45241

Amateur Radio

http://www.cq-amateur-radio.com

COMMUNICATIONS & TECHNOLOGY

NOVEMBER 2008

CQ

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On the Cover: Dave Cisco, W4AXL, of Hoover, Alabama. Details on page 94.

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AIRWAVE SUPERIORITY

Never before has a compact HT offered as many features, and such high powered performance as the TH-F6A. Arm yourself with one today and gain your own airwave superiority.

- Triband (144/220/440 MHz)
- Receives 2 frequencies simultaneously even on the same band
- 0.1~1300MHz high-frequency range RX (B band)[1]
- FM/FM-W/FM-N/AM plus SSB/CW receive
- Bar antenna for receiving AM broadcasts
- Special weather channel RX mode
- 435 memory channels, multiple scan functions
- 7.4V 1550mAh lithium-ion battery (std.) for high output[2] and extended operation
- 16-key pad plus multi-scroll key for easy operation
- Built-in charging circuitry for battery recharge while the unit operates from a DC supply
- Tough construction: meets MIL-STD 810 C/D/E standards for resistance to vibration, shock, humidity and light rain
- Large frequency display for single-band use
- Automatic simplex checker
- Wireless remote control function
- Battery indicator • Internal VOX • MCP software

[1]Note that certain frequencies are unavailable. [2]5W output

TH-F6A
TRIBANDER

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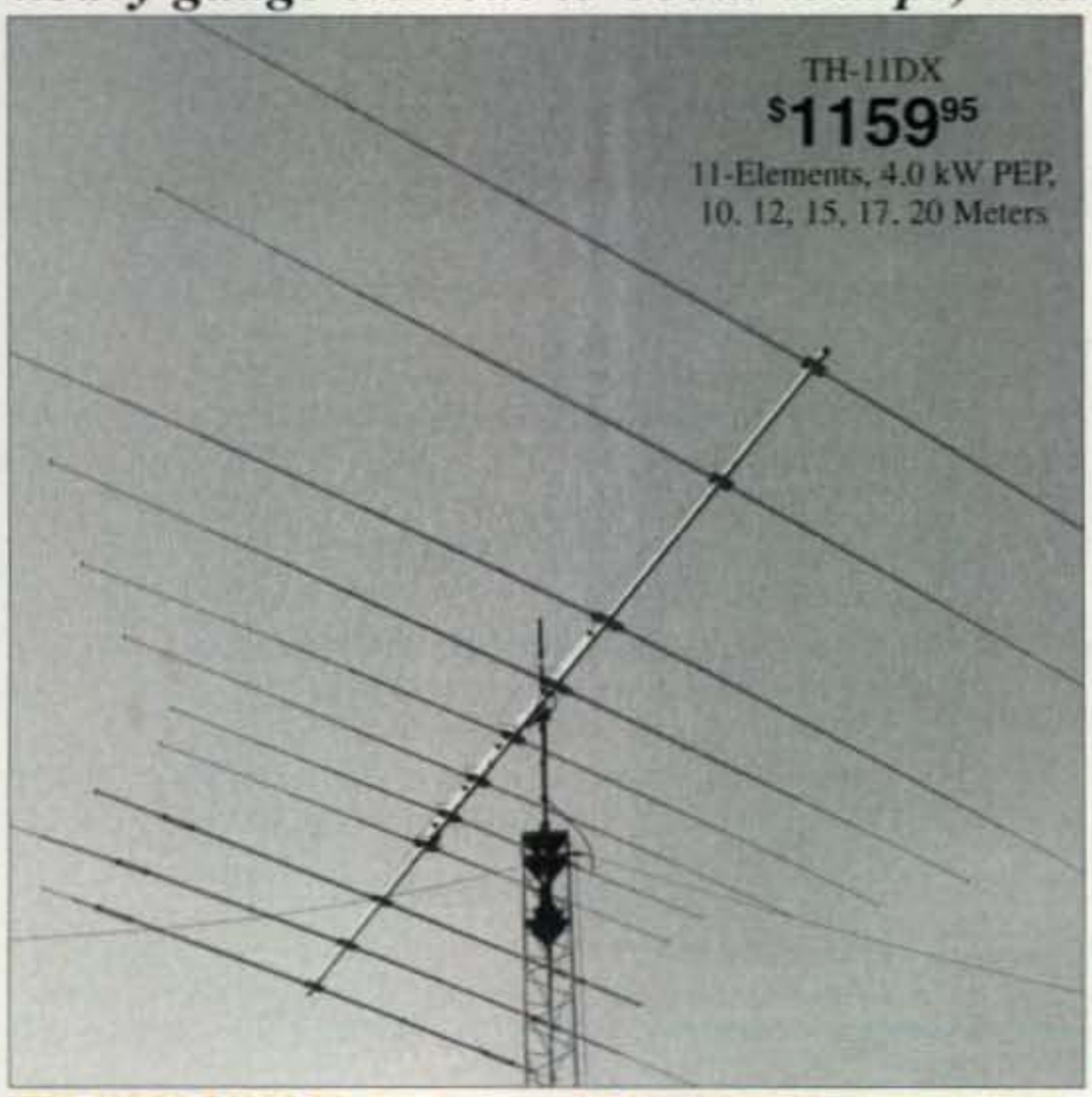
ADS#31608

hy-gain® HF BEAMS...

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



TH-11DX, $1159.95. 11-element, 4.0 kW PEP, 10,12,15,17,20M

The choice of top DXers.

With 11-elements, excellent gain and 5-bands, the super rugged TH-11DX is *the "Big Daddy" of all HF beams!*

Handles 2000 Watts continuous, 4000 Watts PEP.

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

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

Stainless steel hardware and clamps are used on all electrical connections.

TH-7DX, $869.95. 7-element, 1.5 kW PEP, 10,15,20 Meters

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

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

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

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

TH-5MK2, $759.95. 5-element, 1.5 kW PEP, 10,15,20 Meters

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

Separate air dielectric *Hy-Q* traps let you adjust for maximum F/B ratio on each band.

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

TH-3MK4, $469.95. 3-element, 1.5 kW PEP, 10,15,20 Meters

The super popular TH-3MK4 gives you the *most gain for your money* in a full-power, full-size durable Hy-Gain tri-bander!

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

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

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

TH-2MK3, $369.95. 2-element, 1.5 kW PEP, 10,15,20 Meters

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

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

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

EXP-14, $599.95. 4-element, 1.5 kW PEP, 10,15,20 Meters

Revolutionary 4-element compact tri-bander *lets you add 40 or 30 Meters!* Has 14 foot boom and tight 17.25 feet turning radius. Fits on roof tri-pod, mast or medium duty tower.

Hy-Gain's *patented* broadbanding *Para Sleeve* gives you less than 2:1 VSWR. 1.5kW PEP.

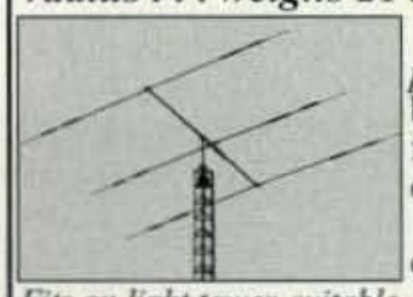
BetaMATCH™ provides DC ground to eliminate static. Includes BN-86 balun. Easily assembled.

***Truly** competitive against giant tri-banders at half the cost!*

QK-710, $179.95. 30/40 Meter option kit for EXP-14.

Compact 3-element 10, 15, 20 Meter Tri-Bander

For limited space . . . Installs anywhere . . . 14.75 ft turning radius . . . weighs 21 lbs . . . Rotate with CD-45II, HAM-IV



Fits on light tower, suitable guyed TV pole, roof tri-pod

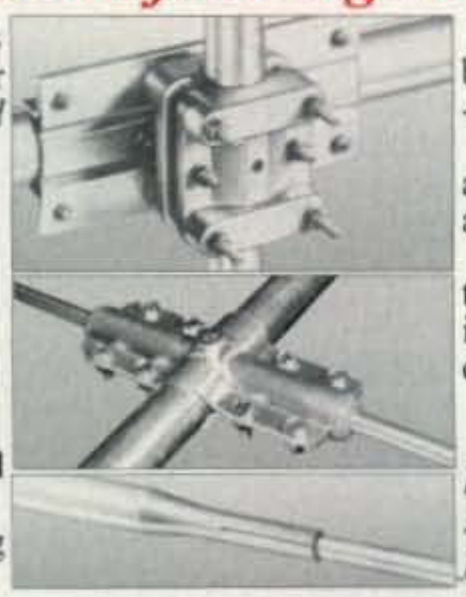
TH-3JRS, $359.95. Hy-Gain's *most popular* 3-element 10, 15, 20 Meter tri-bander fits on most lots! Same top performance as the full power TH3MK4 in a compact 600 watt PEP design.

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

Tooled manufacturing gives you *Hy-Gain* durability with 80 MPH wind survival.

Model No.	No. of elements	avg gain dBd	avg F/B dB	MaxPwr watts PEP	Bands Covered	Wind sq.ft. area	Wind (mph) Survival	boom feet	Longest Elem. (ft)	Turning radius(ft)	Weight (lbs.)	Mast dia O.D.(in.)	Recom. Rotator	Sugg. Retail
TH-11DX	11	*For Gain and F/B ratio--See...*		4000	10,12,15,17,20	12.5	100	24	37	22	88	1.9-2.5	T2X	$1159.95
TH-7DX	**7**			**1500**	**10, 15, 20**	**9.4**	**100**	**24**	**31**	**20**	**75**	**1.5-2.5**	**HAM-IV**	**$869.95**
TH-5MK2	5	• www.hy-gain.com		1500	10, 15, 20	7.4	100	19	31.5	18.42	57	1.5-2.5	HAM-IV	$759.95
TH-3MK4	**3**	• Hy-Gain catalog		**1500**	**10, 15, 20**	**4.6**	**95**	**14**	**27.42**	**15.33**	**35**	**1.9-2.5**	**CD-45II**	**$469.95**
TH-3JRS	3	• Call toll-free		600	10, 15, 20	3.35	80	12	27.25	14.75	21	1.25-2.0	CD-45II	$359.95
TH-2MK3	**2**	800-973-6572		**1500**	**10, 15, 20**	**3.25**	**80**	**6**	**27.3**	**14.25**	**20**	**1.9-2.5**	**CD-45II**	**$369.95**
EXP-14	4			1500	10,15,20	7.5	100	14	31.5	17.25	45	1.9-2.5	HAM IV	$599.95

Tooled Manufacturing . . . Highest Quality Materials



1. **Hy-Gain's** famous super strong *tooled* die cast *Boom-to-Mast Clamp*
2. ***Tooled*** *Boom-to-Element Clamp*
3. **Thick-wall** *swaged* aluminum tubing

***Tooled** manufacturing* is the difference between Hy-Gain antennas and the others -- they just don't have it (it's expensive!).

Die-cast aluminum boom-to-mast bracket and element-to-boom compression clamps are made with specially *tooled* machinery.

Hy-Gain antennas feature *tooled* swaged tubing that is easily and securedly clamped in place. All tubing is deburred and cleaned for smooth and easy assembly.

Durable precision injection molded parts.

***Hy-Gain** antennas are stronger, lighter, have less wind surface area, better wind survival, need no adjustments, look professional and last years longer.*

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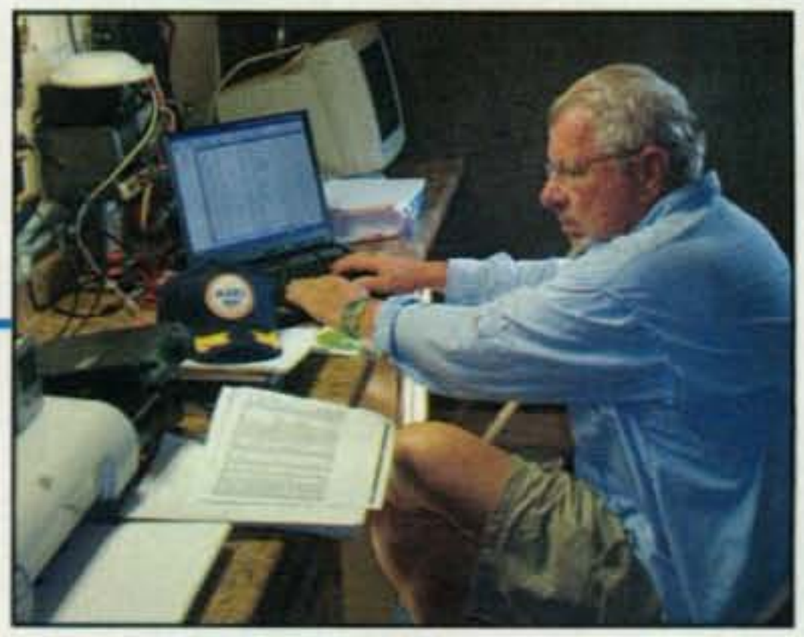

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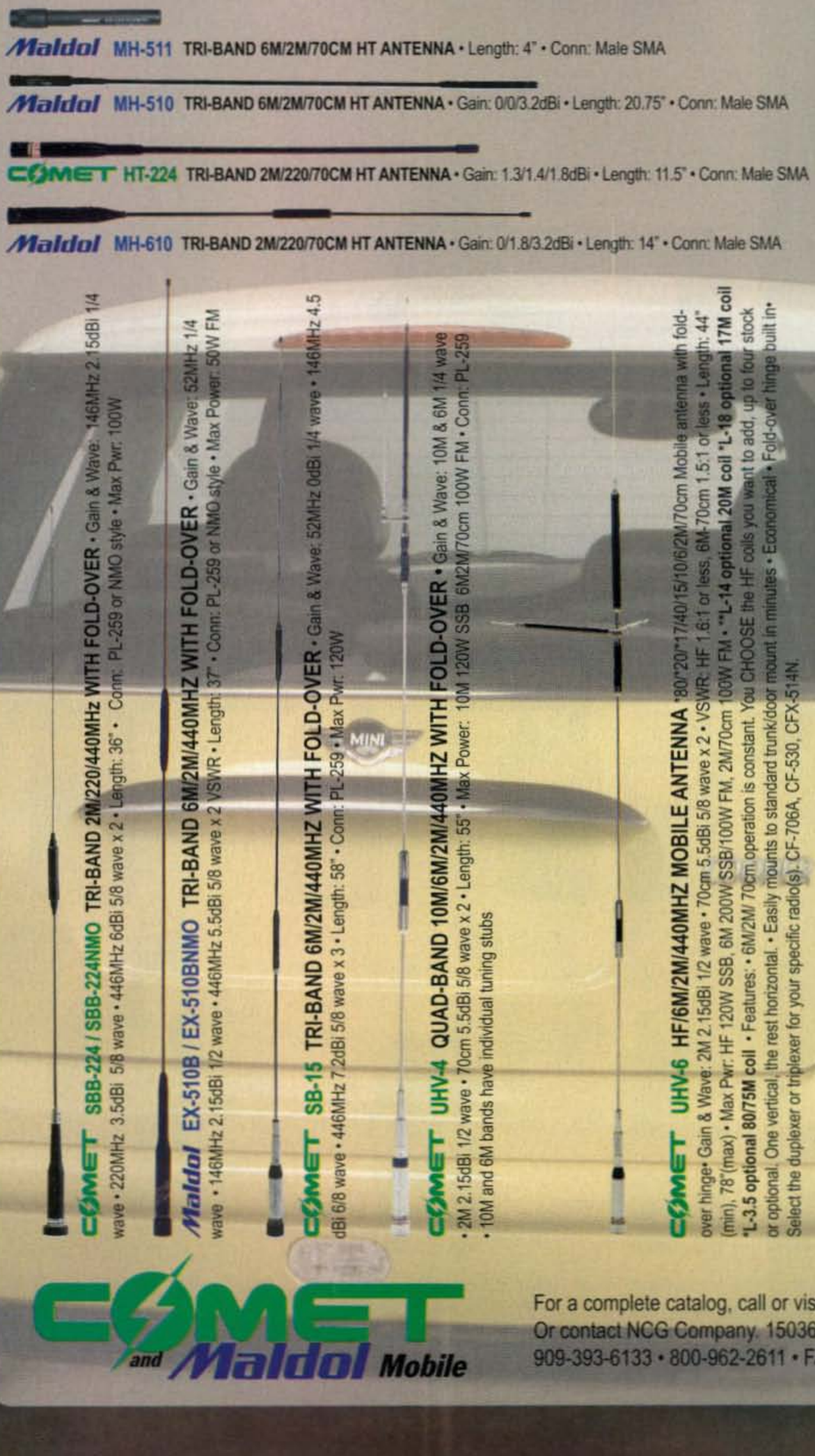
departments

Life is a JOURNEY. Enjoy the ride!



Maldol MH-511 TRI-BAND 6M/2M/70CM HT ANTENNA • Length: 4" • Conn: Male SMA

Maldol MH-510 TRI-BAND 6M/2M/70CM HT ANTENNA • Gain: 0/0/3.2dBi • Length: 20.75" • Conn: Male SMA

COMET HT-224 TRI-BAND 2M/220/70CM HT ANTENNA • Gain: 1.3/1.4/1.8dBi • Length: 11.5" • Conn: Male SMA

Maldol MH-610 TRI-BAND 2M/220/70CM HT ANTENNA • Gain: 0/1.8/3.2dBi • Length: 14" • Conn: Male SMA

COMET SBB-224 / SBB-224NMO TRI-BAND 2M/220/440MHz WITH FOLD-OVER • Gain &
wave • 220MHz 3.5dBi 5/8 wave • 446MHz 6dBi 5/8 wave x 2 • Length: 36" • Conn: PL-259 or NMO style • M

Maldol EX-510B / EX-510BNMO TRI-BAND 6M/2M/440MHZ WITH FOLD-OVER •
wave • 146MHz 2.15dBi 1/2 wave • 446MHz 5.5dBi 5/8 wave x 2 VSWR • Length: 37" • Conn: PL-259 or NMO s

COMET SB-15 TRI-BAND 6M/2M/440MHZ WITH FOLD-OVER • Gain & Wave: 52MHz
dBi 6/8 wave • 446MHz 7.2dBi 5/8 wave x 3 • Length: 58" • Conn: PL-259 • Max Pwr: 120W

COMET UHV-4 QUAD-BAND 10M/6M/2M/440MHZ WITH FOLD-OVER • Gain &
• 2M 2.15dBi 1/2 wave • 70cm 5.5dBi 5/8 wave x 2 • Length: 55" • Max Power: 10M 120W SSB 6M2M/70cm 1
• 10M and 6M bands have individual tuning stubs

COMET UHV-6 HF/6M/2M/440MHZ MOBILE ANTENNA *80/*20/*17/40/15/10/6/2M/70cm
over hinge• Gain & Wave: 2M 2.15dBi 1/2 wave • 70cm 5.5dBi 5/8 wave x 2 • VSWR: HF 1.6:1 or less, 6M-70cm
(min), 78"(max) • Max Pwr: HF 120W SSB, 6M 200W SSB/100W FM, 2M/70cm 100W FM • ***L-14 optional 20M coil *L-18 optional 17M coil
*L-3.5 optional 80/75M coil • Features: • 6M/2M/ 70cm operation is constant. You CHOOSE the HF coils you
or optional. One vertical, the rest horizontal. • Easily mounts to standard trunk/door mount in minutes • Economical • Fold-over hinge built in•
Select the duplexer or triplexer for your specific radio(s). CF-706A, CF-530, CFX-514N.

UHV-6 in fold-over position.
Fold-over hinge included for easy entry to garage, parking structure, drive-thru etc... SB-15 / UHV-4 /
UHV-6 / HMC-6S fold-over hinge has a threaded collar to lock the hinge vertically in place. It can't fold-over
by itself at highway speed!

Maldol HMC-6S *40/20/15/10/6/2/440MHZ MOBILE ANTENNA WITH FOLD-OVER
Gain & Wave: HF-1/4 wave • 2M 2.15dBi 1/2 wave • 70cm 5.3dBi 5/8 wave x 2 • VSWR: HF-6M 1.6:1 orless
2M/70cm 1.5:1 or less • Length: 66" • Max Power: HF 120W SSB 6/2/70cm 150W FM*HMC-7C optional 40M coil

MINI COOPER SHOWN WITH CP-5M UNIVERSAL LIP MOUNT ON THE DOOR EDGE.

All the mounts attach to van doors, truck side doors, SUV doors, etc... and require no holes. Includes 16' 6" deluxe cable assy w/18" mini RG-1888A/U type coax for weather seal entry.

Choose a mount depending on the antenna size and vehicle mounting location space.

For Small Antennas & Limited Space

MODEL	ANT CONN	COAX CONN
Maldol EM-5M	SO-239	PL-259

Footprint: 1.1"x .75"
Max Antenna: 40"

For Medium Size Antennas

MODEL	ANT CONN	COAX CONN
COMET CP-5M	SO-239	PL-259
COMET CP-5NMO	NMO	PL-259

Footprint: 3.4" x 1.25"
Max Antenna: 60"

For Tall or Multi-band HF Antennas

MODEL	ANT CONN	COAX CONN
COMET HD-5M	SO-239	PL-259
COMET HD-5 3/8-24	3/8-24	PL-259

Footprint: 3.75" x 1.1 "
Max antenna: 80"

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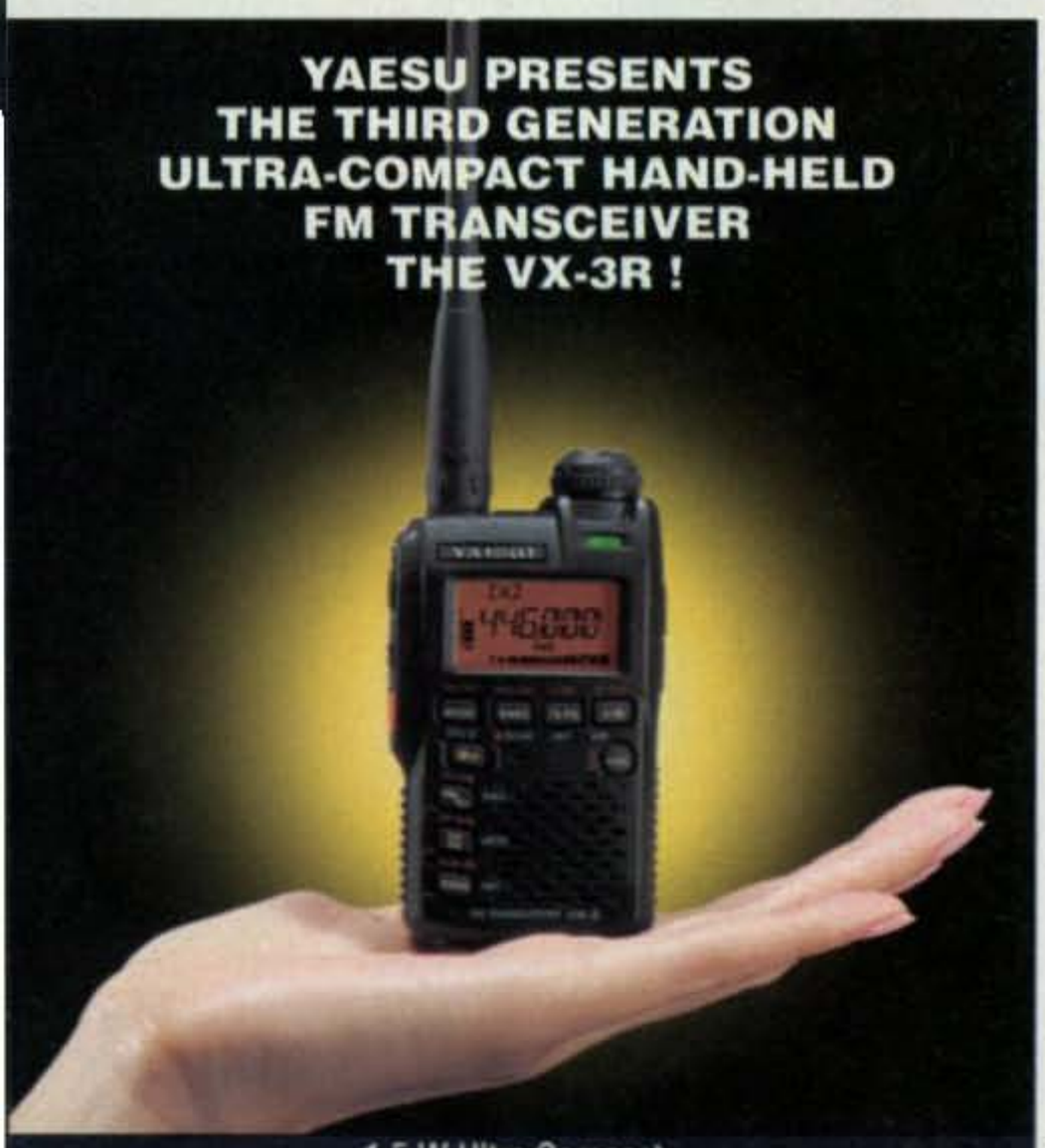
10 W 2 m/70 cm*
Dual Band FM Mobile
FTM-10SR *70 cm 7 W

Great New Features to Support Outdoor Motor Sports Activities
Mobile Transceiver... Great Appearance ... Easy to Operate

DUAL BAND DUAL RECEIVE

50 W 2 m/70 cm*
Dual Band FM Mobile
FTM-10R *70 cm 40 W

YAESU PRESENTS
THE THIRD GENERATION
ULTRA-COMPACT HAND-HELD
FM TRANSCEIVER
THE VX-3R !



2 m / 70 cm Dual Band

1.5 W Ultra Compact
2 m/70 cm Dual Band FM Hand held
VX-3R

50 W 2 m Ultra Rugged VHF FM Mobile
FT-1802M *2 m Band*

65 W 2 m Rugged FM Mobile
FT-2800M *2 m Band*

QUAD BAND DUAL RECEIVE

50 W 10 m/6 m/2 m/70 cm*
Quad Band FM Mobile
FT-8900R *70 cm 35 W

DUAL BAND DUAL RECEIVE

50 W 2 m/70 cm*
Dual Band FM Mobile
FT-8800R *70 cm 35 W

DUAL BAND

50 W 2 m/70 cm*
Dual Band FM Mobile
FT-7800R *70 cm 35 W

5 W Ultra-Rugged, Submersible
6 m/2 m/70 cm Tri-Band FM Hand held *6 m / 2 m / 70 cm Tri-Band*
VX-7R/VX-7RB

5 W Heavy Duty Submersible
2 m/70 cm Dual Band FM Hand held
VX-6R

5 W Heavy Duty
2 m/70 cm Dual Band FM Hand held
FT-60R

(8 key)
(16 key)

5 W Heavy Duty Submersible
2 m FM Mono Band Hand Helds
VX-120 (8 key Version) **VX-170** (16 key Version)

70 cm FM Mono Band Hand Helds
VX-127 (8 key Version) **VX-177** (16 key Version)

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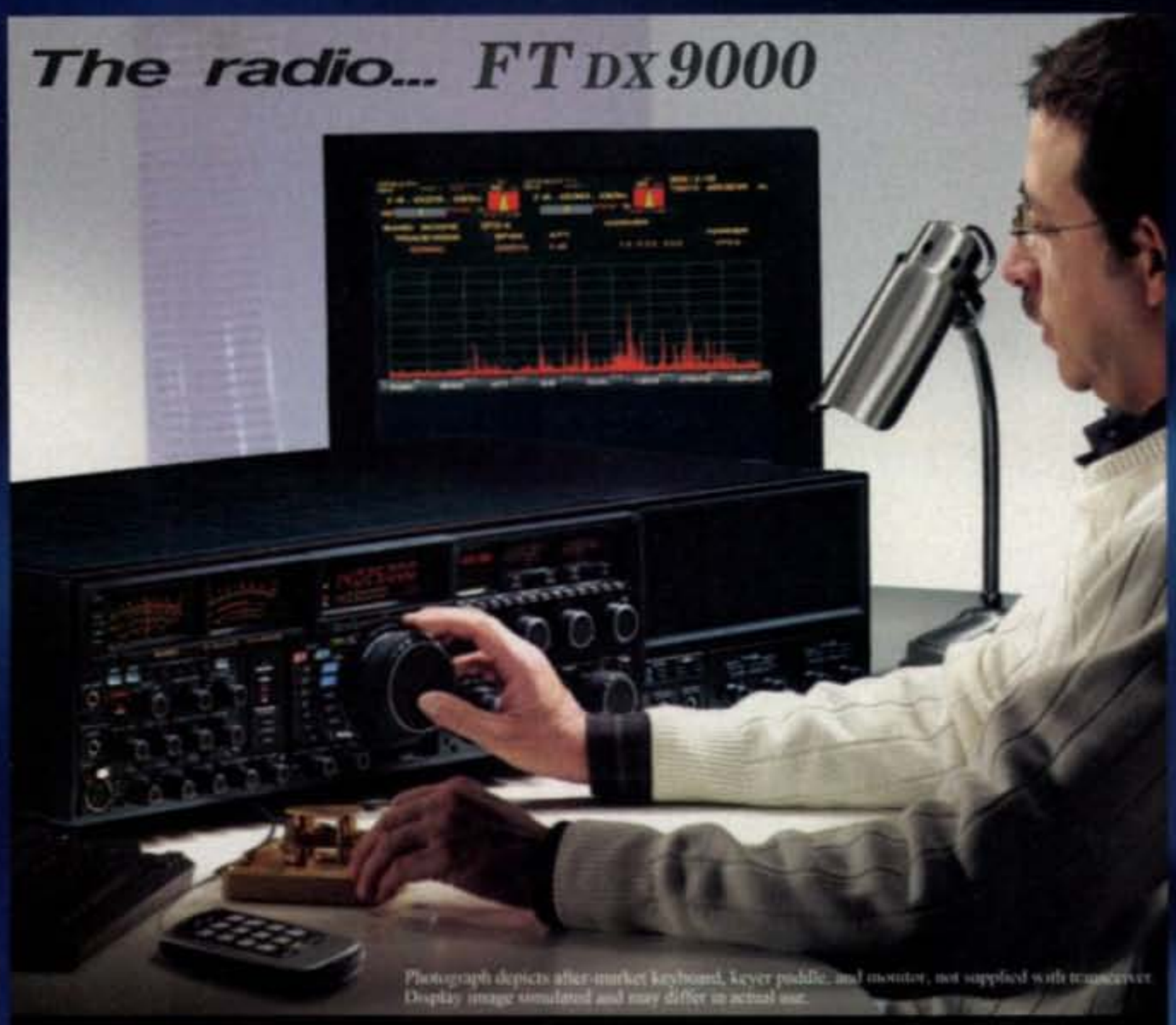

Photograph depicts after-market keyboard, keyer paddle, and monitor, not supplied with transceiver. Display image simulated and may differ in actual use.

HF/50 MHz Transceiver

FT DX 9000MP

Two Pairs of Meters, plus LCD Window; Data Management Unit and Flash Memory Slot Built In; Main/Sub Receiver VRF, plus Full Dual Receive Capability; External 50 V/24 A Switching Regulator Power Supply and Speaker with Audio Filters

Display color (Umber or Light Blue) may be selected at the time of purchase. Modification from 400 to 200 W not possible.

HF/50 MHz Transceiver

FT DX 9000D 200 W Version

Large TFT, Data Management Unit and Flash Memory Slot Built In, Main/Sub Receiver VRF, plus Full Dual Receive Capability, Three μ-Tuning Modules for 160 - 20 M, 50 V/12 A Internal Switching Regulator Power Supply

HF/50 MHz Transceiver

FT DX 9000 Contest

Custom-Configurable Version

Two Pairs of Meters, plus LCD Window, VRF Input Preselector Filter, Three Key Jacks, and Dual Headphone Jacks, 50 V/12 A Internal Switching Regulator Power Supply

Display color (Umber or Light Blue) may be selected at the time of purchase. Modification from 200- to 400-Watt version not available.

Loaded with Leading-edge Performance Capabilities. . .
The First Triumph in the 2nd Generation of the FT DX 9000 Lineage:
The Powerful FT-2000!

Shown with after-market keyboard, and monitor (not supplied).
Optional Data Management Unit (DMU-2000)

HF/50 MHz Transceiver

FT-2000D

200 W Version (External Power Supply)

HF/50 MHz Transceiver

FT-2000

100 W Version (Internal Power Supply)

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http://www.vertexstandard.com

Specifications subject to change without notice. Some accessories and/or options may be standard in certain areas. Frequency coverage may differ in some countries. Check with your local Yaesu Dealer for specific details.

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Aug. Sunspots: Zero, Zilch, Nada, None (Maybe)

Various solar sources, including the National Oceanic and Atmospheric Administration's Space Weather Prediction Center, reported seeing zero sunspots in the month of August. This, according to the DailyTech.com website, is the first time that has happened since 1913. The Brussels international sunspot number, however, was .5 (that's point-5). How do you have half a sunspot? According to spaceweather.com, there were two instances during August in which a sunspot tried unsuccessfully to reach the sun's surface. Apparently, in some quarters, effort counts for something!

There was some encouraging news in late September. On the 22nd, spaceweather.com reported: "For the first time in months, a significant sunspot is emerging on the sun. It is a fast-growing active region with two dark cores, each larger than Earth. The magnetic polarity of the sunspot identifies it as a member of new Sunspot Cycle 24. Because the year 2008 has brought so many blank suns, some observers have wondered if we are ever going to climb out of the ongoing deep solar minimum. Today's new sunspot is an encouraging sign that the 11-year solar cycle is indeed progressing, albeit slowly."

Richard Garriott, W5KWQ, Heads for Space Station

Video game designer and programmer Richard Garriott, W5KWQ, was scheduled to become the sixth high-paying private citizen to "vacation" on the International Space Station. Garriott, whose father, Owen Garriott, W5LFL, was the first person to operate ham radio from space 25 years ago, is planning to make contacts with a dozen school groups during his trip from October 12-22. In addition, he was planning to make random contacts with scout groups during the annual Jamboree on the Air on October 18–19—and to contact his dad by ham radio—according to a joint news release from ARRL and AMSAT. Garriott is also reportedly bringing along slow-scan TV equipment so that he can transmit still photos from the space station during his school contacts. The school contacts are being coordinated through ARISS, Amateur Radio on the International Space Station. Garriott is scheduled to fly to and from the ISS on a Russian Soyuz capsule.

The "Chip" Turns 50

The invention that laid the groundwork for our electronic society is now 50 years old. On September 12, 1958, Texas Instruments engineer Jack Kilby successfully demonstrated the first integrated circuit, which had transistors and other components etched onto a slice of germanium. The first successful commercial product utilizing an IC was TI's first handheld electronic calculator, of which Kilby was a co-inventor. The introduction of the "chip" led to the development of personal computers, cell phones and the myriad other electronic devices which today seem to permeate our lives. Kilby died in 2005. To mark the 50th anniversary of his life-changing invention, Texas Instruments on September 12 opened the new Kilby Labs in Dallas. The new center will bring together university researchers and top TI engineers to work on new advances in chip technology.

ARRL Seeks to Double Size of 500-kHz Experiment

The ARRL has petitioned the FCC to expand from 20 to 40 the number of stations permitted to participate in its experimental license on 500 kHz. According to the *ARRL Letter,* the League says expanding participation will provide greater geographic coverage, including Alaska and Hawaii, and will provide more opportunities for groundwave testing. The petition also included requests for more frequencies (495–510 kHz) and permission for portable operation within 50 kilometers of a station's authorized fixed location.

Who Needs Batteries?

Researchers at the University of Texas at Austin have developed a new material that they say could double the energy storage capacity of "ultracapacitors." According to *Science Daily,* the electrically-conductive material is called *graphene* and it can be produced in sheets that are one atom thick! In principle, the researchers say, the entire surface of a graphene sheet can be in contact with the electrolyte of an ultracapacitor, suggesting it can hold double the charge of existing ultracapacitors. Like any capacitor, an ultracapacitor can store and later release electrical energy. The researchers hope their discovery will make solar and wind power more affordable and practical by increasing the amount of energy that can be stored for use when it is dark or not windy.

Meanwhile, researchers at MIT and other locations are working on devices that use magnetic fields to wirelessly transmit electrical power to wireless devices. This, according to a report in the Newark, NJ *Star-Ledger,* opens up the possibility that you could power or charge a device such as a cellphone, iPod or HT simply by placing it within the magnetic field of the power source. So far, the article says, wireless power transmissions have succeeded over a range of about one foot.

Finally on the power front, a group of hams in Ohio reportedly used fuel cells provided by UltraCell Corporation to power its mobile rigs and handhelds while providing communications for the United States Air Force Marathon September 20 in Dayton.

Radio Nederland Ends N. American Shortwave Service

For the past 60 years, Radio Nederland Wereldomroep —Radio Netherlands Worldwide—has been one of the early catches for thousands of shortwave listeners in the United States and Canada. No longer. As of October 26, Radio Nederland announced, it is terminating its shortwave broadcasts to North America. The decision was based on declining radio listenership as well as a number of other ways to access the station's programming, including the world wide web, satellite transmission and partnerships with North American broadcasters, including the CBC in Canada and many National Public Radio stations in the U.S. In a statement, Radio Nederland's Andy Clark wrote, "We believe that shortwave is still an effective means of reaching listeners in regions where there are fewer alternatives. Radio Netherlands Worldwide will now concentrate its English shortwave broadcasts to South Asia and Africa."

Staff Changes at ARRL

The ARRL has reported two staff changes of note. First, Membership Manager Katie Breen, W1KRB, whom we have spotlighted more than once in these pages, resigned effective October 3. According to the *ARRL Letter,* she will be moving away from Connecticut, but no further information was provided. In addition, Brennan Price, N4QX, has returned to the League staff as Technical Relations Manager, succeeding Paul Rinaldo, W4RI, who retired. Price served as an Assistant Technical Editor and Field and Regulatory Correspondent before leaving the ARRL in 2004. As Technical Relations Manager, he will be responsible for representing the League's interests before federal government agencies, regional telecommunications organizations and international bodies, including the International Telecommunication Union (ITU).

Additional and updated news is available on the Ham Radio News page of the CQ website at <http://www.cq-amateur-radio.com>. For breaking news stories, plus info on additional items of interest, sign up for CQ's free online newsletter service. Just click on "CQ Newsletter" on the home page of our website.

a CQ editorial

BY RICH MOSESON,* W2VU

Connections

Ham radio, in my mind, is all about connections—whether they be physical connections of components and wires on a circuit board, the ethereal connections of contacts on the air or the personal connections of lasting friendships made through our radio hobby. The strength and durability of these connections determines the strength and durability of the hobby itself. A few illustrations…

The Maine Event

While on vacation last summer, I was on a repeater in southern Maine that was part of a linked system covering much of the state. I made a random contact with another ham on another one of the repeaters in the system. In the course of our QSO, this ham mentioned that he was on his way to visit his son in a small town in central Maine. The name of the town rang a bell with me. A ham friend of mine who worked at the same television network I did before joining *CQ* had had a summer house there. I hadn't seen or talked with my friend in nearly 20 years, and had even forgotten his callsign (although I did remember his name). I had no idea whether my friend was still there, or even still here…. Knowing that the odds were remote, I explained the situation and asked the ham if he or his son possibly knew this gentleman. He said that he didn't and that his son wasn't a ham, but that he would check with him when he arrived. That's when the fun began.

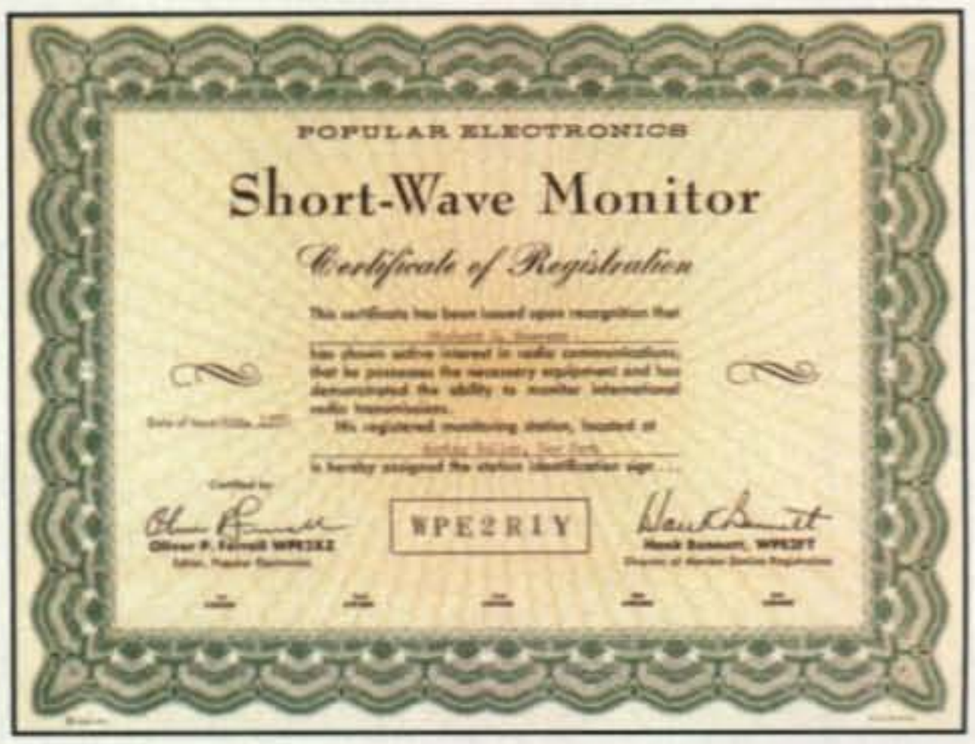
Another station broke in, said he knew my friend, that he was still in Maine, and had been one of his first contacts after he got his license. At that point, two other stations broke in. The first said, "Well, I just drove past the diner where (your friend) often eats breakfast, but I don't see his car there. I talk to him pretty frequently, though, and I'll be happy to give him your regards." The second station simply asked, "Would you like me to call him?" A few miles farther up the road, my cellphone rang. My friend and I were reconnected. Only in ham radio…

The story isn't quite over: Later that evening, while sitting on top of Cadillac Mountain outside of Bar Harbor, a couple of hundred miles from that first repeater, I got onto a different repeater on the linked system—and ran into the same ham on his way home from his son's house! I was able to fill him in on the day's events and complete the circuit.

Saying Goodbye

Another type of connection in ham radio is the link we feel with people who pave the way for us in the hobby, both those we know personally and those public representatives of the hobby whom we feel like we know even though we've never met. We've lost two of these "public hams" in the past month, *Popular Communications* founding editor Tommy Kneitel, K4XAA (ex-K2AES), and former *CQ* Technical Editor Irv Tepper, ex-WB2FUZ.

Tommy was a fixture in the radio hobby for nearly a half century, particularly in the shortwave listening and scanning arenas (see obit in last issue's News section). As a columnist for *Popular Electronics* back in the '60s, Tommy started the WPE program for "registered" shortwave listeners. I remember being one of them; my first (albeit unofficial) callsign was WPE2RIY. Tommy moved on to edit *S9* magazine, and in 1982, he and *CQ* Publisher Dick Ross, K2MGA, launched our sister publication, *Popular Communications*. Tommy was its editor until his retirement in 1995. I never met Tommy in person but still feel the connection. He left an indelible mark on the radio hobby and will be sorely missed.



Tommy Kneitel's WPE program for "registered short wave listeners" provided a sense of accomplishment early on for thousands of SWL novices.

Irv Tepper served as *CQ*'s Technical Editor for 11 years, starting out without a ham license and eventually becoming WB2FUZ. Irv was primarily a teacher. He

(Continued on page 114)

Irv Tepper, ex-WB2FUZ (center), in a photo from 2003 with sons Brian (left) and Robert (right). (Photo courtesy of Brian Tepper)

*e-mail: <w2vu@cq-amateur-radio.com>

announcements

The following special events are scheduled for Nov.:

N2UL, from "Labor Remembers Those Who Served Our Nation," Nutley, New Jersey; Robert D. Grant United labor ARA; 1200–2400Z Nov. 11 on 28.420, 21.360, 14.260, 449.975/W2LI MHz (all ±20 kHz). For certificate send QSL and SASE to RDGULARA, c/o WA2VJA, 112 Prospect St., Nutley, NJ 07110-0716.

N8F & K8F, from Remembering the Edmund Fitzgerald, Whitefish Point, Michigan; Stu Rockafellow ARS; 1800–1800Z Nov. 7–9 on 3.860, 7.260, 14.260, 18.160 MHz. For certificate send QSL and SASE to Richard Barker, W8VS, 264 N. East St., Brighton, MI 48116. (www.qsl.net/w8njh)

WØJH, from Remembering the Edmund Fitzgerald, two stations operating from Split Rock Lighthouse (ARLHS USA 783), Split Rock, Minnesota; Stillwater ARA; 1500Z Nov. 1 to 0100Z Nov. 3 on SSB 3.860, 7.260, 14.260, 21.360 MHz and PSK 14.070 MHz. For certificate send QSL and SASE to WØJH, 1618 West Pine St., Sillwater, MN 55082. (www.radioham.org)

The following hamfests, etc., are slated for Nov. and early Dec.:

Nov. 1, **Enid, Oklahoma Hamfest**, Garfield County Fairgrounds Hoover Building, Enid, Oklahoma. For information contact Jeff, N5UBY, e-mail <n5uby@enidhamfest.com>; table reservations e-mail <enidhamfest@yahoo.com>. (Talk-in 147.375 +.600 MHz)

Nov. 7–9, **Asia Pacific DX Convention**, Osaka International House, Osaka, Japan. For information go to: <http://apdxc.org>.

Nov. 8, **Montgomery (Alabama) ARC Hamfest**, Garrett Coliseum at South Alabama State Fairgrounds, Montgomery, Alabama. For information contact Rik Doll, KU4PY, e-mail <ku4py@arrl.net>, phone 334-277-0864; table reservations contact Phil Salley, K4PO, 334-396-8369; <hamfest@w4ap.org>. (Talk-in 146.84, D-Star 146.92; exams 8 AM)

Nov. 15–16, **Fort Wayne (Indiana) Hamfest & Computer Expo**, Allen County War Memorial Coliseum, Fort Wayne, Indiana. For more nformation call 260-579-2196; <http:www.fortwaynehamfest.com>. (Talk-in 146.88[–]; exams Sat.)

Dec. 6, **Superstition ARC Hamfest**, southeast corner of Dobson Road and Southern Avenue, Mesa, Arizona. (Talk-in 147.120+ CTCSS tone 162.2 Hz; exams)

• • •

our readers say

Attracting New Blood

Editor, *CQ*:

I wonder if a *CQ* type magazine for kids would be a way into their world. You could combine radio and computer technology. I know that when I was a kid I couldn't wait for the electronics magazines and the parts catalogs to hit the streets. I was the first one into the drug store the morning they were due. Reading is what got me into ham radio. Building my own circuits and experimenting were my passion. I really think a magazine of their own might spark a new way to get to this new generation. This is just a thought I had. Keep the good articles coming.

Lenny Bickford, WA1LCW

W2VU replies: Interesting idea, Lenny, and we are starting a youth column next month, but today's kids are not big magazine readers in general. We would need to come up with a way to reach them online. But they won't know to be interested if they don't know what ham radio is all about. In my experience, most kids today know nothing about ham radio but are fascinated when it's introduced to them. Local follow-up is needed, though, to make the most of that interest.

(Continued on page 114)

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Brake Construction	Electric Wedge
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T-2XD
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with DCU-1

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Wind load capacity (inside tower)	20 square feet
Wind Load (w/ mast adapter)	**10 square feet**
Turning Power	1000 in.-lbs.
Brake Power	**9000** in.-lbs.
Brake Construction	Electric Wedge
Bearing Assembly	**Triple race/138 ball brngs**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight	31 lbs.
Effective Moment (in tower)	**3400 ft.-lbs.**

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CD-45II
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For antenna arrays up to 8.5 sq. feet mounted inside tower or 5 sq. ft. with mast adapter. Low temperature grease good to -30 F degrees. *New* Test/Calibrate function. Bell rotator design gives total weather protection, dual 58 ball bearing race gives proven support. Die-cast ring gear, stamped steel gear drive, heavy duty, trouble free gear train, North center scale, lighted directional indicator, 8-pin plug/socket on control unit, snap-action control switches, low voltage control, safe operation, takes maximum mast size to 2 1/16 inches. MSLD light duty lower mast support included.

CD-45II Rotator Specifications	
Wind load capacity (inside tower)	8.5 square feet
Wind Load (w/ mast adapter)	**5.0 square feet**
Turning Power	600 in.-lbs.
Brake Power	**800 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/48 ball brings**
Mounting Hardware	Clamp plate/steel U-bolts
Control Cable Conductors	**8**
Shipping Weight	22 lbs.
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AR-40 Rotator Specifications	
Wind load capacity (inside tower)	3.0 square feet
Wind Load (w/ mast adapter)	**1.5 square feet**
Turning Power	350 in.-lbs.
Brake Power	**450 in.-lbs.**
Brake Construction	Disc Brake
Bearing Assembly	**Dual race/12 ball bearings**
Mounting Hardware	Clamp plate/steel bolts
Control Cable Conductors	**5**
Shipping Weight	14 lbs.
Effective Moment (in tower)	**300 ft.-lbs.**

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HDR-300A Rotator Specifications	
Wind load capacity (inside tower)	25 square feet
Wind Load (w/ mast adapter)	**not applicable**
Turning Power	5000 in.-lbs.
Brake Power	**7500 in.-lbs.**
Brake Construction	solenoid operated locking
Bearing Assembly	**bronze sleeve w/rollers**
Mounting Hardware	stainless steel bolts
Control Cable Conductors	**7**
Shipping Weight	61 lbs.
Effective Moment (in tower)	**5000 ft.-lbs.**

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It almost seems like science fiction . . . cosmic rays from all over our galaxy occasionally, and unpredictably (so far), affecting radio-wave propagation on 160 meters. "Top band" experts NM7M and K9LA think it's science fact, and they say other hams can help collect data to test their theory.

A Theory on the Role of Galactic Cosmic Rays in 160-meter Propagation

BY BOB BROWN,* NM7M, AND CARL LUETZELSCHWAB,† K9LA

Over the years there have been many studies that have tried to correlate solar flux and geomagnetic field activity to propagation on 160 meters. These have not met with much success, suggesting other unknown variables. This article describes one variable that appears to play a critical role in extremely long-distance DX contacts on 160. It's probably something you've heard of, but never associated with propagation on Top band.

The Nighttime Electron Density Valley

The daytime ionosphere is created by the ionizing flux of solar radiation at ultraviolet (UV) and X-ray wavelengths, and its spatial distribution is controlled by the local geomagnetic field. With sunset, ionization ceases and electron-ion recombination sets in. However, the Sun rises again before ionization goes to zero. As a result, ionization at all altitudes goes through a minimum during the night.

One of the most interesting "minimums" in the ionosphere is seen in the electron density above the nighttime *E*-region peak; a valley develops there. Fig. 1 (Proplab Pro) shows a typical electron-density profile (electrons per cubic meter versus height in km) in the quiet (with respect to geomagnetic field activity) nighttime ionosphere.

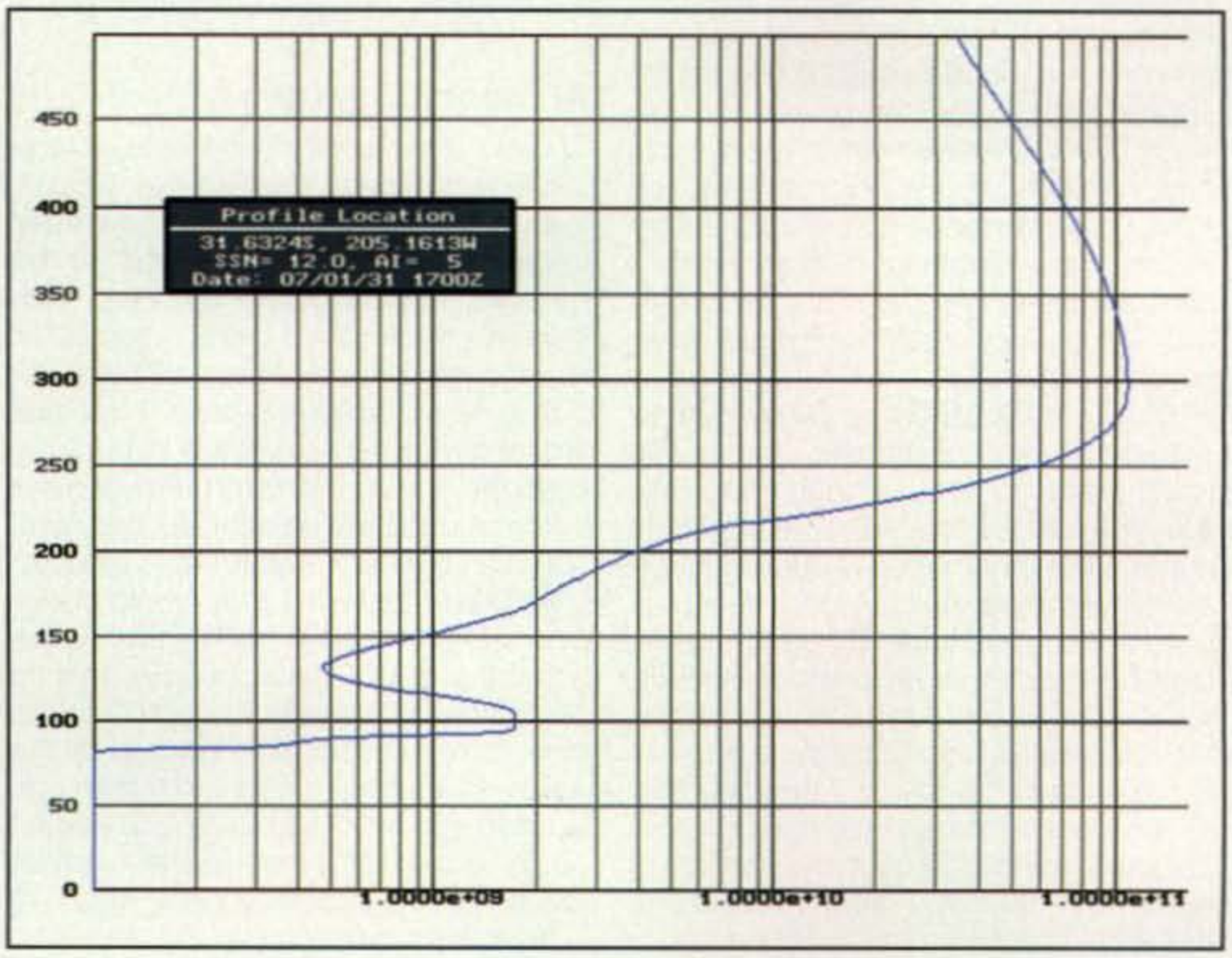

Fig. 1– Example of nighttime valley.

Note the *E*-region peak around 100 km, and the deep reduction in electron density above this peak. The electron density in the valley is three to four times less than the electron density of the *E*-region peak.

Not all nights have a well-developed valley, though, especially at the higher latitudes with increased geomagnetic field activity. Also remember that fig. 1 depicts a valley based on the model of the ionosphere in Proplab Pro (the 1995 version of the International Reference Ionosphere). Actual measurements of the valley are hard to come by and exhibit significant night-to-night variation, but in general the real valley appears to be a bit wider in height than the model indicates and not as deep as the model indicates.

Now propagation during the night on 160 meters can occur via *E* hops at lower elevation angles or via *F* hops at higher elevation angles (Brown, 1996). Both of these modes incur absorptive loss (during transits through the absorb-

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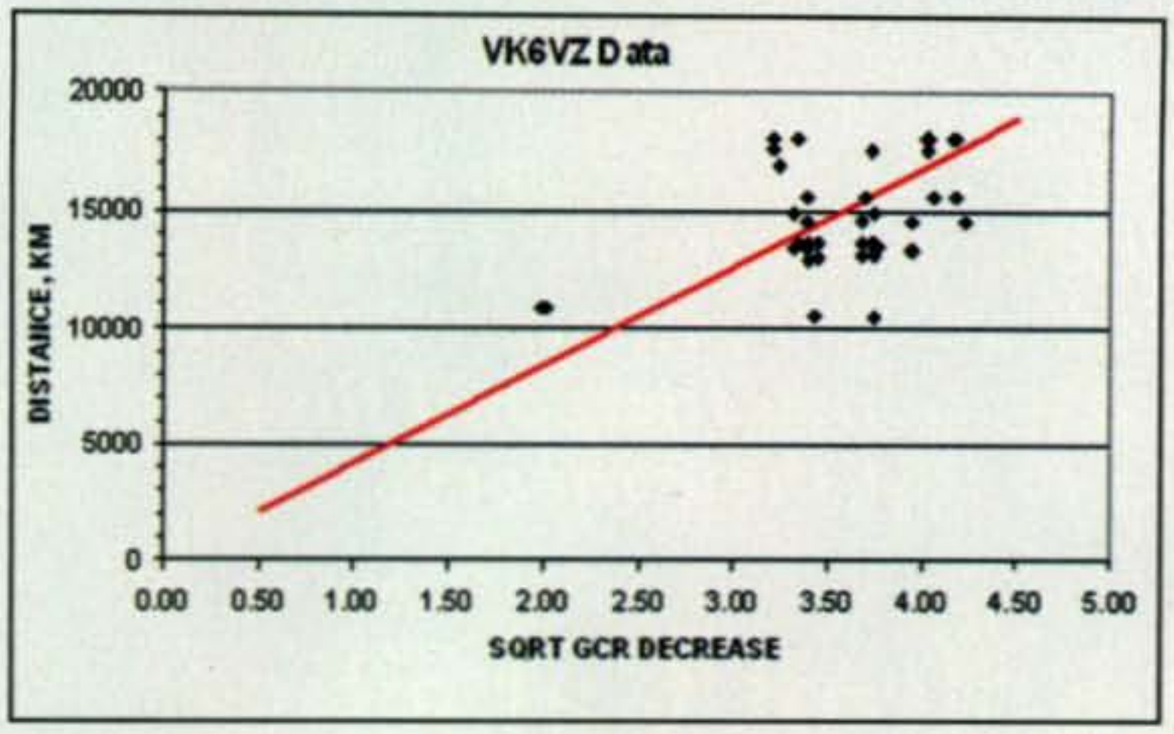

Fig. 2– Data from VK6VZ.

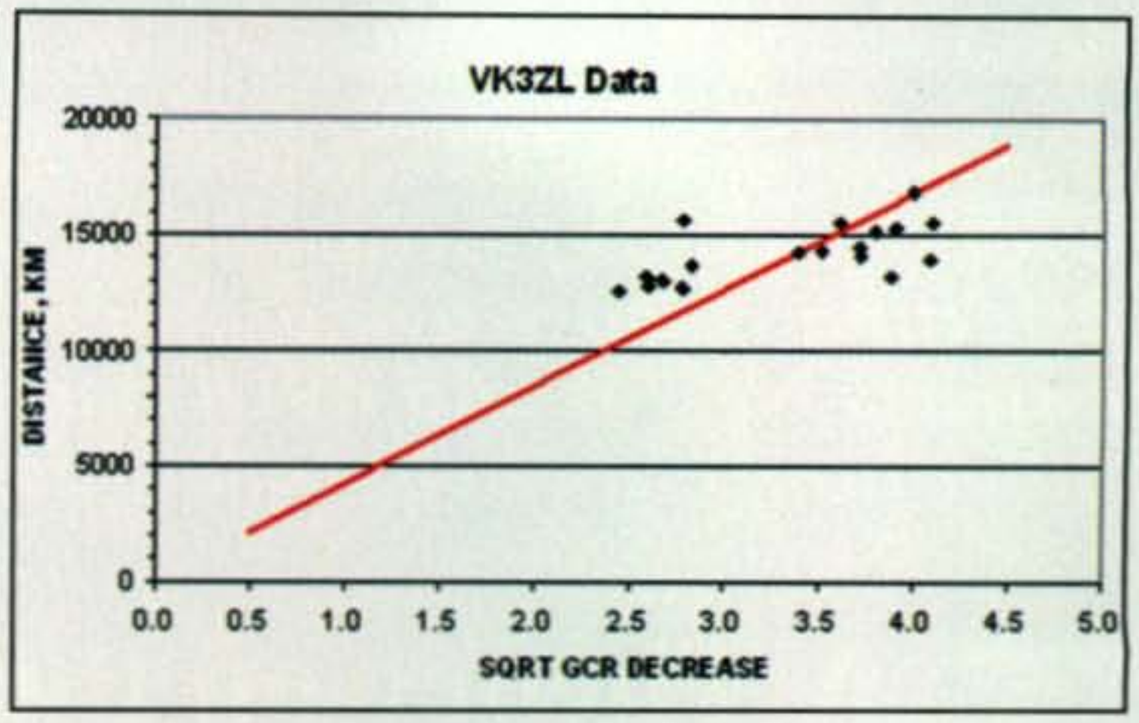

Fig. 3– Data from VK3ZL.

ing region) and ground-reflection loss (for each hop). The total loss adds up quickly, resulting in an upper limit of the distance to which multi-hop signals can propagate and still be heard on 160.

Previous modeling studies with Proplab Pro at a smoothed sunspot number of 50 indicate this distance to be in the neighborhood of 10,000 km for *E* hops with a transmit power of 1000 watts, quarter-wave verticals on each end, and a quiet noise environment. For *F* hops, the distance would be greater. Both of these distance limits are dependent on where we are in a solar cycle, with the greatest distances possible at solar minimum.

Thus, our DX QSOs on 160 meters to extremely long distances, especially when we're not around solar minimum, are likely to be the result of another mode. That other mode is ducting in the aforementioned electron-density valley above the nighttime *E* region peak. Ducting results in an electromagnetic wave successively refracting between the boundaries formed by the top of the *E* region and the lower *F* region. This allows the electromagnetic wave to avoid the many transits through the absorbing region and the many ground reflections that would occur in a multi-hop mode.

Further ray tracing efforts with Proplab Pro indicate ducting occurs over a small range of elevation angles. To get into the duct, the elevation angle of the ray must be high enough to get through the peak electron density of the *E* region (the corresponding nighttime critical frequency is around 0.38 MHz in fig. 1). However, the elevation angle can't be too high or the ray will also go through the *F* region.

Our transmit antennas spray RF over a relatively large range of elevation angles, so in the real world we usually send out rays that result in *E* hops (lower elevation angles), ducting (medium elevation angles), and *F* hops (higher elevations angles). The RF that ultimately gets to our DX target is the mode that has the highest signal strength, which for extremely long distances is likely to be *F* hops around solar minimum and ducting when not around solar minimum.

A Theory Emerges

The electron density in the valley and of the *E*-region peak itself is weakly maintained by several sources. The most important source is believed to be galactic cosmic rays (GCRs), with smaller contributions by radiation at UV wavelengths in star light and by radiation at 121.5 nm (the Lyman-α spectral line of hydrogen) scattered in from the daylight side of the Earth. For general information about galactic cosmic rays, see the Galactic Cosmic Rays sidebar.

It is likely that the valley would disappear at night were it not for the ionization there from galactic cosmic rays. In other words, there is enough galactic cosmic ray radiation to back-stop the valley so that the ionization doesn't go to zero (Brown, 2008). The *E*-region peak would still exist, but at a lower value without galactic cosmic rays.

Now let's work out a cause-effect relation between electron density and galactic cosmic ray flux. One begins with a result used in teaching students elementary chemistry, the method of detailed balancing for chemical reactions. There, in equilibrium, the method states that the production rate of ionization by galactic cosmic ray radiation would be equal to a constant, k, multiplied by the negative and positive ion densities that result.

However, electrical neutrality exists in the ionosphere and those densities are equal so that the ionization rate equals k times Ne times Ne, where Ne is the electron density in the ionospheric region, and k is a constant for the rate of recombination of the charge densities. Using this equation, one sees that Ne is proportional to the square root of the GCR flux, and a decrease in GCR flux will lower Ne. This is the first important aspect of the theory.

The second important aspect of the theory is that long-haul propagation of an electromagnetic wave in the valley results when the effective vertical frequency (EVF) of the electromagnetic wave (Davies, 1990) exceeds the critical frequency of the *E* region (foE). If foE decreases due to a decrease in GCR flux, then signals enter the valley and may be propagated forward efficiently by ducting, without the lossy ground reflections and absorption as in multi-hop. In that situation, the intensity of the electromagnetic wave entering the duct is proportional to the decrease in foE (or Ne). This is analogous to the scenario of incident and reflected waves in transmission-line theory.

The derivation of the theory comes to the conclusion that the effective path length L is proportional to the square root of the percent GCR decrease—i.e., L = a constant times $\sqrt{GCRd}$, with the constant depending on antenna pattern (azimuth and elevation).

In what follows, we will show effective path length L versus $\sqrt{GCRd}$ data for a variety of paths using actual 160-meter log data.

VK6VZ and VK3ZL Data

The initial set of data we studied was across the western Pacific Ocean to the USA. In that regard, VK6VZ near Perth in Western Australia provided 160-meter log data for 2003 and 2004, and VK3ZL in Victoria provided 160-meter log data for 2003 through 2006.

The USA contacts were sorted according to state, and the distances were

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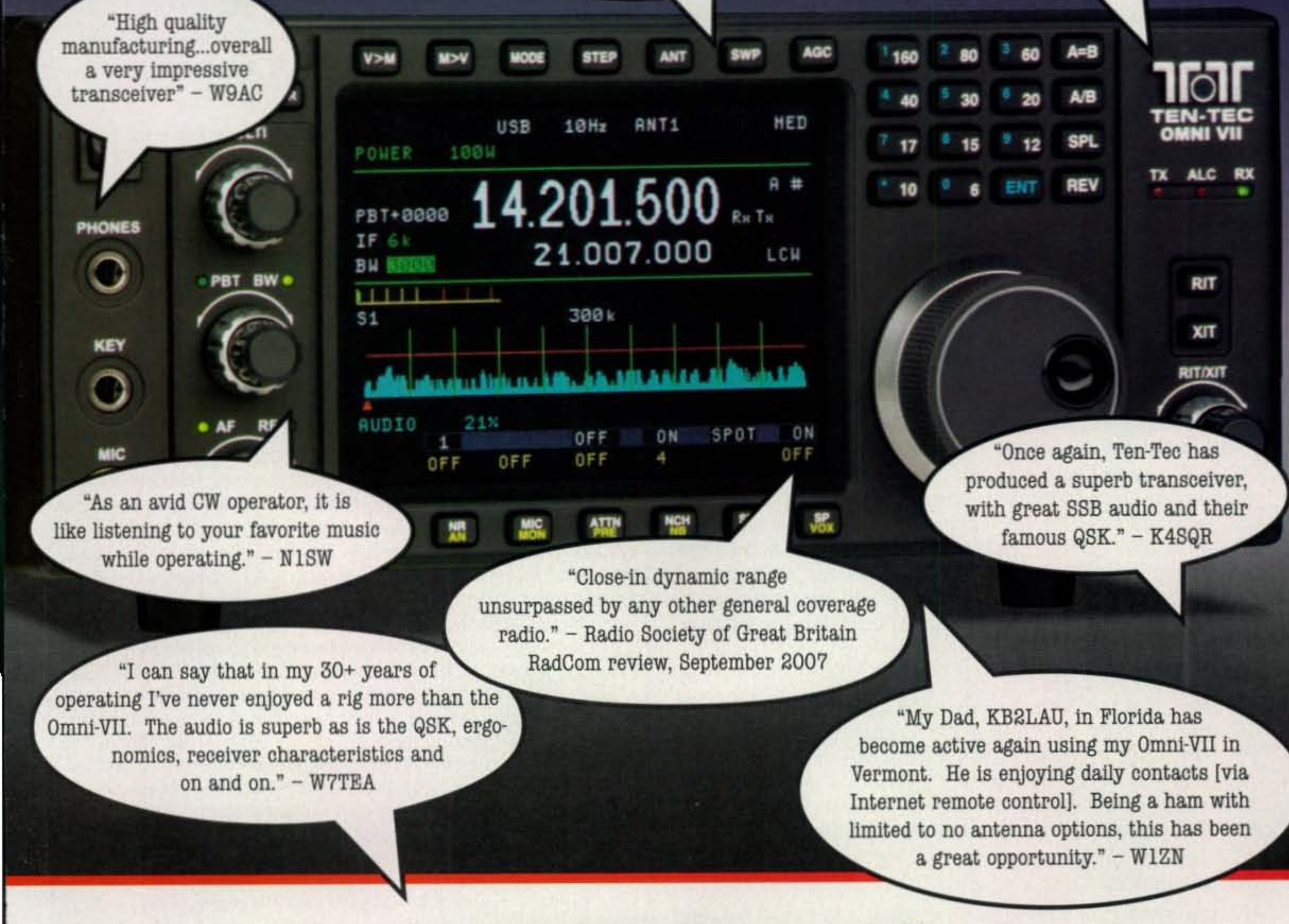
"I was struck by how clean, natural and quiet the receiver sounded in comparison to some DSP based radios. I found the Omni-VII a real pleasure to listen to – in any mode." – W1ZR, in the ARRL Product Review, QST July 2007

"What a neat little package! I'm having more fun with this thing!" – K1SA

"In 40+ years and many receivers, the Omni-VII is the most sensitive, most QRM proof and most pleasant to operate I have enjoyed. The noise blanker and noise reduction systems really help me in dealing my sometimes noisy location." – K6LE

"High quality manufacturing...overall a very impressive transceiver" – W9AC



"As an avid CW operator, it is like listening to your favorite music while operating." – N1SW

"Close-in dynamic range unsurpassed by any other general coverage radio." – Radio Society of Great Britain RadCom review, September 2007

"Once again, Ten-Tec has produced a superb transceiver, with great SSB audio and their famous QSK." – K4SQR

"I can say that in my 30+ years of operating I've never enjoyed a rig more than the Omni-VII. The audio is superb as is the QSK, ergonomics, receiver characteristics and on and on." – W7TEA

"My Dad, KB2LAU, in Florida has become active again using my Omni-VII in Vermont. He is enjoying daily contacts [via Internet remote control]. Being a ham with limited to no antenna options, this has been a great opportunity." – W1ZN

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determined relative to Western Australia and Victoria, respectively. The percent decrease in galactic cosmic ray intensity was taken from the cosmic ray neutron monitor in Calgary, Alberta. The data points were plotted, and give the scatter diagrams of fig. 2 and fig. 3. The data points show a reasonable, but not perfect, fit to a linear trend line (the VK3ZL data more so). We'll elaborate on the trend line a little later.

NI6T Data

With NI6T's data, we looked at QSOs across the central Pacific Ocean to the Asian mainland from the San Francisco area. Twenty-five QSOs were made with islands to the west and three QSOs were made to the Asian mainland. For an L vs. $\sqrt{GCRd}$ diagram as in fig. 2 and 3, there are data points for 14 different islands, boxed in a rectangular region with L ranging from 3800 km (KH6) to 12,600 km (VK3) and $\sqrt{GCRd}$ from 2.8 to 3.7. This was for the same time period as the Australian data, but DX opportunities to the west at long-haul distances were far fewer and made only a minor contribution to the whole study.

ZL3IX Data

The log data from ZL3IX proved to be very interesting and resulted in some head scratching. Fig. 4 shows the data.

ZL3IX by far and away had the most data of the logs we received; he gave us 204 data points. What was bothersome was the scatter of data versus $\sqrt{GCRd}$. The data says ZL3IX could make extremely long-distance QSOs regardless of the square root of the percent GCR decrease.

When we segregated the data by year (fig. 4 does this using color), we realized we likely were not seeing just ducting. The QSOs at low values of $\sqrt{GCRd}$ in 2007 and early 2008 correspond to solar minimum (see the table in the Galactic Cosmic Rays sidebar), and we believe those QSOs were via *F* hops. There certainly could be a mix of ducting and *F* hops as we descend towards and ascend from solar minimum, but it would be tough to tell the difference with the format of the data we have (QSO occurrences, not true signal strength).

More Data

We also have QSO-occurrence data from IV3PRK and signal-strength data on foreign AM broadcast stations from VE7DXR. The VE7DXR data focuses on sunrise enhancements and is intriguing, since it offers true signal-strength data as opposed to just QSO-occurrence data. Both of these data sets need to be analyzed in more detail.

Conclusions

The present focus has been on ducting and long-haul data relative to the ducting equation L = a constant times $\sqrt{GCRd}$. In essence, this represents the effective range of long-haul signals. Clearly, that depends on particulars on the transmitter end (power, antenna elevation and azimuth patterns, counterpoise, and ground conductivity) and on the receiver end (antenna elevation and azimuth patterns and receiver noise). However, the effective range will be realized only if a station is "on the air" at the far end of the path, as with HF propagation.

In figs. 2 and 3 the data points are shown in comparison with the ducting equation when the normalizing constant was taken as 4200. Thus, data points scatter about this line. That form represents the linear approximation for exponential signal absorption in the duct, more valid for smaller L values. A second approximation would take the form of a series expan-

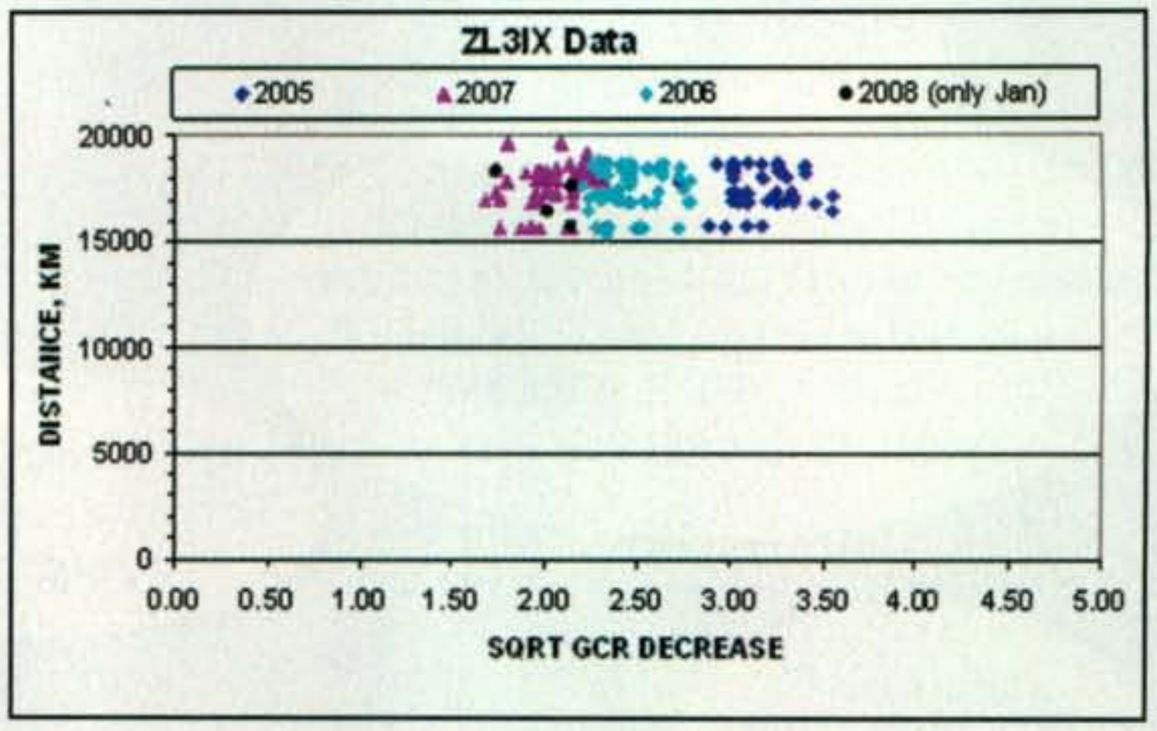

Fig. 4– Data from ZL3IX.

Galactic Cosmic Rays

Cosmic rays are not new to amateur radio. We all know of dead bands, ravaged by solar protons after a flare. We also remember the turmoil of magnetic storms that follow and the belated beauty of aurora. Those are solar cosmic rays, but *galactic* cosmic rays—that's a new one.

Galactic cosmic rays (GCRs) have been with us since the beginning of time. They arrive in the vicinity of the Earth as a low flux of very energetic protons and are isotropic in direction. Thus, you'll see the same general trend in galactic cosmic ray flux regardless of location on Earth.

When galactic cosmic rays reach the Earth's atmosphere, they do show time variations from the interplanetary magnetic field of the Sun expanding outward from time to time, sweeping away the lower energy particles. As a result, the flux of galactic cosmic rays incident on Earth is out of phase with the solar cycle: The flux is greatest at solar minimum and is least at solar maximum. Our interest in galactic cosmic rays in this article is more the shorter-term variations as opposed to the long-term variation over a solar cycle.

The arriving protons have energies ranging from as low as a keV (a thousand electron volts) to as high as many tens of GeV (1 Gev is a billion electron volts). Some do hit the Earth's atmosphere, creating ionization according to their flux, charge, and energy. That ionization contributes to the ionosphere, but only slightly, as the flux of galactic cosmic rays hitting the atmosphere is very low, giving ionization far less than that due to solar UV photons and X-rays. However, it's enough to back-stop the electron density valley above the nighttime *E*-region peak.

Galactic cosmic rays are measured at many stations worldwide. In addition to the raw flux (count rates), the data are also presented in terms of percent decrease from a fixed reference (a background count using a fixed source). With galactic cosmic rays out-of-phase with a solar cycle, the percent decrease from the fixed reference will be greatest at solar maximum and least at solar minimum. Summarizing in tabular format, we have:

	GCR flux	GCR decrease
Solar max.	low	high
Solar min.	high	low

Another interesting characteristic of galactic cosmic rays is the Forbush decrease first observed in the 1940s by physicist Scott Forbush. A Forbush decrease is a *significant* short-term reduction in galactic cosmic ray intensity, much greater than the daily variations, and is tied to significant activity on the Sun.

sion, indicating that the linear approximation over-estimates the distance signals reach at larger L values. While this second approximation gives a better fit with the collection of data points, its form tends to obscure the fundamental fact that the distance ducted signals can reach depends on decreases in galactic cosmic ray intensity.

In the USA, high-power and vertical antennas are becoming the norm on 160 meters, but there is a wide variation in heights and radial systems. Also, noise and receiver sensitivity are other local variables that affect long-haul contacts. Thus, the scatter of data points in figs. 2 and 3 should come as no surprise, but the encouraging aspect is the points are in a cluster about the line for the ducting equation. If the L vs. $\sqrt{GCRd}$ relationship were different, data points would show even more random scatter.

What does this mean for 160-meter DXing? Obviously, GCR will be included in a DXer's vocabulary, along with the usual *K* index, *A* index, and sunspot numbers. Our guess is DXers will check percent GCR decrease data (for example, using the German neutron monitor data at Kiel at <http://134.245.132.179/kiel/main.htm> against their DX logs and may be pleasantly surprised. However, short-haul DXers may not be pleasantly surprised, as the plot of their L vs $\sqrt{GCRd}$ data points will spread out, and not be concentrated like in figs. 2 and 3. That is the difference between ducting and *F* hops.

Scanning years of neutron monitor records shows the events in the present study are average, as it were, but more extreme cases do occur: GCR decreases in excess of 20% and durations up to 14 days (one-half a solar rotation; see the Galactic Cosmic Rays sidebar for a brief discussion of large decreases). While such events may be quite contaminated with geomagnetic and auroral activity, they could reveal other aspects of long-haul and even long-path propagation during periods of darkness.

Finally, the present discussion has focused on the role of variations in GCR in 160-meter propagation, a very narrow topic. Clearly, the interplanetary field (IMF) is involved, driven outward by the solar wind and affecting GCR. Is there something, as yet unknown, that serves to narrow the focus, as it were, or is it the frailty of the electron density valley that is the cause? Put another way, would there be ducting and a GCR effect if the ion-electron recombination rate in the region was slower by a factor of 10 or 100? Or is there some subtle, non-measurable feature of solar-wind variations, such as scale size, that brings forth decreases in GCR and all that was derived from that? Those questions remain to be answered.

Further Studies

Note that this article is not a prediction method to determine the good nights on 160 meters—i.e., a decrease in GCR does not necessarily mean you will have a QSO (which suggests another variable or two is lurking out there). All it suggests is the flux of galactic cosmic rays plays a role in QSOs to extremely long distances on 160 meters. Its importance is probably minimal around solar minimum and maximum around solar maximum.

This is likely not the last word on the effects of galactic cosmic rays on 160-meter propagation. Long-distance QSO data in terms of true signal strength is needed to develop a better understanding of the impact of galactic cosmic rays on ducting.

Additionally, the often observed enhancement in propagation right before a spike in the *A* index may be tied to a decrease in galactic cosmic rays, since the flux reaching the ionosphere depends on the magnetic field. More investigation in this area certainly is warranted.

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Brown, R. R., "Full Circle," *WorldRadio,* April 2008

Davies, paragraph 6.3.1.1, *Ionospheric Radio,* Peter Peregrinus Ltd, 1990

More Reading Material

In addition to the references cited in this article, the following articles (not necessarily tied to galactic cosmic rays) should help your understanding of propagation on Top band.

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Brown, R. R., "Signal Ducting on the 160-Meter Band," *Communications Quarterly,* Spring 1998

Brown, R. R., *The Big Gun's Guide to Low-Band Propagation,* 2002

K9LA's web page on low-band propagation: <http://mysite.verizon.net/k9la/id2. html>

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Building on the success of the AT-1000, LDG Electronics has refined and expanded its 1KW tuner. The AT-1000Pro has an Automode that automatically starts a tuning cycle when the SWR exceeds a limit you set. Other features include: • Operates at any power level between 5 and 1,000 watts peak. RF Relay protection software prevents tuning at greater than 125 watts. • 2 Antenna connections • Tunes from 1.8 to 54.0 MHz (inc. 6 meters) • Tuning time usually under 4 seconds, transmitting near a frequency with stored tuning parameters, under 0.2 seconds. • 2000 memories.• All cables included. ***Suggested Price $599***

AT-100Pro

This desktop tuner covers all frequencies from 1.8 – 54 MHz (including 6 meters), and will automatically match your antenna in no time. It features a two-position antenna switch, allowing you to switch instantly between two antennas. The AT-100Pro requires just 1 watt for operation, but will handle up to 125 watts. All cables included. ***Suggested Price $219***

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Designed from the ground up to provide 100 watt power handling in a small, lightweight package. Perfect for portable as well as sitting on your desk in your shack! The Z-100 will tune with 0.1 to 125 watts (50 watts on 6 meters), making it an excellent choice for almost any radio or operating style. Backpackers and QRP operators will appreciate the latching relays. Power can be removed from the tuner once you have tuned. Additionally, when it's not tuning, it draws nearly zero amps. ***Suggested Price $149***

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- Backlight brightness adjustment is also on the back of the unit; so you can set the backlight to your desired level brightness.

The FT-Meter comes fully assembled and ready to go; just plug it into the radio and you're in the picture like never before. ***Still Only $49***

Z-11Pro

The original portable Z-11 was one of LDG's most popular tuners, accompanying adventurous hams to their backyards, or to the ends of the earth. Now meet the Z-11Pro, everything you always wanted in a small, portable tuner. Designed from the ground up for battery operation. Only 5" x 7.7" x 1.5", and weighing only 1.5 pounds, it handles 0.1 to 125 watts, making it ideal for both QRP and standard 100 watt transceivers from 160 - 6 meters.

"With 8,000 memories in LDG's exclusive "3-D Memory" array, the Z-11Pro uses LDG's state-of-the-art processor-controlled Switched-L tuning network. It will match dipoles, verticals, inverted-Vs or virtually any coax-fed antenna. With an optional LDG balun, it will also match longwires or antennas fed with ladder-line. All cables included. ***Suggested Price $179***

NEW! SLS-2

LDG introduces the SLS-2 microphone switch with RJ-45 mic connectors for modern transceivers. The SLS-2 features two switched and one common jack. You can switch one mic between two radios, or one radio between two microphones. A push-in/push-out button on the front selects the port, and an LED lights to indicate the selection. The SLS-2 makes switching radios or microphones a breeze. ***Suggested Price $59.99***

NEW! ALK-2

The ALK-2 two-port Audio/Linear/Key switch is a versatile Amateur Radio accessory. The ALK-2 electronically switches a common 1/8" stereo jack and stereo RCA jacks between two other sets of 1/8" stereo/RCA jacks. Although the intended purpose of the ALK-2 is to switch stereo audio, code keys, or linear amplifier interface signals; virtually any pair of low voltage signals can be switched between the two ports. On the front panel there is one pushbutton and two LED indicator lights. The button is a pushbutton toggle switch which selects between the two sets of cables connected to the rear ports. The LED's indicate which port is selected. ***Suggested Price $49.99***

radio not included

AT-897 for the Yaesu FT-897

If you own a Yaesu FT-897 and want a broad range automatic antenna tuner, look no further! The AT-897 Autotuner mounts on the side of your FT-897 just like the original equipment. We even added the ability to mount the "feet" on the side of the tuner so when you're transporting your rig by the handle, you can safely set it down and not worry about scratching the case. The AT-897 takes power directly from the CAT port of the FT-897 and provides a second CAT port on the back of the tuner so hooking up another CAT device couldn't be easier. ***Suggested Price$199***

AT-200Pro

The AT-200 features LDG's new "3-D memory system" allowing up to eight antenna settings to be stored for each frequency. Handles up to 250 watts SSB or CW on 1.8 – 30 MHz, and 100 watts on 54 MHz (including 6 meters). Rugged and easy-to-read LED bar graphs show power and SWR, and a function key on the front panel allows you to access data such as mode and status. All cables included.
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Elecraft has earned a significant niche in the amateur radio marketplace with its full-featured kits for both QRP and medium-power operation. The K3 sets a new benchmark for the company, as explained in this two-author review in which each brings to the table a slightly different perspective.

CQ Reviews:

The Elecraft K3 Transceiver

BY BOB LOCHER,* W9KNI, AND RICK TAVAN,† NX6I

My name is Bob Locher, a.k.a. W9KNI. I am a DXer. I don't do contests, except to cherry-pick a few choice DX stations and occasionally get some pile-up practice. I also like CW DX ragchewing. However, the overwhelming joy of amateur radio to me is HF DXing, mostly CW but some SSB as well. I love to listen, to tune a hot band, to work low-power stations across the world.

As a committed DXer I have always owned the very best receiver I could afford. I have owned a Hallicrafters SX-88, a Collins 75A2A, a modified 75A4, and then a Collins KWM-380, followed by an Elecraft K2. When the K3 was first announced in 2007, I immediately ordered one.

For reasons unclear to me, Elecraft asked me to be a field tester. I received serial #14 and was asked to use it and report all issues. While there were a few minor glitches early on, virtually all were firmware issues that were quickly fixed. As time went on, firmware updates added more and more capabilities. What truly amazed me was the lack of hardware changes. I am aware of only three very minor circuit changes.

Modern competition-grade transceivers are not simple boxes. While a user of 40 years ago would recognize many of the knobs and functions on a K3, the radio is far more complex "under the hood," with dozens of menu settings and choices available. However, this radio can also be used right out of the box without engaging the menus. The fancier aspects of the radio can be learned at your leisure. Once you are comfortable with the basics of the radio, the manual reveals many more features in customizing the radio to your tastes.

Front view of the Elecraft K3 transceiver in W9KNI's shack. (Photo courtesy of W9KNI)

The reader should understand I am an imperfect reviewer. There are a number of "top of the line" rigs of which I have little personal knowledge. Thus, please understand that many, indeed most, of the features of the K3 that I feel are significant will surely be found on other top rigs. Now let's cut to the chase: How does the radio work?

For me, the K3 is an absolute delight. The receiver is dead stable and quiet; the tuning is silky. I use 10-Hz steps for CW and 50-Hz steps for SSB, finding both ideal for those modes and can also be changed quickly if desired. The weighted knob has a comfortable feel to my hand. Audio output is clean and clear and non-fatiguing, fine for extended operating sessions. Twin fans cool the K3 and they are extremely quiet.

Microphone and headphone inputs are on the front panel—and on the rear panel! I like a wire-free operating position to the greatest extent possible; rear-panel connectors let me dress leads off the table. The LCD display offers sharp resolution, and while it has many elements, I swiftly got used to them and could quickly visually recognize something out of the ordinary if I pressed the wrong button.

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The radio lacks a feature some other top-of-the-line radios offer—a built-in panadaptor. Personally, I don't care, having had one some years ago and never finding it to be an important operating accessory. However, for those who value such a display, there is a very real answer for the K3. TelePost Inc. offers an outboard adapter kit specifically for K3s, using a computer and monitor for display. The capabilities and visual output offered by this unit are spectacular (see <www.telepostinc.com/LP-PAN.html>).

The K3 offers really slick passband controls. You can vary upper and lower cutoffs, the center frequency and bandwidth, all with simple, intuitive front-panel controls. You can readily change the CW offset frequency, which also changes the monitor tone to match. You have menu access to an audio equalizer to tailor audio output to your personal tastes, both for receive and transmit.

The listening bandwidth is easily adjusted: Turn the knob to the left and bandwidth gets narrower; turn it to the right and the bandwidth widens. The display neatly shows bandwidth and center frequency.

The really spectacular feature of the radio for me is the receiver selectivity system, which is unlike anything I had ever used. In the K3's architecture, IF crystal filters are also roofing filters. Selectivity is achieved by the combination of traditional crystal filters and very modern DSP (digital signal processing). Filters have individual gain settings available in the menu system so there is no attenuation as you sharpen selectivity. The roofing filters define bandwidth, and the DSP works in close conjunction with it to smooth out filter response, narrow bandwidth further if needed, and clean up filter slopes. Therefore, when you tune across a CW signal, for example, the signal drops out quickly and oh so cleanly as you tune away.

When you change bandwidth, instead of switching different crystal filters, you simply tighten or loosen the selectivity by turning the knob, and as bandwidth changes the crystal filters automatically and seamlessly switch in as needed. Slick!

The DSP technology in the K3 is simply outstanding, accomplishing wonders, and in most cases is invisible to the user, as it should be. One exception is the automatic heterodyne notching on SSB; that becomes marvelously visible when you push the button.

When you change modes, say from SSB to CW, all appropriate settings change as well. For example, going to SSB from CW, the selectivity bandwidth and center frequency change to whatever your last SSB setting was. The K3 has loads of settable memories— more than I can imagine really using—but to quote Mae West, "Too much of a good thing is wonderful!"

Rear view of the K3. Note the dual cooling fans, the variety of input/output options, and the Anderson PowerPole™ power connector. (Photo courtesy of Cecil Bayona, K5NWA)

The K3 has not one but two noise blankers, and the combination works very well indeed. One blanker is the traditional IF-stage noise-gate variety; the other is DSP based. Each blanker is individually controlled for both blanking level and length of the blanking pulse.

I love 40 meters, especially in winter months. Recently, however, winter DX days have frequently been trashed by a Chinese over-the-horizon military radar called, unaffectionately, "the Dragon." I was anxious to try the K3's noise blankers on the Dragon.

The results were not perfect. Some mornings, the K3 blanker virtually eliminated the Dragon, allowing easy copy on long-path signals that were no copy without the blankers. Other mornings the blanking was less effective. I believe the difference was due to multi-path signal distortion stretching out radar pulses beyond blanking capability. I know Elecraft has revisited the blanker firmware, and updates may have improved the situation. This winter will tell.

The K3 has very good CW QSK (break-in keying), which I do not use. For me, QSK is too distracting. I prefer semi-auto mode, for which the K3 offers variable delay timing.

You can easily change the CW offset, or "pitch" of the CW signal, as well as the monitor audio level. The K3 features automatic zero-beating of a station on CW if desired.

I love the RIT/XIT. This function for independently varying the receive and transmit frequencies is controlled by a rotary encoder, allowing you to keep tuning without an endpoint, although I can't imagine varying above two kHz off the center frequency. For a larger split the user would surely use the second VFO. However, the RIT/XIT tunes at a very nice rate, with the settings for RIT and XIT held in memory until dumped by the "Clear" button.

The second VFO has its own knob, very useful when a DX station working simplex suddenly announces "Up Three." With the second VFO knob you can accomplish that in two seconds, punch the "Split" button and you are there, ahead of the madding hordes. Or you can preset a second frequency from a spot. Also, when in split mode, or using RIT/XIT, a yellow LED warns you are transmitting and receiving on different frequencies.

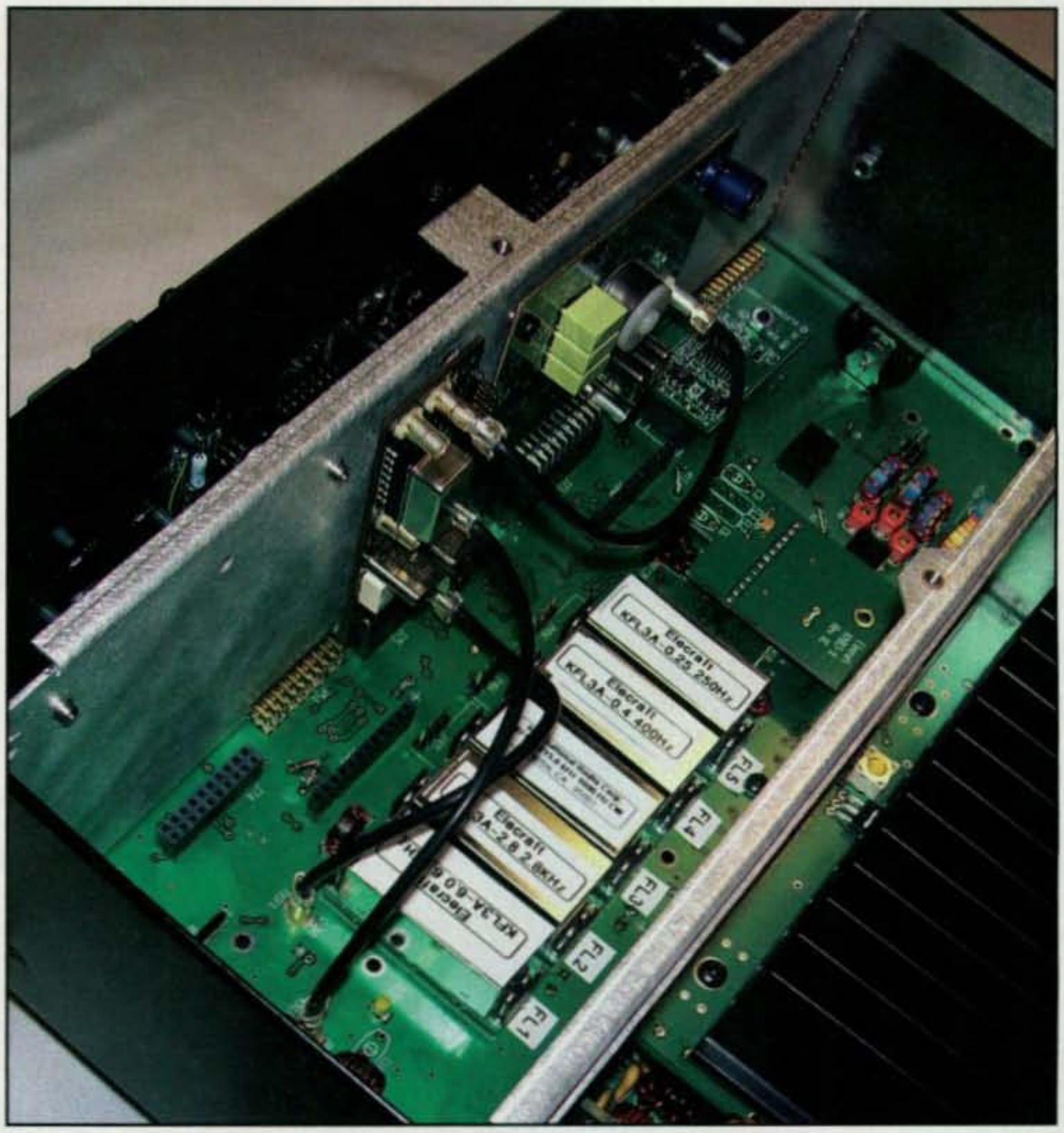
The K3 handles static crashes very well. No, it does not eliminate them, but it seems to recover more quickly and smoothly than any of my previous radios. Thinking about it, I realized front-end performance of any radio is equally affected by static crashes as by strong signals.

Consider that a static crash can be an extremely strong and very broad signal. While bandwidth is attenuated by antenna and input filtering, a strong static pulse will still be at least hundreds of kilohertz wide when it smashes into the receiver. In lesser receivers, this surely will create intermod products and AGC problems that raise havoc with reception for an interval after the static crash. The K3 with its extremely impressive front end deals with such crashes much more effectively. Listening to weak signals through heavy static is still no fun, but I can read and work weak-signal DX I believe would have eluded me in past.

That brings me to weak-signal performance in general. Being a serious DXer means listening to weak signals. The design goal of any serious HF receiver is the capability to copy weak signals in difficult conditions, with strong nearby stations, static crashes, and RF junk noise all around. Copying the desired station is what it is all about.

The K3 has plenty of sensitivity, coupled with very low internal noise. The selectivity, stability, bullet-proof front end, noise blankers, bandwidth controls, passband tuning, etc., all come together to help you, the operator, copy a weak signal. The architecture and integration of these design components perform brilliantly in the K3 in copying CW, making the K3 easily the finest receiver I have ever owned.

What really surprised me, though, is how very well the K3 receiver performs in weak-signal SSB operating. I have worked SSB QSOs that amazed me—solid contacts with exotic DX stations whose signals did not even tickle the S-meter and rare stations spotted by DXers from other continents. I found I could hear them well enough to call them, and to my considerable delight, work them. Regularly, though, no other North American stations even called them—DX stations that would have created huge pile-ups had others been able to copy them. Why should this be? True, I have a good location and good antennas, but so do many other DXers. The K3 is unlikely to be hotter than any other rig, yet I credit the K3 for such contacts. RF sensitivity, low internal noise,



Interior view. The K3 is available fully assembled or as a "semi-kit" in which the circuit boards are preassembled and the builder installs and interconnects them, in much the same way as "building" a computer from a variety of preassembled circuit boards. (Photo courtesy of Cecil Bayona, K5NWA)

good filtering, and front-end integrity all are necessary components, and that is what the K3 offers.

And that is what HF operators buy a new rig for—the ability to copy stations they want to work. I simply cannot imagine any other radio doing a better job of this. What makes the situation even sweeter is that a 100-watt K3 (less power supply) with several filters is under $2000.

What's not to like? For me, the list is short. I wish the RF gain and AF gain were reversed The AF gain is the second most used knob on the radio and in my opinion should be on the lower left corner. It is not. I can live with that. I also dislike that several of the front knobs have dual functions. For example, the output power knob also sets speech compression. More than once I have found myself trying to change power out and instead changing compression. However, Elecraft promises a firmware update allowing such knobs to be set and then disabled as desired.

The K3 offers many features not covered in this review, mostly things I don't use! Thus, I cannot intelligently comment on them. Also, Elecraft has just started shipping the second receiver module, which has identical specifications and circuitry as the primary receiver. This will be especially useful for dual diversity reception. However, I have not yet added one.

A last comment: There is a debate developing on whether radios need knobs at all, when the major radios today all are software defined. For me, the answer is simple—*I love knobs!* I can't imagine tuning an open band with a computer mouse. Daily I spend hours working on a computer keyboard. When I operate, it is for fun, and using a keyboard and mouse to operate would be too much like work. With the K3 and available software, the user can choose —use the knobs or use the mouse.

As mentioned above, there are a number of superb HF transceivers on the market. For my personal tastes, the K3 is as close to perfection as I can imagine. I am truly delighted with mine, and now, I give you Rick, N6XI, for his take...

N6XI Speaks

Bob, W9KNI, has covered many of the positive aspects of the K3 and some of his pet peeves as well. I concur with much of what he says (although I *like* the location of the AF Gain knob!). He invited me to comment on additional aspects of the radio. I was also a field tester, so I have about a year of K3 time under my belt.

Economics, Ergonomics, and Packaging

Although Elecraft built its reputation with full kits, K3 surface-mount technology mandated manufactured boards. You can save money and gain knowledge by buying a no-soldering semi-kit that assembles in 8–12 hours, or you can let Elecraft do all the work. Either way, the rig performs to the same specifications, accepts the same options, and enjoys the same board-level field service capability. Fully loaded, the rig weighs only 10 pounds (4.5 kg.) and measures 10" × 10" × 4" (25 × 25 × 10 cm).

The K3 is highly modular. The $1400 base kit is a QRP rig without peer. You can add a 100-watt power amplifier, high-performance sub-receiver, automatic antenna tuner, and up to five roofing filters. Since the digital signal processor, the heart of the radio, deter-

The K3 on Field Day

Dave Haupt, W8NF, knew of my interest in K3s and, unasked, passed me his experiences with the K3 during Field Day. His comments were not intended for publication but they were of such interest I received permission to add them to this review.— W9KNI

A perpetual problem at our Field Day site has been CW/PSK interference. PSK is done on frequencies very close to the CW frequencies. Until this year, the CW station was an ICOM IC-735 with the extremely high phase noise typical of its class of 1980-vintage radios, and the PSK station used a club-owned Yaesu FT-840, which is better, but was not a high-end radio even when a current design 15 years ago.

Specifically to deal with this problem we used two K3s, one on the CW station and the other the SSB/PSK station. The dedicated SSB station used an ICOM IC-756 Pro III, which has phase noise performance and receiver performance not that far down from the upper echelons of radios. The GOTA (Get On The Air) station still used a club-owned FT-840.

We had *zero* interaction between CW and PSK this year. At one point, I was

operating the CW station at 7.065, the PSK station was on 7.070, and we did not hear each other. Really nice. We also had no troubles with the ICOM 756ProIII while on the same band.

The K3s were both operating at full power into horizontal antennas broadside to each other about 400 feet apart and never heard each other, even when only 5 kHz apart. *Very* impressive.

mines primary selectivity through a continuous range, you do not need separate filters for each desired bandwidth. You do need at least one (included) for SSB and specific filters if you want to transmit AM or FM. For multi-mode contesting, I chose 400 Hz and 1.0, 1.8, and 2.8 kHz. The sub-receiver is electrically identical to the main and can accept five of its own roofing filters. So far I am content with 2.7 and 1.0.

You can buy as much radio as you can afford, adding options later. A "loaded" K3, fully assembled by Elecraft, can cost from $3000 to $4000 and compete effectively with radios costing $10,000 and more.

Testing a Software-Defined Radio

Field testing the K3 included exercising the computer control interface, testing the receiver in the presence of strong adjacent signals, exposing the rig to inter-station RFI in multi-transmitter environments, and attempting to integrate with all manner of accessories, switches, computers, and software. It was impossible to test every combination, but Elecraft took all feedback seriously and the result is impressive. The K3 does so much in firmware and the hardware is so stable that the field-test process was different from any I had previously experienced. Software changes have outnumbered hardware changes, hundreds to one. Now that the rig is in full production, software continues to evolve. Updates are frequent, safe, and easy to apply via internet or CD-ROM.

Some field testers groused that the rig might turn into a contesters' delight, to the detriment of operability by ragchewers. I believe that if a rig can withstand the rigors of contesting, it will be even better for casual operating. Today, contesters are a minority of those commenting on the company reflector and the casual operators are definitely not complaining! The user interface is simple, discoverable, and intuitive for them as well. Elecraft is careful to preserve basic control functionality as versions evolve, frugal with menu items, and yet still seems to find clean implementations of valuable functions almost every month. It's like getting a new radio in the mail, for free!

Computer Control

Computer control of the K3 is conventional. A serial port connects to a matching port on your computer or through a USB converter. Elecraft offers one or you can buy one wherever geek supplies are sold.

Many of the major logging and rig control programs now support the K3 explicitly. If not, you can get basic control by selecting K2 or Kenwood. If your software supports the K3 explicitly, it may offer more sophisticated control and custom macros. For example, a macro command could "Set VFO B to VFO A plus 3.0 kHz and enable SPLIT." Sound familiar?

Integration

Integration was an important design criterion for the K3. For example, there are both input and output receive antenna connectors so you can insert external filters or share antennas for receiver comparison. There are redundant microphone and headphone connectors on front and rear panels. There is an IF output connector to drive external spectrum displays. Fixed-level PC I/O connections support sound cards. Transverter control logic displays operating frequency regardless of the frequency the K3 is actually receiving.

Unlike W9KNI, I enjoy QSK CW. The goal of QSK is to sound like a code-practice oscillator in the foreground with the received pass-band in the background, absent pops, clicks, squeals, and other evidence of RFI or sequencing glitches between transmitter and receiver. The K3 does just that. It's beautiful! I suppose a scope might show millisecond level holes between key up and receiver AF out, but I can't hear them. What I do hear is breaking stations between code elements at high speed.

Multi-Modes

The K3 supports all modes well. There are independent delay and gain settings for phone, CW, and data modes. When you change modes, control parameters change automatically. Memories and the two VFOs store many associated parameters. You can link the VFOs so the sub-receiver tracks the main as you tune, synchronized or offset. The possibilities for diversity reception are tantalizing! The K3 supports true FSK and digitally-driven PSK31 as well as audio equivalents. You can even send with the paddle, get RTTY or PSK RF out, and display incoming text on the panel!

Flat Learning Curve

If all the features of the K3 evoke visions of weeks of setup effort, please forget it! It is highly usable right out of the box. Contesters and DXpeditioners confronted by unfamiliar K3s have done very well, winning competitions and setting records without prior training.

To access the more advanced options, reading helps. The downloadable manual is excellent, albeit sometimes behind the evolving feature set. Its three-page introduction is all you need to realize most of the performance of the K3. As sophisticated rigs go, K3 is one of the easier to set up and learn.

Summary

The K3 is a state-of-the-art, all-purpose, HF+6m transceiver that meets or beats all competition. The feature set is rich and powerful, with most of the bells and whistles that a competitive operator needs and many others that the newer operator insists on. The online user community *cum* support group is outstanding. The Elecraft people listen well and act on input from the field. The K3 is a class act from a solid company, a joy to own and operate.

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HL-1.1KFX

Lightweight HF Linear

This world-class compact HF amplifier has built-in switching mode power supply to save the weight. It is compatible with wide AC line of 100 to 250V, and is best suited for DX-peditioners.

Features

- The amplifier allows operation in full break-in CW mode due to the use of the amplifier's high speed antenna relays.
- The amp utilizes a sophisticated circuit to run the various high speed protection circuits such as overdrive, high antenna SWR, DC overvoltage, band mis-set etc.
- An analog multimeter allows the operator to monitor Pf (Forward output power), Pr (Reflected power), Vd (Drain voltage of power FET), Id (Drain current) etc.

Specifications

Frequency:
1.8 ~ 28MHz all amateur bands including WARC bands
Mode:
SSB, CW, RTTY
RF Drive:
75 ~ 90W
Output Power:
SSB 600W PEP max.
CW 600W.
RTTY 500W (5 minutes)
Final Transistor:
SD 2933 x 4
(MOS FET by ST micro)
Circuit:
Class AB parallel push-pull
Cooling Method:
Forced Air Cooling
Multi-Meter:
Output Pf 1kW, Reflected Power 100W, Drain Voltage Vd 60V, Drain Current Id 50A
Input/Output Connectors:
Type M-J (UHF SO-239)
AC Power:
1.4kVA max. when TX
AC 100 ~ 250V (Auto Select)
Dimensions:
9.1 x 5.6 x 14.3 inches
(WxHxD)
Weight:
Approx. 22.5 lbs.

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HL-2.5KFX

HF Linear Amplifier

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The HL-2.5KFX is the lightest and most compact self-contained 1.5kW output HF LINEAR amplifier in its class. The amplifier's decoder changes bands automatically with most modern ICOM, Kenwood, and Yaesu HF transceivers. It also has a built-in AC power supply – selectable for 220/230/240/250 VAC input, 3kVA max, and a multifunctional LCD display for instant readout of operating parameters. The HL-2.5KFX is equipped with a control cable connection socket for the HC-1.5KAT, automatic antenna tuner by Tokyo Hy-Power Labs for seamless auto tuning operation.

Specifications

SOLID STATE
Freq. Band:
1.8~28 MHz all HF amateur bands
Operation Mode:
SSB, CW, RTTY
Exciting Power (RF Drive):
100W max. (85W, typical)
Output Power (RF Out):
1.5kW min. SSB/CW
(1.2kW on 28MHz)
1kW RTTY (5 minutes key down)
Auto Band Set:
With most modern ICOM, Kenwood, Yaesu HF Transceivers
Antenna Tuner:
Compatible with external Tokyo Hy-Power HC-1.5KAT
RF Power Transistors:
ARF 1500 by Microsemi x 2
Antenna Relay:
QSK (Full break-in compatible)
Power Supply:
Built-in 220/230/240/250VAC, 3kVA max.
Dimension and Weight:
12.8 x 5.7 x 15.9 inches
(WxHxD),
Approx. 57.3lbs.

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World War II reenactments are gaining in popularity and hams are often part of the show, demonstrating and communicating with authentic WW II military radios. W1TP takes us inside one of these events as we mark Veterans' Day in this November issue.

Ham Radio Returns To World War II

BY TOM PERERA,* W1TP

Photo A– Ted Young, W3PWW, operates his perfectly restored BC-669 75-meter AM transmitter-receiver at the Reading PA WW II reenactment while David Kormanicki, KB3ELD, demonstrates the operation of his American WW II M-209 cipher machine. (All photographs by and courtesy of the author)

World War II put thousands of hams in uniform. They served in every corner of the world in every imaginable capacity. They were assigned duties ranging from the operation of military radio stations to repair of equipment, and some never saw a radio during the entire war. The spirit of ham radio was alive and well in the most unlikely places. A troop ship carrying thousands of soldiers to Europe was showing a movie on deck to keep the troops entertained. When the projector operator stopped the show to change film reels, the screen went dark. One ham in the audience pulled out his flashlight and flashed CQ and his call letters in Morse Code on the screen. He was immediately answered by the flashlights of several other hams and they spent the rest of the voyage getting to know each other and talking ham radio.

*e-mail: <Tom@w1tp.com>
web: <http://www.w1tp.com/enigma>

Sixty-three years after the end of WW II, ham radio operators are still involved in WW II military operations. Dozens of annual WW II reenactments take place throughout the world. Hams participate by recreating authentic WW II radio stations and by operating the authentic period radio equipment.

One of the largest of the WW II reenactments takes place at the Reading, Pennsylvania airport each year in early June. It is run by the Mid Atlantic Air Museum, whose website, <http://www.maam.org/maamwwii.html>, gives the latest information and schedule. At the Reading reenactment over 1500 authentically dressed reenactors portray American, British, Australian, German, Japanese, and Spanish soldiers and officers. They set up authentic encampments, cook their own food in authentic field kitchens, and drive authentic vehicles ranging from motorcycles to Jeeps to half-tracks and tanks. Every few hours a major battle takes place with the reenactors shooting blank-cartridge-firing machine guns, artillery firing huge charges of black powder, and overflights and dogfights by authentic period aircraft. Lectures by notable WW II figures, flame-thrower and weapons demonstrations, and flights aboard WW II bombers are scheduled throughout the day. In the evenings, Big Band era music, Abbott and Costello impersonators, and a Franklin D. Roosevelt look-alike entertain the crowd that totals about 30,000. It is total immersion in the culture and events of WW II.

Hams Provide "Battle" Comms

Ham radio operators in many of the reenactment groups set up radio stations and communicate with the other groups on the standard 75-meter AM phone frequency of 3885 kHz. This is the frequency to which most of the crystal-controlled radios and walkie-talkies were tuned during the war (remember, ham radio was shut down during WW II). It has become the standard frequency for use at reenactments and at the many hamfests where military radio enthusiasts set up military radio stations.

Hams buy absolutely authentic uniforms, tents, and radio equipment and display and operate them at these meets. They attend these meets in all kinds of weather and often spend three days sleeping on authentically uncomfortable cots inside leaky tents and eating food cooked over open fires in authentic garbage cans. They all love to demonstrate and explain to the public how military radios were used dur-

Searching for peak HF performance?

"This is the first receiver we've tested with better than 100 dB IMD dynamic range at the closer signal spacings." *QST* Product Review, April 2008

Introducing the Elecraft K3 transceiver

No other rig in this price class comes close to the K3's performance. Its high dynamic range, down-conversion architecture provides roofing filter bandwidths as narrow as 200 Hz, while its 32-bit I.F. DSP handles advanced filtering and noise reduction. The K3 also offers an optional fully independent, high-performance subreceiver, as well as innovative new features like variable-bandwidth, DSP-tracking roofing filters, and 8-band RX/TX EQ.

Then there's the K3's unmatched versatility. It provides state-of-the-art performance as a primary home station, yet its size and weight make it ideal for DXpeditions, RV operation, and Field Day. You *can* take it with you!

- 100-W model starts at $1849; upgradable 10 W model, $1399
- 160-6 m; SSB/CW/AM/FM/data modes
- Up to five crystal roofing filters in both main and subreceivers
- 4"H x 10" W x 10"D; only 8 pounds
- Factory-assembled or *no-soldering* kit (all PC boards pre-built, 100% tested)
- Fully isolated soundcard interface
- Built-in PSK31/RTTY for data-mode QSOs with or without a computer
- Unsurpassed customer support

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Photo B– This is a complete BC-654 transmitter-receiver set up in a field with all of the appropriate accessories, including the hand-cranked generator and some test equipment.

Photo C– Mark Weidmayer, KD3ZK, demonstrates the use of an American BC-611 Walkie- Talkie on 3885 kHz AM while Jason Garver, KB3ATV, cranks a hand-operated generator to supply the high and low voltages necessary to operate a BC-654 transmitter-receiver on the same frequency.

ing the war. Their demonstrations also introduce visitors to ham radio. They welcome thousands of visitors into their tents and patiently explain and demonstrate how the radio equipment worked by making contact with other ham-operated military stations at the meet and elsewhere. Some also go to the shows to honor and feel closer to parents and relatives who were in the war.

Reenactor Profiles

Ted Young, W3PWW, brings his beautifully restored and fully operational BC-669 AM transmitter-receiver to the Reading reenactment and other shows each year (see photo A). He sets up a 75-meter dipole and communicates with other ham-operated stations while his friend David Kormanicki, KB3ELD, acts as a backup operator and demonstrates the operation of the famous M-209 cipher machine that was used by the American forces to encode and decode secret messages in the same way that the Germans used their Enigma cipher machines.

Ted has been a ham since 1949. He was always interested in collecting military radios, which were widely available and cheap in the 1940s. After he had built a world-class military radio collection, he decided that he wanted to show off some of his radios at the military radio shows, and he gradually found his way into the reenactments, where he proudly demonstrates his sets.

Dave had 12 relatives who were in WW II. His father was involved in building the Burma Road and virtually everyone who lived in the houses nearby was a veteran. In 1995, he joined a WW II reenactment group and bought some surplus radios to strengthen his own connection with WW II. Watching the other hams at the reenactments convinced him to get his ham license in 1997. He has been operating radios at the reenactments ever since.

Photo B shows an authentic and fully operational BC-654 transmitter-receiver set up in one of the American encampments at the Reading show. The radio is powered by a hand-cranked generator that is turned by Jason Garver, KB3ATV, who demonstrates and explains its use to thousands of visitors. Mark Weidmayer, KD3ZK, demonstrates the operation of a fully-functional BC-611 Walkie-Talkie (photo C). This was the first hand-held radio, the great grandaddy of all the handi-talkies that we use today. As noted above, most of them were set to transmit and receive on 3885 kHz. They were available in large quantities at the end of the war, but they used a very long 103-volt battery that is no longer available. In order to get these radios working, many hams tape together ten standard 9-volt batteries to produce the needed voltage.

Jason earned his Novice license in 1993. He was a pilot when the 9-11 attack took place in 2001, and this effectively grounded him. His flight instructor had been a radio operator in WW II, and he became more interested in the lore of WW II and joined the reenactment group. He enjoys operating and demonstrating the radios for the huge crowds.

Mark, KD3ZK, has been collecting military radios since the 1970s. His father was a veteran, and when he died Mark was even more motivated to join a reenactment group and relive some of the lore of WW II.

Photo D– Craig O'Brien, G3UZM, is dressed in an authentic WW II German uniform. He is demonstrating the operation of one of the author's German Enigma cipher machines. Behind the Enigma is his fully functional and authentic German transmitter-receiver.

Photo E– This is a beautifully restored and fully functional BC-191 transmitter and BC-312 receiver operating on 3885 kHz AM, which is the standard frequency used by hams to operate their military radios at military meets and hamfests.

Photo F– This is a complete and authentic British WW II Wireless Set 19 transmitter-receiver with all of the appropriate and very hard-to-find accessories. (The much more modern Weller soldering gun and frequency counter are hidden during show hours.)

Craig O'Brien, G3UZM, brings a complete German WW II field radio set to the meets and explains and demonstrates its operation (photo D). Sometimes he also demonstrates one of the author's Enigma cipher machines in his tent. Craig is a long-time collector of military equipment and medals. He became a ham in 1984 partly because his father had been a shortwave listener and he had enjoyed tuning around the dials on his father's radio and listening to the distant stations. When he came to America, he decided to join a reenactment group. Although he is British, he chose to join the German Grossdeutschland group because it was dramatically different from most of the British and American groups and he looked forward to setting up and operating genuine German WW II radios.

Since most people have never seen a real German WW II field radio set, he likes explaining it to the visitors and demon-

Photo G– In addition to some WW II radios, the author's display at military meets and hamfests includes German Army, Navy, and Air Force Enigma cipher machines, an American M-209 cipher machine, and various accessories. You can visit his Enigma museum at <http://www.w1tp.com/enigma>.

strating the use of the radios and the strange-sounding German phonetic alphabet. Here are the German phonetic words used to convey the letters of the alphabet: Anton, Bertha, Casar, Dora, Emil, Friedrich, Gustav, Heinrich, etc.

Other radio stations set up at the Reading WW II weekend include a complete BC-191/BC-312 transmitter-receiver (photo E) and a British Wireless Set 19 complete with all accessories (photo F).

All of the WW II radios used tubes instead of any solid-state devices, so they require both a low-voltage 6-volt filament power supply and one or more higher voltage power supplies for the plate and grid or screen voltages. Although a few hams bring portable generators and use them to power 110-volt AC power supplies, most use authentic vehicle-battery-driven dynamotors, vibrator supplies, or hand-crank generators to produce the required combination of voltages. Powering these old sets is one of the most interesting challenges involved in putting old military radios back on the air.

For More Information...

If you would like more information about military radios and their operation, you may want to pick up a copy of the book *Mil Spec Radio Gear*, available in the CQ Bookstore at <www.cq-amateur-radio.com>. A web search on "green radios" or "green radios military" will turn up additional information. One of the best resources on the web is at <http://www.greenradio.de>. Additional photos by the author from the Reading reenactment are posted on the *CQ* website.[1]

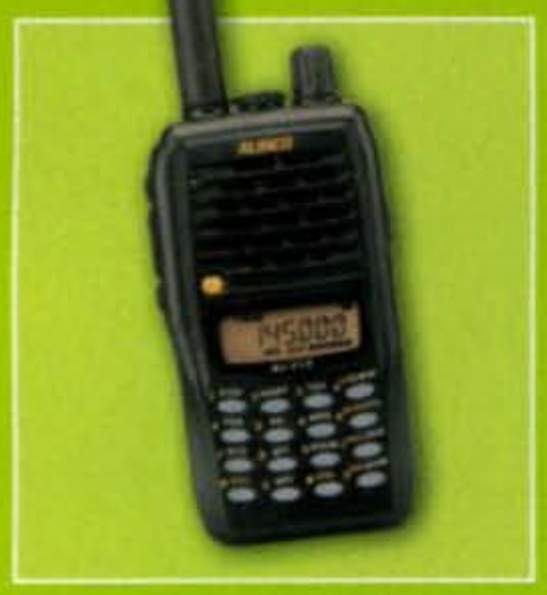
For more information about military radio activities at hamfests and meets, you may want to visit the Military Radio Collectors Association (MRCA) website at <http://www.mrca.ar88.net> or the Surplus Radio Society (SRC) website at <http://home.hetnet.nl/~angrynine/index.html>, or follow the appropriate links at <http://www.virhistory.com/ham/rrab/more_links.htm>. If you would like to hear some of these old military radios *on the air*, there is a Military Radio Collectors Net that meets on Saturdays at 9:30 PM PST on 3980 kHz on AM or SSB.

In addition to various military radios, the author brings his authentic German WW II Enigma machines to many hamfests and meets to display and demonstrate how they were used and explain how their messages were deciphered (photo G). You may visit his Enigma museum at: <http://www.w1tp.com/enigma>, and you will find his CD-ROM entitled "The Story of the ENIGMA: History, Technology, and Deciphering," for sale in the CQ Bookstore.

Note

1.<http://www.cq-amateur-radio.com>; click on November 2008 issue highlights, then click on link to WW II reenactment photos.

Alinco would like to hand it to you!



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TX 144 - 147.995MHz
RX 130 - 173.995MHz

DJ-V27 5 WATT 220MHz
Frequency range:
TX 222 - 224.995MHz
RX 216 - 249.995MHz

DJ-V47 4.5 WATT 440 MHz
Frequency range:
TX 430 - 449.995MHz
RX 410 - 470MHz approx

These "new generation" handhelds are loaded with features, including:

- Rugged polycarbonate body resists dirt, dust and moisture
- Highly visible backlit alphanumeric display
- Direct frequency input through illuminated keypad
- DTMF Autodialer with Memory includes nine autodial memories plus redial function
- 200 Memories and one call channel
- VFO, Memory and Scan modes
- Ultra-flexible antenna with SMA connector avoids breakage
- 39 CTCSS tone squelch (encode+decode) settings
- Tone burst function (1,000, 1450, 1750 and 2100Hz)
- Battery-drain function avoids memory-effect
- Ergonomic design, fits in the palm of your hand
- Wire cloning capability
- Ni-MH standard and varieties of optional batteries including Li-ION packs
- 2-level attenuator
- Single pin speakermic/programming jack

Included Accessories:

- Ni-MH battery pack EBP-65 (7.2V 700mA)
- Wall-charger
- Flexible whip antenna
- Belt clip
- Hand strap
- Instruction manual

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If your amplifier starts to reduce power output as you tune toward the outer limits of your antenna's range of resonant frequencies, LDG's AT-1000 Pro autotuner just might be—pardon the pun—the perfect match! WB6NOA puts it through its paces.

CQ Reviews:

LDG AT-1000 Pro Automatic Antenna Tuner

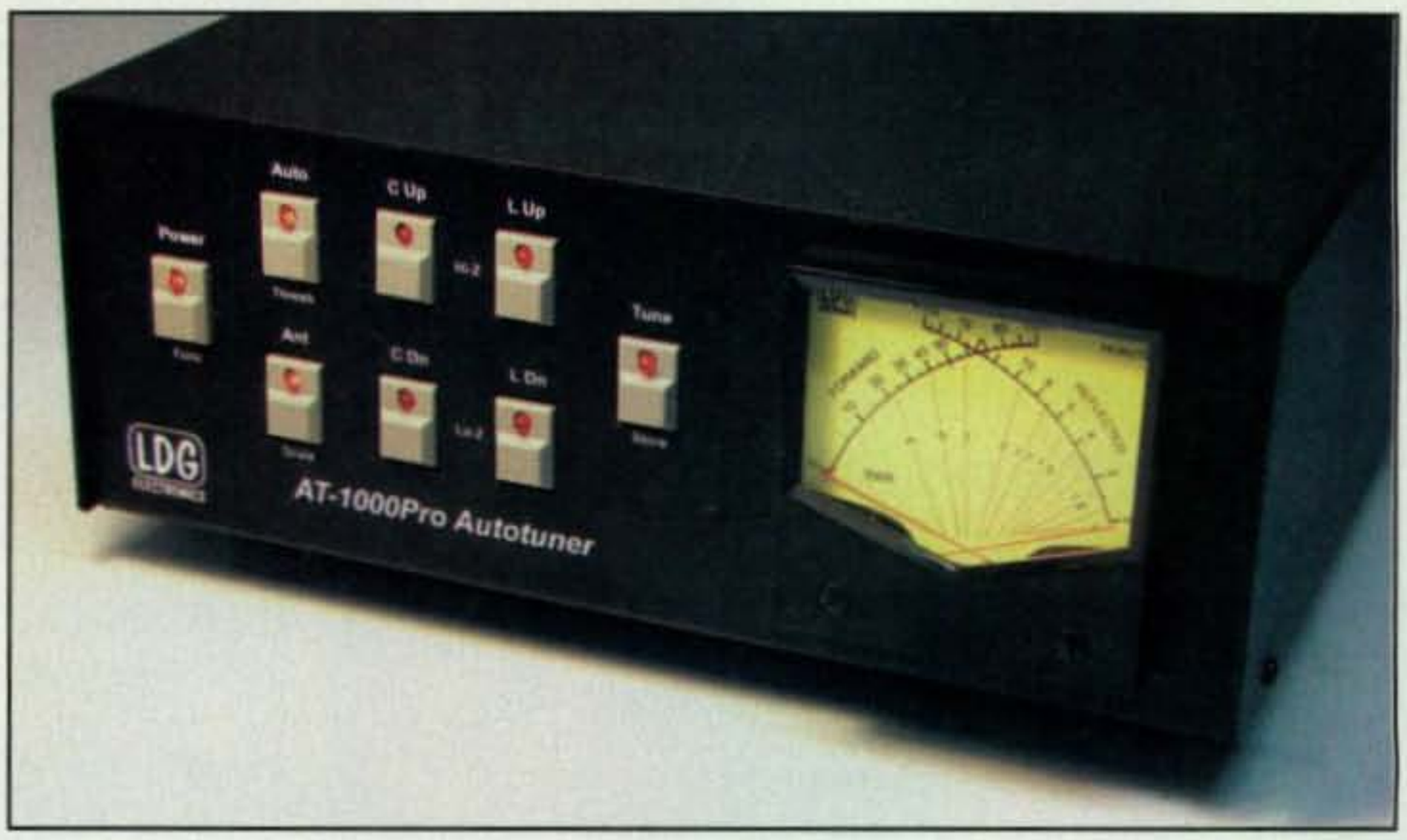
BY GORDON WEST,* WB6NOA

Located in St. Leonard, Maryland, LDG Electronics is celebrating nearly 15 years of automatic antenna tuner design and production. LDG currently sells eight automatic antenna tuners, and its new LDG AT-1000 Pro is designed for the high-frequency, high-power operator.

"Our product is intended for use with most tube or those new solid-state amplifiers, with outputs up to 1000 watts SSB. Our new 1000 Pro will tune dipoles, verticals, Yagis, or virtually any antenna system designed to be coax fed," indicates LDG's Dwayne Kincaid, WD8OYG.

I recall that when LDG automatic tuners came onto the market, SGC dominated auto-tuners, but those models had an absolute requirement that the tuner must always be placed remotely at the antenna feed point. The SGC was also a reactance-fed output, working longwires, non-resonant tall whips, or loops. The LDG, by contrast, is intended for coax input and output, and is *not* intended for remote placement at the antenna feed point. Rather, the LDG AT-1000 Pro sits right at the linear amplifier output, fully automatic in operation, yet "tweakable" by push-button controls on the front panel.

The LDG 1000 Pro offers continuous coverage from 1800 kHz to 54 MHz. It tunes with up to 125 watts (5 watts minimum) from your barefoot ham rig, and will then operate with QRO power levels up to 1000 watts SSB, 750 watts CW, and 500 watts RTTY or PSK. On 6 meters, don't drive it beyond 250 watts at its input.



The AT-1000 Pro autotuner from LDG covers 160–6 meters at power level of up to 1000 watts on SSB, 750 watts on CW, and 500 watts on RTTY or PSK. (Photos courtesy of LDG Electronics)

Warning: Never run a tuning sequence with amplifier ON! This would likely arc the relays inside the tuner. Built-in relay protection software freezes any tuning attempt when power is detected over 125 watts, or 75 watts into a 3:1 SWR.

A "Smoothing" Tuner

Unlike a remote-mounted longwire tuner that will automatically tune nearly anything, from a light bulb to a lawn chair, the LDG is specifically designed to smooth out elevated SWR when operating a resonant antenna away from its natural resonant "sweet spot." This LDG automatic antenna tuner is a "switched L" network, consisting of series inductors and shunt capacitors, and the tuner has a routine that could actually exchange this combination of L and C. Each of the relatively large toroidal inductors is soft-potted onto the circuit board to dampen vibration, yet provides solid holding with this pliable clear compound. Total inductance ranges may be switched from 0 to 10

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e-mail: <wb6noa@cq-amateur-radio.com>

Front-panel controls let you manually "tweak" the inductance and capacitance values, but LDG recommends letting the autotuner find the best match until you get used to using the manual controls.

µH. This will allow more than 100 different L combinations with a resolution of .08 µH, which can be "tweaked" by front-panel buttons.

There are seven 2500-volt capacitors soldered to the glass-epoxy circuit board, offering total capacitance ranges from 0 to 1270 pF. The capacitors are connected shunt to ground through the relays, and that one single relay can switch the capacitors to the input or output side of the inductors, allowing the tuner to match loads that could be below, or above, 50 ohms.

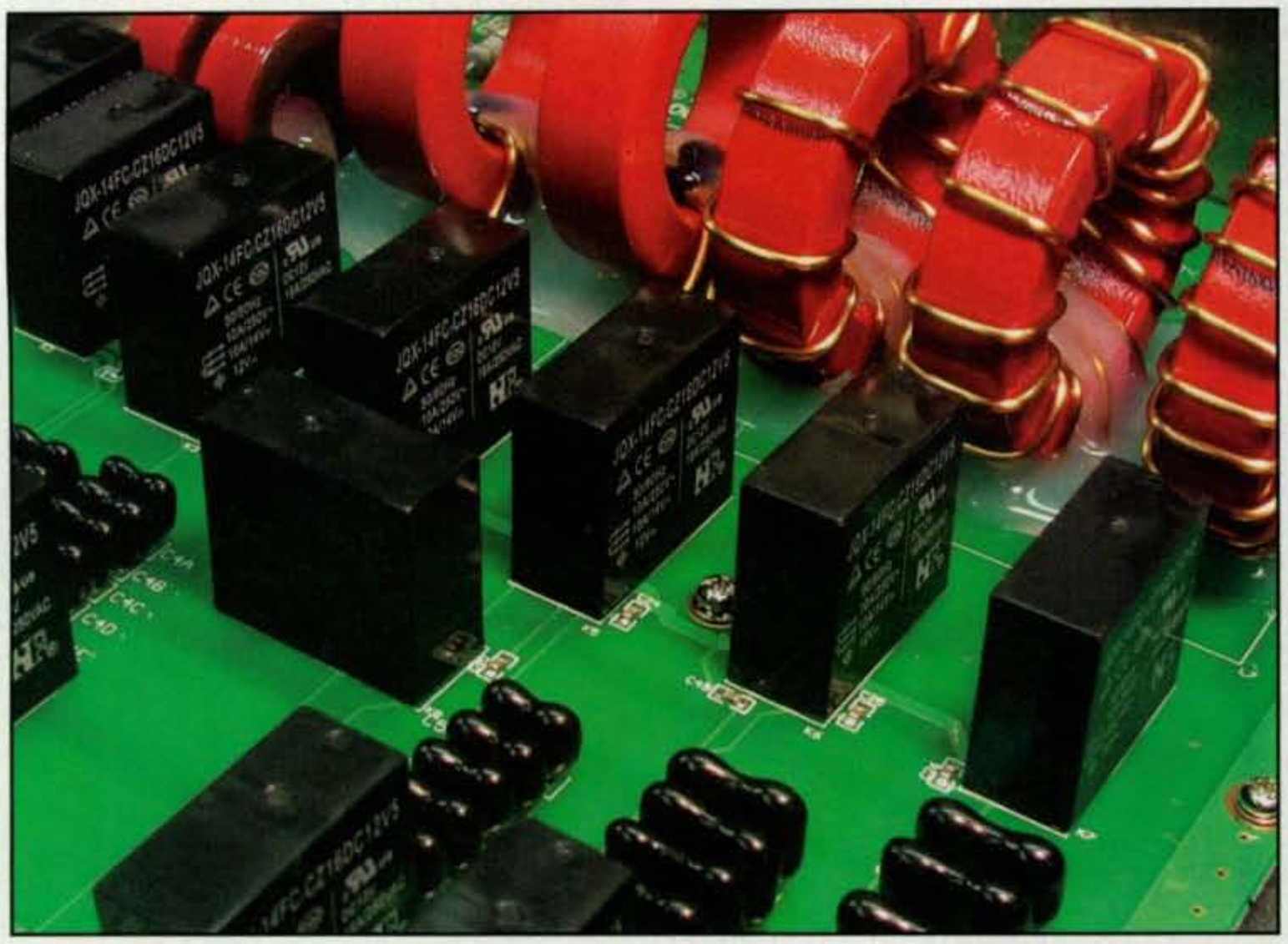
At the 100-watt level PIN switching over relay switching is not an option, and at a kilowatt, even further out of the question, leaving the job to 14 plus one single-pole double-throw relays, each capable of handling 10 amps, and switched via an LDG-designed microprocessor and a 12-volt command.

You can tell these relays mean business by the noticeable clatter during active tune. Unlike smaller remote-mounted tuners where you listen for a purr of relay sounds, there is no mistaking the loud rattling during the 2- to 10-second tune cycle. The tune cycle looks at SWR through a Bruene circuit, slightly modified to provide voltages, instead of current, for the analog-to-digital converter, which provides signals proportional to the forward and reverse power levels.

The microprocessor runs at 20 MHz, with an internal bus speed of half that, at 10 MHz. We tried the tuner on a variety of slightly non-resonant verticals and dipoles, and we could easily see the internal action driving the dual-needle SWR indicator—coarse tuning inductors for homing in on a match, and then individual capacitors to perfect the match, back to one more inductor and more capacitor add-ons, seeing if that particular combination drives down SWR even further.

The front of the tuner has a total of eight red LEDs that blink everything from the version number of the software to tune memory clear. Have the instruction book handy, as the red LED blink is an important diagnostic tool during tune up. Any SWR of less than 1.5 gets automatically stored in non-volatile memory, and the TUNE LED will blink five times, indicating a good tune, and memory save. You can tune using AM, full power CW, or SSB voice, with a firm "hellllllo" or "fooooour." I go for AM, because this is a little easier on all of those gold-tipped relays.

The LDG includes interface cables for most ICOMs, and the Yaesu FT-857 and FT-897 radios. For ICOM, you can press the button on the tuner *or* the radio. For Yaesu, it's only the button on the tuner. For both radios, it changes to CW. On the ICOM it's 10 watts, and on the Yaesu it's 100 watts. On ICOM it shows that it changes to CW, on Yaesu it does not



Toroids and relays handle the coarse-tuning chores for the AT-1000, with capacitors doing the fine-tuning. The unit is designed more to "smooth out" SWR bumps in nearly resonant antennas used by high-power stations than to match the proverbial bedspring.

change the mode on the display (even though it's really now on CW during a tune). You can interface other radios by the start line grounded to start the tuning process, and the key line grounded for the duration of the tuning cycle. You will likely need to manually switch the radio and your homemade tuning wires over to AM to get at least 5 watts output.

During our tests, using the tuner for the first time on vertical antennas counterpoised off a state fairground all-metal roof, tune-up time was less than 5 seconds initially, and the repeat of that frequency cut our tune-up time in half.

"The number of tuner adjustments can be as few as 4 or as many as 288," claims LDG technical staff. "There are 1 to 16 checks for coarse inductor tuning, 1 to 16 for capacitor coarse tuning, and 2 to 256 for fine tuning. On one antenna, a dipole cut for 3600 kHz that we pulled up to 3950 kHz, for the first time the LDG 1000 Pro took 12 seconds to find the match, and less than 3 seconds to repeat this task, thanks to tuner pre-set memory. The further away from resonance an antenna is at the exciter's operating frequency, the longer it takes the tuner to find a match," comments LDG support staff, just a phone call away.

The large cross-needle SWR indicator may be electronically switched to read 100 watts out or 1000 watts out. Read the instructions. They are not complicated, but it is an electronic selection, not a mechanical switch. Speaking of electronic switches, the LDG 1000 Pro can let you manually electronically switch in fine-tuning adjustments of L and C. After a brief rainstorm, we found a slight adjustment would bring the SWR to near flat, as it was before the rain. The instruction manual says to let the tuner find the best match, unless *you* really know how to fine-tune L and C with these buttons.

Turnin' on the Juice

OK, the exciter is now tuned to the antenna load, passing through your amplifier on stand-by. Now it's time to tune the entire system, so drop your exciter's AM carrier to about 40 watts, turn on the amplifier, and then tap the inductance and capacitance buttons to fine-tune any slight variation of SWR with the amp on. Gradually increase exciter power, and stay below 200 watts on AM until you make absolutely sure the tuning process is complete. Now switch to CW or SSB and pour on the coals, cautiously. If you should see the SWR indicator jumping around, shut down immediately and put out the fire on the tree branch touching your vertical radiator! Erratic SWR at high power levels usually means arcing of the load.

As the instruction manual indicates, this tuner will not successfully match an aluminum lawn chair. We also found that random-length home-brew dipoles swirled in an attic may sometimes be tuned by this automatic tuner, yet on other bands the tuner would simply hunt and then go into bypass. (I always worry about the fire danger of a 100-watt transceiver with an attic antenna, but I would very much be concerned piping 1000 watts into any antenna system inside the roof line.) We ran the tuner into non-specific-resonant Carolina Windoms, plus resonant double bazooka antennas, and, of course the automatic tuner liked the resonant antennas best. However, on the off-center-fed Carolina Windoms, the tuner did surprisingly well—well beyond what a transceiver's internal tuner might accomplish, and satisfying the output of our new Tokyo High Power solid-state amplifier.

The sequencing of the red LEDs took some time to figure out, needing a close inspection of the instruction manual. Ditto with getting the SWR meter up to a KW output. Read the manual! And, of course, the manual makes it clear, *never* operate the exciter nor the amplifier when the tuner's metal cover is off. ***Dangerous high voltage*** exists on transmit.

Finally, LDG makes it clear, on force-tuning a piece of wire that is absolutely not resonant, if the LDG should find a match, this absolutely non-near-resonant antenna will likely cause much of your transmitter and amplifier power to dissipate as heat within the tuner ..."A tuner simply fools your amplifier into behaving as though the antenna were resonant," the folks there explain for the newbie and remind the rest of us. If you are running an amplifier, make every attempt to plumb it into a resonant antenna system by first tuning the antenna system itself and then letting the excellent LDG 1000 Pro allow you to operate slightly off resonance without burning up your new amp or causing the exciter to fold back power.

The AT-1000 Pro lists for $599. For more information on LDG products, visit <http://www.LDGElectronics.com>. My one phone call to the technical support line (410-586-2177) was an outstanding success, with trained personnel ready to talk me through any questions about the new kilowatt tuner. The company also has a new online help desk system with frequently asked questions (FAQs), Knowledge Books, and more at <http://support.ldgelectronics.com>. In addition, there is a user group at <http://groups.yahoo.com/group/LDG-auto-tuners/>, where fellow users can offer guidance and suggestions based on their own experiences.

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Your Contest and DX Corner! We Have EVERYTHING and ANYTHING You Need!

DXing is the lifeblood of ham radio, and just about every DXer dreams of someday "being the DX." Jim Smith, VK9NS, has had that dream come true over and over, and now he's sharing his exploits with us. Jim Cain, K1TN, author of another DXpeditioning memoir, YASME – The Danny Weil and Colvin Radio Expeditions, *has our review.*

CQ Book Review:

The Old Timer – 60 Years in the hobby of Amateur Radio 1947–2007

By James B. Smith, VK9NS

REVIEWED BY JAMES D. CAIN,* K1TN

How fortunate we are to have Jim Smith, VK9NS, write an amateur-radio-based memoir. With his life of world travel, his amateur radio exploits, and his flair for writing, he certainly has the "creds" for the job. The number of amateur radio memoirs published can be counted on one hand, as far as I know. Too many candidates have died without leaving a word, and more of the WW II generation is leaving us every day. This is a tremendous loss to us, and all the more reason to be grateful to Smith for his effort.

Born in 1928 in Scotland, Jim Smith was too young to enlist for WW II. He says little about his early life in the book, except that his father and his father's sisters and brothers "inherited a considerable sum of money." Smith describes home life as the war dragged on as "not exactly wonderful." Radio had sparked his interest as a teenager, and at age 17 Smith joined the Royal Air Force to train as a radio technician.

After assignments in the Far East (where he learned Morse code and was first licensed, as VS1BQ, Singapore), Smith and his first wife, Jean, were posted to Germany from 1952 to 1957, then lived in England until 1973. Jean held the calls VS1YL, G3HSQ, and DL2YL. Smith made the DXCC Honor Roll as G3HSR. Through this part of the book the reader is treated to part travelogue and part amateur radio stories and personalities . . . and this takes us through just 90 pages!

After four children and 23 years of marriage, Jim and Jean Smith split up. Jim spent half-a-dozen years "batching it." Then on his first visit to Norfolk Island and operation as VK9NS, he fortuitously met a slightly younger woman named Kirsti. Kirsti is a ham, too (VK9NL). They got married, and she wrote a book of her own about their DXpedition to Heard Island (now, sadly, out of print).

The Old Timer transports us to not only the Far East, but all over the Pacific and Antarctic islands, and in the 1990s to Bangladesh, Bhutan, India, and even the Andaman Islands. The book is loaded with photos conveniently arranged together at the end of each chapter. I found myself turning to the photos first, then reading the chapter, then looking at the photos all over again. Incidentally, when I sat down to begin reading the book I planned to read just a couple of chapters, but ended up reading 250 pages.

*c/o CQ *magazine*

Jim Smith, VK9NS, and wife Kirsti, VK9NL, on Norfolk Island. Both have written books about their ham radio adventures. (Photo courtesy of Jim and Kirsti Smith)

The Old Timer *author Jim Smith, VK9NS (left), and Jim Cain, K1TN, Connecticut, 1990. (Photo courtesy K1TN)*

Smith spent eleven years in the RAF before striking out as sort of a freelance aviation electronics tech and troubleshooter. He was licensed in Papua New Guinea as P29JS before moving to Norfolk Island, where he has lived since 1980. DXers who go back to the '80s will remember the 14220 net, Smith's baby, as well as the Heard Island DX Association, which raised money to support a number of expeditions by Smith and others.

DXing has always been amateur radio's hotbed for rumor, innuendo, personality conflicts, accusations, and even the occasional lawsuit. However, there is little mention of any of that in *The Old Timer.* This reviewer would have liked some of that "dirt," but in the end I was touched by Smith's writing about the positive influence amateur radio has had during the course of his life so far.

I also was struck by the similarities between Smith and three other DX legends: Danny Weil, VP2VB, Iris Colvin, W6QL, and Lloyd Colvin, W6KG, too many connections to try to enumerate here. Maybe there is some sort of gene at work. All four became members of the CQ DX Hall of Fame.

Book publishing has always been a brutal business, and it's worse than ever today. *The Old Timer* is available both in print and on a CD-ROM (at half the print price). The print version mercifully features text in large, dense type for us Old Timers!

At this writing, Jim Smith and Kirsti Jenkins-Smith still live on Norfolk Island. Jim just marked his 80th birthday (in October 2008) and is an active member of the Collins Collectors Association. Jim and Kirsti's website is <www.jimkirsti.com>.

Announcing:

The 2009 CQ World-Wide 160 Meter Contest

CW: 2200Z January 23 to 2200Z January 25
SSB: 2200Z February 27 to 2200Z March 1

PLEASE NOTE: This year's rules reflect several significant changes, so please read them closely. Here is a summary of the major changes:

1. The dates for the 2009 SSB contest are a week later than usual to avoid conflict with the ARRL DX Contest. This is a calendar anomaly and will return to the last full weekend in February in 2010.
2. The start and end times of the contests have been shifted two hours earlier in response to requests from the 160 contesting community.
3. The exchange for DX stations has been changed from RS(T) & country to RS(T) and CQ zone.
4. A new single-operator/assisted class has been added to permit the use of clusters, skimmers, etc.
5. A 40-hour maximum operating period has been added for multi-op entries.
6. Provisions have been added regarding remote operation.

I. OBJECTIVE: For amateurs around the world to contact other amateurs in as many U.S. states, Canadian provinces, and countries as possible utilizing the 160 meter band.

II. BAND USE: 1800–2000 kHz. All entrants are encouraged to spread out as much as possible, obeying frequency restrictions and power limits for their own country.

III. CATEGORIES:

For all categories:

The main site is defined as all transmitters, receivers, and antennas must be located on the same contiguous property. If the property is not contiguous, then all equipment must fall within a 1500 meter radius. All antennas must be connected by wires to the main station. This rule applies to all entrants.

The use of any so-called "Chat Rooms" via the internet or similar means for communication between stations or operators during the contest period is strictly prohibited. Do not arrange or confirm QSOs by any other means than the use of the 160 Meter band and the same mode as used in the contest. Any such use may result in disqualification at the discretion of the committee. The use of self spotting is not allowed in any category.

Remote operation is permitted under the following conditions:

- The use of any receiver located away from the main site is strictly prohibited.
- The use of a separate receiver at the remote control location is prohibited.
- Any receiver linked via the Internet or RF not physically located at the main site is strictly prohibited.
- If the remote station is located in another DXCC entity, it is required to comply with all local country regulations.

Operating time: Each contest is 48 hours long and starts at 2200Z. Single operator stations may only operate 30 out of the 48 hours. Multi-Operator stations may operate 40 hours. Off times must be a minimum of 30 minutes in length for all categories.

(A) Single Operator: One person performs all of the operating, logging, and spotting functions. Maximum operating time is 30 hours. ***Passive spotting is NOT allowed.*** (See definition of passive spotting functions below.) Only one transmitted signal is allowed at any moment in time. Maximum power is 1500 watts total output or the output power allowed by your country, whichever is less.

(B) Single Operator/Low Power: Same as (A) with the exception that the output power shall not exceed 150 watts. Stations in this category compete with other Low Power stations only.

(C) QRP: Same as (A) with the exception that the output power shall not exceed 5 watts. Stations in this category compete with other QRP stations only.

(D) Single Operator Assisted: HIGH POWER ONLY. Same as (A) with the following exception: ***The use of passive spotting IS allowed.*** (See definition of passive spotting functions below.)

(E) Multi-Operator: HIGH POWER ONLY. All rules apply as in Single Op Assisted; however, more than one operator (person) is involved in the operation. Maximum operating time is 40 hours. Only one transmitted signal is allowed at any moment in time. Maximum power is 1500 watts total output or the output power allowed by your country, whichever is less. The use of passive spotting is allowed.

Passive Spotting **is defined as (but not limited to):**

DX spotting nets or QSO alerting assistance of any kind. Over-the-air nets or stations that provide frequency and station information.

Any device or person that provides frequency and callsign information of any station during the contest period. This includes band skimmers or similar devices. Passive spotting does NOT include band scopes, SDR receivers, or the like, which provide no information about the signal other than its presence, which is allowed in all categories.

IV. Exchange: RS(T) and state for U.S., province for Canada, and CQ Zone for DX. Note: Zones are location indicators only and do not count for multipliers.

V. Multiplier:

U.S. States: (48 contiguous states); U.S. District of Columbia (DC) (1)

Canadian Provinces: (14) VO1, VO2,

MFJ *giant* SWR/Wattmeter

World's *largest HF SWR/Wattmeter has* ***giant*** *6½ inch meter!*

This one you can SEE! Extra-long scales gives you highly accurate SWR and power measurements. Huge numbers makes reading easy across your shack.

Like your analog watch, one glance at the meter needle gives you fast and accurate readings without actually examining the scale.

New!

MFJ's exclusive *TrueActive*™ peak reading circuit captures *true* peak or average forward and reflected power readings.

MFJ-868 **$149.95**

Has 20/200/2000 Watt ranges for accurate QRP or QRO operation.

Exclusive MFJ Wattmeter *Power Saver*™ circuit turns on meter only when RF power is being measured.

Covers 1.8-30 MHz. Use 9 volt battery or 12 VDC or 110 VAC with MFJ-1312D, $15.95. 7Wx5½Hx5D in. SO-239 connectors.

New!
Giant 144/220/440 MHz SWR/Wattmeter
MFJ-867, $159.95. Like MFJ-868 giant SWR/Wattmeter, but for 144/220/440 MHz.

MFJ *Weather-Proof* Antenna *Feedthrough* Panel

Bring three coax-fed HF/VHF/UHF antennas, balanced line, random wire and ground into your hamshack without drilling through walls . . . **New!** MFJ-4602 **$69.95**

MFJ's Weather-proof *Antenna Feedthrough Panel* mounts in your window sill. Lets you feed three coax-fed antennas, balanced line, random wire and ground without drilling through walls.

Simply place in window sill and close window. One cut customizes it for any window up to 48 inches. Use horizontally or vertically. High-quality pressure-treated wood with excellent 3/4 inch thick insulating properties is painted with heavy coat of white outdoor enamel paint. Edges sealed by weather-stripping. Seals and insulates against all weather conditions. Gives years of trouble-free service. ¾Dx3½Hx48W in.

Inside/outside stainless steel plates bond all coax shields to ground. Stainless steel ground post brings outside ground connection inside. Three *Teflon*® SO-239 coax connectors, *ceramic* balanced line/randomwire feedthru insulators.


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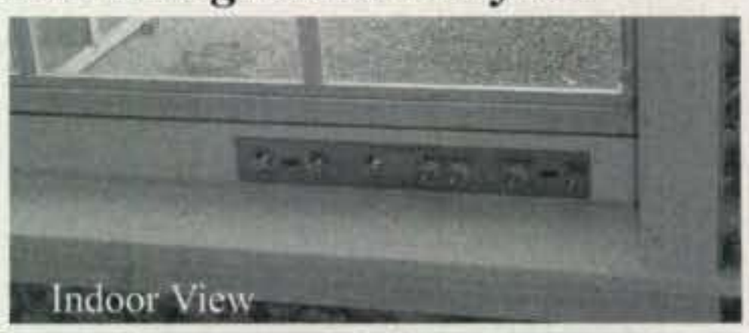
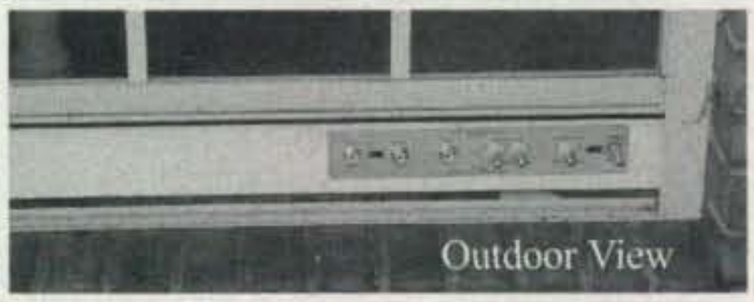

Indoor View


Outdoor View

6-Band *Rotatable* mini-Dipole for 40,20,15,10,6,2 M

Low profile 14 ft . . . 7 ft. turning radius . . . 1.5 kW . . . Directivity focuses signal, reduces QRM/noise . . .

You can hardly see this mini 14 foot rotatable dipole from across the street!

Tiny 7-foot turning radius fits the smallest roof – perfect for houses, apartments/condos.

The low-profile MFJ-1775 is not much bigger than a TV antenna and nicely blends into the sky. It's easily turned by a lightweight TV rotator.

It's no Wimp! Its *directivity* reduces QRM/noise and lets you *focus* your signal in the direction that you want -- so you can work some *real* DX.

Operate 6 bands -- 40, 20, 15, 10, 6 and 2 meters. Run *full 1500 Watts* SSB/CW on all HF bands!

Its entire length radiates. Each HF band uses a separate, highly-efficient end-loading coil wound on fiberglass forms with *Teflon*™ wire with capacitance hats at each end (no lossy traps). 6 and 2 meters are *full-length* halfwave dipoles.

Built-to-last -- incredibly strong solid rod fiberglass center insulator and 6063 T-6 aircraft strength aluminum tubing radiator. Assembles in an afternoon. Adjusting one band has little effect on other bands.

MFJ-1775W, $249.95. WARC band version for 12, 17, 30, 60 Meters only.

80/40/20 Meter Rotatable Dipole

MFJ-1785, $369.95. DX the *low bands* on 80, 40, and 20 Meters with an efficient full 33 foot *rotatable* dipole! Handles a full 1500 Watts. Balun included. 6063 T-6 aircraft strength aluminum tubing with a solid center fiberglass insulator. Requires a medium-duty rotator such as Hy-gain's AR-40.

Compact SWR/Wattmeter

MFJ-822
MFJ-842
$59.95
New!

Compact SWR/Wattmeter has huge 3 inch *lighted* Cross-Needle Meter, easily viewable from across shack. Read forward/reflected power, SWR *simultaneously*. 3¼Wx3¼Hx3¼D in.

MFJ-822 for 1.8-200 MHz, 30/300 Watts.
MFJ-842 for 140-525 MHz, 15/150 Watts.

2-Position *Remote* Ant. Switch

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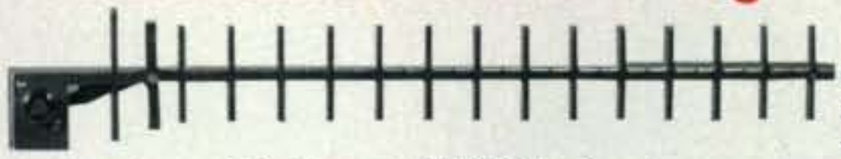

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VI. Points:

Contacts with stations in own country: 2 points.

Contacts with other countries on same continent: 5 points.

Contacts with other continents: 10 points

Maritime mobile contacts count 5 points. There is no multiplier value for a maritime mobile contact.

VII. SCORING: All stations—the final score is the result of the total QSO points multiplied by the sum of all multipliers (states, VE provinces, DX countries).

VIII. Awards: Certificates will be awarded to the top scorers in each class (see provisions under classes) by state, Canadian area, and DX country. Runners-up with high scores over 100,000 points may also receive certificates. The trophies and donors for all categories can be found on the official contest web site CQ160.com. If you are interested in sponsoring a plaque, please contact us at: <questions@cq160.com>.

IX. Club Competition: Any club that submits at least three logs may enter the Club Competition. The name of the club must be clearly identified under club competition on the summary sheet, or summary portion of the Cabrillo log. **Please make sure all entrants from your club use the same club name (spelled the same) in the Cabrillo entry.** Non-compliance with this request may result in your score not being credited to your club's entry.

X. LOG INSTRUCTIONS:

The submission of Cabrillo Logs is highly encouraged. Please submit CQ WW 160 Meter Contest logs via e-mail to **<160CW@kkn.net> for CW** and **<160SSB@kkn.net> for SSB**. Logs are requested to be in the Cabrillo file format. You can view the current list of logs received at <CQ160.com>.

Cabrillo format logs are received by a log processing robot. If your log has been submitted correctly, the robot will reply with an e-mail containing a tracking (confirmation) number. If there is a problem with your log, the robot will send you an error message containing suggestions for how to fix your log. Read this e-mail carefully. Most log submission problems are minor and can be corrected in one pass. Submit your log as many times as needed. The last submitted log will be the version that counts for your official entry. Once you receive a tracking number, your log has been accepted. **Inquiries may be sent to <questions@CQ160.com>.**

Special request for competitive entries: Wherever possible, the entrant is asked to record and save an audio file of the contest for review by the committee when requested. Any type of audio format is acceptable. This is only a request and is not required for awards.

Be sure to send in paper and diskette-based logs early to ensure receipt by the deadlines. Unreadable paper logs will be classified as check logs

XI. Penalties and Disqualification: Logs will be cross-checked and penalties will be applied at the committee's discretion for contacts determined to be bad or busted. The bad QSO is removed and a penalty of three more equivalent QSOs is applied to the points only. No penalty should be applied for unique QSOs unless they are deemed excessive. A log may be disqualified for violation of amateur radio regulations, unsportsmanlike conduct, or claiming excessive unverified contacts.

Report file outputs showing final score calculations will be available for all entrants after the results are published. The decisions of the CQ WW 160 Contest Committee are final.

XII. Deadline: Mailing deadline for CW entries is February 28, 2009; for SSB entries March 31, 2009. Mail all paper/disk logs to: CQ 160 Meter Contest, 25 Newbridge Road, Hicksville, NY 11801 USA. Indicate CW or SSB on the envelope.

SUCH A HAM

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Looking for a good voice-quality microphone? Chances are you already have one . . . but it may not be exactly what (or where) you think it is. W4UW explains.

Talk is Cheap!

BY RICHARD A. GENAILLE,* W4UW

Surprise, surprise! You probably have an excellent voice-quality microphone sitting somewhere in your home and don't realize it! Millions of people have them, and with all the new-fangled telephones on the market, they are being discarded and showing up for sale in flea markets, on the internet, and at hamfests and who knows where else. The going price for these dandies is in the neighborhood of four bucks. Yep, for about $4.00 you can get one of these jewels and what you can do with it is surprising. I surprised myself years ago, and I hate to keep a good thing a secret.

The purpose of this article is to tell you how you can use an ordinary telephone handset for use as a temporary or permanent microphone with excellent results. However, before you start dismantling your home telephone or go out and purchase an old used telephone, let me tell you what happened to me and led me down this path.

Many old timers may remember how they managed to get a microphone for their first on-the-air phone contact. In the old days, many of us used the mouthpiece from a telephone. Never mind how it was obtained, but we did it. The big objection was that the transmitter made use of carbon granules, which, if you didn't use the correct voltage, when packed together rendered this microphone virtually unusable. Operators would complain about what was referred to as "carbon mic hiss."

Many budding young hams couldn't afford Astatic D-104s, Shures, or other exotic microphones when they first got on the air, so they used whatever they could get their hands on. In my case, it was a dynamic mic that came with a public-address system which my father had purchased to use for playing the old 78s and making announcements at the local American Legion functions. I eventually inherited the system, complete with microphone, and used the mic with my first phone rig for many years until I did something to it that rendered the mic unusable.

Photo A– Modified WW II Military Microphone T-17PPT. (All photos by the author)

Photo B– HA-1 receiver unit from the telephone set.

Telephone Dynamic Earpiece as a Microphone

Nearing a contest weekend, contemplating my problem, and being strapped for cash got me thinking about what I could do on short notice. My thoughts went to a simple intercom system that makes use of the loudspeakers as microphones. A few experiments using a loudspeaker as a microphone told me that I was headed in the right direction, and next I knew I had dissected an old Western Electric telephone set to check the handset components. This time I thought about using the dynamic earpiece as a microphone. Thus was born the microphone that I have used since 1964, and with it I have worked every country—excuse me, "entity"—in the world on phone.

While I can afford choice equipment and antennas, I still use the same old mic, as I have received reports of excellent communications audio quality. Unlike crystal, ceramic, and other types of microphones, I can drop my mic on the operating desk or on the floor and it keeps on working.

I wanted to let others know what could be done with the handset of an ordinary telephone, and in 1966 I had an article published entitled "A Dynamic Microphone at Low Cost"

*133 Pebble Ridge Lane, Winston-Salem, NC 27104-2537

Photo C– Western Electric 2500DMG type 500 set.

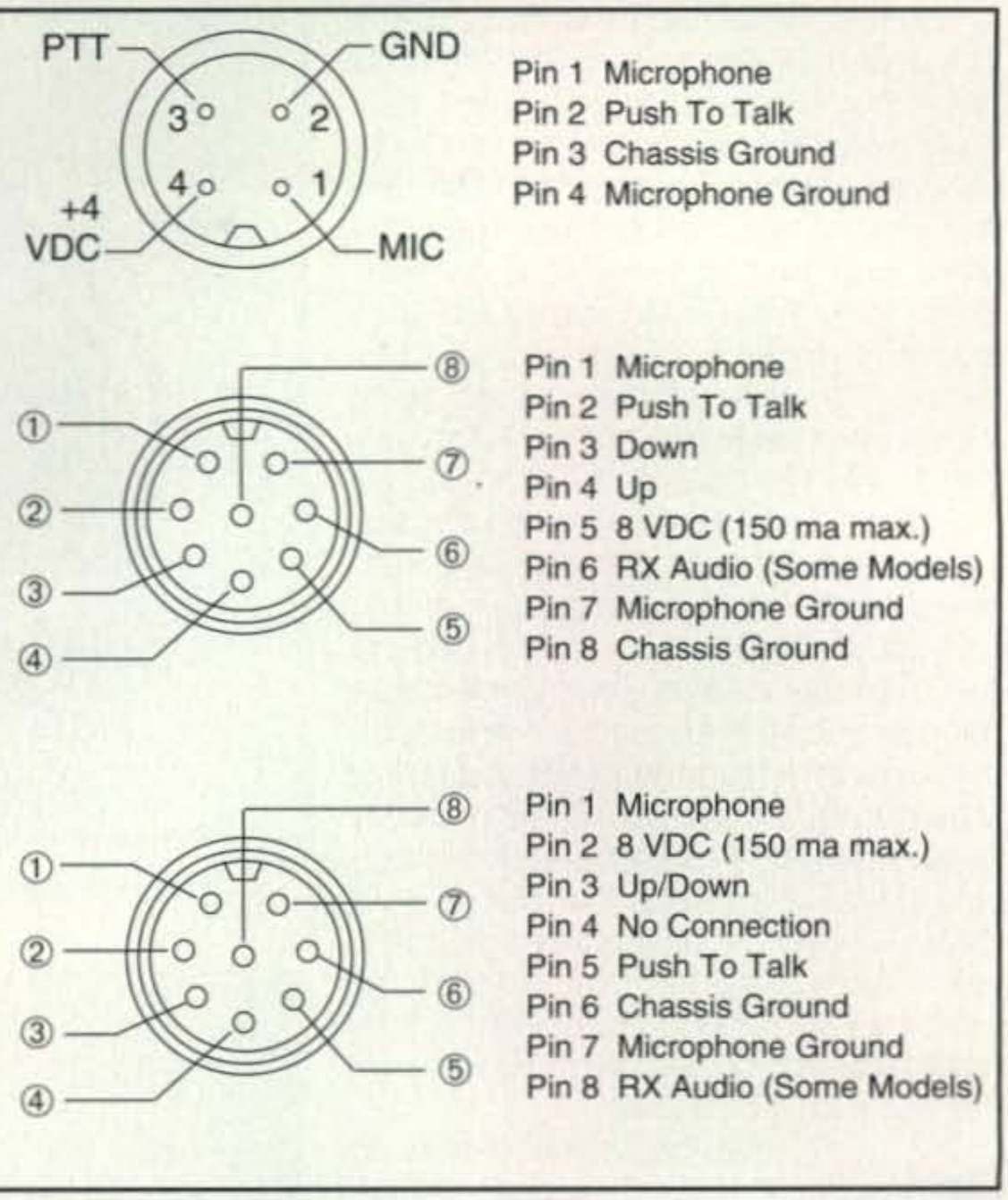

Fig. 1– Typical microphone connections.

in another publication. I guess many fellows didn't want to tear apart what was their only telephone in those days, since I never heard anymore about it!

Fortunately, the telephone, used in telephone transmission, is designed for conveying "intelligibility" from a speaker to a listener. Sounds of that range through the entire scale of audibility are not a requirement for amateur radio communications nor a necessity. The band of frequencies that range from approximately 200 to 3500 cycles per second is the most necessary to make the ordinary spoken words intelligible. The telephone and its component parts were designed for just that. Let's see what can be done using these parts!

Construction

Photo A shows the microphone modified for use by K4ZGM (now W4UW) in 1966 and still in use today. It was made from a WW II Military Microphone T-17PPT Model 1700-V manufactured by the Universal Microphone Co., Inglewood, CA. Many of the hams who were in the military service during WW II will remember this mic. Of course, the transmitter in this unit was a carbon type, and I discarded it and replaced it with the dynamic earpiece from a telephone.

Photo B shows the HA-1 receiver unit (earpiece) from a 500-type Western Electric set. The markings on my HA-1 indicate that it was manufactured on March 5, 1942. It is over 60 years old and virtually indestructible! The unit's impedance is low, so I used a small matching transformer, located under the foam insulation, to provide a match between the low impedance of the handset and the high-impedance mic input of the transceiver. I recently was surprised to find that the microphone input on my Ten-Tec Paragon II is from 200 to 50,000 ohms. Newer solid-state transceivers can handle a wider microphone input range.

I have not used matching transformers for the following modifications, thus saving costs. The large button covering the push-to-talk switch went bad and was removed. A small, momentary push-button switch was mounted in the old switch button cap. What I did mechanically need not be duplicated. Suffice it to say, once you find that the earpiece as a microphone works, then the mounting and other mechanical arrangements are up to you.

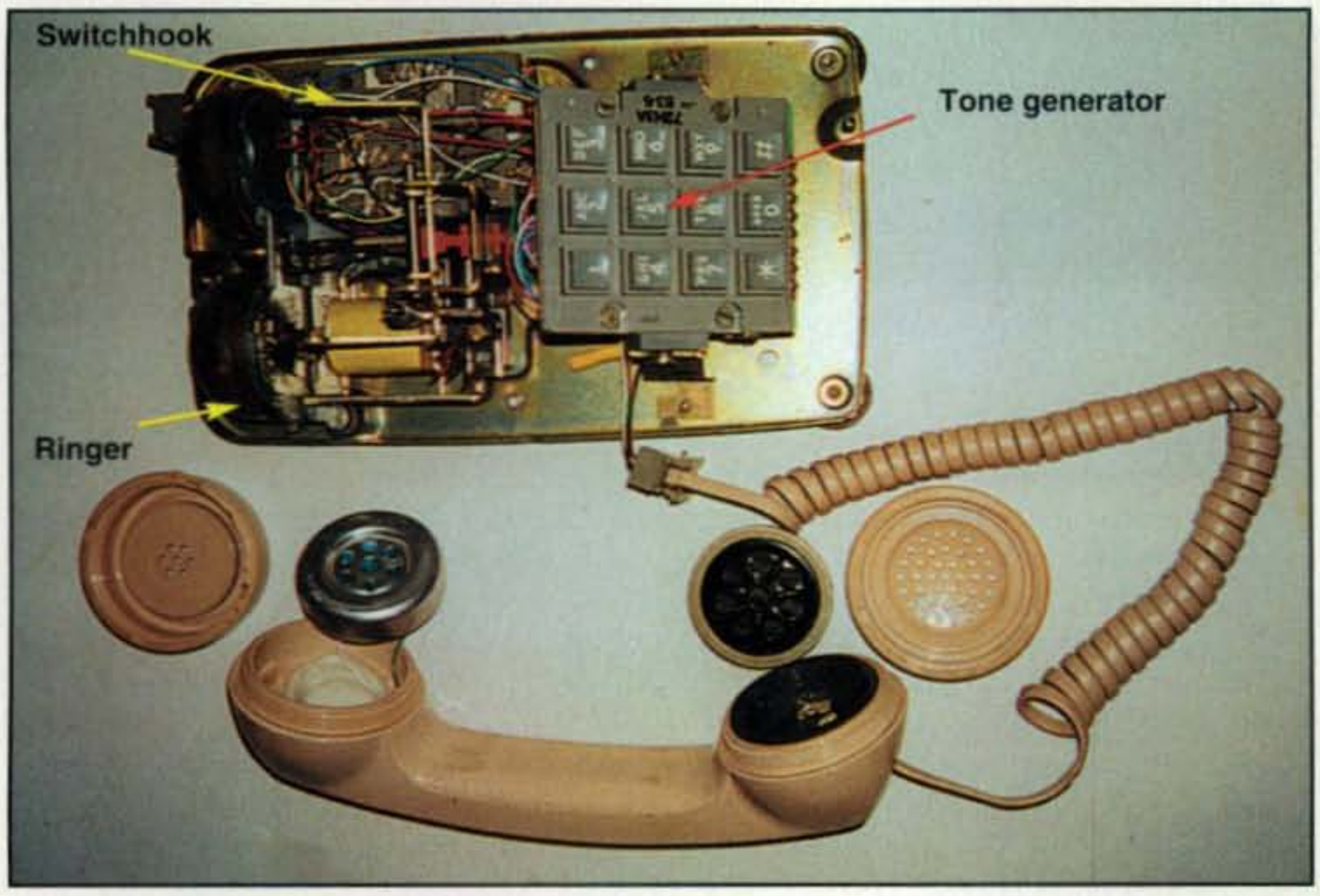

Photo D– The "guts" of the telephone, including speaker, mic, and modular connection of the handset cord to the phone.

The telephone handsets that you see in the photos are all Bell System units made by Western Electric. Don't despair if you can't find one of these. I have seen others manufactured by IT&T and Automatic Telephone that could be used and would work just as well. Telephone system standards are such that most similar telephones should be usable. Basically, all that you are going to use from the telephone set is the earpiece, the handset and wiring, and a modular connector from inside the set. These components will enable you to make the *basic* test and modifications.

Photo C shows what you will need to get started. I have several of these phones around the house, where a fancier designer telephone is not desired or required. Sound familiar? You probably have at least one you can spare to experiment with. If you don't, a visit to your local Goodwill store, hamfest, fleamarket, or radio club is suggested. I have not tried the local phone company's supply facility, but one of them might have a junk pile of these old phones.

The unit shown bears the identifying part number 2500DMG and is basically a type 500 set. The first number and letters following the "500" are used to further identify the set as to color, type dial, coil cord, etc. Don't worry, as the "500" is what you should look for.

The main components of the telephone set are identified in photo D. Note particularly the handset and handset coil-cord modular connector and its mating jack on the base unit. For the moment these are the important components for testing purposes.

The touch-tone pad, ringer, and switch-hook are not required for this modification, but can be useful for sale or trade at local hamfests. I have used the touch-tone pad as a handy two-tone generator for testing sideband transmitters. There are two modular connectors, and their connecting wires, which are shown in photo E. The one with the longer wires—black, green, red, and white (A)—eventually will be used for connection to your transmitter microphone connector. The shorter wire and modular connector can be discarded. There is a transformer in the base unit to which cable A is connected. Remove this cable by loosening the screw terminals on the transformer and carefully pulling out each individual lead. The leads have small spade lugs attached to them which will come in handy for future wiring.

Bear in mind that most of the wiring in a telephone set is quite small, and skinning the wire is difficult. If you wish to solder to them, use a small pencil iron to melt the insulation so that it can be removed by hand. The red and black leads go to the transmitter unit. Colors used by other manufacturers may be different. A simple continuity test with an ohmmeter will tell you what the wires connect to in the handset.

Most transceivers use a four-pin or eight-pin connector plug for the microphone connection. Normal mic connections for both types are shown in fig. 1. Identification of the pins on the transceiver microphone connector can also be found in the operating manual that came with the equipment. Take the wires connecting to the dynamic earpiece in the handset via cable "A" and the handset cord and connect them to the ground and "mic" connections on the chassis plug. Don't worry about the other connections in the chassis plug. They normally are used for PTT (push-to-talk) or frequency-changing functions.

At this point, bear in mind that you have connected the telephone earpiece

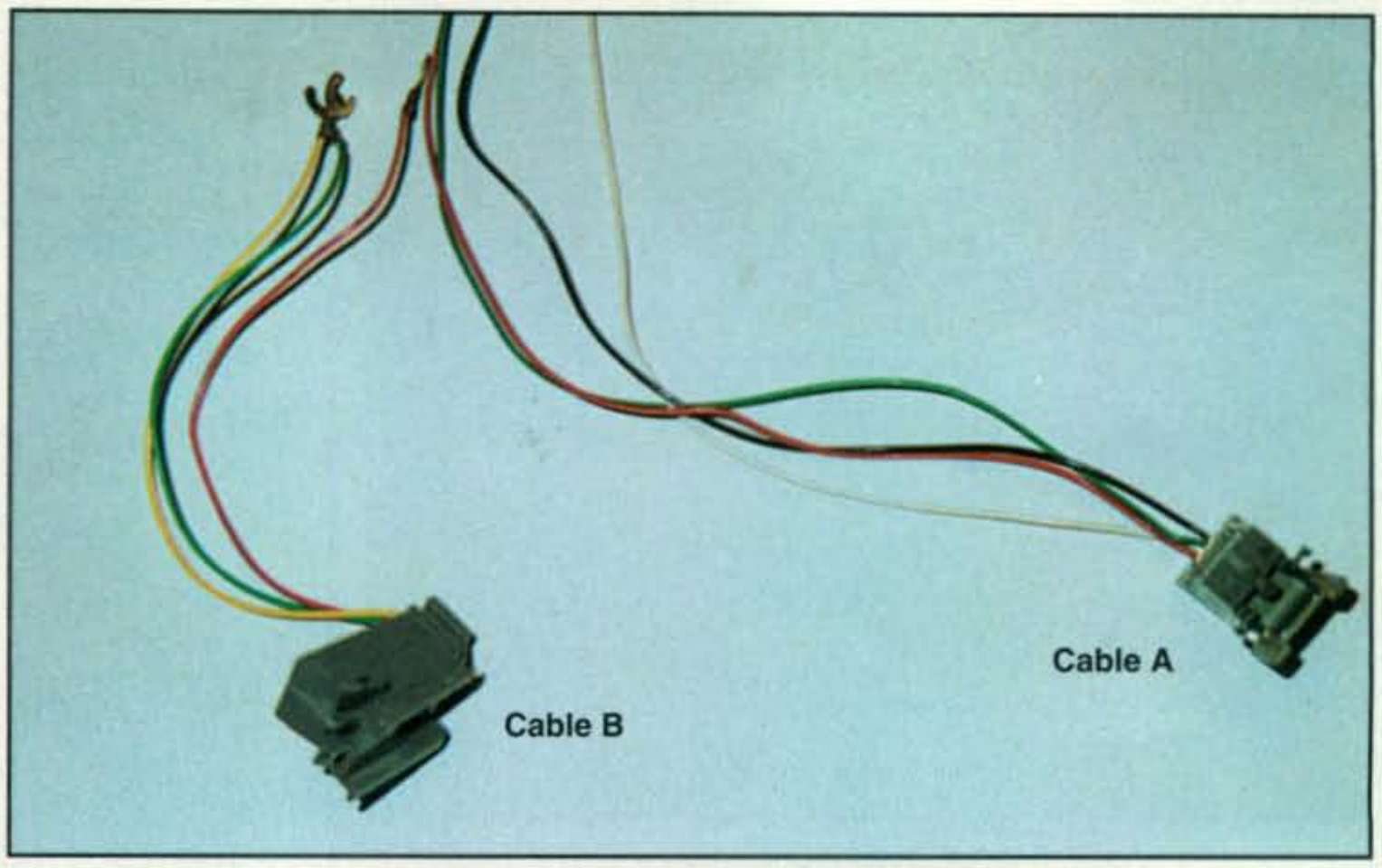

Photo E– Modular connectors removed from the telephone.

Photo F– Handset with mic and receiver exposed.

to the transceiver and that you will need to use a foot switch or VOX to transmit and test the earpiece as a microphone. Place the transceiver in the USB or LSB position and connect the output to a dummy load. Hit the foot switch or go to VOX, turn up the mic gain, and say a few words into the handset earpiece. If your rig modulates, you might want to try it on the air to see what happens. If you have another receiver, you might use it as a monitor or have a friendly local ham listen to you. Talking into the earpiece on the handset will seem awkward, but it will tell you whether you want to pursue the mechanical angles, such as mounting arrangements.

What Next?

Assuming that your initial testing confirmed that the earpiece was functioning and sounded great on the air, what next? You can make some simple modifications to the handset (photo F), such as using a dynamic earpiece at both ends for audio in and audio out just like a regular telephone, only now it is a radio telephone handset! The handles of most of the handsets are hollow so that necessary wiring can reach both ends. Being hollow makes it possible to mount a small PTT switch in the handle for convenience. The main consideration is that the earpiece can be used as a voice-communications-quality microphone and the rest is up to you!

If you wish to use the original handset cable, simple connector junction boxes can be made such as those shown in photos G and H. Use of the existing handset cable makes it easier to bring the plug into the connector box, where access to the handset wires can be connected to

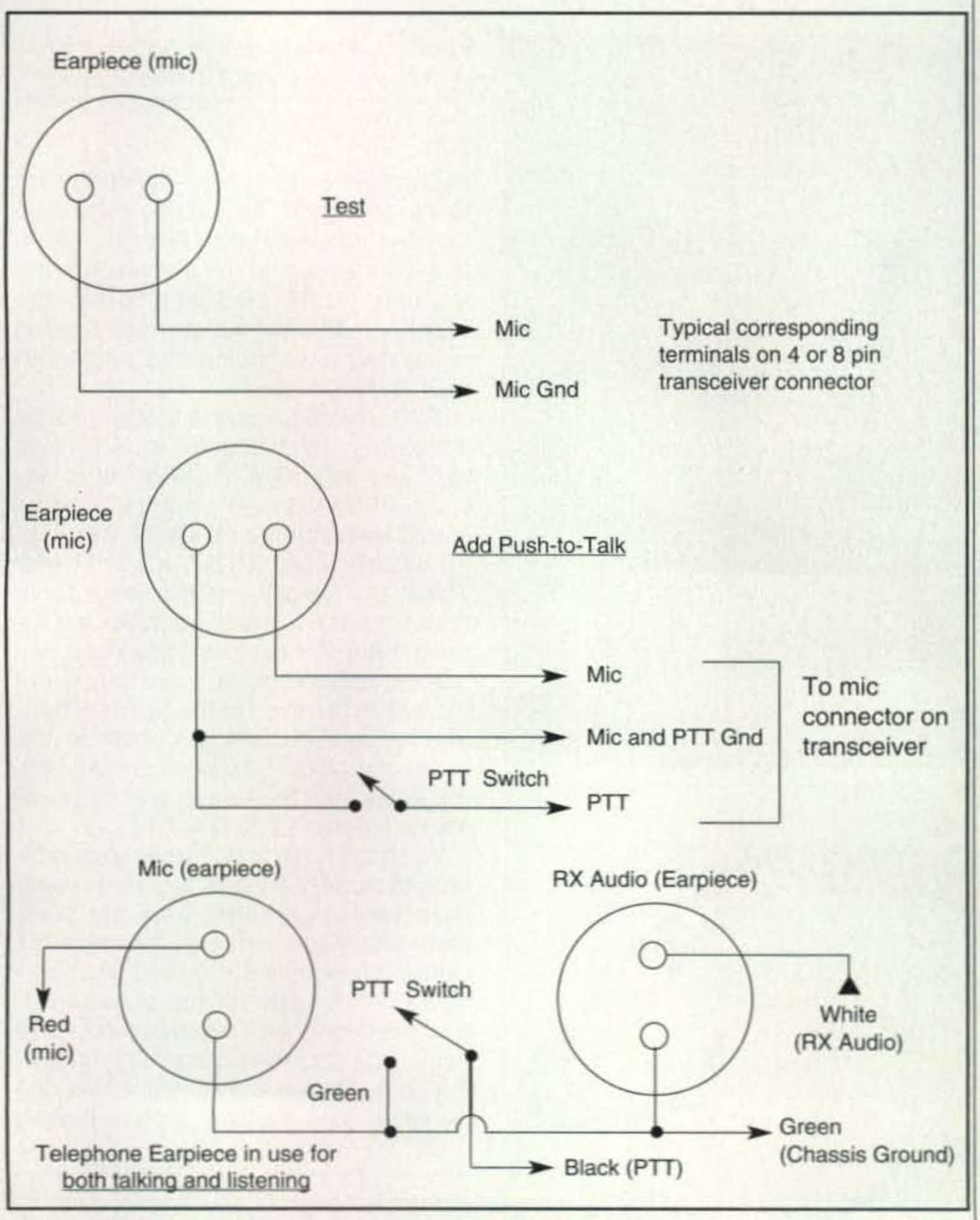

Fig. 2– Basic handset connections.

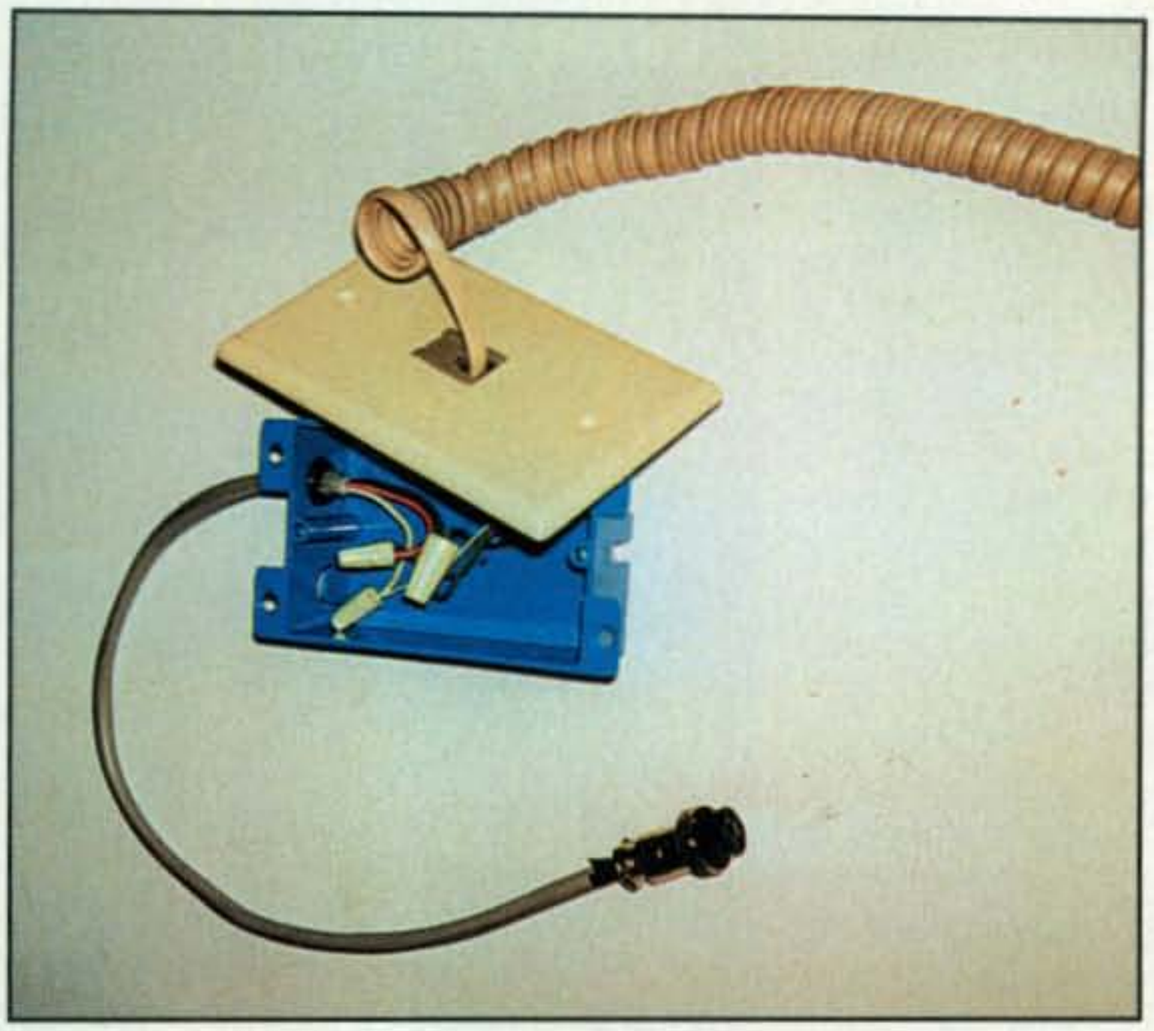

Photo G– Electrical interconnect box and mic cable.

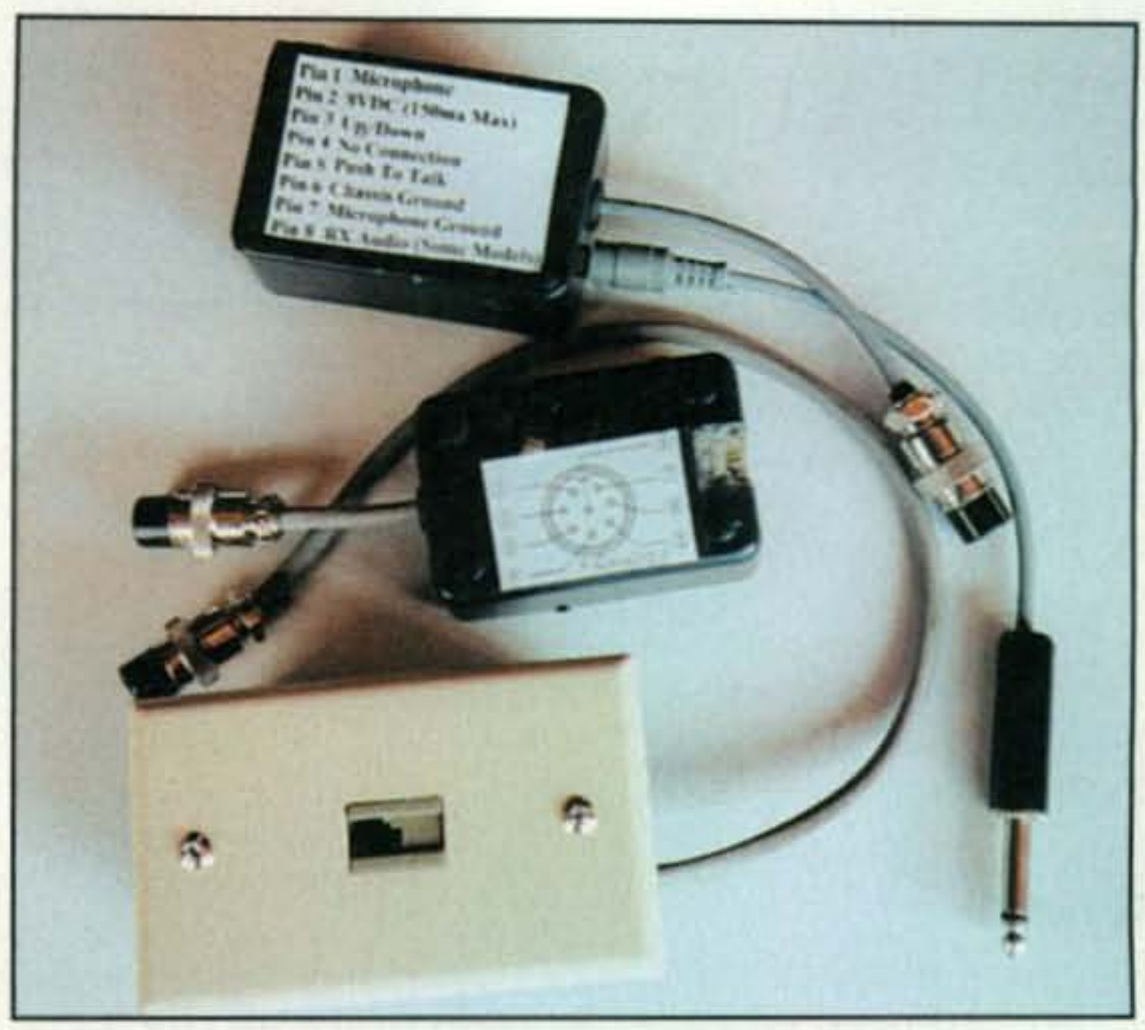

Photo H– Various interconnect boxes using plastic mini boxes.

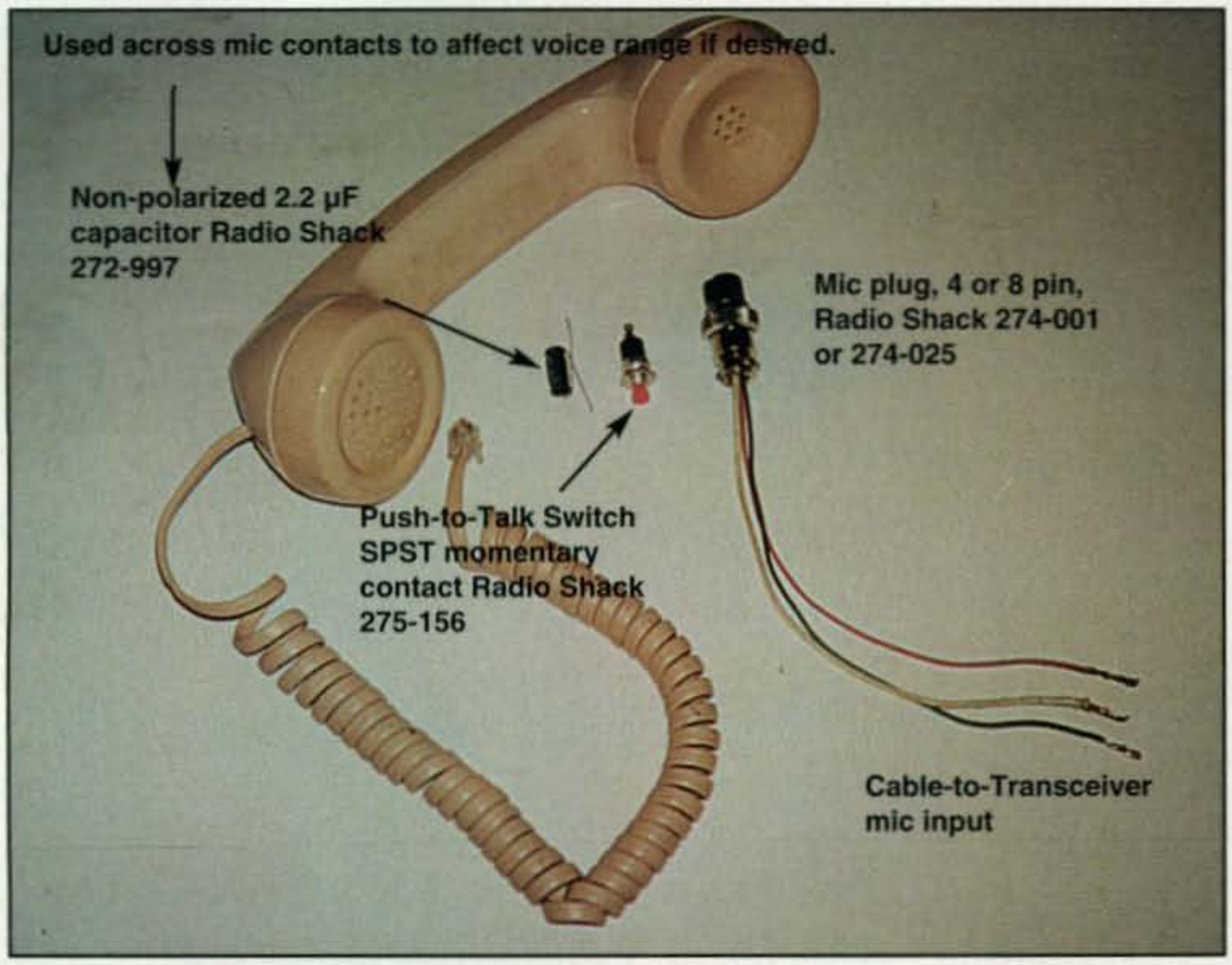

Photo I– Miscellaneous hardware for the "Talk is Cheap" modification.

Photo J– Handset showing location of the PTT switch.

the wires in a short cable and connector to the mic jack. The wires within the handset generally are white and green to the earpiece and red and black to the mouthpiece. The modular plug from the telephone-set base can be removed and reused in the connector box to mate with the handset cable.

The only connections that are really necessary are the ones to GND and MIC and to PTT if push-to-talk is desired. As mentioned previously, fig. 1 identifies the pin functions for Ten-Tec, Kenwood, and ICOM transceivers. These are typical, and the exact functions should be identified in the equipment manual. For push-to-talk you can use the red and black wires to go from the switch installed in the handset handle through the handset cable to the connector box to be cross connected to the leads from the transceiver mic connector labeled GND and PTT.

You don't have to be a genius to come up with some great arrangements using the material garnered from the complete telephone set. Fig. 2 shows the simple connections required. Photos I and J provide information on suggested small parts and arrangement for a basic handset modification. The ends of the cable-to-transceiver mic cable can be wired to a modular jack, removed

Photo K– Multiple test jig for switching between various phones.

Photo L– Testing different modified units with the Ten-Tec Paragon II.

from the telephone set, and installed in a connector box into which the handset cable is plugged.

While writing this article about the use of a 500-type telephone set, I wondered whether or not one could modify a "princess" model handset. I found one at the local Goodwill store for $5.00 and brought it home. I plugged it into one of my telephone outlets and found it to be in working condition. Not more than 10 minutes went by before I had unsoldered the two wires that were connected to the earpiece and with two clip leads had the earpiece (still in the handset) connected to my transceiver. In a few more minutes, tuning 20 meters I worked an English and an Italian station, with both stations giving me a thumbs up on my modulation!

Hopefully you will be surprised at how well this cheap microphone works. If you don't think it gives you what you want, you just have an extra telephone on your hands or food for your voracious junk box.

math's notes

BY IRWIN MATH,* WA2NDM

Simple Linear Power Supplies

Since most of the things we build usually require power to operate them, I thought that this month it would be a good idea to give you a few pointers on to how to build simple AC-line-voltage power supplies. My primary goal is to describe very simple foolproof circuits that can be built with easily obtainable parts and that will work every time. My secondary goal is to try to entice you to actually build something!

Fig. 1 is the basic AC to DC source that we will use. It consists of a transformer to step the AC line voltage down to a safe level, as well as provide isolation from the line. The transformer can be a 115:12.6-volt unit or a 115:25.2-volt unit depending on the end voltage desired (European users obviously will need a 220–230-volt primary). These are available from most electronic parts distributors, and even a doorbell-type transformer from a local hardware store can be used. The transformer secondary is then connected to a full-wave bridge rectifier circuit so that the load on the transformer secondary is equal for both AC half cycles. The diodes used for the rectifier are common low-cost 1N4002 devices that can handle up to 1 amp of current. Finally, the resulting DC is filtered to reduce ripple by a large-value electrolytic capacitor. A resistor is connected across this capacitor to discharge it in the event that no load is connected and input power is removed.

To make matters simple, the output voltage from such an arrangement can be estimated using the following formula:

$$E_{out} = 1.41\ E_{sec} - 1.4$$

By way of explanation E_{sec} is the rms output voltage of the transformer secondary. The 1.41 value is the conversion factor from peak-to-peak to rms, and the 1.4 value is the voltage drop in the two diodes of the bridge rectifier that conduct during each half cycle. You will notice that we have specified a 3300-microfarad 35-volt capacitor for the output filter. This is just a starting point value and may have to be increased if the current draw is more than a hundred milliamperes or so, or if the resulting ripple is too high for your application. Keep in mind that additional capacitors can always be connected in parallel to reduce ripple even further. Note that the working voltage of any capacitor in this portion of the circuit should be well above the actual operating voltage of the circuit. In general, if you use a 12.6-volt transformer you will have a (roughly) 16-volt DC output. If you use a 16-volt doorbell transformer you will have (roughly) 21 volts of DC, and if you use a 25.2-volt transformer you will have about 34 volts of DC at moderate currents.

The voltages indicated above are really approximate and can vary widely with both the load current drawn and the variations in the AC line voltage. Therefore, most experimenters will require some degree of regulation. The simplest way to accomplish this is to use a three-terminal regulator. These devices come in a host of styles, the most popular being the 78xx series, where xx indicates the output voltage. The ones that most experimenters probably will use are the 7805 (5-volt), 7808 (8-volt), and 7812 (12-volt) versions. These come in TO-220 packages which are good for up to 1 ampere and easily heat sinked to a chassis or other metal surface by means of a metal mounting tab.

Fig. 2 is the basic three-terminal circuit (which

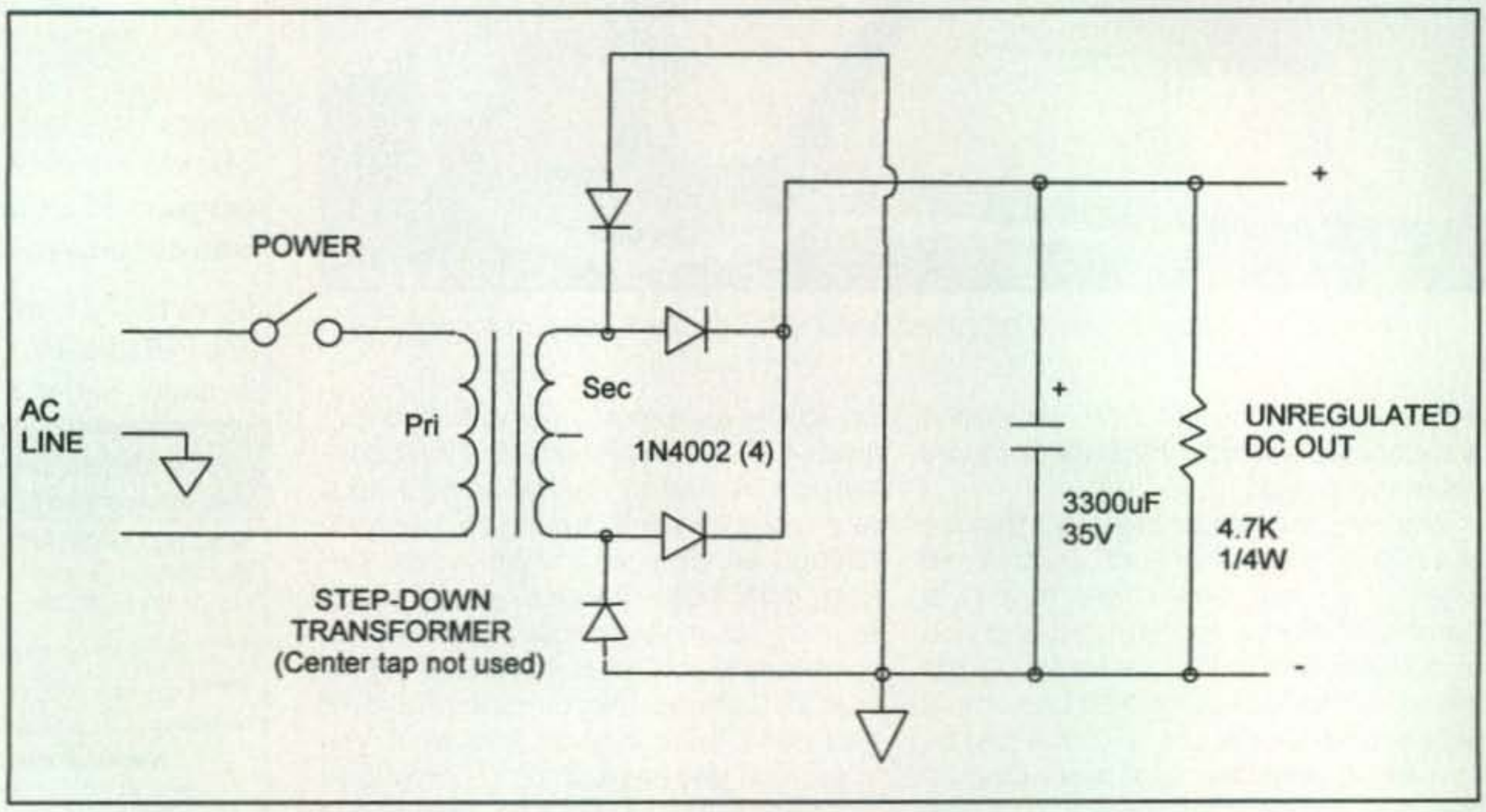

Fig. 1– Basic AC power source.

*c/o CQ magazine

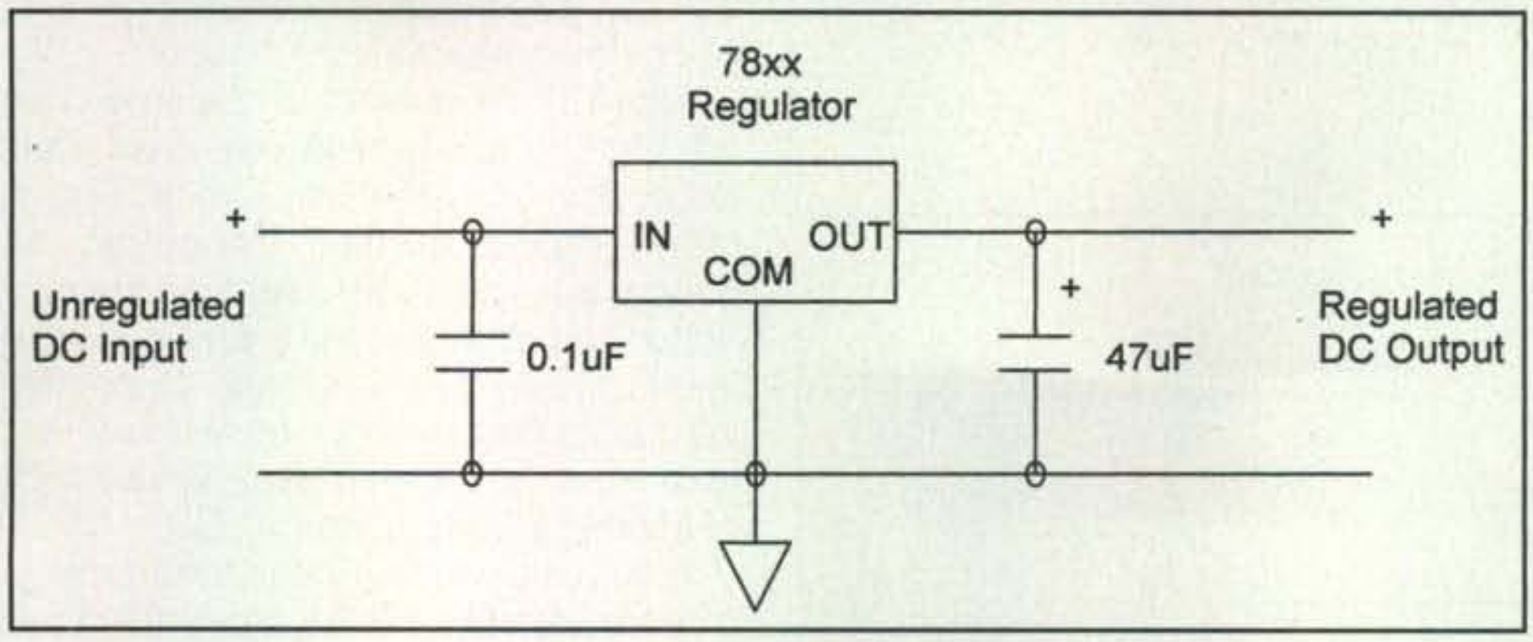

Fig. 2– Three-terminal regulator schematic.

really could not be simpler). The input capacitor can be as small as 0.1µF if you connect it to fig. 1. The output capacitor should be at least 47 µF. The only specific requirement is that the input voltage to the regulator be at least 2 volts higher than the desired regulated output and that it not exceed 35 volts. For a 5- to 12-volt supply a 12.6-volt transformer will be fine. A higher voltage secondary will also work, but the regulator will dissipate more power and get hotter.

Remember that the regulator is in series with the load. The voltage differ-

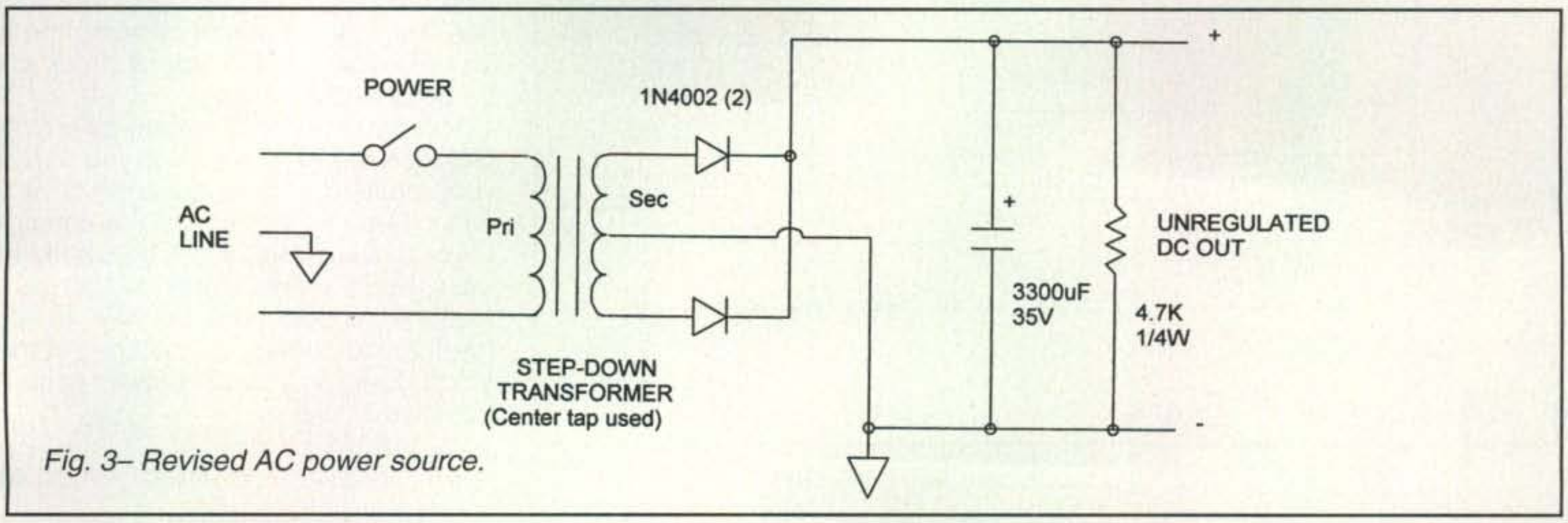

Fig. 3– Revised AC power source.

ence between the input and output voltage across the regulator multiplied by the current drawn by the load is the power dissipated by the regulator. For example, when using a 5-volt regulator driven by the output from a 12.6-volt transformer, if the load is drawing 0.1 amperes the input to the regulator will be 16 volts and the output will be 5 volts. The power dissipated by the 7805 regulator will then be $(16 - 5) \times 0.1$, or 1.1 watts. This will result in a hot regulator and requires that the tab be bolted to a metal heat sink. Since the mounting tab is connected to ground, normally this will not be a problem. If the current drain is higher, however, the input voltage to the regulator must be lowered or the regulator will get extremely hot and may even overheat.

This is easily accomplished by changing the rectifier portion of the circuit to that shown in fig. 3. Here the bridge rectifier has been replaced with a full-wave rectifier circuit (assuming, of course, that the transformer secondary is center-tapped). Now the AC and resulting DC output are about half (roughly 8 volts) and everyone is happy. A 1-amp supply with this configuration will dissipate $(8 - 5) \times 1$, or 3 watts, but with a moderate heat sink all will remain cool.

If voltages other than the standard values are required, you will need an adjustable regulator. The LM317 is just that. It also comes in a TO-220 package, but this time the mounting tab is not insulated so you will either need an insulated heat sink (from ground) or an insulating washer under the tab and mounting screw. Power dissipation for this circuit is the same as for the fixed regulator, and the LM317 should always be heat sinked. Fig. 4 is the circuit of a regulator that can be adjusted from around 1.5 volts to 25 volts when fed from a 28- to 35-volt DC source (a 25.2-volt transformer is good). In the past I have described such a circuit, and it can easily serve as the "heart" of a low-cost, homebrew variable-voltage power supply. The 5K pot is the output voltage adjustment control, and the diode across the regulator is used to protect the device against excessive reverse voltage. The addition of a voltmeter and ammeter completes the project.

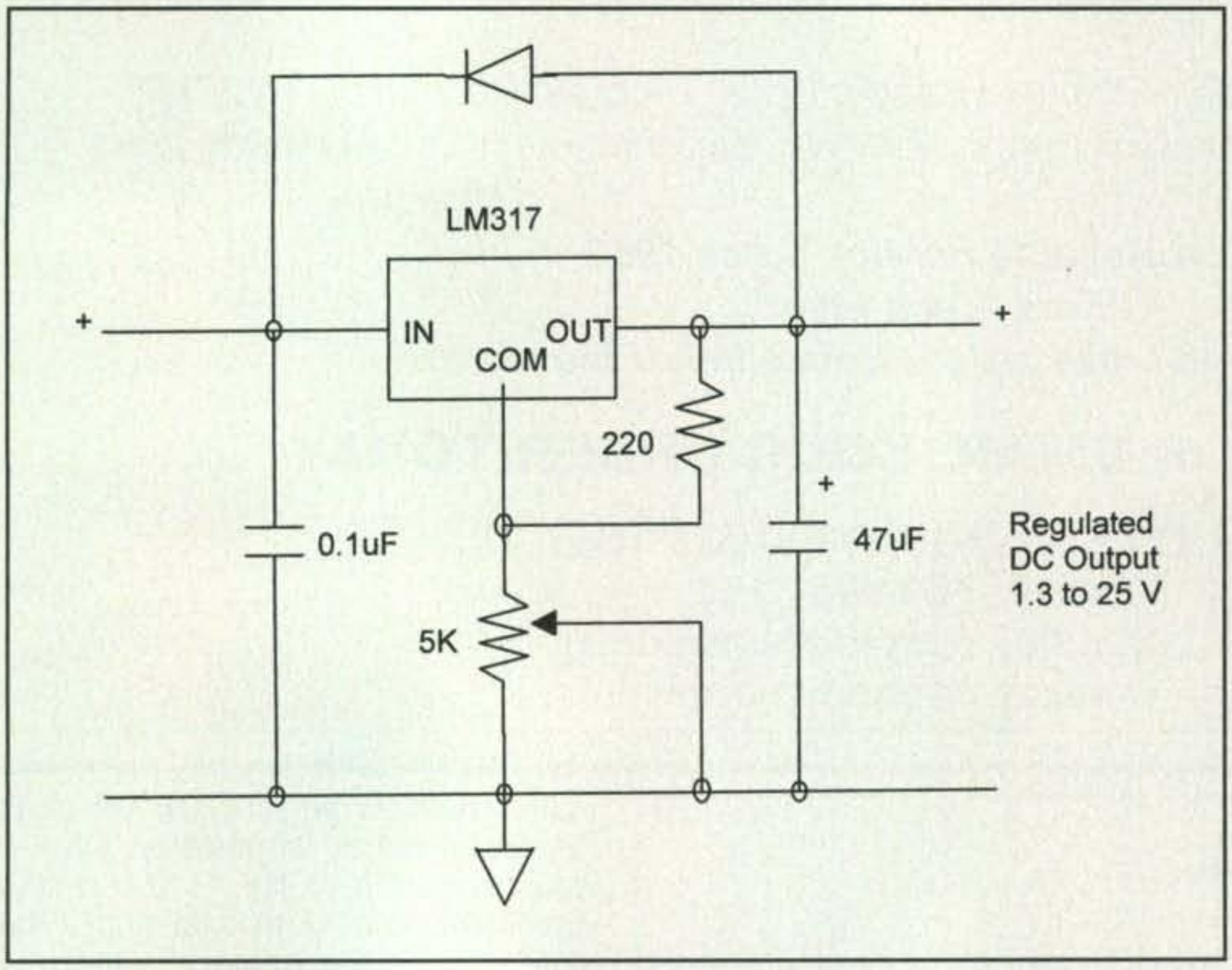

Fig. 4– Adjustable regulator diagram.

When more current is required, you will have to add an external pass transistor to your regulator circuit. Fig. 5 shows how to do this. The output will now be about 0.7 volt lower than the regulator output due to the additional drop in the pass transistor base to emitter junction. These pass transistors will also have to be well heat sinked with insulating washers, etc.

The power supply described here is a linear supply, and the amount of heat dissipated is a result of its design. There are more efficient supplies that involve switching regulators and generate less heat for a given output current, and a simple version of this type of circuit will be described next time.

This month's circuit is really quite simple, however, and hopefully you will be tempted to try to build it or a minor variation. You can easily find the components and the results will be usable in many applications. If you do "get your feet wet" (a poor pun), be sure to well insulate the primary connections of the transformer, as you do not want to contact the AC line.

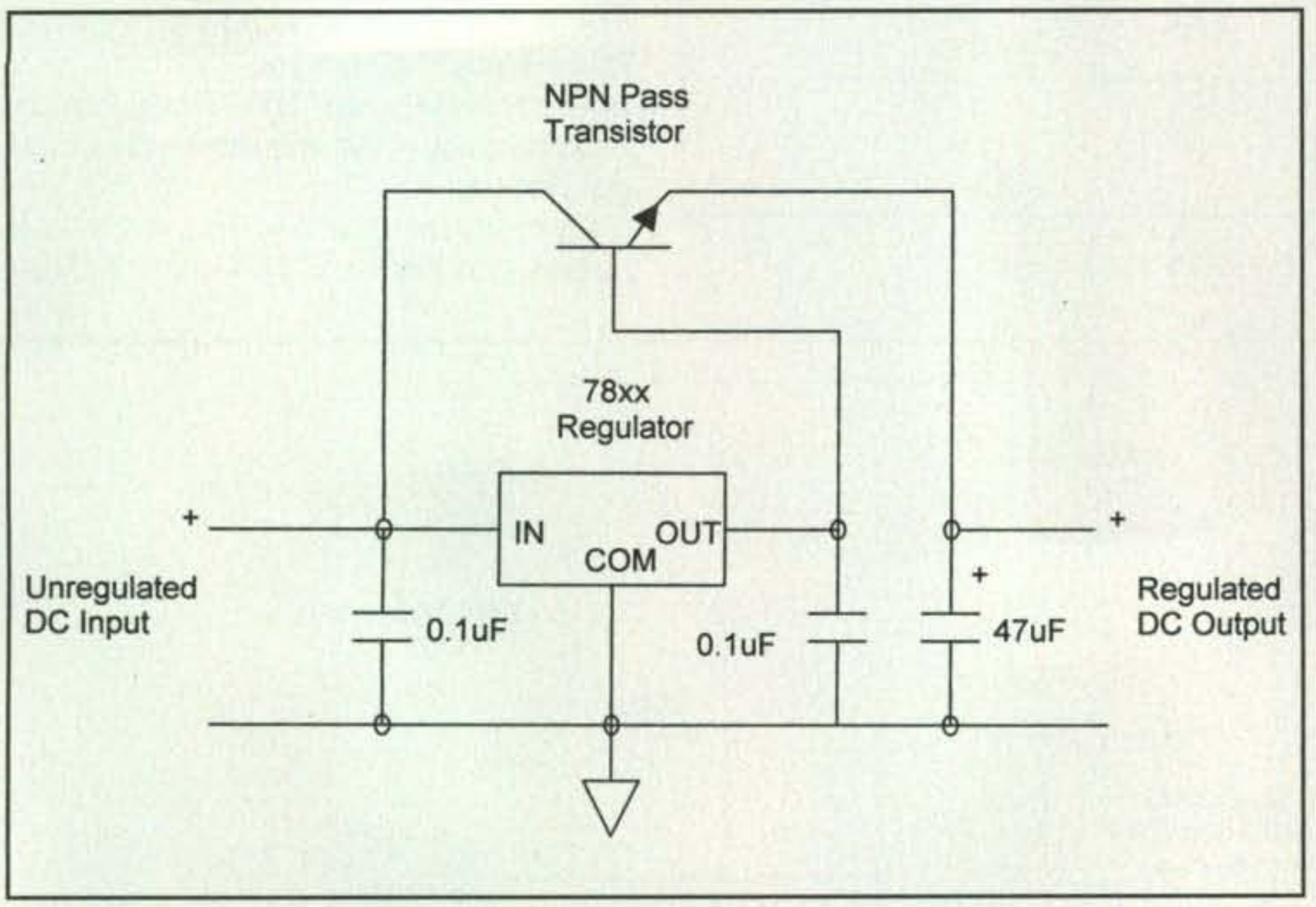

Fig. 5– Adding an external pass transistor.

73, Irwin, WA2NDM

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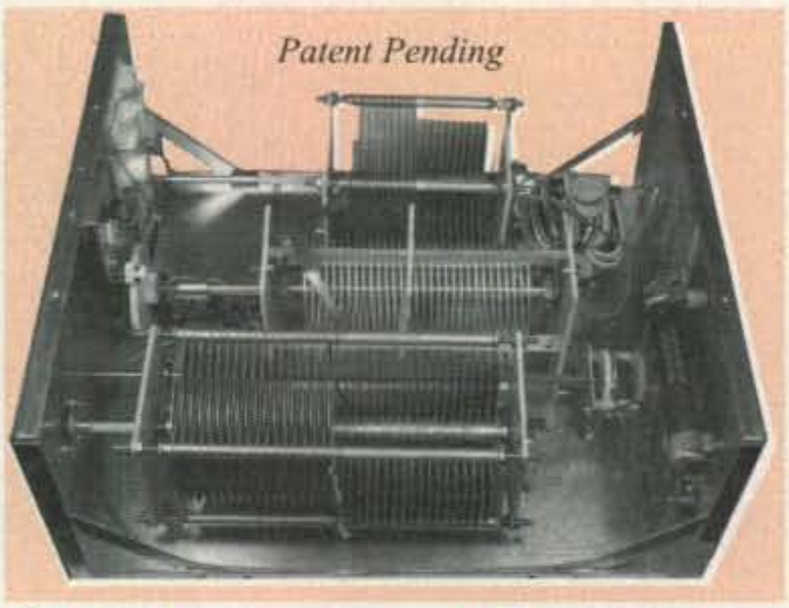

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BY FREDERICK O. MAIA,* W5YI

Early History of Two-Way Radio Communications

Amateur radio began with a few experimenters in the early 1900s. It has since grown to over 650,000 licensed operators in the United States. There are more than 2-million licensed hams worldwide.

In the United States, the Federal Communications Commission (FCC), the Communications Act of 1934 (the document that created this independent governmental agency), and the Code Federal Regulations (CFR) provide the guidelines under which the Amateur Radio Service is regulated. The CFR is organized into various titles, parts, subparts, and sections. Title 47 applies to Telecommunications, and Part 97 applies to the Amateur Radio Service.

Since radio waves do not respect international borders, domestic communications policy cannot be developed without regard to international implications. The Commission is required to regulate wire and radio communications within the guidelines of international telecommunication agreements of which the United States is a part.

The Early Days of Communications

The earliest method of distance communication was by runners, and later by riders, who carried oral or written messages. Next came various forms of manual "binary signaling." Binary signaling is defined as the presence or absence of a single element that when used in prearranged combinations, conveys intelligence. The earliest versions were audible or visual systems. Signal fires, reflected sunlight, smoke signals, flag waving, and jungle drums are early examples of binary signaling.

Communication over electric wires arrived in 1835 when Samuel F.B. Morse (1791–1872), an art professor at New York University, employed a chemical battery and a lever to send currents through a wire circuit. The discovery of the "ground return" circuit meant that only one wire would be needed. The word *telegraph* was coined to mean a device that could print patterns at a distance. It was derived from the Greek *tele* (far) and *graphein* (to write).

Morse gave his first public demonstration of the electric telegraph in 1838. However, it was not until five years later that Congress appropriated $30,000 so Morse could construct an experimental telegraph line from Washington to Baltimore.

The original Morse machine printed code on tape using pulses of current to deflect an electromagnet, which moved a marker to produce written codes on a strip of paper. Morse later developed a key and sounder, since he discovered that the code could better be received by ear, thereby eliminating the printer.

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e-mail: <w5yi@cq-amateur-radio.com>

Samuel Morse ushered in the age of electrical communications by sending his first "What hath God wrought?" message on May 24, 1844 from the old Supreme Court chamber in the United States capitol to his partner, Alfred Vail, in Baltimore, a distance of 40 miles. Three days later the Democratic National Convention was held in Baltimore. Martin Van Buren was considered the likely choice, but James K. Polk was nominated. When this news was telegraphed to Washington, skeptics refused to believe it. Only after people arriving by train from Baltimore confirmed the report were many convinced of the telegraph's value.

Morse and his associates obtained private funds to extend their line to Philadelphia and New York. Small telegraph lines sprang up in the East, South, and Midwest. Dispatching trains by telegraph began in 1851. The Western Union Telegraph Company began business offering telegrams that same year.

Western Union built the first transcontinental telegraph line in 1861, mainly along railroad rights-of-way. It introduced the first stock ticker in 1866, a standardized time service in 1870, and money transfer in 1871. Telegrams were most popular in the 1920s and '30s, when they were cheaper than a long-distance call. However, the telephone and e-mail eventually led to the extinction of the telegram. After more than 150 years of service, Western Union discontinued telegrams in February 2006.

By 1859, both the railroad and the telegraph had reached the town of St. Joseph, Missouri. Two thousand miles farther west and still unconnected was California. The only transportation to California was by stage coach, a 60-day journey. To establish quicker communication with California, the Pony Express mail route was organized. By 1869, the Pony Express was replaced by the telegraph, which now had lines all the way to San Francisco.

The Wireline Telegraph

The telegraph provided speedy communication at the time the West was opened. Together with the railroad, the telegraph built up communications, opened markets, and promoted commerce. A good Morse operator could transmit 40 to 50 words per minute.

Within ten years the tentacles of the electric telegraph had spread to England and Europe. Telegraphed communications became the rage. In an instant, it could cover distances that took stage coaches, Pony Express riders, or locomotives days, or even weeks, to span.

In 1851, countries in Europe adopted a new version of the "American" Morse code which they called the "continental" or "international" Morse. The new code eliminated the characters using close-spaced dots and replaced them with "dahs," which required longer key closure. Nations every-

where began establishing telegraphic networks within their boundaries.

There were problems, however. Telegraph lines did not cross national frontiers, and technical and operating standards varied widely from country to country. Many used a completely different system to safeguard the secrecy of its military and political communications. That meant messages had to be transcribed, translated, and physically handed over at national borders before being retransmitted over the telegraph network of the neighboring country.

The International Telegraph Union (ITU) was formed in Paris on May 17, 1865 when 20 European nations met to work out an international agreement to interconnect their national networks. The ITU thus became the world's first international coordinating body. The second (convened on September 15, 1874) was the Universal Postal Union. Both had similar obstacles, since the mail and telegraph lines had to cross national borders.

The ITU decided on standardized equipment and operating rules to guarantee interconnection to the European telegraph network, and to use the "international" version of the Morse alphabet. It was also agreed that the organization would serve as a meeting place for future amendments.

This marked the birth of the ITU, which changed its name from International Telegraph Union to International Telecommunication Union in 1932. Today, more than 140 years later, the factors which led to the formation of the Union still apply and the fundamental goals of the ITU are basically the same.

The Discovery of Radio

There is a controversy as to who actually discovered "radio," a word coined from the verb *radiate*. In the 1860s, a Scottish scientist by the name of James Clark Maxwell predicted the existence of radio waves. In 1866, Heinrich Hertz, a German physicist, demonstrated that rapid variations of electrical current could be projected into space in the form of radio waves similar to those of light and heat.

Guglielmo Marconi (1874–1937) is generally credited as the inventor of two-way radio. Marconi, a young Italian inventor, proved that communication by radio was possible in 1889. He had read how Heinrich Hertz conducted a series of experiments in Germany that proved the existence of radio waves. Hertz created and radiated electromagnetic waves using a battery-operated induction coil connected to a spark gap.

Marconi reasoned, "Why not use the waves for signaling?" Marconi sent and received his first radio signal locally in Italy in 1895. In 1899, he successfully sent wireless communications across the English Channel. In early 1900, Marconi developed and patented a tuned receiver and transmitter system, and on December 12, 1901 he transmitted the first radio signals across the Atlantic Ocean.

He sent the Morse letter "S" from Poldhu, Cornwall (England) to Signal Hill at St. Johns, Newfoundland. The antenna was a wire hanging from a kite. Up until then all telegraph networks stopped at the edge of the great seas. Marconi also sent the first eastward transatlantic radiotelegraph message in 1902. The era of the amateur radio experimenter had begun.

The Russians have a different view. They believe that Alexander Popov, a Russian scientist, discovered radio a year before Marconi began his experiments. In fact, each year on May 7 Russia celebrates "Radio Day" to commemorate Popov's achievements. History shows, however, that his device was basically a receiver and antenna for the detection of natural electrical waves (lightning). Popov actually wanted to be able to predict the arrival of thunderstorms in advance.

Maritime Radio

Marconi's activities aroused world interest. Sea disasters proved the new medium, "radio," to be an effective aid in rescue work, as well as for communicating between ships and shore points, and a number of ocean liners installed wireless equipment.

At the request of Germany, a conference was convened in Berlin in 1903 to establish international radio cooperation and standardization. The new technique—the radiotelegraph—held great promise for maritime communications. A new common distress call was considered, as well as a system to provide for wireless communication between ships and ship-to-shore. The first wireless distress frequency was set at 500 kHz for ships to use to call for help.

An agreement governing wireless telegraphy was signed at the International Radiotelegraph Conference held in 1906 and another communications organization was formed—the International Radiotelegraph Union (IRU). The conference also agreed to require ships to be equipped with wireless transmitters and receivers.

Before the turn of the century, there was no special radiotelegraph call for emergencies at sea. One pioneer operator simply sent the letters spelling "HELP" in code. In 1903, Italy suggested "SSSDDD" as an international radio emergency call. A year later, land telegraphy operators recruited for sea duty resorted to the general "CQ" call and added the letter "D" to signify distress.

International agreement was reached in 1906 and "SOS" was adopted as the worldwide radiotelegraph distress call. It replaced the "CQD" radio distress call, which meant "Anyone answer (CQ), I am in (D)istress." SOS does not mean "Save our Souls" any more than CQD meant "Come Quick Danger."

In the early years, wireless telegraphy remained confined mostly to the sea. In1899, however, the U.S. Army began using wireless, and two years later the Navy replaced its visual signaling and homing pigeons with a wireless system. In 1906, the U.S. Weather Bureau experimented with radiotelegraphy to speed up the reporting of weather conditions. During World War I, governments began using radiotelegraph to keep abreast of events and to direct the movement of troops and supplies.

The first U.S. legislation dealing with marine radio was approved by Congress in 1910. Known as the Wireless Ship Act, it required installation of wireless apparatus and operators on large sea-going passenger vessels. In 1912, Congress amended the Act to cover large cargo vessels.

Only a few ships staffed their radio equipment around the clock. That all changed after April 15, 1912, when the *Titanic*, ripped open by an iceberg, sank in the North Atlantic. The *Titanic*'s radio operator frantically called for help over the wireless, but the wireless operator on the nearest ship had gone to bed with no one to take his place. Another ship, the *Carpathia*, 58 miles away, responded and managed to rescue 868 of the nearly 2400 people on board.

As a result of the sinking of the *Titanic*, the IRU convened the International Radio Telegraph Conference in London to further wireless uniformity. It was agreed to establish a system that still governs spectrum use to this day. The radio spectrum was divided into bands, the use of which would be reserved for specific purposes. Regulations were enacted to require at least two radio operators on ships and a constant watch, with emergency backup power supplies.

The International Frequency Registration Board (IFRB) was set up to manage the frequency spectrum, which was becoming increasingly congested. Each nation committed to avoid interference to existing wireless stations and to register their own use of radio frequencies. The first Table of Frequency Allocations became mandatory in 1912. These first regulations have since been amended and revised by numerous radio conferences and are now known as the international Radio Regulations (RR).

Early Regulation of Radio

To carry out its obligations under that treaty, the United States enacted the Radio Act of 1912. This was the first law for the domestic control of radio communications. The Radio Act regulated the character of emissions, transmission of distress calls, set aside certain frequencies for government use, and placed licensing of wireless stations and operators under the Secretary of Commerce and Labor. It was pushed through Congress and signed into law by President Taft on August 17, 1912.

Radio station and operator licensing began that year, making access to the electromagnetic spectrum a privilege granted only by government approval. At the time, unlicensed amateur stations accounted for 80 percent of all stations on the air. Amateurs were free to assign themselves callsigns and set up stations wherever they wished. A typical amateur station consisted of an induction coil, a condenser and spark gap for the transmitter, and a simple coherer-decoherer or galena crystal for the receiver/detector. Chaos ruled the airwaves with everyone transmitting on the same wavelength. A key question for the early regulators was what to do about the amateur radio operators.

Legislators decided that instead of abolishing amateur radio stations, they would limit their operation to the supposedly-worthless short-waves. "Regulation Fifteenth" banished radio amateurs to the experimental frequencies above 200 meters and limited transmitter power to a kilowatt.

The lawmakers had come up with a regulation that would finally keep the ham operator off the lower frequencies that were being used more and more for commercial, maritime, and government use. Little did anyone know that the "useless" short-waves would ultimately become the most valuable of the entire radio spectrum for long-distance communication. That was left for the hams to discover. Amateurs also pioneered sound broadcasting in 1920.

At the Telegraph Union's 1927 (Washington) conference, it allocated frequency bands to the various radio

services existing at the time (fixed, maritime and aeronautical mobile, broadcasting, amateur, and experimental). Operating guidelines for each of these stations and operator qualifications were established. It was deemed important that amateurs prove an ability to transmit and receive in Morse signals.

In 1947 (Atlantic City), the ITU agreed that Morse proficiency should only be required of amateur operators when the operation took place on frequencies below 1000 MHz (1 GHz). At WARC-59, the 1959 World Administrative Radio Conference, this level was dropped to 144 MHz. A further reduction was made at WARC-79 to 30 MHz. Finally, at WARC-2003, the Morse proficiency requirement in the Amateur Service was made optional.

How the ARRL Got Started!

In 1914, a Connecticut engineer and inventor by the name of Hiram Percy Maxim wanted to obtain a new "Audion" radio vacuum tube. Maxim, a member of the Radio Club of Hartford, heard that a Springfield, Massachusetts operator had one for sale. However, Maxim was unable to raise Springfield. He solved the problem by calling Windsor Locks, Connecticut and requested his message be relayed to Springfield.

For many months, Maxim had felt the need for a national amateur radio organization, just as he had felt the need for a local club in Hartford. The "relay idea" represented an ideal basis for the needed national organization. Maxim even thought of a name for his organization, the American Radio Relay League.

Today, few radio amateurs realize that "ham" radio nearly ended with World War I, or Maxim's role in saving it. The fate of amateur radio, silenced by the war from 1917 to 1919, was in the balance in the days immediately following the signing of the armistice. The government, having had a taste of "supreme authority" over communications in wartime, was more than half inclined to keep it. The war had not ended a month before Congress was considering legislation that would have made it impossible for the amateur radio of old to be resumed.

At the pleadings of the ARRL's Hiram Maxim, the bill that would have ended amateur radio for all time was defeated. On October 1, 1919, the wartime ban on amateur radio was lifted, and ham radio continues today as the only hobby regulated by international treaty and government regulations.

73, Fred, W5YI

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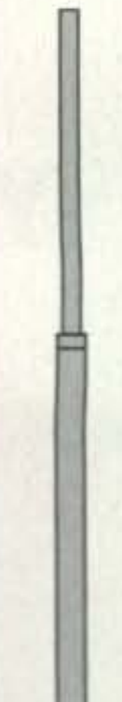

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BY BOB JOSUWEIT,* WA3PZO

Yikes! It's Ike!

Hurricane Season 2008. Have we seen the worst of the hurricanes this year? The answer is probably known by the time you read this, but as of mid-September, the immediate comment was, "Yikes! It's Ike!" This month we'll take a look at several responses to Hurricanes Gustav and Ike.

Ominous Warning

As Hurricane Ike barreled down on the Texas Coast, the National Weather Service issued a warning saying, "LIFE THREATENING INUNDATION LIKELY!" along coastal communities. "ALL NEIGHBORHOODS...AND POSSIBLY ENTIRE COASTAL COMMUNITIES...WILL BE INUNDATED DURING THE PERIOD OF PEAK STORM TIDE. PERSONS NOT HEEDING EVACUATION ORDERS IN SINGLE FAMILY ONE OR TWO STORY HOMES MAY FACE CERTAIN DEATH."

The National Weather Service had not issued a warning this strong since Hurricane Katrina. Hurricane warnings extended from Louisiana south along the Gulf Coast.

Preparations for Ike's arrival continued for a week. As one emergency manager described it, "We're rushing to get cleaned up from helping those evacuated during Hurricane Gustav just nine days before and now preparing to deal with Ike."

*c/o CQ magazine
e-mail: <wa3pzo@cq-amateur-radio.com>

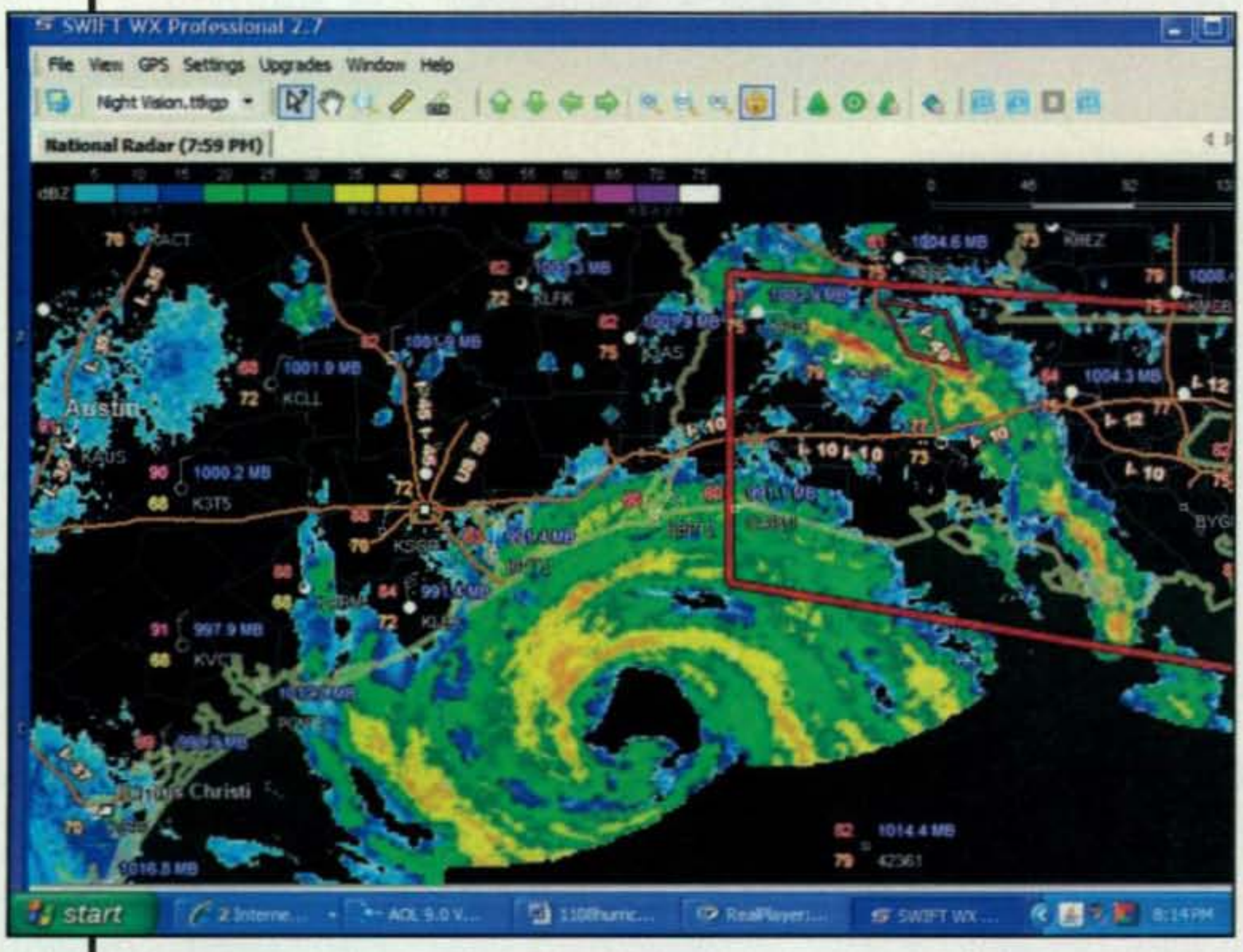
Ike in The Caribbean

Hurricane Ike forced some 1.2-million people, about a tenth of Cuba's population, to move to safety. This left communities, seaside towns, and the streets of Havana empty.

Arnie Coro, CO2KK, IARU Region II Area C Emergency Coordinator, reported that over 100 radio amateurs provided backup communications for Civil Defense officials in all of the 15 municipalities. Area C includes Mexico, Cuba, Jamaica, Haiti, the Dominican Republic, the Turks and Caicos Islands, and several island nations to the east of Cuba. The hurricane left four dead and caused severe damage to housing and the nation's infrastructure. Emergency nets were active in Cuba on both 40 and 80 meters. Many of the stations were using battery power. Since their signals were weak, many stations outside of the disaster area were asked to stay clear of the net frequencies.

VHF Ops Play International Role

The International Radio Emergency Support Coalition, IRESC, provided assistance with its team of English/Spanish bilingual members who served as net control stations. The nets collected information from ham radio operators, television and radio internet stations, and other sources in the disaster area. This information was translated and passed to the VoIP Hurricane Net for potential forwarding to the National Hurricane Center in Miami. According to spokesman Steve Richards,



Hurricane Ike takes aim at the Texas Coast. Amateur radio operators had been following Ike for over a week as it made its way from the Atlantic Ocean into the Gulf of Mexico. (Screen capture by the author using Swift Wx Professional software)

New Orleans was evacuated for fear that the levee system would not hold as Gustav came ashore. (Photo courtesy Ronny Simpson/FEMA)

G4HPE, IRESC translated and forwarded direct e-mails from amateur radio operators in Cuba and passed health and welfare traffic for Haiti and the Turks & Caicos Islands. "Direct contact with fellow amateurs in Haiti in particular has unveiled the human tragedy developing there, with accurate meteorological reporting from many locations bringing benefits to those farther along 'Hurricane Alley'," said Richards. "Reports 'on the ground' in support of official measurements are particularly beneficial to our future understanding of these immense and deadly storms."

Rob Macedo, KD1CY, Director of Operations for the VoIP Hurricane Net, said, "Given the large size of Hurricane Ike, the concern is there for a widespread swath of significant damage as well as an unusually large area of storm surge flooding from Ike. Damage could also extend well inland. This could be a major strike to the Texas and Louisiana coast and particularly the Houston and Galveston Texas area." Fortunately, the storm surge was not as high as predicted. Yet there was still significant coastal flooding, and early estimates said three million people were without power.

As Hurricane Ike barreled into the Texas coast, the VoIP Hurricane Net collected reports from hams in the disaster area. The overnight reports of damage gave those monitoring an idea of how bad things were going to be as the storm passed and daylight came over the coastal areas. This information was passed on to WX4NHC, the amateur radio station at the National Hurricane Center.

David Friedman, KE7GOY, who is part of a National Animal Rescue Team, reported a major squall had passed through his area at around 6:30 PM CDT. There was horizontal rain and wind with whiteout conditions. Power was knocked out. There was some local flooding of low-lying areas reported and they were concerned about river flooding. Ten minutes later a report was received from Myron Romero, KC5OHG, from Lafitte, Louisiana. He reported storm surge flooding of 3 feet. People were being rescued. The Salvation Army activated its SATERN net on 20 meters for a catastrophic response.

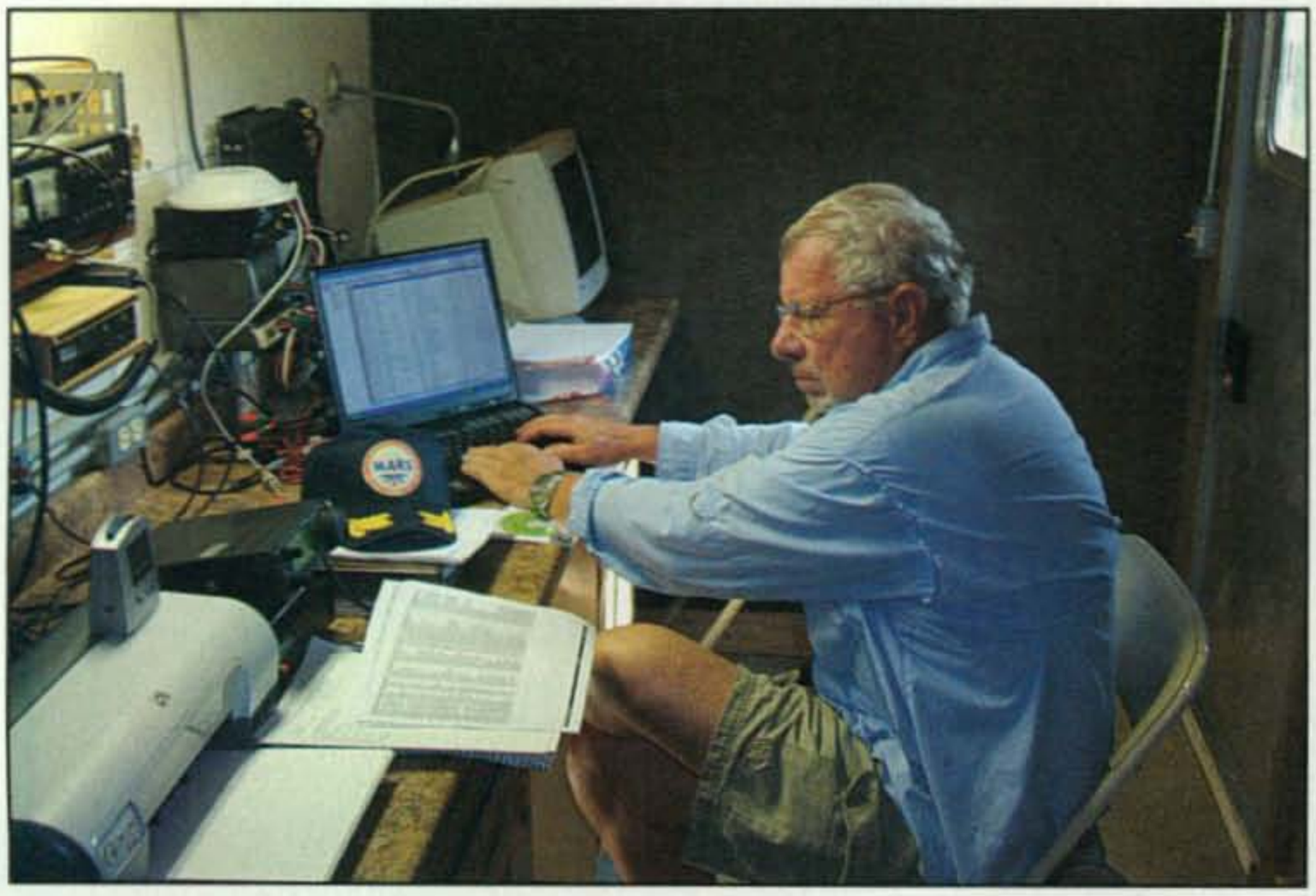
Even the ARRL took advantage of Echolink to stay in contact with emergency operations in Texas. According to W1AW station manager Joe Carcia, NJ1Q, ARRL Headquarters was linked into the HF radio of ARRL West Gulf Vice Director David Woolweaver, K5RAV, via Echolink. This enabled hams in Newington, CT to monitor the Texas Emergency Net. "Through Dr. Woolweaver's initiative, we could use EchoLink in this fashion to assist ARRL HQ staff monitor critical net operations using HF," said Carcia, "a capability we have never taken advantage of before." The nets were operating on 75 meters and could not be heard in New England.

Local Response

While amateur radio operators were supporting emergency operations centers in the path of Hurricane Ike, others were preparing to help at shelters that would house evacuees. In Palestine, Texas, well inland, local officials had ham radio operators lined up and standing by to help if needed. Palestine ended up directly in Ike's path as it moved inland; however, it appeared that damage there was limited primarily to downed trees and power lines.

Hurricane Gustav

A week earlier, Hurricane Gustav made landfall in southeastern Louisiana, leaving flooding, wind damage, and power outages in its wake and evacuees eager to go home. Larry



Ken Wood, KS5R, staffs the W5DSC emergency van of the Victoria (TX) Amateur Radio Club along Interstate 10 west of Houston. (Photo by John Wagner, WA5VBP)

Wagoner, N5WLW, said the response to Gustav had vastly improved compared to Hurricane Katrina. He said there will be time to evaluate the amateur radio response and repair equipment as needed.

At Poplarville, Mississippi, county seat of Pearl River County, Emergency Operations Center Communications Officer David Moore said, "We have some stuff to do, but it's not bad." He noted a defective antenna that was discovered during operations for Gustav, as well as a few operational details that need to be worked out before future events. Wagoner, who manned the Emergency Operations Center in Picayune, Mississippi, said essential services were provided in spite of the problems, as contact was maintained with the shelters in the area, and other individuals and agencies needing assistance.

According to Wagoner, Tom Hammack, Harrison County Emergency Coordinator and District Emergency Coordinator for the Gulf Coast District, echoed that reaction, noting the heavier damage to his coastal community. "The harbors are torn up," he observed, saying that a small tornado had been sighted near the port, which reportedly damaged a few buildings in the area and knocked out power for a time.

"We had communications with the Coast Guard representatives, on 2 meters as well as marine VHF," Hammack said. "We had hams at other locations as well." He noted that Ed Byrd had the radio links to the area hospitals working as well. "In general it went pretty fair," he said. "This was a cakewalk for us compared to Katrina," Hammack noted, adding, "but the farther west you went, it wasn't any cakewalk at all. Hancock County (located due west of Harrison County) got hit pretty hard."

North of the coast, Tim Purvis, EC for Stone County and Assistant EC for the Gulf Coast District, noted that one mobile home was destroyed in the storm. "All in all, it went real well," he said. Like the other officials in the area, he said the storm was a learning exercise for the amateur radio community. "We need to get our repeater to a higher location, and we need to get more people with emergency Yagis." In some cases, he said, hams in outlying areas of the county had a hard time making it into the repeater during the storm. "These are people who may have lost or taken down their antennas," he said, "and they were trying to operate on a mag mount on top of a refrigerator from 20 miles away."

One problem noted by several officials in the area was the signal propagation from the Mississippi Emergency Management Agency (MEMA) office near Jackson. "A new antenna up there would help," said one. "We had a real hard time copying signal from MEMA," said another.

Local hams were not the only ones learning lessons from the storm. Purvis noted that while the MEMA official at the Stone County EOC was familiar with amateur radio, the Federal Emergency Management Agency (FEMA) representative did not know anything about ham radio and the service hams provide before the storm.

By the end of operations Tuesday, she had quite an education, Purvis said, noting that she was not only very impressed with what hams can do, but now wants to become licensed as an amateur radio operator herself and is very interested in Skywarn operations. "We have a feather in our cap on that one," Purvis said.

Skywarn operations went well across the region, as hams from all over the southern Mississippi area called in to report sightings of severe weather and damage from the storm. "We were inundated by warnings and reports," Purvis said, adding, "I just wish we could get all those people to sign in on a regular basis." All the local officials said the area fared much better in Gustav than in the 2005 killer Hurricane Katrina. "Compared to Katrina, we didn't lose any local communications, phone, internet, etc. In Katrina they lost everything," said Purvis. "Our major function was communications with the shelters, storm spotting, and being on standby for other services," he added. Tom Hammack said it all. "We did what we were asked to do."

The Voice Over Internet Protocol Weather Net "provided a very high level of disaster intelligence gathering and situational awareness for WX4NHC... at the National Hurricane Center, as well as other regional and national agencies" said the VoIP Hurricane Net's Rob Macedo, KD1CY.

From stations on the VoIP Hurricane Net, measured sustained winds of 100 mph were recorded in Houma, Louisiana before the ham spotters in that area lost their wind instrumentation. A measured wind gust of 78 mph in Slidell, Louisiana was relayed by a ham operator in Florida who made contact with his family on HF. Many trees and wires were downed with widespread power outages and roofs torn off structures, including the Houma Convention Center having its large-span roof and wall severely damaged as relayed by a ham operator who was monitoring the "WX-Spots" program. Reports out of New Orleans indicated several wind gusts from the water plant measured 101 mph, and the first report of a levee break in Scarsdale, Louisiana came from Joe Glorioso, N5OZG, who is a paramedic in New Orleans. He also reported when the situation was stabilized by sandbagging efforts.

Roof damage and flooding from the storm surge were also reported in parts

Mart Dennis, W5KRG, a volunteer with City of Altus emergency management, monitored the VoIP weather net as well as HF resources during a recent activation. (Photo courtesy W5KRG)

of southern Mississippi, while the Saraland and Mobile, Alabama areas suffered significant flooding on the Bayou Serra River with a flood that crested around 9 feet while flood stage was 4 feet.

"The N5OZG Repeater link in New Orleans and the KG4VVO link to the W4IAX repeater were critical nodes in the affected area," Macedo said. "They were two of two dozen nodes and Echolink PC stations from in the affected area that supported the net along with several stations from outside the affected area that had contacts within the affected area. We recognize every single station that provided us critical reports and information and appreciate their sacrifices in providing us this information." The relayed information was very critical to WX4NHC operations according to Julio Ripoll, WD4R, Assistant WX4NHC Coordinator.

MARS

The Military Affiliate Radio System (MARS) passed hundreds of messages during the hurricanes. Here's a sampling of some of the reports received:

Among the hundreds of storm-related messages passing through HQ this week, MARS operations chief Grant Hays (WB6OTS/AAA9O) quickly spotted one in particular. It was an After Action Report from the Region 6 deployment team at Ft. Polk LA. It reported a new MARS member, WB5JZP/AAR6DQ-T, had set up on VHF at the base community hospital's EOC. Another trainee, KA2BRS/AAR6DP-T, was operating from his RV stationed outside the hospital, relaying traffic onto HF and WinLink. Between them, 27 pieces of emergency traffic had been processed.

Then came a second After Action Report from Ft. Polk. A third new member, W5TMP/ AAR6DO/T, had activated the permanent MARS station at base headquarters, AAR6UAB, and handled 15 messages via Pactor III. All three trainees are from Leesville, LA, which is 8 miles from Ft. Polk, near the Texas state line. All three had the same last name: Partigionini.

Robert Partigionini, AAR6DP/T, is the husband of Joan, AAR6DO/T. Terry Partigionini, AAR6DQ/T, is their grown son. Terry's wife, Donna, is a ham, too, KE5JNA, and her father-in-law Robert says he hopes to sign Donna up for MARS soon. Terry's and Donna's son, Thomas, is KE5KK and they hope to sign him up for MARS when he finishes college.

Robert, an Army retiree, is active in ARES and the West Central Louisiana Amateur Radio Club. A former Air Force

Judy Craven, KC5NXH, Anthony Allen, KE5VAG, and David Craven, AC5CU, staff the radio room of the Harrison County EOC during Hurricane Gustav. (Photo courtesy Tom Hammack, W4WLF)

MARS member, he was recently at the Slidell Hamfest in Louisiana, and, as he recounts it, " they had a MARS forum, which I attended. They were asking for people to join, I heard the call and joined along with my wife and son." He commented in an e-mail: "We, the Partigioninis, were just doing our job as MARS and Amateur Radio Operators."

Texas State MARS Director Dave Martin, AAA6TX/K5YFO, said, "While tracking Gustav it was decided that Texas would be impacted whether or not Gustav landed on our (the Texas) coast." Plans were made to evacuate citizens, especially those with special needs, from the counties in southeastern Texas most likely to be hit by the storm.

The response required a massive bus (over 200) and airplane evacuation operation. The National Guard in Texas (known as the Texas Military Forces or TxMF) was tasked to assist in the refueling and support of the buses along the major evacuation routes. A request from the TxMF was received by Martin as to whether Texas Army MARS could assist with the communications of the deployed Texas Military Forces. By the next day, five communications teams were in place.

Four of the teams deployed to fueling points near Columbus, Madisonville, Carthage, and Lufkin, Texas. In addition, MARS member Lew Thompson, AR6UK/W5IFQ, was dispatched to the mobile command post located in Bryan, Texas. The first team to be operational was Team Columbus (John Wagner, WA5VBP/AAR6CC, and Ken Wood, KS5R/AAT6HN). They provided MARS and Amateur Winlink as well as voice on both MARS and amateur frequencies.

The teams were "embedded" with the TxMF troops at the fueling stations located at road side parks, schools, or TxMF facilities in the cites of deployment. Primarily the MARS communicators provided direct HF e-mail and data communications to the Texas SOC and the TxMF JOC (Joint Operations Center).

With Thanks...

At deadline, Hurricane Ike had slammed into the Texas coast and had moved inland. These early reports would not have been possible without information from many in the field. We would like to thank N1IN, KC5FM, N5WLW, CO2KK, G4HPE, and the ARRL for their assistance.

Until next time . . . 73, Bob, WA3PZO

Snap-on Ferrite Tests

BY PHIL SALAS,* AD5X

Photo A– AADE L/C IIB inductance measurement setup.

This month I want to look at the effectiveness of some inexpensive snap-on ferrites both for RFI suppression and as choke baluns (often necessary when feeding a balanced antenna with an unbalanced coaxial feedline). For these tests I obtained a variety of inexpensive snap-on ferrites from Radio Dan (www. radiodan.com).

Inductive-Reactance Measurements

Snap-on ferrites can keep RF from being radiated or picked up by wiring in your home and shack by placing a high blocking impedance to the offending RF on the wires. Popular uses are on telephone and intercom wires, home-theater cabling (especially speaker wires), power-supply wiring, and computer-interface wires. Because inductance increases as the square of the turns, for maximum effect you'd like to have multiple turns of wire through the ferrites. However, the resulting inductance can series resonate with the distributed capacitance of the wire in the ferrite, resulting in possibly ineffective impedances at some frequencies.

I started my tests by measuring the inductance of a single pass of wire through each ferrite. Then I wound six turns of wire through each ferrite and checked the inductance and series-resonant frequency. Finally, I removed wire turns as necessary to keep the series-resonant frequency above about 30 MHz. My basic inductance measurements were made with an AADE L/C IIB Digital L/C Meter as shown in photo A. I followed up with impedance and self-resonant frequency measurements using an Array Solutions AIM4170B (photo B). You can use most antenna analyzers for these measurements, but the AIM4170 gave me an easy swept measurement. My data is listed in Table I.

*1517 Creekside Drive, Richardson, TX 75081
e-mail: <ad5x@cq-amateur-radio.com>

As the data shows, snap-on ferrites do a good job of adding inductive reactance to cable shields and wires. Remember, the more inductance (the more wire turns) the better, but keep the series-resonant frequency above your highest desired frequency of operation.

Balun Tests

For these tests I built two apprximately 20-inch loops, one with RG-213 and one with RG-8X. One end of the shield connects to the center conductor of a PL-259, and the other end of the shield connects to the sleeve (ground) of the same PL-259. In this way I could easily look at the inductance and choking impedance of the coax shield as ferrites were snapped in place. I used the AADE L/C IIB meter to measure the inductance of each loop. The ferrites were clipped on the coax cables and the resulting inductance was measured to give the coax inductance/ choke. Next the cable with multiple ferrites was measured with my AIM4170B antenna analyzer to look at the impedance at various frequencies.

As can be seen in Table II, the impedance of the loops with the ferrites closely matches the calculated impedance based on the measured inductance.

1:1 Balun Recommendations

I believe that you should have at least 400 ohms of impedance on the coax shields in order to have a good 1:1 choke balun. Five microhenries will give about 400 ohms impedance at 14 MHz. Thus, you need 5 µHy minimum for a choke balun at 14 MHz

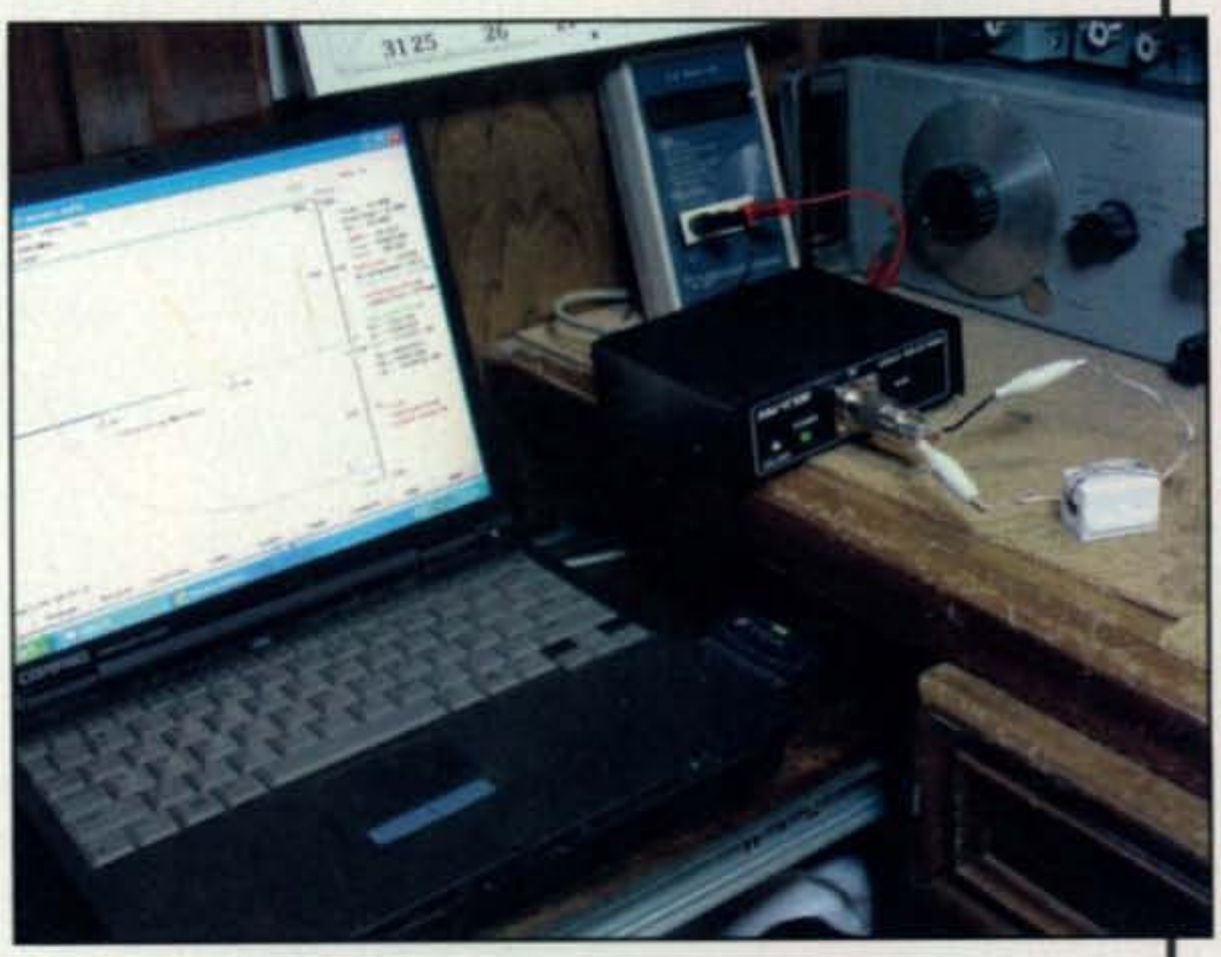


Photo B– AIM4170B swept measurements make finding series-resonant frequency easy.

Ferrite	L@1T	L@6T	SRF@6T	SRF at Reduced Turns
RCT-2	1.35 µH	46 µH	16.8 MHz	37.9 MHz (6.25 µH) at 2 turns
RCT-2T	1 µH	37 µH	24.2 MHz	35.2 MHz (17.5 µH) at 4 turns
RCT-2W	2.2 µH	76 µH	14.9 MHz	56.4 MHz (9.5 µH) at 2 turns
RCT-3	0.22 µH	10.9 µH	43.7 MHz	—
RCT-4	0.48 µH	11.4 µH	33.9 MHz	—
RCT-4W	0.68 µH	18.35 µH	30.1 MHz	—
RCT-5	0.63 µH	23.7 µH	27.4 MHz	34.4 MHz (17.6 µH) at 5 turns
RND-5	1.14 µH	42.5 µH	33 MHz	—

Table I– Inductance and self-resonant frequency measurements.

Photo C– The author's ferrite choke measuring loops.

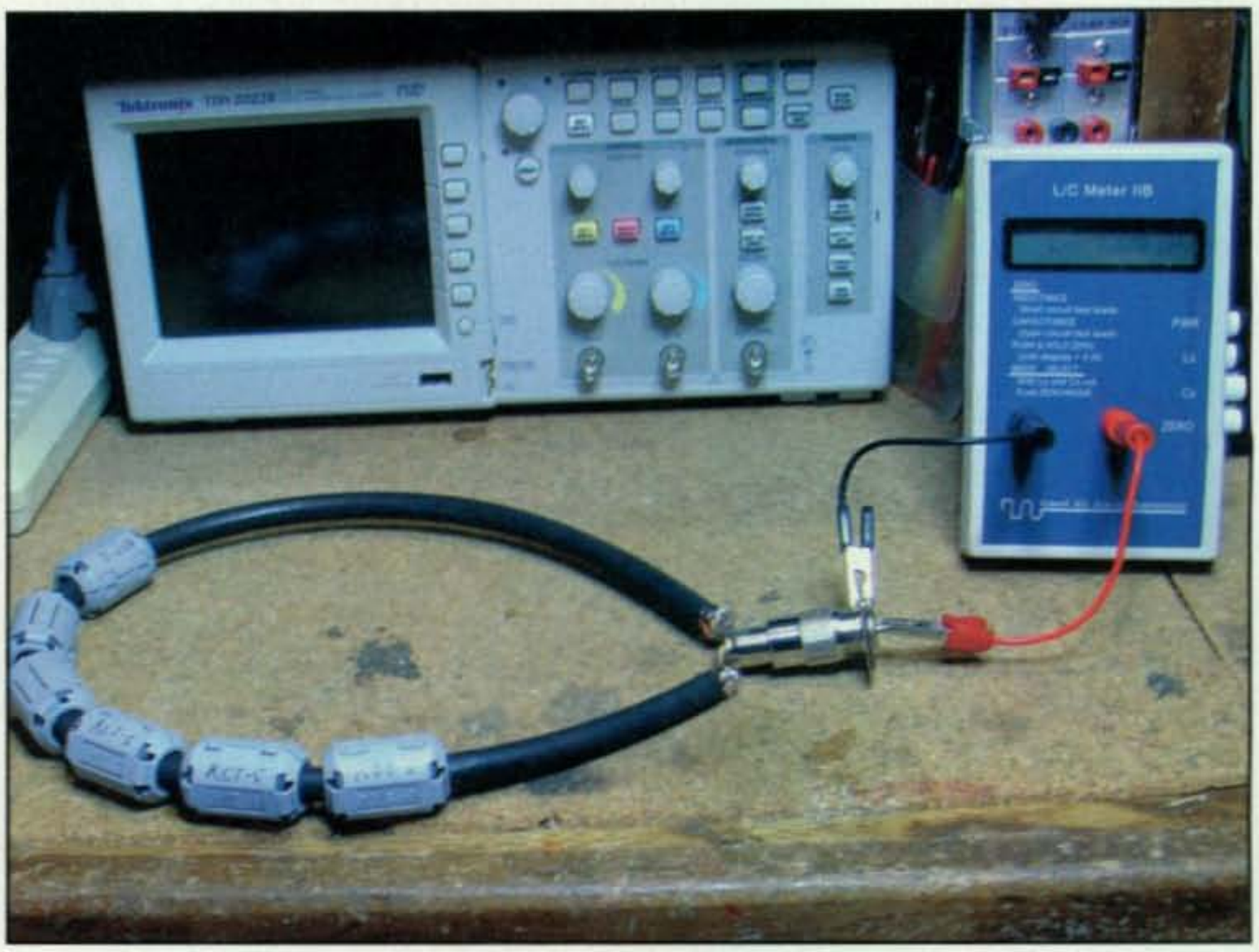


Photo D– Low-frequency loop inductance measurement setup.

Ferrite	Coax L/Choke	Impedance 40m	20m	15m	10m
RCT-2 on RG8X	1 µHy	—	490	>650	>650 (5 cores)
RCT-2T on RG8X	1 µHy	—	490	637	600 (5 cores)
RCT-2W on RG-8X	2 µHy	438	637	>650	>650 (5 cores)
RCT-3 on RG-213	0.25 µHy	—	—	471	>650 (6 cores)
RCT-4 on RG-213	0.35 µHy	—	—	—	490 (3 cores)
RCT-4W on RG-213	0.8 µHy	—	350	553	>650 (5 cores)
RCT-5 on RG-213	0.55 µHy	—	300	—	600 (6 cores)
RND-5 on RG8X	1 µHy	—	400	600	>650 (5 cores)

Table II– The impedance of the loops with the ferrites closely matches the calculated impedance based on the measured inductance.

Photo E– AIM4170B swept impedance measurements.

and above. This can be accomplished with five RCT-2, five RCT-2T, five RND-5, or three RCT-2W ferrites. Five RCT-2W ferrites will make a good 1:1 choke balun on 40 meters and up.

I could not accurately measure impedance at 6 and 2 meters because the loop lengths I chose became series-resonant below these bands (loop inductance plus stray capacitance). However, performance on 6 and 2 meters should be very good with any of these snap-on ferrites. For 6 meters, one RCT-2W, two RCT-2, two RCT-2T, two RCT-4W, or two RND-5 snap-on ferrites should work well. For 2 meters, one of each of the above-mentioned snap-on ferrites will work fine. You can also use three RCT-3, two RCT-4, or one RCT-5 snap-on ferrites.

Summary

While snap-on ferrites are often used for removing noise on wires and cabling, in many cases they can also be used as inexpensive choke baluns. If you use other vendors' snap-on ferrites, you might want to measure the inductance and impedance as discussed to ensure that your particular ferrites will be adequate for the job. Until next month…

73, Phil, AD5X

antennas

BY KENT BRITAIN,* WA5VJB

Transmitting Loops

Last year (in the March and May 2007 "Antennas" columns) we covered using loop antennas for receiving and showed you how to build one. This time we will go over using loop antennas with your transmitter as well.

There has been quite a bit of work done with HF loop antennas in recent decades, primarily by European military organizations. They found that vertically polarized loops on field radios usually work better than short verticals, since a ground plane is not required. Also, horizontal antennas such as dipoles just do not work well when used by field units in the lower HF parts of the shortwave band when the dipole is just a few feet off the ground.

Loop Myths and Facts

I have heard some very interesting myths about loop antennas and their polarization. When the loop is fed from the top or the bottom, the antenna is horizontally polarized. Feed the loop from either side and then it is vertically polarized. For some reason, many people think that if the loop is fed between these points, the loop is somehow putting out both vertically and horizontally polarized signals. Not so. When you feed a loop at a 45-degree angle, you get a 45-degree polarized wave!

Fig. 1 shows a variety of loop shapes. In each case the loop is horizontally polarized when fed at the top or the bottom. The two most important factors for a loop antenna when transmitting are (1) the area inside the loop and (2) the resistance of the loop. You want the greatest area with the lowest resistance, so the circular loop is best. On the other hand, the hexagonal loop is easy to build and the square is the easiest to build. Again, it is *area inside your conductor* you want to maximize.

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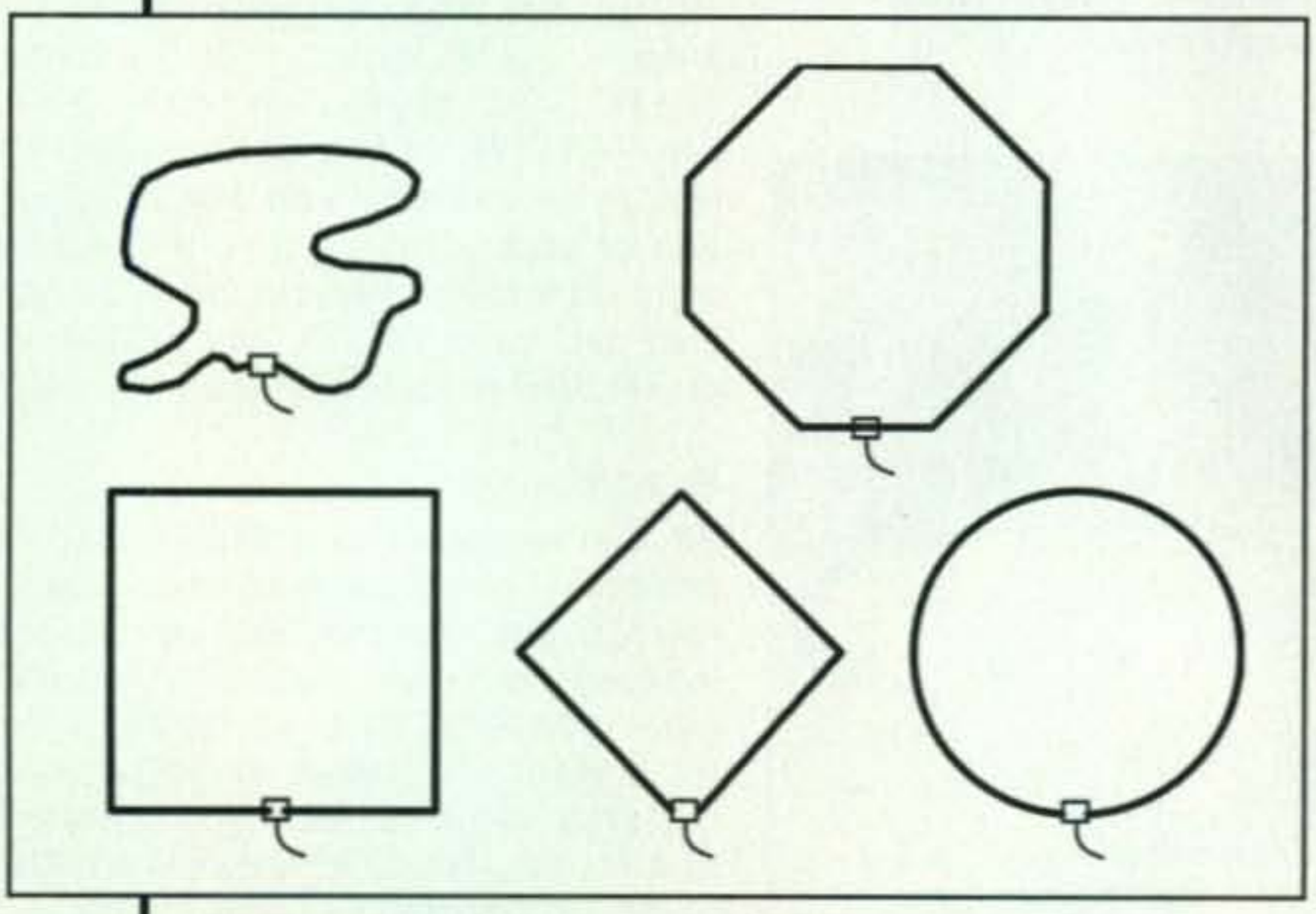

Fig. 1– Horizontally polarized loop antennas.

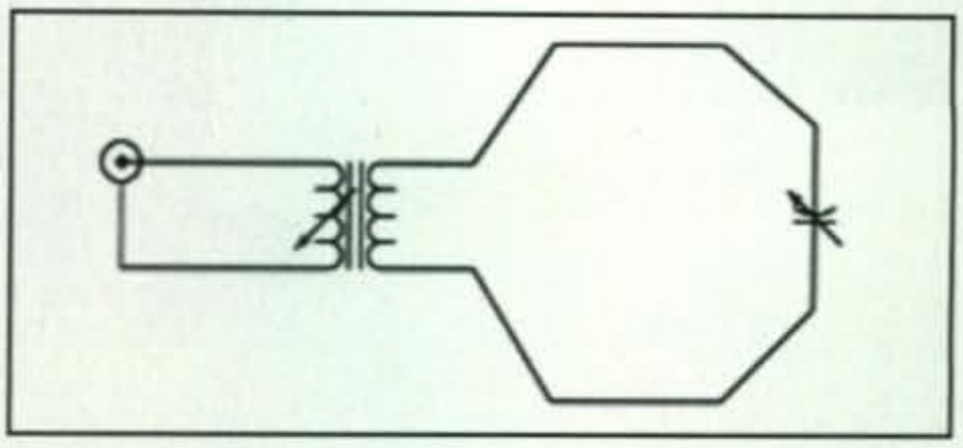

Fig. 2– Schematic of magnetically coupled loop antenna.

When the loop is one wavelength long, as used in quad antennas, the feedpoint impedance is around 100 to 120 ohms. However, as the antenna gets smaller and smaller, the radiation resistance becomes very low, in some cases just a fraction of an ohm. This means there are high currents when radiating even modest power levels. You need to keep the resistance losses in the loop extremely low. This is done by maximizing the surface area of your element. We are not talking about #10 copper wire here; you want to use something such as the outside of hardline coax, 1/2-inch to 1-inch copper water pipe, or a wide aluminum strip.

One aspect of loops that makes them attractive is they can be made just about any size, from large multi-wavelength versions to very small ones. You can make a 10-inch wide 80-meter loop and use it for transmitting. I said you *can.* I didn't say I would *suggest* such a small loop on 80 meters, but it would work. How well your loop antenna will get out is almost entirely a function of how big it is. A 2-foot loop has four times the field area of a 1-foot loop. As with so many other things, bigger is better for loop antennas. However, when it comes to radiation resistance, the formula is R_{rad} = 197 (length in wavelengths)^4 ohms. The 4th power is a pretty big factor, so efficiency of a loop antenna goes up very fast as you make it larger and goes down very fast as you make it smaller.

Next we show a commercial transmitting loop antenna designed for portable and backpacking-type operation. As you can see in photo A, the G4TPH QRP Mag-Loop breaks down nicely into 12-inch pieces for portable operation. For a small package, it expands quite a bit into a full-size loop antenna as seen in photo B. A length of string or rope is all you need to complete the portable installation.

The G4TPH is shown schematically in fig. 2. The antenna is much like an AC transformer with a magnetically coupled input. The ML40 tuning section contains a 15–440 pF variable capacitor, allowing the loop to have a pretty wide tuning range.

Photo A– Ready to go QRP on 40, 30, and 20 meters with G4TPH's collapsible loop antenna.

Photo B– Roughing it in the wilderness on 40-meter QRP.

In fig. 3 we show the 40-meter return loss of the loop antenna. Oh, I wish we could get the ham community to abandon SWR and go to return loss like the commercial folks use. There are so many advantages of return loss. Let's say you have an antenna where the reflected signal is 20 dB weaker than the outgoing signal. Then the antenna has a return loss of 20 dB. Improve the antenna such that it now has half as much reflected power, or 3 dB better, and then the return loss is 23 dB. However, going from 20 dB return loss, or 1.22:1 SWR, to 23 dB return loss, or 1.15:1 SWR, doesn't tell us very much about what is really happening in our antenna match except that the SWR is now a lower number.

We often run into some bad notation on return loss. While the return signal in this example is –20 dB from the strength of the forward signal, return loss is *loss*, sort of a negative of a negative number. Thus, return loss is a positive number, 20 dB.

I have digressed enough. The G4TPH is showing a better than 1.03:1 SWR on 40 meters, and as we change frequency, the loop is changing its size in wavelengths. Now the impedance of the loop is going from 100 ohms or so at 10 meters down to about 1 ohm at 160 meters. The 15–440-pF trimmer capacitor in the tuning unit limits the low end of the tuning range to 3.2 MHz, but if you put a 1000-pF leaded cap across the tuning cap, you can extend the tuning range down to 160 meters.

As you can see in fig. 4, the input coupling is a transformer from 50 ohms to the impedance of the loop. For a full-wavelength loop with its impedance of nearly 100 ohms, a 1:2 step-up transformer works out well. If the loop is much smaller and near 3 or 4 ohms, then a

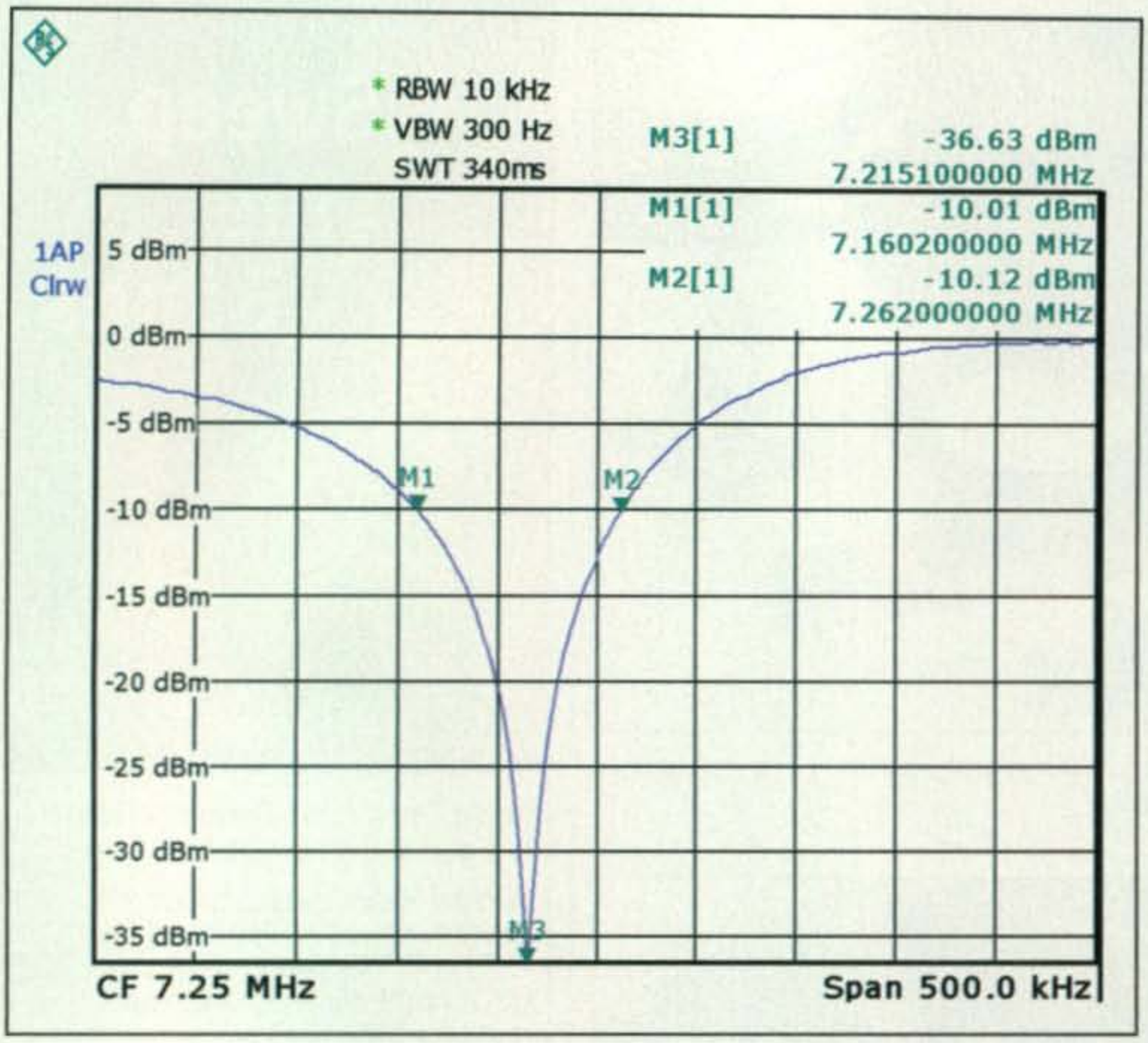

Fig. 3– The 7-MHz plot of the G4TPH loop.

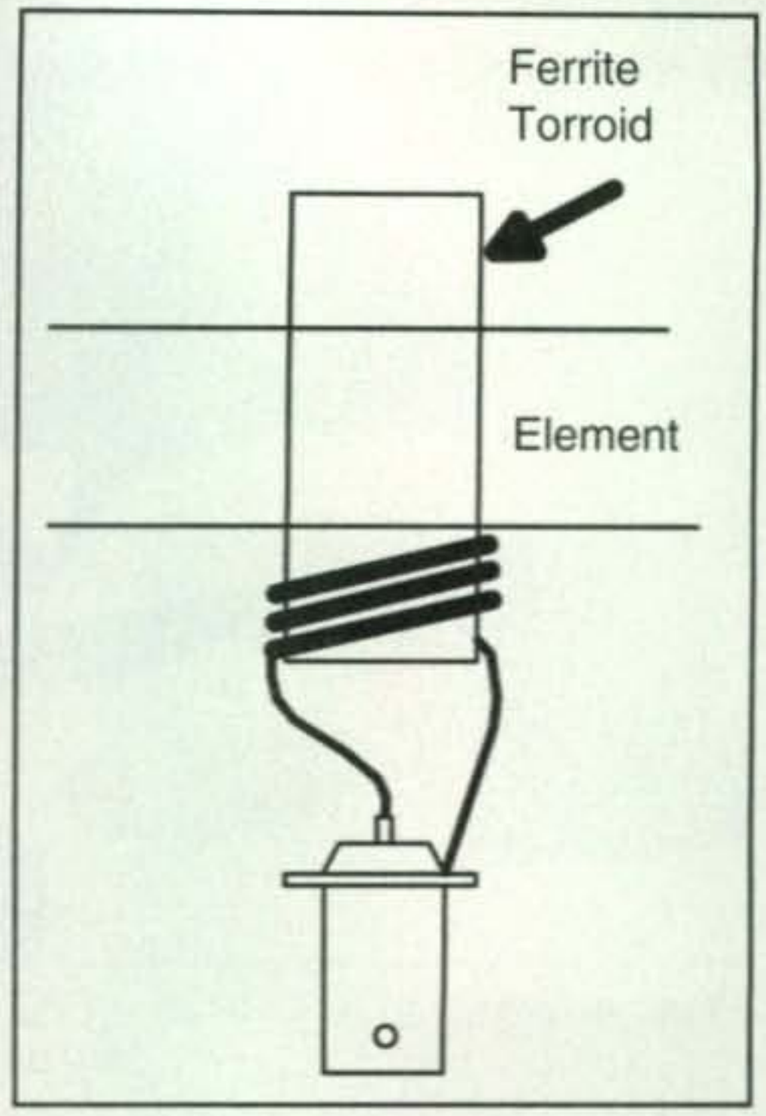

Fig. 4– Coupling transformer.

12:1 step-down transformer is what you want.

Therefore, to stay in the ballpark impedance wise, you have to change the transformer ratio as you change bands. At resonance there is quite a voltage across the tuning cap. This varies with frequency, but the antenna is limited to 15–20 watts before the tuning capacitor arcs. You really see the problems with this high voltage when you look at very small loops such as the MFJ-1786. MFJ solves this problem with some *very* large tuning capacitors and uses a wide aluminum strip on the loop to keep down losses.

Tom's ML-40 matching transformer in photos C and D works well on the 40-, 30-, and 20-meter bands. As I mentioned earlier, the antenna will tune down to 3.4 MHz, but the SWR is 3 or 4 to 1 over the 80-meter band. There is also a matching ML-20 transformer and tuning capacitor for the 20-, 17-, 15-, 12-, and 10-meter bands.

Of course I was not happy with just HF, and even with the 40-meter tuning coil I was able to reduce the loop to only five sections and tune 6 meters with a homebrew matching transformer shown in photo E. My next step will be to see if I can hit 70 MHz with four sections so I can use my new UK call on the 4-meter band the next time I'm in England: "CQ CQ 2E0VAA . . ." There is no reason why I can't make a 2-meter version, either. By the way, Tom has quite a bit of general QRP information on his website, <www.g4thp.com>.

In summary, a loop needs to be made of wide- and low-resistance materials such as aluminum or copper. Loops generate very high voltages, so use very-high-voltage trimmer caps.

Letters, Letters, We Get Letters

From Mat, we got a long letter about what kind of antenna he should use with his new software defined radio (SDR). Mat, it doesn't make any difference if your radio is a vintage super-regen, tube-type S-38, top-of-the-line HF contest rig, or one of the software defined radios. In each case you want the anten-

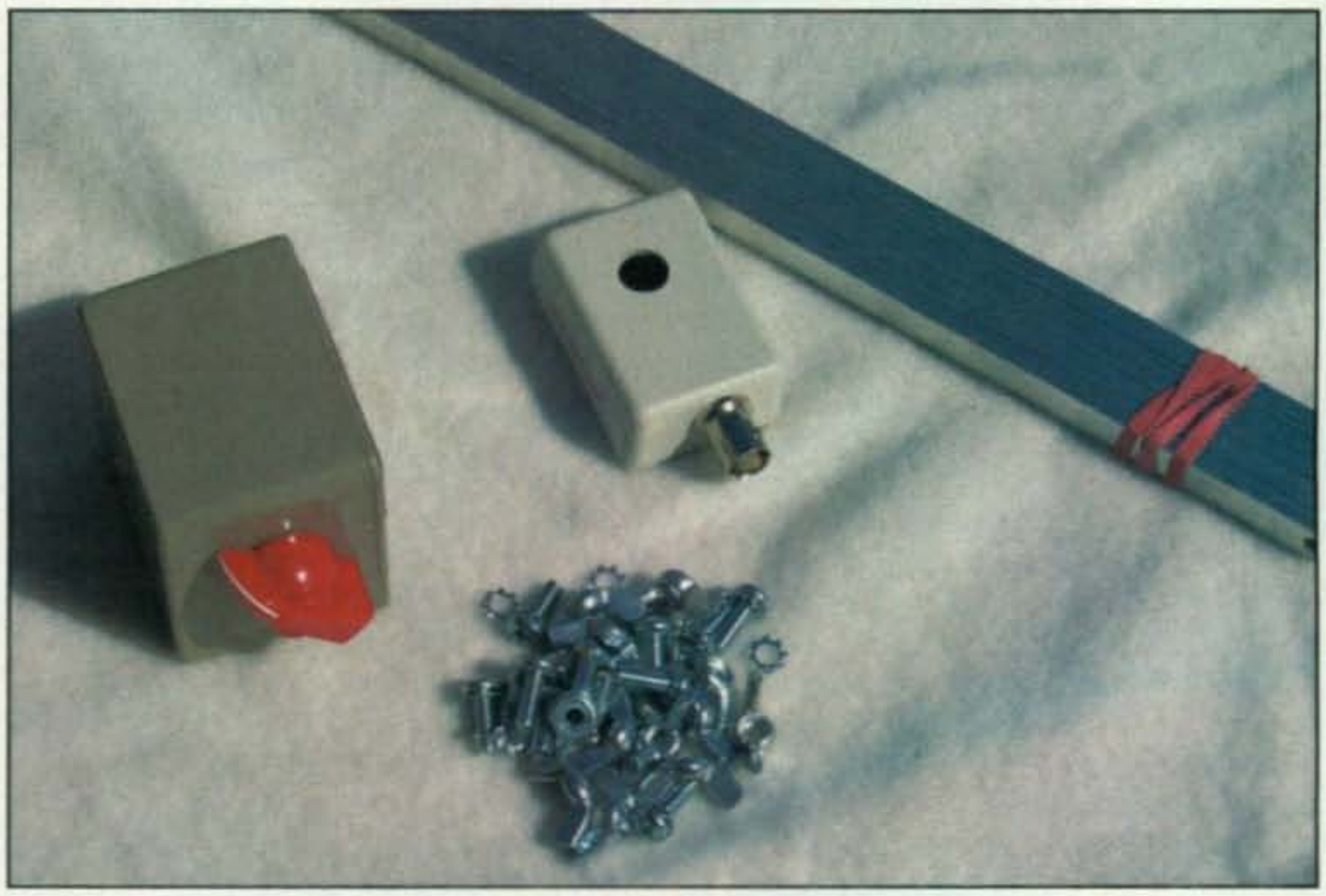

Photo C– Close-up of the tuning unit and coupler.

Photo D– Installed magnetic coupler.

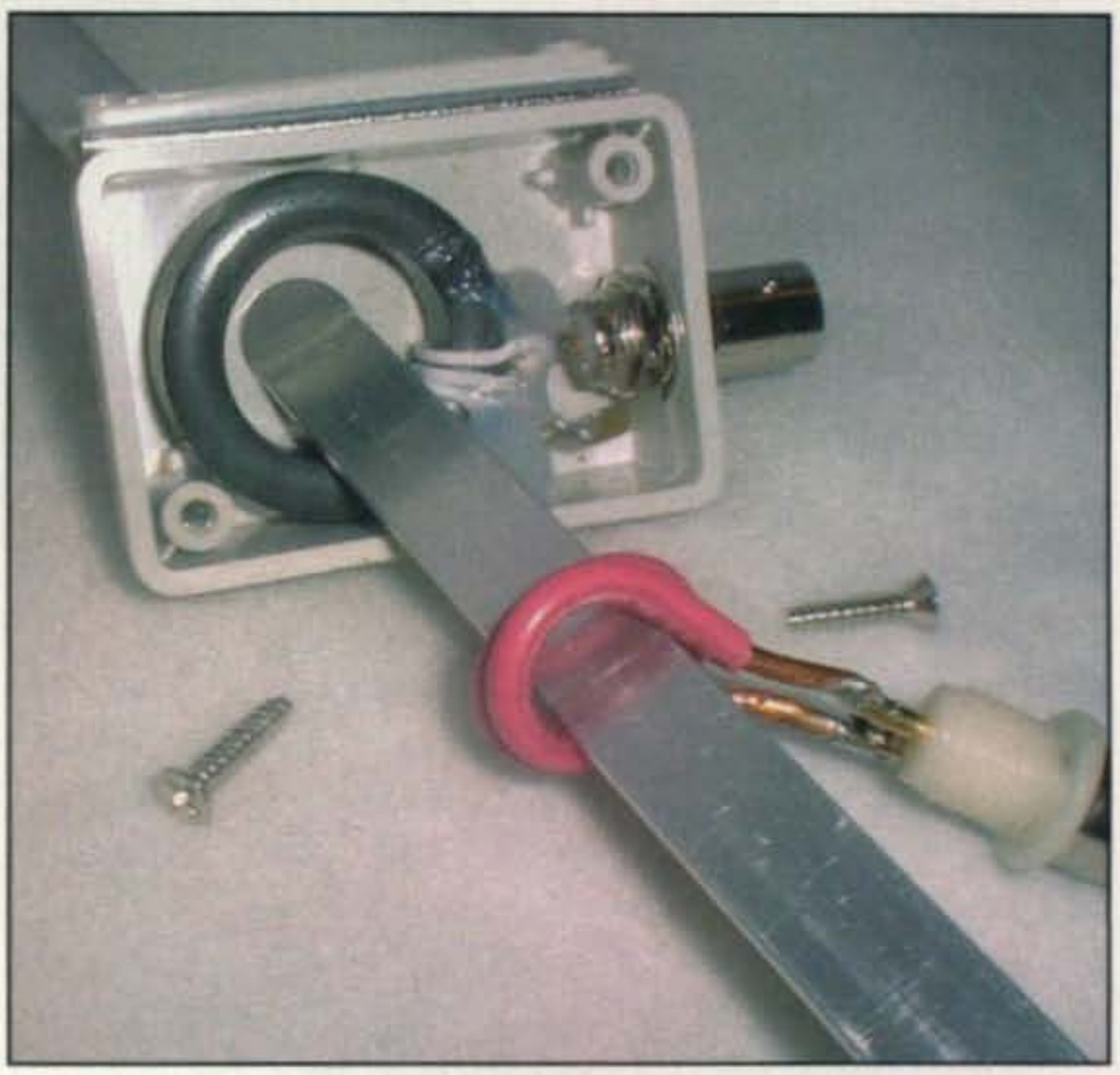

Photo E– Workings of the magnetic coupler and my 6-meter version.

na to be tuned to your frequency of interest. If the antenna works well with your Heathkit HW-101, it will work well with a radio using high-speed digital architecture.

Next Time . . .

By next time I will see if I can finish my ferrite rod antenna project, and, as always, I welcome your e-mails and suggestions for future projects. Just drop me a letter at my snail-mail address on the first page of this column address or send an e-mail to <wa5vjb@cq-amateur-radio.com>. Additional VHF/UHF projects can be found at <www.wa5vjb.com>. Now go get some more metal in the air before it gets too cold!

73, Kent, WA5VJB

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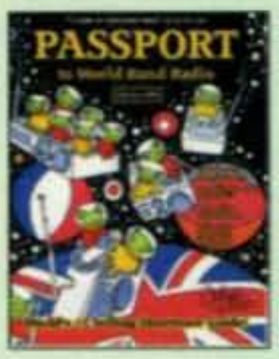

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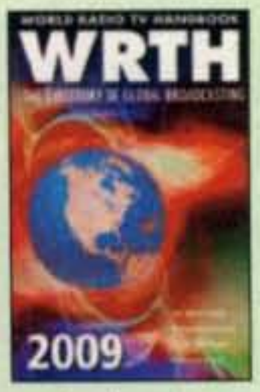

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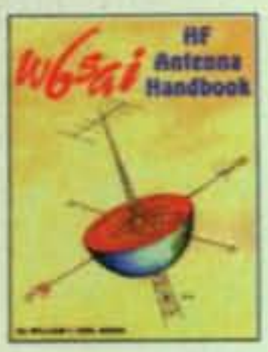

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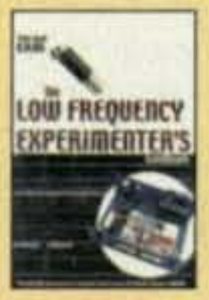

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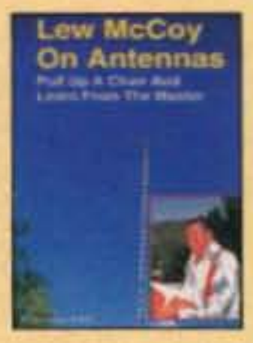

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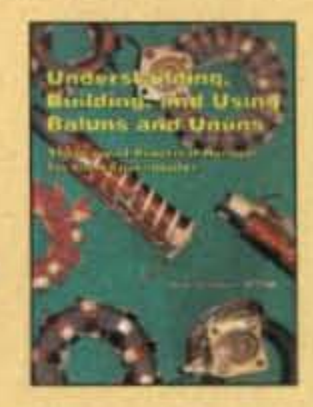

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MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M	20	25	3½ x 19 x 9¾	6.5
SRM-30M	25	30	3½ x 19 x 9¾	7.0

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MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25-2	20	25	3½ x 19 x 9¾	10.5
SRM-30-2	25	30	3½ x 19 x 9¾	11.0

WITH SEPARATE VOLT & AMP METERS

MODEL	CONT. (Amps)	ICS	SIZE (inches)	Wt.(lbs.)
SRM-25M-2	20	25	3½ x 19 x 9¾	10.5
SRM-30M-2	25	30	3½ x 19 x 9¾	11.0

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*ICS – Intermittent Communication Service

BY DAVE INGRAM,* K4TWJ

In The Spotlight: More Vintage Homebrew – Part II

Photo 1– The magnificent Super T transmitter built by Mike Lord, K4ELV, uses a genuine Eimac 35T tube and works 40 meters in high style. Power output is determined by the amount of plate voltage. The pilot lamp on the right side of the front panel serves as tuning aid.

Photo 2– A behind-the-panel view of the K4ELV Super T transmitter showing the layout of parts and rustic glamour of the open-air design. The tube stands almost 5 inches tall, and like the plug-in coil form and magnificent "domino" capacitors, they are slowly disappearing from existence. (Photo courtesy of Mike, K4ELV)

Our double feature on heart throbs in homebrew continues this month with views and details of two more easy-to-brew one-tubers from yesteryear. These mini rigs are, in my humble opinion, especially appealing because they are relatively low in cost, their open-air design exhibits real radio glamour, and they are easily mated with commercially-produced receivers of the same time period.

Before continuing, let's turn the spotlight on you. Have you homebrewed a nice little rig that you would like to share views and details of with us for inclusion in future columns? You will receive plenty of well-deserved recognition and may even start a trend of homebrewing a copy of your favorite rig. Actual 35-mm photos and descriptions sent by postal mail (and well-packed to prevent bending) are fine. If you prefer to send digital pictures (jpg files) be sure they are between 250k and 1 meg resolution and e-mail them to me at <k4twj@cq-amateur-radio.com>. This is your personal invitation to enjoy time in the limelight. Give it a go! Also, someone sent us details of a really neat 7C5 transmitter, but neglected to include a picture and his/her name and callsign. I am standing by to hear from you and to spotlight your rig. Also, another chap sent us a picture of his 6AQ5 transmitter built on a clear sandwich lunch box; we are anxious to put your name and call with this picture.

Once again, I must emphasize these sweet little gems require real tooth-rattling high voltage for operation, and if you are not fully educated on working with same, don't start here. ***Do not build or test these rigs without an "old pro" by your side to provide guidance.*** Just enjoy looking at the pictures and reading the details, similar to the way you envy classic cars. Now let's thank this month's homebrewers extraordinaire—Mike Lord, K4ELV, Pablo Acevedo, KC2MKQ, and Bruce "Blackie" Blackburn, JY9BB/W4TA, and focus on the rigs!

The Super T

While attending the Birmingham (Alabama) Hamfest this past May, I noticed a classy-looking one-tube transmitter made by Mike Lord, K4ELV (photos 1, 2, and 3). Closer study and a brief chat with Mike revealed it was a dear little 35T transmitter like the one featured in the 1936 edition of the famous *Frank Jones Radio Handbook* and highlighted in this column exactly ten years ago. Some readers may have not seen that November 1998 issue of *CQ*, or planned to also build a 35T transmitter but forgot about it until now, so we are quickly revisiting it this month.

*3994 Long Leaf Drive, Gardendale, AL 35071
e-mail: <k4twj@cq-amateur-radio.com>

Photo 3– Straight-on rear view of the K4ELV transmitter shows how Mike used long screws with extra nuts and spacers to mount the tube and crystal socket above the base—a clever idea worth remembering. Those with sharp eyes will also notice the second/"sensing" pickup coil for pilot-lamp tuning aid on the coil form. Thanks to K4ELV for sharing views of this rig with us.

This transmitter's simple but effective circuit makes it an ideal candidate for homebrewing (fig. 1). The main *stumbling* blocks you will face are finding authentic-era parts in good condition and at a fair-and-square price. Large "domino-type" capacitors made by Micamold or Sangamo look like authentic 1930s models for sure, but they are rather scarce. Tubular capacitors from Mallory or Sprague (or home-fabricated look-alikes), however, are good substitutes.

The next challenge is finding a 50- or 70-pFd tuning capacitor for the plate, a 35T tube, and the coil form. We realize real open-air variable capacitors of any value have become rather scarce, so substituting a capacitor of between 35 and 125 pFd and possibly dinking with coil turns as compensation seems logical. As an alternative, you might try wiggling and removing every other rotor plate from an easier-to-find single-section 365-pFd tuning capacitor. There is a second benefit to this approach: resultant wider spacing between plates increases the voltage rating and minimizes arcing and "flashover" when using more than 200 or 300 volts on the plate. The 35T can take up to 1000 or 1200 volts at 200 ma and pump out close to 50 watts, but Mike and I agree on not "pushing" it. A plate voltage of 400 to 500 and an output of only a few watts is much more tube friendly.

Plug in $1^1/_4$-inch diameter coil forms, vintage tubes, sockets, and even tuning capacitors are available from Antique Electronic Supply at <www.tubesandmore.com>. A 50-ohm 10- or 20-watt adjustable resistor with its slider mid-positioned ensures "balanced" keying of the tube's negative high-voltage line, or you can use two 25-ohm 10- or 20-watt resistors with the 400-ohm "keying resistor" connected between them. If the rig's CW note seems slightly raspy, incidentally, connect a .01-mFd 600-volt capacitor in parallel with each 25-ohm resistor (or on each "side" of the 50-ohm resistor).

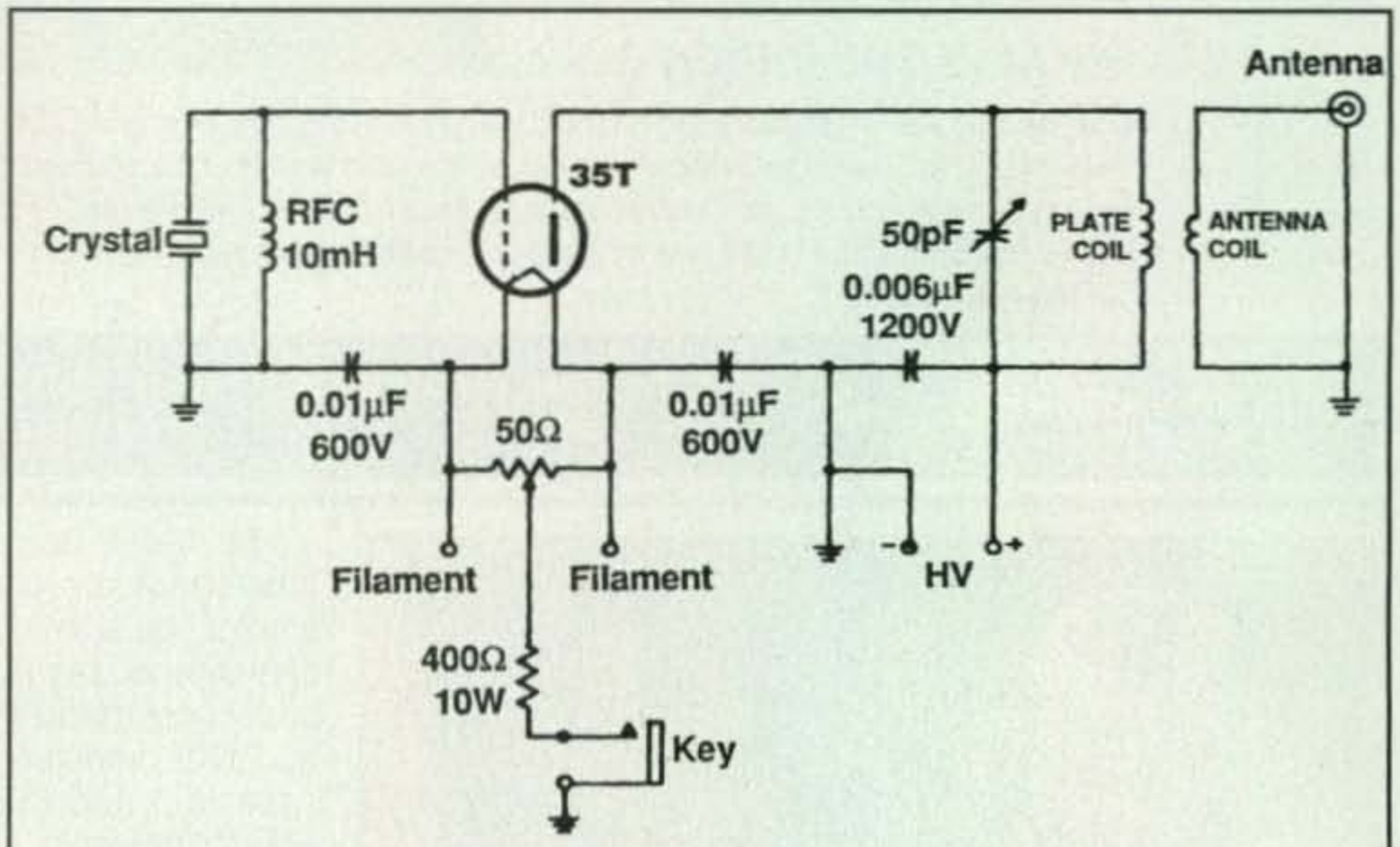
The 10-mHy choke connected between the 35T's grid and ground may be difficult to find and a more common 2.5-mHy choke can be substituted if the resultant CW note remains clean and clear.

Tune-up and operation are quite simple. Just tune the plate capacitor for maximum output consistent with the best-sounding signal. Try repositioning the antenna pickup coil—over the center or over the top/bottom of the plate coil—and re-peaking the plate coil as necessary to acquire maximum clean signal output. Dink. Enjoy.

Once you ensure the little rig is "perking" properly, you might also consider adding the optional 10-mHy inductor and another tuning capacitor (100- or 150-pFd) as shown in the inset in fig. 1 to produce a simple VXO circuit. It typically shifts the crystal's frequency three or four kHz. Our thanks to Mike, K4ELV, for sharing views of his Super T!

The 6AQ5er

A well-known audio amplifier tube frequently used in many AM broadcast radios and shortwave receivers of the 1960s was the sweet little 6AQ5. This tube was often described as a small cousin of the famous 6L6, and like the 6L6, it too found its way into homebrew transmitters of the same time period. A fair number of receivers used the 6AQ5 to develop sufficient audio output to drive a speaker while a previous audio stage produced earphone-level audio. A creative-minded amateur could take advantage of that fact by using earphones and



Coil Data for the Super T/35T

Band	Plate Coil	Antenna Coil
160 m	70 turns No. 24 DSC, 2 " long	20T
80 m	34 turns No. 18 enamel, 2" long	14T
40 m	16 turns No. 18 enamel, 1 1/2" long	7T
30 m	12 turns No. 18 enamel, 1 1/2" long	6T
20 m	8 turns No. 18 enamel, 1 1/2" long	4T

Note: Antenna coil wound over plate coil using No. 18 or 20 plastic- or Teflon®-coated wire.

Fig. 1– Circuit diagram of the Super T/35T transmitter with inset of optional VXO plus coil data.

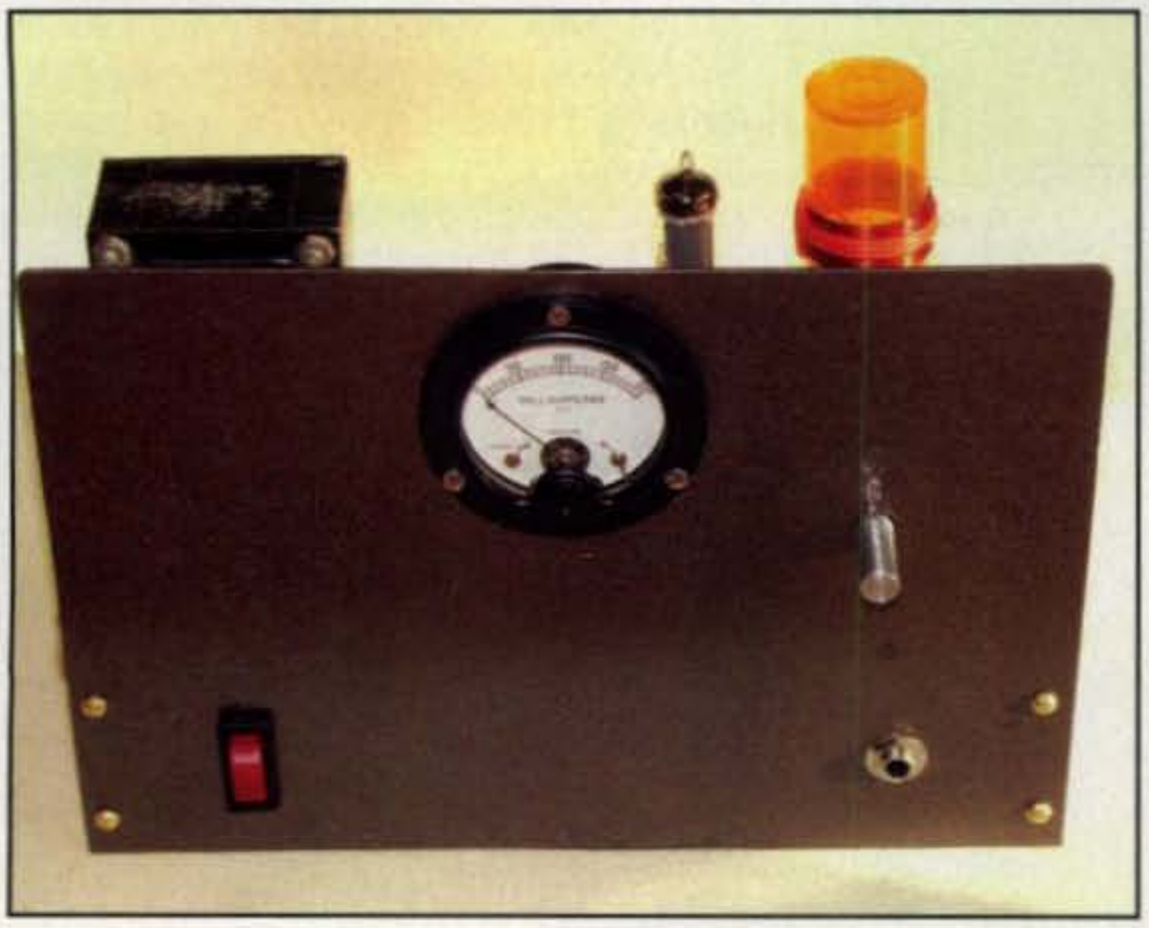


Photo 4– Front-panel view of the 6AQ5er transmitter built by Pablo Acevedo, KC2MKQ, prior to installing the tuning knob. Ah, but look at the proud 6AQ5 standing tall behind that genuine Weston meter! (Photo courtesy of Pablo, KC2MKQ)

Photo 5– Rear view of the KC2MKQ-built "6AQ5er" illustrating the layout of parts on the approximately 7- by 5-inch wood and aluminum-frame chassis. The classic '50s styling is simple and easy to understand. (Photo via KC2MKQ)

moving the 6AQ5 into a home-built transmitter. A home-fabricated plug inserted in the vacated 6AQ5 socket could then "borrow" operating voltage for the transmitter. The arrangement is not elegant, but it proves a quick and easy way to get on the air at low cost.

Some homebrew 6AQ5 transmitters were built on a simple breadboard and others were built fancy on a metal chassis, but few exhibit more glitz and glamour than the one built by Pablo Acevedo, KC2MKQ, and shown in photos 4, 5, and 6. This 6AQ5er is so elite that it even has its own panel meter and power transformer (115 volts to approximately 175 volts, plus a 6.3-volt filament winding). The plate coil is wound on a 1.25-inch diameter pill bottle and consists of 17 turns of No. 20 enamel-coated copper wire for plate coil L1. The antenna coil is three turns of hookup wire wound over L1 and position-adjusted for best output like the way the pickup coil was adjusted in the 35T transmitter. The 6AQ5er works 40 meters with 5 or 6 watts output at 195 volts on the plate, or 2 or 3 watts output with 130 to 150 volts on the plate. I have not tried it, but parallel wiring two 6AQ5s should increase output to maybe 9 or 10 watts—if the plate transformer can handle the load.

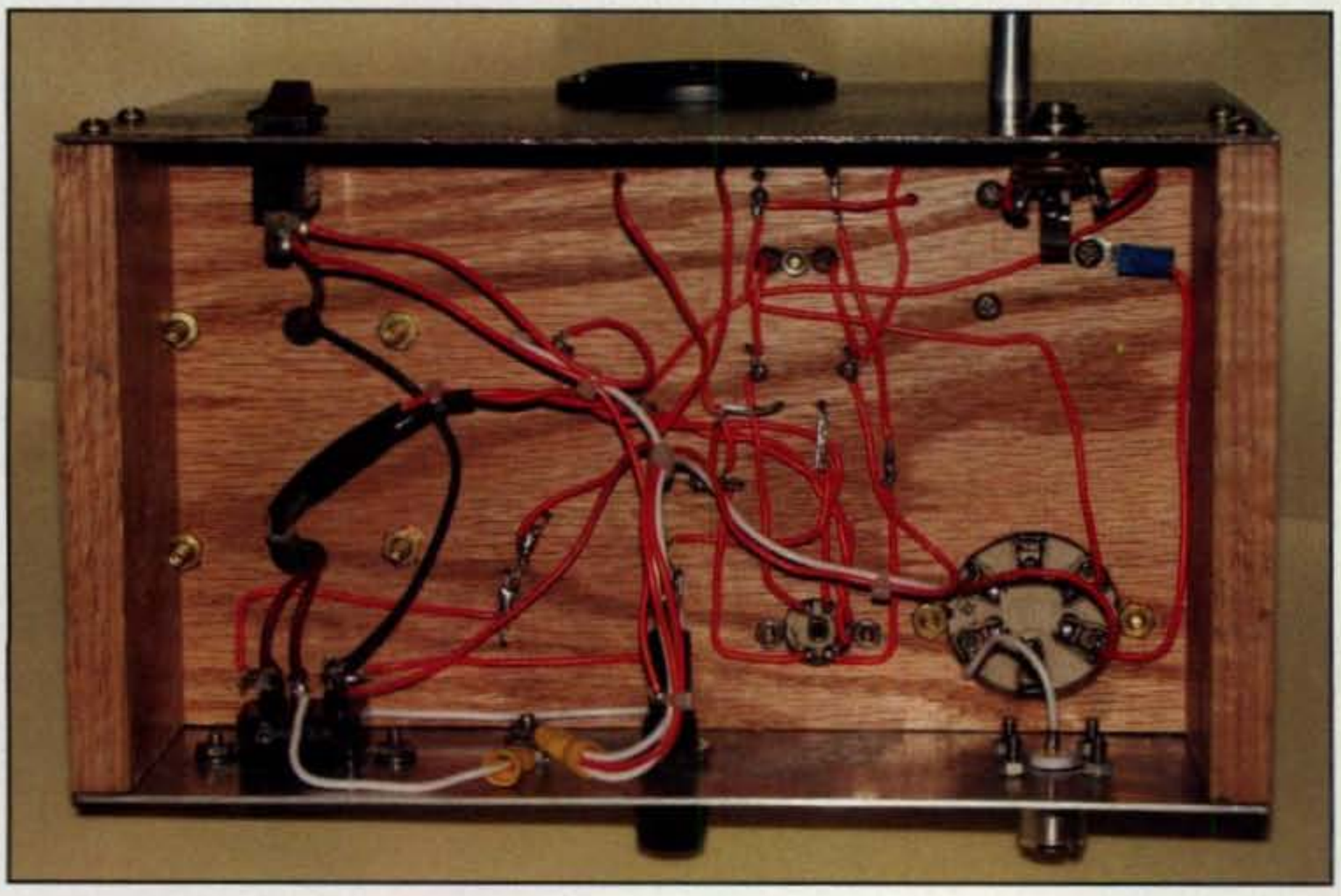


Photo 6– This under-chassis view of KC2MKQ's "6AQ5er" reminds us that even simple one-tube transmitters require time and patience to assemble and wire up, but the end result is worth every minute of invested time! (Photo via KC2MKQ)

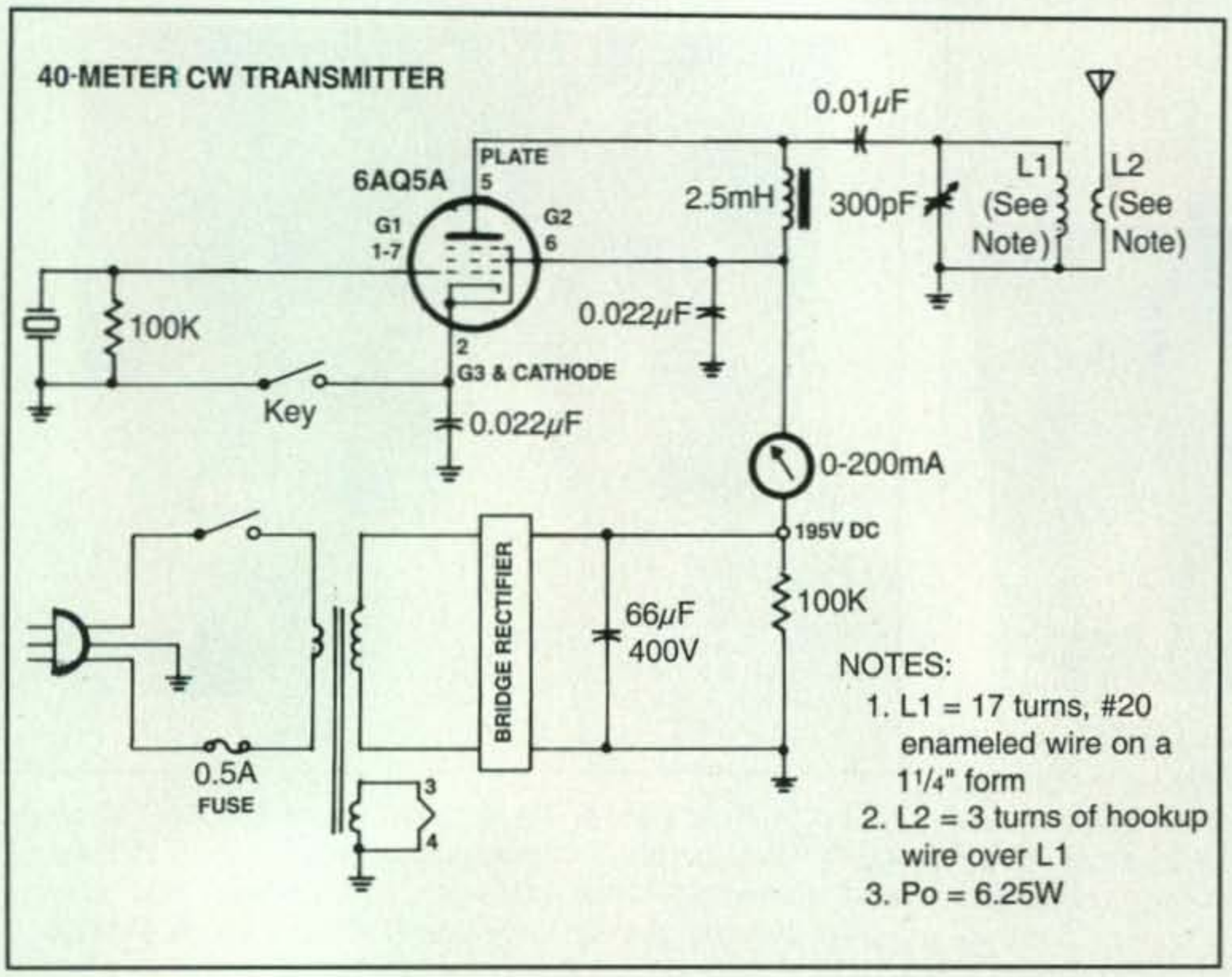


Fig. 2– Circuit diagram of KC2MKQ's 6AQ5er. The bridge rectifier can be replaced with four 600-volt/1-amp (or higher) diodes if desired. Note that this design uses a shunt-fed plate circuit. Another 6AQ5 transmitter slated for a future column will use a series-fed plate circuit.

Like to try dinking? During the 1950s, Bud (Cabinets) sold a neat frequency-warping crystal holder. You removed the quartz crystal slab from an FT-243 crystal, placed it in the Bud holder, and its pressure-adjusting screw in the middle of the front side varied pressure on the contact plate pressing against one side of the crystal. As a result, it shifted the crystal's frequency 5 or 6 kHz. It seems feasible to accomplish the same results by installing an adjustable quartz slab pressure plate on the front of an FT-243 cased crystal. Any technique that varies how tightly the crystal is held in place should work. Are those creative lights flashing yet?

Wrap Up

We have once again gone full throttle all the way to (and beyond!) the closing wire and must bow out for this time. We trust you enjoyed this year's homebrew vintage items, we remind you to send details of your little pride for inclusion in our next "vintage" column, and we look forward to a QSO with each of you one night soon on 30 meters.

73, Dave, K4TWJ

Classic Heathkit Fit for a King

Photo A– His Majesty King Hussein, JY1 (now a silent key), at his main, R.L. Drake station in the Royal Palace of Jordan. The king and his guest operators ensured this setup was used regularly. (Photo courtesy of Bruce "Blackie" Blackburn, JY9BB/W4TA)

Photo B– A Heathkit SB-104 transceiver made especially for a king—King Hussein. His JY1 callsign proudly shines between the meter and frequency readout. (Photo courtesy of JY9BB/W4TA)

Radio amateurs of all lands enjoyed contacting His Majesty King Hussein I, JY1, several years ago when he operated 20 meters from the Royal Palace in Jordan. The king's main line of gear was R.L. Drake, with an L4B linear amplifier adding signal "punch," and his distinguished voice was unmistakable over the airwaves. Unfortunately, JY1 is now a SK—and significantly missed.

Although a little known fact, King Hussein also had a classic Heathkit SB-104 SSB transceiver with a very special feature. When operating, it displayed the call letters JY1 alongside its frequency readout (photo B). The rare picture of this gem came to me courtesy Bruce "Blackie" Blackburn, JY9BB/ W4TA, who for many years was King Hussein's closest ham friend. I met Blackie, incidentally, while checking on King Hussein's CW key.

In talking with Blackie, he related that King Hussein was somewhat a night owl and the two of them often alternated working 20 meters after Queen Noor and family turned in for the evening. Blackie said King Juan Carlos of Spain, EAØJC, occasionally visited King Hussein. The two enjoyed technical talks, and their conversations always migrated to amateur radio. Blackie recalled one instance when King Juan Carlos showed King Hussein a special scanner with EAØJC displayed in its frequency readout area. Although conjecture, that may have been the inspiration behind JY1's unique SB-104.

Looking North

BY JEFF REINHARDT,* AA6JR

Many of us are lucky enough to have a best friend who is a reliable anchor, someone we know will be there not only for the good times, but also when we are facing adversity.

Having grown up on the border of the U.S. and Canada, I look at Canada in that same light—a faithful friend who has its own distinct personality but also shares many of the same values and interests as we in the U.S. In less-threatening times, friends and family would think nothing of crossing from the U.S. into Canada for lunch, dinner, or a quick shopping trip. Today's security concerns make crossing the border anything but casual. Through my countless visits to that country, I have always been impressed with the friendly hospitality of Canadians, from Prince Edward Island in the east to the beautiful city of Vancouver in the west.

With a land mass larger than the U.S. and a population just under 33 million, Canada offers breathtaking scenery and a lot of wide-open spaces. As an illustration, Canada's population spread over that vast area is about the same population as that of the state of California. Talk about "elbow room"!

Mobiling VE Land In Style

What better way to bridge those wide-open spaces than with a mobile radio? Especially the rolling setup put together by Jerry Clement, VE6AB, an inhabitant of the Canadian prairie who took the time to share some photos and tips on his impressive mobile station. With only a few small edits made by me, Jerry sent the following:

"I read your articles in *CQ* with interest and thought you might like to see the system in my Ford F150. I have included photos that show the radio stack in the cab and my antennas on the outside. The tower effectively takes care of equipment mounting problems with today's vehicles and may be removed from the truck in minutes, as the tower has a quick disconnect that mates with a 3-inch stub bolted to the floor of the truck. The tower is fed with 8 gauge cables that are routed from the battery to an accessory fuse box mounted behind the center seat, which has the proper size fuses for all components on the tower. The tower voltage is monitored by the digital volt meter visible in the tower photo.

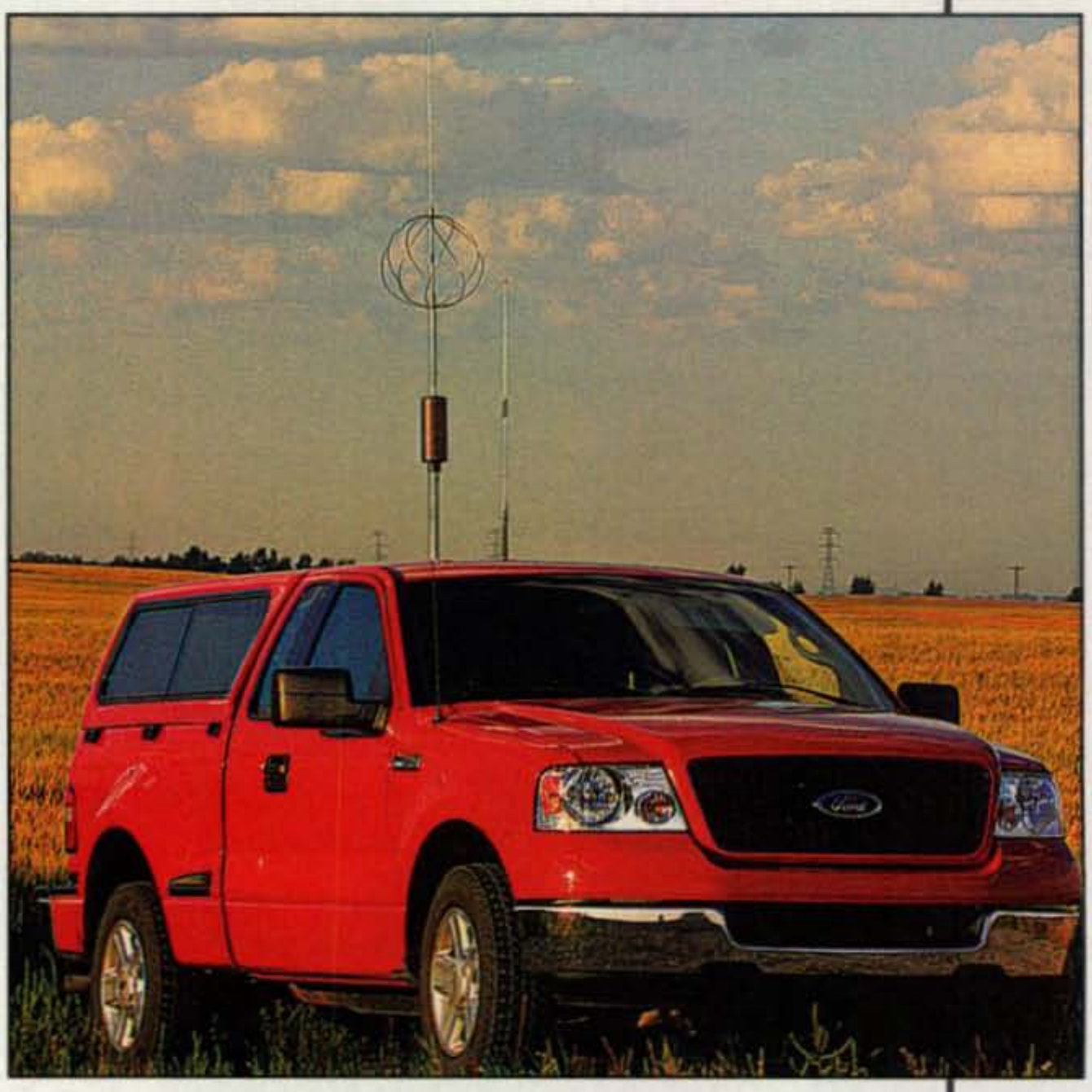
I am using a Yaesu FT-817ND driving a Tokyo Hi Power HL-100BDX amp designed for the 817. The HL-100BDX amp plugs into the accessory port on the 817 and it does full auto switching from the 817, including band switching, mode switching, and ALC levels. I also installed an SSB Collins mechanical filter in the radio. I recently acquired a Heil HM series mic with an HC5 element and it made a huge improvement in the audio out. I constantly receive great audio reports with it. I am running a ClearSpeech® DSP from West Mountain Radio and I believe that anyone running HF mobile needs to have this device as part of your radio setup. It eliminates static crashes, heterodynes, and white noise and makes HF sound like FM radio.

My antenna is a HI-Q 4/80RT. This antenna operates from 10 through 80 meters with a 6-foot whip. My interest lies with the lower bands and the 24-inch capacity hat I built and installed along with the 6-foot whip makes for a high-performance antenna system especially on 80 meters where the cap-hat makes the antenna much more efficient.

It is important to note that Mix 31 ferrite beads are being used on both the motor wires and the controller wires coming out of the antenna base. This is critical to prevent RF from getting back into the radio stack and causing untold grief. If using a screwdriver-type antenna and the controller wiring (reed switches) is not being used, install eyelets on the wires and fasten them to the mast of the antenna to prevent SWR problems. I am constantly upgrading my antenna system which includes a lot of work not visible, such as extensive bonding throughout the truck and other changes that are ongoing, including a new radio before too long.

I had been running a conventional 4-lobe 24-inch cap-hat on my HI-Q 4/80 RT and was looking to improve the efficiency. I have achieved my goal with my new egg-beater cap-hat fresh from the shops of VE6AB. I was able to eliminate another 10 turns off the coil of my HI-Q antenna when tuned for resonance on 80 meters. The egg-beater cap-hat gives me less coil wire resistance and greater radiation efficiency.

Thanks, Jerry, not only for sharing photos of your great-looking mobile setup but for some excellent details. I will add that certain Ford vehicles have had a history of electrically noisy fuel pumps. The ClearSpeech® speaker can help reduce that as well. Hopefully, they've taken some steps at Ford to address that issue. You can learn more



VE6AB's great looking Ford F-150 may be the pride of Canada's mobile setups. (Photos courtesy of Jerry, VE6AB)

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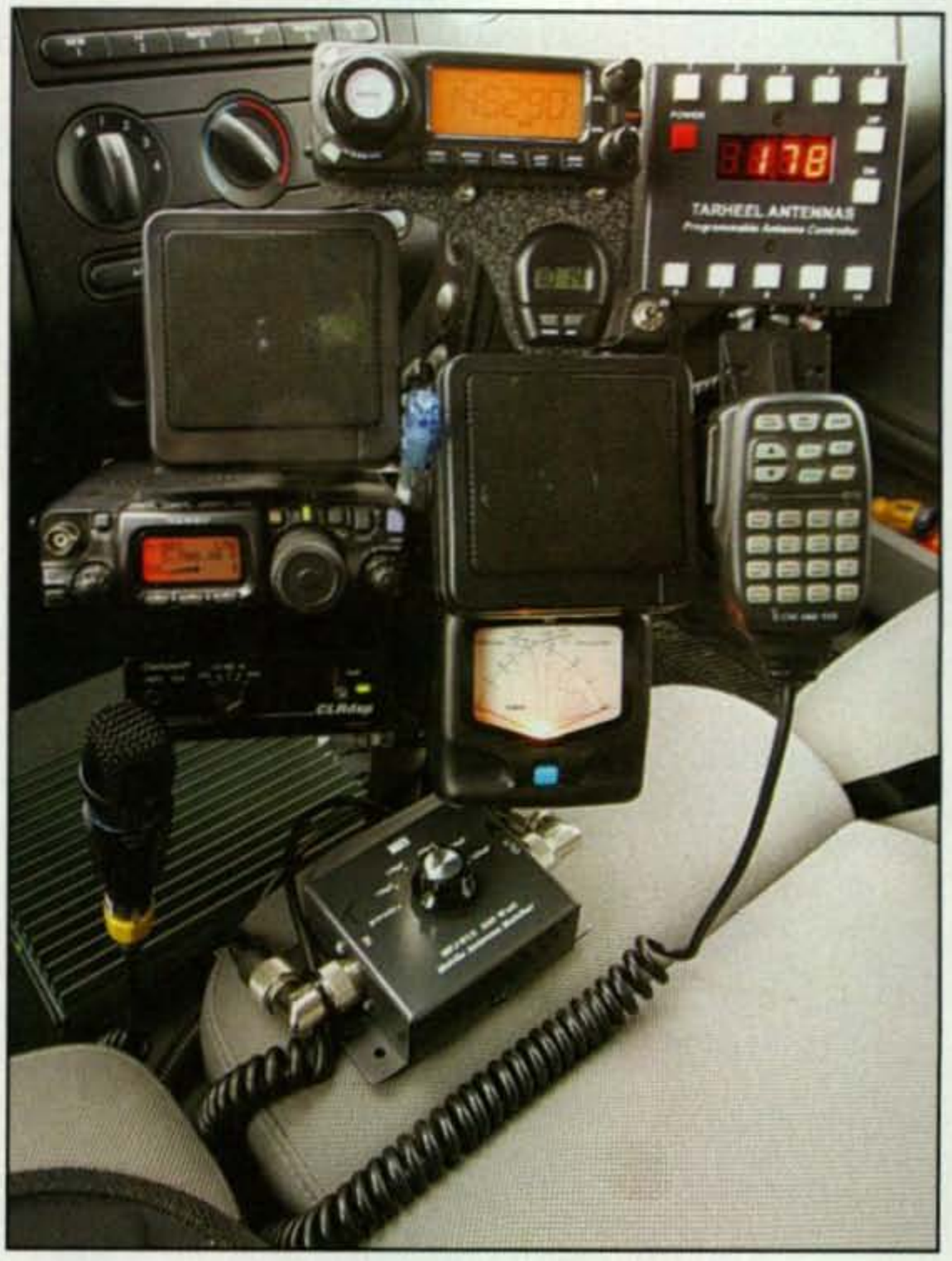
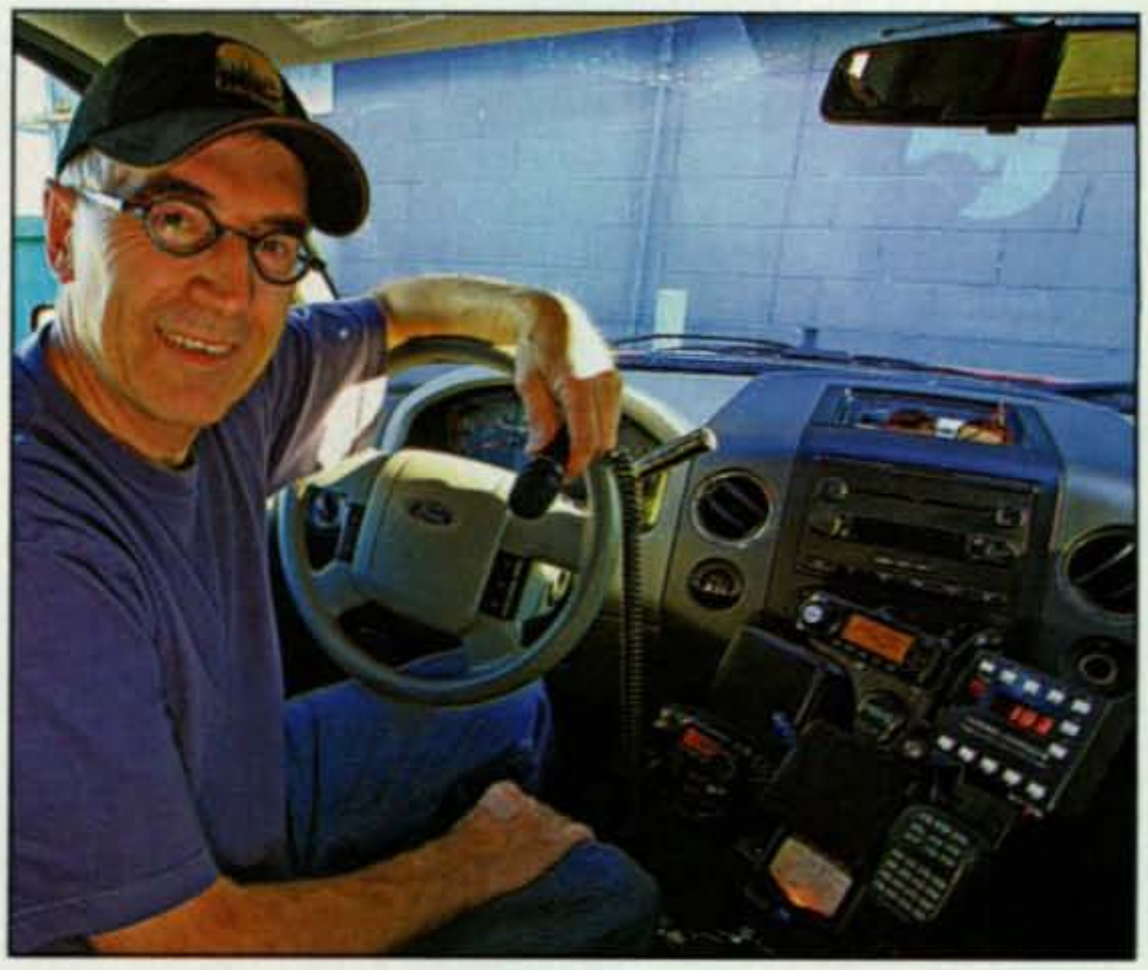
about Jerry and his extensive interests at <www.stormchaser.cjb.net>.

Also note the emphasis Jerry places on electrically bonding the vehicle's body panels. A sometimes overlooked bit of bonding is the exhaust system, which should be electrically bonded to the frame with braided wire. The exhaust pipes run the length of the vehicle and bonding them at one or more places can help reduce spark and other electrical noise.



Jerry's "office" in the F-150 provides fingertip access to multiple bands, integrated audio, and microphones.



I don't think we need to ask why this man is smiling...

Close-up of the egg-beater capacitance hat for 80-meter mobile operation.

Bringing Wireless to Wireless

Is there a manufacturer ready to fully integrate wireless technology, such as Bluetooth®, with a remotely mounted transceiver? Today's newer vehicles beg for a transceiver that can be remotely mounted, perhaps even under the hood or in the trunk of a vehicle, close to the battery. This "ideal" transceiver would communicate via wireless with its remote control display, wireless speaker, and wireless microphone, perhaps similar to the increasingly popular integrated ear-headsets used by cell-phone owners.

It's clear the trend will be toward smaller, fuel- and space-efficient vehicles that seek to maximize interior space in a smaller package, which means less room for aftermarket accessories. I recently changed cars, and it took two people several hours to remove two transceivers (VHF/UHF triband and a HF+6 unit with antennas) from my old car. It occurred to me as we worked removing vehicle trim, the seats, control cables, power cables, speaker leads and coax that there has to be an easier, more modern approach to installing and enjoying amateur radio gear in a contemporary car. I believe a modular wireless approach would have strong appeal to hams who would like to integrate their hobby with mobile operations without having to tear the car apart and risk voiding the new-vehicle warranty. The technology exists. Can any manufacturer rise to the challenge?

Do you have a mobile setup, antenna, or installation tips you'd like to share? Be sure to send an e-mail to me at the address shown on the first page of this column. Happy Mobiling!

73, Jeff, AA6JR

how it works

BY DAVE INGRAM,* K4TWJ

The What and Why of Oscilloscopes – Part II

As you may recall, our previous "How It Works" column (September issue) presented an introductory discussion of oscilloscopes and explained the general functions of their front-panel controls. Since oscilloscopes are rather complex test instruments, much of that column highlighted their operational aspects more than their actual applications. We continue this time with various ways of using an oscilloscope for evaluating transmitted signals, analyzing transceiver passbands, and comparing frequency response of audio amplifiers, speakers, microphones, and more. We will also focus on older-style oscilloscopes and associated test gear rather than on their new, high-tech counterparts, mainly to keep things simple and understandable.

Starting with this "keep it simple" approach and then upgrading your knowledge also makes learning easier. Once again, we are striving to give you maximum information in minimum space, so read this column a couple of times to understand and absorb the material.

Evaluating RF Signals

Our previous column concluded with a popular technique for evaluating SSB quality using a two-tone test signal, so let's start this time with a look at how a CW signal under test looks on an oscilloscope; see fig. 1(A), (B), (C), and (D). Incidentally, these patterns are acquired by setting an oscilloscope's horizontal rate or sweep frequency between 50 and 500 Hz and coupling a small amount of sampled RF energy to the scope's vertical plates. You fine-adjust the horizontal frequency to acquire a stable (non-sliding) display, and you follow the scope's operating manual, guidance for directly connecting an input signal to the vertical plates.

Note: Some of the more elaborate scopes have vertical amplifier sections capable of passing frequencies up to 50 MHz and higher, eliminating the need for direct vertical plate connections. Check your particular scope's model and manual.

Sampling or coupling a small amount of RF energy from a transceiver typically involves adding a shielded box between its SO-239 antenna connector and your station antenna's PL-259 plug. Inside the shielded box the coaxial cable's center conductor is wound in a one-turn loop, and another one- or two-turn loop of insulated wire is positioned near it to pick up a small amount of RF energy. Sampled energy is then routed through a separate cable to the oscilloscope. I prefer taking the "general description" approach here, because there are several methods of sampling (again refer to your scope's manual) and inexperienced newcomers should seek the "hand-holding" guidance of an old pro rather than going it alone when devising an RF sampling unit. Otherwise, you could damage your gear or receive an RF burn.

Fig. 1 should be clear, but a few notes are always helpful. If transmitter output or sampled RF energy is too low, only a horizontal trace will be visible. If sampled RF energy is too high, the displayed signal will overfill the scope's screen and only reflections will be noticed. Synchronizing keying with the scope set at a sub-multiple horizontal frequency (so two, three, or even four CW dots stay stationary) is tricky, but quite possible. Also remember there may be a slight difference be-

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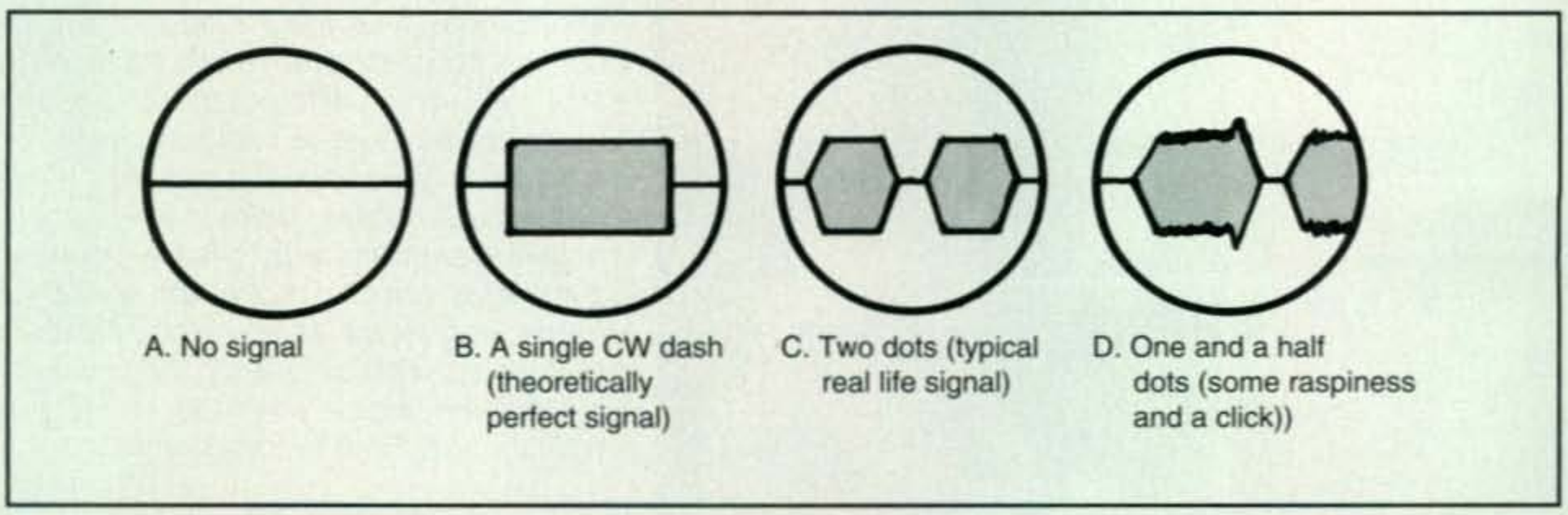

Fig. 1– Example of how an RF-sampled CW signal typically appears on an oscilloscope screen (after setup and level adjustment). (A) indicates key-up or no-signal condition. (B) indicates a theoretically perfect wave form with straight sides. The slight curves in (C) indicate a close to normal delay at key up and key down resulting in a slight amount of "softness" in keying. The jagged top/bottom areas in (D) indicate some raspiness on (key down) carrier, and tooth-like pip indicates key click. Displays as shown here are often included in reviews of transceivers. (Discussion in text.)

tween textbook-type signal patterns and actual oscilloscope-displayed patterns (things often look different in real life). Finally, I should point out oscilloscope displays as shown in fig. 1 are often included in reviews of transceivers.

Analyzing Passbands

If you have devoted a respectable amount of time comparing transceivers and studying manufacturers' brochures, you probably have noticed sketches indicating their IF passbands and filter widths for various modes. If a passband is 2.7 or 2.8 kHz wide for SSB, you also most likely have heard resultant signals going through it sound rich and full-bodied but lacking some audio "punch," whereas a narrower passband of 2.1 or 1.8 kHz will sound more concentrated and usually prove more beneficial for DXing. Carrying those facts a step further, we also learn descriptions of passband response curves apply to both transmitting and receiving, and the flare of passband skirts indicates how much a passband filter's width varies between weak and strong signal conditions.

How are such passband measurements performed? Generally, with the aid of a wideband oscilloscope, a sweep generator, and a marker generator as shown in fig. 2. The latter two items may be somewhat pricey or complex for the usual amateur radio workshop or test bench, but understanding their general concept of operation is always useful, and it also helps to better understand how passband curves in equipment brochures are derived.

A *sweep generator* is basically a (single-frequency) signal generator with a frequency "wobbulating" or shifting circuit added to its main oscillator. The frequency generator may be set to any frequency between 200 kHz and 30 or 50 MHz (or higher, depending on its cost), and the frequency-shifting circuit typically swings a selected/dialed-up frequency from 1 kHz to several megahertz. The rate or speed of the sweep, amount or width of the sweep (above and below the signal generator's set/dialed-up/resting frequency), plus the signal generator's unswept or center or resting frequency and level all are set by front-panel controls.

Stated another way, you set the signal generator in a sweep generator to an RF or IF's center frequency, adjust its output to avoid overloading a stage under test, and then set the sweep generator to shift that center frequency plus or minus a desired number of kilohertz. Exact frequency calibration is extremely important when "sweeping a passband," and some sweep oscillators lack such frequency accuracy, so an external reference called a *marker generator* is used to indicate exact frequencies within a sweep or a passband under evaluation. A marker generator is basically a regular (single-fre-

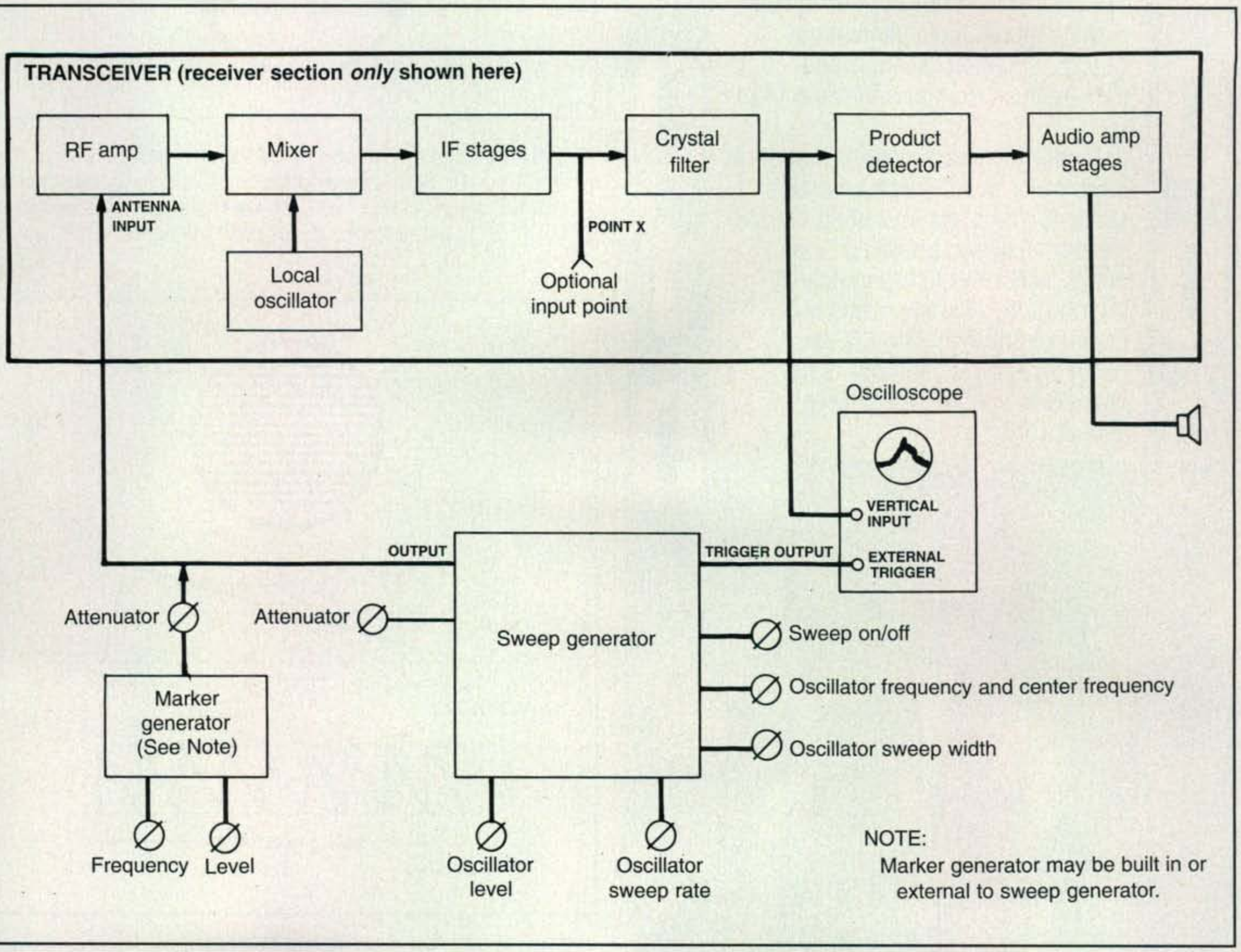

Fig. 2– General outline of equipment interconnections for the sweeping passband of a CW or SSB transceiver (only the receiver section is shown for simplicity). A marker generator may or may not be built into a sweep generator.

quency) signal generator with high frequency stability and exact frequency readout.

If we wish to sweep a receiver's full "front end"—that is, the overall bandwidth from its antenna input, through its RF and IF stages, and on through its IF crystal or DSP filters—we connect the sweep generator's output to the receiver's antenna input and an oscilloscope's vertical input to the passband filter's output (which is also the product detector's input). Incidentally, if only the IF filter's response curve is of interest, moving the sweep generator's output from the transceiver's antenna input (which is also the RF amplifier's input) to the last IF amplifier's output (point X in fig. 2) is all that is necessary. The resultant display of either test will probably slide right or left on the oscilloscope's screen, so trigger pulses from the sweep generator are directed to the oscilloscope's external trigger input for stabilizing the display

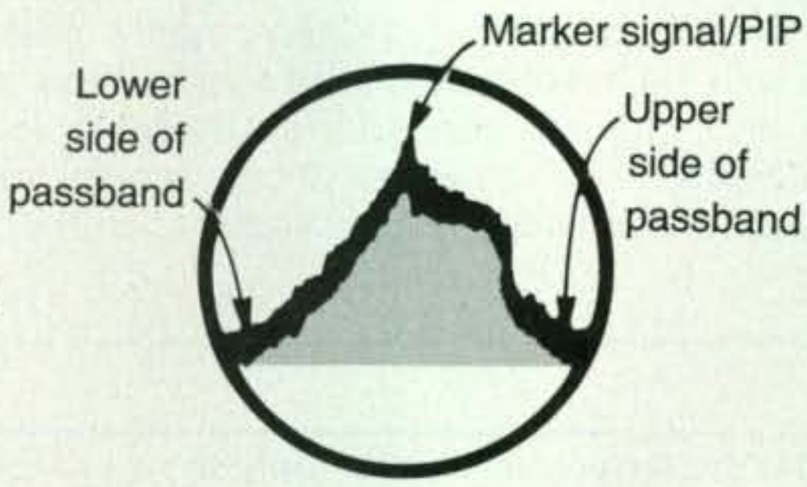

Fig. 3– Illustration of how a passband swept using the arrangement in fig. 2 may appear on an oscilloscope screen. A marker signal can "mark" different frequencies within a passband for calibration purposes.

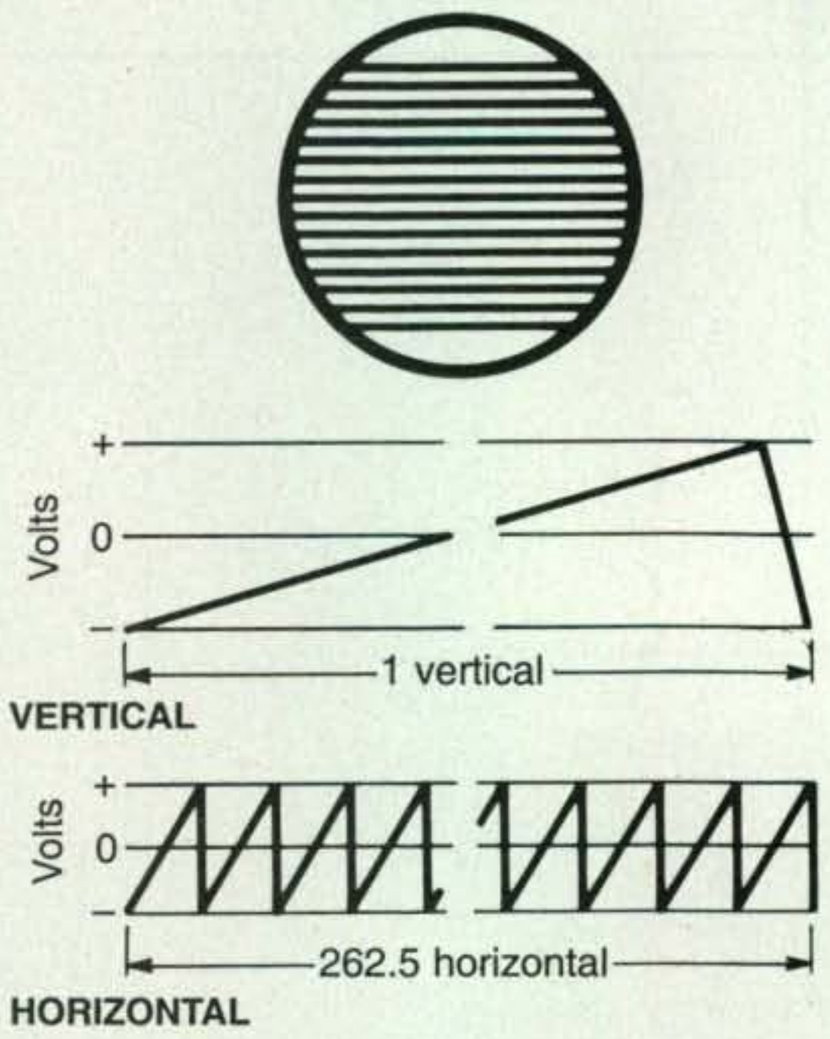

Fig. 4– Illustration showing how 262.5 horizontal sawteeth and one vertical sawtooth appear to produce a raster on a CRT or TV screen. (Discussion in text.)

and preventing it from sliding right or left on the oscilloscope's screen.

Similar "sweeping concepts" of almost any user-defined range—RF, IF, or AF—are also used for determining bandwidths and/or overall frequency response of transmitters, audio amplifiers, speakers, microphones, hearing aids, and much more. In all cases, a group or band of signals or sounds covering the full range of the item under test and an output level indicating device or oscilloscope plot the results for study. I should also mention that passband response curves included in equipment brochures or sketched on paper (theory) and displayed on oscilloscopes (actual practice) can vary enough to prove slightly confusing. That is because an oscilloscope does not necessarily plot a solid line indicating a response curve's exact edges as seen on paper, and an RF, IF, or AF amplifier without equal (flat) response or gain across a particular bandwidth can cause a displayed curve to appear greater at one end than the other (see fig. 3).

The concept of sweeping, displaying, and properly interpreting displays of frequency response may be considered "complex electronics" for some amateur radio operators, but including it here helps improve your ability to learn new techniques. This is also an opportune time to take our learning process a step further.

Scanning TV Screens

Here is an intriguing question to ponder: What would be the resultant screen display if the electron beam in a cathode ray tube was deflected from side to side or horizontally 262.5 times while also being deflected top to bottom or vertically only once, both within 1/60 of a second and both by sawtooth waves? A simplified sketch of this process is shown in fig. 4.

The electron beam will start its lightning-fast trek on the (horizontal) left and (vertical) top area of the CRT's screen, scan approximately 131 horizontal lines before reaching screen middle, and then scan another 131 lines before reaching screen bottom. The beam will then flash-retrace to the screen top and repeat the process, with a very small difference: The next 262.5 lines will fall in between the previously scanned 262.5 lines. This (interlaced) scanning occurs so fast that the screen's persistence in display and our eyes' persistence in viewing integrate both *fields* of 262.5 lines into one full *frame* picture of 525 lines. We also just described a classic TV screen of the NTSC (U.S.) format (translation—analog rather than high-resolution digital TV).

Now visualize fast-varying grid bias on and consequent output of the CRT's electron gun as it is being swept horizontally and vertically. At one instant or microsecond, there is no output and the CRT screen is dark/black. A microsecond later, output may be 50 percent and an adjacent screen area (one or two pixels) will be a shade of gray. A couple of microseconds later, output may be 100 percent and adjacent pixels will be white. Continue that process for 524 more lines, and the CRT displays a TV picture. And you assumed it all happened by magic, right?

There is more—quite a bit more. There are also color TV, digital TV and high-res digital TV, and upcoming laser-projected TV, but we are once again out of space and must bow out rather quickly. Here's hoping you found our information useful and it inspires you to continue to study oscilloscopes and TVs. Never stop learning and growing!

73, Dave, K4TWJ

what's new

BY ANTHONY A. LUSCRE,* K8ZT

New OWA Yagis, Wall Plates, Coax Assembly Tools, Innovative Solder & more

This month's items include some big beam antennas, a way to get coax into your house, and tools to assemble your coax connectors. We also take a look at a new way to solder through-hole components, and we continue with ideas for holiday gifts. Finally, we visit The Amateur Radio Website of the Month.

SuperBertha Yagi Antennas

SuperBertha is introducing new models to its line of Ultimate OWA "Optimized Wideband Array" long-boom Yagis (photo A). Available on 48-foot booms are the following Yagis: full-size 40-meter with four elements, 20-meter with six elements, 15-meter with seven elements, and 10-meter with eight elements. New models include: 10 meters with nine elements on a 60-foot boom and 6 meters with 13 elements on a 65-foot boom. In development: 30 meters with five elements on a 48-foot boom and 17 meters with six elements on a 48-foot boom. We are not talking small backyard tribanders; these antennas are for hams looking for a big edge in contesting or DXing.

The SuperBertha antennas are "developed by two world-class engineers, mechanically tested in the worst weather conditions northwestern Pennsylvania can throw at them, and performance tested at the highest level of DX Contesting," according to the company. Electrical design is by Jim Breakall, WA3FET, and mechanical design is by Tim Duffy, K3LR. The company notes that "Tim not only builds the antennas for our clients ... these are the same antennas he uses at his winning Multi-Multi contest station!" For more information visit <http://superbertha.com> or telephone 814-881-9258.

MFJ AdaptiveCable™ Wall Plates

MFJ's exclusive weather-sealed AdaptiveCable™ Wall Plates (photo B) let you bring nearly any cable—rotator, antenna switch, coax, etc.—through walls without removing connectors. The wall plates can pass cable connectors up to $1^{1}/4 \times 1^{5}/8$ inches. Sliding plates adjust the hole size to accommodate virtually any size cable, while a rubber grommet helps to seal out rain, snow, or wind and pests of both the insect and rodent variety.

The complete kits include 18-gauge stainless-steel plates for each side of the wall, sliding plates, rubber grommets, weather stripping, and mounting screws. Three models are available: MFJ-4614 (four holes) $34.95; MFJ-4612 (two holes) $24.95, and MFJ-4611 (single hole) $14.95.

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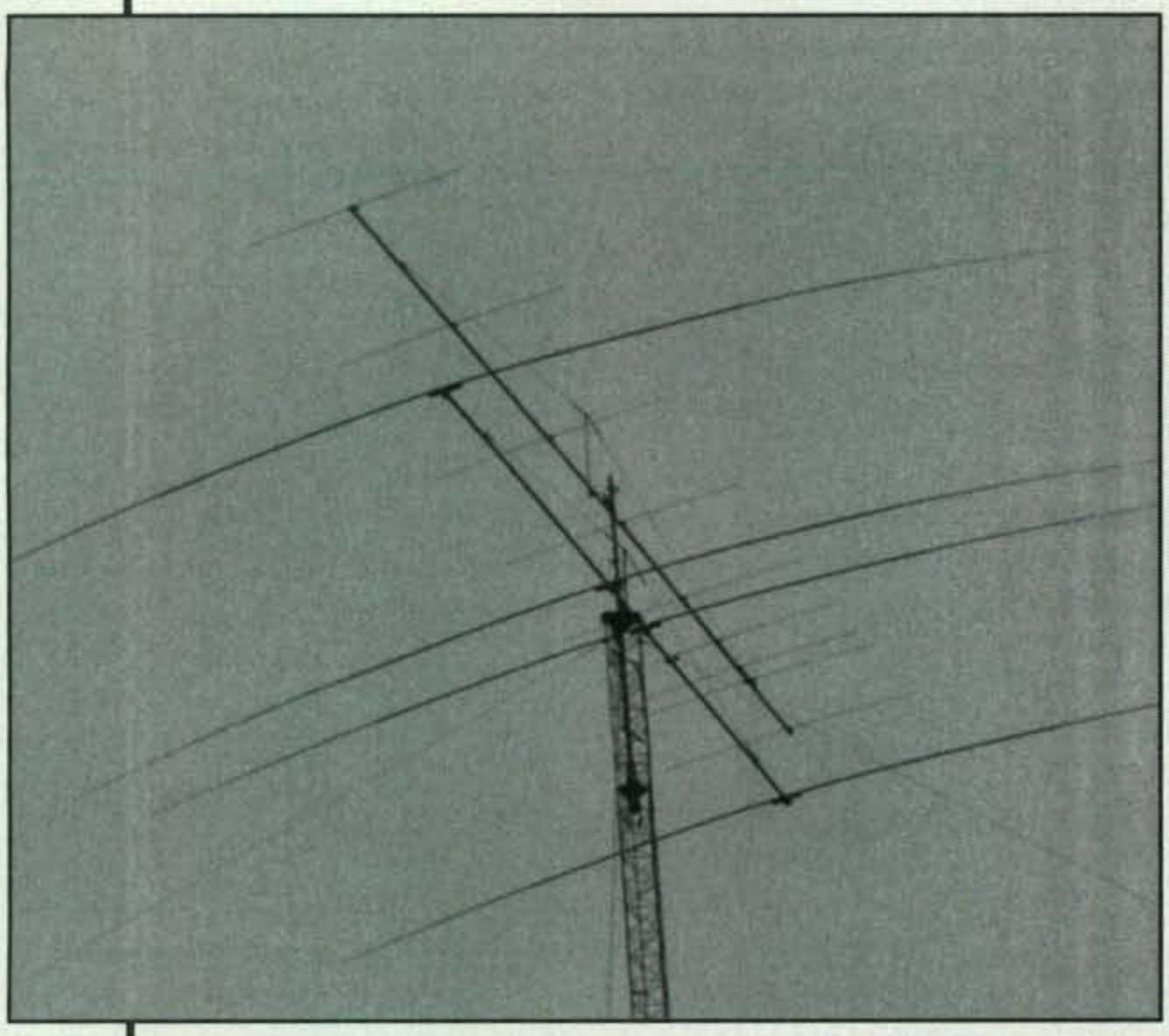


Photo A– An assortment of SuperBertha Yagis on a SuperBertha Tower. (Photo courtesy of Scott, W3TX)

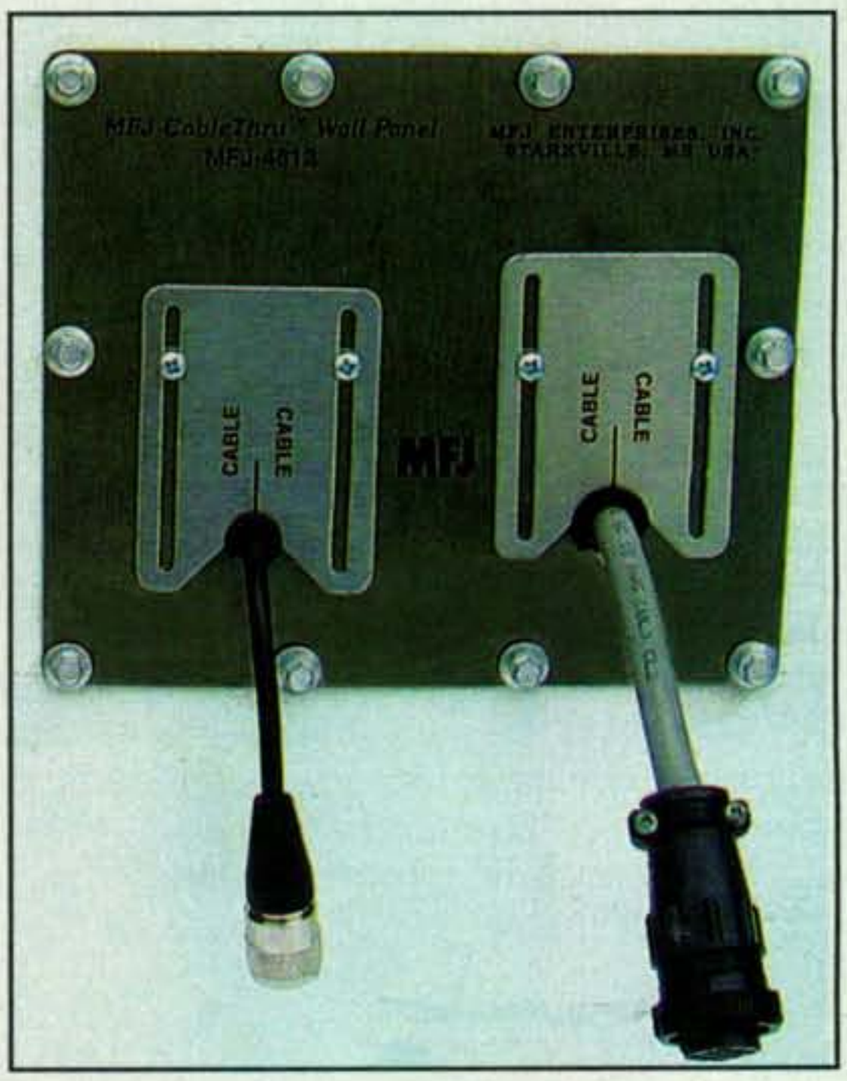


Photo B– MFJ AdaptiveCable™ Wall Plates allow you to get your coax through the wall while maintaining a weather-tight seal. (Photo courtesy of MFJ Enterprises)

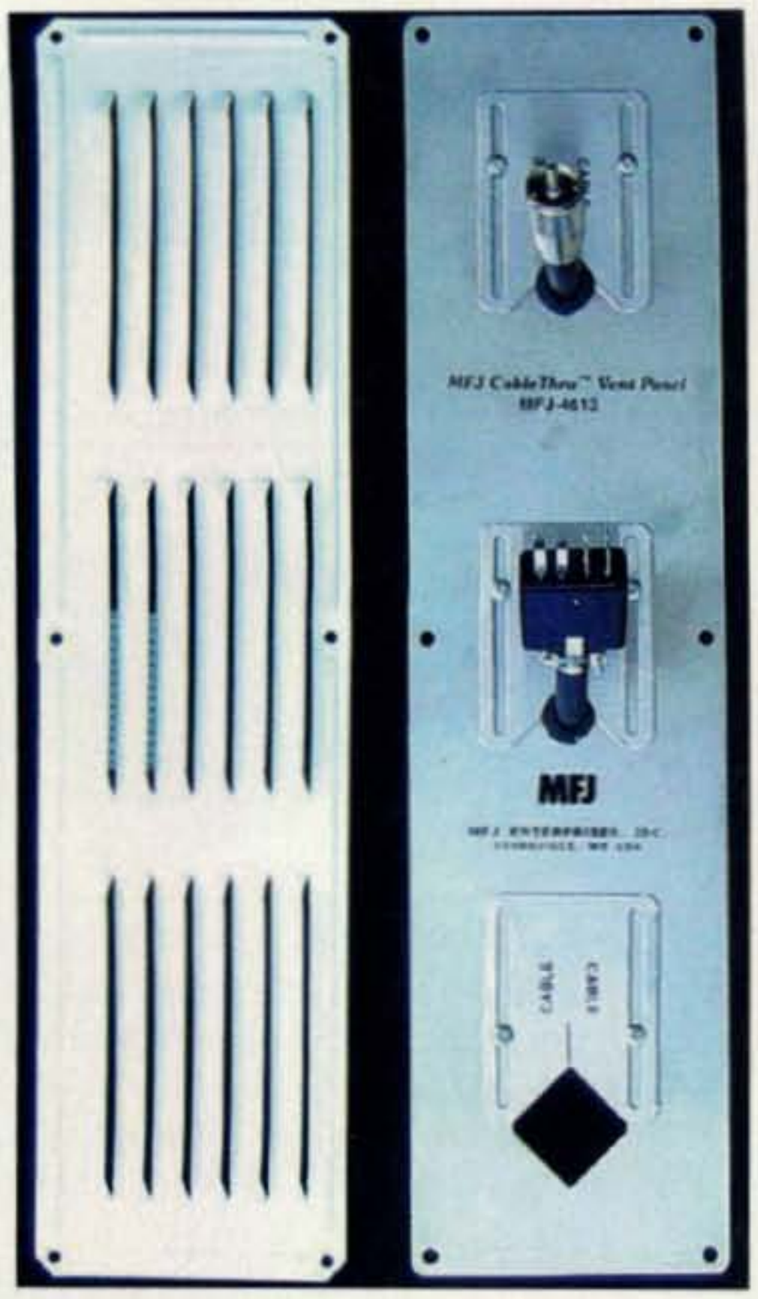


Photo C– MFJ AdaptiveCable™ Air-Vent Plate can replace your standard house eave/soffit air vents. (Photo courtesy of MFJ)

If you are looking for another way to bring cables into your home, there is the MFJ AdaptiveCable™ Air-Vent Plate (photo C). Replace your standard house eave/soffit air vents with these MFJ AdaptiveCable™ Air Vent Plates: MFJ-4616 (six holes) $26.95, or MFJ-4613 (three holes), $14.95. To order, get a free catalog, or for your nearest dealer, call 1-800-647-1800; or visit <http://www. mfjenterprises.com>.

DX Engineering's Coax Connector Installation Tools

Before you get your coax into your shack or up your tower, you may want to take a look at the coax connector installation tools from DX Engineering. First is the DXE-CNL-911 Cable Cutting Tool (photo D). Using this tool, the cable is cleanly cut and round, not oval, as occurs when diagonal side-cutters are used, which can crush the cable while cutting. Price is $19.95.

Once the coax has been cut, the DXE-UT-8213 Coax Cable Stripper (photo E) can simplify the preparation of RG-8 or RG-213 coax to accept PL-259 UHF-style or two-piece Type N connectors. From the instruction manual, "Once you have cut your coax, place the prepared

On the Cover

This month's cover features Dave Cisco, W4AXL, of Hoover, Alabama, along with a small part of his collection of old ham radio gear. He notes that the rigs in our photo cover all of the major American manufacturers of the 1950s and '60s. Next to Dave's right arm is a National NC-173. Below that is a Hallicrafters SX-101A (with a couple of other Hallicrafters rigs below it). Above the NC-173 is a Johnson Ranger, and above that is a Hammarlund Pro-310. Over Dave's head is a Drake 2B, and above that and to the right is a Collins 75A2.

Dave says he's been an avid collector of vintage radios for about 25 years. He says his interest was sparked by trying to recreate his first station (he was licensed in 1953), and then it took on a life of its own. Today, Dave's collection includes several hundred pieces ("I've lost count," he says), and he is president of the Alabama Historical Radio Society, a group interested in all sorts of old radio gear (http://alabamahistoricalradiosociety.org). The AHRS runs a museum in Birmingham and regularly puts on programs about old radios, mostly for senior citizen groups. The presentations focus on radio in Birmingham and include recordings of old radio programs as well as vintage gear.

On the air, Dave operates everything from 160 meters to 70 centimeters and his primary interest is DXing. He has #1 Honor Roll recognition from ARRL and holds CQ's Worked All Zones award. Dave is also active in the Birmingham Amateur Radio Club and the Birmingham DX Club. His current station consists of a Yaesu FT-1000 and a variety of antennas. The main one is a 5-element monobander for 20 meters, but he's always putting up something new. "My wife says the house grows every time she looks at it," he notes. *(Cover photo by Larry Mulvehill, WB2ZPI)*

Photo D– The DX Engineering DXE-CNL-911 Coaxial Cable Cutting Tool. (Photo courtesy of DX Engineering)

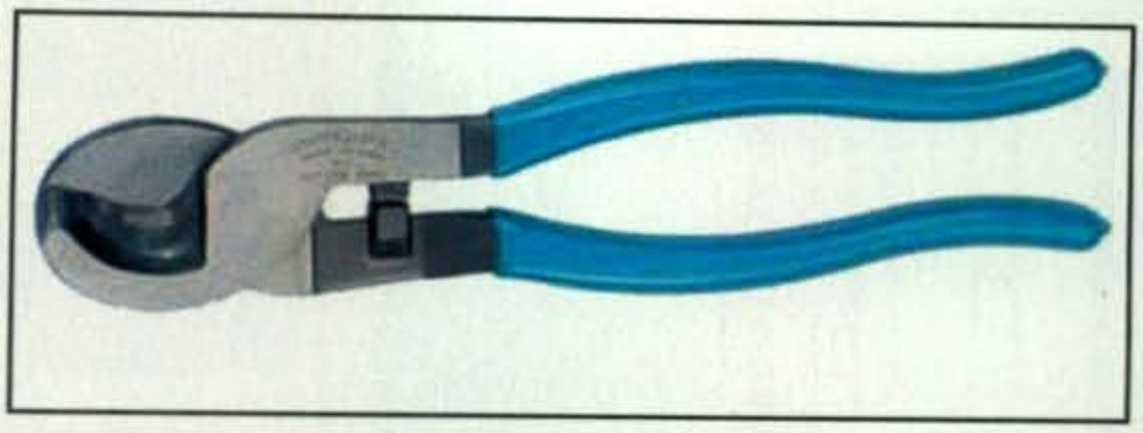


Photo E– The DX Engineering DXE-UT-8213 Coax Cable Stripper. (Photo courtesy of DX Engineering)

coaxial cable end into the body of the UT-8213 labeled '1st CUT.' Firmly grip the coaxial cable and the UT-8213, turn the UT-8213 in a clockwise direction while applying steady and slightly firm pressure. The UT-8213 will begin cutting. Keep turning the tool until it will not cut anymore; it will stop cutting at the proper length. Remove the coaxial cable, turn the UT-8213 around for the second cut. Insert the coaxial cable into the tool, and again turn the tool in a clockwise direction until the cutting is complete. Remove the coaxial cable. Clean any excess cable cuttings from the tool." The DXE-UT-8213 is $39.95

To finish the job, you can use the DXE-UT-80P assembly tool (photo F), which allows simple threading of the PL-259 sleeve onto the vinyl jacket of RG-8/U, RG-213/U, LMR-400, and other similar-size cables. Again from the instruction manual: "Place the threaded sleeve of the PL-259 connector over the end of the coaxial cable. Start the coaxial cable end into the body of the connector and make sure all the strands of the center conductor of the cable are inserted into the center pin. Then, use this simple hand-gripped tool—forget about those pliers that scarred the connector and ripped off chunks of metal—and thread the connector body onto the stripped cable end. Tighten the tool until the PL-259 is fully seated on the coaxial cable. A visual guide at the end allows easy viewing of the cable center conductor for proper depth of installation. When the PL-259 is fully on the coaxial cable, remove it from the assembly. This tool allows a perfect and easy connector installation every time." There is also a similar tool for installing N Connectors. Price for either model is $22.95.

Photo F– The DX Engineering DXE-UT-80P assembly tool which allows simple threading of the PL-259 sleeve onto the vinyl jacket of RG-8/U, RG-213/U, LMR-400, and other similar size cables. (Photo courtesy of DX Engineering)

For more information or to order any or all of these tools, visit <www.dxengineering.com>.

Radio Daze

This month we continue our look at potential holiday gift ideas. The Radio Daze website (www.radiodaze.com) is packed with items for the nostalgic ham or SWL, including books, kits, replacement parts, and reproduction items.

Among the available the books, the *Collector's Guide To Antique Radios,*

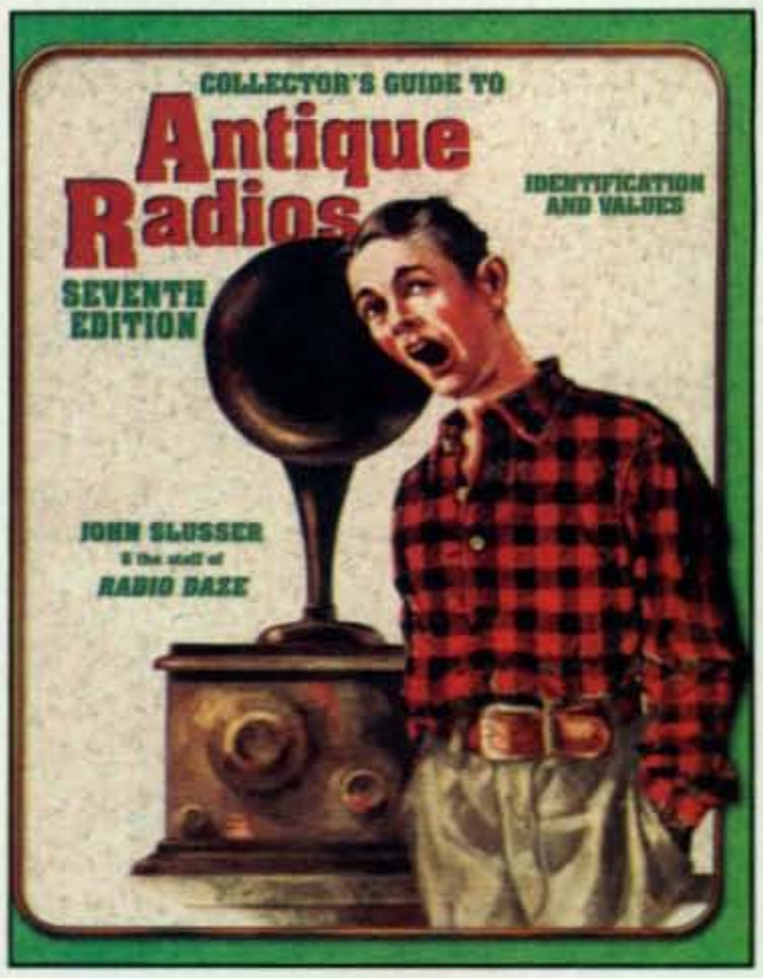


Photo G–Collector's Guide To Antique Radios, *7th Edition, has approximately 1200 photos along with a guide to prices for collectors. (Image courtesy of Radio Daze)*

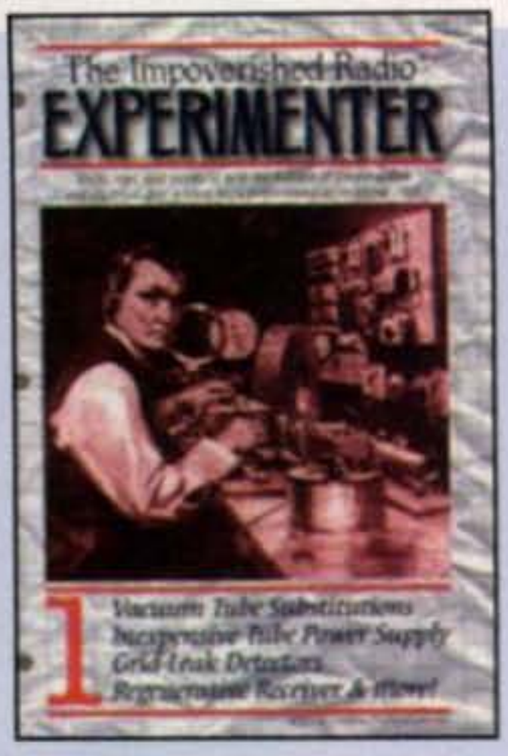


Photo H– The Impoverished Radio Experimenter *series helps you build radios and electronic devices "the old-fashioned way." (Image courtesy of Radio Daze)*

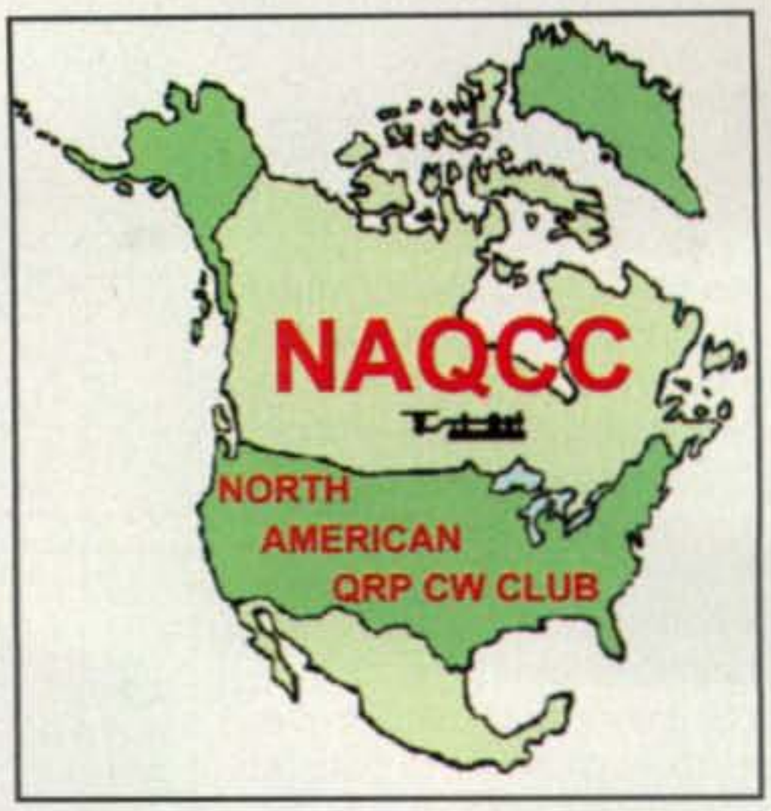


Fig. 1 – North American QRP CW Club (NAQCC) information is part of the fine website of K3WWP. (Screen capture from the K3WWP website)

7th Edition (photo G), has approximately 1200 photos along with a guide to prices for collectors, at $24.95. *The Impoverished Radio Experimenter* series (Volumes I through V, photo H) helps you build radios and electronic devices "the old-fashioned way." Each book in the series is $5.95. Kits include a variety of receivers: crystal, single tube, and even a razor-blade foxhole receiver. For more information or to order visit <www.radiodaze.com>.

SchmartSolder

SchmartBoard, a producer of a number of circuit prototyping boards, has introduced SchmartSolder™. According to the manufacturer, "SchmartSolder makes hand-soldering though-hole easy." SchmartSolder are loops of solder produced in just the right diameter to fit over the component leads. One places the solder over the lead and flush to the circuit board and simply touches the soldering iron to the SchmartSolder. The SchmartSolder quickly melts and flows into the hole. "The result is a perfect, neatly soldered component with no cold solder joints or other flaws." A video showing the use of the product is viewable at: <http://www.schmartboard.com/index.asp?page=resources_howto>. The suggested retail price of SchmartSolder is $5.00 for 50 pieces and the product is available on SchmartBoard's website (www. schmartboard.com) and through SchmartBoard's distributors.

The Amateur Radio Website of the Month

This month's Amateur Radio Website is from K3WWP, John Shannon of Kittanning, Pennsylvania. This is "one of the oldest continuously updated ham radio sites on the internet, founded on September 8, 1996." John's site has comprehensive lists of site links on almost all facets of amateur radio, but three main areas stand out: Encouraging CW Operation, QRP Operation, and the North American QRP CW Club (NAQCC, fig. 1).

John is a member, officer, and co-founder of the NAQCC and you can join for free! "No dues or membership fees—open to any licensed radio amateur or shortwave listener (SWL) worldwide with at least some interest in CW/QRP operation. No need to be a 100% CW nor 100% QRP operator." The NAQCC sponsors NAQCC activity days, special operations, sprints, and monthly activities and a newsletter.

Wrap-up

That is all for this month's column. Remember, I welcome your feedback, questions, and/or comments. If you are a producer of a new product for amateur radio, please feel free to e-mail me or use the address on the first page of this column. Until next month . . .

73, Anthony, K8ZT

Note: *Listings in "What's New" are not product reviews and do not constitute a product endorsement by CQ or the column editor. Information in this column is primarily provided by manufacturers/vendors and has not necessarily been independently verified. The purpose of this column is to inform readers about new products in the marketplace. We encourage you to do additional research on products of interest to you.*

awards

BY TED MELINOSKY,* K1BV

USA-CA Updates

Earlier this year, the staff at *CQ* thought they were going to run out of their stock of the USA-CA Record Booklet. I was asked for a list of changes needed to update the new edition. I prepared a reply, adding Broomfield County, (CO), and correcting the names of Staten Island (NY) to Richmond (NY) and Dade (FL) to Miami-Dade (FL). In addition, there were a small number of housekeeping changes, including corrections to a number of small issues that crept in over the years. For example, the last time the booklet was printed, the internet was still quite young, and "floppy disks using ASCII format" actually meant something to the hi-tech community.

Then another (the last) box of the little red booklets was discovered and the need for a reprint was pushed into the future. Today most of the applications come from spreadsheet or database record-keeping PC programs and use of the red booklet is not as frequent.

Bob Gedemer, KA9JAC, notes that the USA-CA rules shown on the *CQ* website could benefit by some minor updates as well. For example, he suggests that for the majority of applicants who use computer record keeping, a convenient way to print out the application and witness certification forms would be very helpful. The USA-CA rules page on the *CQ* website already provide a handy way to print out county maps via a link to the US Census Bureau. It wouldn't take much effort to prepare a PDF document that could be used for USA-CA certifications. A second suggestion was to include the information about the optional plaque, which is available to all completers. These are good ideas, and I'll follow up on them.

USA-CA Special Honor Roll

James Ashton, W8FNW
USA-CA All Counties #1167
August 20, 2008

USA-CA Honor Roll

500

K9AAA	3437
K9AWR	3438
W8FNW	3439

1000

W8FNW	1754

1500

W8FNW	1470

2000

W8FNW	1362

2500

W8FNW	1281

3000

W8FNW	1191

The total number of counties for credit for the United States of America Counties Award is 3077. The basic award fee for subscribers is $6.00. For nonsubscribers it is $12.00. To qualify for the special subscriber rate, please send a recent CQ mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from CQ Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated June 1, 2000. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 12 Wells Woods Road, Columbia, CT 06237 USA. DX stations must include extra postage for airmail reply.

The PZK Awards Series

This month we present some of the awards sponsored by Poland's national radio organization, the Polski Zwiazek Krotkofalowcow (PZK). Polish hams are active, many are *loud*, and I suspect that your QSL collection already has a hefty bunch of their cards. Another way to get their cards is to start entering the annual SP DX Contest, which is held in early April and usually brings out the SPs in large numbers. The exchange they send is your RS/T plus the first letter of their province, which should allow you to complete the requirements for the Polska award within an hour or two. Then as the cards begin to arrive via the bureaus, you will have plenty of opportunity to earn more of the PZK awards, plus numerous other Polish awards.

General Requirements. Awards are available to licensed amateurs and SWLs. The cost for each award is 5 Euros, $US5, or 5 "new" IRCs. SWL okay. All contacts, with the exception of satellite or repeaters, regardless of band or mode, are valid for the awards. You must possess the QSLs, but the GCR rule applies. Apply to: PZK Awards Manager, Augustyn Wawrzwnek SP6BOW, P.O. Box 54, 85-613 Bydgoszcz 13, Poland; e-mail: <sp6bow@poczta.onet.pl>; internet: <http://www.pzk.org.pl/news.php>. (The award rules are available in English on the site.)

All Countries 15 Zone (AC 15 Z). Contact at least 23 countries/call areas located in CQ Zone 15 as follows: Aland Is. OHØ, Kaliningradsk UA2, Albania ZA, Latvia YL, Austria OE (2 call areas), Lithuania LY, Bosnia T9, Malta 9H, Corsica TK, Market Reef OJØ, Croatia 9A (4 call areas), Poland SP (4 call areas), Czech Republic OK, San Marino T7, Estonia ES, Sardinia IS, Finland OH (3 call areas), Sicily IT,

For the PZK All Countries 15 Zone (AC 15 Z) Award contact at least 23 countries/call areas located in CQ Zone 15.

*12 Wells Woods Rd., Columbia, CT 06237
e-mail: <k1bv@cq-amateur-radio.com>

Polska Award. Contact at least 16 provinces of Poland since January 1, 1999 to earn the Polska Award.

Contact at least 100 different "powiats" (small districts of Poland) to achieve the Powiat Award. Special endorsement stickers are available.

Hungary HA, Slovenia S5, Italy I, Vatican City HV, Macedonia Z3, Yugoslavia YU, Slovakia OM.

The contacts with four call areas of Poland are mandatory. Your list should be in alphabetical order. Contacts since January 1, 1955 are valid for the award.

Polska Award. Contact at least 16 provinces of Poland since January 1, 1999. On HF, SP stations need at least five contacts in each province. EU need two stations in each province. All others need one station in each province.

All bands and modes okay. No use of cross-band QSOs or repeaters. Province identifiers are: B, C, D, F, G, J, K, L, M, O, P, R, S, U, W, Z. Note that most Polish QSLs seem to have this information printed on them.

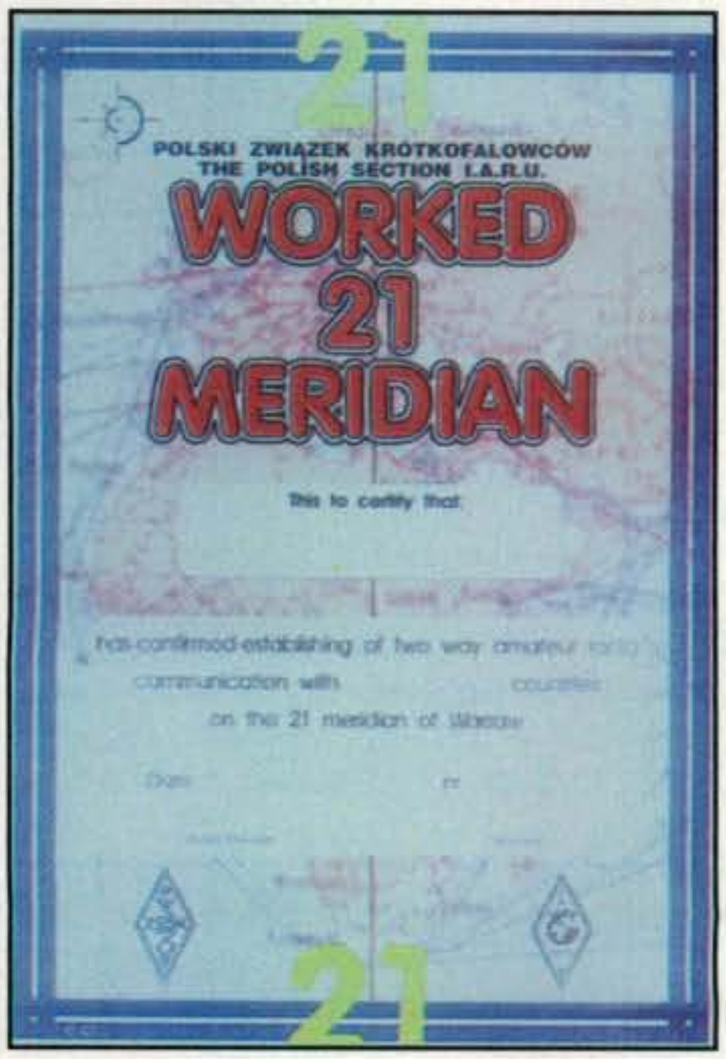
Powiat Award. Contact at least 100 different "powiats" (small districts) since January 1, 1999. Special endorsement stickers for 200, 300, 350 are available. All bands and modes. Cross-band QSOs and ground or satellite repeaters do not count. Special endorsement for use of one mode. Special endorsement for contacting all 380 powiats. Endorsement stickers for the Powiat award are 2 Euros, $US2, or 1 new IRC.

The powiat is frequently found on Polish QSLs sent after 1999. Look for "SPPA" followed by two or three letters. The first would be the province indicator, and the second and third are the powiat designator.

Worked 21 Meridian Award. This award is issued for contacts with at least 16 countries located on the 21st east meridian. A QSO with Poland is mandatory. Contacts since January 1, 1955 are valid for the award. Submit list in alphabetical order. The countries list is as follows: Aland Is. OHØ, Albania ZA, Latvia YL, Angola D2, Libya 5A, Botswana A2, Lithuania LY, Central African Republic TL8, Namibia/SWA, ZS3/V5, Chad TT8, Norway LA, Czech Rep OK, Poland SP, Estonia ES, Republic of South Africa ZS2–6, Finland OH, Republic of Zaire 9Q, Greece SV, Romania YO, Hungary HA, Slovak Republic OM, Kalingradsk UA2, Svalbard JW, Macedonia Z3, Sweden SM, Yugoslavia YU.

European Union - SP Award. Contact at least 25 members of the European Union on or after January 1, 2004, the date that Poland joined the EU. The countries include: CT, DL, EA, EI, ES, F, G, HA, I, LX, LY LZ, OE, OH, OK, OM, ON, OZ, PA, SM, SP, SV, YL, YO, ZC4/5B4, 9H.

We're always interested in hearing from clubs, special interest groups, or individuals who sponsor awards. You can contact me at the e-mail or snail-mail address shown on the first page of this column. 73, Ted, K1BV



The Worked 21 Meridian Award is issued for contacts with at least 16 countries located on the 21st east meridian.

Contact at least 25 members of the European Union on or after January 1, 2004 to earn the European Union - SP Award.

dx

BY CARL SMITH,* N4AA

Stating Your Callsign On The Air plus "News" on Glorioso

Recently, a personal experience on 20 meters SSB brought to mind one of those things I have no doubt mentioned before. It's just one of my pet peeves: DX stations who do *not* give their callsigns.

I saw a station spotted on the cluster, and since I don't have a QSL card from that particular location, I moved up to that frequency. He was operating split, so I set up for that mode and hit the button to warm up my amp, since It was obvious from the pile-up that I would need an extra little boost to break through. My amp takes about three minutes to get up to "temperature," so I just sat back and listened. The DX station must have worked at least 15 or 20 stations while I was waiting. He *never* once gave his call. I listened for a few more minutes and he still didn't give his call. I wondered if I should I throw my call in there. I was not even sure who this guy was, since my only clue was the spot(s) on the cluster.

Throwing all caution to the wind, I gave my call. It took a few tries, but he did come back to me and gave me a report. I replied and he still didn't give his call. I continued to listen for another five minutes or more. For whatever reason, he only came back to a few more stations and then just disappeared—still never having given his callsign. Well, did I work this "spotted" station or didn't I? I guess I'll send a card and see if I get one back, but in my mind I'm not sure if I should claim the contact. I've never been on a DXpedition and that's my loss. However, in my opinion, there is *no* excuse for a DX station not to give his callsign at least once every ten minutes or more often.

Here in the United States, we are *supposed* to give our call at least every ten minutes. Most of us do that, at least every ten minutes. Understand that I usually run "unassisted" if I am in a contest, and for the most part I use S&P (search and pounce). I've had my fun in years long gone just sitting in one place and running the pile-ups. Therefore, it may be the wrong way to look at it, but I've decided that if I don't hear the station give his call after three contacts, I simply turn the knob. Who am I hurting? Myself? My score? Frankly, I don't care who he is, where he is, or if he is. Why should I sit there and listen to this guy for half an hour just to discover I worked him "yesterday" with a different operator in a multi-op situation, so I didn't recognize the voice or pattern of his operation? This is a total waste of my time and energy, and at my age, I don't like to waste either of them.

*P.O. Box DX, Leicester, NC 28748-0249
e-mail: <n4aa@cq-amateur-radio.com>

We're always glad to show young people getting involved in ham radio. Here we find Sarah, the granddaughter of Ted, K7OM, in South Carolina. Ted is quite active on the digital modes (see the screen). Sarah is 11 years old and with Ted's help is studying so she can take the exam and get her own license. (Photo courtesy of Ted, K7OM)

What do you do in these situations? Whether it's just chasing DX or working a contest, there just has to be some operating courtesy, right?

Glorioso

Last month I mentioned the French operation from Glorioso. There has not been any news simply because there was no news. Rumors and speculation began to run rampant, so Didier, F5OGL, the team leader, put out the following to quell the speculation, etc. I quote his comments as written, as of September 7, 2008:

Considering numerous rumours spread by non-authorized hams about the dates of the next Glorioso 2008 DXpedition, I think I have to give some information to avoid any more errors.

On the island, the anti-cyclonics shelters building is nearly finished. The taking over of the French Army sovereignty personnels and the return of the building workers will be effective at the end of this month.

At the beginning of September, after the last checking on the installations, especially on electricity, all the heavy building gear will be evacuated from the island.

I am, more than ever, in very close contact with the military authorities of the French Forces for the South zone of the Indian Ocean, on Reunion Island. I've met the new HQ Chief warrant officer, before his

starting for his new 3 years assignment to the zone. He assured me of his entire support and help for this expedition.

The last problems to be solved are about some local logistics, especially the dates usable for the military plane flights and boat departures, which schedules haven't nothing common with commercial ones. I repeat that all the necessary authorisations are in hand. Believe us about our will to do a most perfect as possible DXpedition to the Glorioso. For that, safety first is our goal.

Know if it could be easy to go, the Glorioso rank in the most wanted list will not be No. 4. For another island in the Eparses, Europa 2003, we had to work several years to prepare it before going. All the ham operators are personnel of the French Military Defense and they all have professional assignments which have priority over all, including the ham radio DXpedition. The major risks in the zone don't allow to include civilian ham ops in the crew.

No date is fixed today, but I'm doing all my best to lead Glorioso 2008 before the end of this year. It must be said that without all combined elements gathered, I prefer to postpone the operations as often as it will be necessary. I continue to work hard to put Glorioso on the air and know that's not very easy.—*73's de Didier, F5OGL, Glorioso 2008 Team Leader*

Didier's comments go right along with the last paragraph of my September column on rumors. He said, "Considering numerous rumours spread by non-authorized hams about the dates of the next Glorioso 2008 DXpedition . . ." The key words here are "non-authorized hams." It just confirms what I was referring to in that September column. Someone hears a word or words, perhaps out of context, repeats it, and before long you have a tale worthy of the *New York Times* Best Seller list. Unless it comes from a known, reliable source associated with the DXpedition, don't repeat it. Just treat it for what it is ... pure speculation not worthy of repeating. When information is available, it will be released by the organiz-

The WAZ Program

6 Meters

85.....K4PI (25 zones)

20 Meter CW

580.....HAØMO

All Band WAZ

Mixed

8523.....IK2YVI 8524.....W4TMR

SSB

5083.....IZ2DDU 5084.....IZ2BVL

CW

545.....HB9FAE

RTTY

189.....JE6TSP

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for all *CQ* awards is $6.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $12.00 for nonsubscribers. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

The WPX Program

SSB

3015.....DK6BT 3016.....N5YY

Mixed

2014.....NØYO 2015.....DK6BT

Digital

16.....JA1CKE

CW: 750 F5PBL. 900 GØDEZ. 1300 VE3CR. 3150 WA5VGI.
SSB: 750 N5YY. 1300 NØYO. 1450 VE3CR. 1850 DK6BT. 2350 WA5VGI.
Mixed: 1250 NØYO. 1850 DK6BT, VE3CR. 3650 WA5VGI.
Digital: 350 JA1CKE.

160 Meters: NØYO, DK6BT, VE3CR
80 Meters: NØYO, DK6BT, VE3CR
40 Meters: NØYO, DK6BT
30 Meters: KT2C
20 Meters: DK6BT
15 Meters: DK6BT
10 Meters: DK6BT

Asia: DK6BT
Africa: DK6BT, VE3CR
Europe: DK6BT, GØDEZ
Oceania: DK6BT, VE3CR
North America: DK6BT
South America: DK6BT

Award of Excellence:
17 Meter Bar: KT2C
6 Meter Bar: N4MM, N6JV
Digital Bar: N6JV

Award of Excellence Holders: N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MDD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GO, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, WB8CNL, W1JR, F9RM, W5UR, CT1FL, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, AB9O, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8UB, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POA, N6JV, W2HG, ONL-4003, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MS, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, I1WXY, LU1DOW, N1IR, IK4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBF, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, WZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, I7PXV, S53EO, DF7GK, S57J, EA5BM, DL1EY, DJ1YH, KUØA, VE2UW, 9A9R, UAØFZ, DJ3JSW, OE6CLE, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY, RAØFU, CT4NH, EA7TV, W9IAL, LY3BA, K1NU, W1TE, UA3AP, EA5AT, OK1DWC, KX1A, IZ5BAM, K4LQ, KØKG, DL6ATM, VE9FX, DL2CHN, W2OO, AI6Z, RU3DX, WB9IHH, CT1EEN, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, KT2C, UA9CGL, AE5B, KØDEQ, DKØPM, SV1EOS, UAØFAI, N4GG, UA4RZ, 7K3QPL, EW1CQ., UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI.

160 Meter Endorsements: N4MM, W4CRW, K5UR, VE3XN, DL3RK, OK1MP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8ILC, K9BG, W1CU, G4BUE, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR2QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N6JV, ONL-4003, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S50A, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, DJ1YH, KUØA, VR2UW, UAØFZ, DJ3JSW, OE6CLD, HB9BIN, N1KC, SM5DAC, S51U, RAØFU, CT4NH, EA7TV, LY3BA, K1NU, W1TE, UA3AP, OK1DWC, KX1A, IZ5BAM, DL6ATM, W2OO, RU3DX, WB9IHH, G4PWA, OK1FED, EU1TT, S53MJ, DL2KQ, RA1AOB, UA9CGL, SM6DHU, KØDEQ, DKØPM, SV1EOS, N4GG, UA4RZ, 7K3QPL, EW1CQ, UA4LY, RZ3DX, UA3AIO, UA4RC, N8BJQ, UA3BS, UA9FGR, UT3UY, WA5VGI.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 355, New Carlisle, OH 45344 USA. Note: WPX will not accept prefixes/calls which have been confirmed by computer-generated electronic means.

*Please Note: The price of the bars for the Award of Excellence are $6.50 each.

5 Band WAZ

As of September 1, 2008, 756 stations have attained the 200 zone level and 1610 stations have attained the 150 zone level.

New recipients of 5 Band WAZ with all 200 zones confirmed:
DL3DXX

The top contenders for 5 Band WAZ (zones needed, 80 or 40 meters):

SU1U, 199 (27)
N4WW, 199 (26)
W4LI, 199 (26)
K7UR, 199 (34)
W2YY, 199 (26)
IK8BQE, 199 (31)
JA2IVK, 199 (34 on 40m)
IK1AOD, 199 (1)
WØCP, 199 (18)
GM3YOR, 199 (31)
VO1FB, 199 (19)
KZ4V, 199 (26)
W6DN, 199 (17)
W3NO, 199 (26)
HB9DDZ, 199 (31)
RU3FM, 199 (1)
N3UN, 199 (18)
OH2VZ, 199 (31)
W1JZ, 199 (24)
W1FZ, 199 (26)
SM7BIP, 199 (31)
SP5DVP, 199 (31 on 40)
N4NX, 199 (26)
N4MM, 199 (26)
EA7GF, 199 (1)
N6HR/7, 199 (37)
JA5IU, 199 (2)
RU3DX, 199 (6)
N4XR, 199 (27)
HA5AGS, 199 (1)
VE3XN, 199 (26)
YU7GMN, 199 (10)
K7LJ, 199 (37)
RA6AX, 199 (6 on 10m)
RX4HZ, 199 (13)
KØGM, 199 (17)
S58Q, 199 (31)
EA5BCX, 198 (27, 39)
G3KDB, 198 (1, 12)
JA1DM, 198 (2, 40)
9A5I, 198 (1, 16)
K4CN, 198 (23, 26)
G3KMQ, 198 (1, 27)
N2QT, 198 (23, 24)
OK1DWC, 198 (6, 31)
W4UM, 198 (18, 23)
US7MM,198 (2, 6)
K2TK, 198 (23, 24)
K3JGJ, 198 (24, 26)
W4DC, 198 (24, 26)
F5NBU, 198 (19, 31)
OE2LCM, 198 (1, 31)
HA1RW, 198 (1, 31)
WK3N, 198 (23, 24)
W9XY, 198 (22, 26)
KZ2I, 198 (24, 26)
W7VJ, 198 (34, 37)
K9MIE, 198 (18, 21)
W9RN, 198 (26, 19 on 40)
W5CWQ,198 (17, 18)
WB9EEE, 198 (17, 18)
K9OW,198 (34on10, 2on15)
I5KKW, 198 (31&23 on 20)
JT1BV, 198 (4, 11)

The following have qualified for the basic 5 Band WAZ Award:

K3MSB (159 zones)

5 Band WAZ updates:

None

***Please note: Cost of the 5 Band WAZ Plaque is $100 shipped within the U.S.; $120 all foreign (sent airmail).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Award Manager, Floyd Gerald, N5FG, 17 Green Hollow Rd., Wiggins, MS 39577. The processing fee for the 5BWAZ award is $10.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $15.00 for nonsubscribers. An endorsement fee of $2.00 for subscribers and $5.00 for nonsubscribers is charged for each additional 10 zones confirmed. Please make all checks payable to Floyd Gerald. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. N5FG may also be reached via e-mail: <n5fg@cq-amateur-radio.com>.

The ICOM 7600! This unit was displayed at the Tokyo Hamfair 2008 the end of August and is the newest addition to the ICOM line. It has three roofing filters, USB ports in front and back, scope features like the IC-7700 ,and more. (Photo and info courtesy of Bill, N2WB, and Markus, DL9RCF)

A very active DX station, Victor, 4S7VK, in his ham shack with a wide variety of equipment. (Photo courtesy of Franz, DJ9ZB)

ers of the operation and published by the various DX news sources in plenty of time.

DXing Opportunities and Other ThingsYou Can Do

The contest season is in full swing now, and we're all trying to squeeze everything we can out of whatever propagation Cycle 23 and/or 24 are allowing. In addition to all of the contest weekends from now through next March, there are some DXpeditions scheduled in the next few months. In November, 5X1NH will be active from Uganda and a group will be on from Palau (T8). In December you can look forward to an operation from Bangladesh (S2), and then in early 2009 an operation has been announced for Spratly Island.

Back in early September I saw a report that an Australian had said we would be waiting at least another six months for the beginning of Cycle 24. Then there was that record-setting period of time in August/ September with *zero* sunspots.

THE WPX HONOR ROLL

The WPX Honor Roll is based on the current confirmed prefixes which are submitted by separate application in strict conformance with the CQ Master Prefix list. Scores are based on the current prefix total, regardless of an operator's all-time count. Honor Roll must be updated annually by addition to, or confirmation of, present total. If no up-date, files will be made inactive.

MIXED

5710 9A2AA	4148 VE3XN	3703 I2UIY	3332 ON4CAS	2873 W2ME	2358 I2EAY	1858 W7CB	1556 W2OO	964 K8ZEE
5152 W1CU	4114 N6JV	3635 KF2O	3294 W9OP	2704 K2XF	2271 VE6BF	1847 W2FKF	1511 KC9ARR	815 KL7FAP
4983 W2FXA	4080 I2PJA	3619 WB2YQH	3227 K9BG	2673 JN3SAC	2162 W3LL	1741 AB5C	1330 K6UXO	726 K5IC
4551 EA2IA	3916 N9AF	3552 WA5VGI	3091 9A4W	2503 K1BV	2116 AE5B	1739 KX1A	1322 AA4FU	682 AI8P
4494 N4NO	3821 I2MQP	3485 IK2ILH	3007 W2WC	2486 N8BJQ	2192 N2SS	1705 W2EZ	1269 K5WAF	644 KWØH
4447 9A2NA	3791 S53EO	3483 YU7BCD	2965 OZ1ACB	2455 W6OUL	1951 KØKG	1662 SV1DPI	1016 RA1AOB	636 ZS2DL
4295 YU1AB	3801 KØDEQ	3325 SM6DHU	2946 W9IL	2410 K5UR	1891 VE9FX	1643 N1KC	976 KM6HB	

SSB

4807 IØZV	3457 9A2NA	2726 IN3QCI	2326 CX6BZ	2076 K2XF	1821 W2FKF	1591 JN3SAC	1258 N1KC	864 VE6BF
4310 VE1YX	3198 CT1AHU	2711 LU8ESU	2300 SM6DHU	2071 N6FX	1765 KQ8D	1525 N8BJQ	1232 AG4W	806 K7SAM
4000 I2PJA	3155 I2UIY	2709 KF7RU	2250 I3ZSX	2046 K5UR	1754 DL8AAV	1480 AB5C	1145 EA3EQT	637 K5WAF
3900 F6DZU	3133 OE2EGL	2595 EA1JG	2209 IK2QPR	1946 W3LL	1729 W6OUL	1464 VE7SMP	1045 KX1A	
3889 OZ5EV	3108 I4CSP	2552 YU7BCD	2178 NQ3A	1935 SV1EOS	1714 IK2DZN	1463 I2EAY	1042 IZØBNR	
3544 I2MQP	2970 KF2O	2451 EA3GHZ	2135 W9IL	1927 AE5B	1688 KI7AO	1386 IK4HPU	1031 IK8OZP	
3473 EA2IA	2857 4X6DK	2431 G4UOL	2094 I8LEL	1866 SV3AQR	1623 VE9FX	1377 EA3NP	978 EA7HY	
3458 N4NO	2726 KØDEQ	2359 WA5VGI	2093 W2WC	1849 K3IXD	1611 W2ME	1338 AE9DX	951 KU4BP	

CW

4953 K9QVB	3412 EA2IA	2632 W2ME	2415 W2WC	2111 VE6BF	1848 I2EAY	1334 RUØLL	1053 K5WAF	608 IK2SGV
4947 WA2HZR	3085 WA5VGI	2623 SM6DHU	2324 OZ5UR	2089 K2XF	1804 EA7AAW	1310 K6UXO	1030 AA5JG	
4114 N6JV	3046 9A2NA	2606 YU7BCD	2309 JN3SAC	1967 I2MQP	1465 AC5K	1250 WA2VQV	915 N1KC	
4042 N4NO	2927 KØDEQ	2587 KA7T	2246 N6FX	1953 N8BJQ	1445 EA2CIN	1220 AA4FU	824 VE9FX	
3685 VE7DP	2688 I2UIY	2586 EA7AZA	2244 IK3GER	1945 K5UR	1395 W9HR	1147 KX1A	749 AE5B	
3557 LZ1XL	2636 KF2O	2582 I7PXV	2175 W9IL	1895 W6OUL	1364 WO3Z	1086 VE1YX	740 F5PBL	

DIGITAL

1107 W3LL	1009 GUØSUP	744 N8BJQ

An international group at the May Dayton DX Dinner (left to right): JK1OPL, 7N4TJR, JA1BRK, and W4NL. (Photo courtesy of David, K4PZT, and Lynn, W4NL)

QSL Information

GBØPIA via 2EØOYG
GB50RMM via GØFYX
GB6GW via GWØTKX
GC3GWB via MØDOL
GC4KPT via MØDOL
GC8LED via MØDOL
GH4KPT via MØDOL
GH8LED via MØDOL
GM3WOJ via N3SL
GM4YXI via N3SL
GM7TJV via VR2XMT
GN4KPT via MØDOL
GN8LED via MØDOL
GP3GWB via MØDOL
GP4KPT via MØDOL
GP8LED via MØDOL
GS2MP via N3SL
GS4KPT via MØDOL
GT3GWB via MØDOL
GT4KPT/P via MØDOL
GT8LED via MØDOL
GX4KPT via MØDOL
GX8LED via MØDOL
GX8LED/P via MØDOL

(The table of QSL Managers is courtesy of John Shelton, K1XN, editor of "The Go List," 106 Dogwood Dr., Paris, TN 38242; phone 731-641-4354; e-mail: <golist@golist.net>; <http://golist.net/>.)

There had not been such a lengthy period of zero spots since the early 1900s. Yet, in spite of all the hype about Cycle 23/24, there has been a large amount of DX on the bands up to 20 and even 17 meters at times. Oh, sure, 15, 12, and 10 have not been contributing much, if anything, to our country totals or our contest scores, but we have to be realistic about such things. We know from history that this too shall pass, and we will once again have those 150–200 Q's per hour rates on the upper HF bands, and we again can be filling in the blanks on our check sheets for DXCC on those bands.

When the bands are "flat" or you just need a diversion, many DXers are turning to their logs to find unconfirmed contacts and try to get them confirmed. Here is one of my own experiences:

Some weeks ago I asked for help in locating Warren Hull, who operated from Macquarie Island in 1996. Several replied, but the information they gave had already been tried. Finally, one reader sent me an address in Australia from a 1997 Callbook. An inquiry sent to that address was answered by an e-mail from a Mr. Warren Hull. He confirmed that he *was* the person I was looking for, and he did have the log and *only one* remaining QSL card for VKØWH. I sent him some green stamps for a reply to my inquiry, and he said he would be confirming my 40-meter CW contact shortly. Sure enough, about two weeks later I got the card. He is no longer licensed and has not been on the air for several years. *Patience and persistence worked for me!*

Until next time, enjoy the chase and please Have Fun! 73, Carl, N4AA

CQ DX Awards Program

SSB

2514 .....W9HT 2515 .....HB9DQD

SSB Endorsements

330 .....K3UA/339 310 .....RA1AOB/312
330 .....W6DPD/338 275 .....HB9DQD/286
320 .....W4MPY/325 150 .....W9HT/150

CW Endorsements

330 .....K3UA/338 330 .....W4MPY/336
330 .....WB4UBD/338 310 .....RA1AOB/317
330 .....K2TQC/337

RTTY Endorsements

330 .....WB4UBD/337 330 .....K3UA/332
330 .....NI4H/336

The basic award fee for subscribers to *CQ* is $6. For non-subscribers, it is $12. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. All updates and correspondence must include an SASE. Rules and application forms for the CQ DX Awards may be found on the <www.cq-amateur-radio.com> website, or may be obtained by sending a business-size, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 338 active countries. Please make all checks payable to the award manager.

vhf plus

BY JOE LYNCH,* N6CL

The First-Ever 2-meter Terrestrial QSO between ZS and FR

On August 14, 2008 history was made when Philippe (Phil) Mondon, FR5DN, and Glenn Kraut, ZS2GK, completed a terrestrial two-way QSO on 2 meters via tropospheric ducting. Tropospheric ducting as a propagation mode for amateur radio contacts dates back to the historical Hawaii to California QSO of July 8, 1957 between Tommy Thomas, KH6UK, and John Chambers, W6NLZ. More information on that QSO can be found in Part 1 of "The Lost Letters of KH6UK," by Mark Morrison, WA2VVA, which appeared in the Summer 2007 issue of *CQ VHF* magazine.

Spurred on by the Thomas-Chambers success, hams have explored possible tropo-ducting QSOs for decades. Encouraged by the 1995 establishment of the Brendan trophies (see below for more on them), hams have continued to look for ways to cross the Atlantic between the Americas and Europe via a terrestrial contact. Thanks to Dave Pedersen, N7BHC, hams in Africa have been encouraged to look into tropo ducting within their continent.

Now comes word of the first tropospheric-ducting QSO between South Africa and Reunion Island. What follows are accounts from Phil and Glenn from Phil's website (http://www.astrorun.com/~fr5dn/radio/tropo/14aout2008/zs2gk_14august2008.html), as well as background information relating to how the two participants were encouraged to make their historic QSO by Dave Pedersen, N7BHC. First, the background information from Dave:

Background of the FR5DN to ZS2GK QSO

By Dave, N7BHC

On August 14, 2008, FR5DN worked ZS2GK on 2 meters for the first VHF-ducting QSO between Reunion Island and South Africa. This was a new tropo DX record for both countries, and the first solid proof of transoceanic ducts in that region. The QSO represents the first of several paths that should be proven very soon, and results from some investigation by N7BHC in early 2008.

In his May 2000 "The World Above 50 MHz" column in *QST* (pages 77–78) Emil Pocock, W3EP, talked about some of the potential—but not yet proven—VHF tropo paths. While my direct interest now is the North Atlantic (having formerly lived in CA and worked HI), I started working with people around the South Atlantic a few months ago.

I lived in South Africa back in the late 1970s and was licensed as ZR2BI. While living there, I once heard Spanish signals from the southwest on 2 meters. Therefore, I've been pretty sure a duct from ZS to PY or LU does exist.

I had a trip coming up to South Africa in February 2008 and considered taking a few extra days to visit the west coast north of Cape Town to try working towards South America. I started closely watching the Hepburn maps *(Editor's note: see <http://www.dxinfocentre.com/tropo_eur.html> for more information on these propagation maps)* and soon noted that conditions were very good from Congo or Angola to the Recife or Salvador areas of Brazil. Not having much activity on 2 meters in Congo or Angola, I contacted some people whom I knew along the Congo coast to see if they could hear any FM broadcasts from South America. I got no response from anyone.

Further research on the web led me to John Turner on St. Helena Island. John has done some SWLing, and worked part time at the only FM station on St. Helena. I suggested he listen for African FM broadcast signals. He said he had occasionally heard French language transmissions on FM. These would probably be from one of the Congos. Within a few days he reported logging a Lubango, Angola station at about 1300 miles. A few days later he heard a station from Rissing, Namibia at 1400 miles. The next day he heard Springbok, South Africa. Several more stations were logged through early February from the west coast of South Africa. On February 18, 2008 John logged 25 stations in South Africa in 30 minutes, all the way down to Cape Town at 1950 miles.

He was receiving some station from the African coast on more than half the days in January and February. All of this was on his car radio with its whip antenna. Many stations were full-quieting stereo signals.

VHF Plus Calendar

Nov. 2	Moon Apogee. Very poor EME conditions
Nov. 6	First Quarter Moon
Nov. 9	Good EME conditions
Nov. 13	Full Moon
Nov. 14	Moon Perigee
Nov. 15–16	ARRL 50 MHz to 1296 MHz EME Contest (See text for details)
Nov. 16	Moderate EME conditions
Nov. 17	*Leonids* Meteor Shower Peak
Nov. 19	Last Quarter Moon
Nov. 23	Moderate EME conditions
Nov. 27	New Moon
Nov. 29	Moon Apogee
Nov. 30	Very poor EME conditions

—EME conditions courtesy W5LUU

e-mail: <n6cl@sbcglobal.net>

Unfortunately, there were no hams on St. Helena interested in or equipped to try to work ZS1. I was in touch with ZS1 hams and they got very keen to give it a shot, however, to no avail.

While this was going on in February, I tracked down Ian Coverdale, ZD8I, and Stedsen (Sted) Stroud, ZD8S, on Ascension Island and asked them the same question. Could they listen for signals from Africa or South America, or had they heard anything in the past? Ian reported that there is a maritime monitor receiver at the top of Green Mountain. It sometimes receives Cape Town Harbor Radio ZSC on 156.8 MHz, a range of 2750 miles. Sted said that it is quite common to hear Brazilian FM stations using indoor FM radios. Recife at 1400 miles and Salvador at 1700 miles are the most likely sources. Unfortunately, again, none of the hams on Ascension Island are interested in or equipped to pursue VHF DX.

On March 1, 2008, I met with some of the Johannesburg hams, including Hal Lund, ZS6WB, and Jan (Pine) Pienaar, ZS6OB, when I was going thorough Johannesburg. We brainstormed and set in motion a plan to set up 2-meter beacons at a few key South Atlantic locations. Work is already under way assembling the St. Helena beacon. It will be based on a 2-meter SSB radio and a 160-watt amp, so it could be used for working DX when the band is open. A number of lower power beacons have been set up in South Africa as well in the last two months. Many ZS hams are now gearing up for transoceanic DXing.

I then posted the information on the South Atlantic FM broadcasting reports on the ZS-VHF forum and issued a challenge to the ZS hams to see who would be the first to work across the South Atlantic. After I posted that challenge, Phil, FR5DN, from Reunion wrote to say he was interested in trying for ZS2 and ZS5 on 2 meters. He quickly set up a 50-watt, 17-element Yagi beacon and ZS5 and ZS2 stations on the coast began listening for Phil, although they realized it was a long shot until next spring.

In the meantime, I worked with Phil to gather better equipment to build a better beacon. The final configuration was a Kenwood TR-9000 and a 160-watt amplifier set to 110 watts. The new equipment went on the air at the beginning of August 2008 with 1800 watts ERP beaming towards South Africa. Phil also hopes to set up a high ERP beacon pointing at VK6/VK8 in the next few months.

Within a few days of its being put in place, Glenn, ZS2GK, received weak

signals from the FR5 beacon. A QSO would have resulted then, but Phil got stuck in a rare Reunion Island traffic jam and did not make it make in time to work Glenn. On August 13, 2008 Glenn started hearing Phil's beacon in the evening. By early morning signal strengths had increased tremendously and the first QSO resulted. The details on that QSO from FR5DN's web page appear below.

In the last few months we've proven the existence of strong, reliable ducts across the South Atlantic, and spurred many people to ramp up to work tropo DX. Thanks to the FR5-ZS hookup, it is certain that many more QSOs will occur, thereby extending the distance as well as adding 70-cm QSOs to the mix. The first ZD7/ZD8 QSOs to South Africa and South America should be expected this coming southern summer as well, if stations can get on the air in both locations.

A network of these stations/beacons around the Atlantic and Indian Oceans would be very helpful to boost activity from areas where the band is open but nobody is on the air. Watch for future publicity describing that project. The first two such beacons have already proven themselves, with FR5DN working ZS2GK, as well as the N7BHC beacon in FM15 being heard by Joachim (Joe) Kraft, CT1HZE, in Algarve, Portugal in August 2008. *(Editor's note: More details on that event will follow in a future column.)*

The QSO: From the Participants

From Glenn, ZS2GK: On Wednesday evening, August 13, 2008, I went to bed at about 0830 UTC, leaving the rig on and antennas pointing toward Reunion. I woke up at 0015 UTC and heard the beacon from my shack. I went over and saw that signals were low even with the Masthead pre-amp on. I was running CWGeT *(Editor's note: CWGeT is a Morse Code decoding program available at: <http://www.dxsoft.com/micwget.htm>)* to confirm hard copy of the signal, but it was not decoding. I switched off the pre-amp and returned to bed. About an hour later I heard the beacon again, but much stronger. I went to the shack and saw the signal on the S-meter.

I am, in fact, 365 km northeast of Port Elizabeth on a reading of 58 degrees east from Port Elizabeth. Grid locator is KF47kt. The QTH is about 200 meters above sea level and is 5 km inland. The track to Reunion is about 80 km over land with a small annoying hill in between, which affects about 3 degrees of the horizon. I am using my 4×2M9SSB array, horizontal polarized, with a mast-mounted pre-amp.

From Phil, FR5DN: At 0135 UTC on August 14, 2008 Glenn called me on my cell phone. He informed me that the beacon was being heard strong enough to allow a QSO. It was 0535 local time here.

So as to not awaken anyone, I spoke low and ran into the shack, switched off the beacon, and prepared to call Glenn on 144.200 MHz. I saw Glenn's signal at 55/56 with the pre-amp. At this point it was necessary to use the pre-amp. We decide to try FM, and I had clear copy on him. Time went fast and I had to get ready for work, and we stopped the QSO some 20/30 minutes later, but the band was still nicely open! The signal was crystal clear, almost no QSB, if any, on my side. Whoa! The first bridge was now there between ZS and FR! Before shutting down, I opened an FM VHF/UHF transponder repeater 145.200/431.050, situated at about 1200 meters altitude I guess, with a vertical antenna. Unfortunately, Glenn did not copy any signals. However, he was horizontally polarized at that time.

On August 11, the evening temperature was quite cold here. It was the same on the evening of August 13. On August 12 and 14, in the morning, a friend of mine living at around 1600 meters altitude found the temperature to be higher than "normal," some 8 to 10 degree C higher. Between August 11 and 12, the barometric pressure was rising. On the morning of August 14, after Glenn's QSO, I saw very, very little inversion layer above the horizon. It seemed stronger when I drove some more south for work.

The setup here is a Kenwood TR-9000 with a PA at 120 watts out into a 17-element Yagi at 6 meters above ground. The ERP is 1800 watts.

More details of this historic QSO can be found on the August 20, 2008 *ARRL Letter* website: <http://www.arrl.org/news/stories/2008/08/20/10269/>.

Will the Brendan Trophies Finally Be Won?

In 1995 the Irish Radio Transmitters Society (IRTS) announced the establishment of the Brendan Trophies for the first two-way communications between the continents of Europe and America (North or South) within the 2-meter amateur band. The Brendan trophies are two inscribed Waterford crystal cut-glass vases. Complete rules for the trophies can be found on the IRTS website: <http://www.irts.ie/cgi/brendan.cgi>.

In his June 1995 "The World Above 50 MHz" column in *QST* (see pages 92–93) Emil Pocock, W3EP, gave a nice history of the establishment of the Brendan trophies, along with some strategies for winning them. Ev Tupis, W2EV, added his insight in an article published in the August 2002 issue of *QST* entitled "The Brendan Trophies: Insights for the New Millennium" (see pages 36–39).

Emil pointed out that the trophies are named after St. Brendan the Bold (also known as Brendan the Navigator), a 6th-century Irish monk, who, according to legend, sailed to distant lands, presumably to the American continent. Unfortunately, there is no historical record of his supposed achievements. Even so, his legend has been the inspiration for centuries of transatlantic explorers.

Since the establishment of the Brendan trophies award, there have been claims of making contacts, most notably between Alexander Dutkewych, N2PIG, and his wife, Debra, K2PIG. According to Alex's posting on <http://www.QRZ.com>: "[Alex] operated as VO1/N2PIG/P, at The Captain's Inn, Old Perlican, Avalon Peninsula, Newfoundland, Canada. Debra operated as EI/VA3PIG/P, from Allaghee Mor, St. Finian's Bay, Iveragh Peninsula, County Kerry, Republic of Ireland on March 17, 19, and 20, 2002. Meteor scatter [WSJT] techniques were used to make the contacts."

Unfortunately for the couple, in August 2003 the *IRTS News* reported that the

Looking Ahead in CQ

Here are some of the articles we're working on for upcoming issues of *CQ*:

- Gordo's view on opportunities from the digital TV switchover
- An Invisible Mobile Installation, by VY1SW
- A Small Spiral Antenna, by KM5KG

Do you have a ham radio story to tell? See our writers' guidelines on the CQ website at <http://www.cq-amateur-radio.com/guide.html>

IRTS Awards Panel decided that the application did not comply with the provisions of its Rule 6, which states that the Awards Panel has sole discretion in deciding on the validity of a contact. The *IRTS News* report said the level of proof provided for the contact was insufficient. (Background information is courtesy the *ARRL Letter*, Vol. 22, No. 36, September 12, 2003. A more complete report can be found in Sean Nolan, EI7CD's "EI VHF News: January – December 2003," which is archived at: <http://www.qsl.net/ei7gl/03news.htm>.)

With the work of Dave Pedersen, N7BHC, and others to establish beacons now under way, there is encouragement that the Brendan trophies will finally be awarded by the IRTS. More information on Dave's effort to establish these beacons will appear in a future column.

Current Contest

The second weekend of the ARRL 50 MHz to 1296 MHz EME Contest is November 15–16. For contest rules, see the issue of *QST* prior to the month of the contest or the League's URL: <http://www.arrl.org>.

Meteor Shower

The *Leonids* is predicted to peak at 0022 UTC on November 17. As with last year's shower, this year's peak may go largely unnoticed.

For more information on the above meteor shower predictions see Tomas Hood, NW7US's propagation column elsewhere in this issue. Also visit the International Meteor Organization's website: <http://www.imo.net/calendar / 2008>.

And Finally . . .

Thanks to Dave Pedersen, N7BHC, and others, efforts are under way to explore new possibilities for VHF-plus propagation. As Dave mentioned in his piece, now that a 2-meter QSO has been achieved, a 70-cm QSO is certain to follow. It's only a matter of time. Also, it is just a matter of time before other areas of the world will experience DX QSOs, again thanks to today's amateur radio communications pioneers.

If you have achieved a special QSO and want to report on it in this, your column, please e-mail me at: <n6cl@sbcglobal.net>. I will be happy to highlight it here in a future column, or in include an article in an issue of *CQ VHF* magazine. Until next month . . .

73 de Joe, N6CL

BY JOHN DORR,* K1AR

Multi-Op Contesting: Some Practical Advice for Everyone

November's Contest Tip

There are an increasing number of top-scoring competitors that are providing real-time streaming audio of their contest operations over the internet. Randy, K5ZD, comes to mind as a notable example (check out http://k5zd.contesting.com/live>). There is no better way to learn from the "winners" than to listen to how they do it. It's worth the time to listen to their operating style to pick up winning techniques on SO2R (Single Op Two Radios) operation, calling in pile-ups, methods of tuning for multipliers, and a wide range of other operating strategies. Stay tuned to their announcements on the CQ-Contest e-mail reflector and elsewhere to learn from the best and hopefully improve your score, too!

Multi-op contesting has become an enormously popular operating mode on both SSB and CW (and the digital modes, for that matter). Not only do you generally make bigger scores than operating by yourself, you also have the advantage of enjoying the camaraderie that comes from operating with a team.

Upon examining my own contest operating over the past 40 years, I discovered that there has been a fairly even split between single operating and participation at multi-op stations. Over the years, I've had the good fortune to participate among some of the best, including from W2PV, W1ZM, W3AU, W3LPL, K1EA, K3LR, KØRF, K1GQ, K1OX, and even a few at my own station. In fact, getting involved with multi-op contests/stations is really where I learned the basics of contesting, putting in my time by operating with some of contesting's best operators such as K2TR, K1ZM, W3LPL, K3EST, and many others. In addition to benefiting from the ability to experience contest operating at its finest, I also discovered that multi-op contesting adds new meaning to the concept of preparation.

There is More to It Than Just Showing Up?

Let's face it: As a single operator, contesting is much easier from a logistical standpoint. It's akin to being single versus married with a boatload of kids. Both have their benefits, but many of us know the extra effort required in managing a multi-op household. Contesting is no different in that regard. Those who are not committed to the ongoing preparation required for success as a team will most certainly underachieve in that context. So, with that in mind, let's focus on some of the details that separate the winners from the losers.

You Can Never Be Over-Prepared

No matter what operating category you choose, being prepared is always a key differentiator. It's the consummate example of what the Boy Scouts of America promote in their group. However, adequate preparation is even more critical when it comes to managing a multi-op situation. Consider the challenges you have to consider in successful planning:

- Operators
- Radio equipment
- Antennas/switching
- Computers/software/networking
- Accessories
- Operating game plan
- Human comforts (sleeping arrangements, food, transportation for some, etc.)
- Inter-station interference

With the list in hand, let's take a look at each and do a little staged planning right now.

Calendar of Events

All year	**CQ DX Marathon**
Oct. 25–26	**CQ WW DX SSB Contest**
Oct. 25–26	ARRL Int'l EME Competition
Nov. 1–2	Ukrainian DX Contest
Nov. 1–2	RCA QSO Party
Nov. 1–3	ARRL CW Sweepstakes
Nov. 8–9	WAEDC RTTY Contest
Nov. 8–9	Japan Int'l DX SSB Contest
Nov. 8–9	OK/OM DX Contest
Nov. 8–9	Kentucky QSO Party
Nov. 8–9	CQ-WE Contest
Nov. 15	Feld-Hell Club Sprint
Nov. 15–16	RSGB 1.8 MHz CW Contest
Nov. 15–17	ARRL SSB Sweepstakes
Nov. 22–23	LZ DX Contest
Nov. 22–23	ARRL Int'l EME Competition
Nov. 29–30	**CQ WW DX CW Contest**
Dec. 5–7	ARRL 160M Contest
Dec. 13–14	ARRL 10M Contest
Dec. 27–28	Stew Perry Topband Distance Challenge

Operators

There are really only two primary issues to consider in the area of operators—finding them and keeping them happy! Over my many years of multi-ops, I've tended to operate with "lean and mean" teams. The result is a group of guys who are good candidates for a sleep deprivation study, but at least they are happy doing it. We have tended to be a group that enjoys lots of operating during any given contest, and an under-staffed team will certainly allow that to happen. The point is that you need to establish a philosophy about team size up front, before you start recruiting your members.

Secondly, there's always the issue of ensuring that everyone gets in enough operating time and on the bands that they enjoy. Put another way, setting expectations for your team members is critical. The last thing you want is for a new member to join your multi-op team thinking that he/she will

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be the main run person on 15 meters when you as the station owner or staffing coordinator have the 20-meter night shift in mind for that person.

There's no better way to plan your operation than to have a team meeting and discuss the details. In fact, if you're new at it or have a number of new members, meeting a few weeks before the contest is an even better idea.

Radio Equipment

Obviously, the task of providing radio equipment is entirely up to the station owner, right? Wrong! Unless they've been blessed with time and money, few multi-op stations have all of the required equipment installed and ready to go. Sweating the details by preparing an inventory of what is needed is key to success. Also, knowing who's bringing what piece of gear is critical. Moreover, over the years I've learned that setting up the station on Friday afternoon of a contest weekend is a formula for disaster. No matter how many times you've done it, there are always issues that will emerge which could be better managed with a little prior preparation. If you have the luxury of time, try setting up your station a week or two in advance.

Antennas/Switching

Unlike inside equipment, I'll have to defer to the station owner on this one. I've yet to see a multi-op where one of the operators strapped an 80-meter 4-square to the car roof and brought it over Friday morning (although there are many who have put one up a few hours before the contest!). This is an area where the station owner needs to take charge and plan months in advance.

It's important to remember that there's more to the game than just ensuring you have the right antennas. In a multi-op situation, you also have to focus on flexibility in antenna switching. For example, do you have the ability to put any antenna on any operating position? Does your 40-meter antenna rotate along with your 10-meter beam causing contention in the late afternoon? Does your 80-meter operator have to go to another room to switch the 4-square from Europe to the west to work a KH6? Common sense prevails here for sure.

Computers/Software/ Networking/Packet

At times, despite all the advantages of computer logging, there are situations when we yearn for the old days of pencil and paper—especially when your network just isn't working! I'm sure many of you can recall times at your stations when you've spent 5% of your energy worrying about the ham stuff and the remaining 95% messing around with computers.

Of course, too, we have this scenario: A large operating team is coming over; let's try out some new software this weekend! This is clearly a plan for failure. While it may not be practical to set up your computers weeks in advance, knowing the game plan is critical. Testing the version of software you plan to use in advance is a pre-requisite. Preparing a "bill of materials" that includes cables, connectors, plug-in cards, and other minutia is equally as important.

Accessories

Don't you hate it when you're all set up and you realize you're one keyer paddle short or someone forgot an extra set of headphones? I'm convinced that a meaningful percentage of Radio

Shack's revenue come from contesters hitting their stores on selected Friday afternoons several times a year. Just as with computers and radio equipment, a well-thought-out list of accessories and their owners is a major component of sweating the details for successful multi-operating, and it doesn't have to be the job of the station owner. Many successful multi-ops parse their assignments out to the team members. Some will manage operators, others will deal with equipment logistics, while still others will manage transportation for out-of-town guests.

Operating Game Plan

This area of preparation is probably the most controllable aspect of multi-op contesting. Just as with sports, having a game plan is a key component of success. Do you have goals for your operation? Does everyone subscribe to the same objectives? Have you assembled the team you need to meet your plan? There's nothing worse than having a station owner mentally prepared to try to win a category be forced to live with an operating team that is there to only have a little fun and drink beer for the entire weekend. Put another way, be connected with your team members ahead of the weekend. Make sure everyone knows their role and set expectations for that up front to eliminate problems during the contest.

A second and equally important aspect is to ensure that you understand propagation and the underlying strengths and weaknesses of your station. Preparing a mental (or even written) plan around these elements is a critical success factor. Again, just as with sports, know your competition and the playing field. With a little forethought, you can truly maximize your operation and final score.

Inter-station Interference

While it may not be practical to set up the entire station weeks in advance, it is reasonable to anticipate inter-station interference challenges, especially if you're new to the game of multi-operating. Some items to prepare for in advance include filters, coaxial stubs, spare cables, etc. The more you can anticipate in this area the less diagnostic time you will have to spend on Friday afternoon before the contest.

Human Comforts

This sometimes can be a touchy subject for many households as hoards of hams converge on a station, taking over the house and turning it upside down for the non-hams in the brood. Make sure, as the station owner, that you've prepared your family for what's to transpire over the weekend. In a similar way, make sure your operating team knows the rules of the house as well. For example, should they bring their own food or expect to be fed? Is the entire house fair game, or are the hams banished to the basement for the weekend? Do your operators need to bring their own bed gear, or should they expect the New York Hilton? Remember, you may be loud on 20 meters, but an unhappy spouse can really slow down the team's overall run rate!

Final Comments

I hope I've given you some food for thought this month. The task of multi-operating is an art in itself. The reason so many contesters do it, though, is simple—it's fun! A little preparation and sweating through the details can make it an even more rewarding experience for everyone involved. Go get 'em, team!

73, John, K1AR

Fair Conditions Predicted for CQ WW DX CW Contest 2008

BY TOMAS HOOD,* NW7US

Flash!

CQ WW DX SSB Contest Conditions Look Favorable

Since this issue of *CQ* should reach most subscribers prior to the start of the CQ World-Wide DX SSB Contest weekend of October 25–26, here is an updated forecast made at press time for the general propagation conditions expected. Based on the 27-day recurrence tendencies of solar and geomagnetic conditions, it continues to look like conditions will be good on both October 25 and October 26 (using our propagation index of 2). Expect "Above Normal" conditions on HF during the contest weekend.

Daily 10.7-cm solar flux levels are expected to be around 66 during the contest weekend. The geomagnetic planetary *A*-index is expected to be about 5 on both contest days.

A Quick Look at Current Solar Cycle Conditions

(Data rounded to nearest whole number)

Sunspots
Observed Monthly, August 2008: 1
Twelve-month smoothed, February 2008: 4

10.7 cm Flux
Observed Monthly, August 2008: 66
Twelve-month smoothed, February 2008: 70

***Ap* Index**
Observed Monthly, August 2008: 5
Twelve-month smoothed, February 2008: 8

The 2008 CQ WW DXCW Contest will start at 0000 UTC, Saturday, November 29 and continue until 2400 UTC, Sunday, November 30. Expect fair to poor conditions for the first contest day, and fair conditions on day two. With quiet conditions, the contest weekend should provide reasonable propagation consistent with a low sunspot count.

The best tool available to predict HF propagation conditions in advance is the 27-day recurrence tendencies of geomagnetic, solar, and ionospheric conditions. It is not an absolute method, but it does give a very good indication of what is expected. Predictions for one 27-day rotational period are far more accurate than for three 27-day rotational periods. Be sure to carefully check conditions on November 2 and 3, since this would be one rotational period before the CW contest weekend. There is better than a 90-percent chance that conditions observed on those days will recur during the November contest weekend.

See the "Last-Minute Forecast" for additional information concerning expected day-to-day conditions for the entire month of November. An updated day-to-day forecast for the CW contest weekend will appear as a bulletin at the beginning of next month's column. December's issue should reach most subscribers before the CW contest begins. You can also see an up-to-the-day "Last-Minute Forecast" on my propagation resource center, at <http://prop.hfradio.org/>.

See Table I in my October column for the observed sunspot count during previous WW DX Contest periods since 1997, and what's predicted for the 2008 contest. Contest conditions could be somewhat like those of last year. With the low probability of geomagnetic disturbance during the contest weekend, the lower frequencies should be stable with quiet conditions. The higher frequencies will experience rapid changes and weaker signals.

*P.O. Box 9, Stevensville, Montana 59870-0009
e-mail: <nw7us@hfradio.org>

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for November 2008

	Expected Signal Quality			
Propagation Index.....	(4)	(3)	(2)	(1)
Above Normal: 5-6, 13, 15, 18	A	A	B	C
High Normal:3-4, 8, 10-12, 14, 16-17, 19-24, 26-27, 30	A	B	C	C-D
Low Normal: 1-2, 9, 28-29	B	C-B	C-D	D-E
Below Normal: 25	C	C-D	D-E	E
Disturbed: 7	C-D	D	E	E

Where expected signal quality is:
A—Excellent opening, exceptionally strong, steady signals greater than S9.
B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.
C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.
D—Poor opening, with weak signals varying between S1 and S3, with considerable fading and noise.
E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing in *The New Shortwave Propagation Handbook* by George Jacobs, W3ASK; Theodore J. Cohen, N4XX; and Robert B. Rose, K6GKU.

2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 2 will be poor (D) to fair (C) on November 3rd and 4th, and then good (B) on November 5th and 6th, etc.

3. As an alternative, the Last-Minute Forecast may be used as a general guide to space weather and geomagnetic conditions through the month. When conditions are Above Normal, for example, the geomagnetic field should be quiet and space weather should be mild. On the other hand, days marked as Disturbed will be riddled with geomagnetic storms. Propagation of radio signals in the HF spectrum will be affected by these conditions. In general, when conditions are High Normal to Above Normal, signals will be more reliable on a given path, when the path is ionospherically supported.

November Propagation

Last month's column contained a detailed review of conditions expected during October. Let's look at what we can expect this month.

160 meters: Expect an increase in DX openings on this band during the hours of darkness and into the sunrise period. Since we are at the very beginning Cycle 24, this season will be quite a bit more favorable for stable conditions on this and the other low bands. This winter season will be reasonably quiet. The combined effect of the decreased static levels and longer hours of darkness in the Northern Latitudes will make 160 a pleasurable band all win-

ter. During this month's CQ WW CW Contest, participants should experience fair to good scores on this band. Look for openings toward Europe and toward the south from the eastern half of the U.S. and toward the south, the Far East, Australasia, and the South Pacific from the western half of the country. These openings should be strong during the contest period. Remember, the best propagation aid for this band (and for 80 and 40 meters as well) is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path.

80 meters: This should be a great band for DX openings to many areas of the world during the hours of darkness and into the sunrise period. Eighty meters becomes a reliable long-distance band throughout the entire period of darkness. The band should peak toward Europe and in a generally easterly direction around midnight. For openings in a generally westerly direction, expect a peak just after sunrise. The band should remain open toward the south throughout most of the night. Noise levels will be down considerably from October, and the period for band openings in a particular direction will be a bit longer. Some contest operators may take the challenge of operating exclusively on 80, an adventure in skill and patience. The conditions are expected to be favorable for high scores on this band.

40 meters: Competing with 80 meters, this should be a hot DX band during the hours of darkness, as the seasonal static levels are lower than they were during the summer. Nighttime MUFs (maximum usable frequencies) on some paths could fall below 7 MHz this month, losing some steam until morning hours. The band should be open first for DX toward Europe and the east during the late afternoon. Signals should increase in intensity as darkness approaches. Signals should peak from an easterly direction closer to midnight, and from a westerly direction just after sunrise. Remember, just as with 80 meters, signals tend to peak as the sun rises on the eastern end of a propagation path. Working against the CW operator is the interference that increases when the propagation is excellent.

20 meters: DX openings should be possible on this band mostly during the day, and somewhat during the night depending on the path and the path end points (where you are, and where your contact is). However, because of the shorter daylight hours in the Northern Hemisphere, nighttime paths will be open for a shorter period this month compared to October, with signal peaks from about an hour or two after sunrise and again during the late afternoon and early evening hours for those paths that may be open. Don't forget to look for long-path openings for about an hour or so after sunrise and again for an hour or so before local sunset.

15 meters: DX propagation conditions in the Northern Hemisphere will be poor to fair on this band, especially at low latitudes. A daytime band, fluctuating conditions are expected at these frequencies from shortly after sunrise through the early evening hours. The band could remain open into the evening toward southern and tropical areas.

10 meters: With an expected 10.7-cm flux no higher than about 80 on the best days of the month, and with most of the days experiencing lower 10.7-cm flux levels of around 70, 10 meters will be a poor band. Contest participants in low- and middle-latitude locations can expect rare daytime *F*-layer propagation contacts during the contest weekend, mainly on north/south paths. If open, the band will peak right after sunrise and just a bit before sunset, local time. Openings toward Europe and in a generally easterly direction will be sparse, if at all, and should peak an hour or two before noon, while those toward South America and Africa are expected to peak during the early afternoon hours. Optimum conditions towards the Far East, Australia, southern Asia, and the South Pacific are forecast for the late afternoon and early evening hours, especially from stations in lower latitudes. This band will require a lot of skill and better-than-average antennas.

CW Contest Tips

Overall, expect good conditions on 20 meters during most of the daylight hours. For stations in the lower latitudes, 20 meters will be usable for most of the contest period, well into the hours of darkness.

From sundown to midnight, 40 meters should be the best band for openings toward the east, north, and south. Twenty meters will close in many locations before midnight, while 80 meters will be a hot band with openings into the same areas as for 40.

Between midnight and sunrise the best DX band should be 80 meters, with 40 a close second. Openings on both bands should be possible to most areas of the world, with conditions peaking toward the south and west. Some good 20-meter openings are also expected

during this period, mainly toward the south and west. The 160-meter band should wake up, offering some good DX openings, similar to 80 meters but with somewhat weaker signals.

Don't be surprised, though, to find activity on 15 meters from the Southern Hemisphere. However, 10 would not appear to be a useful contest band.

During the contest be sure to check my propagation page <http://prop.hfradio.org/> for up-to-the-minute conditions. If you have a WAP/WML device, you may gather the latest propagation information, warnings, alerts, and a look at conditions by pointing your WAP device to <http://wap.hfradio.org/>. This is a special URL for wireless access to this free resource.

VHF Conditions

The *Leonids* meteor shower typically is the big event for November. This year it is expected to peak on November 17 at 0022 UTC with a low count of 130 or more visual meteors per hour. For those readers who will attempt to work off the plasma trails of these meteors, there may well be enough hourly activity this year to make this a hot event. The full *Leonids* period is from about November 10 continuing through November 23.

Remember that the *Leonids* radiant is best around local midnight in the Northern Hemisphere. Working VHF propagation off meteor tails (the highly ionized plasma trails left by the meteor) requires some reasonable power and gain, and good operating skill. With the latest high-speed burst-mode CW software, you can possibly work even the smaller meteors.

Check out <http://www.imo.net/calendar/2008> for a complete calendar of meteor showers in 2008.

Current Solar Cycle Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-cm observed monthly mean solar flux of 66.4 for August 2008, up slightly from July's 65.8. The 12-month smoothed 10.7-cm flux centered on February 2008 is 69.6. The predicted smoothed 10.7-cm solar flux for November 2008 is 68, give or take about 5 points.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for August 2008 is 0.5. The lowest daily sunspot value recorded was zero (0), on August 1–20 and August 23–31. The highest daily sunspot count was 8 on August 22, the only day with spots during all of August. The 12-month running smoothed sunspot number centered on February 2008 is 3.6. A smoothed sunspot count of 11, give or take about 2 points, is expected for November 2008.

The observed monthly mean planetary *A*-index (*Ap*) for August 2008 is 5. The 12-month smoothed *Ap*-index centered on February 2008 is 7.6. Expect the overall geomagnetic activity to vary greatly between quiet to disturbed during November. Refer to the Last-Minute Forecast for the outlook on conditions during November.

I invite you to visit my online propagation resource at <http://propagation.hfradio.org/>, where you can get the latest space data, forecasts, and more, all in an organized manner. If you have a cell phone with internet capabilities, try <http://wap.hfradio.org/>.

Drop me an e-mail or send me a letter if you have questions or topics you would like to see me explore in this column. Also, I'd like to hear any feedback you might have on what I have written. Until next month . . .

73, de Tomas, NW7US

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our readers say *(from page 10)*

Afghanistan Radio Award

Editor, *CQ*:

I saw the article about operating from Afghanistan ("The Responsible Person," by John Kountz, T6EE/KE6GFF. March 2008 *CQ*). I thought of the enclosed copy of a certificate I got when I was a member of the Certificate Hunters run by W6BX in the 1970s. I have DXCC with my own callsign and DXCC from when I operated from Aitutaki in the South Cook Islands as ZK1HJ in 1992. I hope this is of interest.

Harry James, G3MCN

"Vanishing Act"

Editor, *CQ*:

From my view here on the ground, you got it right in your September 2008 editorial, "Vanishing Act." Professionally I've done a bit of data mining and, as you point out, you have to be careful how you read the statistics. Even the most technical of statistical measures is full of external influences (social mores, historical events, time zones, cells phones, internet, etc.) that the analyst has to carefully assess for bias. The one you raised most impressively is the up to 12-year latency between loss of interest and expired license. That is true statistical bias.

I teach in the January and/or September license prep classes taught by the Richmond Amateur Radio Club. With a metro population of 880,000, each semester we have several to a lot in the Tech class, half a dozen in the General class, and three to six in the Extra class. We're growing all the time and we have upgrades every semester. We have zero to three youngsters each year. We also have lots of people like I was 15 years ago when I finally got around to pursuing the hobby that had interested me for decades; graying hair, kids in high school or older, and more time to play. I call that very healthy.

We have a broad and healthy ham techie community that seems to float over and through Saturday lunches, repeater traffic, 6-meter nets, and clubs... So here in Richmond, Virginia ham radio is alive, exciting, healthy, and growing at a fast enough pace to overcome the decline in other members.

Bruce MacAlister, W4BRU

Editor, *CQ*:

In regard to your editorial in the September issue of *CQ*, "Vanishing Act?", I am in total agreement with you in regard to how hams present themselves and their hobby to the rest of the world. We all need to take a more excitable stance when talking about our hobby, especially to non-hams.

Ham radio is a hobby that has contributed much to our modern society. Ham radio continues to be on the cutting edge both technologically and as a resource for the rest of our society when commercial services have been rendered inoperable.

You quote Mr. Barlow as saying, "I've seen local clubs no longer able to field volunteers for events or hold Field Day." Certainly those clubs exist, but so do clubs like the Portage County Amateur Radio Service, Inc. (PCARS). Three short years ago, PCARS did not exist, yet today we have over 100 members! A typical monthly meeting has an attendance over 50, and we also have an activity at least once a month, equally well-attended.

Thomas R. Sly, WB8LCD

Limit CW Access?

Editor, *CQ*:

Now that codeless licensing is here, it seems to me there are additional changes that could be considered. For example, it seems more logical that the use of CW in the bottom 25 kHz of 80/40/20/15m bands should be tied to CW proficiency, not technical knowledge—i.e., the Extra written (only) test. Require either the old 21-wpm Extra requirement or the 13-wpm General requirement. In the latter case, allow "old" Generals who passed the 13-wpm test to use of the lower 25 kHz.

This would provide more incentive for newcomers to learn/use CW as well as allow "old timers" like me who love CW to enjoy the entire band. I suggested this to *QST*, but they chose not to get into it. I think it makes sense; what does *CQ* think?

Lou Camp, W8WBV

W2VU replies: From everything we're hearing, newcomers already have plenty of incentive to learn and use CW, and many of them are doing so. A lot of DX stations are only on CW or easier to contact on CW, and now that the test is gone, learning code is now a challenge instead of an obstacle. One benefit they have now is the opportunity to talk with and learn from "old-timers" like yourself. Creating a "high-speed only lane" would leave the new CW operators talking only to each other. Frankly, Lou, it sounds like you're looking for a way to get access to the Extra Class CW subbands without passing the Extra Class exam.

zero bias *(from page 9)*

taught at the George Westinghouse Vocational Tech High School in Brooklyn, New York, for many years and wrote curriculum for the State of New York. Of course, part of his job as *CQ*'s Technical Editor was to be a teacher as well, making sure everything was not only technically correct, but clearly explained. Irv was also the author of several books on electronics. He became a Silent Key on August 31. While Irv most directly touched his family, friends, students and those with whom he worked at *CQ*, he indirectly touched anyone who read this magazine between 1960 and 1971, and who learned even a little from our resident electronics teacher. It's another one of those connections, those links, between past and present, and among hams.

Saying Hello

While we say goodbye to Tommy and Irv, we also make a new connection, saying hello to Brittany Decker, KB1OGL, *CQ*'s new Youth Editor. Brittany is 14 years old, holds a General Class license, and has already had two articles published in *CQ*, most recently last month's "A Rookie's Guide to Contesting." Starting next month, she will be writing a quarterly column by, about, and for young hams (and other young people thinking about becoming hams). Welcome aboard, Brittany. You are joining a conversation—a connection—between *CQ*'s writers and readers that has been going on nonstop for nearly 65 years. We hope you can help bring along the next generation to join that conversation.

We are also pleased to announce the return after a many-years' absence of CQ logo shirts, hats, etc., which will be available either personalized or in a "generic" format. See our holiday ad on page 72 for details. And speaking of holidays, all the best from all of us at *CQ* for a very happy Thanksgiving.

Clarification

One sentence in my October editorial may have given some people the mistaken impression that one needs to be a computer programmer in order to use, or contribute to software development for, the FlexRadio FLEX-5000 transceiver. I am told by the folks at Flex that no special skills are required to operate a FLEX-5000, that you simply load the driver and PowerSDR software and begin operating. In addition, they say actual programmers are a small minority of their user base, and that participants in the collaborative process that leads to new features, enhancements, etc., range from those with no programming skills whatsoever to those few real, live programmers.

73, W2VU

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