Radio–Homeland Security–Computers & Radio–Family & Hobby Comms

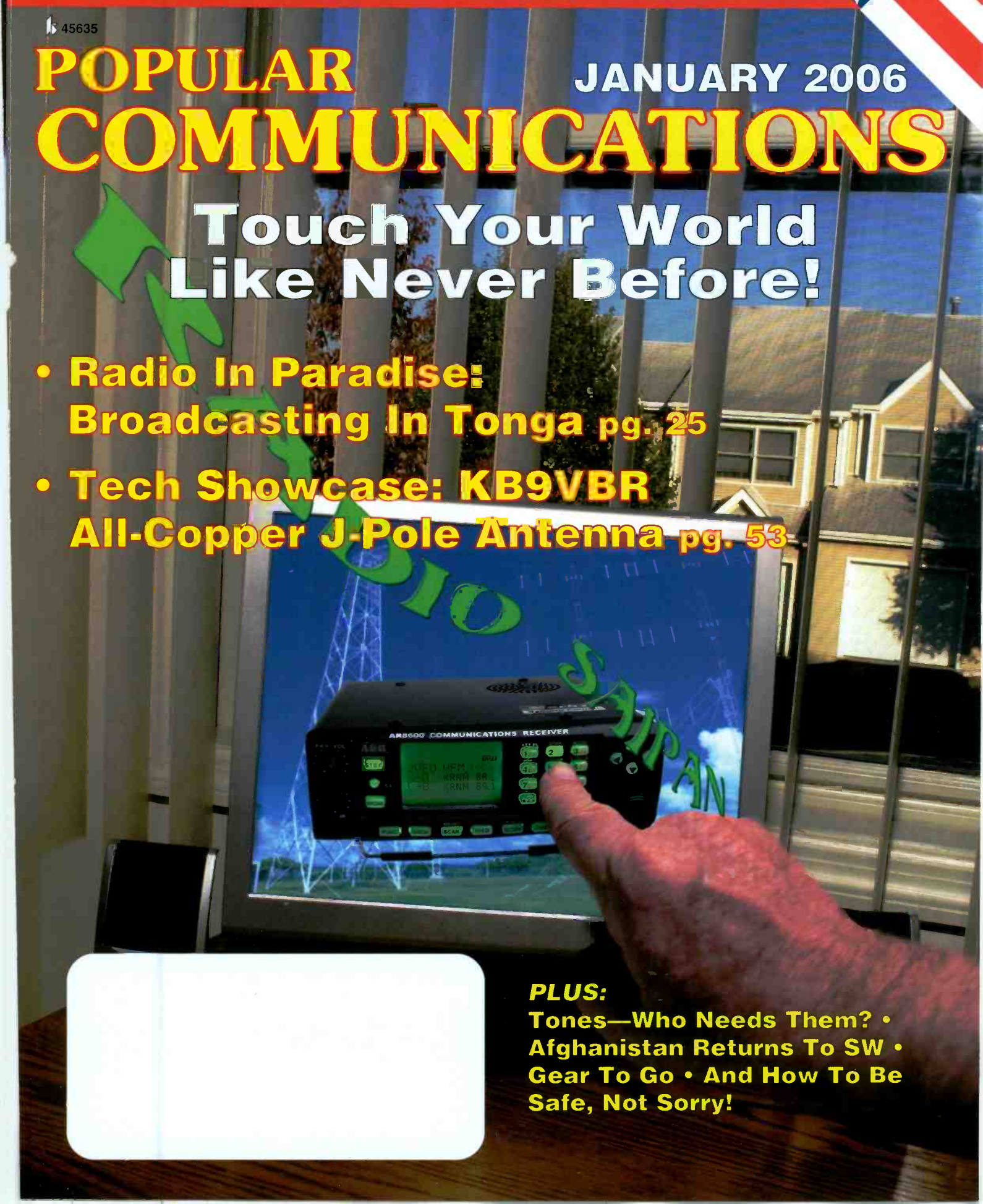
45635

POPULAR COMMUNICATIONS

JANUARY 2006

Touch Your World Like Never Before!

- **Radio In Paradise: Broadcasting In Tonga** pg. 25
- **Tech Showcase: KB9VBR All-Copper J-Pole Antenna** pg. 53



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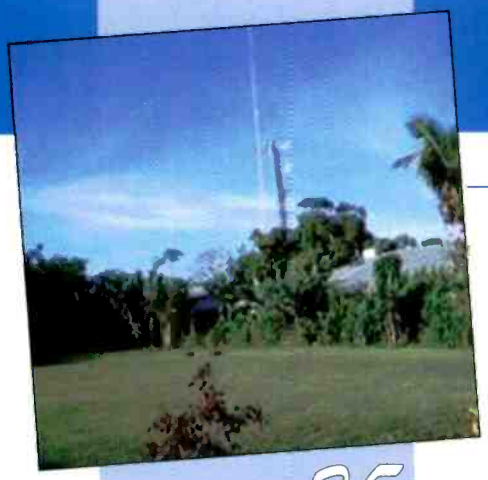

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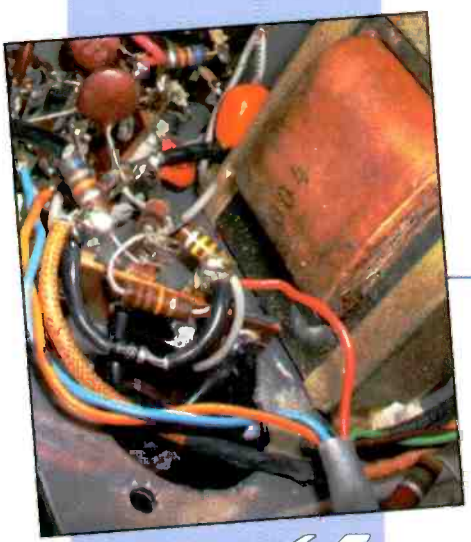

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Features

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On The Cover

Do you hear what Bruce hears? You can, and it's easier than you think. For example, the AR8600 MKIIB multimode mobile/base receiver that covers 100 kHz to 3 GHz (cellular frequencies blocked) could be set up anywhere in the world—and you can remotely tune it to hear stations that would otherwise be out of reach. For details on how you can "Go On A DXpedition Without Leaving Home," check out Bruce Conti's "Broadcast Technology" column beginning on page 20. (Photo by Larry Mulvehill)

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by Harold Ort, N2RLL

What Goes On In Manassas...

Editor's note: Writer Allan Stern is currently unable to do a regular *Military Radio Monitoring* column, but will, however, be writing special features in the coming months.

It's not as if Manassas, Virginia, hasn't been in the news for strange goings-on before, so it's not surprising that there's a battle of sorts going on there between Communication Technologies (COMTek) that operates the BPL (Broadband Over Powerline) system and the ARRL. Actually, the battle centers on the FCC and the deafening sound of silence coming from The Portals.

Seems to me the BPL pot is boiling over with bureaucratic Mumbo Jumbo Soup, but you be the judge. Here's the scoop on the soup: The League has recently called on the Commission to shut down the BPL system in Manassas because it's the source of reported interference to amateur radio—and I'm sure other licensed radio services, including wiping out shortwave listening/DXing. Trouble is, COMTek isn't listening and neither is the FCC's Office of Engineering and Technology staff.

Remember, the FCC's year-old Part 15 rules designed to govern BPL deployment give the City of Manassas the edge over hams (money talks, as we've said here before.) The City of Manassas also gets a portion of the BPL subscriber revenue to, according to the League, "offset its costs of installing and maintaining the system." The responsible folks at the Commission, in allowing the flawed technology to move forward to deployment stage in Manassas, and essentially waving off the amateur radio community, are either incapable of doing their jobs or interpreting their own Part 15 rules. Either way, something is woefully wrong at the Commission.

Fact is, the BPL system in Manassas should never have become operational because interference was there from *day one*. But what's puzzling to me is why the Commission would snub the radio community. This is a diverse group of responsible Americans who are there for America when the chips are down; reference the recent rash of severe weather and natural disasters across the country, from tornadoes and forest fires to the devastating hurricanes of the past few months.

In an intelligent, thinking America, the ARRL shouldn't *have* to get on the FCC's case and *formally* "request" the Manassas BPL system to be shut down. For Heaven's sake, even a grade school kid with a $100 analog receiver without an S-meter could determine the source of the interference and subsequently make the right judgment call.

Remember, too, the ARRL publicly and very appropriately scolded the Commission, saying none of the complaints have resulted in "any action or even interest" on its part. I still think it's the dollar bill that's the main factor in BPL. Flash a few bucks under some noses—that, after all, matters more than life itself today—and, as I've said before, what's up is down and weird is acceptable today. The Manassas, Virginia BPL deployment and bureaucratic posturing is no different.

I guarantee, and even bet you a couple of donuts and coffee, that if you were to talk this situation over briefly with a friend or neighbor who knows nothing about radios, BPL, or even what the FCC does other than sit on its duff, your friend would be dumbfounded, likely saying to you, "Geez, Larry, why would they allow BPL in the first place; you amateur radio people showed them the interference, practically doing their jobs for them, and now they turn around and tell you to kiss off."

The League also bears some of the responsibility in this convoluted matter. True, while they've repeatedly asked—pleaded—with the Commission and COMTek to shut it down, and while neither Manassas Power nor COMTek are compliant with the Commission's Part 15 regulations, nothing has been done. Yes, the League has been on their case, but now comes the League's latest statement:

> It is no longer the case that all BPL systems inherently radiate high levels of RF energy on amateur allocations on overhead medium-voltage power lines...thus, not all BPL architectures have similar potential for harmful interference to the Amateur Radio Service (and to other licensed services). Some have inherently greater potential for interference, as currently configured, than others.

This backpedaling—in my opinion, not a very good PR move—from their initial, and certainly appropriate and correct, contention that BPL was flawed technology in the first place, using overhead powerlines to deliver Internet access to homes and businesses, is pretty strange. I would have stuck to my guns. Very simply, however correct, it still sends the wrong message to BPL providers.

So just what "high levels of RF energy" means is anyone's guess, other than the engineer measuring noise at a determined distance from the BPL equipment. If you'll recall, a couple of years ago they were talking about virtually *any* RF placed in overhead power lines as ominous. At the grassroots radio level (that's you and me) it's common knowledge that you don't need to be on the receiving end of "*high* levels of RF energy" to experience severe interference. Most of us have experienced a *low* level of RF energy, from computers, monitors, FAX machines, and alarm systems, that has virtually wiped out shortwave reception.

The mere fact that the BPL systems were *deployed first* (the cart before the horse syndrome), *then* in some cases had to be notched to prevent interference to amateur frequencies, speaks volumes about how we do business and about the Commission's dumb and dumber attitude and inability to do the right thing, especially when it was *proved* beyond a shadow of a doubt that BPL in fact causes interference. That would be like an auto manufacturer letting a new vehicle go through the assembly and inspection process with a known brake defect, the thought being, "well, we can always fix it after thousands of cars are on the road endangering lives, *if* it's discovered or anyone reports it." Doesn't make sense, does it?

Yet the League continues to talk publicly about *permitting* BPL systems that are "benign"—those that don't apply HF signals to overhead lines and include fixed, permanent *notches* in the ham bands. But rewind, please, to a year ago when the ARRL said, "Precluding interference by so-called 'notching' techniques is not the answer either...notching has proven difficult to implement effectively and has not been successful generally in remedying BPL interference at test sites."

So I ask the League, which statement is true?

Apparently, according to League findings, there are actually BPL system designs that don't create harmful interference,

(Continued on page 64)

by Harold Ort, N2RLL, Editor, and D. Prabakaran

News, Trends, And Short Takes

Russians Take Right-wing Flemish Program Off The Air

The controversial weekly shortwave radio program Zwart of Wit produced by Flemish MP Jurgen Verstrepen of the right-wing political party Vlaams Belang has been taken off the air by the Russian government. The program was originally intended to be broadcast in Digital Radio Mondiale (DRM) mode, but transmission providers, Deutch Telecom and Merlin Communications, refused to air it after being made aware of its political content. Vlaams Belang then started renting airtime on an analog shortwave transmitter in Russia.

The Russian authorities began investigating the content of the programs, and even requested an English translation. They then ordered the broadcasting of the program from Russian transmitters to be stopped. Verstrepen says on his website that "the shortwave transmitter is temporarily off the air" but that the weekly program will continue via the Internet, MP3, podcasting, and live streaming.

BBC Enhances Radio On Freeview With Text Services

Listeners tuning into national BBC digital radio through Freeview will be able to browse genre and program-related content, when BBCi launches enhanced radio content on Digital Terrestrial Television. Not only will listeners be able to view and browse interactive content while they listen to BBC digital radio networks, integrating the news, sports, and weather headlines already available on BBCi, but also they will also be able to see program listings, features, and competitions previously available only via the Internet or DAB (Digital Audio Broadcasting) Digital Radio.

The enhanced service will also give listeners the option of viewing what's on other BBC radio channels and switching to any one of them directly. Listeners can also opt for a blank screen while listening to radio if they wish. The BBC has offered browsable services for Radio 1 on digital cable television and radio pages with network branding and LiveText on Freeview since 2003.

The development builds on the increasing popularity of radio on digital television: 33 million UK adults have digital TV and half of these have listened to digital radio through their television, with 9.7 million listening weekly.

"Talk To America" Launches SMS Text Messaging Service

"Talk to America," the Voice of America's flagship daily international call-in show, has added text messaging as a means for listeners to join the program's live discussions. Listeners with SMS (short message service) enabled cell phones can now contact Talk to America via text messaging to communicate immediately with on-air guests in addition to telephoning, faxing, or e-mailing their messages to talk@VOANews.com. Listeners in Asia can send their messages to 63 928 761 4588, while VOA audiences in Africa can text message to 27 838 894 3335.

"Talk to America" is broadcast Monday through Friday at 1600 to 1700 UTC and covers topics such as U.S. foreign policy, the environment, health and nutrition, and American media and sports. The talk show format allows VOA's large international audience to engage in dialogue with a variety of American decision-makers and experts who are now available through SMS text messaging.

Radio Afghanistan To Return To Shortwave Soon

According to the Indo-Asian News service, the 100-kW shortwave transmitter with seven antennas being installed by India at Yakatoot in Kabul, Afghanistan, is being completed. It will enable Kabul Radio programs to be heard in Southeast Asia, South Asia, Africa, and Europe. People in remote areas of Afghanistan who remain cut off during the harsh winter months will now be able to follow the happenings in Kabul and other areas of the country through the programs beamed on this shortwave transmitter.

VOA Launches Expanded Programming For The Horn Of Africa

The Voice of America has doubled its Amharic language broadcast and moved the time and frequencies for Afan Oromo and Tigrigna language broadcasts in response to audience requests. VOA's Amharic language broadcast has expanded to a full hour every day from 1800 to 1900 UTC. The half-hour expansion will allow VOA to provide new programs, including a Saturday audience-request music show and other features designed especially for young listeners.

VOA also moved its half-hour weekday Afan Oromo and Tigrigna language broadcasts to new times. Afan Oromo now begins at 1730 UTC and Tigrigna begins at 1900 UTC. All three programs will move to common frequencies: 9875, 11905, and 13870 kHz. VOA's Horn of Africa broadcast languages are believed to reach at least two-thirds of the total population of Ethiopia and have a significant audience in Eritrea.

Boston Acoustics Launches HD Recepter Radio

Boston Acoustics launched the Recepter Radio HD with digital HD Radio technology by iBiquity Digital at the Custom Electronic Design and Installation Association (CEDIA) Expo 2005. The Recepter Radio HD is one of the first HD home radios to become available. It's a compact, high-performance digital AM/FM table model with a compact satellite speaker, allowing listeners to enjoy the Recepter Radio HD in true stereo. A credit-card size remote control is included for extra convenience and ease of use. The Recepter Radio HD features the dynamic, FCC-approved HD Radio technology developed by iBiquity Digital Corp.

(Continued on page 69)

Each month, we select representative reader letters for "Our Readers Speak Out" column. We reserve the right to condense lengthy letters for space reasons and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid e-mail address. Upon request, we will withhold a sender's name if the letter is used in "Our Readers Speak Out." Address letters to: Harold Ort, N2RLL, SSB-596, Editor, Popular Communications, *25 Newbridge Road, Hicksville, NY 11801-2909, or send e-mail via the Internet to popularcom@aol.com.*

I Got Mine...

Dear Editor:

Just finished reading the October "Tuning In." Talk about Code, and all those who say, "Okay, I had to do it, so do all others"—(HA)! I recall years ago when SSB came in and was being touted. *QST* had scads of hot letters against SSB, and it waxed hot and heavy for years. Never could see why something new and useable was so debased. I thought it might be good to throw that up in the face of those who want everything as they had it whenever they had to face the FCC people and do the written questions, and then the code, or whatever order they came in.

Roger Petersen, KA9ANN
Louisville, KY (via e-mail)

Ahead Of His Time

Dear Editor:

I've got three atomic clocks in my shack and love each one. There's one on the desk and two others on the wall. They each receive the WWV signal quite well here in Virginia, but the trouble is now that I've got them I really don't know why I need three when one works just fine. You usually seem to be able to come up with just the right words, so I thought maybe you could help me understand why we radio nuts do what we do.

Marvin Breen
Norfolk, VA (via e-mail)

Dear Marvin:

You're not alone, that's for sure. Some people collect cats, we collect electronic goodies. I've got two atomic clocks and even an atomic wristwatch. Why? Beats me. I suppose it's for the same reason other radio nuts like us have eight or 10 scanners or receivers.

A Purple Heart And A Salute

Dear Editor:

I just want to let you know that my son completed his tour in Iraq and has been home for about a month. He is doing well. When his unit arrived for demobilization at Fort Riley, my wife and I had dinner with some of his unit. They started telling stories about their experiences (some, as a parent, you'd wish you didn't hear), and after a while when they kept referencing that they got on their radio I asked them what radios? They replied, the CBs.

I realized at that point that the support from the people who donated money for radios or donated radios themselves saved the lives of these soldiers on more than one occasion. They talked about how their entire unit came home, no one killed nor med-evacuated. Yes, they saw some very tough action. Many of their vehicles destroyed by IEDs, coming under heavy fire, and many received Purple Hearts, including my son.

Listening to them talk that night it struck me: One Voice did make a difference. My deepest thanks to you and your readers for making a difference.

Senator Hatch has yet to return my call about my need for his help to support the troops.

Bill Taylor
Utah (via e-mail)

Dear Bill:

Our sincere thanks to you for the letter and for staying in touch. Here's a hearty, snappy salute to your son, Mark, and the countless others for their service and dedication to duty, especially under such seemingly unending adverse conditions. (Regular *Pop'Comm* readers will recall our article in the March 2005 *Pop'Comm* in which Mark's unit, deployed to Iraq, was without two-way radios—until we and other folks helped out with CBs from home). I'll continue to do what my gut and heart tells me to do: Support Our Troops. If that means honking off the bureaucrats to get supplies, including radios, to the troops because they're too disconnected or inept, then so be it. Thanks again, Bill!

The Code Rant And Politicians

Dear Editor:

All the blah, blah, blah about the CW situation here in the USA is making me sick. Why is it we make more of keeping, abolishing, or reworking the code requirement than we do healthcare, the federal deficit, or the war in Iraq? I'll bet other people think we're crazy. We worry about things that don't matter.

Thank you for allowing me to vent. You have a great magazine, but don't let the Beltway bozos make you lose sleep. I know there are more of them today than there were a few years ago...I put on my headphones and listen to the noise on shortwave and it all seems to go away.

Robert Bingham
Milwaukee, WI (via e-mail)

Dear Robert:

Amen! Have you considered running for office somewhere...anywhere?

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Suggested list price $799.95/**CEI price $519.95**

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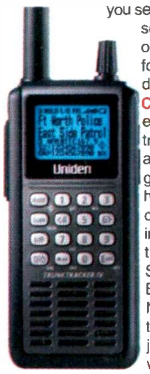
Frequency Coverage:

25.0000-512.0000 MHz., 764.0000-775.9875 MHz., 794.0000-823.9875 MHz., 849.0125-868.8765 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning.



Close Call Radio Frequency Capture – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. Useful for intelligence agencies for use at events where you don't have advance notice or knowledge of the radio communications systems and assets you need to intercept. The BCD396T scanner is designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS, LTR and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. **Dynamically Allocated Channel Memory** - The BCD396T scanner's memory is organized so that it more closely matches how radio systems actually work. Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 3,000 channels are typical but **over 6,000 channels are possible** depending on the scanner features used. You can also easily determine how much memory you have used and how much memory you have left. **Preprogrammed Systems** - The BCD396T is preprogrammed with over 400 channels covering police, fire and ambulance operations in the 25 most populated counties in the United States, plus the most popular digital systems. **3 AA NiMH or Alkaline battery operation and Charger** – 3 AA battery operation - The BCD396T includes 3 premium 2,300 mAH Nickel Metal Hydride AA batteries to give you the most economical power option available. You may also operate the BCD396D using 3 AA alkaline batteries. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - A blue LCD light remains on when the back light key is pressed. Autolight - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at www.usascan.com or call 1-800-USA-SCAN.

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Scancat Gold For Windows Software	$99.95
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Bearcat® BC246T Trunk Tracker III

Suggested list price $399.95/**CEI price $214.95**

Compact professional handheld TrunkTracker III scanner featuring Close Call and Dynamically Allocated Channel Memory (up to 2,500 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.72" Wide x 1.26" Deep x 4.6" High

Frequency Coverage:

25.0000-54.0000 MHz., 108.0000-174.0000 MHz., 216.0000-224.9800 MHz., 400.0000-512.0000 MHz., 806.0000-823.9875 MHz., 849.0125-868.9875 MHz., 894.0125-956.000 MHz., 1240.0000 MHz.-1300.0000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at www.usascan.com and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** – Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group ID, custom search range, and S.A.M.E. group using 16 characters per name. **Memory Backup** - When power is lost or disconnected, your BC246T retains the frequencies that were programmed in memory. **Unique Data Skip** - Allows the BC246T to skip over unwanted data transmissions and birdies. **Attenuator** - You can set the BC246T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAH nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part **#HF24RS** for $29.95. Order now at www.usascan.com or call 1-800-USA-SCAN.

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Scanner Programming: Man-Machine Interface—Part II

Dynamic Memory Programming For Trunked Systems

by Paul Opitz, popitz@uniden.com

Last time we met, we looked at how to plan and program conventional channels into one of Uniden's latest scanners using Dynamic Memory. This month, we'll take it a step further and look at what you need to do to set up a Trunked Radio system in the BC246T, BR330T, BCD996T, or BCT15. Note that these last two models are still in development, so there could be some differences when they finally get in our hands, but the basic idea will remain the same.

As with a conventional scanner, a trunked scanner contains system information (things like the system name, system hold time, and, very important, the system frequencies). The system also has channel groups that hold the information about channels you want to listen to.

Unlike conventional scanners, where a channel contains frequency information, a trunked system's channels contain information about the Talk Groups on the system you want to listen to. If you don't know how a trunked radio works, take a moment to read the sidebar "A Quick Trunking Tutorial."

Planning Our Approach

Again, even more important than with conventional systems, planning is critical when setting up a trunked system. There are several Internet resources for finding information about trunked radio systems, but by far the most extensive is found in the Database area of http://www.RadioReference.com. I'll use

RadioReference.com
Your Complete Reference Source

Arlington System

System Name:	Arlington System
Location:	Arlington, TX
County	Tarrant
System Type:	Motorola Type II Smartnet
System Voice:	Analog
SysId:	162A
Connect Tone:	105.88
Last Updated:	09-11-2005 07:35

System Frequencies

Red* are Primary Control Channels Blue* are Secondary Control Channels

Site	Description	Freqs								
001	Primary	856.48750	856.71250	857.48750	857.71250*	858.48750	858.71250*	859.48750	859.71250*	860.48750
		860.71250*	867.56250	868.26250						

Figure 1. Find the system type by looking at the top part of the system's webpage.

System Frequencies

Site	Description							
001	Primary	01-868.53750	02-868.08750	03-868.58750	04-855.46250	05-868.63750	06-857.21250	07-868.73750
		08-868.83750	09-866.58750	10-868.91250				

Figure 2. You'll need all the frequencies and their LCN (logical channel numbers), which are indicated on the website by a small number preceding the system frequency.

Arlington Fire Talkgroups

DEC	HEX	Zone	Description
53520	d11	1	Fire Dispatch
53552	d13	2	EMS 1
53584	d15	3	FIREGROUND
53616	d17	4	FIREGROUND
53648	d19	5	TRAINING
53680	d1b	6	ADMIN/SUPV
53712	d1d	7	EMS-2
53744	d1f	8	CH-8
53776	d21	9	CH-9 EMS Supv
53808	d23	10	CH-10 TALK
53840	d25	11	CH-11 (Arlington Memorial Hospital)
53872	d27	12	CH-12 (Medical Center of Arlington)
53904	d29	13	CH-13 Training
53936	d2b	14	CH-14
56496	dcb		Arlington Fire Alerting

Arlington Police Talkgroups

DEC	HEX	Zone	Description
53968	d2d	APD NORTH	Arlington Police North Dispatch
54000	d2f	APD WEST	Arlington Police West Dispatch
54032	d31	APD EAST	Arlington Police East Dispatch
54064	d33	APD SOUTH	Arlington Police South Dispatch
54096	d35	CIC 1	Arlington Police CIC Information
54128	d37	North T/A	Arlington Police North Talk-Around
54160	d39	West T/A	Arlington Police West Talk-Around
54192	d3b	East T/A	Arlington Police East Talk-Around
54224	d3d	South T/A	Arlington Police South Talk-Around
54256	d3f	Supervisors	Arlington Police Supervisory
54288	d41	VICE/NARC	Arlington Police Vice/Narc
54320	d43	CID	Arlington Police CID
54352	d45	TACT 1	Arlington Police Tac 1
54384	d47	TACT 2	Arlington Police Tac 2
54416	d49		Arlington Police Ops
54448	d4b		Arlington Police Ops
55088	d73	TACT 3	Arlington Police Tac 3 (Ballpark Details)

Figure 3. In this example, the data is for the Arlington FD and PD.

A Quick Trunking Tutorial

So-called conventional systems are easy to set up and scan, because each frequency in the system typically carries traffic for a single agency or group within an agency. But, while simple, using a discrete frequency for every user group results in either many frequencies to cover all agencies in an area, or the lumping together of agencies onto single frequencies, which could mean that the radio frequency resource is in use by Agency A when Agency B also needs the frequency.

Trunking solves this problem by using a pool of frequencies that is shared by many agencies. The basic concept that lets this work is that any particular agency is typically using a frequency less than 10 percent of the time. With a trunked system, one channel acts as a control channel to assign a frequency to an agency (or, in trunking parlance, a Talk Group) when it needs one, then returns the frequency to the open pool when the agency no longer needs it.

Here's how it works for a typical call. A user in Talk Group A presses PTT on his or her radio. This sends a request to the control channel to assign a frequency. The channel grant for that talk group is then transmitted out on the control channel. This grant tells all the other radios assigned to Talk Group A to tune to the assigned frequency for the duration of the call. The original caller's radio then beeps, and the user can begin the transmission. While it sounds complicated, this all usually happens in a fraction of a second.

For a scanner to follow the traffic for a particular Talk Group, it needs to know the Talk Group ID (a number that identifies the talk group) and the system frequencies. You program in the Talk Group ID (TGID) and system frequencies. The scanner then listens to the control channel data until the TGID you're interested in is granted a channel. The scanner follows that channel grant to the appropriate frequency and you hear the conversation.

information from this site to create an example of programming frequencies from the Arlington, Texas area into my scanner.

Here's what you need to find out about your target area:

System Type: The main types of Trunking systems are Motorola, EDACS, and LTR. There are subtypes; for example, Motorola 800 MHz, 900 MHz, VHF, UHF, and P25 are all possible system types. You can find the system type by looking at the top part of the system's webpage shown in **Figure 1**. The system type identified here is Motorola Type II and, since all the frequencies are in the 800-MHz band, we can tell that this is an 800-MHz Type II system.

System Frequencies: These are clearly listed, as shown in **Figure 1**. For Motorola systems, you only really need the frequencies in red or blue (the possible control channels). For other systems, you will need all the frequencies and their LCN (logical channel numbers); these are indicated on the website by a small number preceding the system frequency as shown below for the Irving, Texas EDACS system. (See **Figure 2**.)

Talk Group IDs (TGIDs): Identify which groups you want to listen to. It isn't necessary to program in every ID (unless you're interest includes listening to the water department and dogcatcher). Each system type uses a different format for TGIDs. For Motorola systems, you need the decimal format for whatever "flavor" of Motorola you're monitoring. **Figure 3** shows the data for Arlington FD and PD.

That's it for *collecting* information, now let's organize for our scanning needs. Say I want to be able to independently turn on/off scanning for FD/EMS and for each PD district, I would then create six channel groups as follows:

FD/EMS
Group Quick Key: 1

Channel	Tag
53520	FD Dispatch
53552	EMS 1

PD North
Group Quick Key: 2

Channel	Tag
53968	North PD Dispatch
54128	North PD T/A

PD West
Group Quick Key: 3

Channel	Tag
54000	West PD Dispatch
54160	West PD T/A

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- Dual conversion superheterodyne circuit design
- Stereo line-level audio inputs and outputs and external antenna connections
- Dual Clocks and programmable timers
- Headphone jack
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Features are subject to change

E10 $130*

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- 550 programmable memories with memory page customization
- Manual and auto scan, direct keypad frequency entry, ATS
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- Supplementary wire antenna
- Power Source: 4 AA Batteries (included) or AC Adapter/Charger (included)
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- Weight: 1 lb. 1oz.

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Features
- Shortwave range of 1711 – 29,999 KHz
- 200 programmable memories
- Memory page customization
- Manual and auto scan, direct keypad frequency entry
- Earphones
- Power Source: 2 AA Batteries (included) or AC Adapter (not included)
- Dimensions: 5"W x 3"H x 1-1/4"D
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PD East
Group Quick Key: 4

Channel	Tag
54032	East PD Dispatch
54192	East PD T/A

PD South
Group Quick Key: 5

Channel	Tag
54064	South PD Dispatch
54224	South PD T/A

Putting It All Together

Okay, we've collected, planned, and organized, so now it's time to turn on the scanner and load up the system. Again, some details could vary by model, so make liberal use of the Owner's Manual to find out how to enter alpha tags, the specific menu sequence, and so on.

Power the scanner and press MENU. The very first option, "Program Systems," is the one we want, so give the scroll control a tap or press E. The scanner now displays the name of a system programmed into your scanner. Scroll back one to "New System" and press scroll or E to select it.

The scanner asks what type of system you want to program. From our planning above, we know that this is a Motorola 800 Standard system, so select that option and tap the scroll control.

Now, you need to program in the system-level settings. These settings are the system name ("Arlington TRS"), System Options (such as the Quick Key, Hold Time, etc. we learned about last time), and most importantly for a trunked system, the System Frequencies. Scroll to "Set Frequencies" and follow the prompts to enter all the frequencies for the system. Note that for Motorola systems you only have to enter the Control Channels, but if you opt to enter only these you need to turn on the "Control Channel Only system option.

Now, use the same method we used last month for *conventional* systems to create channel groups and enter channel information for this system (select "Edit Group," create a new group, and create channels in that group).

While tedious (entering alpha tags does take some time), since we prepared by learning about our target system and organizing our data before we started programming, this was pretty simple. It also shows off some of the big advantages of Dynamic Memory.

With a banked scanner, even though a bank might have 100 channels for frequencies, since you could only enter one type of system per bank any unused channels were pretty much wasted. Also, since a banked scanner only has 10 banks, at most you can program and scan 10 systems at a time. With dynamic programming, though, the scanner's memory is completely freed up until you use a channel. A system could have a single channel (which would use up one memory) or 1,000 channels (using 1,000 memories), leaving the rest of the memory completely available for additional systems, up to the scanner's memory limit. It's a much more efficient use of memory.

Around The Corner!

Well, we've reached the end of this tutorial, look for future articles where I'll discuss some enhancements to the basic Dynamic Memory scheme that is being implemented on future models, which will make some advanced programming issues easier.

If you've got questions, please send them to me in care of *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or directly to popitz@uniden.com. ■

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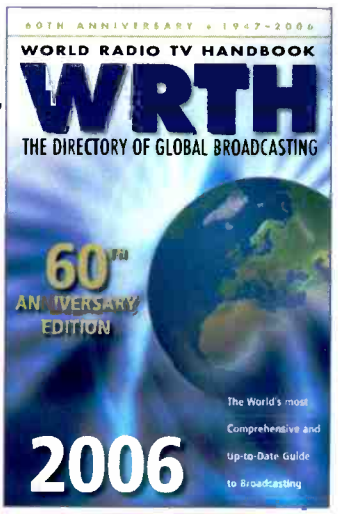

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- 12 international bands
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- Weight: 1 lb. 2 oz.
- Power Source: Built-In Rechargeable Ni-MH Battery Pack; 3 AA Batteries (not included); Crank power alone; AC Adapter (not included); AC Adapter recharges built-in Ni-MH battery pack
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FR300 $50*
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This all-in-one unit offers functionality and versatility that makes it ideal for emergencies.

- AM/FM/TV-VHF/NOAA Radio Reception
- Built-in power generator recharges the internal rechargeable Ni-MH battery (Included)
- Can be powered from four different sources:
  1. The built-in rechargeable Ni-MH battery that takes charge from the dynamo crank and from an AC adapter (AC adapter not included)
  2. 3 AA batteries (Not included)
  3. The AC adapter alone (AC adapter not included)
  4. The dynamo crank alone, even with no battery pack installed
- Cell-phone charger output jack 3.5mm (various cell phone plug tips included)
- Built-in 2 white LED light source and one flashing red LED
- Weather alert
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- Weight: 1 lb. 3 oz.

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- Available colors: Metallic Red, Black

Improvements over S350:

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- Digital clock with selectable 12/24 hour format
- Dimensions: 10-3/4"W x 7"H x 3-18-1/2"D
- Weight: 3 lb. 2 oz.
- Power Source: 4 D Batteries (not included) or AC Adapter (included)

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Digital expertise

Offering high-tech digital performance and portability, the YB550PE packs performance into a small radio. Palm-sized and only 11oz, the YB550PE can receive AM, FM, and continuous Shortwave across all 14 international bands.

- Shortwave range of 1711 – 29,995 Khz
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- 200 customizable station presets
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- AC adaptor and supplementary antenna inputs
- Dimensions: 3-1/2"W x 5-3/4"H x 1-1/2"D
- Weight: 10.5 oz.
- Power Source: 3 AA Batteries (included) or AC Adapter (not included)

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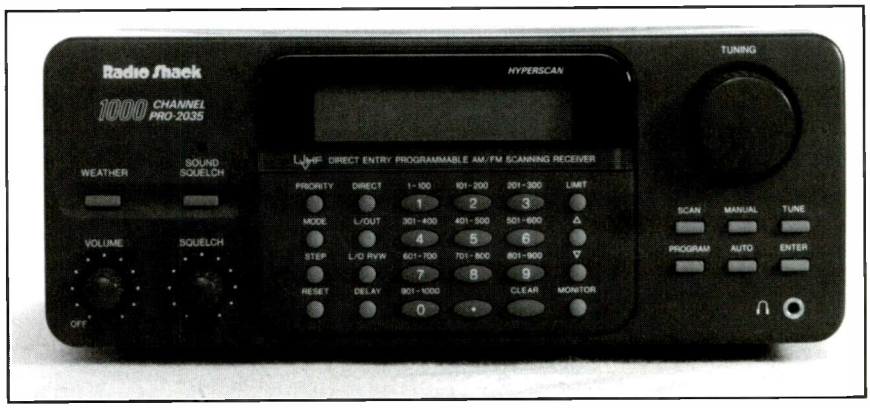
Tones—Who Needs Them?

Mention the word tone to many scanner enthusiasts and you'll get the same raised eyebrows or moan from most of them. Tones are generally a source of aggravation for the scanner listener as they have a habit of getting into the receiver in places where we don't want them. But there *is* an up side to all this noise.

Tones divide themselves into two categories: tones you can hear if you're listening to the radio, called audible tones, and tones you can't hear, called sub-audible tones. We'll deal with the audible first since they're generally the most annoying.



A surprising number of scanners don't come with any type of tone decoding. This PRO-2035 was in that category until Optoelectronics put out an add-on computer control board that included an excellent CTCSS and DCS tone reader. The addition of software like Datafile's Probe, Signal Intelligence's Scanstar, or CAT System's ScanCat make this a highly desirable base station. The 2035 (shown here), the 2042, and their older brothers, the PRO-2005 and 2006, still sell for premium prices on eBay, if you can find one.

Audible Tones

In their simplest form, a audible tone can simply be used to let those listening know that there's something important coming, or that an important situation is underway. The beep that many police departments put out just before an all points bulletin serves just this purpose. If you weren't paying attention to the radio before, you should now because there's something important about to be said. Our local police also use a "situation" tone that beeps every 30 seconds or so to let everyone know that there's an emergency underway and any non-essential traffic (like license plate checks) should be held or taken elsewhere.

Tones have all sorts of uses in electronics, and in two-way radio in particular. By building a device to listen for a *particular* tone, or sequence of tones, you can effectively get remote control of that device.

The simplest form of tone control is probably the old tone-based pagers that came out in the early '60s. It was essentially a radio receiver that listened to only one frequency waiting for its special tone to be broadcast. When that happened, the receiver would open its squelch and the next part of the transmission was the actual message, such as "call your office, Bob."

If you listened to a scanner that operated anywhere near one of these transmitters, you knew it. To get any kind of reliable coverage, particularly with a portable and battery-operated receiver, the signal strength had to be as high as possible. Pager systems were operated at maximum power and ran 24 hours in most cities. Many larger operators would have many channels in operation at the same time, although each individual pager was still limited to a single frequency for listening. Adding more frequencies meant that as a pager operator you could have that many more subscribers.

If you think about this from a simple technology viewpoint for a minute, what we have is a remote-control receiver made possible by the tone control mechanism. The radio listens on the frequency waiting for a cue (the transmitted tone), then opens its squelch so the message can be heard. If you happened to be listening to a scanner, what you'd hear is the audible tone followed by the message, followed by another audible tone for the next message. So, what if we use those tones to do something else, like open the garage doors on a fire house at the start of a call, or set off an alarm in some remote location when the temperature of a refrigeration unit gets out of tolerance? There are many uses for this simple remote-control scheme, all based on simple audible tones.

Finally, audible tones can contain *data*, information that's encoded and sent to another device for later processing. Some good examples of this include the emergency call button on many police and fire handheld transmitters, or telemetry data sent back from satellites or transmitted via shortwave (or more local means in some cases). In either case, the tone is probably not a pure tone, but will have some changes in it as it's broadcast. Those changes (say lack of tone, or replacing one tone with another very rapidly) represent the encoded data so that, for instance, a dispatcher can know which radio pressed the emergency button or what the temperature of a spacecraft is just before it crashes into Mars. It's all done with smoke and audible tones.

Sub-audible Tones

So what good is a tone you can't hear? Well, they're called sub-audible because they take place below the level of hearing in one of two ways: Either the tone itself is so low in frequency that the human ear won't notice it, or the tone is stripped out of the signal before the audio is amplified and sent to the speaker. In either case, it's still good for some kind of remote control of another device or for sending data. Let's look at a couple of common examples.

Tone Squelch

The most common form of sub-audible tone is tone squelch. Tone squelch is used in commercial two-way systems to help

Many high-end receivers didn't include tone functions either. This AR-8200 required an add-on card, a unique approach that at least gave an option for those who needed the function for interference control.

control interference in congested areas. Essentially, the tone acts like a password for the receiver. In a traditional system, the receiver simply waits until it senses a radio signal and then opens the squelch and amplifies the signal, regardless of what that signal is. It might be a signal you are interested in (like your dispatcher or one of the cars calling back), but it could just as easily be noise produced by some outside source, or it could be a transmitter that's close to your frequency but not quite on channel. If it's strong enough, or close enough to your receiver, you're going to hear it. Of course, you can turn the squelch level up, to a point, but eventually you'll squelch out the things you want to hear, too.

CTCSS or Continuous Tone Coded Squelch System is sometimes known by the trade names of Private Line (trademark of Motorola) and Channel Guard (trademark of GE). Many public safety systems use what's known as DCS (Digital Code Squelch) or DPL (Digital Private Line), and they're becoming much more common for hams and other two-way radio systems as well. If you've looked at FRS radios or MURS radios, some of them come with a "Privacy Code." That's probably a CTCSS subaudible tone.

With CTCSS, the receiver doesn't use the carrier level at all. It's looking for the correct tone, a low level (below the level of our hearing, for most of us) signal that acts like a "password" and says to the receiver "this signal is for you." An interfering signal, or even other users on the same frequency who *don't* have this password, won't get through. These tones have to be transmitted continuously with the signal, or the squelch closes and the rest of the transmission is not received. The tone is filtered from the audio that comes out of the speaker, so there's not much chance of hearing anything.

The interference, or a signal a few kHz away, won't have the right tone. Or even if it has the tone, it will be distorted enough that it won't be recognized. So the receiver stays squelched even in the presence of very strong signals without the correct tone. Pretty cool.

Most, but not all, two-way systems in the VHF range use one of these two approaches, and many on UHF do as well. Scanner listeners can use this tone information just like the two-way folks: to stop interference from getting through to our receivers. If you've got a situation where two stations share a frequency, or you're getting interference from an adjoining or nearby transmitter, a CTCSS- or DCS-equipped scanner can really be a treat! Of course, for this to work the agency you're trying to listen to has to be transmitting a CTCSS or DCS signal, or there won't be anything for your scanner to use as the password.

The other thing tone squelch can do is help identify the station talking. If you can read the tone information from a transmitting station, it can be helpful in knowing who's transmitting, or sometimes even in identifying other users on a frequency. At a minimum, if the station you normally listen to uses a tone of 103.5 and you suddenly start seeing 123.0 tones show up, you know that you're receiving something out of the ordinary.

On the business bands, CTCSS or DCS of some kind is almost required. Business users have long been pioneers—or guinea pigs, depending on your point of view—for new communications systems, and

Newer scanners include DCS and CTCSS on the high-end models. This PRO-92 from RadioShack is unique in that it uses only the slow-speed data contained in the individual voice channels to follow trunking systems instead of relying on the system's control channel information.

one of the early uses of CTCSS was to allow multiple users to actually share the same frequency in the same community.

It is fairly common for businesses that need to use radio communications to be able to share, or be forced to share, a frequency with several other companies. The reasoning is that there just aren't that many frequencies to go around, and many smaller companies (some of the companies that can benefit most from two-way communications) don't have enough units or traffic to justify a full-time exclusive frequency. In a large metropolitan area, the cost of putting up repeaters and systems all over town to get coverage can be prohibitive, but by sharing a system, small businesses can get a much better communications system than they could afford by themselves.

So why not have Joe's Pizza Parlor share with Ralph's Plumbing? Great idea. Except that now all of Joe's people have

This Trunktracker III from Uniden includes sophisticated tone squelch as well as an option for choosing to follow the end of transmission code or ignore it. It's basically the controller telling the mobile unit that you're done and it can turn off now so you don't have to hear the squelch tail when you shut off the transmitter. On some systems, if you turn this function off, you're more likely to hear any reply conversation, but you'll have to experiment to see if it works for your system.

to listen to all those plumbing calls all day, and vice versa. CTCSS can take care of that problem. If Joe has one tone and Ralph has another, then as long as they both don't talk at once, they probably won't know each other is there. In fact, it may be possible, depending on how many units Joe and Ralph have on the street during the day, to have several other companies share that frequency too.

Another major advantage of tone squelch systems is frequency re-use, which essentially means, "how close geographically can I assign two users to the same frequency without causing interference?" Public safety agencies are a great example of this problem.

If my local police are on 154.845, how far away does another city have to be in order to use 154.845 for their city's police? The answer to that depends on the local geography, and the use of the frequency by the agencies. If the frequency is used for dispatch operations, with a big powerful base transmitter, then another

Frequency Of The Month

Each month we ask our readers to let us know what they're hearing on our "Frequency Of The Month." Give it a listen and report your findings to me here at "ScanTech." We'll pick a name at random from the entries we receive and give the lucky winner a free one-year gift subscription, or extension, to *Pop'Comm.*

Our frequency this month will be **160.275**. Have a listen and let us know what you hear. Please be sure to put the frequency in the subject of the e-mail, or on the outside of the envelope so it can be handled correctly. You can send your info to radioken@earthlink.net, or via snail mail to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126.

Send entries via regular mail to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or via e-mail to radioken@earthlink.net. "Frequency of the Month" entries must have the frequency in the subject of the e-mail, or on the outside of the envelope in order to be processed and entered correctly.

base transmitter will have to be quite a distance away so they don't interfere. About 150 miles is usually fine, although on some frequencies that probably doesn't cut it. Of course, if there's a mountain range between the two cities, then the rule can change a bit.

One problem that we scanner listeners can run into is being between two such transmitters. The base stations transmitting might be 75 or 100 miles apart, but if you're right in the middle, your scanner is quite likely to hear *both* signals. That's fine, if you're interested in both, but tone squelch can help if you're not.

If both operators are using the channel for public safety car-to-car or low-power operations, then the frequency can be recycled a lot closer to home. The lower power transmitters won't carry as far, and with CTCSS, they can almost share a frequency like the business band folks, if there isn't too much traffic.

Locating Tone Information

Once you have a tone reader, or CTCSS-capable scanner, you have to find the tone information for the channels you're interested in hearing. There are a number of public safety agencies that still don't use CTCSS or DCS, but most do, especially in larger metropolitan areas, and particularly agencies that still use the VHF and UHF bands. Conventional 800-MHz systems are likely to use tone, but trunked systems do not, as they rely on the central controller for receiver control.

You may get lucky and be able to find the tone information published, or you may have to do some detective work to find them. And if you have a reader, you can just sit back and wait, because the reader will report them to you. Of course, once you find them, you should send them in to *Popular Communications* so we can publish them and save everyone else the work.

Other Tones

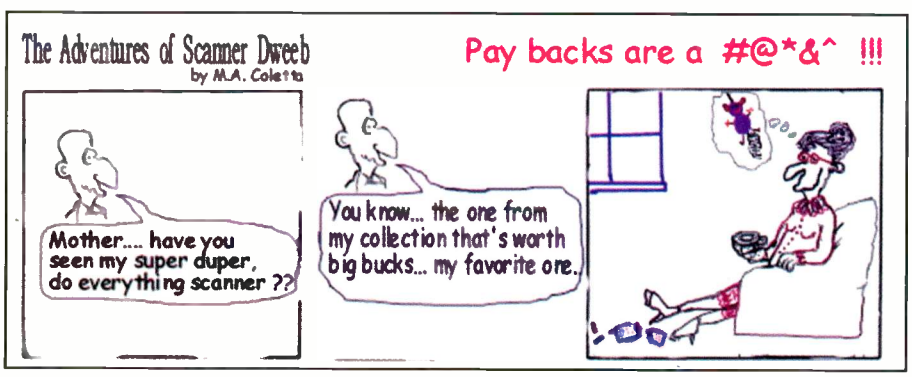
If you've ever stumbled across the control channel for a trunking system without a trunking scanner, you heard a lot of tones, or data to be more specific. Of course, the trunking radios have controls to make sure that the users of the trunked system never have to hear that racket, and if you're using a trunktracker it will also do that for you.

There's one more "tone" that you may encounter. Trunked radios send out data constantly, even on the voice channels. This low-speed data contains information about talkgroups and other info that works very much like a digital tone squelch in a trunked system. Newer trunk-tracker scanners have a control for the End Code detect. The End Code is sent by the controller over the voice frequency (in the slow-speed data stream) to tell the radio that the transmission is complete and it can return to the control channel. This helps pick up the next call sooner, as well as make sure that the user doesn't have to hear squelch tail or other artifacts.

On some of the newer scanners you can choose to ignore this sub-audible control and stay on the channel until the carrier drops. You'll have to experiment with your local system and see which works best, but on some systems this helps you hear more of the reply transmissions, while on others it has little effect.

Let's Hear It For Tones

And there you have it! Tone squelch can really be a help to your regular scanning, particularly if you're experiencing interference problems. It can also help you with identifying unknown agencies. At least it's another piece of information you can put into the monitoring puzzle. Don't forget to let me know what you're hearing and how tones play a part—if they do—in your regular monitoring activities. ■



by Bruce A. Conti, BAConti@aol.com

Go On A DXpedition Without Leaving Home!

These days any seasoned broadcast DXer may wonder how one ever survived in this hobby without the Internet. Obviously the ability to communicate with large groups of DXers through bulletin boards, e-mail lists, and instant messaging has been a major asset to the hobby. On the other hand, trying to find valuable Internet resources can be frustratingly time consuming. An Internet search for any DX-related topic may return hundreds, if not thousands, of sites, some useful, many not so useful.

To help you get through the noise, occasionally "Broadcast Technology" will feature websites found to significantly enhance the broadcast DX experience. Here are three recommended websites. You can go on a DXpedition without leaving home via DXTuners.com and V-Soft.com, and then check out the latest podcasts or create your own on Odeo.com.

That's right, you can do it. And when you're not DXing, check out the latest podcasts or create your own. Here are some outstanding websites and exceptional DX logs guaranteed to keep your radio dial spinning all winter.

This is the Kristianstad, Sweden, DX Tuner, typical of the display and controls available on receivers worldwide.

DX Tuners (www.dxtuners.com)

DX Tuners provides access to remote-controlled receivers located in Australia, Canada, Germany, Ireland, Sweden, the United Kingdom, the United States, and Venezuela. Here are some of the special receivers as described by DX Tuners:

- Broome, Western Australia—Located in a very remote area of the world in Western Australia's tropics, this receiver is good for tropical DX and other unusual skip.
- Rommele, Northern Europe—If you are a shortwave DXer, this will be your favorite radio. Control an array of seven Ewe antennas located in a very low noise area in northern Europe. This radio pulls in a lot of DX, covering 100 kHz to 30 MHz.
- Santa Clarita, California—This rig has three switchable antennas: wideband discone, endfed longwire, and ground mounted vertical.

DX Tuners is an indispensable live mediumwave reference. Brad Wall of the DX Tuners Support Team introduces visitors to the site from another aspect of the hobby. Brad writes,

Mediumwave DXing is the art of hearing far-away and rare stations on the mediumwave band. DXpeditions are trips listeners take to remote areas to hear radio stations from a remote location. DX Tuners.com combines these two and adds a whole new dimension to MW DXing. Mediumwave signals generally propagate poorly during the day, usually less than 100 miles. At nighttime, however, mediumwave signals can travel thousands of miles. Using a DX Tuner, you can choose from several major parts of the world for your own DXpedition.

One of my favorite receivers is located in Kristianstad, Sweden, for comparison with transatlantic mediumwave DX. Three receivers located in Venezuela have proved to be helpful in identifying Latin American signals. The ICOM PCR-1000 is the receiver of choice for a majority of the online sites, with the JRC NRD-545 DSP a distant second. Most use discone antennas. Access to all the DX Tuners is by subscription. A demo ICOM R-75 located at Skurup Beach, Sweden, is available for free so you can give DX Tuners a test drive before subscribing.

V-Soft Zip Code Signal Strengths (www.v-soft.com/ZipSignal)

Find the field strengths of AM day, AM night, and FM stations within U.S. postal zip codes throughout the U.S. This web program produces accurate radio station field strengths, organized by zip codes, from the FCC's AM and FM database. V-Soft Communications provides this data free of charge as a service to its customers and friends. Simply enter the zip code of the post office nearest your receiver location, and you will get a listing of AM and FM radio stations, including FM LP and repeater stations, sorted by signal strength from the strongest to the weakest, or +100 dBu extremely strong signals to +50 dBu weaker coverage that may have interference.

"This is an excellent research tool, right on par with dxtuners.com in saving the DXer a lot of time as well as the

cost of gasoline and airline tickets," says Mark Connelly, WA1ION. Mark has found the data to be especially useful for receiver and antenna testing. "By obtaining a listing of signal strengths that is reasonably accurate for a given location, the values can be used as a 'transfer standard' to calibrate a receiver's S-meter readings with a given antenna."

The V-Soft data is also useful in scoping out potential DXpedition sites, or in preparation for a stateside vacation that might include some radio listening. For example, a DXpeditioner can obtain listings for several potential locations, and then choose the best site for intended targets based on minimum interference per the V-Soft data.

Odeo Podcasting (www.odeo.com)

Odeo is an outstanding website for anyone interested in podcasting. Odeo was founded in 1994 by Web publishers and bloggers Noah Glass and Evan Williams. Their mission statement says it all:

> As a company, we believe strongly in the democratization of media. We think that giving more people powerful tools for the creation and distribution of media will result in more knowledge, ideas, art, truth, and amusement available to all. This, we see, is one of the most important roles that the Internet is playing in society today. And we think that the potential for new forms of audio content is particularly exciting, as it is one of the most ubiquitous mediums possible, yet also one that has lacked options for so long.

Odeo can be used with an iPod, any MP3 player, or any computer with MP3 audio capability. Odeo makes podcast listening and creation easy, so you don't have to know how it actually works. The "Odeo Synchr" tool lets you download anything from their catalog of podcasts to your computer or MP3 player with ease. You can browse through featured channels, new shows, new channels, and the top 40 podcasts, or you can search by topic, such as documentary, food, music, politics, sports, and technology. The "Odeo Studio" creation tool provides the ability to publish your own audio content for podcasting, which will then be listed in the Odeo library.

Brent Taylor, VE1JH, one of the producers of the podcasts "This Week in Amateur Radio" and "This Week in Amateur Radio International," gives Odeo two thumbs up. "I have had a 256 MB player since May, and use it religiously when I'm walking or commuting," says Brent. "Using Odeo I subscribe to my list of favorite podcasts." In addition to his amateur radio podcasts, Brent says he listens to "The ARRL Audio News," "Glenn Hauser's World of Radio," "On the Media" from National Public Radio, and dozens of xml subscriptions that relate to non-radio pursuits, including astronomy, aviation, politics, and history.

The service is free, only requiring setup of an account and password for access.

Stay Tuned

Of course there's much more of interest to broadcast DXers available on the Internet. Additional outstanding websites will be featured in the months to come. In the meantime, if you have a favorite website to recommend to fellow DXers, please let us know about it here at "Broadcast Technology."

DX Club News

The National Radio Club has introduced "e-DXN" on the Internet (www.e-dxn.com). e-DXN is the electronic publication of the club newsletter presented in a bulletin board forum format. The DX Audio Service monthly program is also downloadable via e-DXN as an MP3. Access to e-DXN is by subscription.

The International Radio Club of America has announced the release of its latest IRCA Mexican Log. The log lists all AM radio stations in Mexico by frequency, including call letters, state, city, day/night power, slogans, schedule, formats, networks, and additional notes. It's an indispensable reference for anyone who hears Mexican radio stations. Visit www.irca.org for more info.

Although the Association of North American Radio Clubs was officially dissolved in 2005, the website lives on. The North American Shortwave Association will continue to maintain the site and invites all DX clubs to join. Visit www.anarc.org for info and links to DX clubs of all flavors.

Broadcast Loggings

There's a lot of DXing going on, so let's check 'em out! All times are UTC.

549 Alger Chaine 1, Les Trembles, Algeria, at 2258 strong with Arabic male vocal parallel to 153 and 891 kHz. (Wolfish-NB) At 2354 an Arabic group vocal, strings, flutes; low audio level on big carrier. (Connelly-MA) At 0049 good with Arabic chanting. (DeLorenzo-MA)

549 Deutschlandfunk synchros, Germany, at 0020 good; instrumental music and talk parallel 6190 kHz, loud het against 550 WDEV. (Conti-NH)

620 WGCV Cayce, South Carolina, at 0443 a spot promoting the station's gospel format and how it connects with the African-American community. Good signal that faded into the mix. "WGCV, where knowledge is power." (New-GA)

648 Radio Murski Val, Nemcavci, Slovenia, at 0115 weak instrumental music, not BBC or RNE Spain. A check of Sweden and UK online DX-Tuners had a mix of the unidentified music and BBC Orfordness, while a Germany DX-Tuner had solid BBC. Jan Alvestad in southwest Norway suggested Radio Murski Val as the number two station under BBC. Streaming audio on the Radio Murski Val website matched both the Sweden DX-Tuner and weak signal received here, carrying the Nocni night program per the European "Medium Wave Guide." (Conti-NH)

660 CFFR Calgary, Alberta, at 0920 fair, with WFAN phased/nulled. '60s and '70s gold, "Calgary's station for good times," into Strawberry Alarm Clock's "Incense and Peppermints." A new province for the logbook. (Taylor-NB)

730 WLTQ Charleston, South Carolina, at 1150 a simulcast of WSCC 94.3 FM in Goose Creek, SC, with Charleston area traffic and weather. Good signal that would fade into and under the static. "Newsradio Ninety-Four Three, WSC-FM." (New-GA)

850 KOA Denver, Colorado, at 1005 fair to poor, with WEEI nulled near local sunrise. Weather report for the rest of the night, followed by temperatures in Boulder and Denver, then the ID, "Newsradio 850, KOA." (Taylor-NB)

880 CKLQ Brandon, Manitoba, at 0901 fair, with WCBS phased/nulled, Loto 6/49 winning numbers, weather forecast with temperatures in Celsius, into a country western song with no call letter ID. New province. (Taylor-NB)

880 KRVN Lexington, Nebraska, at 0130 University of Nebraska volleyball play-by-play, "You're listening to the Pinnacle Sports Network" and station ID. (Barton-AZ)

909 VOA Sebeli-Phikwe, Botswana, at 2115 began to surface with the same VOA programming as on 1530 Sao Tome. Classic Rock Show playing Rolling Stones tunes "Lady Jane" and "2000 Light Years from Home." VOA news headlines at 2130 and then "Sympathy for the Devil." No sign of BBC yet on 909 kHz. (Wolfish-NB)

940 WMAC Macon, Georgia, heard at 0330 a constant signal, heard with news. (Weronka-NC)

945 France Info, Toulouse, France, at 2355 noted with classical music parallel to 1557 kHz. (Wolfish-NB) At 2330 an excellent, local-like signal! Bottom of the hour

AM and FM Station Changes And Updates

Pending

New Call	Location	Freq.	Old Call
KZRG	Joplin MO	1310	KOCR
KZHN	Paris TX	1250	KPJC
KMPT	Victor ID	92.3	KMQS
KBEN-FM	Belle Fourche SD	102.1	KFMH
KZKL	Wichita Falls TX	90.5	KTEO
KUSZ	Laramie WY	98.7	KHIH

Changes

New Call	Location	Freq.	Old Call
WKTT	Saraland AL	1160	WZFN
KPIG	Piedmont CA	1510	KMZT
KNRV	Englewood CO	1150	KNRC
KJME	Fountain CO	890	New
KHNR	Honolulu HI	870	KAIM
WSFE	Burnside KY	910	WLLK
WJQI	Fort Campbell KY	1370	WKFN
WKRD	Louisville KY	790	WXXA
WPYR	Baton Rouge LA	1380	WYNK
WZQK	Brandon MS	970	WRKN
WAKK	McComb MS	980	WAPF
WAPF	McComb MS	1140	WAKK
KZYM	Joplin MO	1230	KWAS
KADI	Springfield MO	1340	KIDS
KVOT	Taos NM	1340	New
WLZR	Canton NC	970	WOXL
KGND	Vinita OK	1470	KITO
WXXP	Waynesburg PA	1580	WANB
WIGN	Bristol TN	1550	WBCV
WKFN	Clarksville TN	540	WJQI
WNVL	Nashville TN	1240	WMDB
KJJL	Pine Bluffs WY	540	New
KFTT	Bagdad AZ	103.1	KRCI
KRZS	Flagstaff AZ	97.5	KZLB
KAIH	Lake Havasu City AZ	89.3	KVKL
KMZQ	Payson AZ	99.3	KSXX
KZIG	Cave City AR	89.9	KVMN
KAPW	Cotton Plant AR	99.3	New
KYCJ	Camino CA	88.3	New
KTKZ-FM	Dunnigan CA	105.5	KKFS
KPIG-FM	Freedom CA	107.5	KPIG
KBAA	Grass Valley CA	103.3	KCEE
KLMG	Jackson CA	94.3	KSFS
KKFS	Lincoln CA	103.9	KVMG
KLLE	North Fork CA	107.9	KZOL
KXCL	Placerville CA	92.1	KBDB-FM
KLZN	Susanville CA	96.3	New
KKDV	Walnut Creek CA	92.1	KABL-FM
KUUR	Carbondale CO	96.7	New
KZMV	Kremmling CO	106.3	KKHI
KCUF	El Jebel CO	100.5	New
KRKV	Las Animas CO	107.3	New
WHWY	Marathon FL	91.5	New
WFFL	Panama City FL	91.7	New
KFMS	Franklin ID	97.5	KTPM
KQZB	Troy ID	100.5	New
WBBE	Heyworth IL	97.9	WVWN
WSHP	Attica IN	95.7	WLFF
WLFF	Brookston IN	95.3	WSHP
WTFX-FM	Clarksville IN	93.1	WJZL
WXVW	Veedersburg IN	88.5	New
KMXN	Osage City KS	92.9	KKYD
WSEK	Burnside KY	93.9	WLLK-FM
WHSX	Edmonton KY	99.1	WKNK
WLUE	Louisville KY	100.5	WTFX-FM
WLLK-FM	Somerset KY	102.3	WHMJ-FM
WKEQ	Somerset KY	97.1	WKEQ-FM
KHEV	Houma LA	104.1	KSTE-FM
KCKR	Kaplan LA	91.9	New
KNGT	Lake Charles LA	99.5	KBXG
WPDD	Norco LA	91.1	WWLA
WXPZ	Clyde Township MI	90.1	New
WZHN	East Tawas MI	91.3	New
WJCE	Elkton MI	88.9	New
WDPW	Greenville MI	91.9	New
WKOQ	Newaygo MI	92.5	WODJ-FM
KADI-FM	Republic MO	99.5	KADI
KRQS	Alberton MT	105.5	New
KSCY	Big Sky MT	96.3	New
KQBL	Billings MT	105.1	KNDZ
KNBE	Beatrice NE	88.9	New
KLNC	Lincoln NE	105.3	KKUL
KOYT	Elko NV	94.5	New
KRGT	Indian Springs NV	99.3	KQMR
KVKL	Las Vegas NV	91.1	KAIH
WLKC	Campton NH	105.7	WUSX
KKTC	Angel Fire NM	99.1	New
WHAZ-FM	Hoosick Falls NY	97.5	WZEC
WWNK	Farmville NC	94.3	WWGL
WJKA	Jacksonville NC	90.1	New
WWHA	Oriental NC	94.1	WWEA
KLJA	Jamestown ND	88.9	New
WXXR	Fredericktown OH	98.3	WWBK
WXXF	Loudonville OH	107.7	WBZW
KSSX	Chickasha OK	90.5	New
KSSO	Norman OK	89.3	New
KLBR	Bend OR	88.1	New
KRJT	Elgin OR	105.9	New
KKJA	Redmond OR	89.9	New
WUFR	Bedford PA	91.1	New
WWWH	Halifax PA	88.5	New
WMHX	Hershey PA	106.7	WCPP
WZZH	Honesdale PA	90.9	New
WXFR	State College PA	88.3	New
WANB	Waynesburg PA	103.1	WANB-FM
KVFL	Pierre SD	89.1	New
KVAR	Pine Ridge SD	93.7	New
KSFS	Sioux Falls SD	90.1	New
KSUR	Mart TX	88.9	New
KVEE	White Oak TX	99.3	KLBL
KSL-FM	Midvale UT	102.7	KQMB
KCYQ	Richfield UT	97.5	KLGL
KLGL	Richfield UT	93.7	KCYQ
KYLZ	Tremonton UT	104.9	KBNZ
WUSX	Addison VT	93.7	WXAL-FM
WLEQ	Bedford VA	106.9	WBWR
WKSK-FM	South Hill VA	101.9	WRWV
WWED	Spotsylvania VA	89.5	New
KTRW-FM	East Wenatchee WA	88.1	KTRJ
KBDB-FM	Forks WA	103.9	KLLM
KTRT	Winthrop WA	97.5	New
WDNQ	Kenova WV	97.9	WVMG
WWLA	South Charleston WV	89.3	WPDD
WOVM	Appleton WI	91.1	WLFM
WHQG	Milwaukee WI	102.9	WLZR
KSHF	Cheyenne WY	93.7	New
KFMR	Marbleton WY	95.7	New
CKNI	Moncton NB	91.9	New
CHNI	St. John NB	88.9	New
CJNI	Halifax NS	95.7	New
WZMY-TV	Derry NH	50	WNDS
KNIC-TV	Blanco TX	17	New

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news by a woman in French. (Conti-NH) At 0231 parallel 1206 kHz with fast French talk by woman; to good peak. (Connelly-MA)

1026 Jigaawa Broadcasting Corporation, Dutse, Nigeria, at 2143 African drum music heard over/under Spain. Male announcer in unknown language. Seemed to go off the air at 2204 after a possible call to prayer and also the national anthem. No ID heard, but clearly it was the Nigerian anthem. It sounded familiar to me and also matched up with the anthem posted at www.intervalsignals.net. (Wolfish-NB)

1070 WINA Charlottesville, Virginia, at 0920, a decent signal, heard with a talk show concerning security leaks. (Weronka-NC)

1130 CKWX Vancouver, British Columbia, at 0935 fair, with WBBR nulled/phased. News with woman anchor, several mentions of "Lower Mainland," a traffic report mentioning Vancouver area locales including "Cloverdale." Then sports with CFL football, NHL exhibition Canucks game (lead story), and MLB scores. Reception confirmed using recording of that program hour provided a few days later over e-mail by the chief engineer at CKWX. New province! My first Pacific coast reception and best domestic logging in 30 years of DXing from New Brunswick! (Taylor-NB)

1140 CHRB High River, Alberta, at 0949 good, no need to phase null, in occasional WBBR slop with immediate ID, "Southern Alberta's community radio station, AM 1140," into a country western song. New logging! (Taylor-NB)

1169 IRIB Sarasary, Semnan, Iran, at 2318 a big het here below 1170, but never any audio. Iran, I assume. (Wolfish-NB) At 2310 pop style Middle Eastern music; huge carrier, stronger than WWVA, but mushy audio. (Connelly-MA)

1206 France Info, Bordeaux, France, at 2138 talk in French about a car accident. Fair signal at this time. This and 1377 kHz were usually the best France frequencies while DXpeditioning in Miscou, New Brunswick. (Wolfish-NB) At 2313 '40s Cuban-style jazz; strong, equal to 1200 WKOX, 60 dBu: 1 mV/m per V-Soft. (Connelly-MA)

1250 WTMA Charleston, South Carolina, at 0047 a good signal that faded away with a promo, "...on Newstalk 1250, WTMA." (New-GA)

1377 Radio Free Africa, Mwanza, Tanzania, at 2238 a fair signal mixing with France. Woman in Swahili talking on the phone and some lively African music heard. The next day at 2136 better than previously with no sign of France. Man in Swahili playing soul/R&B music. (Wolfish-NB)

1521 BSKSA Dubai, Saudi Arabia, at 2236 a woman in Arabic parallel to shortwave 9555 and 9870 kHz. Strong. (Wolfish-NB) At 2229 good with a radio drama in Arabic parallel to 9555 and 9870 kHz. WWKB phase-nulled. (DeLorenzo-MA) At 2322 Arabic talk, on late for Ramadan. Signal 15 dB stronger than 1520 WWKB. (Connelly-MA)

1575 Radio Farda, Al Dhabiya, United Arab Emirates, at 0227 over Spain at this time with Middle Eastern music and ID by a man at 0230 in Persian. (Wolfish-NB) At 2252 high-energy Middle Eastern dance music, female talk; to good peak. (Connelly-MA)

1590 WAKR Akron, Ohio, at 0610 bad fading with nostalgia including a Helen Reddy song. (Weronka-NC) WAKR does very well for 5 kW on a crowded regional frequency, received often in New Hampshire, too. (Conti-NH)

1600 WTZQ Hendersonville, North Carolina, at 2300 Chuck Mangione's "Feels So Good" into ID and news. Good signal that faded away from time-to-time. "Timeless Classics on WTZQ, Hendersonville, Flat Rock." (New-GA)

Thanks to Rick Barton (Ford Ranger stock radio), Mark Connelly (Drake R8A, Drake SW8, dual-feedline Flag 5 x 10.6-m, to DX Engineering RPA-1 amplifier), Marc DeLorenzo (JRC NRD-525, Mini-DXP-3 phasing unit, noise-reduced vertical, broadband loop and longwire), Bert New (Drake R8B with 135-ft north/south wire, Sangean ATS-909 with Select-a-tenna), Brent Taylor (Icom R75 with Kiwa mods, 1800-ft unterminated north-northwest Beverage, 935-ft terminated Beverage, Ewe, Quantum Phaser, and barefoot Sony ICF-2010), David Weronka (Grundig Mini-100PE), and Niel Wolfish (AOR-7030+ with Ewe antenna and two Beverages). ■

Radio Broadcasting In Tonga

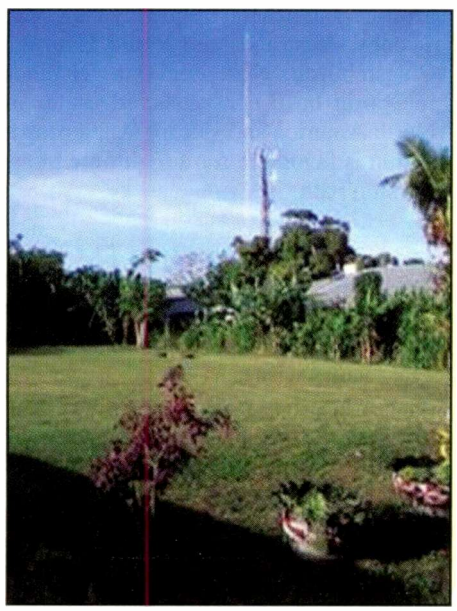
There's No Shortwave, But You Can Still Try For Tonga's Mediumwave Station!

By Bob Padula, bobpadula@mydesk.net.au

Editor's Note: Much of the content of this story is based on information Bob gleaned from his visit to the Kingdom flying Air New Zealand out of Melbourne, transiting in Auckland for several hours, and then finally arriving at the International Dateline Hotel in Nuku'alofa at 3.15 a.m.! Bob tells us, "Travelers leaving the Kingdom are reminded at the airport that expressing comments critical of security requirements, or of other regulations, may result in detention."

The Kingdom of Tonga occupies some 700,000 square kilometers of ocean, but consists of only about 799 square kilometers of land area, comprising 171 small islands, fewer than 40 of which are inhabited. It lies in a time zone of UTC +13 hours, and the capital is Nuku'alofa, located on the main island of Tongatapu. The island is about 30 kilometers by 20 kilometers and is predominantly flat, with extensive cultivation of many varieties of crops and vegetables year-round.

The colonization of the Tonga Islands can be traced back about 3,500 years. The origin of the first settlers is unknown, but it is thought that there was immigration from the west, such as the Philippines or the East Indies. It's also believed that pre-European colonizers of the island region of Samoa and Fiji were from the same seafaring people. Over time, however, Tonga's settlers lost contact with their origins and the early people in Samoa and Fiji.



The A3Z Antenna mast and adjacent microwave tower in Nuku'alofa.

Early settlers depended on fishing, and used tools made from shells and stones. In time, coconut, taro, breadfruit, yam, banana, and meat such as rat, pig, dog, and fowl were introduced to their diet. Farming was developed somewhat later and surplus food was readily shared with neighbors.

The first fishermen built their homes around the coast and the farmers moved further inland where the soil was fertile. Villages and townships did not exist, nor was there any form of centralized government or currency. Instead, an elite class ruled over districts, which were subdivided to a middle management group who sublet these land holdings to the common folk/slaves. It's not certain that all Tongans accepted this regulated form of culture. Tongans developed a complex family ranking system whereby the eldest female (and her descendants) held higher rank within the family than did the brothers.

Religion in the pre-European culture was associated with violence and unrest. Great emphasis was placed on the local spirits and ghosts who had a direct effect on daily life.

The First Europeans

The first European contact was in 1616 when the Dutch visited the region en route to the East Indies. The first English contact was in 1767, followed in 1777 by Captain James Cook (a plaque marks Cook's landing spot). The French and Spanish also visited the islands in the late 1700s. The first permanent European settlement was started in 1796 by deserters from an American ship. They were followed in 1797 by missionaries from London.

In 1789, mutineers from the *HMS Bounty* were set adrift by Captain Bligh and landed briefly on Tonga's Tofua island. Their experiences, of course, formed the basis for the well-known *Mutiny on the Bounty*!

The 1800s And Beyond

Christianity reached Tonga in the early 1800s, through the influence of Wesleyans and French Catholic missionaries. The period prior to the early 1900s was marked by unrest fueled by religious dissent. Tonga became a British Protectorate in 1893, and full Sovereignty was granted in 1970. Dissatisfaction with Tonga's traditional government emerged in the early 1990s and resulted in the formation of the pro-Democracy Movement, which ultimately became the Human Rights and Democracy Movement (HRDM) in 1998. A year later Tonga was granted membership in the United Nations in September 1999.

Today, the powerful Wesleyan and Roman Catholic churches support the HRDM, but the majority of Tongans do not support any major democratic change. Sunday's is especially important in the culture, with its significance even protected by Tongan law. It is set aside for eating, enjoying family contacts, resting, and attending church. Sunday commercial activity is almost non-existent, limited to small launches crossing to the nearby islands, a bakery, and a petrol station!

Radio In Tonga

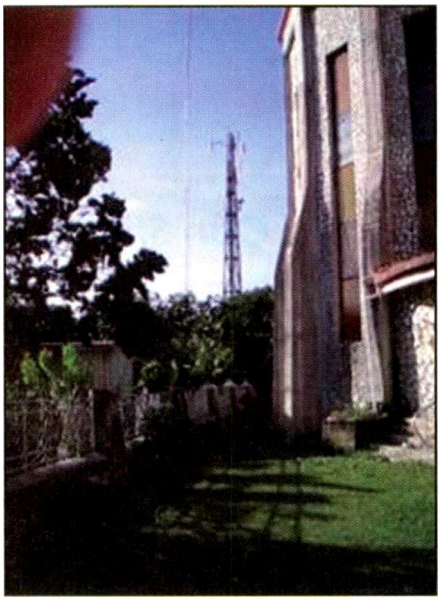
International radio communications and telephones came to Tonga in the 1920s. At first radio simply provided a means of sending and receiving messages between Nuku'alofa and another station outside Tonga (in Fiji, or on ships). A few years later, a link was established between Nuku'alofa and the island of Vava'u, and in 1929 substations were established in Ha'apai, Niuafo'ou and Niuatoputapu islands. At the same time, the Nuku'alofa station was upgraded to improve international contacts. The main use for these facilities was shipping communications and notification of local emergencies.

Broadcast radio came to Tonga in 1933 when the British shortwave service was extended to the Pacific, and in 1935 New Zealand began broadcasting to the Pacific. Today there are still very few broadcasters in Tonga, with Radio A3Z the major radio broadcaster on the islands.

Radio Tonga

Radio Tonga came into existence on July 4, 1961, when a new AM station was inaugurated with 10 kW on 1020 kHz. At that time, the new broadcasting service was a department of the Tongan government, with the callsign ZCO. In 1972, the callsign was changed to A3Z. In 1975, Radio Tonga became an independent statutory organization—the Tonga Broadcasting Commission. Two years later, the frequency was changed to 1017 kHz, in alignment with the new 9-kHz channel spacing in ITU Region Three.

A new shortwave service appeared unexpectedly on February 28, 1989 as a 1-kW transmitter went on the air with a relay of the AM service using 5030 kHz. This new broadcast on tropical shortwave was intended for coverage of the scattered populations on the outer islands. However, four months later, a problem



A view of the A3Z antenna mast and microwave tower next to the magnificent Anglican church.

developed in the transmitter and from that time onwards, Radio Tonga was heard on shortwave only sporadically. Although a new final tube was obtained from France and the transmitter moved to a new location, it was never again on the air for any appreciable amount of time.

The end of shortwave service from Tonga came when a storm demolished the antenna on February 16, 1993. At this time, Radio New Zealand International provided a brief relay service from Radio Tonga and beamed the programming back to the "Friendly Isles" of Tonga. Unfortunately, there are no plans to reactivate a SW service at this time.

A3Z Radio One AM

Radio Tonga's mediumwave station, Radio One, a 10-kW outlet on 1017 kHz, has the callsign A3Z Radio One. "The Call of the Friendly Isles," is the only Tongan broadcaster covering all of the Tonga Islands, providing news and information for the country.

It's really grassroots radio, as Radio One broadcasts a mix of English and Tongan language programs with a very high community development focus, with community groups given airtime. Church news programs are very popular and college programs are part of the mix, as are live broadcasts of festivities and sports programs. Radio One broadcasts out of Fasi-moe-Afi and retransmits world news programs by Radio Australia, the BBC, and Radio New Zealand. These international broadcasts are also translated into Tongan for rebroadcast, giving the radio listener a very broad range of information.

The only AM broadcaster in the nation has excelled in many areas of its responsibility to the community, but on the other hand it has been slow to respond in others. The AM station is also in need of modernizing its approach to paying and listening customers. The retransmissions of international stations are often of marginal quality, but open a vast window of exposure for locals to the events beyond their island nation.

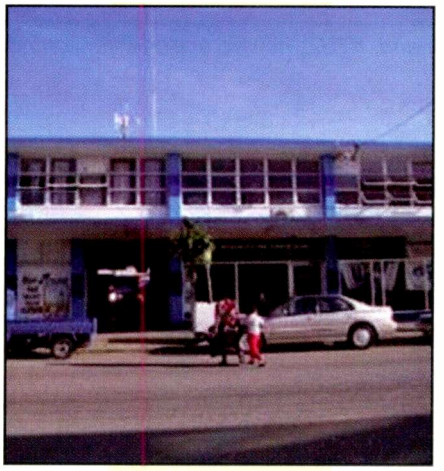
Sign-on is at 6 a.m., with the rendition of the Tongan Anthem, announcing in Tongan as "Radio Tonga A3Z on AM." Local spots are carried for TV-Tonga. English is broadcast at 6.30 a.m., followed by the BBC news relay at 7 a.m. Relays of Radio Australia news are at 8 a.m., RA and RNZ news is at 1 p.m., and another Radio Australia news relay is at 8:15 p.m. Sign-off is at midnight.

The station has its studios behind a modest shop-front in the main street of downtown Nuku'alofa. This shop sells all kinds of electrical appliances, and is commercially linked to Radio Tonga. The transmitter is in a small building at the rear, and the antenna is a vertical omnidirectional radiator, adjacent to the tower carrying FM and microwave facilities. This site is next to the magnificent Anglican church.

Interestingly, the 1017-kHz outlet provides good coverage out to about 300 kilometers during the daytime, reducing to some 200 kilometers at night, which is adequate to serve the majority of the population across the main island groups. It shares the frequency with 2KY Sydney, Australia, and Radio Hauraki, Christchurch, New Zealand. Distance reception has been observed as far as North America and Europe when propagation is favorable for a nighttime transmission path.

A3Z Radio One FM

A3Z Radio One FM is a venture of the broadcaster into the FM band on 90.1 MHz and has principally used this frequency for the broadcast of music programs. Although older than the AM, and having a better library collection, this experiment has faltered, coming up against competition from local FM broadcasters. Smaller and new FM broadcasters have quickly attracted the younger FM



Tonga Broadcasting Commission at Nuku'alofa with studio shop front and A3Z antenna mast at rear.

listeners with a better understanding of their listening preferences as well as the needs of advertisers.

The station announces as "Radio Tonga—Kool FM," opening each morning just prior to 7 a.m., one hour later than its AM counterpart; Close-down is at midnight. A relay of the BBC World Service news is carried at 7 a.m.

Christian Radio In Tonga

The Kingdom of Tonga is the main "Ministry Base" for the Pacific Partners religious organization in the South Pacific Islands. Christian Radio 93 FM is managed by Loni Akolo, a local Tongan man who has been trained by United Christian Broadcasters (UCB) Pacific Partners and who serves on the UCB Pacific Partners Trust board.

The goal of UCB Pacific Partners is to train local people to minister the Gospel to their own people, so Christian radio 93FM broadcasts few western radio programs. Instead Loni and his team make most of the programs locally, and in the Tongan language. He has three full-time paid local staff and many part-time volunteer announcers for the station—the youngest announcer is 12 years old!

Christian Radio 93FM was the first Christian radio station in the South Pacific Islands. It has been broadcasting in Nuku'alofa since 1993. After 10 years of hosting ministry teams and broadcasting out of an old house in Nuku'alofa, UCB Pacific Partners recently moved into a new "purpose-built" ministry and radio station facility. Broadcasting is 24 hours daily, its programming includes some relays of the New Zealand-based religious broadcasting network "Radio Rhema." An additional FM service is planned for Vava'u Island.

A3V Millennium Radio 2000

A3V Millennium Radio 2000, using 89.1, broadcasts popular music 122 hours per week with the slogan "Tonga Radio." With a current broadcast range reaching all of the Tongatapu island group the new entry into the Tonga radio broadcast spectrum has quickly garnered a following among the general populace, especially youth. It is funded from commercial advertising revenue.

Entrepreneur Sam Vea is the lead DJ as well as business manager at A3V. Primarily focusing on music broadcasts, Sam is negotiating with overseas entertainers for retransmission of their music programs as well as assessing means for acquiring quality non-music programming for his customers.

The studio and transmitter are located in Nuku'alofa. Transmissions commence at 6 a.m., and close-down is variable, generally around 11 p.m. or midnight.

There is also an FM outlet in Talau, Vava'u Island, operating on 101.1, with the same schedule.

Radio Nuku'alofa

Operating 24 hours a day on 88.7 from downtown Nuku'alofa, this broadcaster focuses on popular music with English- and Tongan-speaking presenters. It announces as "Radio Nuku'alofa."

Learn More About Radio In Paradise

That's it for our brief look at radio in this South Pacific Kingdom. If you're interested in finding out more, check out these useful Tonga Internet resources:

Tonga on the Net
http://www.tongatapu.net.to
Pacific Partners, Christian Radio in Tonga
http://www.pacificpartners.org
Tonga Radio
www.tongaradio.com/

Additionally, interesting stories about long-distance reception in Finland of Radio Tonga on 1017 kHz, November 1998, may be found at http://www.dxing.info/profiles/tonga.dx.

A photographic study of my 2004 trip may be found at http://worldisround.com/articles/59380/index.html ■

by Rich Arland, K7SZ, richard.arland@verizon.net

Gear To Go

This month's "Homeland Security" column is a bit of a departure from the norm. Rather than focusing on all that is bad in the world, for a change I decided to showcase a couple of items that I personally have used and find extremely useful in the pursuit of our radio hobby. I am constantly on the lookout for accessories and gear that will make life on the bands a little more tolerable and provide increased enjoyment.

Without a doubt, one of the more exciting—and helpful—aspects of the radio hobby in the last few years has been the advent of the multi-mode HF+ transceivers that have flooded the market. Starting with the Vertex Standard (Yaesu) FT-817 transceiver (HF + VHF/UHF, AM/CW, SSB, FM and DATA modes plus a general coverage receiver), we've been treated to a wonderful assortment of very small, highly portable, battery-powered radio gear. It's designed for a variety of applications, including QRP (low-power) operation from the shack, car or trail, and emergency communications. The tiny FT-817 really sparked a revolution within the ham radio hobby that has had major repercussions throughout the world.

The FT-817 was soon followed by the ICOM IC-703+ (HF plus 6 meters), the Elecraft KX-1 (four-band CW-only transceiver with internal auto antenna tuner and battery pack), along with higher powered radios like the FT-857, IC-706, TS-50S, and the FT-897. In short, there is a whole world of portable radio gear out there to fit anyone's needs. All you gotta do is look!

Advanced by the HF Pack crowd (www.hfpack.com), the most popular communications choice is undoubtedly the FT-817 coupled to an auto antenna tuner like the now discontinued LDG Z-11. Add a medium size (and weight) gelled electrolyte battery (somewhere around 2300 mA/hr) and portable vertical antenna like the Ventenna HFp, Super Antennas MP-1, or the WA3WSJ Black Widow fishing pole vertical antenna, and you have a mini-station that can go just about anywhere you can physically carry it! The only problem is how do you transport this mini-station, or even operate it on the go as a pedestrian mobile station?

The Radio Rucksack!

All this ultra-portable gear is great, but you still need some way to get it into an emergency situation short of carrying it in a cardboard box or a milk carton. Enter what I like to call "the radio rucksack." Several companies market and sell radio-related backpacks intended for use with many of the newer multi-mode HF+ transceivers.

The idea behind "the radio rucksack" is to provide the avid hiker/backpacker/naturalist with a means to easily transport the necessary radio gear into the bush so he/she can enjoy the wilds while also enjoying some quality ham radio operation. Of course, this also makes it extremely interesting to the provider of emergency communications (EmComm).

Two Perfect Fits From Communication Outfitters

Greg Peralta of Communication Outfitters (www.communication-outfitters.com) recently provided me with two samples of his product line: the Expedition Trail Pack and the Expedition Pack. Both packs are quality products made of Cordura (ballistic nylon). I'm a fairly big guy (not as big as I used to be since losing about 130 pounds, but still bulky) and I have a hard time with backpacks in general. None of them ever seem to fit me correctly and it's no fun lugging my radio gear into the bush using an ill-fitting backpack. From the get-go both of the Communication Outfitters packs fit me like they were tailored for me. I was definitely impressed.

The Expedition Pack's internal stays make it a snap to pack and head out toward an emergency situation, or just hit the trail in comfort with your gear.

Although the names are *very* similar, there is a big difference in these two backpacks. The Expedition Trail Pack, the larger of the two, is designed as a day-pack-type backpack, and you can load a lot more gear into it than you can into its smaller brother, the Expedition Pack. Additionally, the smaller Expedition Pack is a semi-rigid backpack designed specifically to permit easy radio operation while in motion (pedestrian mobile, if you will).

If you're heading to an emergency preparedness drill, Field Day, or just a weekend in the woods, something like the Expedition Trail Pack would be a great choice because it allows you to pack a lot of gear and accessories. Also, the Expedition Trail Pack can double as your regular EmComm "Jump Kit," since it is large enough to hold most, if not all of the things you'll need for deployment under EmComm circumstances. Since I am always on the lookout for ways to improve my "Jump Kit," the Expedition Trail Pack has come in very handy.

The Expedition Trail Pack is a soft pack without any internal stays or frame. This is a comfortable pack to don and wear thanks to the heavily padded shoulder straps, sternum strap, and waist strap that all adjust for comfort. There are internal pockets and partitions that can be customized to fit a multitude of radio gear. This type of pack was designed specifically to house the larger generation of multi-mode HF+ radios including the FT-857, FT-897, IC-706, IC-703, and the TS-50S along with an auto antenna tuner and battery.

The Expedition Trail Pack is *not* the type of pack I would use with a radio to "walk-and-talk" a la the HF Pack folks. However, I have heard that some folks have remote-mounted the HF rig inside the pack and used a "remote head pouch" attached to the outside of the pack to operate pedestrian mobile. The only drawback I can immediately see to this idea is the necessity of carrying a lot of battery power (which equates to added weight, and a *lot* of it at that) to run the higher-powered radio gear. When required to do a lot of carrying, weight is your ultimate enemy.

While the Expedition Trail Pack is designed with the larger HF+ rigs in mind, Peralta's company offers a "fanny pack" that will accommodate the FT-817 along with the LDG tuner. This pack attaches to the outside (back) of the Expedition Trail Pack and can be detached for operations at camp. Now this is a very tidy design that lends itself extremely well to the idea of an EmComm "Jump Kit" whereby you have the radio gear readily available outside the pack while all of your other EmComm gear is tucked safely away inside the pack to stay nice and dry and be accessed only when needed.

The Expedition Trail Pack lets you attach a water bladder hydration kit (not supplied by Communication Outfitters) along with various other paraphernalia, including your cell phone, VHF HT, FRS/GMRS HT, portable CB, and/or GPS unit. There is an ID pocket and antenna openings on the top of the pack. All in all, the Expedition Trail Pack is a good investment if you need the convenience and space of a daypack with radio as the underlying theme.

The other pack I received from Communication Outfitters is its semi-rigid Expedition Pack, which is specifically designed to support radio gear, antennas, a large capacity battery, and a trailing wire counterpoise for "walk-and-talk" portable HF/VHF/UHF operations. The Expedition Pack is compartmentalized to fit several of the small multi-mode HF+ rigs. An auto antenna tuner similar to the LDG Z-11 (now sadly discontinued) can be added to the internal pack compartment to provide instant antenna tuning when changing bands. The unique internal radio support system makes it easy to position and secure your radio gear and battery pack for pedestrian mobile operations.

The Expedition Pack, when outfitted with the Yaesu FT-817 transceiver, LDG Z-11 auto antenna tuner, 2300 mA/hr gelled electrolyte battery, and MP-1 antenna weighs in at around 10 pounds! That's almost like not carrying anything on your back! At that total weight, adding a second battery is a good idea to ensure that you have plenty of power while operating in the field.

The Expedition Pack has been optimized to hold the Tokyo High Power Labs HL-50B 50-watt HF linear below the radio/tuner combo. There are nooks and crannies inside the Expedition Pack that can accommodate extra gear and accessories, including a battery. As with the higher power transceivers discussed earlier, however, using the HL-50B amplifier wouldn't give you much airtime with these smaller batteries.

The internal stays of this pack make it both a snap to pack and comfortable to carry. This is *NOT* a pack for use over more than an afternoon, however. There is just not enough room to hold more than a rudimentary personal survival kit plus your radio gear. But having said that, if what you need is a radio platform to transport your gear for shorter periods of operating ham radio, this pack might be for you. My initial thought about the Expedition Pack was that it would be useful for "shadowing" disaster response key personnel, where you might need the added power, larger antennas, and portability of this type of radio platform to adequately perform your EmComm duties.

Sound interesting? Then visit Communication Outfitters' website and check them out for yourself.

The MFJ-269 HF+ VHF/UHF Antenna Analyzer

Recently a good friend of mine, Bill Rankin, WAØYPA, asked me what I would recommend as an antenna analyzer. His primary interests lie in 6- and 2-meter weak signal operating and he was in the process of building some directional antennas. He needed a piece of test gear to help him optimize his designs, especially in testing and evaluating phasing harnesses for multiple antenna arrays.

Without hesitation I told him to find an MFJ-259B. I had been using one (actually it was the original Model 259) for several years and really liked the unit, despite its ability to gobble up "AA" batteries at a frightening rate.

One thing led to another and Bill talked me out of my Model 259 in exchange for his father's old mid-1960s vacuum tube "Boatanchor" ham radio station, consisting of a Hallicrafters SX-117 receiver, matching HT-44 transmitter, PS-150-120 power supply and Turner +2 microphone. Bill got a great piece of test gear and I got my old college amateur radio club station (WA7CDH, Yakima Valley College) that I had lusted after for many years!

Now I was faced with a dilemma: replace my old MFJ Model 259 analyzer that I traded to Bill with the same device, or with one that would cover HF along with VHF and UHF. A quick call to Richard Stubbs at MFJ Enterprises and one of their *new* MFJ-269s was on its way to me. The Model 269 is not only newer, but it covers more spectrum. While the Model 259 covered all of HF plus VHF up through 170 MHz, that's where the coverage stopped. The Model 269 has all the coverage of the older model *PLUS* it covers 415 to 470 MHz, making it a great piece of test gear for not only ham radio applications but also commercial public service/EMS/fire/police installations as well! At last I had a way to evaluate antenna performance, test feedlines, construct phasing lines and power divider harnesses, and adjust my 19-element UHF Yagi, all with one little box!

The Little Brown Truck arrived in a couple of days with the new MFJ Model 269. The first thing I noticed was that the internal battery pack had been redesigned and, while it was no easier to get inside to access the battery pack (you still have to remove eight screws), the new pack was made of sturdier material and used one-piece construction rather than the two "four packs" of AA cells in the older Model 259. The dual meters will instantly show reflected power/SWR and impedance at a glance. The digital multi-line display reads out frequency along with capacitive and inductive reactance, phase angle and a lot more. And all this is just for starters!

MFJ has really done its homework and provided the antenna experimenter/commercial installer with a valuable tool for a reasonable price. The manual is very detailed and thorough. Learn to love the manual, as it will answer about 99 percent of your questions regarding the operation of the unit and what you are actually seeing on the display. There is an optional carrying bag and coil set for testing tuned circuits and coaxial cables. The unit will function on internal batteries (10 AA cells for a 15-VDC input) or via an optional external wall-wart AC adaptor.

When you're using internal batteries, the analyzer "goes to sleep" after a short time of inactivity to conserve battery power. This is great since it's a hassle to get the unit apart to replace these batteries.

Speaking of batteries, this unit has a built-in battery charger to accommodate rechargeable batteries, and it will work on standard non-rechargeable alkaline AA cells, as previously mentioned. There is an internal switch that will defeat the charger circuitry so you don't end up trying to recharge non-rechargeable batteries. For anyone who has encountered the mess associated with leakage encountered when non-rechargeable batteries are hooked up to a recharger, you'll like this feature! Don't forget the risk of a fire that's always a possibility when trying to recharge non-rechargeable batteries! Hey, all that heat has to go somewhere!

What's really nice about the Model 269 is that it's extremely portable, allowing you to drag it up on the roof, onto the side of the tower, or out to a vehicle to check coaxial cables, tuning stubs, traps, baluns, and antennas right at the feed point. The multi-line display coupled with the various modes of operation can tell you a lot about your antenna installation and your feedlines. You can also use this unit to measure and cut to proper length those pesky coaxial cable power dividers used to stack VHF+ antennas for added gain.

Coaxial stubs got you down? Not any more! The Model 269 will allow you to accurately measure and cut coaxial cables for matching purposes. If you have a feedline you suspect is shorted, you can use it to find the physical distance to the "fault" within a piece of coax. Using the optional coil set you can make this unit function like the old grid dip oscillators and use it to test and align tuned circuits in transmitters, antenna tuners, etc. Oh, yeah—did I mention that the Model 269 also functions as a frequency counter up to almost 200 MHz? Well, it does! Talk about a versatile piece of test gear.

MFJ Enterprises' new MFJ-269 is an HF+ VHF/UHF Antenna Analyzer that also functions as a frequency counter almost all the way up to 200 MHz!

If you're an ardent antenna experimenter or a commercial radio technician who works in the HF, VHF, and UHF spectrum then you *need* this antenna analyzer. Not only can you maintain your antenna farm in fine style, this unit is indispensable when it comes to ARRL Field Day, various VHF/UHF contests where you need to erect and trim antennas under field conditions and installing gear in a mobile environment. Interested? Check out the MFJ website at www.mfjenterprises.com for further info and pricing.

See You Next Month

I hope you enjoyed this brief look at some cool equipment and accessories. And why not drop me a line about some of the radio gear you've found useful in EmComm or in our hobby in general?

Until next time, please remember: Preparedness is not optional! ■

The Eyes And Ears Of MacArthur

"Come What May"—These Signalmen Helped The Allies Retake The Philippines!

by R.B. Sturtevant, KD7KTS

In war, many acts of bravery are unsung or forgotten with the passage of time. But in his autobiography, *Reminiscences*, General Douglas MacArthur helped immortalize the heroism of some when he wrote:

After the fall of Corregidor and the southern islands, organized resistance to the Japanese in the Philippines had supposedly come to an end. In reality, it had never ended...I was certain that a great number of those indomitable defenders of Bataan and Corregidor had escaped into the mountains and jungle that they were already at work against the enemy. Unfortunately, for some time I could learn nothing of these activities. A deep, black pall of silence settled over the whole archipelago.

Two months after the fall of the Manila Bay defenses, a brief and pathetic message from a weak sending station on Luzon was brought to me. Short as it was, it lifted the curtain of silence and certainly disclosed the start of the human drama with few parallels in military history. The fire and the spirit of this indomitable nation burned as brightly as ever. I knew that the remnant of my soldiers was not abandoning the fight while they lived and had the means. The words of that message warmed my heart. "Your victorious return is the nightly subject of prayer in every Filipino home."

Colonel Russell W. Volckmann, who commanded guerilla forces in the northern Philippines toward the end of the war. (U.S. Army photo)

Official patch worn by General Douglas MacArthur's 978th Signal Service Company in the Philippines. Their unit slogan "Bahala Na" is Tagalog and can be loosely translated into English as "Come What May," "So Be It," "We Don't Give a Damn," or "Whatever the Outcome."

MacArthur's Reply

That message was sent by Lt. Colonel Guillermo Nakar, a former battalion commander of the 14th Infantry of the Philippine Forces in mid-1943. MacArthur's answer to that message was picked up by Lt. Colonel Macario Peralta, among others, on the island of Panay and sent to all guerilla forces in the Philippines: "Guerilla activities should be postponed until ordered from here. Premature action of this kind will only bring heavy retaliation upon innocent people. Your intelligence by covering maximum territory can perform greater service. The enemy is now under heavy pressure and victory will still come. I cannot predict the date of return to the Philippines but I am coming. sig. MacArthur."

With these two messages the communications channel was open in both directions. MacArthur was familiar with guerilla radio nets. While he was on Corregidor sweating out what would become the fall of the Philippines, he was kept informed on the Japanese actions by Brigadier General Simeon Jesus. Jesus had set up a network of 60 agent-operated radio stations, which after infiltrating the Japanese-held areas, reported conditions to a central station in a Manila movie theater. Information collected was forwarded to Corregidor's communications center. Remnants of this net continued long after MacArthur's evacuation.

Among the American and Philippines forces who avoided capture or escaped from the Japanese were a few radio operators. One of them was Captain Robert Arnold who sent out reports beginning in June of 1942 from a secret location on Luzon from a transmitter made of junk parts. Captain Truman Hemingway, Jr., also established a radio net on Leyte and sent radio reports to hundreds of passing ships.

The 1st Reconnaissance Battalion

The Australians trained some of the Filipinos who escaped when MacArthur evacuated. There were six groups of trained radio operators inserted into the Philippines by the Aussies from submarines. One of these groups was led by Captain Jesus A. Villamar, a distinguished pilot of the Philippines Army Air Corps and already a national hero. But these few stations were simply not enough to provide communications for all the active guerilla groups who needed to contact MacArthur's headquarters.

Meanwhile, the United States Army was hearing from a lot of Filipinos in the States. Sergeant Leo M. Giron, a member of the 978th Signal Service Company, remembers,

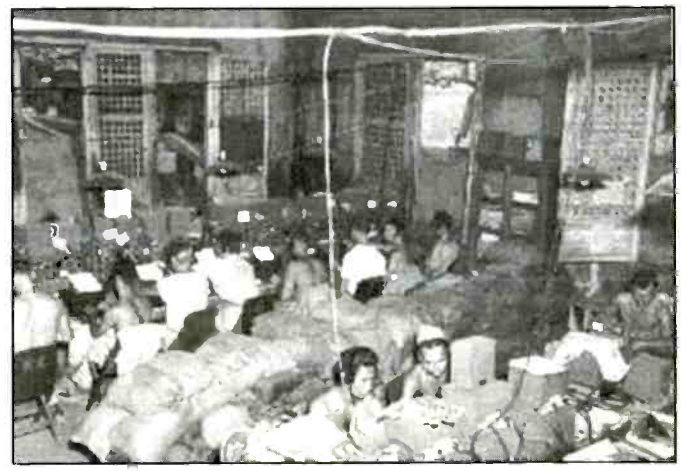
During the outbreak of World War II many Filipinos volunteered for service. The outpouring was so incredible that orders were issued to activate the First Filipino Infantry Regiment in Salinas, California

effective July 13, 1942 and the Second Filipino Infantry Regiment on November 21, 1942. The 1st and 2nd Filipino Infantries were one division with the strength of 12,000 men, three regiments, plus other special companies. In addition, out of these 12,000 men, about 1,000 were selected for special missions. This force of fighting Filipinos was known as the 1st Reconnaissance Battalion and was activated November 20, 1944. This included the 978th Signal Service Company, which was identified with the Allied Intelligence Bureau [MacArthur's Intelligence Headquarters].

The enlistment of these troops presented an interesting dilemma for the Army. All the Filipinos were aliens; therefore, they could not be enlisted. Filipinos were not eligible for citizenship before the war, but as resident aliens they were required to register for the draft. The Army had to have all these future soldiers volunteer to be drafted. This whole process took longer than a simple enlistment would. The 1st and 2nd Filipino Infantry Regiments were the only military units in the American military of World War II made up completely of non-citizens with a few, but not all, American officers.

Off To Australia

The 200 American-trained radio operators of the 978th Signal left the United States and went to Australia where they were trained at what was officially called Camp X. Camp X, also known as Camp Tabragalba, was near the town of Beaudesert, in the hilly cattle country about 50 miles south east of Brisbane in southern Queensland. Here the Filipinos met natives of the Dutch East Indies and New Guinea, as well as Coast Watchers and members of other special Australian units. They were all taught the fine art of underground radio operation and other forms of secret communications, cryptography, weapons training, the use of rubber boats, and hand to hand combat. Jungle warfare and survival was taught at Canungra, about 60 miles south of Brisbane, which is still the Australian Army Jungle Training Center.



Filipino and American signalers in the radio transmitting and receiving room, Tacloban headquarters, Leyte, the Philippines, November 7, 1944. Many of the 978th Signal Service Company served here after the Philippines was liberated. (U.S. Army photo)

After training, the 978th Signal Service Company came under control of the Allied Intelligence Bureau (AIB) which coordinated all intelligence activities for the Southwest Pacific Area Command and was located in MacArthur's Brisbane Headquarters. AIB's mandate was "to obtain all possible information about the enemy, his disposition, movements, strength, etc. through such agencies as the Coast Watchers, native agents and civilian operations." Although still working out of Camp Tabragalba, they became the net control for the Philippines Regional Section of the AIB. Their job was to receive and translate message traffic from the Philippines and immediately forward it to MacArthur's intelligence staff in Brisbane.

About half the radio operators made their way to Brisbane's American submarine base. From there, along with some Americans, the Filipino radio operators were sent as Mission Men to be infiltrated into the Philippine Islands. One of the Mission Men remembers that they were personally briefed by MacArthur who forcefully brought home the danger of their assignment when he said, "You're no good to me dead."

The Mission

The Mission Men's primary mission was to tell the Filipino people that MacArthur was really coming. They also supplied the guerillas with weapons, ammunition, medicine, and victory money as well as other needed supplies.

The Mission Men would then set up and maintain the growing radio connections with MacArthur and keep the Allies informed of Japanese troop strength, morale, shipping movements, aircraft locations, military or civil actions, and intentions as well as weather reports. The guerilla effort was very well informed on the Japanese activities. Some of their leadership even posed as collaborators and held high civil government offices.

The 978th sent radio operators on 13 landings from Special Mission Submarines between November 12, 1943, and October 22, 1944. Twelve of the parties were successfully inserted. The 11th party was lost when the *USS Seawolf (SS 197)* was sunk

with all hands lost off Morotai Island in Indonesia. Unfortunately the loss was caused by friendly fire from *USS Rowell (DE 403)* and aircraft.

Sergeant Giron was a member of one of these insertion teams and remembers sleeping on the boxes of equipment in the cramped space of the submarine, underneath the torpedo racks. He also remembers being attacked by Japanese aircraft and warships with depth charges and torpedoes. Because MacArthur had ordered minimal military contact with the Japanese, the Filipino guerilla forces acted mostly in a defensive nature. Their primary mission was to gain intelligence, organize resistance, sabotage, psychological warfare, and maintain communications.

Military Action!

In all, there were 134 radio stations communicating with the Allies by late 1944. This meant that the guerillas took relatively few casualties and the Japanese were unprepared for MacArthur's secret communiqué of December 30, 1944. MacArthur ordered Colonel Gyles Merrill, formerly of the U.S. 26th Cavalry, then commander of Guerilla Forces, Philippines, to, "institute military action in support of our main operations." And so the guerillas went to work.

Members of the 978th who had been left in Australia landed alongside the American landing force. They set up additional clandestine radio stations, which told guerillas all over the islands that MacArthur had truly returned.

Guerillas saw to it that Japanese communications, ports, fuel, and ordinance dumps as well as air facilities were immediately sabotaged. Japanese troops were attacked, or if the force was too large, were reported to the Allies with frequent updates.

Sergeant Giron, a trained martial artist before the war, remembers a Banzai charge on his guerilla group in early 1945, relating how the Japanese attacked yelling and screaming that they were not afraid to die. He also said the Filipinos gritted their teeth and defended their position with bolo knives and pointed bamboo filled with sand and ground chili peppers to spray the enemy so they could not see. Pitting bolo knives and sharpened bamboo against samurai swords and bayonets, however, was not the guerillas primary job. They knew they had to keep the American forces informed about the Japanese.

In many cases ships preparing to land troops were met by guerilla officers in dugout canoes who informed naval commanders that shore barrage would not be necessary as all the Japanese were gone or killed. In other cases, Japanese troops left behind to destroy facilities, bridges or the like met with Filipino machetes before the American's arrived.

Retaking The Philippines

Retaking the Philippines from the Japanese was by no means a cakewalk. Many brave American and Filipino soldiers gave their lives during that operation; indeed the Philippines suffered most of its one million war casualties at this time. But the sacrifice was much less than it might have been thanks of the efforts of the 978th Signal Service Company and the vital intelligence it gave MacArthur's advancing army.

After the fighting the 978th was reunited in Manila it was notified that it had been awarded many individual citations as well as the Meritorious Service Unit Citation, Presidential Unit Citation, and Philippines Presidential Unit Citation for a job well done. They had literally been the eyes and ears of MacArthur. ■

Pop'Comm January 2006 Survey Questions

I have cable or satellite TV in my home
Yes 1
No 2

I receive broadcast TV with an outside antenna
Yes 3
No 4

In a typical week how much time do you spend listening to your AM/FM news station?
Less than an hour 5
About an hour 6
More than two hours 7
Three or four hours 8
More than four, but less than eight 9
More than eight hours 10

AM or FM DXing is one of my hobby interests
Yes 11
No 12

I use my computer and the Internet to listen to radio stations in the USA
Yes 13
No 14

I use my computer and the Internet to listen to radio stations outside the USA
Yes 15
No 16

I'm interested in PODcasting and want more information about it
Yes 17
No 18

I have a dial-up connection to the Internet
Yes 19
No 20
I don't have a computer 21

I have a high speed connection to the Internet
Yes 22
No 23

The computer and Internet play an important role in my radio hobby
Yes 24
No 25

by Richard Fisher, KI6SN

Capitol Hill And FCC Actions Affecting Communications

APCO Urges Congress To Address Communication Needs

In testimony before the U.S. Senate Committee on Commerce, Science, and Transportation, an executive with the Association of Public-Safety Communications Officials (APCO) has recently offered recommendations to improve communications following the devastation of Hurricane Katrina. "Lack of coordinated incident command and control, lack of direct support for communications centers and their personnel, and the inability to communicate were obvious problems in every area I visited," said Willis Carter, APCO International first vice president. He offered 10 recommendations for Congressional action to the committee:

- Make significant improvements in local, regional, and national interoperability.
- Plan and train for disasters.
- Establish common incident command structures at all levels of the emergency response effort.
- Fund to ensure that public safety communications networks are built and maintained to withstand worst-case scenarios.
- Establish a deadline for nationwide public safety access to the 700-MHz band.
- Allocate additional 700-MHz band spectrum for mobile broadband operations to provide high-speed video and data to and among public safety personnel and agencies in the field.
- Provide additional funding to assist public safety agencies in their acquisition of state-of-the-art interoperable communications equipment.
- Consider public safety answering points (PSAPs) and other emergency communications centers as core elements of the first response structure.
- Mirror telephone central offices supporting 911 tandems in locations sufficiently remote to allow for quick restoration of 911 services.
- Provide funds to assist PSAPs in their upgrades for wireless E911 and other technologies.

"I want to emphasize that our solutions need to focus not just on major disasters, such as Hurricane Katrina and 9/11," Carter said, "but also on the day-to-day communications requirements of public safety agencies." In written testimony, Carter emphasized that "we must also work to identify the real problems and develop carefully planned approaches to solve those problems. This is no time to throw money at ill-conceived Band-aid solutions. I also caution that solutions must not be thrust upon state and local governments without consideration of cost."

Carter's remarks came following visits he made to several Gulf Coast area communications centers.

FCC Investigates California Amateur Repeater Operations

UHF repeater owners in two California cities have been contacted by the FCC following separate complaints alleging their operation was uncoordinated and causing interference to coordinated machines on the same frequencies. Jeffrey A. Stouffer, K6JSI, of Vista, and H.R. Dixon, WB6NIL, of San Diego, have been contacted by FCC Special Counsel for Enforcement Riley Hollingsworth for information about their stations.

"The complaint indicated that you have been made aware of the interference and the apparent lack of coordination but that you have declined to resolve the interference," Hollingsworth wrote, according to the *ARRL Letter*. FCC regulations state that "the licensee of the uncoordinated repeater has the primary responsibility to resolve the interference." The FCC's letter to Dixon was undeliverable to his address on record at the time in Oakhurst, Hollingsworth said. It was remailed to Dixon's San Diego address, which had been updated in the FCC's database in September.

FEMA Offers Courses On Amateur Radio Resources

Three- to four-hour workshops designed to provide state and local elected officials, emergency managers, and other public officials with an understanding of how amateur radio volunteer groups can help in supplementing telecommunications and warning systems are being offered by the Federal Emergency Management Agency (FEMA), according to the American Radio Relay League's *ARES E-Letter*.

Information and registration for "G250.6—Workshop: Amateur Radio Resources" can be found at FEMA's Emergency Management Institute at www.training.fema.gov/emiweb/.

"The unavailability of local FEMA Incident Command System/National Incident Management System seminars should not deter anyone from undertaking these important training topics (IS-100, IS-200 and IS-700, as well as other emergency management courses), as they are available on-line," said Neal Sacon, N7RX. A completion certificate is issued by FEMA for the on-line courses. Visit www.training.fema.gov/EMIWeb/IS/crslist.asp.

CC&R Antenna Bill Comes Before 109th Congress

Legislation what would make it simpler for radio amateurs to erect suitable antennas in communities with deed covenants, conditions, and restrictions (CC&Rs) was reintroduced in the 109th Congress by New York Congressman Steve Israel.

"State and local governments, as well as disaster relief agencies, could not possibly afford to replace the services that radio amateurs dependably provide for free," a statement from Israel's office said. "However, the hundreds of thousands of radio amateur licensees face burdensome regulations that make it extremely difficult to provide their public services."

Congressman Mike Ross, WD5DVR, of Arkansas, was one of the original cosponsors of the "Amateur Radio Emergency Communications Consistency Act" (HR 3876), according to the

American Radio Relay League's *ARRL Letter*. The legislation has been assigned to the House Energy and Commerce Committee. League officials said that passage of Israel's bill "will help to ensure that amateur radio will continue to be able to provide emergency communication should a disaster occur."

License Revocation Hearing Ordered For Convicted Felon

In an application of the FCC's "1990 Character Order," the Commission has issued an Order to Show Cause prompting a hearing to determine if an amateur radio operator should have his license revoked.

Multiple felony convictions of David Edward Cox, W5OER, of Pride, Louisiana, "raise serious questions" about his character qualifications, according to the FCC, which said Cox is "hereby ordered to show cause why his authorization for Amateur Radio Advanced class license W5OER should not be revoked." Records, however, show Cox to be a Technician class licensee. Cox was issued the callsign KC5OER on April 28, 1995, and granted W5OER on July 11, 2000, under the commission's vanity callsign program.

First convicted in January 2004 for simple burglary—a felony—Cox was "sentenced to five years in prison, but the judge suspended the sentence and put him on supervised probation for five years," the FCC said. Cox was arrested again in September 2004, the FCC continued in its recitation, and, earlier (in 2005), following a plea agreement, a U.S. District Court judge sentenced him to concurrent terms of 41 months for felony violations of various firearms provisions," according to the *ARRL Letter*.

The hearing would "attempt to determine the effect of Cox's felony convictions on his qualifications to be and remain an FCC licensee and, in the light of evidence, whether Cox is qualified to remain a Commission licensee and whether his amateur radio license should be revoked," the ARRL said. Copies of the Order to Show Cause were sent to Cox's home address and the Catahoula Correctional Center in Harrisonburg, Louisiana. He was given 30 days to file written notice that he will appear for the hearing and present evidence. The ARRL said that the FCC Enforcement Bureau would bear the burden of proof in the case. ■

Our January Winner: Rob Sivadon of Kellyville, Oklahoma!

Here's Rob Sivadon of Kellyville, Oklahoma, in his well-equipped—and very neat—monitoring room.

Pop'Comm reader Rob Sivadon of Oklahoma tells us,

I got started in radio before CB became popular. I was about 14 and a friend of my Dad's gave me a five-channel CB. I received my license and talked on it before the CB fad took off in the early '70s.

I got into shortwave listening in the early '90s and have loved my hobby ever since. I also studied for my ham license and received it as well...I have listened and enjoyed a lot of fine radios, but my favorite receiver is my older Drake R8. I also have a Kenwood R-5000 and a Grundig PE-400. I like listening to other countries and learning about their cultures. I also enjoy reading *Popular Communications* magazine and what other SWLs listen to and what works for them. Thanks for a great magazine.

Popular Communications invites you to submit, in about 300 words, how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo should be included.

Each month, we'll select one entry and publish it here. All submissions become the property of *Popular Communications,* and none will be acknowledged or returned. Entries will be selected taking into consideration the story they relate, and if it is especially interesting, unusual or even humorous. We reserve the right to edit all submitted material for length, grammar, and style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*. Address all entries to: "V.I.P. Spotlight," *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or e-mail your entry to popularcom@aol.com

by Joe Cooper, carm_popcomm@hotmail.com

You Can Do It—Computer Programming Made Easy

As I have been outlining in this column for the past several months, radio receiving and transmitting technology has undergone a significant transformation since the beginning of this decade. That transformation has been the switch from the use of "real" electronic components to "virtual" components in a new type of radio design called Software-Defined Radio (or SDR).

SDR works by sampling large bandwidths of radio signals directly off the antenna, turning that information into digital form and then processing that digital information through digital signal processing (or DSP) software in a computer.

As in the case of any new technology, the first casualty is generally the dominant technology that is replaced. Currently the primary radio monitoring technology that will be the most directly affected will be those radios using super-heterodyne (or simply, superhet) circuitry, which have been mass produced since the 1920s.

The nice thing about the old superhet radios was that they were simple to build, so anyone with a good understanding of electronic circuits could put one together. Even for those who found the superhet radio complicated, there were even simpler designs available, such as crystal radios. Therefore, the true foundation for today's radio monitoring hobby is that just about anyone can put together a working radio.

If you look through one of the many books or magazines about simple home-built radio designs published during the early to mid-20th Century, you'll see hundreds of plans and projects for crystal radios, tuned-radio frequency (TRF), or regenerative radios. Radio monitoring in the 20th century was a real reflection of democracy because after 1920 everyone in the United States had unrestricted access to radio parts, plans, and expertise. That democratic ideal was displayed during periods of wartime when citizens "of the free world" were allowed to keep their shortwave monitoring radios and could listen in to "real-time" radio activity taking place on the battle fields of Europe, North Africa, and the Pacific.

Nor were there restrictions placed on listening in to propaganda broadcasts, first from the Axis powers during the 1930s and '40s and later from Communist countries during the Cold War. Contrast that with the experiences of people living in Germany, Italy, or Japan during the height of Fascist power, or in the Soviet Union during the Stalinist period. During those times, listening to "unauthorized" frequencies was punishable by brutal treatment, imprisonment, and even death.

The "Kit Radio" Legacy Of Freedom

So all those Heathkit and Knight kit radios that were sold during the 1950s, '60s, and '70s were not just an inexpensive and easy way for people to become involved in the radio monitoring hobby, those simple-to-build radios were a tangible symbol of the democratic freedom that so many people had fought and died for during World War II. Their manufacture and distribution showed the difference between our political system and those of communist and totalitarian nations.

While today's radio technology, with its emphasis on integrated circuits and miniaturized components, has made construction slightly more complicated, there are still several companies selling radio kits to the public. However, the truth is that digital technology dominates the fields of radio and electronics today; not just for receiving, but for transmitting as well. Like it or not, time is running out for both the AM and FM modes because new digital modes like DAB (Digital Audio Broadcasting), DRM (Digital Radio Mondiale), and HDC (Hi-Definition Compression) are going to be the new modes of radio transmission.

Working With Today's Technology

There is, however, a problem with today's SDR receiver and digital modes of radio transmission. It's that the former democratic accessibility the old radio technology provided is going to change radically—and very soon. This is because digital signals must be processed using computer software rather than through electronic components, and not everyone can work with digital technology as easily as they did with simple technology like crystal radios.

There will still be hardware components in SDR technology, so people will still need their soldering guns to put together *part* of an SD radio. However, these parts will be used only to sample radio signals and then ship the resulting digital information off to a computer via a USB port. But from now on, the real "innards" of any SDR will always be a personal computer, an SDR software package, and a computer sound card. The question this raises is whether this change will also bring about a serious curtailment of hobbyist radio construction and tinkering because of the cost and complexity of the tasks involved.

Certainly in the case of hardware tinkering the number of opportunities available for "soldering iron jockeys" will decrease dramatically, particularly when digital modes of transmission become the norm in 10 or 20 years (if not sooner). However, that does not mean that certain forms of "hands-on" tinkering will not be possible.

While SDR technology may be closing a chapter of radio history, it is also opening up a new one. This will be a new hobbyist field of software programming for SD radios.

The Challenge Of Computer Programming

I know that many of you out there may be saying "who, me—a software programmer?" and the answer is most definitely "yes, you!" Frankly, not only am I saying this, but so are many other people within the computer and radio industries.

Like it or not, computer programming is going to become the new literacy and will determine how you participate in the world of the 21st century. I know a lot of people were unable to

get their VCRs to stop flashing "12:00" back in the 1980s and '90s, and as with any new technology there will be people who will not be able to adjust to this. Still, most of you, if you actually sit down and invest a little time to read and experiment, will find (much to your surprise) that you can become a fairly decent computer programmer in less time than you may expect.

The main reason I make this claim is because you now have at your fingertips more support, information, and resources—and for free—than at any other time since the advent of the personal computer. Plus, the Internet has changed how people obtain information and the extent and range of information that's available. And more importantly, there are many people out there who want you to succeed, and that includes the leaders of the computer industry such as Bill Gates of Microsoft.

In the upcoming series of columns I'll outline how you can set yourself up to succeed in learning how to be a good computer programmer using free or inexpensive training resources. And, since you're reading this magazine, you already have a tremendous advantage over most people when it comes to learning how to program computers. Specifically, that advantage is that you can read English! When it comes to computer programming, the truth is that the vast majority of the *good* training material on the market today is *only available* in English.

Let's start at the beginning—what do you need in order to become a good computer programmer?

How To Become A "Hobbyist" Computer Programmer

Some of you may be surprised that, in my experience, the most important thing you need to become a good computer programmer (as opposed to someone who is simply a software hacker) is a well-defined goal for your programming tasks.

Unless you really want to go into a career as a computer software designer or commercial application developer, you really do not need to know everything that there is to know about programming. Nor do you need to know every single programming language available or every technique or process used to put all the bells and whistles common in today's computer software.

All you need to do is focus on one particular area that will give you the most reward for the least amount of time and effort spent on your computer. Remember, the real purpose of this entire exercise is to give you better access to, and control over, your SD radio. Therefore, you should first establish the make, model, or type of SD radio you want to be working with and start building your skills around that particular radio. It does not even have to be as sophisticated as an SD radio, because there are many computer-controlled radios out there that can be the foundation for your programming exercises.

As I've outlined in past columns, computer-controlled radios are relatively simple to program since all you are doing is placing a particular numerical value into the radio's built-in computer via a serial cable. These numerical values then trigger a particular function, such as changing frequencies, adjusting bandwidth, or changing the mode (AM, FM, SSB or CW) of transmission that is being monitored. In most cases the programming requirements for a computer-controlled radio are very simple and can be satisfied by a relatively easy software language, such as BASIC. And the novice computer programmer will appreciate that there are several versions of BASIC available for free through Internet downloads (see the sidebar accompanying this column).

First develop a simple strategy in your approach to becoming a programmer. The simplest and most straightforward approach is to make your point of focus the particular SD radio you happen to own.

What You Need To Know

Even for those only interested in radio monitoring (rather than, say, hams who might also want to transmit with SDR technology), the number of receive-only SD radios is still very limited. Also, some of those SD radios are primarily designed to work with the LINIX operating system, which while stable and popular, is really best tackled by someone with a more advanced background in computing.

In this column I'm going to be focusing on the Flex Radio System's SDR-1000R since the company actively supports the concept of open source software (OSS), meaning the programming code used to create a software application is made freely available. OSS allows anyone with programming experience to revise or change the programming code so they can modify the code to build new versions of customized software. This is valuable because many people can bring their unique skills to help develop a software program in ways that may not occur in traditional software development settings, where cost and "time-to-delivery" limitations normally restrict the number of development cycles.

Moreover, the unique nature of SDR technology allows for the *independent* development of software programs because they are hardware independent. In fact, you may have three programmers come up with three very different software packages that work equally well with the same hardware component. This is where the ability to experiment and customize SDR software becomes an important motivation for getting involved.

Building Your Knowledge Toolbox

It is important to understand where you're going to get your new "toolbox" to begin building "virtual" radios. There are many tools that will help you become an amateur computer programmer; some are tangible (program editors, compilers, and debuggers) and some intangible (knowledge, skill, and experience). Just remember that the acquisition of programming skills does not come overnight, but rather through a series of steps, which if systematically perused, will deliver good results over time, much like learning a musical instrument. And just as there are many forms of music, such as jazz, rock, classical, and folk, there are many forms of computer programming languages, such as Visual Basic, C+, Java, and assembly language.

It is beyond the scope of this column to go into detail about each of these languages, or about how to create a computer program. I will, however, give you some pointers on where to find more information. I'll also point you to a number of free, or at least reasonable, resources. You don't need to spend a fortune on books or programming software that can become obsolete very quickly, simply to get started.

I am assuming as you lay out an entry-level strategy for learning computer software programming that it will be with the aim of becoming a hobbyist level programmer. So before you do anything, you need an idea of what computer software programming is, and is not. This will give you a good understanding of the "culture" of computer programming, which has its own language, logic, and rules, and you'll

need a basis in it to be able to read (and appreciate) your next level of training.

In the sidebar you will find a series of suggested titles that are currently available through many bookstores or your local public library. These are just a few of the slew of books (not to mention training videos, audio CDs and DVDs) that are available. One that I would strongly suggest is *Code: The Hidden Language of Computer Hardware And Software* by Charles Petzold. While the text is a bit out of date, his overview of how computer programming has developed is still very worthwhile reading as he talks about computer technology and its direct link to the human need to communicate. This is a point that you need to understand because computers are more than just mechanical devices that make calculations; they are tools of communication that are transforming the culture and civilization of the entire world.

As I have pointed out in this column, today's common microcomputer developed out of a complex set of social and economic events, including accidents, ironic circumstances, and just plain human luck. As Petzold points out, microcomputer technology has not developed out of a rational plan in a laboratory setting, but through the work of people who find a technology and discover hidden potentials within it (hence the title of his book). More importantly, Petzold, who holds solid programming credentials, takes the reader through a detailed (but understandable) explanation of how software code actually "works" inside the computer, performing various operations within its CPU and other components. Truly, if you want a proper understanding as to why you are writing lines of computer code when you build a software program, this is the place to start.

After you've become familiar with the general theory and practice of computer programming, it's time to begin learning how to build a software program. Again, there are many books that will provide you with an understanding of the different parts of a programming language before you go on to learn a specific programming language. One I'd like to bring to your attention to is *Learning Computer Programming* by Mary E. Farrell. The subtitle for this book is interesting: "It's not about languages." In saying that Farrell is raising a very important point that anyone who is starting to learn computer programming should remember. It's not the language that makes a computer program do what it does, but rather the sequence of concepts and the logic behind them that the programmer uses, through whichever programming languages that best serves his or her needs.

When trying to learn computer programming, people often find what they encounter is arcane and downright frustrating. But by looking at the "why" of computer programming, rather than the "how" of languages, Farrell provides you with the "thinking tools" that you will need to undertake real software programming. Only after you've mastered the internal processes common to all modern programming languages does Farrell introduce you to how specific programming languages (C++ and JAVA) are used and how they differ in their approach.

A Guide To Hobbyist Level Computer Programming

Many people who become interested in learning how to program a personal computer on a casual basis find that a lot of the training books and material available are too complicated to really help them get started. The following books and materials are geared toward those people who simply want to understand computer programming at a beginner level and maybe create simple software programs for their own use. Check a few of them out.

General Introduction To Computer Programming

You Can Do It!: A Beginner's Introduction To Computer Programming, Francis Glasborow, John Wiley and Sons, 2003.

Sams Teach Yourself Beginning Programming In 24 Hours, Greg Perry, Sams, 2001.

How Computer Programming Works, Dan Appleman, Apress, 2002.

Code: The Hidden Language Of Computer Hardware And Software, Charles Petzold, Microsoft Press, 2000.

Learning Computer Programming

Learning Computer Programming (with CD ROM), Mary Farrell, Charles River Media, 2002.

Computer Science Lab Home Learning Program (a step-by-step course for $19), www.computersciencelab.com.

e-Learning For Dummies (affordable on-line learning from the same people who brought you the books), www.dummies.com.

Microsoft Express (free hobbyist software), http://lab.msdn.microsoft.com/express/

Learning Programming Languages

Dr. Dobb's Journal (one of the oldest and most trusted sources of information on computer programming), www.ddj.com.

Programming In C (excellent free on-line tutorials to get you started), www.cprogramming.com.

Programming Tutorials (more free on-line tutorials on just about any computer programming language you can think of), www.programmingtutorials.com.

Association of C and C++ Users (even more free tutorials that feature excellent learning strategy sessions), www.accu.org/resources/public/terse/learn.htm.

Some Free Programming Software From Microsoft

Armed with this background, you can begin to learn to program in one or more languages. But just how do you do this without spending hours in a classroom or significant amounts of money on editor, compiler, or debugging software?

Well, fortunately, Mr. Bill Gates wants you to become a computer programmer and he wants to help you in some rather interesting ways. First off, Gates will provide you with working software that will allow you to program in popular languages such as Visual Basic, C++, and JAVA, and he'll provide you with on-line training for those languages as well. Best of all, it's all free!

Now, there are a couple of catches to this wonderful offer. First is that all the

software and documents are "betas" and, unfortunately, that means that you may run into bugs or incomplete features. The other catch is that these are not the "standard" editions that are used by professional programs, but "express" versions that are designed specifically for beginner or hobbyist programmers. However, this line of programming tools is precisely what you, as a beginner programmer, need because they will allow you to create usable software without having to work in a complicated environment.

Over the next several columns I'll focus on how to set up one of Mr. Gate's "Express" software language programming tools so you can do it yourself. Then I'll show you how to use that programming tool to add customized features to Flex Radio System's PowerSDR software in order to control the SDR-1000R.

Again, if you start with an overview of the basics and work your way through the primary concepts needed to understand how computer software programming is undertaken, the actual act of programming is not all that complicated.

So begin your "career" as a computer programmer by checking out one or more of the books listed in the sidebar. Remember, many of these books are available through your public library or can be purchased used in stores or though on-line booksellers such as Amazon.com.

Again, as I have stated in the past, do yourself a favor and keep a log of the work efforts you have made while learning computer programming. There's a lot of detail to be found in software programming, so when you learn something, write it down, otherwise you will lose it and have to re-discover it (if you are lucky). Make it a habit now and you will thank yourself in the years to come.

Next Month

Next month we'll see what's involved in downloading and installing one of the "Express" software development tools. We'll also take a look at the structure of the source code files that Flex Radio System provides for the PowerSDR software. Yes, it is a little complicated at first, but once I've shown you the layout and structure of the files and how they are viewed and modified in the editor program, you will begin to see the bigger picture of computer programming.

You can e-mail me with any questions you may have. Use my e-mail address at carm_popcomm@hotmail.com. As mentioned before, I cannot answer general questions on computers, but will be more than happy to help you with any issues raised in the columns.

During the writing of this column Hurricanes Katrina and Rita had caused horrific devastation to New Orleans and many other communities along the Gulf Coast, and Hurricane Wilma blasted Florida. While these areas may be in the process of rebuilding as you are reading this, please do not forget that many people still need a great deal of help.

I would suggest you send donations to the American Red Cross (www.redcross.org/donate/donate.html). However, there are also many other good (and ethical) organizations that you can contribute to, so please use them if you wish.

Despite the many terrible things that have been happening at home, do remember our troops overseas and give them your support. As mentioned previously, the "Any Service Person" mail program no longer exists for security reasons. Please refer to the U.S. Department of Defense's official webpage, "Defend America." They have a specific section found at www.defendamerica.mil/support_troops.html that has an amazingly wide range of practical and useful ways that you can directly help.

If you are fortunate to have a home, a job, and your loved ones around you in these times when so many don't, please remember to give thanks for your personal blessings and remember to pass that blessing on to others through sharing. See you again next month! ■

World News, Commentary, Music, Sports, And Drama At Your Fingertips

This listing is designed to help you hear more shortwave broadcasting stations. The list includes a variety of stations, including international broadcasters beaming programs to North America, others to other parts of the world, as well as local and regional shortwave stations. Many of the transmissions listed here are not in English. Your ability to receive these stations will depend on time of day, time of year, your geographic location, highly variable propagation conditions, and the receiving equipment used.

AA, FF, SS, GG, etc. are abbreviations for languages (Arabic, French, Spanish, German). Times given are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

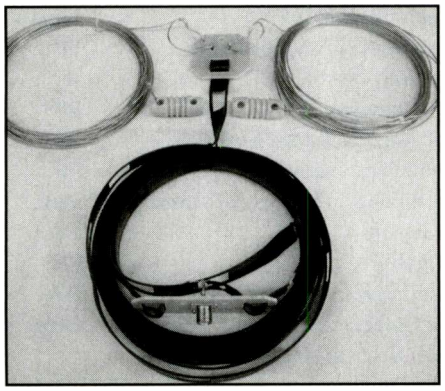
UTC	Freq.	Station/Country	Notes
0000	15385	Radio Exterior de Espana Relay, Costa Rica	
0000	9845	Radio Nederland	
0000	15720	Radio New Zealand Int.	
0000	6973	Galei Zahal, Israel	HH
0000	13700	RDP Int., Portugal	PP
0000	7475	Voice of Greece	Greek
0000	6115	Radio Tirana, Albania	Albanian
0000	4960	Radio Cima, Dominican Republic	SS
0030	15748	Sri Lanka Broadcasting Corp.	Hindi
0030	4052.5	Radio Verdad, Guatemala	SS
0030	6190	Deutschlandfunk, Germany	GG
0030	9585	Radio Farda, via Morocco	AA
0100	7305	Vatican Radio	SS
0100	3320	Radio Sondergrense, South Africa	Afrikaans
0100	10330	All India Radio	
0100	7260	Radio Cairo, Egypt	SS
0100	9835	Radio Budapest, Hungary	
0100	9615	Radio Cultura, Brazil	PP
0100	9665	Radio Marumby, Brazil	PP
0130	7250	Voice of Russia	
0130	3279	La a Voz del Napo, Ecuador	SS
0130	11500	Radio Bulgaria	PP
0130	6214	Radio Baluarte, Argentina	SS
0200	4819	La a Voz Evangelica, Honduras	SS
0200	3340	Radio Misiones Int., Honduras	SS
0200	4810	Radio Transcontinental, Mexico	SS
0200	4800	Radio Cultural Coatan, Guatemala	SS
0200	4985	Radio Brazil Central	PP
0200	9805	Radio Farda, via Greece	Farsi
0200	9365	Radio Free Asia, via Armenia	unid
0200	5910	Marfil Estereo, Colombia	SS
0200	9980	AFRTS, Iceland	SSB
0230	9460	Voice of Turkey	TT
0230	9480	Radio Rossii, Russia	RR
0230	6010	Radio Sweden, via Canada	
0230	9440	Radio Slovakia Int.	SS
0230	9560	RKI World Radio, South Korea	
0230	15180	Voice of Korea, North Korea	SS
0230	9737	Radio Nacional, Paraguay	SS
0230	3249	Radio Luz y Vida, Honduras	SS
0230	4780	Radio Buenos Nuevas, Guatemala	SS
0230	11710	RAE, Argentina	
0230	7160	Radio Tirana, Albania	

UTC	Freq.	Station/Country	Notes
0230	9700	Radio Bulgaria	
0230	4886	Radio Clube do Para, Brazil	PP
0300	4910	Radio Zambia	various langs
0300	9720	Republic of Yemen Radio	AA
0300	7440	Radio Ukraine Int.	
0300	5890	Radio Thailand via USA	
0300	3345	Channel Africa, South Africa	
0300	5010	Radio Madagasikara, Madagascar	Malagasy
0300	6940	Radio Fana, Ethiopia	Amharic
0300	6175	Voice of Vietnam, via Canada	SS
0300	10320	AFRTS, Hawaii	SSB
0300	4780	RTV Djibouti	FF
0300	5025	Radio Rebelde, Cuba	SS
0300	11745	Voz Cristiana, Chile	SS
0300	9625	CBC Northern Service, Canada	
0300	7200	Sudan National Bc Service	AA
0300	7110	Voice of Ethiopia	Amharic
0330	4976	Radio Uganda	
0330	3240	Trans World Radio, Swaziland	vern
0330	7180	Voice of Russia via Moldova	
0330	9720	China Radio Int., via French Guiana	CC
0400	4990	Radio Apinte, Suriname	DD
0430	5985	Radio Congo, Rep. of Congo	FF
0430	7275	RT Tunisienne, Tunisia	AA
0500	11690	Radio Okapi, Congo (Dem. Rep.) via S. Africa	FF
0500	5005	Radio Nacional, Equatorial Guinea	SS
0500	4950	Radio Nacional, Angola	PP
0530	9685	Channel Africa, South Africa	
0600	7275	Radio Nigeria	
0600	4760	ELWA, Liberia	
0600	4915	GBC, Ghana	
0600	6020	Radio Victoria, Peru	SS
0600	7125	RTV Guineenne, Guinea	FF
0700	6185	Radio Educacion, Mexico	SS
0745	9870	Trans World Radio, Monaco	
0830	11870	KNLS, Alaska	
0900	11750	HCJB, Australia	
0930	4919	Radio Quito, Ecuador	SS
0930	3310	Radio Mosoj Chaski, Bolivia	SS
0930	6135	Radio Santa Cruz, Bolivia	SS
1000	4747	Radio Huanta 2000, Peru	QQ
1000	5020	Radio Horizonte, Peru	SS
1000	6060	Radio Nacional, Argentina	SS

UTC	Freq.	Station/Country	Notes
1000	6010	La Voz de su Concencia, Colombia	SS
1000	12085	Voice of Mongolia	
1000	5954	Faro del Caribe, Costa Rica	SS
1030	4955	Radio Cultural Amuata, Peru	SS
1030	4815	Radio Buena Pastor, Ecuador	SS
1030	6140	Radio Lider, Colombia	SS
1100	9545	Solomon Islands Bc Corp.	
1100	9885	Radio New Zealand Int.	
1100	4890	NBC, Papua New Guinea	
1100	9525	Voice of Indonesia	CC
1100	9560	Radio Australia	
1100	3925	Radio Nikkei, Japan	JJ
1100	9625	Radio Fides, Bolivia	SS
1130	11710	Radio Japan/NHK via UK	RR
1130	7445	Radio Taiwan Int.	CC
1130	11675	Radio Nederland Relay, Bonaire, NWI	
1130	11580	KFBS/Far East Broadcasting, Northern Marianas	CC
1130	12020	RDP Int., Portugal	PP
1130	15725	Italian Radio Relay Service	vairous pgms
1130	3385	Radio East New Britain, Papua New Guinea	
1130	6010	Radio Mil, Mexico	SS
1130	4605	RRI-Serui, Indonesia	II
1200	13720	Radio Exterior de Espana	SS
1200	9740	BBC, England, via Singapore Relay	
1200	9795	Radio Nederland, via Singapore	unid
1200	7120	Wantok Radio Light, Papua New Guinea	
1200	4860	All India Radio	
1200	11850	Radio Polonia, Poland	
1200	9965	KHBN, Palau	various
1215	13685	Rikisutvarpid, Iceland	II; SSB
1230	15225	Voice of Turkey	
1230	9700	Voice of America Relay, Thailand	Indonesian
1230	6150	Mediacorp Radio, Singapore	
1230	9650	RKI World Radio, South Korea	
1230	15290	Radio Jordan	AA
1300	9920	FEBC, Philippines	unid
1300	9650	China Radio Int., via Canada	
1300	17880	China Radio Int., via Mali	CC
1300	11530	Voice of Mesopotamia. via Moldova	unid
1330	15240	Radio Sweden	
1330	15735	Radio Sweden	
1400	15140	Radio Sultanate of Oman	
1400	17660	Sudan Radio Service, via England	
1430	9430	FEBC, Philippines	CC
1430	11535	Radio Free Asia, via Tajikistan	unid
1430	11595	RS Makedonias, Greece	Greek
1500	13775	Radio Austria Int., via Canada	
1530	9636	VOIRI, Iran	
1530	15225	Adventist World Radio, via UAE	
1600	15100	Radio Pakistan	
1600	11690	Radio Jordan	
1600	17895	VOA Relay, Botswana	
1630	15215	Radio Jamahiriya, Libya, via France	AA
1630	15420	BBC, England, via Seychelles Relay	
1630	15205	BSKSA, Saudi Arabia	AA
1630	17605	Radio France Int.	
1630	11555	KWHR, Hawaii	
1700	17570	RTBF, Belgium, via Germany	FF
1730	15140	Radio Sultanate of Oman	AA
1730	11710	KCBS, North Korea	KK
1730	15120	Voice of Nigeria	various langs
1730	11625	Vatican Radio	
1800	15640	Kol Israel	HH
1800	15335	YLE-Radio Finland Int.	Finnish
1800	15180	BBC, England, via Cyprus Relay	FF
1830	15380	RAI Int., Italy	II
1830	15555	RDP Int., Portugal	PP
1830	15235	Voice of America Relay, Morocco	AA
1830	15475	Africa No. One, Gabon	FF
1830	15565	Voice of Ethiopian Unity, via Germany	vern.
1900	15505	Radio Kuwait	AA
1900	15085	VOIRI, Iran	FF
1900	15345	RTV Marocaine, Morocco	AA
1900	15630	Voice of Greece	Greek
1900	11775	Caribbean Beacon, Anguilla	
1900	11720	Radio Pilipinas	EE/Tagalog
1900	9470	Bible Voice, via Germany	wknds
1900	9495	IBRA Radio, Sweden, via Germany	
1930	15730	Voice of America Relay, Sao Tome	
1930	11885	Salama Radio Int., England	to Nigeria
1930	11975	Voice of America Relay, Sao Tome	
1930	15520	Deutsche Welle, Germany	
2000	11665	Radio Cairo, Egypt	AA
2000	9565	Radio Marti, USA	SS
2030	13680	Radio Nacional Venezuela, via Cuba	SS
2030	11735	Radio Tanzania-Zanzibar	Swahili
2030	11735	Voice of Korea, North Korea	AA
2030	11995	Radio France Int.	FF
2030	15400	BBC, England, via Ascension Relay	
2100	12133.5	AFRTS, Florida	SSB
2100	11865	Deutsche Welle Relay, Rwanda	
2100	12085	Radio Damascus, Syria	
2100	11965	Star Radio, Liberia, via Ascension	
2100	13830	Croatian Radio	Croatian
2100	9580	Africa No. One	FF
2130	7345	Radio Prague, Czech Rep.	
2130	9715	Adventist World Radio via Austria	
2200	11690	Deutsche Welle, Germany, via Canada	GG
2200	7460	Radio Nacional de la RASD, Algeria	AA
2200	7590	AFRTS, Iceland	SSB
2230	5470	Radio Veritas, Liberia	
2230	15320	KTWR/Trans World Radio, Guam	
2230	4845	Radio Mauritanie, Mauritania	AA
2300	7390	Voice of Russia	PP
2300	11940	Radio Romania Int.	
2300	9855	Radio Kuwait	AA
2300	11800	RAI Int., Italy	II
2300	11830	Radio Anhanguera, Brazil	PP
2300	9925	Voice of Croatia, via Germany	Croatian
2300	11760	Radio Nacional de Venezuela, via Cuba	SS
2330	9875	Radio Vilnius, Lithuania	
2330	12040	HCJB, Ecuador	GG
2330	17815	Radio Cultura, Brazil	PP

by Harold Ort, N2RLL

New, Interesting, And Useful Communications Products



MFJ Enterprises' new collinear array antenna is ready to use!

Seven New Collinear Array Antennas From MFJ

MFJ Enterprises has reached back in time to when radio was king and brought back to life some of the most popular, classic antennas that gave the most powerful signals. These classic high-performance antennas give you a powerful, booming signal and need just two trees or other points for support! According to MFJ, the antennas are made of stronger, more durable modern materials, with some adapted to simple, direct coax feed, and are "hang and play."

The MFJ-62XX single-band, two half-wave element collinear array provides nearly 2 dB gain and twice the receiving capture area of a half-wave dipole, with direct coax feed and low SWR across the entire band. The MFJ-64XX four half-wave element collinear array gives a 4.5-dB gain and four times the receiving capture area of a half-wave dipole. It requires a balanced line tuner or a tuner with a balun for balanced lines.

There's no cutting, soldering, or trimming required. The antennas come assembled and include custom fiberglass center insulators, glazed ceramic end insulators and heavy duty seven-strand, 14-gauge hard copper element wire and solderless, crimped construction. The antennas can be mounted a quarter-wavelength above the ground, but perform best at a half- to three-quarter wavelength above ground. Lengths are 55 to 136 feet horizontally. The feedline and stub simply hangs from the antenna and can be bent at the bottom or pulled away at an angle to make installation convenient.

For more information and complete pricing on these antennas, which range in price from $39.95 to $109.95, contact MFJ Enterprises at 800-647-1800 or write to them at 300 Industrial Park Road, Starkville, MS 39759. Visit MFJ on the Web at www.mfjenterprises.com. Please tell them you read about their new antennas in *Popular Communications*.

Garmin Introduces The nüvi

Garmin International Inc., a unit of Garmin Ltd. has announced the nüvi, a Personal Travel Assistant that combines a GPS navigator, language translator, travel guide capability, MP3 player, audio book player, currency and measurement converter, world clock, and a digital photo organizer in one slim and easy-to-use device.

The nüvi's introductory screen lists two familiar options: "Where to?" and "View map," which offer the user Garmin's GPS navigation functions. A third option on the title page, "Travel Kit," contains additional functions, including the optional Garmin Language Guide, a multilingual word bank, phrase bank, and five bilingual dictionaries. The word bank and phrase bank supports nine languages and dialects, including American English, British English, French, German, Italian, Brazilian Portuguese, European Portuguese, European Spanish, and Latin American Spanish. The Travel Kit will also support the new Garmin Travel Guide SD data cards with helpful travel information like reviews and recommendations for restaurants, hotels, shopping, nightlife, sporting events, and tourist attractions.

Gramin's nüvi is the company's latest high-tech GPS product with a ton of included features.

To pass the time on long trips, the nüvi comes equipped with an Audio Book Player, with content provided by Audible.com and featuring more than 70,000 hours of audio programs from more than 200 content partners. Its MP3 player lets users browse music by artist, album, song, or genre and also lets the user build playlists by loading music onto an SD card. Sample MP3s from AudioLunchBox.com are pre-loaded onto the unit. Additionally, the nüvi offers a Picture Viewer for displaying digital photos, a World Travel Clock, Currency and Measurement Converter, and Calculator.

Approximately the size of a deck of playing cards, the nüvi is sold with a suction cup mount and 12-volt adapter, AC power cable, PC/USB cable, owner's manual, and quick reference guide for $969. The Garmin Language Guide and the Garmin Travel Guide are sold separately. Visit garmin.com for more information.

Timewave's New TZ-900 AntennaSmith Antenna Impedance Analyzer

We just got word about the new Timewave TZ-900 that the manufacturer calls "a bright, colorful window to your antenna system." The display is a transreflective TFT LCD that's very visible in direct sunlight. Every two seconds the AntennaSmith's rapid sweep updates the data graph. You quickly set the start, stop, or center frequencies to see the data as you want. Tap a button to get a different parameter, tap another to store a graph to print later or to display as a reference while you optimize your antenna system. You'll

Timewave's TZ-900 has a bright, colorful window display.

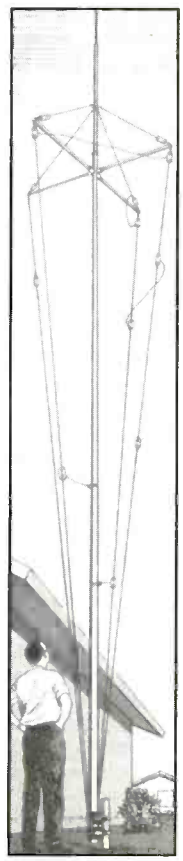
instantly see the effect of an adjustment or a change.

The TZ-900 also features an adjustable frequency cursor/generator that allows you to quickly tune the cursor to check your antenna system at the desired frequency while looking at the big picture on a graph. You can also use your laptop or PC to run the AntennaSmith with the included remote control program, giving you the same displays and controls as the AntennaSmith itself.

The case is rugged extruded aluminum and holds four "AA" NiMH cells for hours of operation. A 12-VDC power supply/charger is included. The introductory price is $995. For more information, contact Timewave Technology, Inc., at 1025 Selby Ave. Suite 101, St. Paul, MN 55104, phone 651-489-5080, or visit them online at www.timewave.com.

New Hy-gain HyTower-Jr.

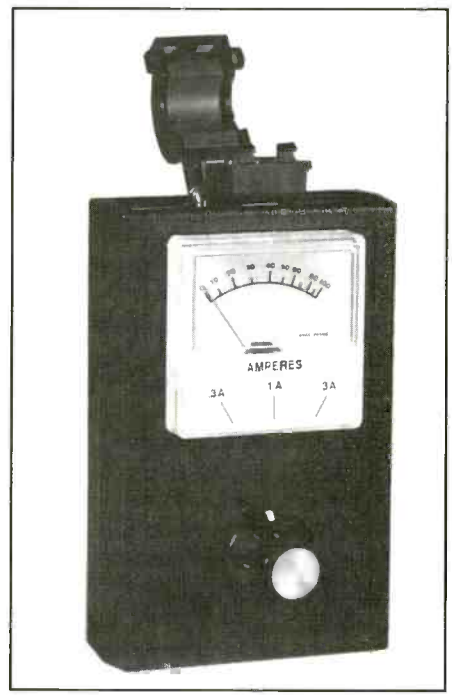
Standing 39 feet tall with full-size elements and rated at 5 kW, the new vertical AV-18JR Hy-gain HyTower-Jr. covers 80/40/20/15/10 meters. Stub-decoupling is used to give full-size quarter-wave radiators on 40, 20, 15, and 10 meters with, according to the company, "super efficient cage loading on 80 meters." The company also tells *Pop'Comm* that the HyTower-Jr. has "almost no losses—your ground system determines your efficiency." The antenna requires a good ground system for optimum performance.



The AV-18HT-Jr. is Hy-gain's new 39-foot vertical that covers 80, 40, 20, 15, and 10 meters.

It features automatic bandswitching, is fed with 50-ohm coax, and has low SWR over an exceptionally wide bandwidth with SWR less than 1.2 at resonance. The antenna's main radiator is aircraft heavy-walled two-inch aluminum tubing that's swedged at the top, and the antenna is self-supporting in winds up to 40 mph.

The AV-18HT-Jr. is $349.95, less than half the price of the 53-foot Hy-gain Tower with nearly the same performance. To order, get a free catalog, or for your nearest dealer, call 800-973-6572, write to Hy-gain, 308 Industrial Park Road, Starkville, MS 39759, or visit them online at www.hy-gain.com.



The new MFJ-853 is a calibrated clamp-on RF current meter that sells for $39.95.

New MFJ Clamp-On RF Current Meter

Also new from the company is the MFJ-853 calibrated clamp-on meter, which accurately measures RF current in antenna elements, ground wires, and coax shields. It simply slips over your mobile whip to tune for maximum current/radiation. It has 0.3, 1, and 3 amp ranges. The non-metallic case minimizes field disturbance for accurate readings.

The MFJ-853 is $39.95.

by Tomas Hood, NW7US, pc-prop-man@hfradio.org

A Look At Mediumwave DXing—The Winter Season

The mediumwave (MW) broadcast band, also known in the United States as the AM Broadcast Band (or simply AM band), currently extends from 525 to 1700 kHz. In the United States and Canada, channels are spaced in even 10-kHz increments starting at 530 kHz. Elsewhere, channels are spaced in 9-kHz increments, starting at 531 kHz.

The hunt for signals from far away AM broadcasting stations is an exciting activity, especially during the late fall and winter seasons. The distant stations you're able to hear depend largely upon signal propagation. Propagation at these frequencies is very different than it is for frequencies in the high-frequency range (3 MHz through 30 MHz), varying depending upon the time of day, the season, and other factors.

For mediumwave, the most obvious factor for good DX is the time of day. The *D* layer of the ionosphere almost always absorbs mediumwave radio signals during the daylight hours. As a result, nearly all mediumwave signals received during midday hours will arrive by groundwave propagation, rather than by skywaves refracted off the ionosphere. Groundwave propagation makes reception of signals over a few hundred miles away unusual in daylight. At night, however, the ionosphere refracts these mediumwave signals, making it possible for radio stations to be heard at much greater distances, sometimes as far away as Australia, Europe, and Asia.

Groundwaves

The groundwave, as its name implies, travels along a path close to the Earth's surface. The distance a groundwave is able to travel depends upon the transmitter power, frequency, antenna pattern, and the Earth's conductivity along the path of the signal. Lower frequencies travel greater distances, all other factors remaining the same. A signal on the lowest end of the AM broadcast band, say, 540 kHz, will travels twice as far as a signal broadcast on, say, 1600 kHz, if all other parameters remain the same for both stations.

If the land between the transmitting antenna and the receiving antenna is rocky, a groundwave signal might only travel 150 to 300 miles. On the other hand, if the signal is moving over salt water, the groundwave signal could make it some 1,000 miles away. While most groundwave signals are stable and strong, some fading and changes in reception can occur for groundwave signals. Sometimes, this fading is the result of signal cancellation due to weak skywave reception at the

The Ap Index And Understanding Propagation Terminology

The Ap index, or Planetary A index, is a 24-hour averaging of the Planetary K index. The Planetary K index is an averaging of worldwide readings of Earth's geomagnetic field. High indices (Kp > 5 or Ap > 20) mean stormy conditions with an active geomagnetic field. The more active, the more unstable propagation is, with possible periods of total propagation fade-out. Especially around the higher latitudes and especially at the Polar Regions, where the geomagnetic field is weak, propagation may disappear completely. Extreme high indices may result in aurora propagation, with strongly degraded long distance propagation at all latitudes. Low indices result in relatively good propagation, especially noticeable around the higher latitudes, when transpolar paths may open up. Maximum K-index is 9, and the A-index can exceed well over 100 during very severe storm conditions, with no maximum.

Classification of A-indices is as follows:

A0–A7 = quiet	A30–A49 = minor storm
A8–A15 = unsettled	A50–A99 = major storm
A16–A29 = active	A100–A400 = severe storm

Solar Flux (SFI): This flux number is obtained from the amount of radiation on the 10.7-cm band (2800 MHz). It is closely related to the amount of ultraviolet radiation, which is needed to create the ionosphere. Solar Flux readings are more descriptive of daily conditions than the Sunspot Number. The higher the Solar Flux (and, therefore, the higher the Sunspot Number), the stronger the ionosphere becomes, supporting refraction of higher frequencies.

Ionosphere: A collection of ionized particles and electrons in the uppermost portion of the Earth's atmosphere, which is formed by the interaction of the solar wind with the very thin air particles that have escaped Earth's gravity. These ions are responsible for the reflection or bending of radio waves occurring between certain critical frequencies, with these critical frequencies varying with the degree of ionization. As a result, radio waves having frequencies higher than the Lowest Usable Frequency (LUF) but lower than the Maximum Usable Frequency (MUF) are propagated over large distances.

Sunspot Number (SSN): Sunspots are magnetic regions on the Sun with magnetic field strengths thousands of times stronger than the Earth's magnetic field. Sunspots appear as dark spots on the surface of the Sun. Temperatures in the dark centers of sunspots drop to about 3700° K (compared to 5700° K for the surrounding photosphere). This difference in temperatures makes the spots appear darker than elsewhere. Sunspots typically last for several days, although very large ones may last for several weeks. They are seen to rotate around the sun, since they are on the surface, and the sun rotates fully every 27.5 days.

Sunspots usually occur in a group, with two sets of spots. One set will have positive or north magnetic field while the other set will have negative or south magnetic field. The field is strongest in the darker parts of the sunspots (called the "umbra"). The field is weaker and more horizontal in the lighter part (the "penumbra").

Galileo made the first European observations of sunspots in 1610. The Chinese and many other early civilizations have records of sunspots. Daily observations were started at the Zurich Observatory in 1749; continuous observations were begun in 1849.

The sunspot number is calculated by first counting the number of sunspot groups and then the number of individual sunspots. The "sunspot number" is then given by the sum of the number of individual sunspots and 10 times the number of groups. Since most sunspot groups have, on average, about 10 spots, this formula for counting sunspots gives reliable numbers even when the observing conditions are less than ideal and small spots are hard to see. Monthly averages (updated monthly) of the sunspot numbers show that the number of sunspots visible on the sun waxes and wanes with an approximate 11-year cycle.

For more information, see http://prop.hfradio.org.

Optimum Working Frequencies (MHz) - For January 2006 - Flux = 76, Created by NW7US

UTC TO/FROM US WEST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	18	15	11	11	10	10	10	9	9	9	9	9	9	8	12	16	18	19	20	21	21	21	20	19
NORTHERN SOUTH AMERICA	25	23	20	15	14	13	13	12	12	12	12	12	11	11	12	21	24	26	27	28	28	28	27	27
CENTRAL SOUTH AMERICA	25	23	18	15	14	13	13	13	12	12	12	12	12	11	16	22	25	26	27	28	28	28	27	26
SOUTHERN SOUTH AMERICA	27	25	22	16	15	14	13	13	13	12	12	12	12	11	11	20	24	25	26	27	28	28	28	28
WESTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	10	13	12	12	11	9	9	8	8
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	10	10	9	9	9	9	8	8
EASTERN NORTH AMERICA	20	17	13	12	11	11	11	10	10	10	10	10	10	10	13	18	20	21	22	22	22	22	22	21
CENTRAL NORTH AMERICA	11	11	9	7	6	6	6	6	6	6	5	5	5	5	5	8	10	11	12	12	12	12	12	12
WESTERN NORTH AMERICA	6	6	5	4	3	3	3	3	3	3	3	2	2	2	2	2	4	5	6	6	6	6	6	6
SOUTHERN NORTH AMERICA	19	18	16	12	11	10	10	10	9	9	9	9	9	9	9	15	18	19	20	21	21	21	21	20
NORTHERN AFRICA	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	12	14	15	15	13	10	10	9	9
CENTRAL AFRICA	10	10	9	9	9	8	8	8	8	8	8	8	8	8	8	11	13	14	15	13	12	12	11	11
SOUTH AFRICA	18	15	12	11	11	10	10	10	10	10	9	9	9	9	13	17	19	20	20	21	21	21	20	19
MIDDLE EAST	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11	12	10	9	9	9	9	8
JAPAN	17	16	16	15	13	10	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	11	14	16
CENTRAL ASIA	17	16	16	15	13	10	9	9	9	9	8	8	8	8	8	8	8	8	10	10	10	10	10	17
INDIA	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
THAILAND	16	16	15	14	12	10	9	9	9	8	8	8	8	8	8	8	8	10	10	10	10	10	10	10
AUSTRALIA	24	25	26	24	22	15	15	14	13	13	12	12	12	12	12	11	11	16	15	14	16	18	20	22
CHINA	14	15	15	13	12	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9
SOUTH PACIFIC	26	27	26	24	21	15	14	14	13	13	12	12	12	12	12	11	11	15	16	19	21	22	24	25

UTC TO/FROM US MIDWEST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	20	16	13	12	11	11	11	10	10	10	10	10	10	15	19	22	23	24	24	24	24	24	23	22
NORTHERN SOUTH AMERICA	22	19	15	14	13	12	12	12	11	11	11	11	10	14	20	23	24	25	26	26	26	26	25	24
CENTRAL SOUTH AMERICA	23	18	15	14	14	13	13	12	12	12	12	12	11	19	23	25	26	27	28	29	29	28	27	26
SOUTHERN SOUTH AMERICA	26	23	17	16	15	14	14	13	13	12	12	12	12	12	21	23	24	25	26	27	28	28	28	27
WESTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	10	13	15	15	14	14	13	11	9	9	8
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	11	13	13	12	10	9	9	8	8	8
EASTERN NORTH AMERICA	14	11	9	8	8	8	8	7	7	7	7	7	7	7	13	14	15	16	16	17	17	16	16	15
CENTRAL NORTH AMERICA	7	6	4	4	4	3	3	3	3	3	3	3	3	3	4	6	7	7	7	7	7	7	7	7
WESTERN NORTH AMERICA	12	11	9	7	7	6	6	6	6	6	5	5	5	5	5	8	10	11	12	12	13	13	12	12
SOUTHERN NORTH AMERICA	13	12	9	8	8	7	7	7	7	6	6	6	6	6	10	12	14	14	15	15	15	15	15	14
NORTHERN AFRICA	11	10	9	9	9	8	8	8	8	8	8	8	8	12	15	16	17	17	17	17	13	12	12	11
CENTRAL AFRICA	11	10	9	9	9	8	8	8	8	8	8	8	8	12	14	16	16	17	17	13	12	12	11	11
SOUTH AFRICA	19	15	14	13	13	13	12	12	12	12	12	11	11	20	23	25	26	27	27	27	27	26	24	22
MIDDLE EAST	8	8	8	8	8	8	8	8	8	8	8	8	8	9	13	14	15	14	10	10	9	9	9	8
JAPAN	16	15	14	10	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	9	14	16
ENTRAL ASIA	15	15	13	10	9	9	9	9	8	8	8	8	8	8	8	8	10	10	10	10	10	10	10	16
INDIA	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
THAILAND	14	13	12	9	9	9	9	8	8	8	8	8	8	8	8	8	11	11	10	10	10	10	10	10
AUSTRALIA	24	25	23	20	15	14	14	13	13	12	12	12	12	12	11	11	17	16	15	14	16	19	21	22
CHINA	13	13	11	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
SOUTH PACIFIC	27	26	24	19	15	14	14	13	13	12	12	12	12	12	11	17	16	15	17	20	22	23	25	26

UTC TO/FROM US EAST COAST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CARIBBEAN	15	11	10	10	9	9	9	9	8	8	8	8	10	15	17	18	19	20	20	20	20	19	18	17
NORTHERN SOUTH AMERICA	19	16	15	14	13	12	12	11	11	10	10	10	12	17	19	21	23	23	24	24	24	23	23	21
CENTRAL SOUTH AMERICA	21	18	17	16	15	14	14	13	13	12	12	12	19	22	23	25	26	27	28	28	29	28	27	25
SOUTHERN SOUTH AMERICA	24	20	19	17	16	15	14	14	13	13	12	12	16	20	22	23	25	26	27	27	28	28	28	27
WESTERN EUROPE	8	8	8	8	8	7	7	7	7	7	7	7	13	15	15	16	15	15	15	14	12	9	9	8
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	12	12	12	12	12	11	11	9	8	8	8	8
EASTERN NORTH AMERICA	6	4	4	4	4	3	3	3	3	3	3	3	3	6	7	7	8	8	8	8	8	8	7	7
CENTRAL NORTH AMERICA	14	11	9	9	9	8	8	8	8	8	7	7	7	8	13	15	16	17	17	17	17	17	17	16
WESTERN NORTH AMERICA	20	17	13	12	11	11	11	10	10	10	10	10	10	10	14	18	20	21	22	23	23	22	22	21
SOUTHERN NORTH AMERICA	16	13	10	10	9	9	9	8	8	8	8	8	8	11	15	17	18	19	19	19	19	19	18	17
NORTHERN AFRICA	11	11	10	10	10	10	10	10	10	10	10	14	18	20	22	22	23	22	21	19	13	12	12	11
CENTRAL AFRICA	11	11	10	10	10	10	10	10	10	10	10	14	18	20	22	22	23	22	19	15	13	12	12	11
SOUTH AFRICA	15	14	14	13	13	12	12	12	12	12	11	18	23	26	27	28	28	28	28	28	27	26	24	19
MIDDLE EAST	10	9	9	9	8	8	8	8	8	8	8	9	14	16	17	18	18	18	14	12	12	11	11	10
JAPAN	14	10	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	13	15
CENTRAL ASIA	13	10	9	9	9	8	8	8	8	8	8	8	8	8	11	11	11	10	10	10	10	10	10	14
INDIA	8	8	8	8	8	8	8	8	8	8	8	8	8	12	13	11	10	10	9	9	9	8	8	8
THAILAND	10	9	9	9	9	8	8	8	8	8	8	8	8	11	12	12	11	11	11	10	10	10	10	10
AUSTRALIA	24	22	16	15	14	13	13	13	12	12	12	12	11	11	18	18	16	15	15	14	17	19	21	23
CHINA	10	9	9	9	9	8	8	8	8	8	8	8	8	9	9	9	8	8	8	8	8	8	8	8
SOUTH PACIFIC	25	22	16	15	15	14	13	13	12	12	12	12	12	11	18	17	16	16	19	21	23	24	26	27

same point where the groundwave component is received.

Groundwave propagation provides a broadcast station with reliable, stable coverage to its target audience, and radio station engineers optimize the antenna system to ensure the best delivery of that groundwave signal. During the day, because the *D* layer of the ionosphere so completely absorbs the MW radio signals, groundwave is the only mode of propagation a MW station can rely on.

At night, however, because of the recombination that occurs in the *D* layer and the sharp reduction in MW signal absorption that results, many stations must reduce their power so they do not interfere with other stations. Some stations must even cease transmitting during the night hours. Those stations that do not need to cease transmitting will have signals radiating up into the ionosphere and possibly refracting back to Earth at far distant locations, making for AM DX.

A Hop, A Skip, And A Jump!

The ionosphere is therefore directly responsible for MW DX signals. After sunset, when the *D* layer is no longer under the direct radiation from the sun and nearly disappears, MW signals make it up to the *E* and *F* layers, to be refracted back to the Earth, much like a flashlight beam might be reflected off of a mirror. The distance of the skywave skip is anywhere from 10 to 500 or so miles.

MX DX signals may travel farther, if the ground is highly conductive, providing a reflection of the signal back up into the ionosphere. Multiple hop skywave signals can enable a broadcast signal at night to span thousands of miles. It is typical to hear European and Asian stations over the salt water of the oceans.

There is a region between about 10 miles out to about 500 miles where both the groundwave and the skywave signals can be heard. This typically causes a cancellation of the radio waves when the two signals arrive out of phase. The listener will experience deep fades, slow at times, or fast. Sometimes it is strong enough to cause severe distortion of the signal. Out beyond 500 miles, past the influence of groundwave signals, skywave signals also experience some fading and variations due to changes in the ionosphere.

It's Better In Winter

Reception of MW signals tends to be better in winter than in summer, due to lower levels of atmospheric noise and longer hours of darkness. During times of severe geomagnetic storms, when the planetary K index is above 4, auroral ionization can absorb the skywave MW signals, causing any higher-latitude broadcast signals to disappear, which would allow weaker mid- and low-latitude stations to be heard. At the same time, it has been observed that mid- and low-latitude skywave signals may be enhanced during these times because of ionospheric tilting and other phenomena. DXing of stations from south of the equator is often possible during highly active geomagnetic storms.

One of the most exciting aspects of mediumwave DXing is known as the "sunrise and sunset DXing window." The most fruitful times to reap distant MW signals are from just before sunset to a few hours after sunset and again just before sunrise to a few hours afterward. The sunset skip period is particularly useful to DXers in the eastern part of North America, because stations in time zones farther west become audible after local daytime stations have stopped transmitting. Western DXers, on the other hand, have an advantage in being able to pick up many eastern stations as they begin their broadcast days in the morning.

Because of the seasonal decrease in geomagnetic activity during December and January, and because of the longer hours of darkness in the Northern Hemisphere, you will find a rich selection of MW AM signals from as far away as Europe, South America, Asia, and even the South Pacific. Let me know your experiences, and we'll print them in your column!

Current Cycle 23 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-centimeter observed monthly mean solar flux of 90.8 for September 2005, only a 10th of a point up from August. The 12-month smoothed 10.7-centimeter flux centered on March 2005 is 97.2, just down from February's 98.5. The predicted smoothed 10.7-centimeter solar flux for January 2006 is about 78, give or take about 17 points.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for September 2005 is 22.1, down from August's 36.4. The lowest daily sunspot value during September 2005 was 7, occurring on the 30th. The highest daily sunspot count for September was 50 on the 13th. The 12-month running smoothed sunspot number centered on March 2005 is 33.6. A smoothed sunspot count of 16 is expected for January 2006, give or take about 12 points.

The observed monthly mean planetary A-Index (Ap) for September 2005 is 21, up from the previous few months (13, 16, and 16). The 12-month smoothed Ap index centered on March 2005 is 15.3. Expect the overall geomagnetic activity to be quiet during most days in January. At the time of writing, the forecast holds that January will be a very quiet month with little to no geomagnetic storminess.

HF Propagation

We are in the heart of the winter season, with very short daylight hours. Average daily maximum usable frequencies (MUFs) are at their seasonal lowest, but so are noise levels. During the winter months the MUFs are generally higher during the daylight hours than during the summer daylight hours. (See the notes at http://vesuvius.jsc.nasa.gov/er/seh/sun.html.) This provides short but strong openings on higher shortwave bands during the winter day. Then, at night, the MUF dips down much lower than what would be seen during the summer nights. Summertime MUFs are generally higher during the night hours than during the winter nights, in part because the ionosphere stays energized through the short nights. Winter nights are longer, so recombination of the ionosphere (which results in a lowering of the MUF) is more complete.

This also means that the *D* layer of the ionosphere is less ionized during the winter, allowing MW and SW frequencies to propagate *through* the *D* layer and off of the *E* and *F* layers. Finally, the seasonal decrease in weather-related noise makes it easier to hear the weaker DX signals on lower frequencies. With thunderstorms few and far between, storm-related static and noise is greatly reduced.

The End Is Near!

Seasonally, the geomagnetic activity tends to quiet down during the winter months. The most active geomagnetic seasons are centered on the two equinoxes, in the spring and autumn. Combined with the seasonal decrease in geomagnetic activity, the 11-year solar cycle geomagnetic activity is continuing its downward trend toward the end of the current cycle, which will occur sometime at the

end of 2006. This results in more stable and reliable propagation on the SW spectrum, especially on the lower frequencies.

The Winter Anomaly

The only exception to this winter propagation is "the winter anomaly." There are actually two different winter anomalies. First, there is a small winter anomaly that appears in connection with ionization at relatively low latitudes in the bottom of the *D* layer of the ionosphere. There, the electron densities in the winter happen to be less than should be expected. Second, the better known classic winter anomaly is present when the upper *D* layer, again at relatively low latitudes, has more ionization than would be expected during the winter. (Check out http://www.sciencemaster.com/physical/item/solar_glossary.php.)

Both of these effects are due to the slant compression of the geomagnetic field produced by the solar wind in the winter season. The standard winter anomaly is caused by the influx of a super solar wind that penetrates into the Earth's polar atmosphere down to E-layer heights. There, it is concentrated through a funneling action at the winter pole of the distorted geomagnetic field, slowing down the winter polar vortex. An equator-ward motion of the polar air with its content of nitric oxide brings about the excess of ionization in the upper D layer at lower latitudes. (See Gian-Carlo Rumi, Italy at http://www. ingv.it/~wwwannali/rumi443.htm.) The end result of this winter anomaly is that the MW and lower-frequency SW bands are attenuated much like you would expect during the summer season.

This winter anomaly also appears to happen in relationship with sudden stratospheric warming events. Check out http://www.albany.edu/faculty/rgk/atm101/weather.htm for more information. The Space Weather reports provided by WWV and NOAA, and also found at http://prop.hfradio.org, list stratospheric warming events. On those days with stratospheric warming alerts, it is possible that the winter anomaly condition exists, causing a degradation of MW and low HF band propagation.

Nineteen meters through 11 meters will have occasional openings, though short lived for the most distant DX. They will close shortly after sunset, to open again just before sunrise. But morning and evening DX openings between some areas in the Northern Hemisphere on these bands are very short, because the band in question closes on one end of the path before it opens on the opposite end.

Paths on 31 through 15 meters remain in their seasonal peak, especially between North America and Europe in the morning, and between North America and Asia during the late afternoon hours. Twenty-two and 19 meters continue to be the best daytime DX bands, with 31 and 25 running a close second. Plenty of surprises are possible on 31 meters during the morning and evening hours and well into the hours of darkness. North/south paths on 25 through 15 meters will be reliable and open for most of the daylight hours, especially where paths terminate in the Southern Hemisphere. Nighttime conditions on these higher frequencies remain short and weak, with mostly north/south path openings since the Southern Hemisphere has longer daylight hours.

Signals are strong on 90 through 41 meters this year, and seasonally they are at their nighttime peak. DX activity tends to increase later in the evening toward midnight. Look for Africa and the South Pacific (Australia, Papua New Guinea, and so on) on 90 through 60 meters throughout the night. On 41, 49, and 60 meters, long path DX is possible along the gray line.

Seventy-five through 120 meters continues to remain stable, with very low noise levels. Some high noise may occur during regional snowstorms, but on average you can expect great nighttime DX conditions with the longer hours of darkness. Look for Europe and Africa around sunset until the middle of the night, and then Asia, the Pacific, and the South Pacific as morning approaches.

Signals below 120 meters are also greatly improved, unless we experience those intense coronal mess ejection (CME) events, where conditions will become degraded. MW DX is really hot during this season.

VHF And Above

Don't forget to monitor the low VHF for DX TV signals (remember, European TV uses *AM* instead of FM for their

Working Meteor Scatter

Meteors are particles (debris from a passing comet) ranging in size from a spec of dust to a small pebble, and some move slowly, while some move fast. When you view a meteor, you typically see a streak that persists for a little while after the meteor vanishes. This streak is called the *train* and is basically a trail of glowing plasma left in the wake of the meteor. The trains of meteors can last from several seconds to several minutes.

Meteor scatter propagation is a mode where radio signals are refracted off of these trains of ionized plasma. The ionized trail is produced by vaporization of the meteor. Meteors no larger than a pea can produce ionized trails of up to 12 miles in length in the *E* layer of the ionosphere. Because of the height of these plasma trains, the range of a meteor scatter contact is between 500 and 1,300 miles.

The frequencies that are best refracted are between 30 and 100 MHz. However, with the development of new software and techniques, frequencies up to 440 MHz have been used to make successful radio contacts off of these meteor trains. On the lower frequencies, like 6 meters, contacts may last from mere seconds to well over a minute. The lower the frequency, the longer the specific "opening" made by a single meteor train. A train that supports 60-second refraction on 6 meters might only support a one-second refraction of a 2-meter signal. Special high-speed methods are used on these higher frequencies to take advantage of the limited available time.

A great introduction by Shelby, W8WN, on working High-Speed Meteor Scatter mode is found at http://www.amt.org/Meteor_Scatter/shelbys_welcome.htm.

OZ1RH wrote "Working DX on a Dead 50 MHz Band Using Meteor Scatter," a great working guide found at http://www.uksmg.org/deadband.htm. And W4VHF has also created a good starting guide at http://www.amt.org/Meteor_Scatter/letstalk-w4vhf.htm.

Links to various groups, resources, and software can be found at http://www.amt.org/Meteor_Scatter/default.htm.

audio), as there might be sporadic-*E* (*Es*) openings once or twice this month. I'd like to hear from you if you catch one!

Es activity can appear three to four days during January on the low VHF frequencies for stations in the Northern Hemisphere. The average opening may last an hour or two with distances of up to 1,000 kilometers. A particularly good time to monitor for *Es* activity is during the ARRL VHF contest, which begins at 1900 UTC on January 22 and ends at 0400 UTC on January 24, 2006. A surprise one- or two-hour opening has been known to occur during the contest period in the past and this has led to increased multiplier counts for contest efforts. This contest is on 50 MHz and higher amateur radio bands.

The Quadrantids meteor shower is the major meteor shower for January and it can appear any time during the first week of January. This can sometimes be quite intense, so it may be a good idea for setting up some 2- and 6-meter schedules. Morning meteor openings may be the best bet during this month. The Fall/Winter Meteor Scatter Sprints on 50 MHz is held on January 26 from 0100 UTC to 0500 UTC. This might afford you a chance to hear some of these meteor contacts.

I'd Like To Hear From You

Let me know how you fare on hunting MW stations, beacons, and other signals. I would love to share with readers your propagation observations on the LF spectrum, so please write an e-mail to me, or drop me a letter. Don't forget to share a bit about your radio equipment and antenna that you use for your LF DXing.

You can join in with others in discussing space weather, propagation, and LF, MW, SW, or VHF listening, at http://hfradio.org/forums/. Be sure to check out the latest conditions, as well as the educational resources about propagation, which I have put together for you at http://prop.hfradio.org/. I also provide a WAP/WML resource for wireless devices. If you want the latest propagation information like the solar flux, Ap reading, and so forth using a cell phone or other WAP device, check out http://wap.hfradio.org/, the wireless version of my propagation site.

Please don't hesitate to write and let me know about any interesting propagation that you have noticed. Do you have questions about propagation? I look forward to hearing from you. Until then, happy signal hunting! ■

by Laura Quarantiello, KI6AOK

KB9VBR's All-Copper J-Pole Antenna

The J-Pole antenna is one of the best known amateur radio antennas. It's simple to build, easy to put up, and withstands the elements like a champ. Plans for building a J-Pole in one of its many guises can be found all over the Internet and in the back issues of this magazine and others catering to radio enthusiasts. In fact, there are so many plans for this antenna that it's tough to figure out which one to use. As a new ham, and one who wanted to get on the air sooner rather than later, I decided that *buying* a J-Pole was the best option for me. The antenna I eventually settled on was KB9VBR's All-Copper J-Pole (www.kb9vbr.com/jpole.htm).

I originally found this antenna for sale by its builder, Michael Martens, on eBay. The price was right and, best of all, I wouldn't have to worry about soldering or tuning—the antenna is shipped already assembled and ready to go. Michael responded to a pre-purchase e-mail question very quickly, so I knew technical support wouldn't be a problem. He builds these antennas himself and has made hundreds of them. Each antenna is individually tested before shipment, and mine arrived via Priority Mail within two days, well packaged in cardboard.

The antenna stands 69 inches tall, with the radiator measuring 58 inches and the stub 19 inches. An SO-239 connector is soldered on at the point of lowest SWR, ready to accept a coax cable with a PL-259 fitting. I ordered the 2-meter version of the antenna, which is tuned for 146 MHz and sports an SWR of 1.2:1 at that frequency. According to Michael, the SWR is 1.4:1 or less throughout the entire 2-meter band. This version of the antenna will also load up on 70 centimeters, where the SWR is reportedly 2:1 to 2.5:1 between 445 and 450 MHz. Gain is reportedly 3 dB over a quarter-wave groundplane.

The antenna is constructed of Type M copper pipe, soldered with rosin core solder. The fit and finish out of the box are solid, with all joints well soldered. The attention to detail is obvious and you can tell this isn't somebody's weekend project. The top of each element is covered with a copper cap that is soldered on.

The antenna comes "plain," in its natural copper finish, and after exposure to the elements it will oxidize into a dark brown patina that does not affect the performance of the antenna. To protect it, you can paint it with any non-metallic paint. I thought about doing this to blend the antenna into the environment, but the copper looked so good, I ended up spraying it with a few coats of clear lacquer instead.

The KB9VBR J-Pole antenna at Laura's California QTH. (It's also a great scanner antenna; remember, it's tuned for 146 MHz, so if most of your local action is in the VHF band it'll perform quite well).

On The Air

Mounting the antenna is easy once you decide on a suitable mast. The antenna is at DC ground, so it can be clamped directly to a metal mast or support and still radiate. I used an extendable fiberglass tree trimmer pole, painted white, and clamped the antenna to it with two hose clamps. The mounting mast should not extend above the T connector. The antenna has an 11-inch mounting stub, which is plenty for a secure mount. I connected a length of RG-8X coaxial cable to the SO-239 connector and used plastic ties to secure it to the pole. Once I waterproofed the connection, I was ready to raise the antenna into place. Michael notes that the antenna's SWR can be affected by nearby buildings, so he recommends mounting it either above or at least six feet away from any structures,.

Once I had the antenna up, the mast U-bolted into place, and the coax run, I was ready to go on the air. Connecting the coax to my Yaesu VX-6R, I tuned around and found an active repeater. During a lull, I put my callsign out and received an immediate reply. Imagine my surprise when I was told that the repeater was on Catalina Island—69 miles away from my location. Not bad!

A Bargain And Then Some

KB9VBR's All-Copper J-Pole is a steal at $20 plus $6 shipping and handling for the original 2-meter version. There are also several other versions of the J-Pole available: the Breakaway 2-meter J-Pole ($25) is a two-piece design that will fold to fit in the trunk of a car; the 6-meter J-Pole ($45) measures 13.5 feet and is also a two-piece design; the 222-MHz J-Pole ($18) is 29 inches long; and the 440-MHz J-Pole ($16) is 30 inches overall. Special requests are welcome. Contact Michael Martens, KB9VBR, at KB9VBR@yahoo.com, phone 715-845-2794, or order online at www.kb9vbr.com/jpole.htm. ■

by Gordon West, WB6NOA, WB6NOA@arrl.net

Commercial SSB For The Line Islands!

One thousand miles due south of Hawaii, nearly on the Equator, lies a line of islands so remote that high-frequency SSB is their only reliable link. I'm talking about Washington Island, Fanning Island, and Christmas Island of the Republic of Kiribati.

"These islands are largely cut off from the world, except for an occasional supply ship and maybe a day stop by a cruise ship," says Carlton Smith, KE5EUL, a ham radio operator with a communications plan to allow Christmas Island to maintain medical comms up and down the Line Islands, Republic of Kiribati. "We have received permission from the Republic of Kiribati Ministry of Health and the Telecommunications Authority to set the frequency of our medical communications to 7312 kHz, upper sideband," reports Smith. "The SSB radio system is replacing an old one that never really got off the ground. Our new SSB system will, for the first time, permit nurses on Fanning Island to communicate reliably with doctors and nurses on their main island, Christmas Island, and will undoubtedly alleviate suffering and save lives," adds Smith.

He recently visited these remote islands and, as a ham operator, could easily envision how a 40-meter "hop" from the Line Islands could easily fill in rock-solid communications.

Coordination was conducted over 20 meters to an active ham, "Tek" T32LN, on Christmas Island. Coordinating with Smith as well as a powerful maritime mobile shore station on the West Coast, Ken, KB6EVR, it was determined that the Christmas Island hospital station could be put back on the air with some needed repairs, but the equipment at the other islands was damaged beyond repair in recent bad weather.

Solar Power

The first phase of getting the Line Islands all in touch with each other was setting up a complete solar station at Fanning Island (Tabuaeran Island). A 40-meter homebrew dipole, cut specifically to 7312 kHz, would be pre-tested with enough coax to allow the dipole to be hoisted up a tall palm tree. A flexible solar panel, obtained from a West Marine store in San Diego, could provide nearly 2 amps of charge current during the day, fully charging a 132-amp-hour, deep cycle gel battery.

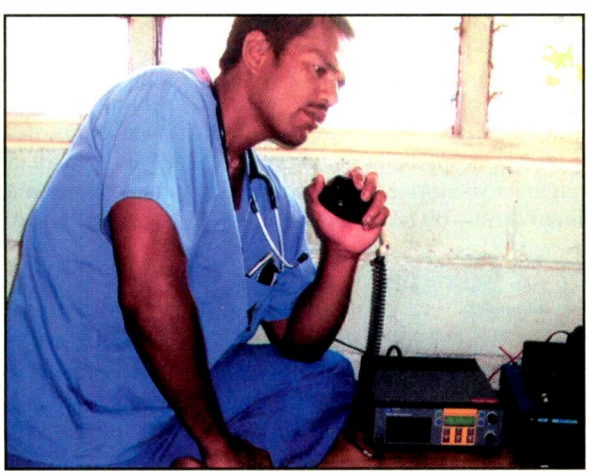
The single sideband station was required to have only the 7312-kHz frequency operational, with all other frequencies locked out. It also had to be rated to commercial specifications and have no operator control that might allow frequencies to be changed.

The Vertex Standard Yaesu System 600 HF multi-mode, 100-watt SSB transceiver was chosen. It includes 100 memory channels that are easily programmed via the keypad, and then may be permanently configured to only one memory channel by use of a proprietary lock key. Although the equipment is pre-loaded with *all* marine safety, emergency, and operations maritime single-sideband channels, they, too, would be locked out by the proprietary "key" that would be later hidden at the nurse's station in the locked-up pharmaceutical chest. In case of an emergency, such as a hurricane, they could always "unlock" the System 600 radio and call out for help on international distress frequencies.

The whole system was tested weeks before Smith would hop aboard a ship in Hawaii and sail south to Fanning Island. Everything worked well, and there was so much charge current from the flexible solar panel that several strings of white LED lights were added to keep the nurses' quarters lit for nighttime medical aides!

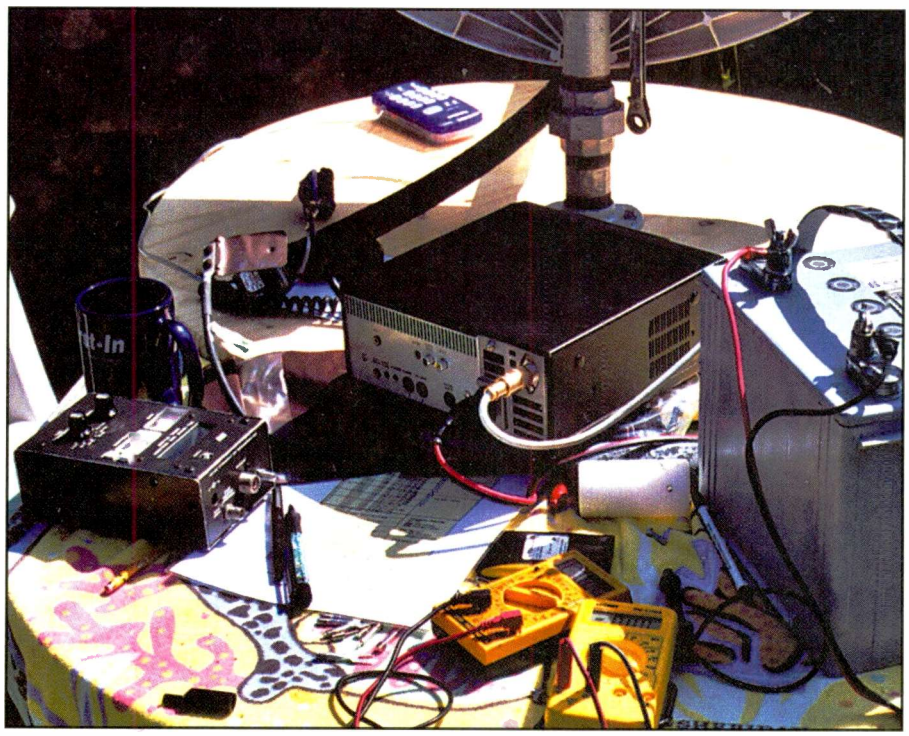
Making Contact!

Smith had only hours to set up the station and make contact from Fanning Island back to Christmas Island. The lay-



Dr. David Langston, Christmas Island's only surgeon and one of two doctors serving a population of 5,000 islanders, speaks with Senior Nurse Nukai Tanaua on Fanning Island, 175 miles to the northwest, now that Fanning has its new communications system. (All photos by Carlton Smith)

Fanning Island Senior Nurse Nukai Tanaua makes "crystal clear" contact with nurses and the doctor at Christmas Island, 175 miles to the southeast.



Testing the SSB radio with big gel battery and 2-amp solar panel.

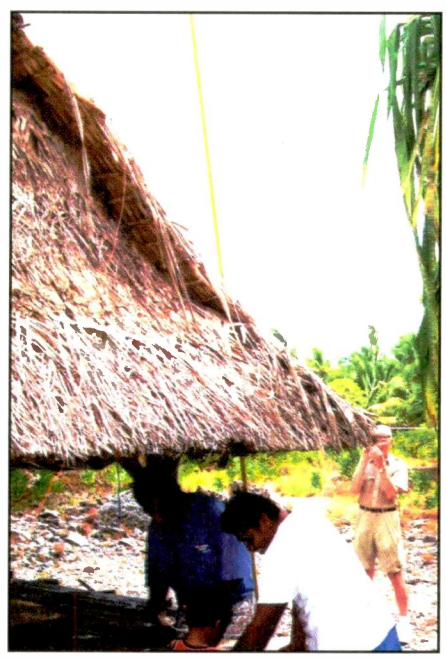
over at Fanning Island was just a one-day deal, but Smith executed the plan with solar cells and antennas fully deployed in just two hours.

Initial contact from Fanning Island back to Christmas Island was loud and clear, and subsequent reports confirmed everyday contacts with plenty of medical traffic going back and forth.

"The Yaesu System 600 HF multimode radio is perfectly suited for non-ham operation. The keypad has a protective cover so the operators don't even know there are push buttons behind the plastic," says Smith. The main dial is electronically frozen with the hidden key lock, leaving just power on/off, volume, and squelch controls. The System 600 HF transceiver is internally constructed to Mil Spec standards, keeping moisture from eating up the circuit boards, and incorporates other weatherproof techniques to keep it working in a harsh environment. Down at Christmas Island, the environment is tough!

Line Up

Carlton Smith is planning additional visits to the Line Islands, and will be setting up more radio systems on both HF as well as VHF for medical personnel on each island to be able to communicate regularly among themselves. "The new radio system will undoubtedly save many lives in the future," says Smith.



Installation and successful operation of the remote communications system was accomplished in less than two hours. Here, islanders work to put the radio in place while volunteer Vincent McKusick uses his compass to set the Yagi.

Any ham or VHF/HF radio enthusiast wishing to take a trip to the Line Islands and work with Smith may contact him at 14951 County Road 3300, Brownsboro, TX 75756 or via e-mail at carltondvr@aol.com. ■

by Ron McCracken, KG4CVL / WPZX486

After The Storm And More

Disaster Fund Launched

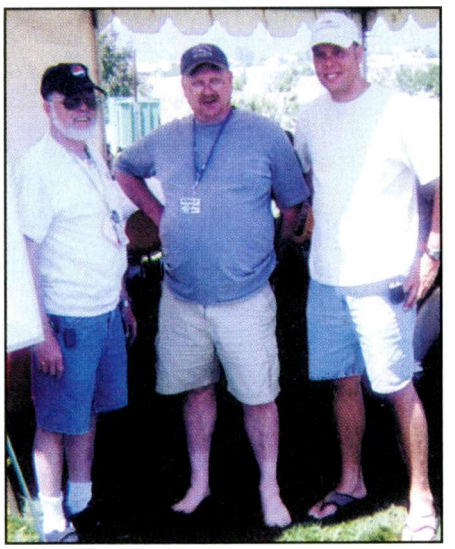
Hurricanes Katrina and Rita, which devastated huge swaths of the Gulf coast last fall, did do at least one thing worthwhile. They prompted the Board of REACT International, Inc. to establish the REACT Disaster Fund. The fledgling REACT Disaster Fund will focus on relief to ease the devastation caused by these two natural disasters occurring in rapid succession. You read and saw horror stories about the nightmare that haunted the authorities and the general public alike after the hurricanes leveled their double whammy at the beleaguered coastal areas of at least four states.

Now REACT hopes to make a dent in the terrible losses resulting from the twin disasters. Readers can help to build up the new REACT Disaster Fund. It is an opportunity to contribute to a relief effort through an organization directly related to your radio hobby interest. It's easy to do. Just visit the REACT website at www.REACTintl.org and click on "Donations." You can make a secure donation to the REACT Disaster Fund using your credit card. All donor information remains *strictly confidential*.

Do it now so planning can begin for a rapid REACT response. Please help while the idea is fresh in your mind. Your generosity will be much appreciated by REACT and by those disaster victims who will benefit.

Hurricane Christmas

By the time you read this, Junior REACTers of the Wausau REACT Team (Wisconsin) will have already brightened Christmas for children affected by earlier hurricanes in Florida last year. Wausau REACT teens gathered gifts and donations in their hometown after the hurricanes devastated Florida. They went on TV in Wausau and residents responded generously. Salvation Army officials in Wausau provided a van to transport the gifts and the junior Santas to Florida. REACT and Salvation Army assist one another through a Memorandum of Understanding that has served both organizations well.



REACTer Lonnie Trummell (left) enjoys a break with unidentified pals at the Yucaipa Valley ARC. He helped man ham radios on Field Day, right after several busy days at the REACT International convention in nearby Corona, California.

North Brevard REACT in Titusville, Florida, helped the teens with local arrangements, and businesses provided a hearty breakfast for them after they drove the 1,500 miles. A motel provided rooms so the teens could enjoy a comfortable sleep before the return trip next day.

Oh, to be young again and able to do that! The future is in good hands with young people of their quality soon ready to take leadership roles in the nation.

Run, Run, Run

First it was off to the REACT International convention in Corona, California, for Southwestern REACT (California) last summer. Before the convention ended, a raging brush fire in the hills summoned Southwestern REACTer Patricia Pearce away to dispatch fire-fighting resources.

As the convention ended, Field Day hit and Southwestern REACTer Lonnie Trummell helped work various ham bands to assist the Yucaipa Valley Amateur Radio Club, of which he is also a member. As so often happens, it was one hectic

Junior REACTers of Wausau REACT, Wisconsin, unload Christmas toys from a Salvation Army van. They collected the gifts and trekked 1,500 miles to deliver them to Florida hurricane victims. North Brevard REACT linked the Wausau teens with needy kids locally.

week for the Southwestern REACT Team, but it was one satisfying week, too!

REACT 101

In the Philippines, REACT is going to school. Kaamulan REACT has introduced the Junior REACTer program to schools in its area. Bukidnon State School already has 60 Junior REACTers among its student body.

The REACT Juniors are a real asset to school authorities. They have received radio communications training from their Teams. In addition, they hold Basic Life Support qualifications with the Red Cross. Currently, they are also studying to earn their amateur radio licenses so they can be even more effective. Just another example of the good hands our future is in with such talented and dedicated young people.

REACT Rescues Repeater

Serving your community can be costly. Repeater tower sites are often donated to ARES and REACT groups by tower owners for the public good. Sometimes, however, tower owners charge rent, and the rent can be about as high as the tower.

Hill Country REACT in San Antonio, Texas, recently saved the day for a local amateur radio club, which was being forced to discontinue the most valuable repeater in the area. Rent on the tower site had become just too expensive. The ham repeater served the National Weather Service SKYWARN program, as well as three local ARES groups, traffic reports, etc. Rent wasn't the only expense. Upkeep and licensing costs mounted quickly too, adding to the burden of operating a repeater system.

Hill Country REACT agreed to help the hams with the rent in exchange for use of the repeater in its work for the community. The Team's liability insurance coverage, through its membership in REACT International, Inc., meant further savings to help keep costs down for everyone.

The result was a happy ending for all. The repeater will continue to serve the needs of its users in providing emergency communications for San Antonio residents, most of whom likely don't even know it exists. Hill Country REACT can now rely on three repeaters to conduct its work. It's had one repeater operating since 1987, and a second for about 10 years. This one will give it the widest coverage yet, while enabling all the other users to continue to benefit. REACT will retain the two existing repeaters as back-ups. Nicely done!

That's a Wrap

Our time is gone again. Hopefully, these accounts have helped you better understand the varied ways in which REACT Teams serve and benefit their communities. Perhaps you'd like to be part of this worldwide organization. Remember: it only takes you and two pals to form a REACT Team. You can grow from there. Visit www.REACTintl.org to get details. You can also call 866-REACT-9-9 and ask for a membership package.

Tune in again right here in March for more reports on REACTivity. Meanwhile, if you have reports you would like to share with me on how a REACT Team has helped you or someone you know, drop me a note here at *Popular Communications* at 25 Newbridge Rd., Hicksville, NY 11801 or e-mail me at ronmccr@hotmail.com.

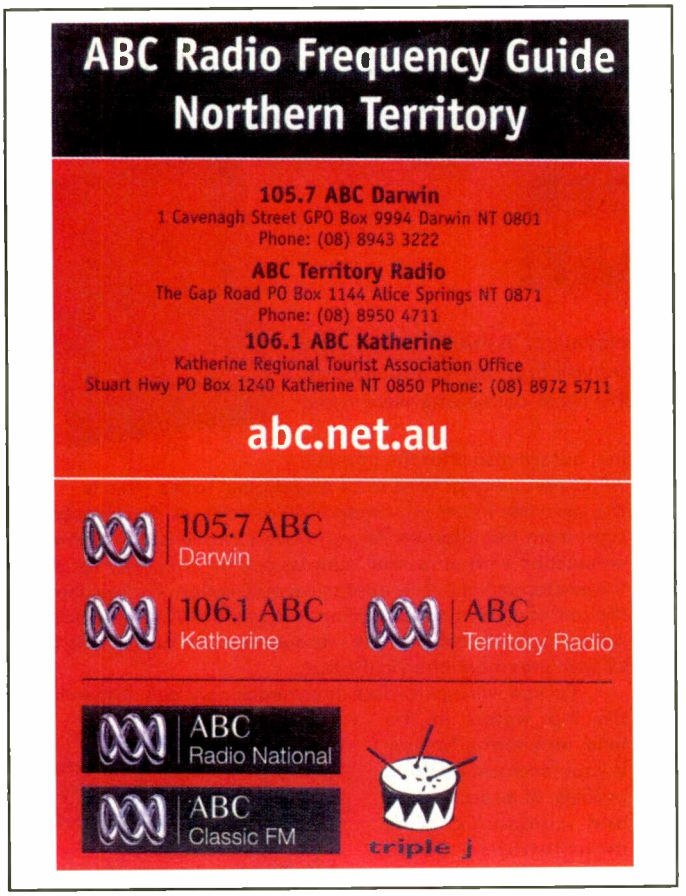
So long until next time! ■

by Gerry L. Dexter, gdex@genevaonline.com

Radio Afghanistan Returning To Shortwave, Plus St. Helena Needs Help!

Good news is word that Radio Afghanistan is coming back on shortwave, and in fact may have done so by the time you read this. The new effort will involve a 100-kW transmitter and several antennas, which will beam programming to Asia, Africa, and Europe. The station's transmission facilities will be at Yakatoot, which apparently is in or near Kabul. The Indian government is funding the facility. At this point, we have no information as to times and frequencies.

Efforts are underway to reinstate the annual test broadcasts from Radio St. Helena, which had to discontinue the highly popular yearly transmissions a couple of years ago when the point-to-point transmitter it had been using was retired from service. Station Manager Ralph Peters would be happy to begin the broadcasts again, but the station does not have a transmitter (other than for local services) and has also had to deal with a budget cut. A decision was due back in September, but even if it turned out to be a "no" there's always "next year." So, it wouldn't hurt to contact them and let them know you'd like to see the annual broadcasts back again. The manager's e-mail address is listed as RalphPeters@helanta.sh, but mail we've sent has bounced.



ABC Northern Territory stations are occasionally heard on the 120- and 60-meter bands.

New Orleans' WWL On Shortwave!

In the wake of Killer Katrina, one of America's great clear channel radio stations was getting worldwide coverage on shortwave. WWL-870 in New Orleans was being relayed for several hours a day by World Harvest Radio. The programming was some sort of co-op venture under the umbrella title, "United Radio Broadcasters of New Orleans." The relay, obviously, is or was only a temporary deal and, as of this writing, no one could say how long the broadcasts on shortwave would continue. Initially, the schedule was:

Monday to Friday: 0500 to 1100 on 5845; 1200 to 1400 on 11785 and 2200 to 2400 on 15285

Saturday: 0500 to 1200 on 5835; 1400 to 1700 on 15285; 2300 to 0000 on 9840; 0000 to 0200 on 5835 and 0300 to 0500 on 5835

Sunday: 0500 to 1200 on 5835; 1400 to 1700 on 15285; 1800 to 2100 on 15285 and 0200 to 0500 on 5835

We suggest you not attempt to QSL these broadcasts, at least not from WWL. It goes without saying the people there still, months later, have enough to deal with!

And, speaking of New Orleans, it just may be that the long-troubled WRNO, silent or barely operating over a number of years now, will soon be back on the air. The most recent on-air target date was the end of October. Good News World Outreach (located at 5601 Bridge St., 3rd Floor, Ft. Worth, TX 76112) now owns this new version of the first of the modern era U.S. shortwave broadcasters.

HCJB's Situation Worsens, And Other SW News

We understand that HCJB's transmission situation has worsened considerably. Now it seems there is no chance of keeping the Pifo, Ecuador, transmitter site even partially active, and the plans to build a site elsewhere are facing serious funding problems. Worst case: no HCJB broadcasts from Ecuador at all in another two years when the Pifo site must be closed down due to the opening of Quito's new airport.

A station of the Australian Defense Forces is now carrying the ABC-Western Australia service. It's relaying ABC-Perth (720 kHz) and was being widely reported at various hours of the day and night on 7875 upper sideband. "Was" because it went inactive after a week or so, though hopefully it has returned by now. The transmitter is believed to be located at Exmouth, on Australia's northwest cape.

Help Wanted

We believe the "Global Information Guide" consistently presents more shortwave broadcast loggings than any other monthly SW publication! (This month we processed 422 loggings!)* Why not join your fellow SWLs, let us know what you're hearing, and also become eligible for our monthly shortwave book prize! Send your logs to "Global Information Guide," *Popular Communications*, 25 Newbridge Rd., Hicksville NY 11801-2953. Or e-mail them to Editor Harold Ort at popularcom@aol.com, or to your "GIG" columnist at gdex@genevaonline.com (please see the column text for basic formatting tips.) Come join the party—we look forward to hearing from you!

**Not all logs get used; there are usually a few which are obviously inaccurate, unclear, or lack a time or frequency.*

The International Radio of Serbia and Montenegro has ceased several of its target broadcasts, including English and Serbian to North America.

Japan has closed down those low-band, low-power SSB relays of NHK.

Still another shortwave returnee is Radio Union in Lima, Peru. We understand it has reappeared on its old 6115 frequency, although we've yet to hear it or see an actual loggings yet.

A new one is Radio Tacana in Tumpuasa, Bolivia, occupying 4781.3. That is a messy frequency choice, with

Abbreviations Used In This Month's Column

*	— before or after a time (time the station came on or left the air)
(l)	— after a frequency (lower sideband)
(p)	— presumed
(t)	— tentative
(u)	— after a frequency (upper sideband)
v	— variable
//	— in parallel
AA	— Arabic
ABC	— Australian Broadcasting Corporation
AFN	— Armed Forces Network
AFRTS	— Armed Forces Radio TV Service
AIR	— All India Radio
Anmt(s)	— announcement(s)
Anncr	— announcer
AWR	— Adventist World Radio
BSKSA	— Broadcasting Service of Kingdom of Saudi Arabia
CC	— Chinese
Co-chan	— co-channel (same frequency)
Comml(s)	— commercial(s)
CP	— Bolivia, Bolivian
CRI	— China Radio International
DD	— Dutch
DJ	— disc jockey
DW	— Deutsche Welle/Voice of Germany
EE	— English
ECNA	— East Coast of North America
f/by	— followed by
FEBA	— Far East Broadcasting Association
FEBC	— Far East Broadcasting Company
FF	— French
GBC	— Ghana Broadcasting Corp
GG	— German
GMT	— Greenwich Mean Time
HH	— Hebrew, Hungarian, Hindi
HOA	— Horn of Africa
ID	— station identification
II	— Italian, Indonesian
Int	— international
IRRS	— Italian Radio Relay Service
IS	— interval signal
JJ	— Japanese
KK	— Korean
LSB	— lower sideband
LV	— La Voz, La Voix
NBC	— National Broadcasting Corporation (Papua New Guinea)
ORTB	— Office de Radiodiffusion et Television du Benin
PBS	— People's Broadcasting Station
PP	— Portuguese
PSA	— public service announcement
QQ	— Quechua
RCI	— Radio Canada International
Rdf.	— Radiodifusora, Radiodiffusion
REE	— Radio Exterior de Espana
RFA	— Radio Free Asia
RFE/RL	— Radio Free Europe/Radio Liberty
RNZI	— Radio New Zealand International
RR	— Russian
RRI	— Radio Republik Indonesia
RTBF	— RTV Belge de la Communate Françoise
Relay	— transmitter site owned/operated by the broadcaster or privately operated for that broadcaster
relay	— transmitter site not owned by the broadcaster
SCI	— Song of the Coconut Islands (transition melody used by Indonesian stations)
s/off	— sign off
s/on	— sign on
SIBC	— Solomon Is. Broadcasting Corp.
Sked	— schedule
SLBC	— Sri Lanka Broadcasting Corporation
SS	— Spanish
TC	— time check
TOH	— top of the hour
TT	— Turkish
TWR	— Trans World Radio
Unid	— unidentified
USB	— upper sideband
UTC	— Coordinated Universal Time (as GMT)
UTE, ute	— utility station
Vern	— vernacular (local) language
(via)	— same as "relay"
VOAS	— Voice of America
VOIRI	— Voice of Islamic Republic of Iran
WCNA	— West Coast of North America
ZBC	— Zimbabwe Broadcasting Corporation

Did this kid grow up to be a world famous DXer?

A new card from the newly renamed Radio Taiwan International.

Radio Oriental in Ecuador and Radio Cultural Coatan, Guatemala, all operating in the neighborhood.

It's been a real struggle to log much of anything lately due to a series of major solar storms that did a number on the ionosphere back in the early fall. We had some periods of near blackout conditions and other times when the higher frequencies were nearly devoid of signals. We've all been through such periods before and we all know there's nothing to be done but hang in there and wait for better times.

Reader Logs

Remember, your shortwave broadcast station logs are always welcome. But please be sure to double or triple space items, list them by country, and include your last name and state abbreviation after each log. Also much wanted are spare QSLs you don't need returned, station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And how about sending a photo of you at your listening post? Step right up and get your 15 minutes of fame!

Here are this month's logs. All times are in UTC. Double capital letters are language abbreviations (SS = Spanish, RR = Russian, AA = Arabic, etc.). If no language is specified, the broadcast language is assumed to be in English (EE).

ALBANIA—Radio Tirana, 6115 in Albanian to ECNA at 0014 and 7160 in EE to ECNA at 0253. (DeGennaro, NY) 7160 at 0245. (Brossell, WI)

ANGOLA—Radio Nacional, 4950 with domestic service in PP heard at 0223. (DeGennaro, NY)

ANGUILLA—Caribbean Beacon, 11775 with Dr. Gene Scott at 1922. (Wood, TN)

ARGENTINA—Radio Nacional, 6060 in SS at 1003. (DeGennaro, NY) RAE, 11710 with EE broadcast at 0230. (Burrow, WA) 15345 with Argentine music and SS anncr heard at 1849. (MacKenzie, CA)

ASCENSION IS.—Star Radio, Liberia, 9525 with interview, feature, ID and time check at 0732. (D'Angelo, PA)

AUSTRALIA—Radio Australia, 6020 in EE at 1049, 9475 to East Asia at 1107, 9560 to East Asia and Pacific at 1107, 9580 at 1110 and 9590 to Pacific at 1113. (DeGennaro, NY) 9625 at 1430 and 9580 at 1345. Also 15515 at 0215. (Maxant, WV) 11880 in EE at 1700. (Burrow, WA) 15320 opening at 2257. (Barton, AZ) ABC-Tennant Creek, 2325 with a discussion program at 1030. (Wilkner, FL)

AUSTRIA—Radio Austria Int., 13775 via Canada at 1500 in GG/EE. (Maxant, WV)

BELGIUM—RTBF Int., 17570 via Germany in FF at 1725. (Charlton, ON)

BOLIVIA—Radio Santa Cruz, 6134.8 with possible news in SS at 2308, many mentions of Santa Cruz, IDs at 2311 and 2318. (Alexander, PA) Radio Mallku, Uyuni, 4796 in QQ at 1011. (DeGennaro, NY) Radio Mosoj Chaski, Cochobamba, 3310 in possible QQ at 0947. (DeGennaro, NY) Radio Fides, La Paz, 9624.8 in Aymara heard at 1151. (DeGennaro, NY)

BOTSWANA—VOA Relay, 4930 with "Jazz America" program heard at 0525. (Wood, TN) 17895 with EE lessons at 1628. (Charlton, ON)

BRAZIL—Radio Nacional Amazonia, 6185 with futbol in PP at 0049 and 11780 with futbol at 0052. (DeGennaro, NY) 11780 in PP at 0015. (Brossell, WI) 0307. (MacKenzie, CA) Radio Nacional, Macapa, 4915 at 0220 with music and talk. (Brossell, WI; DeGennaro, NY) Radio Clube do Para, Belem, 4885 with ID at 0254, religious talk in PP. (DeGennaro, NY) Radio Difusora Roraima, Boa Vista, 4875 with futbol at 0217. (DeGennaro, NY) Radio Cancao Nova, Cachoeira Paulista, 4825 with futbol broadcast at 0245. (DeGennaro, NY) 9675 with religious vocals at 0740. (D'Angelo, PA) Radio Aparecida, 11855 in PP at 2025. (Charlton, ON) Radio Rural, Santarem, 4765 with music and talk in PP at 0231. (DeGennaro, NY) Radio Nova Visao, Santa Maria, 11735 with PP religious message at 1107. (DeGennaro, NY) Radio Clube Paranaense, Curitiba, 6040 with phone-ins at 0237. (DeGennaro, NY) Radio Brazil Central, Goiania, 4985 with futbol at 0227. (DeGennaro, NY) Radio Anhanguera, Goiania, 11830 with futbol at 2317. (DeGennaro, NY) Radio Difusora Amazonas, Manaus, 4805 with music and talk at 0942. (DeGennaro, NY) Radio Educadora, Guajara Mirim, 3375 with music and talk at 0951. (DeGennaro, NY) Radio Cultura, Sao Paulo, 17814.9 at 2325 with romantic PP ballads and anmts. Better on //9615. (Alexander, PA)

BULGARIA—Radio Bulgaria, 7500 in GG to Europe at 1933, 11500 in FF to Europe at 1719 and 13800 in SS to Europe at 2102. (DeGennaro, NY) 9700//11700 in EE at 0239. (Burrow, WA) 11500 in PP at 0132. (Brossell, WI)

CANADA—Radio Canada Int., 9515 to ECNA at 1306. (DeGennaro, NY) 9635 via England in AA at 9235. (Brossell, WI) 17765 in FF at 1747. (Charlton, ON) CBC Northern Service, 9625 on new music artists in Quebec at 0100. (Gay, KY) 0315 with EE and FF songs. Also noted at 1430. (Maxant, WV)

CHILE—Voz Cristiana, 6070 in SS at 1007 and 6110 in PP at 1010. (DeGennaro, NY) 11745 in SS at 0313. (MacKenzie, CA) 17680 in SS at 1920. (Charlton, ON)

CHINA—China Radio Int., 6040 via Canada in EE to ECNA at 1129, 7210 in SS to Europe at 2333, 9570 via Cuba to ECNA at 1312, 9650 to ECNA at 1317, 9800 in SS to South America opening at 0000, 11775 in GG to Europe at 1847, 11790 to Europe at 2050 and 11975 via Mali in CC to North Africa at 2332. (DeGennaro, NY) 6145 (*via Canada—gld*) to 0000 close. (Gay, KY) 9665 via Brazil in SS at 0345 and //9560 via Canada. Also 9720 via French Guiana in CC at 0335. (MacKenzie, CA) 11670 in RR at 1230.

Here's the staff that produces "Truth for the World," a religious program of the Duluth (Georgia) Church of Christ, aired over Radio Africa, Equatorial Guinea on 15190.

(Brossell, WI) China Music Jammer, 15250 against VOA Philippines at 1250. (Brossell, WI)

CLANDESTINE—Radio Nacional de la RASD, 7460 in AA at 1927. (DeGennaro, NY) 2308 to 0007 close. Aimed at Western Sahara. (D'Angelo, PA) Radio Xoriyu (p) 15670 (via Germany) in Somali at 1645. Poor level but in the clear. (Strawman, IA) Voice of Oromo Liberation, 15670 (via Germany) at 1701 with flute IS and "Toon Sagalee Bilisummaa Oromoo" ID. (Strawman, IA) Radio Farda, 9775 via Greece in presumed Farsi at 0211, //9805 via Morocco. (Brossell, WI) Radio Free Asia, 9365 via Armenia in unid Asian language at 0228. (Brossell, WI) Voice of Ethiopian Unity, 15565 via Germany in Afar at 1845. (DeGennaro, NY)

CONGO (DEM REP)—Radio Okapi via South Africa, 11690 monitoraed at 0515 in FF with "Okapi" jingles at 0555 and 0559 sign off. (Alexander, PA)

COLOMBIA—La Voz de tu Concencia, Puerto Lleras, 6009.8 with religious message in SS at 0958. (DeGennaro, NY) Radio Lider, Bogota, 6139.8 in SS with national and domestic news and commercials at 1020. (DeGennaro, NY)

CROATIA—Croatian Radio, 9925 via Germany in Croatian at 2342. (Charlton, ON) In Croatian to North America at 2322. Also 13830 (direct) in Croatian to Europe heard at 2103. (DeGennaro, NY)

CUBA—Radio Havana Cuba, 5965 in SS at 1109, 6060 in SS at 0336, 9505 in SS at 1102, 9550 in SS at 1309, 11655 in SS at 1141 and 11760 in EE at 2042. (DeGennaro, NY) 9550 with anthem, woman in SS and IS at 1426. (Yohnicki, ON) Radio Rebelde, 5025 in SS at 0305 and 6120 in SS at 0343. (DeGennaro, NY)

CYPRUS—BBC Relay, 13660 in AA at 0244. (Brossell, WI)

CZECH REPUBLIC—Radio Prague, 7345//9870 at 0306 with mailbag program, IDs and addresses. (Burrow, WA) 7345 in SS at 2320, 11600 in EE at 2145 and 13580 in SS heard at 1920. (DeGennaro, NY)

In Times Past...1954!

And now for a bit of fun. We'll give you a blast from the past here each month; perhaps a logging or station tidbit from the *Pop'Comm* shortwave history book. Here's one for the memory books...

COLOMBIA—Radio Pacifico, HJEX, Cali, Colombia, 6054 in SS with music, talk and "Radio Pacifico" ID at 0400 on July 7, 1954. (Dexter-IA)

Pirate Radio Maildrops

To help you reach some of the pirate stations we report on each month, whether you wish to contact them for QSLs, general information, or just to send a report on their programming, here's the latest contact information.

Belfast, Box 1, Belfast, NY 14711
Blue Ridge Summit, Box 109, Blue Ridge Summit, PA 17214
Elkhorn, P.O. Box 69, Elkhorn, NE 68022
Huntsville, Box 11522, Huntsville, AL 35814
Lone Pine, Box 929, Lone Pine, CA 93545
Lula, Box 24, Lula, GA 30544
Merlin, Box 293, Merlin, ON, N0P 1W0, Canada
Pittsburgh, Box 25302, Pittsburgh, PA 15342
Providence, Box 28413, Providence, RI 02908
Wellsville, Box 422, Wellsville, NY 14895

DJIBOUTI—RTD Djibouti, 4780 at 0300 sign on with local instrumental music, vernacular talk at 0301, Koran at 0302. Appears to be irregular as it's not heard every evening. (Alexander, PA)

DOMINICAN REPUBLIC—Radio Cima, Santo Domingo, 4960.4 at 0020 with minor audio problem. Rechecked at 0250 and just a carrier there—no audio. (Wilkner, FL)

ECUADOR—HCJB, 11960 in SS at 1144, 12005 in EE at 1150 and 12040 in GG at 2339. (DeGennaro, NY) 12040 in GG at 2343. (Charlton, ON) Radio Quito, 4919, at 0805 with lively Latin tunes and romantic songs hosted by man. (D'Angelo, PA) 0946 talking about events in history. (DeGennaro, NY) 0205 with SS talks. (Brossell, WI) La Voz de Napo, Tena, 3279 with music and talk in SS at 0945. (DeGennaro, NY) Radio Buen Pastor, Saraguro, 4815 with two men in SS over background music at 0240. (DeGennaro, NY)

EGYPT—Radio Cairo/Egyptian Radio, 7260 at 0159 sign on with opening ID and program features. (Wood, TN) 0218 with EE ID for North American service. Also 11855 in AA at 0306. (Brossell, WI) 0225. (Maxant, WV) 0245 with ME music, ID and current events program. (Burrow, WA) 7260 in SS at 0105, 9990 in EE at 2123, 11665 in AA at 2014 and 12050 in AA at 2036. (DeGennaro, NY) 9990.1 with music, time pips and time check at 2115, f/by ID and program preview. (D'Angelo, PA) 11885 in AA at 0020 and 15335 in FF at 2207. (Charlton, ON)

ENGLAND—BBC, 5975 (*probably French Guiana—gld*) good at 0215. (Maxant, WV) 6195 with news at 1005, 7105 Cyprus Relay in unid language at 0229, 7120 via South Africa at 0404, 13660 in AA at 2053, 13745 in RR at 1915, 15105 Ascension Relay in FF at 1805 and 15180 Cyprus Relay in FF at 1809. (DeGennaro, NY) 15105 (Ascension) in FF at 1803, 15400 (Ascension) in EE at 2031 and 21740 in EE at 1831. (Charlton, ON) Salama Radio Int, 11885 (unid. site) to Nigeria at 1947 with talk in Hausa, EE ID at 1959. (D'Angelo, PA) VT Merlin Communications, 6040 at 0221 with EE loop anmt: "You are listening to a test transmission by VT Merlin communications, a leading provider of international broadcast services. If you would like to find out more about us visit www.vtpic.com/merlin." Cut at 0230 but found again an hour later. (D'Angelo, PA)

EQUATORIAL GUINEA—Radio Nacional, Bata, 5005 heard at 0458 sign on with long NA, then continuous African folk, high-life and pops. (Alexander, PA) 2244 with SS tunes, ID and off at 2257. (D'Angelo, PA)

ETHIOPIA—Radio Fana, 6940 in presumed Amharic heard at 0308. (Brossell, WI)

FINLAND—Radio Finland Int., 11755 in Finnish to Europe at 1841 and 15335 in Finnish to Africa at 1822. (DeGennaro, NY)

FRANCE—Radio France Int., 11615 in FF to Africa at 2000, 11705 in FF to Africa at 2030, 15300 in FF to Africa at 1816 and 17570 in FF to ECNA at 1125. (DeGennaro, NY) 11995 in FF at 2027 and 17605 in EE at 1632. (Charlton, ON)

GABON—Africa Number One, 15475 in FF at 1745. (Charlton, ON) 1831. (DeGennaro, NY)

GERMANY—Deutsche Welle, 11690 via Canada in GG at 2209, 15295 in GG at 2028 and 15520 in EE to Africa at 1925. (Charlton, ON) 11795 with GG to Africa at 1851. (DeGennaro, NY) Deutschland Radio, 6005, Berlin, in GG at 2359 with anmt, ID, 3 + 1 time pips and news. EE rock/pop show at 0005. (D'Angelo, PA) Deutschlandfunk, Berlin, 6190 at 0024 with classical piano, brief GG anmts and more classical music. (D'Angelo, PA)

GREECE—Voice of Greece, 7475 in Greek at 2352, 12105 in Greek at 2345 and 15630 in Greek at 1900. (DeGennaro, NY) 9775 at 1420 in Greek, later into EE. Also 15190 in Greek at 0615. (Barton, AZ) RS Makedonia, 7450 in Greek at 1739. (DeGennaro, NY)

GUATEMALA—Radio Cultural, Coatan, 4780 in SS at 1157. (Brossell, WI) 1129. (Barton, AZ) 0155 to 0232 close. (Alexander, PA) 0220 to 0230 close. (D'Angelo, PA) 0227 with ID, sign off at 0229. (DeGennaro, NY) Radio Buenas Nuevas, San Sebastian, 4800 in SS at 0211. (Brossell, WI) 0236 with religious message, music. (DeGennaro, NY)

GUAM—Adventist World Radio/KSDA, 15320 on people with asthma at 2230. (Barton, AZ) Trans World Radio/KTWR, 9465 in Asian language at 1212. (Brossell, WI)

HAWAII—AFN/AFRTS, 10320 at 0319 with NASCAR program and "Money Minute." (MacKenzie, CA)

HONDURAS—La Voz Evangelica, 4819 with SS religious music and talk at 1040. (Barton, AZ) 0201. (Brossell, WI) 0243. (DeGennaro, NY) La Voz de Misiones Int., 3340 at 0215 with SS religious talk and music. ID at 0259 and off. (Alexander, PA) Radio Luz y Vida, 3249.7 with SS religious talks, vocals at 0225. (D'Angelo, PA)

ICELAND—Rikisutvarpid, 13865u in Icelandic at 1220. (DeGennaro, NY)

INDIA—All India Radio, 4860-Delhi with EE news at 1227. (Strawman, IA) 10330-Bangalore in Hindi at 0119. (DeGennaro, NY) 0220. (Brossell, WI) 15075 in Hindi at 0239. (Brossell, WI)

INDONESIA—RRI-Serui, 4605 (Papua) in II with island music at 1152. (Strawman, IA) Voice of Indonesia, 9525 in CC at 1121. (Brossell, WI) 1455 in EE. (Maxant, WV)

IRAN—VOIRI, 7320 in AA at 2345, 9935 in AA at 2318, 13755 in FF at 1909 and 15085 beginning GG at 1730. (DeGennaro, NY) 9495 at 0220 with "Voice of Justice" program. Also 9905 in SS at 0217. (Brossell, WI) 9635 in EE at 1552. (Burrow, WA) 11860 "Voice of Justice" program at 1335. (Maxant, WV) 15085 in Farsi at 1850. (Charlton, ON)

ISRAEL—Kol Israel, 9345 in HH at 2352, 11585 in HH at 2142 and 15640 in FF to Europe at 1040. (DeGennaro, NY) 11590 in EE at 1923 and 15640 in HH at 1812. (Charlton, ON) Galei Zahal, 6973u in HH at 0003. (DeGennaro, NY)

ITALY—RAI Int., 11800 with II interviews at 2312, 15320 via Ascension in II at 1756 with sign off at 1800 and 15380 in II to 1904 close. (DeGennaro, NY) Radio Mi Amigo via IRRS, 15725 at 1140 with continuous oldies, ID at 1156 and off with IRRS ID heard at 1200. (Alexander, PA)

JORDAN—Radio Jordan, 11690 with pops at 1556, ID and into Mideast news at 1600, weather, ID and more pops. Simulcast of local 96.3 FM. (Burrow, WA) 15290 in AA at 1259, frequencies, anthem and off at 1301. (Brossell, WI)

JAPAN—Radio Japan/NHK, 6145 via Canada in JJ to ECNA at 0325, 6120 via Canada in EE to ECNA at 1000, 6145 via Canada to ECNA at 0011, 11710 via UK in RR to Europe at 1133 and 15355 via Gabon in JJ to South Africa at 1847. (DeGennaro, NY) 6145 via Canada with news at 0000. (Gay, KY) 9835 in JJ at 1730. (Brossell, WI) 15220 in JJ at 2206. (Charlton, ON) Radio Nikkei, 3925 in JJ at 1130 and 9595 at 0945. (Barton, AZ)

KUWAIT—Radio Kuwait, 9855 in AA at 2351, 15495 in AA at 1834 and 15505 in AA at 1836. (DeGennaro, NY) 11675 in AA at 0317 and 15505 in AA at 1920. (MacKenzie, CA) 15505 in AA at 1810. (Charlton, ON)

LIBERIA—Star Radio, 11965 via Ascension Is. At 2115 with "You are listening to the geo-political events which shaped Africa this past week coming to you from Star Radio, Liberia." Off with an FF ID at 2200. (Brossell, WI) Radio Veritas, 5470 at 2245 with high-life music, EE talk, religious talk, ID, closing anmts and off at 2303. (Alexander, PA)

LIBYA—Radio Jamahiriya, 15215 via France in AA heard at 1646. (DeGennaro, NY)

LITHUANIA—Radio Vilnius, 9875 at 2300 with ID, news. (Brossell, WI) 2345 to ECNA. (DeGennaro, NY; Charlton, ON)

MADAGASCAR—Radio Nationale Malagasy, 5010 at 0254 sign on with IS, choral NA, opening anmts in Malagasy and into religious programming. (Alexander, PA) 0257 sign on with vocals from 0305. (D'Angelo, PA)

MEXICO—Radio Educacion, 6185 with ID and address at 0400. (DeGennaro, NY) 0510 with local ballads, pops and mariachi. (Alexander, PA) 0945 with romantic ballads. (Barton, AZ) Radio Mil, 6010 at 1150 with ballads and ranchero music. (Strawman, IA) Radio Transcontinental/XERTA, 4810 in SS at 0215. (Brossell, WI) 0254 with SS talks, formal ID and frequency anmt at 0300. (D'Angelo, PA)

MOLDOVA—Voice of Russia relay, 7125 in RR at 0056 and 7180 at 0242. (DeGennaro, NY) 7180 heard at 0335. (Maxant, WV)

MOROCCO—RTV Marocaine, 15345 in AA at 1819. (DeGennaro, NY) 1918 in AA. (Charlton, ON) 1940. (Wood, TN)

NEW ZEALAND—Radio New Zealand, 9520 to the Pacific at 1100 and 9885 to Pacific at 1114. (DeGennaro, NY) 15720 at 0000. (Gay, KY) 0215 on educating children. (Maxant, WV) 0221 on atoms, molecules and atomic power. (Brossell, WI) 0308 with regional news and ID at 0308. (Burrow, WA) 0420 with "Home Grown" Several IDs for "National Radio." (Wood, TN)

NETHERLANDS—Radio Nederland, 9795 in Asian language at 1215. (Brossell, WI) 9845 in EE at 0025 and 15315 in DD at 2205. (Charlton, ON) 17810 at 1930 on telecom infrastructure in Africa. (Gay, KY)

NETHERLANDS ANTILLES—Radio Nederland Relay, Bonaire, 9590 heard at 0405. (Maxant, WV) 0433. (Wood, TN) 9895 in DD at 1126 and 11675 in EE at 1144. (DeGennaro, NY)

NIGERIA—Voice of Nigeria, 7255 at 2215 to 2300 close and again at 0459 sign on but announcing 15120. EE news at 0501 and 0600. Also 7275 at 0600 in EE but 7255 much stronger. (Alexander, PA)

NORTH KOREA—Voice of Korea, 9990//11545 in EE at 1614. (Burrow, WA) 11735 in AA to Africa at 2035. (DeGennaro, NY) 15180 in SS at 0235. (Brossell, WI) KCBS, 11710 in KK at 1735. (Brossell, WI)

NORTHERN MARIANAS—KFBS/ Far East Broadcasting Co., Saipan, 11580 in CC to Asia at 1133. (DeGennaro, NY)

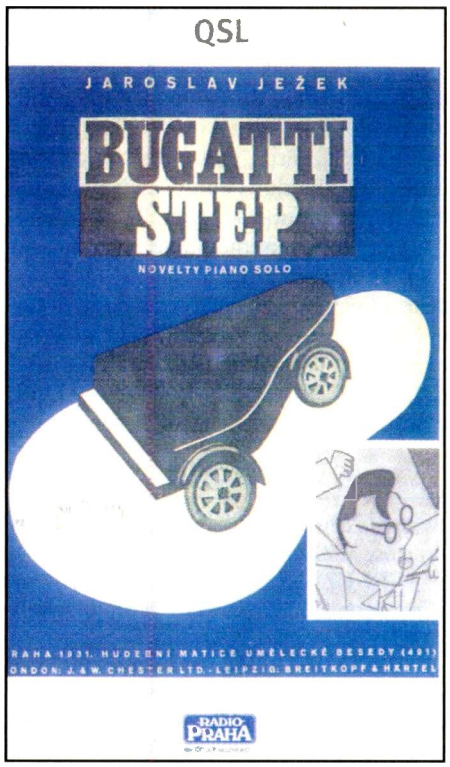
OMAN—Radio Sultanate of Oman, 13640 monitored at 2050 and 15140 at 1745. (DeGennaro, NY) 15355 in AA at 1807. (Charlton, ON)

PAKISTAN—Radio Pakistan, 11570// 15100 with IS, ID, time pips at 1600 and into news. (Burrow, WA) 15100 with news in Urdu at 1703, ID and Koran monitored at 1715. (D'Angelo, PA)

PAPUA NEW GUINEA—NBC Port Moresby, 4890 in EE & Pidgin at 1052, with talk and music. (DeGennaro, NY) Wontak Radio Light (p) 7120 at 1236 with choral and religious music. (Strawman, IA) Radio East New Britain, Rabaul, New Britain, 3385 at 0958 with vocals to 1000 ID and EE news. (D'Angelo, PA) 1118 with usual pops. Always the best 90-meter signal here. (Strawman, IA)

PARAGUAY—Radio Nacional, 9737 in SS at 1058 with talk, domestic news. (DeGennaro, NY) 1135 with ID. (Brossell, WI)

PERU—Radio La Oroya, La Oroya, 4904 with men talking in QQ at 1019. (DeGennaro, NY) Radio Cultural Amuata, Huanta, 4955 in QQ at 1023. (DeGennaro, NY) Radio



Is it a roller skate? A piano on wheels? No—it's a QSL from Radio Prague. (Thanks Rich D'Angelo)

Horizonte, Chachapoyas, 5019 in SS at 1006 with non-stop OA vocals. (D'Angelo, PA) Flutes and drums at 1008. (DeGennaro, NY) Radio Tarma, Tarma, 4775 in SS with music and time check at 1007. (DeGennaro, NY) Radio La Hora, Cusco, 4855 in SS and QQ at 1008. (DeGennaro, NY) Radio Huanta dos Mil, 4751.8 in SS with musica Latina at 1040. (Wilkner, FL) Radio Altura, Cerro de Pasco, 5014.5 at 0315 with OA music, SS talk and IDs. (Alexander, PA)

PIRATES—The Crystal Ship, 6854v at 0117 with several mentions of "Blue States Republic" news parodies, audio clips from civil defense films. Gave the Belfast address. (Wood, TN) WHYP 6874.7 at 0030 with rap, heavy metal. Anncd broadcast as an antenna test. QSL through whypradio@gmail.com or Belfast address. (Hassig, IL) KSUR, 6925 at 2310 with rock, occasional IDs. E-mail given as radioksur@yahoo.com. (Zeller, OH) Captain Morgan, 6924.2 at 0100 with unsteady carrier, "Spirit in the Sky", *Mission Impossible* theme, pieces of 70s pop tunes. (Hassig, IL) Pirate Radio Boston, 6925 at 0033 with rock, frequent IDs, Stoneham MA address and e-mail as pirateradioboston@yahoo.com for reports. (D'Angelo, PA)

PHILIPPINES—FEBC Radio Int., 9405 in CC to East Asia at 1103. (DeGennaro, NY) 9920 with soft religious vocals and talks in unid Asian language at 1310. (Brossell, WI)

PORTUGAL—RDP Int., 11620 in PP at 0005 and 13700 in PP at 0017. (Charlton, ON) 12020 in PP to Europe at 1155 and 15555 in PP to Europe at 1840. (DeGennaro, NY)

ROMANIA—Radio Romania Int., 9715 in FF at 0239. (Brossell, WI) 11765 in Romanian to Europe at 1843 and 11940 in EE to ECNA heard at 2328. (DeGennaro, NY)

RUSSIA—Voice of Russia, 7250-Moscow in EE to ECNA at 0150, 7300-Armavir in SS at 0109, 7330-Moscow in PP to Brazil at 2314 and 7390-Samara in PP to Brazil at 2328. (DeGennaro, NY) 15485-Yakaterinburg in FF at 1805. (Strawman, IA) Radio Rossii, 9480-Moscow in RR at 0250. (Brossell, WI) 0239 to Europe and Africa. Also 13665-Moscow in RR to Europe and Africa at 1203. (DeGennaro, NY) Golos Rossii Radiokanal Sodruzhestvo, 15430-via Germany in RR at 1401 with news, ID with laser sound effects. Mix of talk and music and numerous IDs. Off at 1500. (D'Angelo, PA)

RWANDA—Deutsche Welle Relay, 11865 with news at 2104. Also 15145 in FF at 1749. (Brossell, WI) 17680 in GG at 1750. (Charlton, ON)

SAO TOME—VOA Relay, 11965 with news at 2100. (Gay, KY) 11975 with news at 1943. (Wood, TN) 15730 in FF at 1928. (MacKenzie, CA)

SAUDI ARABIA—BSKSA, 15205 in AA monitored at 1630. (Charlton, ON) 1643. (DeGennaro, NY) 15380 in AA at 1253. (Brossell, WI)

SEYCHELLES—BBC Relay, 9610 in an African language at 0313. (Brossell, WI) 15420 at 1642 to 1659 close. (Strawman, IA)

SINGAPORE—Mediacorp Radio, 6150 at 1458 with music, promos and ID at 1459 f/by news, (Burrow, WA) BBC Relay, 9740 with soccer at 1258. (Brossell, WI)

SLOVAKIA—Radio Slovakia Int., 5930 in FF to NA at 0215. (DeGennaro, NY) 9440 in SS at 0249. (Brossell, WI)

SOLOMON ISLANDS—SIBC, 5019.9 at 1127 with island music. Also at 0930. Also at 1010 with a sports program in progress. (Wilkner, FL) 1100 and into FF shortly after. (Maxant, WV)

SOUTH AFRICA—Channel Africa, 3345 at 0257 sign on and into news at 0300. (D'Angelo, PA) 9685 with news magazine program at 0524. (Burrow, WA) 0530 with various songs. (Wood, TN) Radio Sondergrense, 3320 with man and woman in Afrikaans at 0030. (DeGennaro, NY) 0224 with soft vocals and anmts in Afrikaans. (Brossell, WI)

SOUTH KOREA—RKI World Radio, 9560 in EE at 0240 with ID, "Shaping Korea" feature. (Burrow, WA) 9650 at 1230 with mailbag program. (Barton, AZ) 15360 via UK in RR at 1825. (DeGennaro, NY)

SPAIN—Radio Exterior de Espana, 3350 Costa Rica Relay in SS at 0450 with ID on the hour. (Wood, TN) 6055 in SS at 0241, 6125 in SS at 0345, 7275 in SS at 1944, 9765-Costa Rica in SS at 1201, 11625 in SS at 2149 and 13720 in SS at 1210. (DeGennaro, NY) 15110 in SS at 2029 and 17950 in SS at 1626. (Charlton, ON) 15385-Costa Rica in EE at 0010. (Maxant, WV)

SRI LANKA—SLBC, 11905 opening at 0027 and into Hindi vocal, ID, 3 + 1 time pips monitored at 0030 and pgm of Hindi music. (D'Angelo, PA)

SURINAME—Radio Apinte, 4990 in DD at 0301. (DeGennaro, NY)

SWAZILAND—Trans World Radio, 3240 at 0312 in listed Shona with lively vocals, ID at 0327 and into Ndau language at 0330. (D'Angelo, PA)

SWEDEN—Radio Sweden, 6010 via Canada at 0200 and 15240 at 1330 mentioning technical difficulties (Maxant, WV) 0250. (DeGennaro, NY) 15240 monitored at 1240. (Brossell, WI).

SYRIA—Radio Damascus, 12085 with EE to NA at 2116. (DeGennaro, NY)

TAIWAN—Radio Taiwan Int., 5950// 9680 (*both via Florida—gld*) at 0245 with mailbag program. (Burrow, WA) 7445 with CC classical music at 1115. (Barton, AZ)

TANZANIA—Radio Tanzania-Zanzibar, 11735 at 2021 with Swahili talks and local vocals. Closing anmts and NA at 2058. (Strawman, IA)

THAILAND—Radio Thailand, 5890 via Greenville in EE at 0042. (DeGennaro, NY) 0259 with IS, national news. (Burrow, WA) VOA Relay, 9700 with Indonesian service at 1240. (Strawman, IA)

TURKEY—Voice of Turkey, 6140 in EE at 0256. (Burrow, WA) 0330 with Turkish music and ID. (Maxant, WV) 6140 at 0258, 7270 to Mideast at 0300, 9460 to ECNA at 0334 and 13760 in GG to Europe heard at 1214. (DeGennaro, NY) 15225 at 1250. (Brossell, WI)

TUNISIA—RTT Tunisienne, 7190 in AA at 1957 and 7225 in AA at 1950. (DeGennaro, NY) 9720 in AA at 0255. (Brossell, WI)

UGANDA—Radio Uganda (p), 4976 at 0310 noted in passing with man in unid language. Nice signal but weak modulation. (D'Angelo, PA)

UKRAINE—Radio Ukraine Int., 7440 with "Ukraine Today" at 0006. (Charlton, ON) 0204 in UU to NA. (DeGennaro, NY) 0309 with Ukrainian news and comment. (Burrow, WA)

UNITED STATES—United Radio Broadcasters of New Orleans, via WHRI, 5835 at 1034 with WWL-870 programming and call-ins re Hurricane Katrina and its aftermath, IDs for WWL. 9840 at 2250 with related anmts. WHRI ID at 2301 and CBS News, more call-ins. (D'Angelo, PA) 11785 at 1200. Also 15285 at 2015. (Barton, AZ) 15285 at 1445 with interviews and remotes. (Yohnicki, ON) (*This is likely off the air by now but it certainly was interesting while it lasted, and dramatic evidence of the value of SWBC.—gld*) AFN/AFRTS, Key West, 12133.5u with news for military people at 2044. (DeGennaro, NY) Adventist World Radio, 15245 (site unknown) at 1952 with religious songs, woman in FF, EE ID at 1959. (Wood, TN)

VATICAN CITY—Vatican Radio, 7305 in SS to South America at 0112 and 11625 in EE to Africa at 2007. (DeGennaro, NY) 9645 with ID, news at 1345. (Maxant, WV) 11830 to close at 2245. (Barton, AZ)

VENEZUELA—Radio Nacional de Venezuela, 13680 via Cuba in SS to close at 2057. (DeGennaro, NY)

VIETNAM—Voice of Vietnam, 6175 via Canada in SS heard at 0304. (DeGennaro, NY)

YEMEN—Republic of Yemen Radio, 9780 in AA at 0257 opening with vocal to 0300, ID, frequency anmt and news in AA to 0305 and Mideast vocals. Dramatic program began at 0315. (D'Angelo, PA) 0318. (Brossell, WI)

ZAMBIA—ZNBC/Radio Zambia, 4910 at 0302 with local vocals, woman anncr in EE and other languages. (D'Angelo, PA) 0312 in vernacular. (Brossell, WI) 0449 with pops, ID on the hour, woman with news in EE. "This broadcast comes to you from Lusaka on the Zambian Broadcasting Company." (Wood, TN) 6165 at 0243 with fish eagle IS, NA at 0250, opening EE anmts at 0252. Not parallel with 4910. In the clear until Radio Nederland sign on at 0259. (Alexander, PA)

And, once again, order is restored! Full huzzahs to the following who braved the propagational elements and came up with the goods this time: Charles Maxant, Hinton, WV; Jerry Strawman, Des Moines, IA; Joe Wood, Greenback, TN; Robert Wilkner, Pompano Beach, FL; George Zeller, Cleveland, OH; William Hassig, Mt. Prospect, IL; Stewart MacKenzie, Huntington Beach, CA; Robert Brossell, Pewaukee, WI; Michael Yohnicki, London, ON; Rich D'Angelo, Wyomissing, PA; Rick Barton, Phoenix, AZ; Brian Alexander, Mechanicsburg, PA; Robert Chandler, Windsor, ON; Ciro DeGennaro, Feura Bush, NY; and Chris Gay, Lexington, KY.

Thanks to each one of you, and may 2006 be a great year for you! ■

This Month's Book Winner

To show our appreciation for your loggings and support of this column, each month we select one "Global Information Guide" contributor to receive a free book. Readers are invited to send in loggings, photos, copies of QSL cards, and monitoring room photos to me at *Popular Communications*, "Global Information Guide," 25 Newbridge Road, Hicksville, NY 11801, or by e-mail to popularcom@aol.com. The e-mail's subject line should indicate that it's for the "Global Information Guide" column. So come on, send your contribution in today!

Our book winner this month is **Brian Alexander** who has received a copy of the 2006 edition of *Passport to World Band Radio*, courtesy of the good folks at Universal Radio. You should have Universal's current catalog on your radio bookshelf. It's easy to get a copy of this gem-filled wish book. Just call Universal at (614) 866-4267, e-mail them at dx@universal-radio.com, or drop a note to them at 6830 Americana Parkway, Reynoldsburg, OH 43068.

TUNING IN *(from page 4)*

specifically the Motorola Powerline LV BPL system. The ARRL reported that they and Motorola have cooperated in a BPL test at Newington's W1AW that has operated successfully, and there was apparently no significant interference to amateur radio. The League also named a couple of other systems (by Current Technologies, IBEC, and Corridor Systems) that result in interference that, "is minimal relative to Amateur Radio facilities."

It doesn't take a rocket scientist to read between the lines or pick out key words such as "significant" and "minimal." Unfortunately, what's minimal or insignificant today is likely to change over time, especially if BPL hardware is maintained like the overhead power line systems themselves, and given the Commission's less than keen interest in enforcing Part 15 rules on BPL providers.

And what about *other* licensed services? Who speaks for them? What about those good citizens at REACT volunteer stations who regularly monitor not just CB (licensed by rule) Channel 9, but other frequencies for emergency calls, taking hundreds of distress calls a year?

Amazingly, the Commission, in its business as usual politics, allows BPL operators to continue to operate their systems even in the face of proof of interference caused to amateur radio and other services under their new Part 15 rules. Ordinarily, if history were the litmus test, as it should be, the *offending* Part 15 system shuts down until the interference is remedied. But that was when common sense prevailed, that's not today. This unlicensed service means big bucks. I can't help wondering if any of those bucks will find their way back through the Good Ol' Boy Network coax.

I don't really think it matters much whether the overhead powerline is shielded or unshielded; it's still flawed, misplaced technology, period. I'd like the FCC to drop us a letter—we'll print it here—and respond to the League's statement that the Commission "has assisted not at all, or imperceptibly, in these [interference] cases, and the BPL system operator has either been uncooperative or unable to resolve the interference."

So let's again go back to just over a year ago when the League called BPL a "bad method" of providing broadband services to consumers and said, "Notching has proven difficult to implement effectively and has not been successful generally in remedying BPL interference at test sites...," and respectfully ask them to let us know in plain English what has significantly changed, other than the direction of the breeze blowing from Connecticut. ■

by Peter J. Bertini, radioconnection@juno.com

Heathkit's T-4 Signal Tracer— Do You Need One On Your Bench?

After fixing up a few nice old radios, you've probably discovered that it's also nice to have the right test equipment on the bench when the need arises. We've talked about basic test equipment in past columns, but this time around, for the first *Pop'Comm* of 2006, we'll be discussing signal tracers and how to use them to isolate and find problems in radios.

There are two signal tracers being used on my workbench, which are shown in **Photo A**. Both are Heathkits; one is a model T-4, the other is a later version, the model IT-12. Despite the difference in model numbers and age, both share very similar circuitry. Heath regularly changed model numbers and cabinet styles (note the knobs) to impart modern, updated looks to their test equipment lineup, while keeping the same circuitry inside! I suspect a lot of folks bought into the latest-is-greatest syndrome. From what I can see, both of these units use the identical circuit and internal components. Nonetheless, they also probably stayed with proven designs that worked as intended and were very reliable. We'll also cover the restoration steps needed to ensure these instruments will continue to give years of trouble free service.

Why Do I Need One?

A signal tracer allows the tracing of a signal from the antenna through the set's mixers and IF amplifier stages, detector, and audio amplifier stages. This lets the technician locate the exact point in the radio where the signal is lost or becomes overly attenuated or distorted. The signal tracer requires a signal source, which can be either a convenient local strong radio station or, better yet, a modulated signal from a good signal generator.

What Is A Signal Tracer?

As shown in **Photo A**, signal tracers are generally packaged in small, self-contained enclosures and require little bench space. They're transformer-powered, meaning the signal tracer case and chassis is electrically isolated from the AC line. We'll discuss this more in next month's column when we actually put these units to work diagnosing problems.

The heart of the signal tracer is a high-gain audio amplifier. The audio amplifier includes a two-stage preamp (a 12AX7 dual triode is typical) followed by a power amplifier stage (Heath used a 12CA5 7-pin miniature tube) and self-contained speaker. The two Heath models shown have internal 3-1/2-inch speakers. **Photo B** gives a good view of the controls and various jacks on the T-4 signal tracer.

At left is the volume control, and the knob to the right operates the off/on switch. Two slide switches are in the lower center of the panel. The upper switch disconnects the signal tracer speaker from the circuit, so when the internal speaker is disconnected from the internal amplifier it can be substituted for the radio's speaker via the two banana post jacks on the upper

Photo A. The author's Heathkit signal tracers are a model T-4 and a model IT-12. They appear very similar on the outside and are identical internally. These two units were purchased as guinea pigs for this month's column.

outside corners. When the signal tracer is off, the three jacks on the lower right allow the signal tracer's audio transformer (which is center-tapped permitting it to be used with push-pull or single-ended audio stages) to substitute the radio's audio transformer and speaker. Be careful here, these are high-level DC voltages and can be dangerous!

Another feature Heath included was a 1629 eye tube. The 1629 display area is seen at the lower left of the T-4 front panel. The eye tube activity gives a visual indication of the signal being monitored by the signal tracer. When the internal speaker is switched off, the eye tube activity provides a visual indication of what is happening as the probe is moved along the radio receiver's signal path.

There's another advantage to having the eye tube give a visual indication of the signal, at least for me: It will respond to audio signals that are out of my hearing range. I have a good degree of hearing loss above 5 kHz, but the eye tube easily captures high-frequency whistles or noises that are out of my hearing range. Their presence might indicate feedback problems in the radio.

Heathkits became popular after WWII, and many of their designs were influenced by the vast amounts of inexpensive,

quality electronic components that became available on the surplus markets. Hence, the use of the 12-volt 1629 eye tube, instead of the popular 6E5 consumer eye tube, which was used as a tuning indicator in ARC-5 military transmitters.

The Probe

The signal tracer probe is a bit more complicated than it appears. The probe contains a DC isolation capacitor to block DC voltages while allowing audio signals to pass to the signal tracer. The probe also contains a switch that places a small-signal germanium diode into the signal path. When the diode is switched into the circuit, the probe works like a small crystal radio, allowing the tracer to detect radio signals from the antenna circuit, through the set's RF, mixer, IF, and detector stages. Switching the probe from RF to AF (audio) allows tracing the demodulated (recovered audio) from the receiver's detector to the receiver's speaker.

In next month's column we'll show how the instrument works by tracing through a signal path in a Zenith tombstone radio and also how it can "substitute" for some of the receiver's stages to isolate problems in the radio's different stages.

Finding And Fixing Up The Heath T-4

Despite their age, there isn't a lot to go wrong with these instruments. The first step is to find one in *nice* condition! Heath, Eico, and many other companies sold thousands of these devices, and they are neither expensive nor difficult to find. I bought three of these units to write this column, paying an average price of $10 dollars each (I suspect many went unused after the novelty wore off). It's important that the probe is with the unit; for some reason probes become separated and lost, or broken and damaged. No one sells a direct replacement, so you will have to fabricate one if it's missing. It's not worth the effort in most instances, unless you want the challenge.

Look the unit over carefully. Ask if it works, and if does ask for a quick demo. You want to be sure that the unit powers up and that advancing the audio level control causes some hum or noise in the speaker. You might have to touch the probe tip to introduce some hum for testing.

The eye tube should display a bright green V display pattern. Is the cabinet paint clean and tight, or is it badly scratched or starting to lift and peal from the aluminum? That might indicate years of damp storage. Are the knobs present? Is front panel free of scratches, are the knobs correct, and are the silk-screened legends for the controls clean and free of wear?

Next, ask if you can open the unit and inspect it. Ninety percent of the kit builders who built these units did a passable job. You don't want one done by the other 10 percent, though, unless you don't mind getting involved in a full restoration and rebuild of what is essentially a very inexpensive piece of equipment.

I almost forgot the manual! The original manual, or at least a very good copy of the entire manual, should be with the signal tracer. If not, the cost of a good copy from a manual dealer can equal the cost of the instrument! And you want the full assembly manual, not an abridged collection of loose papers showing the operation and perhaps the schematic. If you have to retrace a wiring error going back to when the instrument was built, you will need the step-by-step instructions to follow as you check for errors.

Photo B. Here's a nice close-up view of the control markings and front panel for the T-4 signal tracer. When picking out a unit, look for a front panel that's free of scratches and silk-screened lettering that's crisp and sharp. Any peeling or lifting paint might indicate a unit that has languished in a damp cellar for decades.

What you're checking for inside is the quality of the solder connections. Are they clean and shiny, and are the component leads dressed neatly (not left too long or cut too short!). Also check the condition of the plastic insulated wire; if overheated while soldering, the insulation will often have softened and crept back, leaving exposed uninsulated wires that could short to other nearby bare wires. If the unit works, looks clean, and the internal inspection all pass muster, you have a winner!

Where to find one? Internet auction sites, public flea markets, tag sales, or any radio-related auctions are all good bets. As I mentioned earlier, many thousands were sold and they are readily available and inexpensive.

Restoring The T-4

If it works, it's probably good to go as is. These are fairly simple instruments, and for the most part they will work as found without much fuss.

I'm a bit of a perfectionist, though, so there's a short list of changes that I'd suggest implementing in the T-4 before using it on a daily basis. If the speaker grille flocking is dirty or damaged there's an easy trick to make it look new. The grille material is

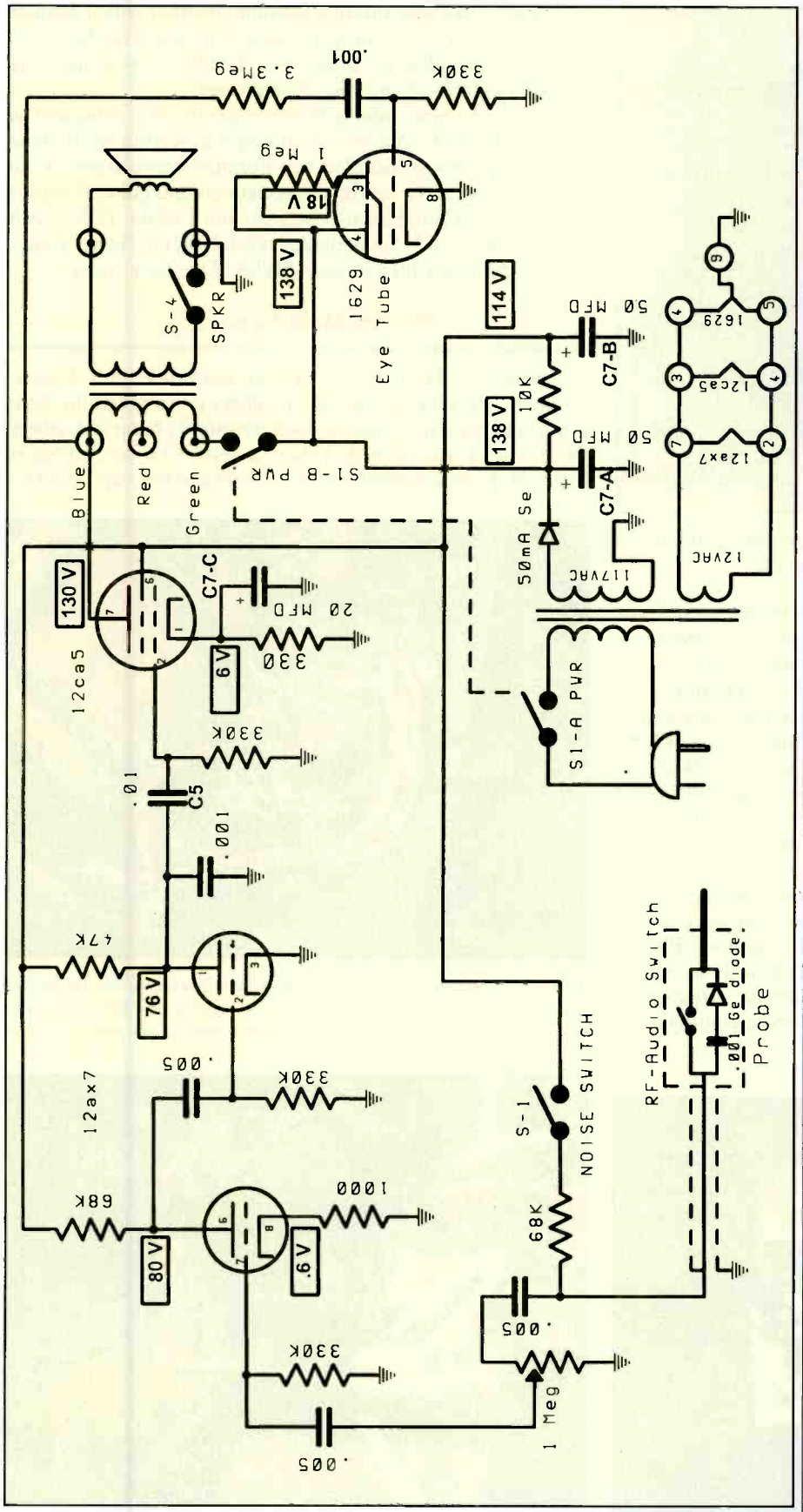


Figure 1. Here's the schematic for the Heathkit T-4 Signal Tracer. Heath used the same basic circuit for many model number revisions over the years; the author's model IT-12 is virtually identical.

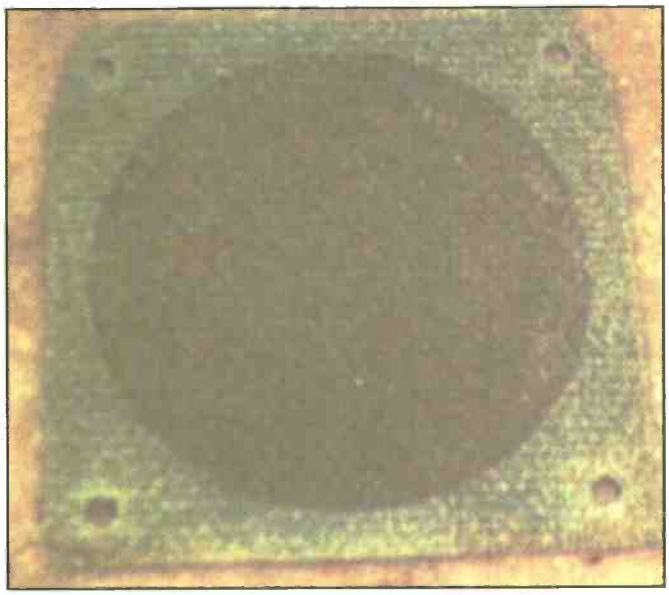


Photo C. Reversing the speaker grille puts a fresh face forward and makes the unit look 30 years younger.

the same on both sides, and the side that's to be hidden and protected on the speaker cone side will still be as good as the day it was made! Simply remove the speaker mounting hardware and reverse the grille material for this simple fix (see **Photo C**).

I've redrawn the T-4 schematic for inclusion in this column; it's shown in **Figure 1**. The original filter capacitor (see **Photo D**) was a three-section metal can capacitor, with two 50-µFd @ 150-volt sections (C7-A, C7-B) for the power supply filters, and a single 20-µFd @ 25-volt section (C7-C) for the cathode bypass for the 12CA5 audio amplifier. I used the nearest modern values (47 µFd @ 160 volts, and 22 µFd @ 25 volts) for replacements. (Actually, I used a 100-µFd for the cathode bypass because it was all I had on hand; I'm sure a sharp-eyed reader will catch the change in the photos if I don't fess up now). **Photos E** and **F** show how replacement radial lead electrolytic capacitors were installed, replacing the original filter can. A four-position terminal strip was installed using one of the mounting holes previously used by the old filter capacitor.

Photo D. This is a view showing where the original can filter capacitor was mounted.

I also replaced the original selenium rectifier with a modern 1N4007 silicon diode; this part was also mounted on the terminal strip. Notice that the tuning eye assembly was temporarily removed to facilitate making these changes.

Finally, the new cathode bypass capacitor was relocated as shown in **Photo G**. A new 330 cathode bias resistor, with a new 22-µFd capacitor in parallel, was installed between pin of the 12CA5 socket and a nearby convenient ground point. If capacitor C5 (.01 µFd and located between pin 1 of the 12AX7 and pin 2 of the 12CA5) has a molded black Bakelite body, I'd suggest replacing it with a modern Mylar of the same value.

Probe Maintenance

The original Heath probe was hard-wired into the T-4 tester. I removed the probe cable and the rubber grommet on the front panel, and mounted a quarter-inch monaural phono jack where the grommet was located. This is a perfect fit; no drilling is required. I wired a short jumper in between the "tip" connec-

Photo E. A four-position terminal was installed using one of the old filter capacitor's mounting holes. The new radial lead filter caps and the 1N4007 silicon diode are mounted on the strip.

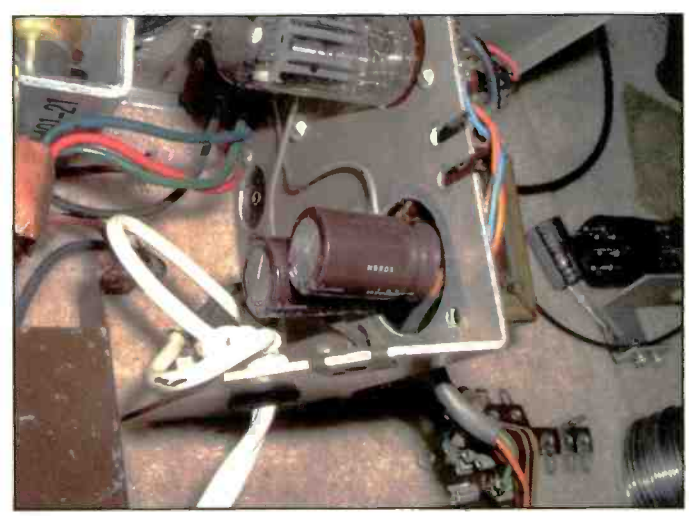


Photo F. Space is at a premium, so I positioned the new radial lead capacitor bodies to fit in the old capacitor opening on the chassis. Axial leads might be easier to mount under the chassis.

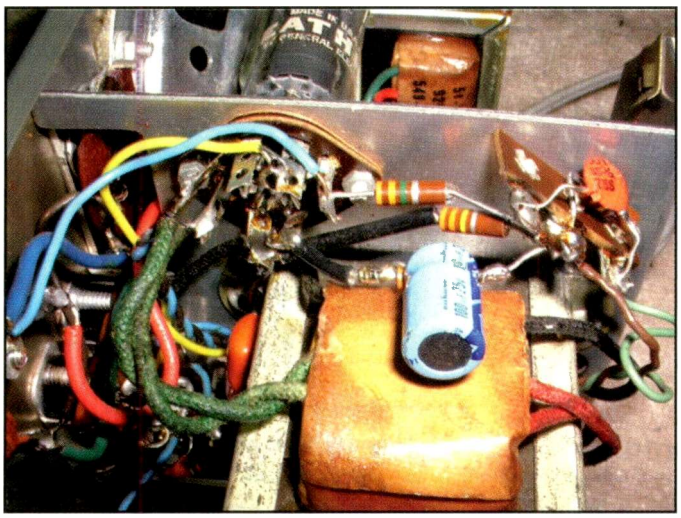


Photo G. The new 12CA5 cathode bypass capacitor is now connected directly between pin 1 of the 12CA5 and a nearby ground. I replaced the 330-ohm cathode resistor with a new unit with longer leads to facilitate this relocation.

tion on the jack and the .005 disc ceramic capacitor that the probe center conductor previously attached to. I attached a quarter-inch monaural phono plug to the probe (center wire to the "tip," shield to the "ring"). This modification allows the probe to be shared between units. The probe uses a germanium crystal diode for RF signal tracing. The diode can be checked using the *diode test* position on a modern digital multimeter. A small-signal general-purpose germanium diode can be used as a replacement; a 1N34A or NTE 109 will do.

Final Checkout

Spray all the slide switches and controls with a good-quality contact cleaner. Power the unit up, and verify that the voltages are close to those shown on the Heath schematic (I noted the voltages in boxes). The voltages won't be exact; if a point marked as 138 volts reads between 128 and 145 volts, it is probably close enough. When the noise switch is "on," there should be about 125 VDC on the probe tip. Set the controls as follows: speaker "on," noise "off," volume level at one-quarter CW, power "on," and probe switch to "audio." The eye tube should show a green V pattern as it warms up.

Touching the probe tip should cause a loud hum in the speaker, and the eye tube should deflect accordingly. The hum level should follow the volume control setting. Next, connect the probe to the shop RF signal generator output, and set the probe to *RF*. Set the signal generator to about 1 MHz at full output with the internal modulation on. The modulating tone should be audible on the signal tracer.

More Tips To Come

Well, that's a wrap for this month! Next time I'll show the T-4 in action and give some pointers on using a signal tracer to best advantage in your shop. In the meantime, keep those soldering irons warm and those old tubes glowing!

I'm always looking forward to hearing from you. Your ideas, photos, and suggestions are always welcome, although it is hard to respond personally to everyone who writes in. See you next month! ■

INFOCENTRAL *(from page 5)*

In addition to HD radio technology, the Recepter Radio HD includes a second satellite speaker for stereo separation. A stereo input accepts iPods, MP3 players, and other external audio sources, and the radio's stereo headphone output doubles as a high-quality line output, allowing it to serve any component audio system as an HD radio source.

BBC World Service Expanding Its Programming To Africa

BBC World Service English for Africa is responding to listener demand by further expanding its programming to Africa. Starting in October, its popular flagship programs "Africa, Have Your Say," "Fast Track," and "Network Africa" began offering listeners across the continent new opportunities to take part and engage with news, sports, and music seven days a week.

The BBC English for Africa schedule changes are as follows: "Africa, Have Your Say," the hour-long interactive BBC radio and online program formerly known as "Africa Live!" will now increase from one day a week to broadcast every Tuesday, Wednesday, and Thursday at 1600 UTC.

"Fast Track" is the African sports program previously broadcast for a half-hour. Listeners can now enjoy 60 minutes of sports news and analysis from the continent and across the world on Mondays and Fridays at 0400 UTC.

"Network Africa," which sets the day's agenda with a popular mix of news, sport, features, and music, can now be heard on the weekends, in addition to its weekday broadcasts. On a weekday listeners can hear the program at 0330, 0430, 0530, 0630, and 0730 UTC and on Saturdays and Sundays at 0400 and 0600 UTC.

Kashmir Clandestine Radio Reported Off Air After Quake

The clandestine radio station, which had been broadcasting from across the Line of Control (LoC) of India and Pakistan, has gone off the air following the earthquake that hit the region in October. The radio was the mouthpiece of the United Jihad Council, an umbrella organization of various militant groups operating in the Indian section of Kashmir. The radio station, allegedly operating from Pakistan-controlled Kashmir, stopped broadcasting immediately after the quake, and it appears that it, too, has been hit, reports said.

European Commission To Provide Access To Info On Events In Belarus

The European Commission has begun preparations for a 2-million-euro project to increase access in Belarus to independent sources of news and information. This follows the 138,000-euro contract already granted to Deutsche Welle Radio, which began broadcasting via radio and Internet in November. Broadcasters had until October 11 to signal their interest in a new contract for co–production and broadcasting on television and radio in Belarusian and Russian over a period of two years starting on January 1, 2006. The aim is to provide access to independent information about events in Belarus and in the outside world and to enhance the knowledge of the Belarusian population about democracy, pluralism, rule of law, freedom of the press, and human rights. ■

by Kirk Kleinschmidt, NTØZ

How To Be Safe, Not Sorry!

Although I'd love to play on the radio all day—pausing only once each month to write this column—I still have to bring home enough bacon to pay the rent and electricity bills. To that end, I recently accepted a contract job helping three small, rural towns set up a wireless Internet system. The town fathers call it "high-speed" wireless, but by my standards it's not even close to high speed, but that's another story. The really disturbing part came when I watched one of the technicians sent by the company that provides the bulk of the wireless bandwidth install a transmission hub atop a 30-foot Rohn 25 tower that was itself bolted to the top of a 90-foot tall grain silo.

In farm country, big silos provide a handy and inexpensive way to zip signals back and forth, avoiding the much higher costs associated with commercial tower sites, etc. In a way, the rural wireless companies are a lot like hams—taking advantage of alternative, non-commercial solutions whenever possible. And the lucky silo-owning farmers get 256 kilobits of reliable wireless Internet for free while their phone-line-bound neighbors are lucky to maintain 33-kilobit dial-up connections that don't disconnect every few minutes.

Anyway, back to the scary stuff. The wireless tech was installing the hub, antenna and the tower all by himself, in a back corner of the lot, with nobody even glancing in his direction every now and then! He'd climb the silo's access ladder, pull up a tower section, bolt it onto the top of the silo, climb down, climb up to the top of the recently installed tower section, pull up another tower section, bolt it on, etc., etc.

He told me he does this regularly, and that his company has about 25 such installs scattered around the region. I say he's lucky to be alive! Needless to say, I pitched a fit when he suggested we do the same with our site installs! In advising my local group of wireless entrepreneurs, I rose up and became Uber Safety Dude. And I'm doing the same thing in this month's column. It's a topic that needs revisiting every now and then, so pay attention!

Ham radio, an otherwise interesting and friendly pursuit, can kill you in a jiffy if you don't play it safe. As in kill you—dead! We don't talk about it as much as we should, but it all comes down to vigilance, common sense, and observing "good amateur practice." Just get into the habit up front so you won't have to worry later on.

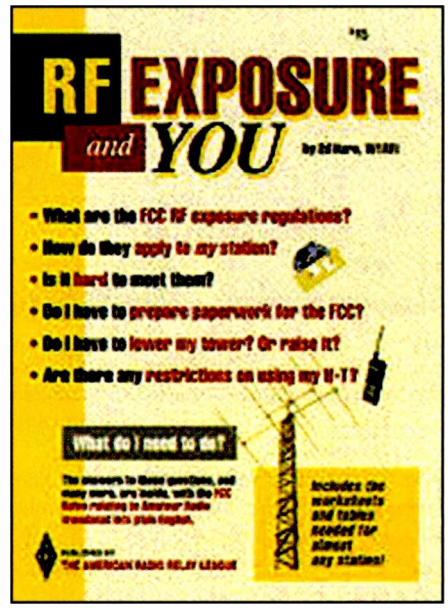
Bad Examples

Although I was actively trying to be safe, my own illustrious ham radio career, and my life in general, came perilously close to ending just as it was beginning. I still remember the incident as though it were yesterday! At the ripe old age of 13, I was adjusting a military surplus tube-type transmitter while standing on a rubber mat and employing a screwdriver that I had wrapped with electrical tape (like I said, I was trying to be safe). Somehow, my big toe moved off the edge of the mat (contacting the cement of the basement floor) and my screwdriver tip came into contact with the high-voltage bus (possibly via a defective capacitor or other nearby component).

Anyway, after being surprised by the loud "snap," I flew across the room, hit the wall and felt my heart starting, stopping, and beating crazily before settling down a minute or so later. It's a lesson I never forgot! Later, in college, I was excruciatingly careful as I homebrewed linear amplifiers and tube-type transmitters. Fortunately, my caution paid off and I had no further "accidents."

Other hams haven't been as lucky...

In the mid-'80s, an experienced North Dakota ham was killed when a vertical antenna he was installing accidentally touched an overhead power line. In the late '80s a life-long ham from Texas—with thousands of hours behind the key and test bench—was fatally shocked when he touched a high-voltage line inside his linear amplifier. Had he lived he would have had to adjust to the fact that the powerful jolt had *charred his hands completely off his body*. While operating from remote locations, hams have electrocuted themselves by running power cords (plugged into gas-operated generators) through standing water. And more than a few hams have been killed by lightning strikes. Just a few years ago a prominent contester from the Carolinas was killed in an accident atop one of his many world-class towers.



RF Exposure and You, written by Ed Hare, W1RFI, is the book on the topic. You can find it at your favorite amateur radio bookseller or at your local library (if you're lucky!).

It happens, but we don't talk about it much.

Recalling these events—and there are others—is a chilling reminder that *anyone who works with or around electrical equipment needs to be alert and careful.*

High voltages *are not* required to cause death or injury. Lower voltages can be just as deadly, and strong RF fields can cause severe burns and can damage tissues and organs. Working on rooftops and towers also calls for caution and common sense.

Ham radio isn't an inherently dangerous hobby, especially if you use your head. But by learning—and practicing—the right safety habits at the start of your ham career, you'll hopefully avoid having to learn them the hard way.

Safety: Learn All About It

A comprehensive treatment of safe amateur radio practices can be found in any *ARRL Handbook* or *Operating Manual*. These are both excellent references, and I encourage you to get a copy of either or both.

Linux: It's Not Just for Conspiracy Theorists Anymore!

I'm feeling more than a little subversive as I type this month's column on my main PC, which now runs SUSE Linux 10 as its operating system. Actually, considering that *Pop'Comm* itself reports on spy planes, the military-industrial complex, pirate broadcasters, and various conspiracies, the typical anti-establishment experimenter will feel right at home with Linux!

I'll be investigating native Linux ham radio software and experimenting with running Windows-based software in Linux. Yes, tons of Windows programs run in Linux, thanks to a software layer/program called "wine," which stands for "wine is not an emulator" (if you're ever going to mess with Linux, get used to goofy names and acronyms).

I'll report in more detail in a future column, but after two weeks of SUSE 10, I can safely say that Linux has emerged from its "geeks only" roots and is now a viable alternative to Windows. The really nice part is that viruses, spyware, adware, malware, etcware are total non-issues. SUSE 10 is smooth!

The other Linux distribution I've been amazed by lately is perfect for those of us who have a bunch of older, slower PCs lying around. Puppy Linux—a complete desktop OS with a graphical interface and tons of software—takes up only 50 MB and boots itself to RAM (OS and all software in RAM), making most any old clunker seem as speedy as a new-generation machine! You can even boot it from a USB key, and the PC it runs on doesn't even need a hard drive! Check it out at www.goosee.com/puppy.

Tremendous innovation is taking place in the open-source Linux community. It's the ham radio of computing!

For a ton of targeted, helpful information about ham safety, and especially RF safety, point your web browser to www.arrl.org/rfsafety. Among the many PDFs and linked resource pages you'll find *RF Exposure and You*, a definitive book written by my old friend Ed Hare, W1RFI. Ed's essentially forgotten more about RF safety than most hams will ever know, which is somewhat ironic, considering that Ed mostly operates QRP, with a scant few milliwatts of output power.

Even if they sound rote, try to keep the following tips in mind while building, repairing, installing, adjusting, and operating amateur radio and electrical equipment: The life you save could be your own!

RF Safety

- Use good-quality feedlines and connectors.
- Never touch an antenna with RF power applied.
- Never operate a transmitter or amplifier with its safety shielding removed.
- Make sure antennas cannot be powered up while you're working on them. If you're out in the back yard or on top of a tower, put a warning sign in your ham shack, pull out fuses, or switch off circuit breakers, and disconnect all feed lines at the transmitter. (The previously mentioned wireless Internet tech thought nothing about working on and around a 24-dBi-gain dish antenna that was being fed 200 mW of RF at 2.4 GHz!)
- Never look into the open end of a power waveguide, and never aim a beam antenna (dish, Yagi, etc.) toward yourself or others. Keep VHF/UHF antennas up in the air and away from people.

Climbing Safety

- Never climb alone. Always use a helper/spotter.
- When working on a tower, always wear and use an approved, secure safety belt.
- Plan your work before you start. Have the proper tools and materials on hand.
- Take a break every now and then.
- If you're uncomfortable working at heights, stay on the ground and get help from an experienced climber.
- Stay away from, and be alert for, power lines or other overhead wires.
- Don't climb when you're tired or distracted.

Electrical Safety

- If possible, *personally* disconnect equipment from power sources before beginning your work.
- Drain (ground) electrolytic capacitors before touching them.
- Try not to work alone.
- Use tools with insulated handles.
- Install a master "power cut-off switch" near your test bench and make sure everyone in your household knows how to use it.
- Work in a well-lighted area.
- If you must service equipment while the power is on, follow the electrician's rule of thumb: Keep one hand in your pocket while you work. That way, electrical energy won't have an easy path across your chest should your working hand contact a live source.

Two Final Suggestions

Because life, in addition to ham radio, is often full of surprises, consider attending Red Cross First Aid and CPR courses. Why not take your ham club buddies with you!

One last thing. Don't be afraid to enjoy your new amateur radio hobby. Common sense and clear thinking cover almost every situation. Have fun and be safe! ■

by R.B. Sturtevant, KD7KTS

Radio Fun And Going Back In Time

Q. When was the car phone invented?

A. Around the turn of the 19th Century driving an automobile was considered a rather daring sport. Driving out of town was considered the height of recklessness because of bad road conditions and the scarcity of repair facilities. In 1908, Valdemar Poulsen developed a wireless telephone. An American, Arthur Collin also developed one the same year. It was touted as the ultimate accessory for anyone touring the country in a powerful car. Collin's customers were supposed to be drivers at garages who would rush out to service the disabled automobiles. Collin was a little premature. He also ran into legal problems and spent a year in prison for stock manipulation.

Q. Hitler tried to keep Germany and occupied Europe from listening to "foreign" radio stations. How did he do that?

A. Heavy fines and threats of prison were first used. Then he simply took everyone's radios away from them. Over a million were confiscated in Holland alone. Some people were "trusted" enough to keep their own radio with medium and shortwave frequencies. Those who couldn't be trusted were able to buy a "People's Radio," which only picked up three stations. Transmitters were in Munich, Hamburg, and Berlin, and were all Adolph all the time. There was a boom in homebrew crystal sets, which picked up the BBC in London and Radio Oranje from the Dutch Government in exile just fine.

Q. The Korean War was the Army's first use of VHF. What kind of problems did they have with it?

A. U.S. Army VHF relay stations used during the Korean War weighed about two tons each. Broken down for transportation one piece weighed 300 pounds. Moving them around took several trucks and a crew of Korean laborers, when laborers were available. Much of Korea is remote and doesn't have roads, which made the use of trucks somewhat problematic.

This, of course, did not stop the Army's signalmen. The North Korean and Chinese had brought mules south to carry equipment for the 1951 Spring Offensive. Some of these beasts of burden escaped or were abandoned during the rout of Communist forces. Signalmen from the 101st Signal Operations Battalion found some of these poor animals foraging in rice paddies and mountainsides. Sick and starving, the mules were in pretty sad shape. The resourceful GIs fed the mules candy, sugar, and cereal from their 5-in-1 rations. They soon had the ex-Communist mules healthy and ready to resume their burdensome life under capitalism.

Q. Who was the first licensed amateur radio operator in the United States?

A. Before 1912 there were no laws governing the use of radio of any sort. The air was filled with signals, but chaos reigned. Congress passed Public Law 264, "An Act Regulating Radio Communications." On December 12, 1912, representatives of the Department of Commerce, which was to administer the law, began giving exams at the Brooklyn Navy Yard in New York. At 7 a.m., 22-year-old Irving Vermilya showed up with his stomach full of butterflies and hands shaking to take the test. He passed and was issued the first Certificate of Proficiency. His call sign was W1ZE. He'd been working with radio for 11 years and was present on Goat Hill (later Signal Hill) in Newfoundland when Marconi made his historic reception of the letter S transmitted from Cornwall, England.

Always keeping his amateur equipment close by, Vermilya went to sea as a radio operator and later worked as a broadcast engineer. He retired from WNBH-WFMR in New Bedford, Massachusetts. He kept on hamming until the end.

Q. What are Fox Hole radios and who made them?

A. The generation that fought World War II grew up in the '20s and '30s building crystal sets and listening to swing music. Like most GIs, they had been taught by the military to be good scroungers. The Fox Hole radio is exactly what its name says it was: a radio for use in a fox hole. The radio showed up during the Anzio campaign. The troops used a bayonet for a ground and "found some wire" to put the thing together. A razor blade and the lead from a pencil attached to a safety pin were put together for a detector. A pair of earphones could be traded with a signal guy or found in leftover German equipment. The plans came from the GIs themselves with a thousand variations.

The strongest signals came from Rome in the daytime and Berlin at night. The enemy put on special Swing and Boogey Woogey programs (music unfit for German audiences) especially for the American troops. The hardest part of building one today is finding the old fashioned blue razor blades because the stainless steel ones sold these days won't work. ■

Looking Back...

Five Years Ago In *Pop'Comm*

They're still a hotbed of activity, the oil-rich countries, and we were there with the news of places like Iran, Iraq, and Qatar with Gerry Dexter's "Monitoring The Black Gold Countries," complete with frequency listings. AOR was advertising its new AR8600 with coverage from 530 kHz to 2040 MHz, less cellular of course.

Ten Years Ago In *Pop'Comm*

Tommy Kneitel did it again in January 1996 with his article, "Set Up Your Own Beeper Network," but today, it's cell phones with cameras, nationwide two-way radio service, text messaging, and more. What will they think of next? Ham radio in a cell phone? New was RadioShack's PRO-26 handheld scanner boasting 200 memory channels and a scan rate of 50 channels per second.

Twenty Years Ago In *Pop'Comm*

There's the Florida Highway Patrol officer on the cover in January 1986 using a "brick"; the radio was as large as the officer's arm! Regency was advertising its new scanners, the MX3000, 4000, and 5000, and the 800-MHz coverage MX7000, a 20-channel, no-crystal unit that received continuously from 25 to 550 MHz and 800 MHz to 1.2 GHz, cellular included!

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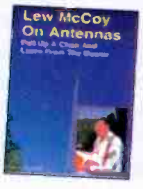

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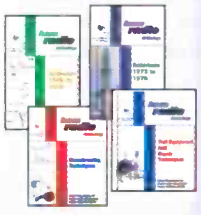

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by Steve Douglass, webbfeat@gmail.com

MILCOM Above 30 MHz: MILCOM Antenna Alternatives, And An HF Mystery!

Last month we had a brief overview of basic MILCOM and MILAIR antenna systems. We even detailed the most popular off-the-shelf monitoring antennas available from today's manufacturers. But half the fun of military monitoring is experimenting, tweaking, and fine-tuning your antenna array so that it becomes the ultimate military/utility communications signal-sucking system!

With that in mind, let's look at some antenna alternatives that might inspire you to get out the soldering iron, spools of copper wire, coaxial cables and calculators and build your own (or modify an existing) VHF/UHF antenna masterpiece!

Homebrew Antenna Design Programs

Designing an antenna is much more than whipping out the calculator and figuring the length of a half-wave dipole cut to your favorite frequency. As any antenna designer will tell you, it is as much an art form as it is a science, but if you are as mathematically impaired as I am, antenna design specifications listed in technical journals are almost as confusing to decipher as a hormone-driven teenager's emotions.

However, even though I can't help you with the latter, there are programs (most available for download) that can aid you in designing your own MILCOM/MILAIR antenna.

PC-Based Antenna Programs

A great place to find over 40 PC-based antenna (and other) design programs is at www.ac6v.com/antsoftware.htm. Although most of the designs are for amateur radio receive and transmit antennas, with a little re-figuring they can be adapted to serve your MICOM/MILAIR needs.

One of the links on that page will take you to another great antenna design page at www.qrz.com/download/antennas/index.html. There you'll find programs and designs for all kinds of antennas, from HF to SHF. VHF and UHF J-Pole designs, Yagis, and log periodics are all listed. Easy-to-build dipoles and discones are listed as well. Most of the information is in zip files and can be downloaded into your computer for free. Just be sure to drop the author(s) a thank you to encourage more programs of this sort.

Mac-Based Antenna Programs

My PC buddies all deride me for using a Macintosh computer. They say things like "Why don't you buy a real PC?" and "When are you going to get a real computer?"

True, there are many things their PCs can do that my Mac can't. For example, there aren't many Macintosh (OS-X) computer-aided scanning programs for the Mac, and the few there are can't compare with programs like SCANCAT or Butel's ARC series. But, on the other hand, I don't have to deal with the constant problems I hear my PC–owning buddies all constantly complaining about, such as computer viruses, spy ware, Windows bugs, crashes, and bombs.

My Mac-Mini is very stable, almost invulnerable to viruses (Mac users love their machines so they see few reasons to write viruses for them), and runs like a well-oiled Chevy. The only failures I've experiences were due to hardware problems (like just plain wearing out the hard drives with so much use) and with software glitches that are rare and usually benign. So when I hear my PC companions whining about another system's crash or a virus their computers have contracted, I can't help but smirk and say, "If you had a Mac you wouldn't have that problem!"

In any event, there are a few radio-related Mac-compatible programs available for download (including an antenna design program called RF Toolbox) at www.blackcatsystems.com. Formerly called Mac Antenna Master, RF Toolbox will cost you a few bucks ($19.99), but is well worth the price. I have built several antennas using calculations (for Yagis and log periodics) that are good performers. There are even versions available for PC and LINUX users.

In later columns I'll detail the building of home-brew antennas from many of these programs.

Military Surplus Antennas

Since we're trying to intercept military communications, what could be better than using the real deal—military gear? Chances are you've considered this option not only because the military stuff is built tough and usually cut and optimized for the frequency bands you're interested in, but it (I have to admit) looks really cool to boot.

However—and there is always an "however"—adapting military surplus gear to work in a civilian world can be tricky at best. Finding appropriate connector adaptors can be a problem, not to mention the best gear is usually very expensive, in high demand, and hard to find. Having said that, a great resource page dealing with tons of links for military surplus radio suppliers can be found at www.pacificsites.com/~brooke/MSD.shtml.

The most popular military surplus antennas are the discones (designed for UHF MILAIR reception), blade antennas (designed for aircraft and operation on VHF/IUHF military aviation frequencies), and high-gain directional SATCOM antennas for military satellite work.

Blade antennas are the easiest to find especially on eBay. I have tried several, one of which was very good on VHF, but not so hot on UHF, and another that was a fair performer on both VHF and UHF MILAIR frequencies. Don't pay more that

Here's a surplus military blade antenna I bought on eBay for $30. Note the two antenna connectors for this dual-band VHF/UHF antenna. Although it was easy to find a suitable adaptor (UHF-N) for the VHF side, I have failed to find the proper connector for the UHF side locally. Make sure if you buy a surplus antenna for MILCOM/MILAIR work that adapting it for civilian use won't be difficult. (Photo by Steve Douglass)

Notice the many blade antennas hanging under the chin of this Army Chinook helicopter. They're used for communicating on a number of bands, including HF, VHF Low, VHF Civil Air, and UHF. (Photo by Steve Douglass)

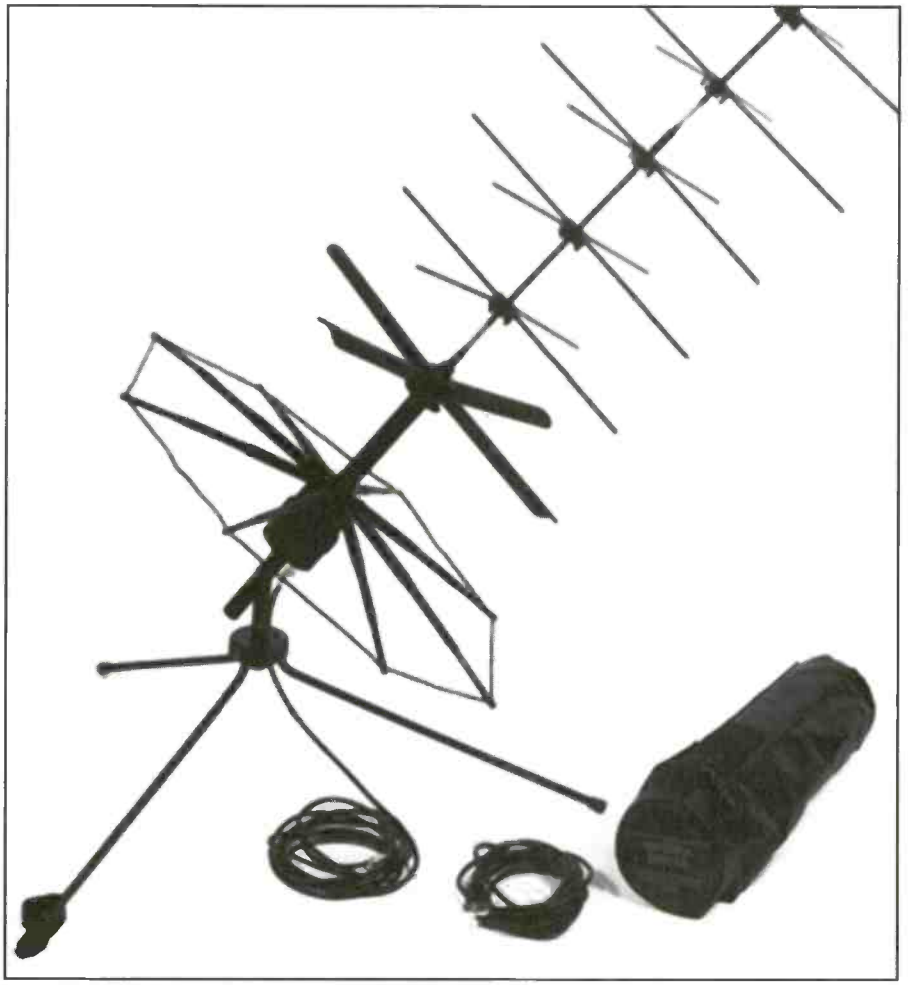
$30 to $50 unless it's a collectors item, such as an antenna from a B-52.

Military discones, like the type on military and civilian air traffic control towers, work very well for VHF/UHF MILCOM, but again are expensive and difficult to find, with the most popular being the AT-197/GR. However (there's that word again) although they are built to last and last and last, look really great, and are designed well, the one I tested didn't seem to work any better than my Diamond Discone D130J.

For UHF military SATCOM work, the most sought after signal grabbers are some of the Dorne/Margolin (now EDO) portable high-gain antennas, such as the DE SE 109 series. You can view the specs of one of these cool antennas and others at www.edocorp.com/Antenna MilGround.htm.

Rarely some surplus SATCOM antennas become available for sale on eBay and the like, but they usually go for a pretty penny—sometimes close to $ 1,000—and are out of reach of most MILCOM monitoring enthusiasts. Also their condition can be poor to fair (repairable) and they may need work to get them back to spec.

Those who are lucky enough to own a one say they are great performers, especially for MILCOM SATCOM work. A good way to get more information on



This portable UHF military SATCOM antenna manufactured by EDO is for use by troops in the field to communicate via secure satellite with command centers. Antenna systems like this can sometimes be found for sale at government surplus liquidation sales or on Internet auction sites, but they usually are in used (sometimes not repairable) shape and cost hundreds of dollars.

these antennas is to join one of the military surplus radio e-mail lists at QTH.NET and, in particular, the milsurplus group. Reading the archives first will help immensely with your understanding of this highly technical topic.

Using A Television Antenna As A MILCOM Antenna

What? You can use a TV antenna for MILCOM? You sure can, because a commercial TV antenna is just a VHF/UHF log periodic! There are wide-ranging opinions on this subject, from "they don't work worth spit" to "mine works great. Keep in mind they are also *very* directional and should be used with an inexpensive mast rotator *or* fixed and pointed in the direction of the communications you wish to monitor. Don't expect to hear much from the sides or behind. My own experience has been good, and they work quite well if you perform some very important adaptations.

If you're going to go this route, choose an antenna that has high gain and is both a VHF- and UHF-capable model. The antenna must be adapted to be turned on its side and mounted vertically. TV antennas are horizontally polarized and won't work well with vertically polarized signals if they are mounted in the horizontal plane. To change the polarity you'll have to do some simple hardware changes, like drilling holes in the mounting boom.

Some trimming of the elements can optimize the antenna for UHF MILCOM/MILAIR reception. You can do this by connecting the antenna to a spectrum scope or, if you have a discerning ear, to a scanner with a signal strength meter. In the this, using a constant UHF signal source, you carefully trim the elements in small increments until some improvement is heard. While TV antennas are usually wide-banded enough not to require much tuning, you may want to attempt this if you're having little to no luck with reception. It does, however, take some technical know-how and a patient partner (you need one person in the shack, one at the antenna) and can be a difficult at best.

What About An FM Broadcast Antenna?

Some monitors have reported varying degrees of success adapting outdoor antennas used for FM broadcast (88 to 108 MHz). For instance, the RadioShack Model #15-2163 can be used by trimming the elements and mounting it vertically. Reports vary from great (for VHF Civil Air, 108 t0 136 MHz), to acceptable on VHF Military Land Mobile (138 to 144 MHz), to just okay (when radically trimmed) for the MILAIR 225- to 400-MHz band. Since the RadioShack Model #15-2163 is relatively cheap ($24.99) and you won't be out much if you completely trash the antenna, it might be worth experimenting with, or stay tuned and we'll post our own experimenter's report on this antenna in a future issue.

What Have You Learned?

This "officially" concludes our look at our series on MILCOM above 30 MHz, but we will continue to cover the subject from time to time in this column. As always I want to hear from you and what you find works best. Send your stories, news clips, shack photos and comments to the e-mail address listed above.

An HF Mystery

Emery Sterling writes with a question about a weird transmission he's intercepted, saying,

> I am 90 years old and do not see very well so I listen a lot to my radio, a Grundig Model S350. I sometimes hear something on SW that baffles me and I thought you might explain it. It is a female voice (in Spanish) that repeats random numbers, 0 through 9 in groups of five. It seems to go on and on and on with nothing else said. I last heard it on August 25 about 6 p.m. (local) on 6855 kHz. I would much appreciate it if you can tell me about this.

Emery, what you have discovered is one of the infamous "spy numbers" stations that have been reported using shortwave since the early days of the Cold War. Although never confirmed, they are thought to be coded secret messages aimed at undercover operatives in foreign countries. Some intrepid utility monitors have tracked some of these covert and strange sounding transmissions as originating from the United States.

Supposedly the numbers you are hearing are what are called "one-time codes" (or pads) and can't be deciphered by any known means, except by those for whom the messages are intended. Since an intelligence agency knows their codes can be—and are being—intercepted by anyone, some of the messages (probably the majority) apparently contain nothing, and since the sender has no way of knowing when the operative will have an opportunity to listen for a message, it is usually repeated over and over again for many weeks.

Quite possibly the numbers work this way: The "spy" jots down the number and consults a "one-time pad" that contains the key to what the message means. It is called "one-time" because the key is only good for deciphering the message on one given day. In this way the code constantly changes and can't be cracked. Some monitors have noticed that when a spy numbers message is finished, it is often followed by the time and date. This may refer to the only day for which the code is valid.

Another theory is that the numbers are not a message in themselves but a set of reference numbers that the operative uses to decipher the message. For security reasons, the reference material (used to crack the code) is known only to the sender and receiver.

For example, the first part of a spy numbers message may consist of the key, such as the page number of a publication picked out in advance by the covert operative. In other words, the message may be unlocked by a simple cipher that reads something like "2 equals the third letter in the third word in the second paragraph of the first story on page 26 of *The New York Times*." The spy then looks in *The New York Times* and finds that the number 2 equals F. It's then just a matter of substituting numbers for letters to decipher the code.

Once the message is deciphered it is destroyed. In this way, if an operative's home or place of residence is searched by agencies that may suspect him of being a spy, there are no incriminating one-time pads or ciphers lying around that might blow his cover. This way the key to cracking the code is kept in a very safe place: the operative's head.

One would think that in this day and age of instant Internet communications and cell and satellite phones that spy numbers stations would be outdated, but they may serve as back-ups when other communications channels are unavailable. Keep in mind, in other countries shortwave radios in households are as common as AM/FM radios in America. So having a good shortwave radio (capable of receiving spy numbers) is not out of the ordinary.

It's interesting that after almost 50 years of being broadcast, spy numbers stations have finally caught the attention of Hollywood and are now being used as a major plot device in the ABC series,

Lost. If you have an Internet connection you can read more about spy numbers stations at the following sites:

www.spynumbers.com
http://home.freeuk.com/spook007/UNIDgerfem.mp3 (good audio samples here)
www.dxzone.com/cgi-bin/dir/jump2. cgi?ID=10485

Reader's Logs

0000 (Frequency MHz): STATION, Anytown, USA, summary of traffic heard in MODE at 0000Z. (monitor/sometimes location)

4270.0: CFH, Halifax, Nova Scotia with wx in RTTY (850 Hz shift, 75 bd) until off at 2359Z. (CG)

5732.0: REACH 1500 in QSO with Atlantic Area Command Center. USB at 2300Z. (CG)

6270.0: UNID YL/EE with 5-ltr grps. USB at 2325Z. (CG)

6489.0: Unid: 1023 RTTY 75/850 encrypted. Poss U.S. Navy. (RP)

6604.0: Gander Radio, Newfoundland with wx for Canadian cities in USB. Off at 2330Z. (CG)

6797.0: UNID YL/SS with 5-fig grps, followed by "finale." AM at 2237Z. (CG)

6977.0: CIW 681, Trenton, NCS for some type of net, probably Canadian. Assistant NCS was CIW516. QSYed to "frequency Y," which was 4051. USB at 2223Z. (CG)

7650.0: R24522 (helo) 0304 USB/ALE TO T3Z238 (3/328th Avn, MI NG, Grand Ledge MI). (RP)

8047.0: INFEOC1NGB (unidentified Nat'l Guard entity) 1443 USB/ALE TO M070ON Nat'l Guard, Missouri). (RP)

8056.0: CLS (prob Sabre AAF, Ft Campbell KY) 1417 USB/ALE sounding. Also sounding on 10691.5. (RP)

8831.0: Gander (MWARA NAT-F) 1313 USB w/Iberia 6275 (not heard) w/altitude change request. (RP)

8831.0: Gander (MWARA NAT-F) 1250 USB w/Alitalia 604 & SEH 904 w/position report. (RP)

8915.0: San Francisco (MWARA NP) 1230 USB w/unid aircraft w/position report. (RP)

8971.0: Cardfile 711 (P-3C, NAS Jacksonville) 1502 USB calling Fiddle (TSCC, NAS Jacksonville) w/no response. (RP)

8983.0: CAMSLANT Chesapeake in QSO with CG1504. Tfc consisted of phone numbers. USB at 2310Z. (CG)

8983.0: CG1720, on final approach to New Orleans, calling CAMSLANT Chesapeake to report that 1720 can't complete flyover of requested area due to visibility and flight condx problems. USB at 2321Z. (CG)

8992.0: Offutt 1522 USB w/Cardfile 711 (P-3C, NAS Jacksonville) who request pp w/DSN 312-942-XXXX (Fiddle) reporting that they are "ops normal" and 40 mins out from homeplate. (RP)

9007.0: Trenton Military 1205 USB w/unheard aircraft w/wx for undisclosed locations. (RP)

9031.0: Architect (RAF Flight Watch) 1830 USB w/airfield color states. (RP)

11186.0: Unid 2037 RTTY 75/850 encrypted. (RP)

11232.0: Trenton Military 1833 USB w/Shado 42 (MC-130, Kirtland AFB NM) in pp w/Coyote Ops regarding current wx at Kirtland. (RP)

11253.0: RAF West Drayton 1901 USB w/volmet. (RP)

11279.0: Gander (MWARA NAT-D) 1309 USB w/Air France 382 (not heard) w/position report. (RP)

11232.0: Trenton Military 1757 USB w/Atlas 39 (CC-144 # 144608, 414th Combat Support Sqdn) w/SELCAL check (FM-EL). (RP)

11232.0: Trenton Military 1807 USB w/Tiger 326 (CC-130E # 130326, 436th Sqdn CFB Trenton) in pp w/Trenton RCC reporting they are airborne from CFB Bagotville enroute to Trenton w/ETA of 1930. (RP)

11232.0: Trenton Military 1810 USB w/Canforce 87 who requests wx for Trenton, London, Ontario & Toronto. (RP)

12087.0: INFEOC1NGB (unidentified Nat'l Guard entity) 1434 USB/ALE TO M080TN (Nat'l Guard, Montana). (RP)

12390.0: Unid 1820 Fax w/pressure gradient chart. Prob Royal Navy. (RP)

12735.0: URL (Sevastopol Radio) 1831 CW. (RP)

12823.5: CTP (Portuguese Navy) 1851 RTTY 75/850 w/NAWS. (RP)

12590.5: RRR34, Moscow Radio with beacon in SITOR and CW at 1309Z. (CG)

12843.0: HLO, Seoul Radio with beacon in CW at 1300Z. (CG)

12857.0: 6WW (French Navy, Dakar) 1853 RTTY 75/850 w/test tape. (RP)

13170.0: Olympia Radio, Greece, YL/EE with voice marker. USB at 1750Z. (CG)

13291.0: Gander (MWARA NAT-B) 1307 USB w/Delta 21 w/position report & SELCAL check (DL-GR). (RP)

13254.0: Shannon at 1807 in USB w/volmet. (RP)

13568.0: INFEOC1NGB (unidentified Army Nat'l Guard entity) 2346 USB/ALE TO P020RN (Nat'l Guard, Puerto Rico). (RP)

14757.0: R23687 (helo) 1445 USB/ALE TO T24MED (24 MedCo (AA), 24th Medical Company (Air Ambulance), NE NG, Lincoln, Nebraska). (RP)

16355.0: SARBR (Brazilian Rescue Coordination Center, Brasilia) 2208 USB/ALE sounding. (RP)

16808.0: WLO: 1705 w/CW & SITOR A markers and SITOR A traffic. (RP)

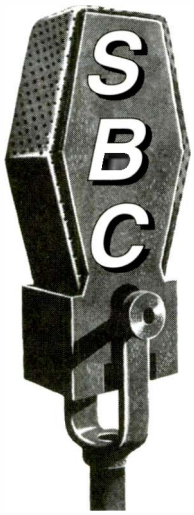
17230: CWA, Cerrito Radio, Punto Carretas, Uruguay with beacon in CW at 2257Z. (CG)

17982.0 HERMES (HQs, Brazilian Air Force) 2328 USB/ALE sounding. (RP)

Contributors this month are Ron Perron (RP) and Chris Gay (CG). ■

by Shannon Huniwell, melodyfm@dreamscape.com

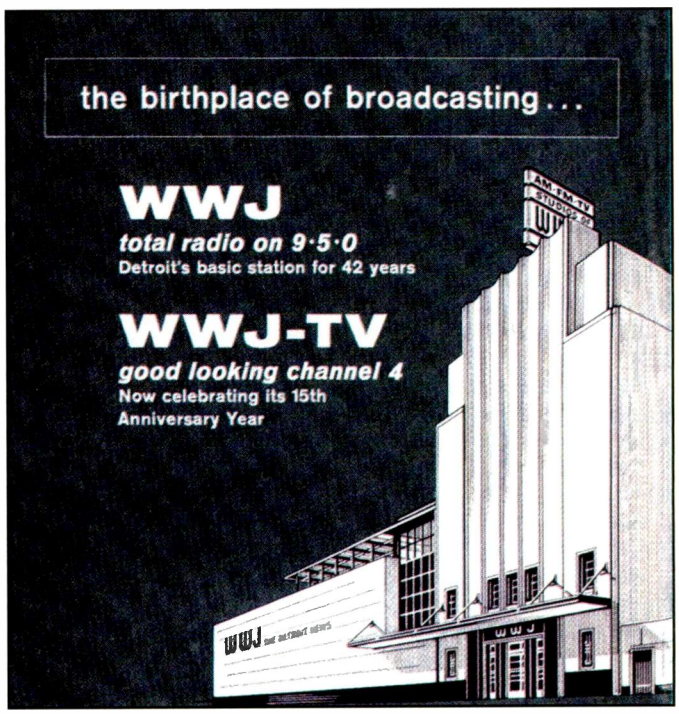
Broadcasting At 40— Where Were You In '62?



One of my old college roommates is always noting that, except for age 20, women hate any birthday with a zero in it. Maybe this phobia is true for guys, too, but I meet a lot of folks who are happy to be aiming for another year—and take pleasure in reaching even-numbered milestones.

One of broadcasting's first big birthdays was its 40th, widely celebrated by electronic and print media alike in 1962. A decade earlier, when TV was quickly capturing consumer attention, radio's future seemed comparatively dim, so not a whole lot was done to celebrate broadcasting's birthday number 30. To be sure, there'd been a bit of a splash in '52 about broadcasting's birth, but most of the focus was on *video's future* rather than audio's past. By the early 1960s, though, the undeniably robust television industry and decidedly revitalized (by music and news-weather) radio business had the time, resources, and resolve to reflect on its glories.

Here, courtesy of *Pop'Comm* reader Tony Gates of Washington, D.C., we'll open this month's column with a look at some 40th anniversary hoopla, as presented in a special 1962 issue of *Sponsor* magazine that Tony kindly sent my way.



Several pioneer stations claimed to be "the oldest" or having given birth to broadcasting. Among them is the Motor City's WWJ, long owned by the Detroit News, a paper that began experimenting with radio transmission circa 1920.

David Sarnoff's Two Cents

Though a shameless promoter of himself and the Radio Corporation of America he controlled, David Sarnoff can be credited with having possessed the wisdom to concentrate on the future, rather than rest on past or even present performance. That is to say, as soon as Sarnoff got RCA radio receiver production on its feet in the mid-1920s, he set about building the National Broadcasting Company's radio empire.

Sarnoff's 1926 purchase of AT&T's big New York station WEAF is still notable today, as (now WFAN 660 kHz, 50,000 watts, non-directional) its dial position, power, and antenna array ratio continues to yield what is arguably the best signal of any AM facility on the East Coast. Even before he started assembling NBC, which solidified in late 1928 when it went from relatively ad hoc to being a "permanent coast-to-coast network," Sarnoff foresaw the necessity for a flame-throwing flagship station. With WEAF in place, and WJZ (the present WABC) also under Radio Corporation of America control, the RCA and NBC chief focused on gathering talent to draw listeners to his radio NBC Red and Blue networks and acquiring other key outlets (like WMAQ 670 Chicago) to be owned and operated by NBC, as well as signing-up NBC affiliates from coast to coast.

Before the ink dried on the early affiliation papers, Sarnoff was again eyeing new territory: Television. Once black and white TV was commercially established in the late 1940s, color became Sarnoff's obsession. Admittedly, along the path, he strong-armed FCC officials to see things RCA's and NBC's way. Resultantly, FM treaded water for decades, CBS's UHF color system got summarily nixed by the Commission (in favor of an RCA color broadcast method) after originally having been given an FCC okay, and a paltry 525 lines of video imaging became the standard for TV pictures over the objections of most other television pioneers, such as A.B. DuMont.

But, Sarnoff's business plan didn't include much looking back. What was he envisioning in 1962 when *Sponsor* sought his thoughts on radio's 40th? By then, Sarnoff was looking towards outer space and on to the next big thing. In 1962, when few broadcasters probably imagined some fledgling "space bird" ever having much impact on their local stations, he said, "In an age poised on the threshold of *satellite* communications, it is difficult sometimes to recall that the entire history of broadcasting is less than a half century old. It is stranger to recall an event that occurred only forty-one years ago, at a dusty ringside in Jersey City," the media magnate mused, conveniently forgetting earlier broadcasters like California-based Charles Herrold or even Lee de Forest operating in Sarnoff's area, "foreshadowed the beginnings of public service spanning the nation and the world." Sarnoff continued,

> In the summer of 1921, I was at Boyle's Thirty Acres, across the river from New York, to assist Mayor J. Andrew White broadcast the first blow-by-blow report of a championship prizefight—the Dempsey-Carpentier battle. We were announcing over the microphone

of WJY, temporarily installed by RCA at Hoboken [New Jersey]. I do not know how many persons, glued to the earphones of their crystal detector sets and one-tube receivers, heard the description of this ring classic. But they were listening to history. In 1922, the first football game—Princeton-Chicago—was broadcast. The New York Philharmonic Orchestra went on the air. That same year marked the surge of independent radio stations, opening a new horizon of entertainment and information for America. I doubt whether many of us, forty years ago, gave serious thought to ourselves as pioneers. We were too busy experimenting and building to wrap our work in the mantle of the future. Nevertheless, all of us, I feel, were consciously aware of radio's significance and impact—its vital role as the recorder of history. In retrospect, the stations that opened their studios in 1922 and earlier were pioneers, perhaps the greatest in communications history.

That foreword from the then-most recognized captain (or Army general as Sarnoff wanted people to address him following his arranged stint helping to set up communications for the D-Day Normandy landing) of the broadcasting business was followed by an interesting compilation of commercial radio milestones. Assembled by Edward Shurick, a Blair-TV advertising sales executive and author of *The First Quarter-Century of American Broadcasting*, the roster appears to have been at least mildly influenced by RCA's/NBC's publicity machine that often obscured any "first" that hadn't been accomplished by RCA, NBC, or some affiliated party.

That timeline began with the 1909 debut of an institution called The Marconi Institute, a school of radio instruction "later incorporated as a part of the Radio Corporation of America." Curiously, Charles Herrold's San Jose, California, radio school and/or broadcast station got no mention, even though it came into being at the same time.

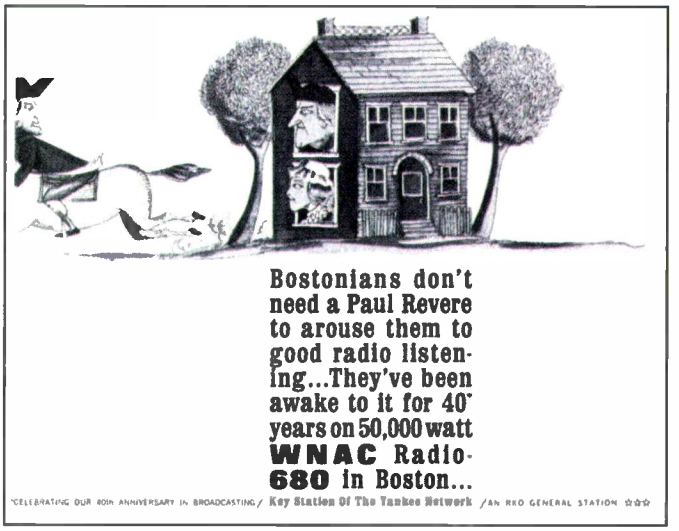
The year 1922 is typically cited as the year that AT&T "invented" the radio commercial. *Sponsor's* historical roster pays tribute to that August 28 event at WEAF when a commercial—or "toll" broadcast, as the phone company management dubbed it—aired for the Queensbury Corporation's housing project it was marketing. Interestingly, though, Shurick noted that two years earlier *The Jersey Review* had "leased WAAT Newark and regular programs are given twice a week consisting of news and music for two hours with a commercial rate of $35 per week for the time."

Broadcast history buffs also know that by 1915, the Herrold station was airing what, in more modern advertising parlance, amounted to "trade-out" commercials for a music store in exchange for records and other small items that the station then gave away in on-air contests. Because the AT&T "first commercial" occurred on WEAF, which was later acquired by RCA/NBC, its significance was exaggerated by NBC when, starting in the late 1930s, the network publicity staff was directed to chronicle radio history.

WIAI—One 1922 Station That Few Remember

Leave it to *Broadcast Pro-File* to select a rare radio outlet from among the hundreds in their new catalog (write them for your own copy at 28243 Royal Road, Castaic, CA 91384-3028) so we could get an alternate glimpse of the class of '22. Jan Lowry suggested a 20-watter on 833 kilocycles, licensed in the fall of that year by the Radio Division, Department of Commerce to Heer Stores Company in Springfield, Missouri.

Apparently, Heer was a department store operation, which began to dabble in radio parts, such as wire, crystal detectors,



According to this 1962 publicity piece, 50,000-watt WNAC had been entertaining Boston area folks for four decades. Truth is, WNAC had been 10 times smaller and on a regional channel for years before its owners bought out a larger station in nearby Lawrence, Massachusetts, so WNAC could be moved to 680 kHz and 50-kliowatts. Bean Town broadcast buffs will also verify that WNAC's history up until 1962 was insignificant compared to what lay ahead for the facility as Drake Top-30 formatted WRKO.

Radio that Elvis would like? Probably not, even though WMC could come in loud and clear at his Graceland mansion. Rather than spin the rock and roll or country/rockabilly hits in a pioneer rock and roll town, Memphis 790 AM chose to target a "good music" clientele. The 5-kW NBC affiliate, which was already 39 itself by radio's 40th birthday, offered the following records to its 7:35 to 8:00 a.m. audience on May 29, 1962: Frederick Fennell's Begin the Beguine, Doris Day's Love Me or Leave Me, David Caroll's It's a Wonderful World, the Pete King Chorale's Just in Time, Perry Como's Make Someone Happy, and Morton Gould's I Get A Kick Out of You. In this early 60s artist's rendering, the station was co-located with its television sister, WMCT Channel 5.

and headphones. Heer officials had heard from other store-owners that establishing a small radio station in a spare corner of an upper floor would be a great way to promote their wares and attract curious customers who wanted to witness a broadcast. Oddly, Heer didn't ask for any special callsign, such as WHDS or WHSC, which would be a mnemonic of the department store's name. Instead, Uncle Sam assigned Heer with WIAI from a sequential roll of letters. When the authorization came through, Heer wired-up the station's gear and put it on the air by Thanksgiving 1922.

Broadcast Pro-File reports that WIAI's programming fare was "typical of the 1923–23 era [for a retailer] operating the station as a promotional arm of their business. Concerts, vocalists, news and market reports, made up most of the station's offerings to Springfield *radioists*." But apparently few of these folks provided much worthwhile feedback to Heer, even when its station switched frequency from 833 to the less crowded 1190 kc spot and requested listener comments in late 1923.

This is undoubtedly why the store deemed WIAI's broadcasts as "not successful and the cost in operation to Heer was found to be greater than the value of the project." Sometime in early 1924, WIAI went dark and, in June, got deleted from the government roster of radio stations in good standing. The little AM never even got to celebrate a second birthday.

Anything New In '62?

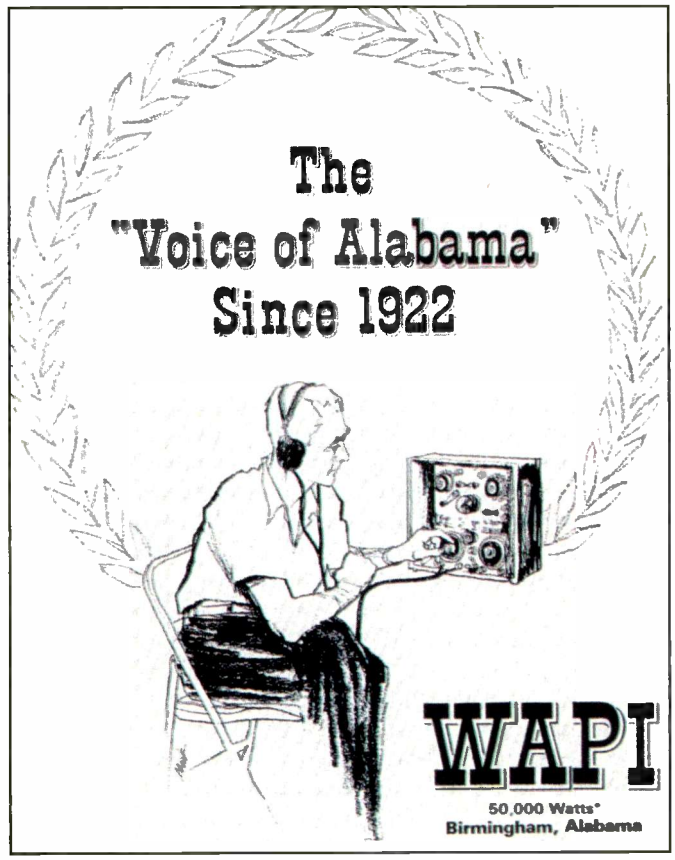
Broadcasting's 40th Birthday, got pegged to 1962 because 1922 was arguably the year that most of America's "cornerstone" radio stations were founded. For *Sponsor's* readership among those blue-blooded stations, the special issue's chronological listing of historically significant radio/TV happenings at the latter end of its 40-year timeline probably received only light perusal, because it was then considered a rehash of current radio industry events. Now that more than four *more* decades have slipped by, though, those few notations give us a neat snapshot of big broadcasting issues in '62.

For instance, ABC reported that December of 1961 was its best revenue month (with some $4.7 million in new and renewed business) since the mid-1950s. It's not clear, however, whether this figure included local revenue from ABC's owned and operated stations, such as 770 WABC in New York, which by late 1961 was pulling lots of listeners via a Top-40 music format.

The Radio Advertising Bureau spent February drawing up "a new plan for revitalizing radio, involv[ing] simplified [spot advertising] buying and ideas for stimulating new interest." This reflected the RAB's refocus from national network radio sponsorship income to the growing trend toward locally placed spot sales for everything from national accounts (like car makers) to dollar-a-holler commercials for the local hardware store.

In March 1962, 570 WMCA New York commissioned the Psychological Corporation to study WMCA's listeners. It found them to be "loyal, tolerant, patient, and inquisitive in [their] listening habits." This boded well for WMCA's daytime Top-40 music/half-hourly newscasts daytime programming and its pioneering late night talk shows.

The April radio biz buzz centered upon a U.S. Census Bureau report which "show[ed] radio penetration at 89.9 percent—a drop from 1960s 91.3 percent and considerably lower than the 95.7% penetration of 1950." The RAB argued that radio was "being sold short" by the Census Bureau and pointed out flaws in the government's tally of the aforementioned figures.



Begun as a 500-watt school station by Alabama Polytechnic Institute in Auburn, WAPI went commercial, moved to Birmingham, and eventually jumped day power to 50 kW. Night output was limited to 5000 watts to prevent interference with other stations on or near 1070 kHz.

During the annual April National Association of Broadcasters (NAB) convention, officials conceded that in 1950 there were 1,976 radio stations in America with a total ad revenue of $340,891,476, "as opposed to 3,300 stations in 1960 with a revenue of $560,315,348." That meant that while the radio ad revenue pie got a lot bigger, it was being sliced into more pieces than ever before. The NAB president urged formation of "a committee to investigate the overpopulation of radio and the resulting economic problems." Imagine how the convention attendees might have shrieked in horror had they been able to see late 20th Century AM/FM population numbers showing over 10,000 stations!

Directly related to the radio traffic jam salient at the NAB gathering, was a May 1962 FCC edict aimed at "cut[ting] down the number of AM stations." The Commission "announced it would accept no applications for new or changed [AM] facilities unless the station would bring primary service to a minimum of 25 percent of proposed coverage area, would not cause interference with existing stations, would be on one of the 13

Embracing America's still new and lots of fun Top-40 music format, gave WABC New York great ratings as well as millions of devoted fans—and 24,000 of them showed up in 1961 to help celebrate the 50,000-watt station's 40th birthday party at Freedomland theme park. Originally called WJZ, and once under NBC control, WABC began a year earlier than most of its pioneer sisters.

clear channels, and would increase power up to 1kW for existing Class IV [on 1230, 1240, 1340, 1400, 1450, or 1490 kHz.] stations." More than any other FCC action, this declaration sparked new FM applications, a goal the Commission sought to satisfy when it revamped the FM allocation rules the previous November.

Starting in big cities and quickly trickling down, AM broadcasters, especially those with daytimers, began snapping up FM frequencies as the next best thing to receiving an FCC construction permit for some AM night power. Most did so rather reluctantly, believing FM to be a second-class service foisted upon small station owners by FCC nabobs who protected the best pieces of AM spectrum for big wheels like Sarnoff. But these oft-disgruntled radio people inadvertently positioned FM for the coast-to-coast preeminence it would enjoy less than two decades later.

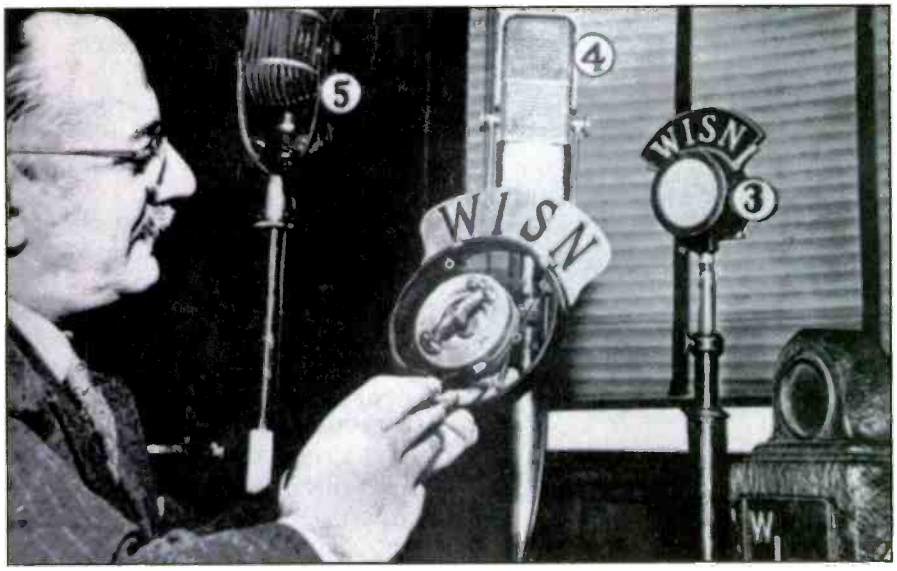
An Arkansas Station Compliments Of A 50-Plus-Year "Radio Fanatic"

That's how Jim St. John, K5HY, describes himself, thanks to his love of broadcasting. The *Pop'Comm* reader says he's been especially interested in radio since about 1953 when he was first captivated by the lure of the aural medium after dialing in his local station. Down the road, he would earn an FCC First-Class Radiotelephone license "the hard way as opposed to those 'fake firsts'" [see *Pop'Comm* August 2004] as well as a Second-Class Radiotelegraph and Amateur Extra licenses. He's never been involved in commercial radio despite his First-Class Phone ticket, which he earned by studying electronic technology for two-plus years.

His experience as a commercial operator was gleaned while a technician with Southwestern Bell Telephone (now SBC) when he maintained the old mobile telephone base transmitter and the mobile maintenance radios and associated repeaters. Jim admits he could have worked for a commercial broadcast AM or FM facility, but the cut in pay (compared to his career as a crop duster pilot, and later SBC tech) would have been too great. No matter, he never lost his affection for radio and sent us a nice shot of

This "combo" operation—in which the on-air personality, not engineering department staff, ran the equipment—was pretty much the norm at most small-to-medium market radio outlets in 1962. Though KLZ 560 Denver offered the photo as evidence of its modernization, the 16-inch transcription turntable was then outdated and would have been a 12-inch model with recessed section for 45-rpm records if truly state-of-the art in 1962.

It's likely that the Central New York residents standing on line in front of the WSYR building were waiting to witness a telecast at the co-located WSYR-TV Channel 3, as opposed to being part of a radio program. Though the Syracuse AM is often thought to be the city's oldest station, it actually started during 1922 as a wealthy man's hobby on an estate in Cazenovia, New York, and was dubbed WMAC. Several years later, the facility morphed into WSYR when it got moved to Syracuse. And there's an interesting callsign twist in this story...WSYR-TV was spun off and its calls changed decades ago. Clear Channel Communications has acquired WSYR-AM (along with several other area radio stations) and Channel 3's biggest local TV news competitor, WIXT-TV Channel 9 Syracuse. It plans to recast this television outlet as WSYR-TV.



WISN didn't wait until its 40th birthday to publicize radio's audio improvements. For some 25th anniversary publicity, the Milwaukee station pulled several antique microphones from deep storage to compare them with then modern mics. The carbon microphone held by WISN's manager, Gaston Grignon, was the facility's first. Number 2 is a 1930 condenser microphone. The dynamic type, labeled 3, hails from 1935. That RCA 44 ribbon unit (#4) and cardioid-type by Western Electric (#5) saw regular duty when the 1947 photo was taken.

Newport, Arkansas' KNBY and KOKR-FM with the following details:

KNBY AM 1280 first went on the air 1949 with a 1,000 watts, daytime only. It still runs [a non-directional] 1 kW in the daytime and 83 watts at night. KOKR-FM first went on the air [on September 1, 1966] as KNBY-FM on 105.5 MHz, [with 3 kW]. It's now on 96.7 MHz. The studios moved last year about a block west of the AM transmitter site. The FM transmitter is approximately 12 miles southwest of Newport.

Jim interviewed station official Dale Turner, but found that an historical sketch on KNBY/KOKR written in 1999 for KNBY's 50th birthday has since been misplaced. And, not unlike many a busy contemporary station manager trying to multi-task several key positions, Turner told Jim that he doesn't remember much more about the station's history than Jim already chronicled.

There was some recollection of the Newport AM construction permit being issued sometime in 1948, with the station going on the air on October 12, 1949. A 1952 source shows C. W. Craft as president of the Newport Broadcasting Company, which built KNBY. Several years later, documents note the 1000-watter, dubbed the *Voice of the White River Valley*, as being owned by Harold Sudbury, Sr., of Blytheville, Arkansas. In fact, Sudbury controlled KLCN AM/FM and the cable TV operation there.

Additionally, the Harold L. Sudbury stations (all in Arkansas) included KTPA Prescott, KAWW AM/FM Heber Springs and KSUD West Memphis. The latter was a 250-watt daytimer with studio/offices in Memphis, Tennessee, and represented the chain's "big market" outlet. The West Memphis AM has since been sold, but Sudbury interests have added several stations to their group, including some high-powered FMs capable of squarely hitting Memphis.

As Jim reports, KNBY and her FM are "still owned by the Sudbury heirs and licensed to Newport Broadcasting Company. When they answer the phone at KNBY/KOKR they say, " 'Sudbury Group.' " He says he personally remembers when Mr. Sudbury, Sr. would fly in here in his Beech Bonanza to pick up Joe Long, his Chief Engineer, recounting,

I was in commercial pilot training at the time at Newport Airbase (actually Newport Municipal Airport but it retained the "airbase" title ever since getting turned over to the city after its tenure as a training base for the military during WWII). If my memory serves me correctly, I think Mr. Sudbury's airplane had 22 decals on the fuselage with the callsigns of the different stations he owned.

One online source mentions the airfield and station coming together for a bit of politics, and Jim continues,

On July 2, 1952, radio station KNBY broadcast an exclusive—a speech at the Newport Airport by President Truman, who was in the state to dedicate the Bull Shoals and Norfork dams. Such presidential "remotes" from rural America were then typically the province of whatever local radio station could get a micro-

From this solid-looking masonry building, both KNBY and her FM sister offered Newport, Arkansas-area residents over 55 years of local radio. Many media historians view small local radio stations such as this AM/FM combo as representing the real spirit of American broadcasting. Today, KNBY airs a talk format by hometown and national hosts.

phone there. And, after the address, the hometown station's lucky local newscaster would invariably get to phone the audio into his or her affiliated network headquarters for airing on the national news. Like many savvy hometown broadcasters, Mr. Sudbury wasn't one to pass up an opportunity for his station to receive some nice publicity. It was a fine way to get your name and station's call letters into the public eye.

Jim recalls when he took his written exams for Second and First-Class radiotelephone certificates, the FCC examiner, George Bourdeux, pointedly said to him, "Say, I see you are from Newport, Arkansas. Do you know Mr. Harold Sudbury?" He replied that he had met the man a time or two. Jim says,

> The FCC official then told me that he had been in Mr. Sudbury's office in Blytheville when [the station owner] had his desk piled "a foot-high" with several stacks of payroll checks ready to go to the employees at his various AM and FM properties. The sight of all those checks certainly made an impression on the Commission man, as he never forgot Sudbury or the sight of that dough in the Newport station building.

Jim suggested we check out KNBY on a search engine to see if there'd be references to any music stars that first appeared on KNBY. That little Newport station, according to Jim, was host to many rockabilly/rock-'n-roll stars including Elvis, Jerry Lee Lewis, et al. Sure enough a few seconds on Google resulted in related details from rockin' country-style singer Chuck Comer who says,

> In 1952 [his family] finally settled in Newport, Arkansas...where I began my career in radio. I started playing the guitar when I was 17 years old. In 1953 the local radio station KNBY in Newport had an amateur talent contest and I won 2nd prize. Out of this came a 15-minute program three times a week—just my guitar and I singing songs.

No Doubt Many Happy Returns

If this down-home 1000-watt daytimer's live musical fare was akin to the repertoire of singing DJs on lots of other small stations in the early 1950s, no doubt happy birthday was sung several times a week. A tribute to some devoted listeners to be sure, but the song could have just as sincerely been crooned in honor of broadcasting's milestones.

And so ends another broadcast day at *Pop'Comm...* ■

ADVERTISERS' INDEX

readers' market

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by Bill Price, N3AVY

Communication Humor, Taken To Extremes

Communication humor. Now there's a topic. Couldn't get my !@#$%! phone line connected properly to the modem. *Loose Connection*! That's what it was. I should have taken that as an omen and written this in a fountain pen and sent it to New York via the Pony Express, except they're all extinct now.

So, last weekend I got to speaking with a new guy at church and the conversation gets to *Pop'Comm* instead of the golden rule, and it turns out that he's been a loyal reader for quite some time now. I was beginning to feel as if we should save this conversation for the parking lot as I thought of the moneychangers and all that stuff, so we did indeed "save it for later."

What would you say the odds are that I would run into a person who has actually been behind the microphone at a numbers station?

Well, of *course* he can't give an interview, and not much more data than you already can surmise on your own, which is almost nothing, except that he does *appear* to work for the government (ours, I think), and after I arranged a clandestine meeting with none other than Alice Brannigan in exchange for what I hope to be an interview which will crack the lid off the whole question of "what the heck are numbers stations anyway?" I find out that he'll have to kill me if we discuss it. Oh well.

So, onto another topic. Have you communicated with any machines lately? Of course, there are the voices in your car, and you can talk to your computer. I have often been heard talking to many inanimate objects, often rather crudely, but today I created quite a stir in a local building supply store that rhymes with Chrome Fleepo.

The chain has taken to using automated self-checkouts, whereby a customer can scan his or her own items and put them in a bag, then pay for them with cash, credit, etc. In the store near me, there are four self-checkouts and one person there to help when difficulties arise. One arose today. A big one.

Every time I use one of these, the thing tells me there's an unexpected item in the bagging area. Since it's the item I just scanned and put there, I figure she (the voice) had better start to expect the item to be in her bagging area. So this time, after I fill my first plastic bag, I move it to another part of the bagging area so that I can fill a second bag.

"Items have been unexpectedly removed from bagging area," she says.

I have had it with just about everything that life can throw at me by this point and I (more loudly than I really should have) tell her to osculate my kiester, or something similar in a blunter style.

The kindly woman tending the four self-checkout stations starts toward me to help. "STOP" I tell her. "I'm not going through another one-sided conversation with 'her' again." I took my purchases to a human, paid, and spent some time with someone purporting to be an assistant to the assistant manager.

No, he couldn't fix the problem, nor could his boss, or his boss's boss, but if I were to go to this website, and click on this, and do this, someone would read my complaint.

"What would you say the odds are that I would run into a person who has actually been behind the microphone at a numbers station?"

Well, believe me, if anyone reads my complaint, you'll likely hear about it before the next issue is on the stands, because I'll be dragged off to either jail or a loony bin wearing a love-yourself sportcoat for saying such things.

On a happier note, Norm has surfaced once again, with his new car, and has brought me a rig of sorts, promising me that if I get on the air, it'll only be with CW and there'll be no microphone involved. Since he and I are both gun nuts, I spent some time showing him my latest handgun purchases. The two .45s will make a .452-inch diameter hole in most any material, suitable for RG-8U or similar cable, eliminating the need for all that pesky drilling and sawdust, while the compact .380 makes a nice .355-inch opening, suitable for RG-58 or control cables, without connectors.

Norm is not sure I'm kidding about using the handguns instead of drills. There are several advantages, not the least of which is that you don't have to run an extension cord *or* bother with those annoying batteries. The neighbors have become aware of my plans, though, and have advised me that if I don't use a conventional drill, they'll call the authorities. Oh, well, where did I put that extension cord?

I've always been one to make fun of OSHA and many of their silly regulations. However, today, when one of the producers at our television station came to me with a techie project for me to help with, I thought that maybe OSHA actually *does* serve a purpose. One of the bits he's going to produce (film, tape, or whatever they call what they do) will involve a person with a light bulb lighting up over his head, indicating that he has an idea. How clever. Wish I'd have thought of that. His call was to get me to help him solder a wire to the aluminum base of the bulb. "Forget it, Charlie," I told him. Gotta find a bulb with a brass base.

I can't tell you how long it took to find a bulb with a brass base. I could have *made* one for him in the time I spent shopping for one.

So I solder the wires onto the base. There's an AC plug on the other end, and I tell him how dangerous this exposed wiring can be. He tells me we can't tape it, because he wants the base of the bulb to show in his film, or tape, or whatever it is that he calls what he does.

I probably should have disavowed any knowledge of my being involved with his dangerous little wiring job, in case he fries between now and the next issue. If that happens, this was only a joke. Never really happened.

Oh, and *DON'T* shoot holes in your walls to run cable, Okay? Really. It was just a joke. Not even a good joke. Even Norm and I wouldn't actually do that. Really. ■

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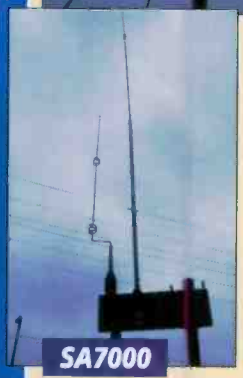
Discover these Accessories & Add to your Capabilities.

Antennas for the Great Outdoors

DA3000: a 16 element receive wideband discone antenna with useable frequency coverage from 25MHz to 2GHz. Using different length elements to ensure true wideband characteristics, the DA3000 also includes one 'loaded' element to enhance low frequency performance. Engineered and manufactured to AOR's exacting standards, the DA3000 comes with 50 feet of quality RG58/U coaxial cable terminated in a BNC plug for the radio connection and a low-loss TNC plug in the antenna base. Pole clamps are also standard.



Designed for areas where space is a problem or when an "unobtrusive" installation is essential, **SA7000** is a super wideband coverage receive antenna with useable frequency coverage of 30 KHz to 2 GHz. The SA7000 is a passive arrangement with two whip elements: a long element for short wave up to 30 MHz and a second shorter loaded whip antenna for frequencies up to 2 GHz. The loading coils are tuned around 150 & 800 MHz to enhance VHF & UHF performance.

Antennas for Indoor Enjoyment

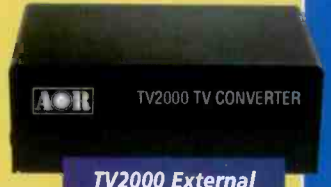
AOR has made performance even better with the new **LA380** indoor antenna as successor to the popular LA350. The LA380 features full frequency coverage (40KHz – 500MHz) using a single receiving element. Designed to provide reception when away from the main monitoring location or when large external antennas are not practical, the LA380 is a compact active (1 foot diameter) loop antenna which features an internal high-gain amplifier (20dB for 40KHz-250MHz) and excellent overall strong signal handling (high IP3 +10dBm). The loop design allows directional control and nulling noise or interference. Perfect for listening in remote locations or in antenna-restricted areas.

Accessories for Added Monitoring Capability

Now you can monitor APCO 25 signals using an AR8600MKII. The **P25-8600 APCO25 Decoder** can be installed in the AR8600MKII receiver to automatically decode the APCO25 signal. The decoded audio is then output from the receiver's speaker. *(Installation is required.)*

The **TV5000A NTSC TV Internal Converter** adds the ability to receive broadcast television signals (NTSC) and allow monitoring video feeds from a variety of sources including broadcast TV channels, public safety agencies, aircraft, Amateur Radio FSTV, news media video and more when used with AOR AR5000A series of communications receivers.

The **TVA-1 External NTSC TV Converter** is compact, lightweight and easy to install. Designed to be used with the AOR AR5000A series of communications receivers, its simple operation uses the 10.7 MHz IF input from your receiver. Audio and video outputs allow monitoring a variety of sources such as broadcast TV, public safety agencies, aircraft, Amateur Radio FSTV, news media video and more.



The **TV2000 External NTSC Video Decoder** is designed to be used with the AOR SR2000. Compact and lightweight, no external power supply is required (power is supplied from the SR2000). The video output is available from the rear panel of the TV2000 and audio is provided from the SR2000 through the external speaker jack.

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