/1.2	LPA	309
4410G	10	100	19	12/1.2	Standard	367
4412G	15-30	100	19	12/1.2	Standard	355
4448G	1-5	75-100	25	12/1.2	HPA	429
4450G	5-10	185	35	12/1.2	HPA	585
4452G	25	185	30	12/1.2	HPA	547

Description	Size	Wt	Connectors
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Standard=Mobile/Base	3x6x11	6lbs	UHF or N
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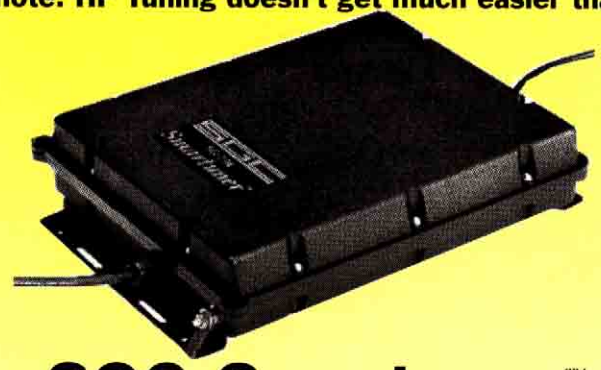

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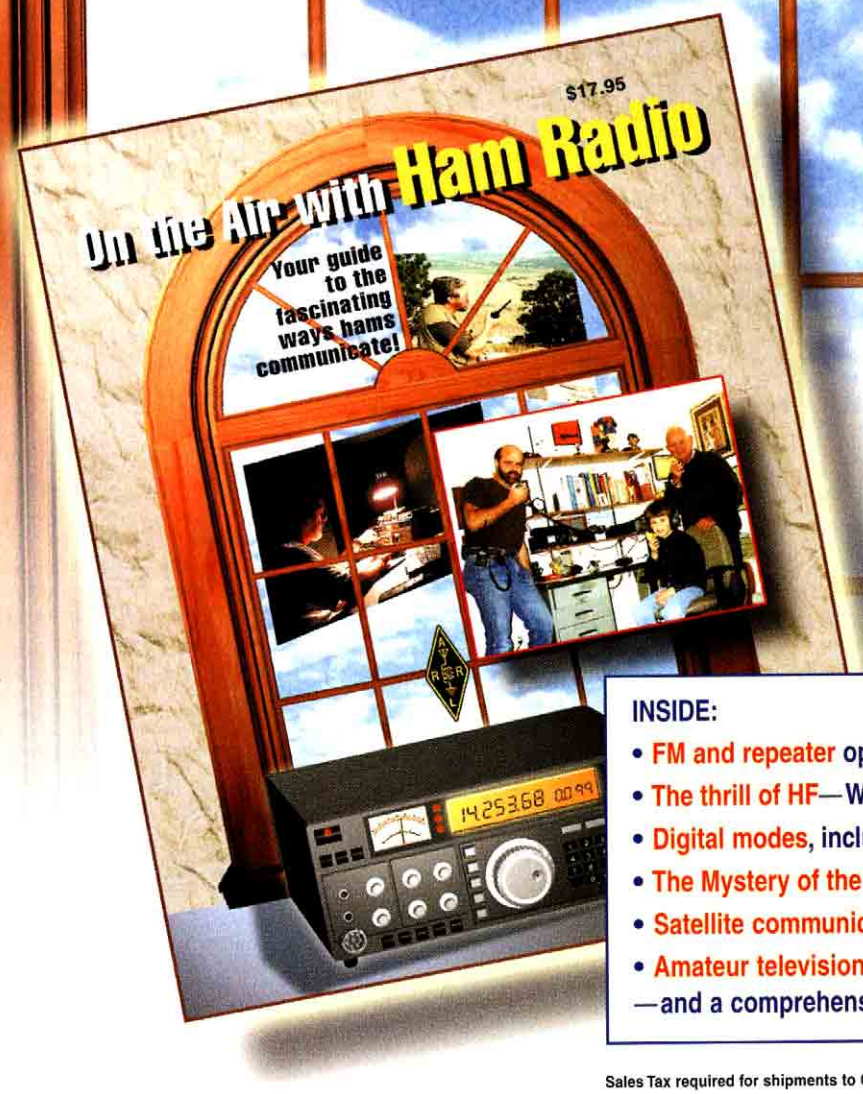

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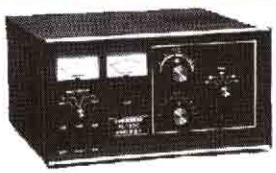

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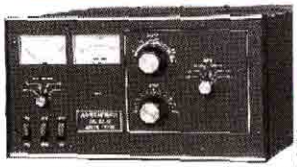

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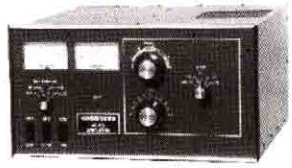

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VX-150 Designed to perform under the most difficult operating conditions. (left) Compact yet incredibly rugged, this 2M HT provides exceptional receiver performance along with clean, clear transmit audio. Built to withstand the rigors of outdoor use, the 16-key 150 is constructed of a die-cast aluminum housing to MIL-STD standards, with a large, high-output speaker delivering commercial-grade audio. And, the Omni-Glow™ illuminated keypad makes nighttime operation easy. It also pipes out a full 5 Watts. 4.3"h x 2.3"w x 1"d, 11.5 oz..... © **$129.99**

FT-50RD/41B Commercial-grade, military spec. It's rugged, reasonably priced, and simple to operate. Boasting 5 Watts output power, the 50RD covers 144 and 430MHz while also offering the "widest" band receive allowable. Perfect for participating in and monitoring outdoor activities. The 50RD is built with 112 alphanumeric memories, DCS and CTCSS encode, and ARTS. 2.2"w x 3.9"h x 1.2"d, 11.5 oz..... © **$209.99**

FRG-100B High performance receiver for high priority listening. The FRG-100B covers 100kHz–30MHz (CW, SSB, AM and optional FM). It also features 50 tunable memories, multi-function scanning, all mode squelch, noise blanker, CAT system for PC control, and backlit LCD. 9.38"w x 3.5"h x 9.5"d, 6.6 lbs..... © **$599.99**

FT-1500M A masterpiece of RF and mechanical engineering. This 144MHz FM mobile is the quietest and most efficient radio transceiver ever built. 50-tone CTCSS encode/decode, direct keypad frequency entry, alphanumeric memory, 50 Watts of output power, and 6-pin mini-DIN data port are just the start. 5"w x 1.4"h x 4.9"d, 2.2 lbs.... © **$139.99**

FT-817 First self-contained, battery powered, multi-mode portable. Providing up to 5 Watts of output power, the 817 is designed for operation on HF, plus 6M, 2M, and 70cm. Whether you perfer SSB, CW, AM, FM, Packet, or SSB-based digital modes, it is ready to join you on your next hiking, camping, or search-and-rescue adventure. 5.3"w x 1.5"h x 6.5"d, 2.6 lbs..... © **$669.99**

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TH-F6A Unique features the competition is still scratching their heads over. (left) The FM 144/220/440MHz F6A offers dual-channel RX capability, 16-key pad, multi-scroll key, and no fewer than 435 memory channels. Other attractive features of this 5W HT include built-in ferrite bar antenna for AM, backlit LCD, lithium-ion battery, and a MIL-STD design. 2.3"w x 3.44"h x 1.18"d, 8.8 oz **$389.99**

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TM-261A Fully equiped, supremely user-friendly 2M mobile. The 261A puts out an impressive 50 Watts with mid and low-power settings. For quick access, essential data can be stored in 62 "memory name function" channels. Other features include DTSS selective calling, multi-scan, and a case built to MIL-STD. 5.5"w x 6.56"h x 1.56"d, 2.2 lbs..... **$169.99**

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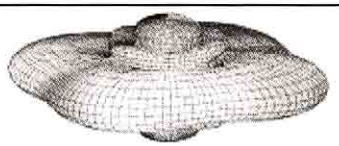

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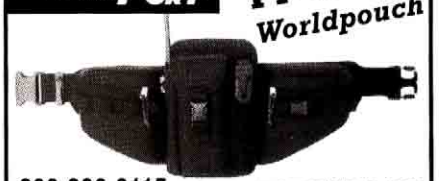

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Turning Power (in pounds)	1000	800	600	350
Brake Power (in pounds)	9000	5000	800	450
Brake Construction	Electric wedge	Electric wedge	Disc brake	Disc brake
Bearing Assembly/How many	Tripl race/138	Dual Race/96	Dual race/48	Dual race/12
Mounting Hardware	Clamp plate	Clamp plate	Clamp plate	Clamp plate
Control Cable Conductors	8	8	8	5
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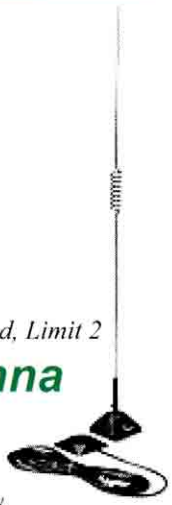

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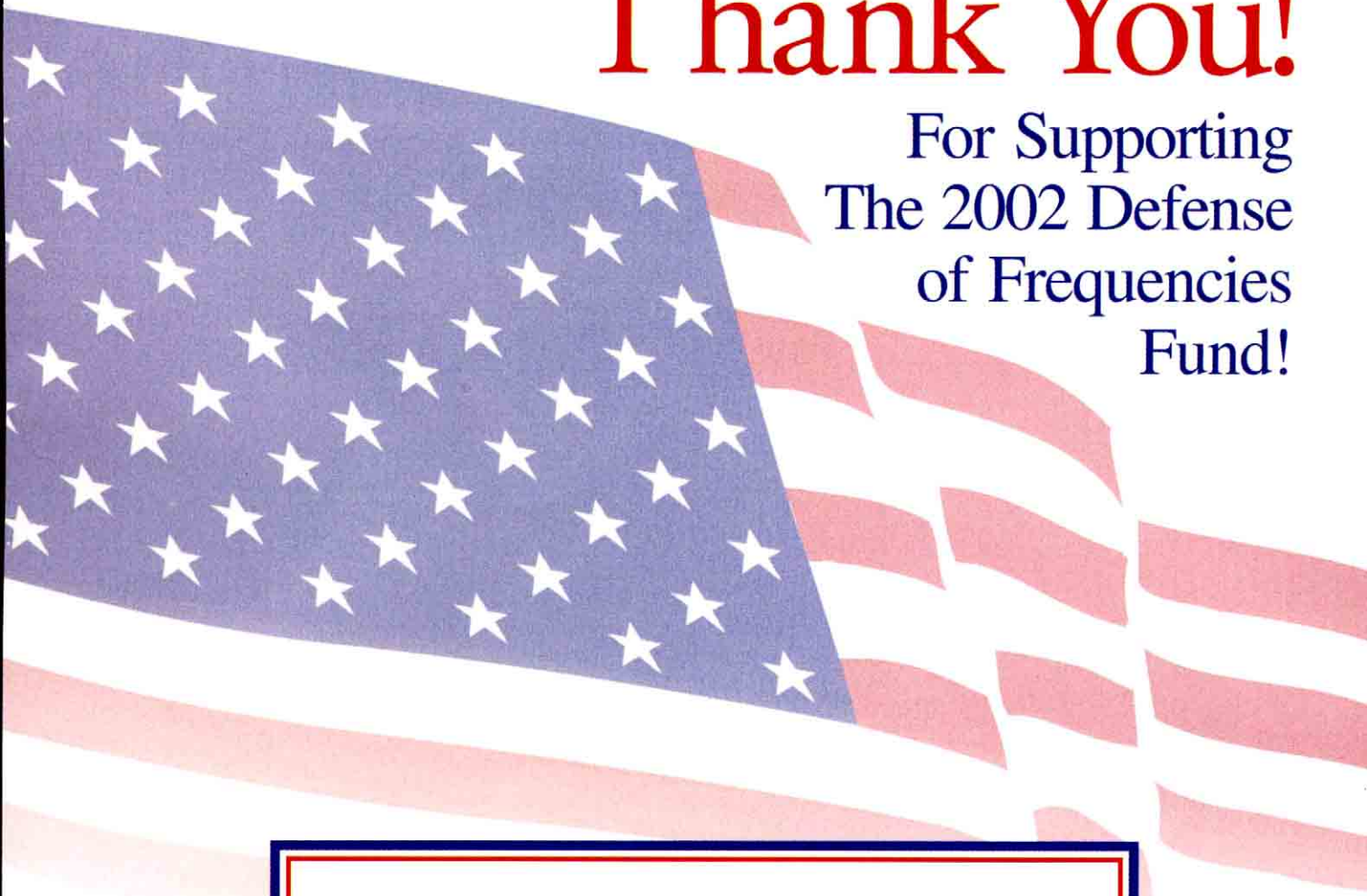

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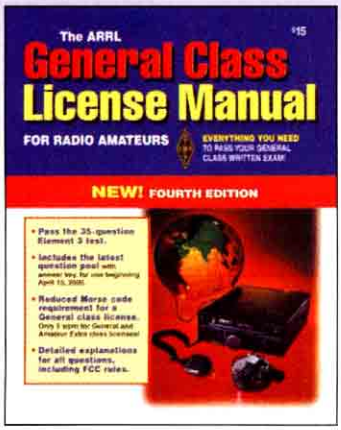

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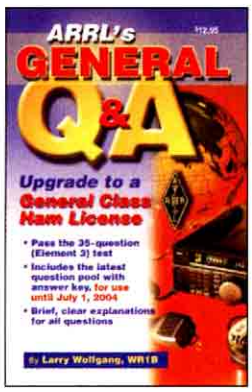

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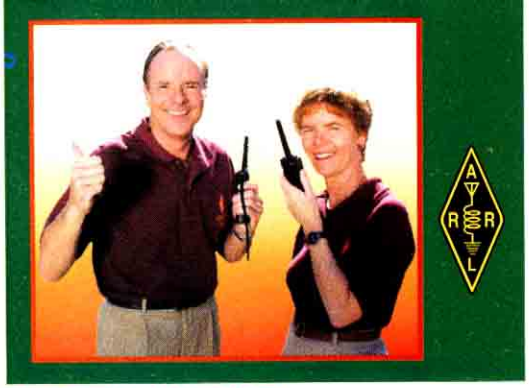

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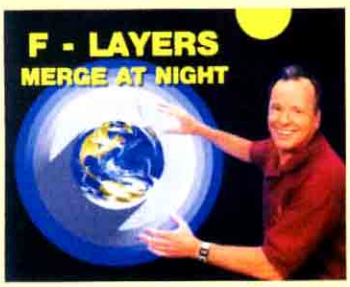

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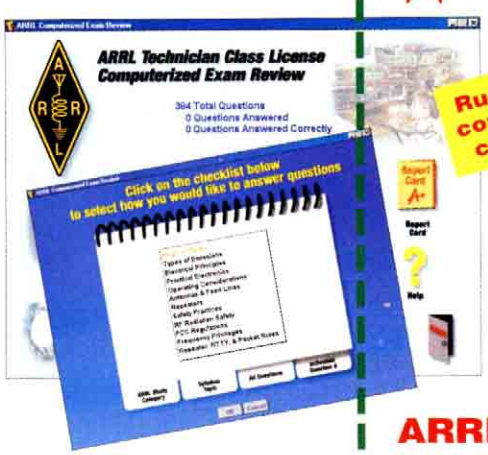

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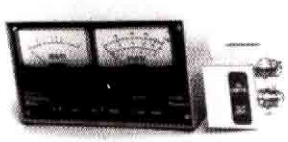

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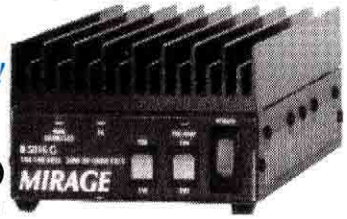

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Draws 17-22 Amps at 13.8 VDC. 12x3x5½ in.

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

Power Curve -- typical B-5016-G output power

Watts Out	130	135	140	145	150	155	160	165
Watts In	20	25	30	35	40	45	50	55

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

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MIRAGE RUGGED!

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Watts Out	25	50	75	95	100	100	100	100
Watts In	¼	½	1	2	4	6	7	8

- ***100 Watts out with all handhelds up to 8 Watts***
- ***All modes: FM, SSB, CW***
- ***Great for ICOM IC-706***
- ***15 dB low noise GaAsFET preamp***
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***Boost** your 2 Meter handheld to 100 Watts!* Ultra-compact all mode B-310-G amp is perfect for all handhelds up to 8 Watts and multimode SSB/CW /FM 2 Meter rigs. *Great for ICOM IC-706!*

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Power Curve -- typical B-34-G output power

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Watts In	1	2	3	4	5	6	8

- ***35 Watts Output on 2 Meters***
- ***All modes: FM, SSB, CW***
- ***18 dB GaAsFET preamp***
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BD-35
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Power Curve -- typical BD-35 output power

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Watts Out 440 MHz	16	26	32	35	35	35	35+
Watts In	1	2	3	4	5	6	7

- ***45 Watts on 2 Meters/35 Watts on 440 MHz***
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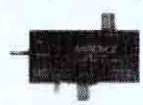

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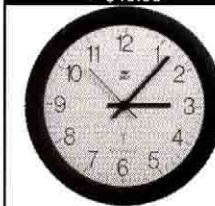

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In 6' or 12' lengths, 6' lengths ship UPS. Call for 3/16"& 1/4" rod, bar stock, and extruded tubing.

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A3S/A4S	$449/539
A50-3S/5S/6S	$95/169/259
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AR2/ARX2B	$49/69
AR270/AR270B	$85/99
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Please call for more Cushcraft items

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C3E	10/12/15/17/20m, 8 el	$649
C3S	10/12/15/17/20m, 6 el	$539
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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
C4XL	10/12/15/17/20/40m, 9 el	$1119
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Many more Trylon towers in stock!

BENCHER / BUTTERNUT

Skyhawk, Triband Beam	$1129
HF2V, 2 Band Vertical	$219
HF5B, 5 Band Minibeam	$429
HF6VX, 6 Band Vertical	$299
HF9VX, 9 Band Vertical	$349
A1712, 12/17m Kit	$54
CPK, Counterpoise Kit	$129
RMKII, Roof Mount Kit	$159
STRII, Roof Radial Kit	$125
TBR160S, 160m Kit	$119

More Bencher/Butternut–call

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144–148 MHz

2M4/2M7/2M9	$89/109/119
2M12/2M5WL	$149/199
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

2MCP14/2MCP22	$169/219
436CP30/436CP42UG	$219/259

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25G/45G/55G	$89/189/239
25AG2/3/4	$109/109/139
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AS25G/AS455G	$39/89
BPC25G/45G/55G	$75/99/110
BPL25G/45G/55G	$85/109/125
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GAR30/GAS604	$35/24
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TB3/TB4	$85/99

Please call for more Rohn prices

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TMM541SS	$1499
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TX472/TX489	$2459/4579
HDX538/HDX555	$1269/2269
HDX572MDPL	$5899

Please call for help selecting a US Tower for your needs. Shipped factory direct to save you money!

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GP15, 6m/2m/70cm Vertical	$149
GP6, 2m/70cm Vertical	$139
GP9, 2m/70cm Vertical	$179
B10NMO, 2m/70cm Mobile	$36
B20NMO, 2m/70cm Mobile	$49
SBB2NMO, 2m/70cm Mobile	$39
SBB5NMO, 2m/70cm Mobile	$55
SBB7NMO, 2m/70cm Mobile	$75
Z750, 2m/70cm Mobile	$55
Z780, 2m/70cm Mobile	$69

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M2 ANTENNAS

50–54 MHz

6M5X/6M7	$199/279
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HO LOOPS

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RT424, 4 Foot, 6 sq ft	$159
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RT1832, 17 Foot, 12 sq ft	$499

Please call for Glen Martin info

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4-40'/50'/60'	$539/769/1089
7-50'/60'/70'	$979/1429/1869
9-40'/50'/60'	$759/1089/1529
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35-30'/40'	$1019/1569

Bold in part number shows wind-load capacity. Please call for more Universal models. All are shipped factory direct to save you money!

DIAMOND ANTENNAS

D130J/DPGH62	$79/139
F22A/F23A	$89/119
NR72BNMO/NR73BNMO	$39/54
NR770HBNMO/NR770RA	$55/49
X200A/X3200A	$129/210
X500HNA/700HNA	$229/369
X510MA/510NA	$189/189
X50A/V2000A	$99/149
CR627B/SG2000HD	$99/79
SG7500NMO/SG7900A	$75/112

More Diamond antennas in stock

MFJ ANTENNAS

259B, Antenna Analyzer	$219
269, Antenna Analyzer	$299
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, 3kW Antenna Tuner	$309
1798, 80–2m Vertical	$249
1796, 40/20/15/10/6/2m Vert.	$189

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RG-213/U, (#8267 Equiv.)	$.36/ft
RG-8X, Mini RG-8 Foam	$.19/ft
RG-213/U Jumpers	Please Call
RG-8X Jumpers	Please Call

Please call for more coax/connectors

TIMES MICROWAVE LMR® COAX

LMR-400	$.59/ft
LMR-400 Ultraflex	$.89/ft
LMR-600	$1.19/ft
LMR600 Ultraflex	$1.95/ft

TOWER HARDWARE

3/8"EE / EJ Turnbuckle	$11/12
1/2"x9"EE / EJ Turnbuckle	$16/17
1/2"x12"EE / EJ Turnbuckle	$18/19
3/16" / 1/4" Preformed Grips	$5/6

Please call for more hardware items

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5 FT x .12" / 5 FT x .18"	$35/59
11 FT x .12" / 12 FT x .18"	$80/150
15 FT x .12"	$105
17 FT x .25	$267
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Challenger Counterpoise	$29
Challenger Guy Kit	$19
Eagle DX	$299
Eagle Guy Kit	$29
Titan DX	$329
Titan Guy Kit	$29
Voyager DX	$409
Voyager Counterpoise	$49
Voyager Guy Kit	$45

Please Call for Delivery Information

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9106 ... 6m	9115 ... 15m	9130 ... 30m
9110 ... 10m	9117 ... 17m	9140 ... 40m
9112 ... 12m	9120 ... 20m	9175 ... 75m

All handle 600W, 7' approximate length, 2:1 typical VSWR ... $24.95

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G6-270R, 2m/70cm Vertical	$169
G6-144B/G7-144B	$129/179

Hustler Resonators in stock–call

ANTENNA ROTATORS

M2 OR-2800P	$1219
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

ROTATOR CABLE

R62 (6, #18)	$.32/ft.
R81/82	$.25/.39
R83/R84	$.52/.85/ft

PHILYSTRAN GUY CABLE

HPTG1200I	$.45/ft
HPTG2100I	$.59/ft
PLP2738 Big Grip (2100)	$6.00
HPTG4000I	$.89/ft
PLP2739 Big Grip (4000)	$8.50
HPTG6700I	$1.29/ft
PLP2755 Big Grip (6700)	$12.00
HPTG11200	$1.69/ft
PLP2558 Big Grip (11200)	$18.00

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Solid state 1 kW autotuning amplifier.

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The Yaesu FT-920 is an all mode HF/6m transceiver featuring digital signal processing, automatic antenna tuner, CW memory keyer, CTCSS tone encode/decode, 127 memories, and more. Supplied with up/down hand mic and DC power cord.

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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.

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IC-2100H ..... Great Low Price!
The IC-2100H is a rugged 2m mobile XCVR with CTCSS tone encode/decode/scan, DTMF paging/squelch, 113 memory channels, switchable display color and more.

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- Bar antenna for receiving AM broadcasts
- Special weather channel RX mode
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- Automatic simplex checker
- Wireless remote control function
- Battery indicator • Internal VOX • MCP software

[1]Note that certain frequencies are unavailable. [2]5W output

"Specifications subject to change without notice."

NEW

TH-F6A

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