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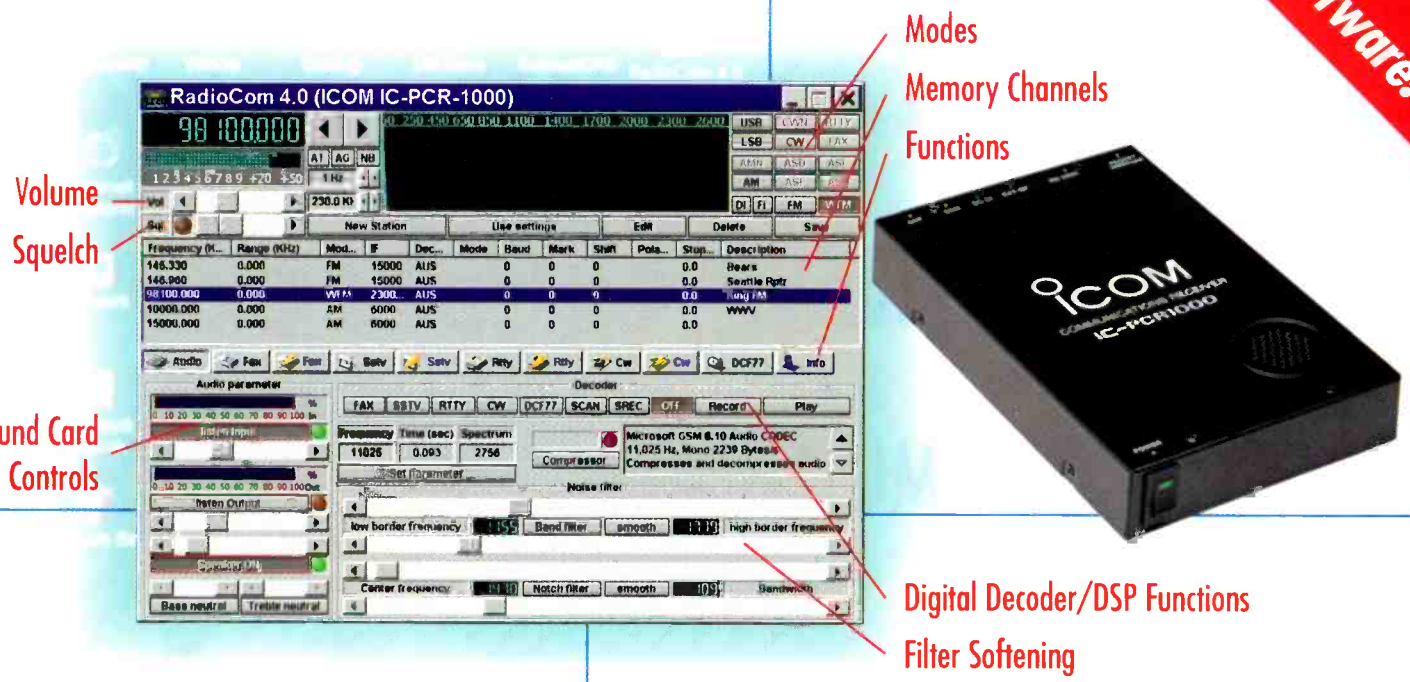

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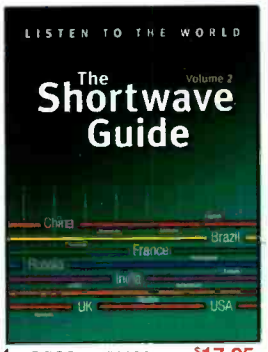

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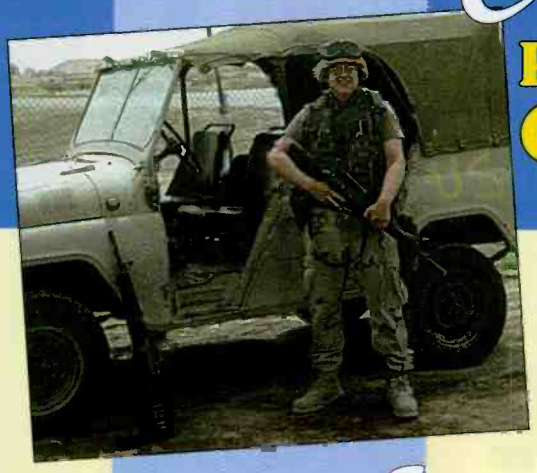

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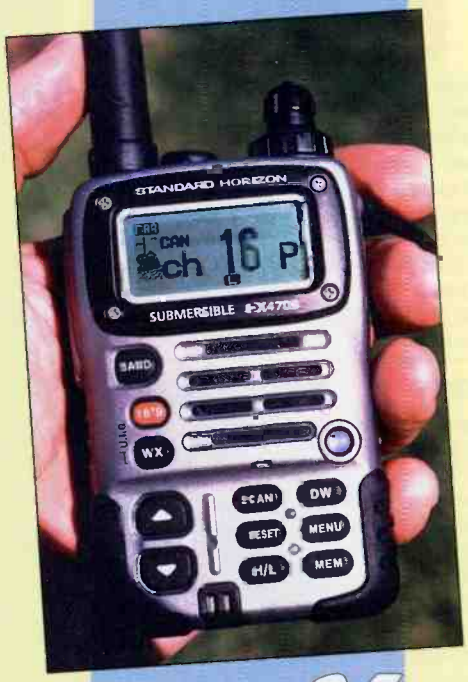

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tuning in

by Harold Ort, N2RLL, SSB-596

an editorial

Are We One Step Closer?

You knew it would happen eventually. At the recent meeting of the World Radiocommunication Conference, the requirement for amateurs to pass a Morse code exam to operate below 30 MHz was dropped. It took effect on July 5.

The decision leaves it up to individual countries, if and when to follow suit. Ten days later Switzerland eliminated the code requirement for access to HF, and only 10 days after that, on July 25, the United Kingdom did likewise. Now we'll see how long it takes the FCC to drop the requirement for U.S. hams. After all, in this age of high-tech marvels and instant worldwide communications *outside* the ham bands, the United States. would want to take the lead, wouldn't you think? (At least that's the face our politicians—and this is most certainly a heated political issue—put in front of the world). Of course you can't take the lead when others have already done it for you.

I'm told by a to-remain-unnamed FCC official that it's "not that easy to change things..." when it comes to our radio rules and regulations in the United States. But, at a minimum, the FCC will have to issue an official decree—once a Petition for Reconsideration is received, which, as of this writing, hasn't happened. According to the ARRL,

> As for where the FCC stands, the Commission itself may have tipped its hand slightly in its December 1999 *Report and Order* restructuring the Amateur Radio licensing system. "We believe that an individual's ability to demonstrate increased Morse code proficiency is not necessarily indicative of that individual's ability to contribute to the advancement of the radio art," the FCC said in dropping the 20- and 13-wpm Morse code elements from the testing regime.

I know we'll get a lot of irate mail and phone calls about this, but really, let's be honest with ourselves. Pretend there's no one in the room except you—none of your ham friends from the local club—and a small group of interested 15-year-olds. You're explaining the A to Zs of ham radio and you get to the licensing part of your discussion, explaining the No-Code Technician privileges and showing them how easy it is to use your 2-meter HT. Then you start talking about how they can talk *around the world* using a radio, microphone, and simple wire antenna. So far, so good.

Then you mention the *additional* licensing requirement, the 5-wpm Morse code test. News flash: These are young folks, who *really* don't care that "back in the day" all hams had to learn the code, that today's 5-wpm requirement is a piece of cake, and the code is a sort of tradition in the U.S. and not to be challenged. Do *you* really care that Great-grandpa had to crank-start his car to get a six-pack and some donuts? It's interesting and makes a neat story, but as times change (oops, there's part of the problem!), so should we.

Before you blame our give-it-to-me-now-I'm-not-waiting-until-morning American society for wanting instant gratification and something for nothing, don't forget that this is the world we're handing over to them, not the other way around. It didn't begin with any particular Administration, political party, or any such thing. We're responsible. So let's not blame the "young folks today" or "today's generation" because these kids are taking more tests every *week* than we took in a year of school. And they're learning a ton *more* stuff. I'll bet you a box of old tubes that if they dumped that burden on us we'd be making a year of appointments with a shrink because we're all stressed out! Tests aren't a problem for them—it's a *big* part of their lives. Any go-through-the-motions-testing—ham or otherwise—is a problem for any thinking person, don't you think?

Frankly, ham radio and the monitoring hobby needs *them* more than they need us. If the United States finally gets with the program—and I'm sure it will eventually—and eliminates the code requirement, it'll be one piece of the puzzle that will contribute to the growth of our wonderful hobby.

When I talk with non-radio people about the code requirement portion of our licensing program, without convening a

(Continued on page 78)

POPULAR COMMUNICATIONS

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letters to the editor

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Nailed Singapore!

Dear Editor:

Fantastic article by Gerry Dexter in the July *Pop'Comm*, "Diabolically Difficult DX"! I was up all night hunting, and it paid off about 5 a.m. PDT with Radio Singapore International on 6150. It was S9 at 1200 UTC and peaked at 20 over at 1300 UTC—and in English, too! They give Asian weather and news from the BBC on the hour. Started to fade about 1400 UTC here in Northern California. I'm up on a hill with a really good path over San Pablo Bay toward Asia.

I have a Drake R8B with three antennas: a two-element beam, Eavesdropper longwire, and a shorter longwire. China was coming in about 40 over 9 this morning, too. Now I'll work on the tough ones! Thanks again for a great article, guys—this is one issue I'll definitely keep handy.

Floyd Fessler
Richmond, CA

CB On The Water

Dear Editor:

Wise boaters will heed your tip to carry a CB radio aboard. A tiny FRS radio would be well worth having along, too, not to mention a cell phone these days. A case in point:

Several years ago, two boaters set out early from the Massachusetts coast for a day of saltwater fishing. They would be back by 4 p.m., they had told their wives. The vessel's motor later died, leaving them adrift far off shore. A fault in their VHF marine radio system then left them unable to contact the USCG. Murphy's law at work.

Fortunately, the boat's owner remembered he had a CB stowed aboard. He hunted it out and set it up. Their distress calls were soon heard by a **REACT** volunteer—confined to an iron lung—monitoring CB-9 in the *Salem, Oregon* area. He had once lived in the Massachusetts area from which the boaters had sailed, so he knew the distress call details were valid. Imagine. God was sure looking after those two fellows.

The USCG on the west coast first believed the derelict ship was in the Pacific. Then they thought the report was a hoax. Finally, the REACT monitor convinced them that it was in the Atlantic, and it was for real. Frantic calls from the wives had also alerted USCG in Massachusetts, but they had no idea where to search for the overdue fishermen.

Soon, with the REACTer's CB report relayed east, a Coast Guard cutter located the men and had them in tow. Eight hours overdue, they were safely re-united with their families. What if they hadn't had that CB radio aboard? It could have been tragic.

Anyone who can afford a boat and a VHF radio can certainly afford a CB and an FRS radio as inexpensive back-ups. You can't afford not to have them along. The NOAA weather channels in some units are an added bonus well worth considering.

Just remember: use them exactly as you would your VHF radio in an emergency. Marine radio operators are some of the best trained around. However, experience has shown that those expert operators often forget all their training when they operate on CB or FRS. In an emergency, that can be just as fatal as not having the radios.

Broadcast the same distress message (**Who, Where, What**) that you would broadcast on VHF when you use CB-9 or FRS-1 (increasingly, the call/distress channel nationwide on FRS). If you don't have a VHF radio, check with boaters who do and learn how to broadcast a correct distress message.

It can save your life and the lives of your passengers.

Ron McCracken, Past President
REACT International, Inc.
Keswick, ON, Canada

Freebanding—An Amateur's Viewpoint

Dear Editor:

I just had to respond to Mike Cornwall, KB9WQJ, for his obvious misreading of my letter about the Freebands. We Freebanders never wanted anything for nothing. In fact, the letter clearly expressed our desire to be tested in the same manner as ham Technicians, to pay a fee for a license, and be fully responsible to the FCC for our actions.

As far as Mike's comment on my reference to hams as snobs, ham-clique-kings, holier-than-thou, with high-horse attitudes and such, it's just Mike's own guilty conscience speaking. His attitude is the type that those words were describing and not the many great amateur operators that consider radio as a fun and challenging hobby—just those who think the bands are a dictatorship, with them on the throne.

Mr. Cornwall canceling his subscription to this wonderful outlet of radio information just because others have opinions that differ from his own is very sad. The only loss will be his. And even though Harold Ort did not defend the Freebanders in his Editor's reply, he was fair and balanced in defending our right to have our opinions. That is rarely seen these days. Thank you *Pop'Comm*. I will subscribe forever.

Harold, you have restored my faith in fairness in your magazine, and in the open-minded amateurs that grace your magazine each month. In fact, you and *Pop'Comm* inspired me to take the amateur Technician's exam which I passed with a 100 percent score! I'm now talking to the world on Echolink.

Dave, Pennsylvania

Uniden's BC-785D APCO-25 Digital Capable Scanner—A Canadian Perspective

The Latest On Buying And Using This New Uniden Radio

by Joe Lockhart, VE5JL

Here's the new Uniden BC-785D scanner.

For the Canadian scanner hobbyist, the talk of the town is the arrival of Uniden's New BC 785D (base) and BC 250D (handheld) APCO25 Digital capable scanners. While the arrival of the scanners in the United States was a done deal, we here in the Great White North were not sure if we were ever going to be able to get our hands on one of these radios.

While the FCC has applied no restrictions on the sale of these new radios, our equivalent governing body, Industry Canada, has as far back as 1996 put restrictions on who would be able to obtain these radios. While some people are against this measure, I for one am in favor of restricting who has access to this technology.

In the post-9/11 world, people who intend to use the radios for unlawful reasons shouldn't have them. That would seem the likely reason why Industry Canada is attempting to restrict the sale of the radios. But, while I applaud the effort, it is futile. If someone really wants a radio in Canada, all they have to do is order one from our neighbors to the south, or win one on an online auction like eBay.

Getting Permission

For Canadians to be able to purchase a radio, we must meet the criteria set out by Industry Canada. The following is taken from IC's document (IPC-2-1-04) and lists the qualifications.

Licenses for digital scanner receivers capable of receiving radio communication may be issued to persons or public service organizations involved in:

(a) preserving or protecting life and property which includes providing emergency assistance;

(b) investigating or prosecuting an alleged contravention of any law of Canada or a province, or when intended to be in the interests of the administration of justice;

(c) managing the radio-frequency spectrum for the purpose of identifying, isolating or preventing an unauthorized or interfering use of a transmission;

(d) ensuring the security and integrity of communications and communications systems;

(e) conducting the business of any communication station or system through which such communication is transmitted or received;

(f) carrying out international affairs, national defense or security on behalf of Her Majesty in the right of Canada; or

(g) operating radio apparatus in the amateur radio service.

Amateurs appear to be the only non-professional group that will be able to obtain a radio. This, of course, is with the understanding that the Amateur will only use the radio in conjunction with his or her Amateur activities. (Like there are any APCO25 repeaters in Canada, or the United States for that matter). This list of qualifications unfortunately does not include the thousands of people who are bona fide members of monitoring clubs who pose no threat to anyone, and, if anything, are a benefit.

Canadian radio enthusiasts have been waiting for quite some time for these radios to be approved by the governing body for sale in Canada. When I received a phone call from my local radio shop telling me the radios would be available, I was ecstatic. However, I was told conflicting information about licensing from two radio shops in Canada, as well as from Industry Canada.

One of the radio shop owners told me that you need to get a license first, then show it to him when he sells you the radio and decoder card (that was in Calgary). On the other side of the country (Toronto), I was told that you can buy the radio (providing you meet the qualifications), the radio shop will tuck a license form in the box, and when you get the radio you then apply for the license.

With all of the confusion, I decided to call the local branch of Industry Canada for the correct information. Unfortunately they only added to the confusion.

Industry Canada's Response

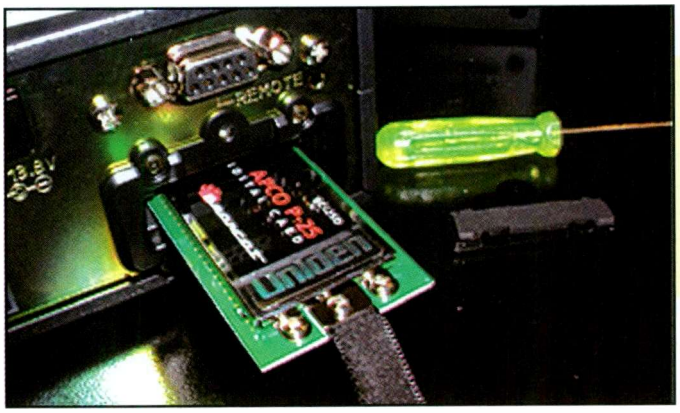
I'm told by a source in Industry Canada in Calgary that there is no license currently available. He also told me that Amateurs will be able to purchase the radio and decoder card simply

by showing their Amateur Radio Certificate—and, of course, only using the radio on amateur radio frequencies. The licensing of these radios for people other than Amateurs is currently under discussion by IC.

I also called IC in Ontario and was told that the radios are not even certified for sale in Canada. So, here we have more confusion over the sale and use of digital capable scanners. Industry Canada said they would get back to me with more information. As of this writing, they have not.

I have received a lot of e-mail asking the simplest way to get a new digital-capable radio, other than getting one from the United States. I suggest that radio enthusiasts in Canada become amateurs. In an attempt to attract younger people to the hobby, the exam has been made much simpler than when I took it in 1987. You no longer have to know Morse code to get on the airwaves. Contact your local Ham radio club for more information on how to join the wonderful world of ham radio.

No shack would be complete without the Shack Cat. Like all cats, Mouzer has the habit of getting his butt right in the way when Joe is in the middle of a contest or pileup!



Inserting the decoder card is easy—Uniden even gives you a screwdriver!

Getting Acquainted

Feeling like a kid in a candy store, I couldn't wait to rush down to my local radio shop when the radios showed up for sale. The debate I was having with myself was whether it would be the base (BC 785D) or the handheld (BC 250D). I do a lot of traveling between three cities in western Canada, so I could have used the handheld, but a base radio is always my favorite. So the base it is.

I went to the store with my frequency list in hand. The 785D looks like my 780XLT, but the programming is a bit different. As I put the radio into scan mode, I also noticed the absence of the annoying raw digital sounds that I love to block out on my 780. The sound of a police dispatcher's voice sending a call to a car was music to my ears.

Since I've been listening to it, the Calgary Police Service has been digital. This was a listening treat. Well almost. Being the first generation of digital decoding scanners, the new radios are bound to have a few quirks. The most notable one is the robotic like audio that needs to be adjusted frequently.

You also have to set the radio into an adjustment mode, wait for an APCO25 signal, then tune to the lowest number on the display. Being professionals, the police don't spend a lot of time gossiping about the weather. The conversations are short and sweet. So you have to tune as fast as you can.

This problem can be compounded if the system you are listening to has many frequencies. You have to wait until the APCO25 signal appears on the frequency that you're monitoring. Once you are in audio adjustment mode you cannot select the frequency, so you must wait until you hear APCO25 activity. That can be time consuming, but once I adjusted the audio, the sound quality was not too bad. Without the adjustment, the audio sounds a bit like listening to someone on an out-of-range digital cell phone.

Throughout the day, I had to adjust the audio quality several times, but then I found a simple solution that worked most of the time. When you first find a good audio quality setting on the radio's display, write down the value. The next time the audio quality changes, simply re-tune the audio quality settings to the value that worked the best. (Well, at least it worked for me!)

There is another small drawback I found that will annoy people who have both the 780 and the new 785D. On the 785D, the volume and VFO controls are reversed in comparison to the 780XLT. I kept turning up the volume on the 785D instead of tuning the audio control. Well, like all new toys, it will take some time to get used to.

Kudos From Canada!

Hats off to Uniden for being the first with an APCO25-capable scanner. We'll have to wait to see if the rumors are true that RadioShack will be releasing their version of an APCO25 scanner later this year. Just my luck, RadioShack will most likely market the radio to the U.S. only. But that's another story. ■

Special Report: Operation Iraqi Freedom

A Pop'Comm Reader Shares His Wartime Radio Experiences

by Steve Conway

The GAZ jeep where I found the Soviet R-123M radio gear.

A look at our forward-deployed communications package.

Having returned from operation Iraqi Freedom a little over a week ago I thought I would share with your readers a little about the communications I was involved in "over there." It was, as you can imagine, a most interesting trip, beyond the obvious fact of being there for the conflict.

I'm a member of the Michigan Air National Guard and was activated in early March for the operation. We were sent to Southwest Asia a few days later and were in-country about two weeks before the opening of hostilities. I am an aircraft electrician operating in a flight-line aircraft maintenance environment, so in addition to my own duties I was able to see the workings of many other maintenance fields.

On our base, transmitting on 107.5 MHz FM, was a continuous music station set up by the communications squadron for morale purposes. Since most vehicles (and personnel for that matter) had standard AM/FM radios, there was a selection of music other than local Arabic programming to be heard. An unusual mix of all popular types of music (rock, country, hip-hop, and rap) was played without any breaks. Doing a little research, I found a computer on the network with a selection of mp3 files that played randomly and were broadcast.

During the first few days of the conflict, the music was stopped but the station transmitted a silent signal, used to give air attack warnings. This was to ensure that the entire base population could be warned. The primary means of warning came from the system of speakers throughout the base, but they could not always be heard everywhere on base, so the FM transmission was a good alternative. The music eventually resumed, but would be cut off by any attack warning.

As a side note, the various nets on which we used our duty HTs also simulcast the warnings automatically in the event of an alarm.

As the conflict progressed, certain members of our unit were selected to head into Iraq to begin flying and mainte-

nance operations from a newly liberated air base. This was a "bare-bones" operation, with nothing to use other than what we brought with us. There was no official communications support at our maintenance dispatch level, nor did we know what was going on in the outside world. This is where my hobby helped us enormously.

I hold a GMRS license and thought about this eventuality before I left, so along came my pair of Audiovox GMRS-1535 HTs. This was a perfect situation for this type of radio, as we lived about one-quarter mile from our work site. We were able to improve our living conditions while flying was going on, and my counterpart on the flight-line would just give me a quick call if he needed more help. These were to become a real asset to us.

Obviously there was no spectrum coordination at the time, so we weren't worried about interference to other users too much—there was a war going on, you know! I imagine as time went on the "normal" rules came into effect, but as many of us noticed, it was like the Wild West over there, and we did what needed to in order to accomplish the mission. GMRS was a big part of that.

News From The World

As far as news from the outside world went, we relied on a 10-year-old Hitachi KH-450 SW/AM/FM portable radio with a RadioShack roll-up long wire antenna. Through the BBC World Service we learned that U.S. Forces were rolling into downtown Baghdad. Those not familiar with shortwave were impressed that we could receive English language broadcasting

"As far as news from the outside world went, we relied on a 10-year-old Hitachi KH-450 SW/AM/FM portable radio with a RadioShack roll-up long wire antenna."

in Iraq! As word went around that I had the radio, it became a morning ritual to tune in the BBC for the latest news while munching on an MRE. Even those with an idea from other sources about what was going on out there would stop by for the news.

While scrounging around for vehicles to use (none of our own was there yet), one of our guys pointed me to the back of a Soviet-built GAZ jeep he had been able to get running. On an angle-iron mount was an R-123M armored fighting vehicle radio built by the Soviets for export use, but the labeling was all in English! This apparently had been some type of command jeep, using a 7-meter whip antenna while mobile and a long-wire of undetermined length while "camped." From the little research I did, it transmits in the 27-MHz area and up to, I believe, 50 MHz FM. The transceiver itself was about 8x8x18 inches and must have weighed close to 50 pounds—*without* its power supply! It would have made a wonderful souvenir, but war souvenirs were strictly *verboten*, so behind it stayed.

All in all, it was a very interesting journey, but it's good to be home again. I would like to thank all of you for the support we received from the home front. It was good to know we were thought about. I'm glad to be able to share some of my communication-related experiences with you and your readers. ■

the wireless connection

a look behind the dials

by Peter J. Bertini, radioconnection@juno.com

Demystifying Molded Capacitors

The Beitman CD project is underway and ordering information is at the end of the column. But this month's column kicks off with the info you'll need to decode those strangely marked mica-molded capacitor values.

A recent foray into a forgotten corner of the "Wireless Connection's" storage area yielded a trove of forgotten postage stamp NOS mica capacitors. It's a large cigar box of them to be exact—probably a fleamarket find brought home and forgotten years ago. Old timers sometimes refer to these parts "postage stamp" caps, because their rectangular molded cases and size resembles a typical postage stamp in size and appearance.

They were probably stored and forgotten any of several reasons (I may already have had a large selection of new dipped-silver micas sorted in plastic storage bins). But most likely, because decoding the often cryptic color coding systems can be a challenge, I simply didn't want to be bothered at the time. I now decided it would be worthwhile to sort and grade these caps; it's always nice to be able to use reliable NOS parts in keeping with our vintage theme whenever possible.

Fortunately, mica capacitors are among the least likely components to fail; they're also very stable devices. The only caveat is to be aware that some of the larger value molded caps might actually be paper capacitors, which are as failure prone as their wax-paper cousins! It's usually fairly easy to differentiate between the two varieties; the mica capacitor color codes *generally* begin with a black or white dot (there are exceptions), and the mica capacitors are generally fairly low pF values. I'll show some practical examples later.

The problem is that over the years there were several different marking schemes, each with its own idiosyncrasies! Sometimes, it's hard to decide exactly which code applies to the particular specimen you're trying to decipher. Fortunately, it's often easy to figure out which code is proper by process of elimination. **Table 1** shows the color code marking systems for most of the capacitor examples we'll be discussing.

Table 1. Molded Mica Capacitor Color Codes

Color	Digits	Volts x 100	Multiplier	Tolerance
Black	0	0	1	20%
Brown	1	1	10	1%
Red	2	2	100	2%
Orange	3	3	1,000	3%
Yellow	4	4	10,000	4%
Green	5	5	100,000	5%
Blue	6	6	1,000,000	6%
Violet	7	7	10,000,000	7%
Gray	8	8	100,000,000	8%
White	9	9	1,000,000,000	9%
Gold			0.10	5%
Silver			0.01	10%
None				20%

Note: Voltage ratings may not apply to all capacitors.

***Table 1** gives a value of 750 for these colors. Continuing clockwise, reading the bottom three color dots from right to left we have* gold-gold-brown. *The fourth* gold *dot is a multiplier value of 0.1; 0.1 times 750 yields a value of 75 mmfd for this capacitor. The fifth* gold *dot indicates a 5-percent tolerance for the EIA marking code. The sixth dot is brown, for a voltage value of 1. Because the rating is in hundreds of volts, the actual working voltage for this device is 100 volts.*

Obsolete Codes

To read a molded capacitor, orient the body so the color dots can be read in the correct sequence (the markings are read from left to right). There are several variations for indicating the correct position. The manufacturer's mark or name—if present—will be right side up. Sometimes the dots are stamped on a long arrow, and the arrow head should point to the right hand side. In other instances, one or more of the dots may be slightly "pointed" to indicate the correct orientation. For vintage consumer radios, you'll most

*Photo A. This early mica capacitor uses a simple, but obsolete, RMA 3-dot marking system. With the indicating arrow(s) pointing right, the color-coded dots are read left-to-right as brown-black-brown. According to **Table 1**, this is a 100-mmfd (100pF) capacitor.*

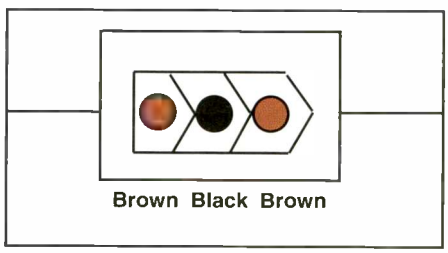


Figure 1. The color dots are orientated with the arrows pointing towards the right-hand side. Reading from left to right, the color code is brown-black-brown, *indicating the device is a 100-mmfd capacitor. This cap uses the obsolete RMA three-dot marking system; these capacitors have a 20-percent tolerance and 500-volt rating.*

likely encounter molded capacitors using the three-dot marking system.

Early Three-Dot RMA Code

Figure 1 and **Photo A** illustrate an example of a molded mica capacitor that uses the obsolete RMA three-dot code. This part is a Cornell Dubilier molded cap which uses arrow heads to the right of each dot to show the correct orientation. The dot colors are *brown, black, brown*. **Figure 1** shows how to decipher these color-coded markings. This capacitor has a value of 100 mmfd, or 100 pF using modern conventions. In some odd cases, the tolerance may be indicated by the addition of a fourth dot. Otherwise, the capacitor is 20 percent tolerance with a 500-volt voltage rating.

One minor note: In the examples shown in the drawings, the closest color on the drawing palette was used—some of the colors are the nearest examples I could find. For example, *orange* may actually be more red than orange, so read the labels shown on each example in the drawings for the precise color.

EIA, JAN, Or Industrial?

Sigh. Nothing is as easy as it should be! You'd think the color codes for these parts would be universal, but mica capacitors have been marked with many different standards over the decades. Here are just a few we've run across: RMA (Radio Manufacturer Association) using three-, four-, five-, and six-dot marking systems, RMA 1948, JAN (Joint Army Navy), AWS (American War Standard), EIA (Electronic Industry Association), "Commercial," and "Industrial." Whew! How can we keep track of which standard goes with which capacitor? Things aren't always straightforward, and this is where intuition and experience are helpful! And, there are exceptions to every rule.

First, let's take a look at the EIA, MIL (military), and JAN standards used on six-dot molded capacitors. Again, indicating arrows show proper orientation and values are read from left to right on the top row, continuing in clockwise rotation from right to left on the bottom row!

Figure 2 and **Photo B** show some examples of NOS JAN/MIL color-code mica capacitors. Now, if the first dot is *black* or *white*, the capacitor is most likely a mica capacitor. *Black* indicates a MIL or JAN color-coded mica capacitor. If the first dot is *white*, the capacitor likely follows the "modern" 1948 RMA marking code. Except for the differences in available tolerance ratings (again, see **Table 1**), the actual capacitance values would be the same for either MIL or EIA coded capacitors.

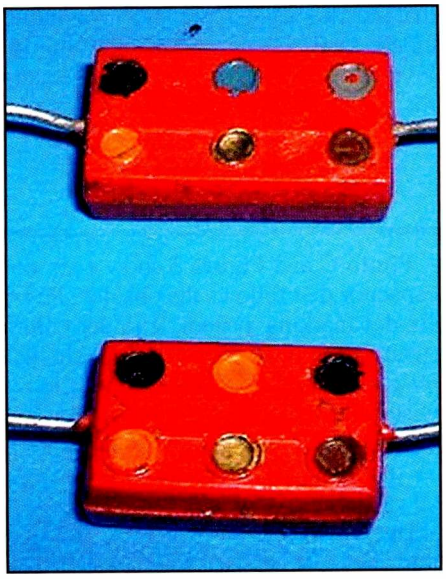


Photo B. Here are two examples of six-dot capacitors, which follow the JAN military marking system. The first dot on both devices is black, *indicating a mica dielectric.*

Now, the fly in the ointment is this: the *white* dot could indicate a mica capacitor, or it could indicate a first digit capacitor value of 9 for industrial color-coded caps! A *silver* first dot was also used to indicate a molded paper capacitor. A three-dot capacitor in a black body might also be a molded paper capacitor.

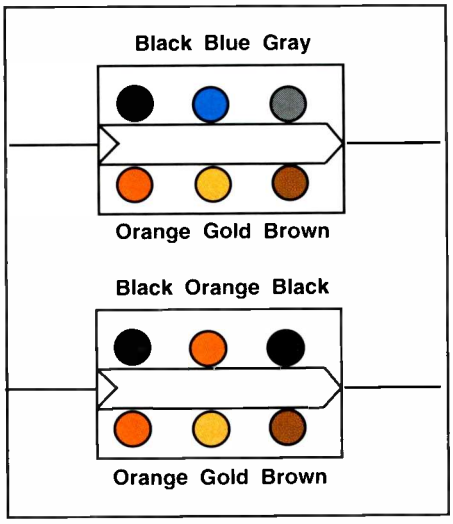


Figure 2. Reading in a clockwise direction, the color code for the top capacitor reads black-blue-gray-brown-silver-orange. *According to* ***Table 1****, this is a mica capacitor, with a value of 680 mmfd. The* silver *dot indicates a tolerance of 10 percent; the* orange *dot specifies the temperature drift tolerance. The second cap has a 300-mmfd value.*

The first component in **Figure 2** is a 680-mmfd capacitor. The first dot is *black*, and according to JAN standards this is a mica dielectric capacitor. The first digit value (second dot) is *blue*, for a value of 6, the second digit value (third dot) is *gray*, for a value of 8; and the multiplier dot (fourth dot) is *brown*, for a multiplication of 10x. This gives us a final value is 680 mmfd. The fifth dot (*gold*) indicates a 5 percent tolerance. The sixth dot is a "class" rating for the device.

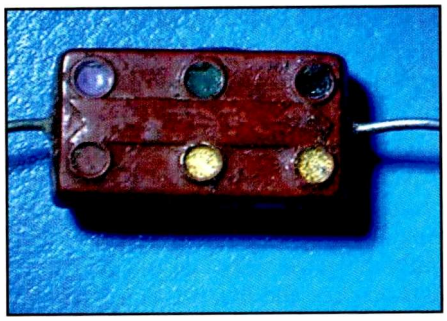


Photo C. This six-dot mica capacitor uses the obsolete RMA 6-dot marking standard. With the capacitor placed so that the arrows point to the right, the first three dots read violet-green-black going in a clockwise direction.

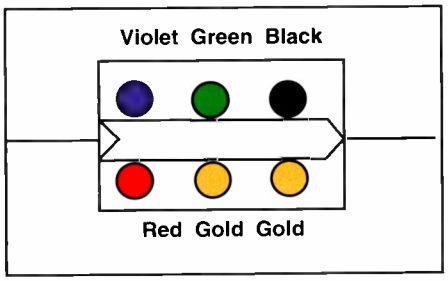


Figure 3. RMA six-dot molded mica capacitor. The color code for this device reads (clockwise) violet-green-black-gold-gold-brown.

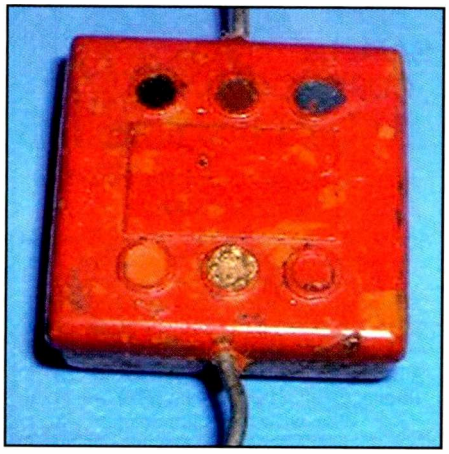


Photo D. The dots read black-brown-green-red-silver-orange. *What's the dielectric and capacitance?*

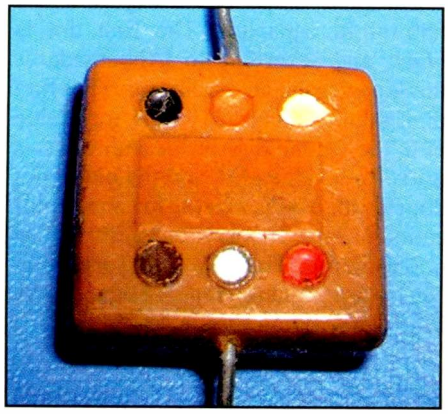


Photo E. The dots read black-orange-white-red-silver-brown. *What is the capacitor?*

The second example is 300-mmfd capacitor. The color code reads *black, orange, black, brown, gold, orange.* Again, the first *black* digit indicates a mica dielectric. The second and third dots, *orange* and *black*, indicate a value of 30. The *brown* multiplier band indicates a 10x multiplication, thus the capacitor has a value of 300 mmfd. The tolerance is 5 percent, as indicated by the fifth (*gold*) tolerance band. The sixth (*orange*) mark is for the class rating for the capacitor (this last aspect of the rating system is beyond the scope of this article).

Voltage Ratings?

What about the voltage rating for these caps? Often the voltage rating was determined by the size of the case and the by the capacitance value. There are some examples where the voltage rating and other parameters were marked by additional color dots on the backside of the component. It's probably safe to assume that most caps will have a 500-volt rating unless their values exceed 6000 mmfd. Five-hundred volts is more than adequate for vintage receiver circuits.

Obsolete RMA Six-Dot Code

Photo C and **Figure 3** show a six-dot capacitor that follows the obsolete RMA six-dot marking system. The dot colors (from left to right across the top) are *violet-green-black*, and continuing clockwise right to left across the bottom are *gold-gold-red*. **Table 1** shows this to be a 75-mmfd capacitor (verified on my digital capacitance meter).

Here's how the code is read: the first three dots decode to a value of 750. The fourth *gold* dot indicates a multiplier of 0.1. Multiplying 750 by 0.1 yields a value of 75 mmfd. The fifth dot, also *gold*, is the tolerance, in this case 5 percent. The sixth and last dot is *red*, indicating a value of 2, and representing the voltage rating in hundreds of volts. Thus, the capacitor has a 200-volt voltage rating.

Practice Drill!

Photos D and **E** show two other examples of molded capacitors. Can you identify their values using **Table 1**? **Figure 4** shows the physical characteristics of both capacitors.

Bumble Bees!

No, not the insect kind! Some paper capacitors were molded in thin Bakelite cases. Often the values and parameters are printed on the cases, but there are a few varieties that use color bands to denote their values and characteristics. These are rather colorful devices, and the colorful stripped bands over the black bakelite cases bear some resemblance to the stripes on a bumblebee, hence the nickname. These capacitors are notoriously bad and should be changed when encountered in older equipment! One would think the Bakelite case would provide an effective moisture barrier to protect the paper dielectric, but it apparently doesn't.

In any event, **Table 2** gives the color codes for these parts, and **Figure 5** shows an example of a 4700-mmfd capacitor. The first three bands are the value; in this case, *yellow* (4) *violet* (7) and *red* (2) equate to 4700 mmfd (.0047 mFd). The fourth black band indicates the cap has a

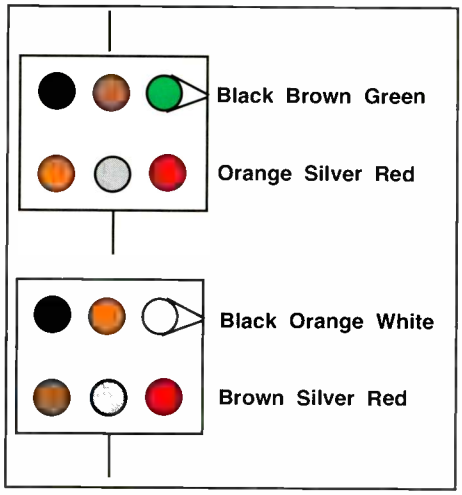


Figure 4. Pictorial drawings for the two "mystery" capacitors. What is the value for both caps, and identify the dielectric.

20% tolerance. The last two bands are the voltage rating in hundreds of volts. For our example, the two voltage bands are *brown* and *blue* (16), the voltage rating for the capacitor is 1600 volts.

Beitmans On CD

Morris Beitman would assemble schematics and service data for the most popular sets sold that year by various manufacturers, and then publish them annually in soft-covered book form. The volumes were inexpensive and very popular since they covered the majority of sets likely to be encountered by the average serviceman or technician. The last volume was for sets made between 1967 and 1969, which pretty much marked the end of the vacuum tube era as well.

Several months ago I mentioned that the Beitman "Most Often-Needed" series of manuals was being scanned and placed on the Internet for downloading at http://www.eskimo.com/~p0lez1/beitman/beitmanhome.htm. The ambitious project was entirely due to the generosity of Scott W. Harvey, the gentleman who supplied the time, labor, and Web space to make the digitized versions available for free download and use.

The volumes were scanned and compressed in Djvu format, which means you'll need to have the Djvu browser plug-in installed on your computer to view these files. The entire set of compressed Djvu files takes up over 200 MB of disk space, so downloading it all could present some problems for folks with dial

Table 2. Color Codes For Molded Tubular Capacitors

Color	Digits	Multiplier	Tolerance	Voltage
Black	0		20%	0
Brown	1	10		1
Red	2	100		2
Orange	3	1,000	30%	3
Yellow	4	10,000	40%	4
Green	5	100,000	5%	5
Blue	6	1,000,000		6
Violet	7			7
Gray	8			8
White	9			9

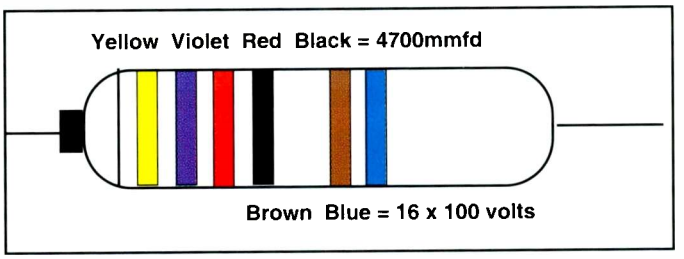


Figure 5. Pictorial for a .0047-mFd molded Bakelite tubular wax-paper bumble-bee *capacitor.*

service, or for those who have to pay by the minute for dial line service.

What Is Djvu?

On the website Scott explains how Djvu is a revolutionary form of file compression developed by AT&T. It compresses files to about one sixth their original size, greatly reducing download time. Scott notes that it would not have been practical to offer the manuals for download without Djvu. The volumes are broken down into several smaller compressed zip files, making them manageable for slow dial up connections.

Scott has given us the okay to offer the Beitman volumes on CD, including the Djvu browser and creation software, as a service for our readers whose Internet access is slow or expensive enough to make it impractical to download the *otherwise free files*. Scott will also be offering the Beitman manuals on CD in a higher resolution PDF format at a later date. Check his website for developing information regarding availability or pricing.

Ordering The CD

The Wireless Connection Beitman CD is $15 for U.S. and Canadian readers. Canadian orders will be sent by parcel post, U.S. orders will be mailed by priority mail. At these prices, I can't guarantee that everyone's computer software or hardware will be compatible with the Djvu browser plug-in software. Some have reported that the Djvu creation software will allow file viewing if the Djvu browser plug-in doesn't. We've had a few test CDs in the field, so far the feedback has been entirely positive. These CDs are being burned on my computer on a one-by-one basis, so don't expect a fancy label or colorful packaging!

To order the CD, please send your request to "Wireless Connection" CD Offer, Peter Bertini, 20 Patsun Rd., Somers, CT 06071-1810 with a check or money order for $15 enclosed. Readers outside the United States or Canada should first determine actual shipping costs by e-mail before attempting to order a CD.

In closing, here are the values of the caps show in **Photos D** and **E**. They are both mica (indicated by the first black dot.) The cap in **Photo D** is 1600 mmfd, and the cap in **Photo E** is 3900 mmfd. ■

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Incorporating a sensitive, high-performance analog tuner with digital frequency readout, the S350 receives AM, FM-Stereo, and continuous Shortwave coverage of 3,000 to 28,000 KHz, including all 14 international broadcast bands. Its classic analog tuning knob with superimposed fine-tuning control makes it a pleasure to operate, and the variable RF gain control, wide/narrow bandwidth selector and low pass filter give you complete control over incoming signals. Operates on 4 'D' batteries for long battery life.

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- Multifunction LCD shows digital frequency, clock, and more
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- Left/right line-level outputs (stereo in FM)
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FR200 AM/FM/ Shortwave Emergency Radio

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Key features include:

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- Hand-crank power generator recharges internal Ni-MH battery
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- Splash-proof ABS cabinet withstands your adventures and abuse
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Info Central

by Harold Ort, N2RLL, Editor

news, trends, short takes, and other things radio

"StormReady" Label Proves Correct For Ohio County In Recent Tornado Outbreak

To earn a January 2002 NWS StormReady designation, Van Wert County, Ohio, placed a series of warning alert systems in public locations, including the movie theater recently destroyed in the November 10 to 11 storm outbreak which killed 35 people.

Quick action by Van Wert Cinemas' manager Scott Shaffer and his staff got more than 50 adults and children out of theaters in the multiplex and into safer conditions in a hallway and restrooms. Minutes later a tornado tore off the building's roof and tossed cars into the screen and front seats where minutes earlier kids and parents had been watching *The Santa Clause 2*.

"This story illustrates a great success for the NWS, NOAA Weather Radio, and StormReady programs," said NWS Headquarters Warning Coordination Meteorologist Program Manager Stephan Kuhl. "It also illustrates the importance of establishing a close working relationship between our local NWS offices, our emergency management partners, and ultimately the communities that we serve!"

The theater office was equipped with a Federal Signal Corporation local warning alert system called the "Informer." The "Informer" is activated via a digitally encoded pager signal that automatically turns the unit on and sounds an alert. The theaters' unit was tied directly into the Van Wert County siren system and activated immediately once the Van Wert County Emergency Operations Center (EOC) sounded the warning sirens. The unit then remains open for "live" broadcasts by the emergency manager until the reset button is hit.

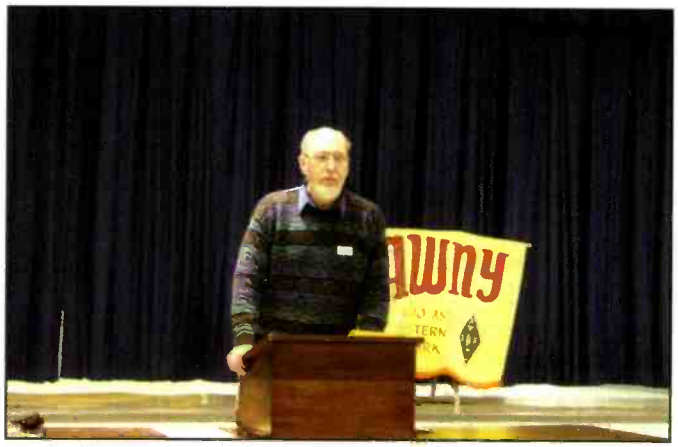
The Van Wert County EOC received the NWS Tornado Warning via a NOAA Weather Radio receiver tuned to the Fort Wayne, Indiana NWR transmitter frequency. Van Wert County Emergency Manager Rick McCoy received the warning and immediately activated the city of Van Wert siren warning system. McCoy also broadcast the NWS Tornado Warning and action statement live over the "Informer."

Seventy of the alert units and a number of NOAA Weather Radio receivers were purchased with grant money by Van Wert County Emergency Management as one of the requirements to become StormReady. Van Wert County was designated StormReady by WFO Northern Indiana on January 10, 2002.

"If we hadn't gone through the StormReady process and gotten our warning system in place before this storm, a lot of people would not have gotten the warning, and we could have lost many more lives," McCoy said. "All communities across the country need to look at becoming StormReady, because at some point they're going to have severe weather of some kind. People shouldn't say 'it can't happen here,' because it can."

The tornado touched down in Van Wert County with 13 min-

Joe Cooper, VE3FMQ, our "Computer-Assisted Radio Monitoring" columnist was the guest speaker at a recent meeting of the Radio Association of Western New York (RAWNY). The Radio Association of Western New York is believed to be the second oldest amateur radio club in the United States and has been associated with the ARRL for over 82 years. (Photos by Jim Collins, KA2IWK)



Columnist Joe Cooper fields a question at the RAWNY meeting.

utes lead time. It struck the movie theater 28 minutes after the warning was issued.

Sharpe Hams

I had the pleasure of meeting Diana (KB3JVC) and Scott Sharpe (KB3JVD) of Austin, Pennsylvania, at the recent Rochester, New York hamfest. Their ear-to-ear smiles told me something good just happened for them; sure enough, they just passed their Technician class exams. Diana said,

A bit over three years ago, I bought the book *Now You're Talking!* I never finished more than the first chapter until the week of the Rochester Hamfest. A week before it began, Scott said we were going and we would take the exam. He studied Sunday through Tuesday. I then studied Wednesday and Thursday. We quizzed each other on the three-hour drive. We passed with high scores, bought a radio, and waited anxiously for the database to show our callsigns.

On Wednesday, we were legal to transmit! We couldn't hit a repeater from our house (we live in a small, narrow valley), but Scott had borrowed a radio from a friend so he drove around so we could at least say we had transmitted. Now we are researching antennas and more powerful radios. We look forward to the Morse and General exams, which we hope to pass this year.

Is their young daughter, Faith, a future radio enthusiast, too?

International Broadcasters Must Move

By 2009 international broadcasters must move off 7100 to 7200 kHz. That's the news from the recently concluded World Radiocommunication Conference (WRC-03) and decided by the International Telecommunication Union (ITU0). The band segment will then be available to amateurs worldwide.

Hams had sought a 300-kHz allocation. It's the first time the ITU has moved an HF broadcasting allocation to make room for another service. Currently, amateurs in the Americas must compete with broadcasters for nighttime communications on 7 MHz.

Morse Code Dropped By ITU

The requirement for amateurs operating below 30 MHz to pass a Morse code exam has been dropped by the International Telecommunication Union (ITU). The change took effect on July 5. They've left the question of requiring a code test optional for each government licensing authority. Several countries, including the United States, still feel the code is important as a license requirement.

FCC rules still require passage of a five-word-per-minute code test for access to frequencies below 30 MHz, but many feel the opponents of the code requirement will quickly file petitions with the FCC to drop it.

BBC, VOA Allowed To Use All India Radio (AIR) Stations On Reciprocal Basis

The Prasar Bharati [broadcasting] Board of India has decided to allow the British Broadcasting Corporation and the Voice of America to use the All India Radio (AIR) platform to broadcast some of their programs, provided the AIR is allowed to use their radio stations to air its own programs

Since both public broadcasters are governed by rules which do not permit them to raise revenues, the Prasar Bharati has decided to market the programs they bring in—and keep the revenue. Also, in the case of VOA, which does not have a domestic channel, the Prasar Bharati has retained the option of charging the broadcaster a slot fee if AIR does not want to air programs on its overseas radio stations.

A decision to this effect was taken after both BBC and VOA approached the Prasar Bharati. While the Board warmed up to the idea on a reciprocal basis, it has been stipulated that neither broadcaster would air programs relating to news or remotely connected to current affairs.

All India Radio Eyes AIRtime For Foreign Broadcasters

Here's another chance for Prasar Bharati to earn quick bucks—this time from foreign broadcasters. Foreign broadcasters would have to shell out anywhere from $300 to $700 per hour for purchasing time on AIR, depending on the power of the transmitter and time of transmission. The fee has been kept on the high side, keeping in mind the paying power of foreign broadcasters, sources said. The proposal is for AIR's mediumwave and shortwave frequencies.

AIR, it was learned, is already in talks with transmission companies such as TDF of France and WRN of the UK. It is an accepted norm in some countries in the West for transmission companies, such as TDF, to strike deals for broadcasters, sources said. Interestingly, a few months ago, the BBC had launched a weekly program on AIR FM, on an experimental basis. Due to "internal" resistance, the program was taken off, an AIR official admitted.

Currently, certain AIR FM time slots are open for sale. The fee varies from $100 to $200 per half-hour in the case of FM. Again, the rate depends on the city and time of transmission. ■

ScanTech

by Ken Reiss, radioken@earthlink.net

strategies and techniques to keep YOU informed

Working With Multiple Radios!

One of the questions I get from people just getting started goes something like this: "I've just gotten my first scanner and don't have anywhere near enough channels to fill up all the memories. I keep seeing pictures of people with lots of radios. Why?"

Well, that's not an easy question to answer, but let's try. There are two good reasons and one not so good that come to mind right away.

One reason, of course, is for extra capabilities. Most people who have multiple radios didn't buy them all at once, but rather accumulated them over several years of listening. As new radios came out with capabilities or frequency ranges that weren't available, a new one was added. But the used market often doesn't make it worthwhile to dispose of the old radio, so it finds another use somewhere in the shack. A good example of this has been the trunktracker radios of recent years. If you live near a trunking system that those radios can follow, you'll want one regardless of the equipment that you already have.

The other reason is to get more banks. As you begin to listen more, you start to focus on things that are of interest. You also begin to learn what frequencies are active at what times. Many frequencies are only of interest when something major is happening, and the rest of the time the traffic is of little interest. Being able to switch in a bank quickly (and without having to stop and reprogram a radio) makes all the difference in hearing the early action in many cases.

Banks Of Banks

If you think about it for a minute, banks are really the "channels" of your scanner. Bear with me for a second, and forget about channels in the "200-channel scanner" sense. I'm thinking more like TV channels; there are also "programs" you want to listen to on your scanner. In this sense, I mean groupings of things that make some sense to monitor together because they have something in common.

With multiple radios, you have multiple groups of banks. If one of your radios is old enough to still need crystals, then that "bank" is pretty much fixed and can't be reprogrammed easily. But, for most of us, the programmable scanner means that we can move frequencies around easily and pretty much at will. If you've ever reprogrammed a 500-channel scanner, you know that it takes a lot of will and patience.

Switching on and off a bank can be done rapidly—much more rapidly than locating a particular frequency and locking it out (on most scanners anyway). It's also easy to tell which banks are turned on or off. Making use of this "grouping" function allows you to get much more mileage, and ultimately information, from your scanner.

Service Or Geography?

Most of the methods I've seen come down to separating the channels by the type of service that uses them (such as police, fire, medical, and ham) or by area (all of the "south" stuff in one bank, "north" in another, for example). Quite frankly, I hadn't really given it a whole lot of thought until I started messing with computer control systems and it became possible to reorganize banks quickly and easily.

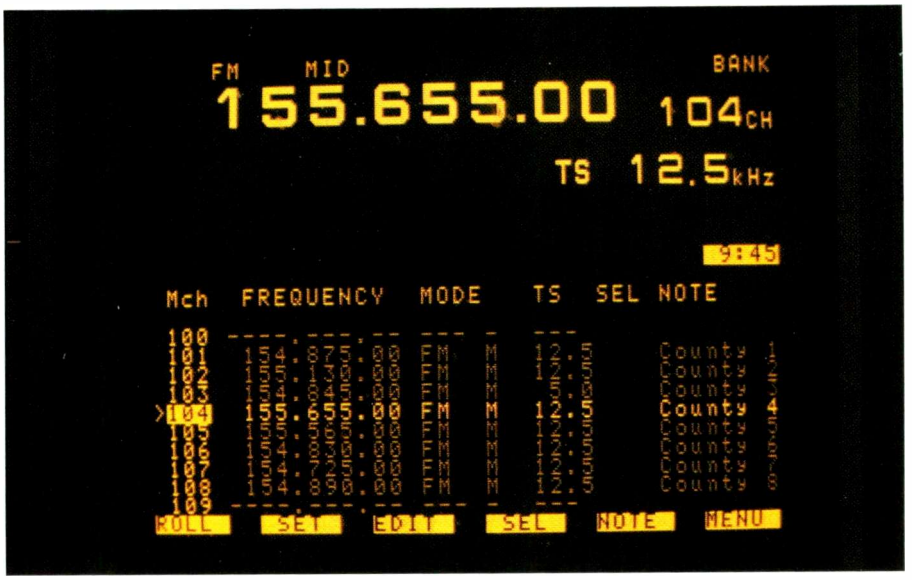
I had always been pretty much a service fan. All of the county police channels in one bank, city in another, state and outlying areas in another. Then there was a bank for fire. Then it depended on the radio as to how much room I had to put together any others. This method works quite well if you're interested in a particular department or section of scanning. Or if you seldom listen to a particular service, but want to have them

Even the old stuff can find a use. Put a few seldom heard but very interesting channels in that old scanner and let it run. Or put all the fire channels in one radio and the police in another. It's amazing how much more you'll hear!

handy for when something does happen (assuming, of course, that you have open banks to store them in). This method also works well for scanning from a fixed location, like home.

The primary disadvantage of this method comes to light when you get into a busy radio environment. If you have a busy police department with several channels, it's entirely possible that your scanner can be held up for quite some time plowing its way through activity, stopping here and there as it goes. Perhaps some of the channels are not of much interest, but if they are grouped together by service, you'll probably have them active. It's entirely possible that you'll get tied up on some major event in the police bank and miss some other event in another bank. Of course, there's no complete cure for this, but you can mitigate the damages a bit by planning.

Having another radio doesn't hurt either. Eventually, if there's enough traffic, you'll either have to give up listening to some channels or add another radio just to have a chance of hearing what's happening. Often if a second radio is available it can be parked on a single channel where the main action is happening while the other one scans. You can pick up a lot of detail in a hurry this way, if you pick the right channel to park on.



Large communications receivers may or may not have banks. This R-9000 from ICOM features 10 banks of 100 channels each, but there is no good way to scan more than one bank at a time without computer assistance.

Geographically Speaking

The other popular method of organizing your scanner is by area. You can put all the south side stuff in one bank, all of the north in another. This means that probably some channels will have to be duplicated, like mutual aid and point-to-point channels that are in use no matter where you are. Things like fire dispatch and medical services may also not follow clean geographic lines and have to be duplicated as well. it seems like a waste of channels.

Well, back in the old days of four- and 16-channel scanners, I would have agreed. Of course, most of the four- and 16-channel radios didn't have banks anyway, so the point was moot. However, with today's 200-, 400-, and even 1000-channel radios, some duplication begins to be a little more tolerable, and even make some sense at times.

Here's another case in point. Our county is divided into seven precincts. Most of the precincts have their own dispatch channel, although a couple of them are shared. There's a detective channel, a car-to-car channel, and an emergency channel that are shared county wide. As I mentioned earlier, I used to keep all of the police channels in one bank and scan them all full time.

The problem is that in the car, particularly with a handheld, if you're up in the north precinct, you can't hear much of what's going on in the south precinct. It's simply too far away to get much of anything but static.

In addition, there are several municipalities within the county (somewhere around 80), some of which have their own police departments and some that do not. Some of the municipalities which have their own departments also have their own dispatch, but some contract it out to other departments or even the county. The county has an additional two channels dedicated just to these municipalities, one for north-side stuff and one for the west group. So, in addition to listening to the county precinct you're in, here you also have to follow these municipal channels—and there's a bunch.

Finally, I got the bright idea "why not give each precinct a bank?" (I may be old, but I'm slow.) It could include the precinct channel, any municipalities in that precinct that I care to listen to, the fire dispatch channels that cover that area, and the shared channels that I want to listen to most of the time. In addition, I created a bank of all fire, one for air stuff (when I'm near the airport at lunch time), and one or two left over for experimental stuff or special events.

Works like a charm. I simply switch banks on and off like I did the channels, but now I'm not missing all the action on other frequencies in the area. The tradeoff is that there is a lot of duplication in my scanner, and there are several banks with very few channels in use. Oh well.

Here again is a great excuse for an extra radio. I certainly wouldn't want this arrangement at home, so a handheld for strictly mobile use makes sense (or a mobile scanner mounted in the car, but that's another story). The point here is that this radio really isn't a "multiple radio" system, because that radio is removed to a special use.

Event Scanning

A friend of mine is a nut for special events. Hmmm...come to think about it, even if he didn't like special events, I'd be half right. Anyway, he groups many of his scanner banks by event. He has a handful of channels that he likes to listen to all the time, and dedicates one or two banks in one of his scanners to that, mostly grouped by geography. It's mostly local stuff that he's interested in tracking. The rest of the banks in his radios are dedicated to one type or another of special event scanning, some of which border on services, but some do not.

For instance, there's a bank for severe weather events. Any time during the year that severe weather threatens, he flips this bank on and immediately has access to the

highway department, weather observation channels, ham radio frequencies that are used for storm spotting, etc.

You can make a challenge out of this type of thinking. Consider an event that is likely to occur in your area. What would happen, say, if the President came to your town? Okay, if you live in the District, this won't be very challenging, but if you live somewhere else, think about it. What kind of frequencies might be active because of a VIP visit? Would the person receive Secret Service protection? They're mostly encrypted, so you can't listen to them, but activity on those channels might tip you off that something was about to happen.

Would your local police have a role? Sometimes they're used to provide traffic control and other assistance. What frequencies might they use? How about medical services, or fire? News coverage? You can fill up a bank pretty quickly with good possibilities.

Now, depending on where you live, you might have to wait a long time to see just how good your guesses were. But once it happens, it can be quite a lot of fun and get you in on the action just a bit earlier, particularly if you have more than one radio and can dedicate a bank to channels you don't need very often. Even if you can't spare a bank, you can think about the frequencies and write them down somewhere. That way, you'll have the planning done if you hear something's happening and can reprogram quickly. You do have a list of the frequencies that are normally in your scanner, don't you?

Another possibility might be if a factory, school, or other major facility near you had a major event. It could be a celebration of some sort, or a disaster situation. With the recent rash of school violence, there are all sorts of possibilities. SWAT operations seem to be showing up more frequently in many parts of the country. Do you know where to find your local special operations? Our county has a frequency set aside for such events, but once at the scene they switch to an unpublished and unannounced channel. Since it's all low-power stuff, you won't hear much unless you're too close for comfort!

What frequencies would be in use? What outside agencies might be called in? If you are located within listening distance of any large facility, chances are that they use radio during their day-to-day operations, most of which are probably very boring. But if something happens, having those handy might get you information that you wouldn't have until the evening news. In the event of a major local disaster like a chemical spill, that could be very good information to have in advance.

Some of the later Uniden scanners featured as many as 20 banks. A-J and 1-10 could be switched on and off quickly. This made the 8500 and 9000 family of scanners a great choice for event listening.

Hopefully, you'll never get to test your theory, but it's fun to plan. And maybe they'll have a smaller event or drill just for you to test things out on.

Parking

Another use for multiple radios is to park them on a particular frequency as something catches your attention. By not scanning, of course, you'll hear a lot more of the activity and callback traffic on that channel. Of course, you'll be missing everything else if you only have one radio. By having an extra radio to park on an interesting channel, you can get a lot more of the action, and perhaps even know when to anticipate traffic on other channels.

By listening to the police car-to-car traffic for an accident, you'll learn that they've requested the fire department. Switching to that bank in another scanner might help you learn more as they dispatch and arrive at the scene. The more radios you have available for this process, the more you can track closely (as long as there isn't so much activity that you can't concentrate on anything!).

I know many enthusiasts have a dedicated "fire radio" that is normally programmed with only fire dispatch channels. The theory is that something on the fire channels is much more likely to be an important event than the other stuff we listen to most of the time. Once an interesting event occurs, the fire radio could have banks to switch on for the local or fireground channels used by a particular department. This leaves your regular scanner free to listen to all the routine police, air, ambulance, drive-through window traffic, and other things that are interesting when nothing is happening. But you won't miss the big fire because somebody was running a license plate or ordering lunch.

Here's some more advice from the AOL Radio Listener's Conference. Armadillo's first law: You can never have too many radios. At one time, having more radios meant more channels. At one time, more channels meant an extra four, eight, or 16 channels, and every one was a precious (and expensive if you had to buy crystals) resource. That's simply not true in these days of multi-hundred channel receivers that are so common.

Trunking Systems

Trunktracker radios have made the need for organization quite apparent. While many of the newer trunktracking receivers can, in fact, mix conventional and trunked banks into a single radio, it may not be at all practical. Large trunking systems are busy almost all the time, and even if you're only interested in a few select channels, there's a good chance that something will occur and you'll miss it while you're off in the radio's conventional mode. It is possible, but my experience with even moderate trunked sys-

tems indicates that two receivers is a much better option.

You can, however, still group your ID lists together in banks, or scan lists as they're called, at least on most radios. Most trunk system listeners eventually settle on a group of IDs they like to listen to, and have another group that they don't want to hear at all. Using the ID list function allows you to group those IDs that you want to listen to into logical "channels" or "virtual banks" in your scanner. By turning them on and off, depending on what's happening at the time, you'll find your listening can have a lot more continuity. You'll hear the outcome of more stuff, and the follow up calls will make sense to you. Even on a busy system, if you pick and choose your IDs carefully, it will increase your understanding of what you're hearing.

What Do You Use?

As you can see, there's no one right answer to this question. It depends a lot on the kind of events that you are likely to see in your area, as well as how much you want to listen to. There's a balancing act between scanning too much so that you can't really follow anything, and listening only to one channel so you follow all that traffic, but miss everything else.

Frequency Of The Month

Our frequency this month is 460.700. Have a listen and let me know what you hear, even if it's nothing! We'll enter your name in our quarterly drawing for a one- year extension on your *Pop'Comm* subscription. Please put the frequency in the e-mail or on the envelope front so it can be routed to the correct place for entry! Send in your monitoring results by e-mail to radioken@earthlink.net or via snail mail. Remember, I'm always interested in your comments or questions. Send information to Ken Reiss, 9051 Watson Rd., #309, St. Louis, MO 63126.

Until next month, Good Listening! ■

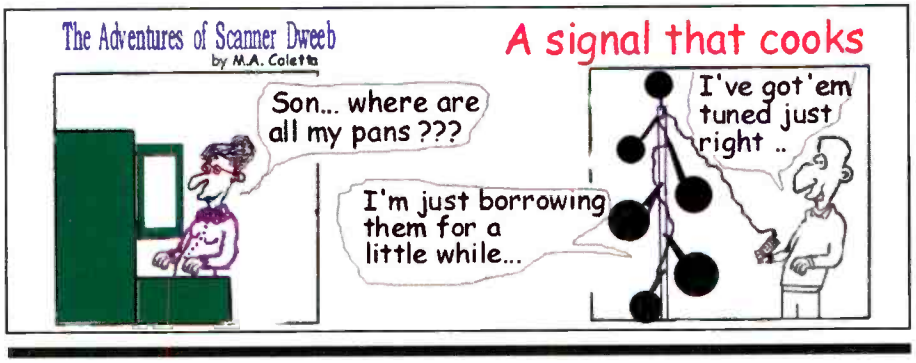
Banks You Might Consider

Here are a few ideas to get you started. This list is by no means exhaustive.

Service
Police
Fire
Medical
Media
Aviation
Military
Ham
Business
Malls
Casinos
Unknown or Experimental
Schools
Railroads
Busses/Taxis
All-the-time stuff
Mutual Aid/Shared frequencies
Maritime, Lake, River

Geographic
City
County
Local
North, South, East, West
Out of State
Your City
Neighboring City
Precinct or District

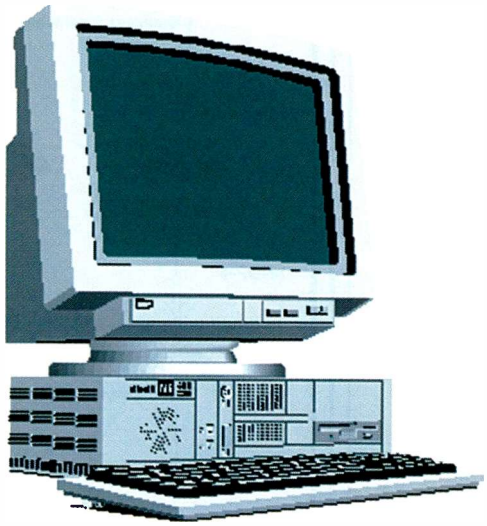
Special Banks
Airport Problems
Parade/Fair
Rail Accident
Major Vehicle Accident
River/Lake/Ocean Incident
Industrial Incident
VIP Visit
Jail or Prison Incident
Major Media Event
Sports Event
Severe Weather
Natural Disaster
Major Fire
Riot or Other Civil Disturbance
Concert or Theatre Event
Special Use Channels (emergency, detectives, traffic, etc.)



computer-assisted radio monitoring

by Joe Cooper,
carm_popcomm@hotmail.com

Audio Digital Recording—Part I



Next to hearing static and noise, the number one frustration experienced by radio monitors is...not being able to hear it! The next most frustrating thing is monitoring a station or signal and *missing* what was sent or said because you couldn't pick it out.

This is the reason that, next to a good antenna, the serious radio listener's best friend is the trusty tape recorder. With this device you can record a radio signal as you listen to it, or, if your radio has a timer, record a signal when you're not there to listen later.

Many hours of radio communications have been stored in this manner, capturing events ranging from the historic to the trivial. So, no matter what changes take place in radio technology over the next few years, you can bet that someone out there will still be recording off the air one way or another.

Over the next two columns I will be looking at the digital recording techniques currently available for personal computers. As you'll see, PC computer-based digital audio recording has moved far ahead of more traditional analog techniques, such as tape recorders, even in the last year. The main reason for this superiority lies in the digital techniques of signal sampling and processing.

In this month's column I'll introduce you to the basics of audio theory so you can appreciate the techniques used to make recordings. Next month I'll introduce you to the software you can use to easily make your digital recordings. Let's begin this month by looking at some important legal and ethical issues regarding the recording of audio signals off the air, then move on to an overview of the differences between analog and digital audio recording.

Audio Recording And Copyright Laws

Making audio recordings of what is coming out of your monitoring radio's speakers is governed in much the same way as radio monitoring itself; that is by democratic law, some gentlemen's agreements, and a lot of common sense.

The rule of law regarding radio monitoring states that you can listen to whatever is not specifically prohibited, such as cell phones, as long as you don't share private information you've heard with other people or use that private information for financial gain. The same holds true for recording material off the air, which is permitted as long as you abide by the rule of "Fair Use."

The term "Fair Use" is important, in part, because anything original expressed by anyone through a concrete "medium of expression" (radio, for example) is automatically copyrighted. This is true even if the sender doesn't attach a copyright notice to what is being expressed or formally register it as a copyrighted item with the government.

All the rules about copyright are laid out in simple English in the U.S. Copyright Act, 17 U.S.C. If you're thinking about making recordings off the air you should read it. You can find a copy with the help of your local public library or by going to the U.S. Copyright Office website at http://www.loc.gov/copyright/. You can download for free the entire Act or those portions of it that are relevant for you.

For those of you who want to record off-the-air signals and want to understand what the legal concept of "Fair Use" is, go directly to Chapter 1, Section 107 of the Copyright Act and read what it says. From my reading of the section (and remember, I'm not a lawyer, just a journalist), I understand that you can make audio recordings for the purpose of "criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research." Frankly, I've always seen the legal justification of the hobby of radio monitoring in these six examples.

The justification based upon "research" appears to be the strongest rational for making recordings off the air. After all, when we're using our monitoring radios aren't we researching what exists on the publicly owned radio spectrum by tuning through the various frequencies? And who's to say that what you're listening to may not one day become the subject of a newspaper or magazine item—be it an article or a radio log? That recorded material could eventually be used for a course taught by you, even if it's simply instructing a friend on how to use a radio properly. Certainly anything that is transmitted is open for comment, as long as the terms of secrecy outlined in the Radio Act are followed.

As you read through the U.S. Copyright law, you'll see there is nothing legally wrong with making off-the-air recordings of your monitoring events, as long as you respect the ownership rights of the creator of the material, as is outlined in that law. That simply means you cannot deprive the copyright owner of income by making the recording, or make a mockery of the work by "mutilation," or by significantly changing it to make it into something new, then claiming it as your own. Likewise, you obviously cannot sell what you record off the air unless you have explicit permission from the copyright holder to do so.

Also, when you record something off the air, you must leave

it as it was originally heard to satisfy the "Fair Use" provisions of the Copyright Law. Obviously, however, you can edit your copy for length or to extract a specific item you want to save (AM radio station jingles come to mind).

I think that resolves the legal issue of making such recordings as far as this column is concerned, though I welcome comments on what I've presented here. So let's get on to the business of how to actually use your computer to record audio.

Getting Started In Audio Recording

Why would you want to use your computer to record audio signals from your radio? As I said, the trusty tape recorder has been around for years and most people have mastered the basics of using one. In fact, there are even a few popular monitoring radios out there that have tape recorders built into their cabinets.

To understand the advantages of using your computer to make audio recordings you first need understand exactly what it is you're saving when you record, no mater what method you use. You should also understand how each technique records the sound and how each affects what you hear when you play it back.

Actually, it all boils down to what sound is.

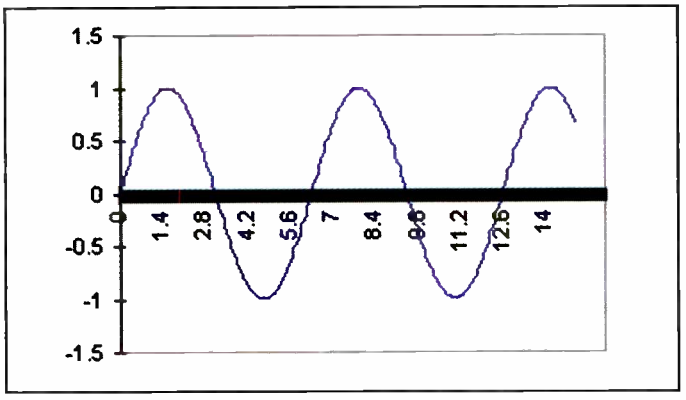


Photo A. This is a graphic representation of sound, shown as a sine wave. You have all of the components of sound, which is frequency (number of cycles per second it oscillates) and amplitude (how loud it is by the peak of the wave).

Sound 101

In its simplest form, sound is a wave of compressed air that makes our ear drums move back and forth, causing nerve impulses to flow to our brain. It is when the nerve impulses are properly interpreted by the brain, and organized into a form that our minds can understand, that they are actually heard as sound.

In graphic form, sound is generally represented as a sine wave (see Photo A). Waves have many characteristics, such as frequency, wavelength, and amplitude (which I will introduce to you in more detail as we cover this topic). While pure sound waves can be very precise looking when graphed, sound waves in the real world are made up of a multitude of different frequencies. Sound as we experience it is very complicated, containing many different frequencies of different amplitudes.

To process natural sound into electronic media, such as sound recordings or the audio output of a radio, those waves of compressed air must be converted into electrons by some means. This is generally done through a microphone or a line plugged directly into the audio output of a radio. Once this conversion takes place, the electrons produced move through electronic circuits as electrical impulses, where their characteristics are acted upon through processing or amplification. For instance, whenever you change the sound of something you're listening to on the radio by either increasing or decreasing its frequency range (treble or bass settings) you are processing the signal. Likewise, changing the volume control setting changes the level of amplification that is taking place within the radio's audio circuits.

When these electrical impulses finally encounter a loudspeaker or headphones they are converted from electrical energy back into mechanical energy. That mechanical energy moves a diaphragm (either the speaker cone or a vibrating plate in the headphones), which compresses the air near it. The compressed air then reaches our ears, hitting and vibrating our eardrums, which convert that energy into nerve impulses that our brain uses to experience and interpret as sound.

Without getting into too much theory (I've probably used too much for some people already) our brains seem to prefer clear signals, because we find so much information in sound. When somebody speaks we are able to make sense of what they are saying, and when people play music, we are able to pick out notes. But to do this, the sound must be loud enough and clear enough for us to understand. When you add a lot of extraneous sounds to what you're listening to, your brain starts to have problems processing the information. These additional sounds are heard as noise. The more noise there is, the greater difficulty the brain has in finding the particular information it is trying to understand.

Analog Recording With Tape

This brings us back to our tape recorder. If there's one thing it does very well, it is to record everything it "hears." This results in what is known as an "analog" signal, which is simply a signal that includes absolutely everything that can be picked up by the recording device.

If the signal being "heard" by the tape recorder is very good, the signal is said to have a lot of fidelity (ranging from "high" to "low"). This term simply means that the noise is (subjectively) hardly heard when listening to the sound played back, while the information (voice, music or natural sound) is (again subjectively) very strong and clear.

The problem with using an analog tape recorder is in controlling the level of noise that's recorded along with the information you want to hear. The success in doing this can be expressed as either fidelity (a subjective measurement) or signal-to-noise (S/N) ratio, which can be objectively measured with audio test equipment.

When you make tapes of sound in a controlled environment, such as a professional audio studio, you can achieve very high fidelity in your recording. However, when making tape recordings in the real world, particularly when the signal is coming from the noisy world of radio waves, it's much harder to achieve the same level of fidelity. Typically, when you use a tape recorder you wind up with a low signal-to-noise recording. While there are techniques that can "dig" a signal out of the noise, generally they're very expensive and the results are not all that great.

There's also the issue of the noise that's a natural component of the tape you are using to record with. (Just play a brand new tape and listen to the hiss). This is where digital recording comes in. While not as convenient as using audio tapes, digital record-

ing media produce excellent signal-to-noise ratios with great fidelity which more than makes up for the extra effort involved.

Digital Recording Basics

First, what's the difference between digital and analog recordings? Let's say you've placed a music CD into your computer's CD player. When you play it, it produces a signal in the computer as it would in any electronic device. However, rather than being the complex sine wave of an analog device (such as, an old-style LP or 45 record player), the signal is represented by a series of zeros (0) and ones (1). Rather than the sine wave that you would find in an analog electronic device, the computer moves the data through its circuits as electronic pulses, which are represented as zeroes or ones. The computer is merely representing the sine wave as those numbers.

This method of representing analog sound as numbers is called "sampling.". The most important thing to remember when comparing a digital signal to an analog one is that analog recordings pick up everything, including noise, while digital recordings only record small samples of what you hear, but with less noise (see Photo B).

With analog recordings all you are concerned about is controlling the level of sound (volume) and the fidelity (treble and bass), but with digital you have that plus the rate at which you're sampling the sound. As I'll be showing you, the greater the sampling rate, the closer the digital recording will be to the original source. The problem with this is that the more samples you

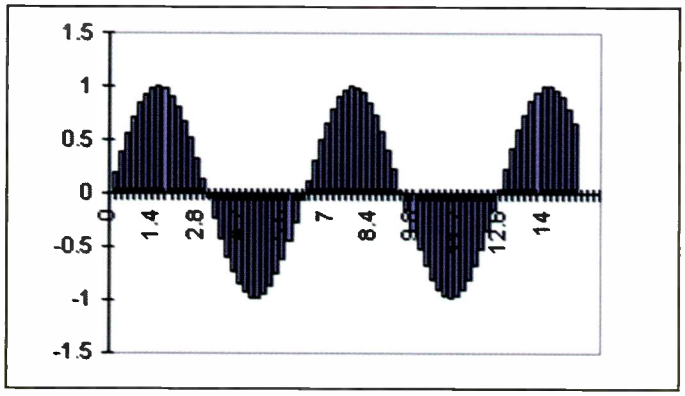


Photo B. This picture shows you how a sound wave is sampled into a digital representation. See how each part of the sine wave is sliced up into a small part. The computer takes these samples and stores them as zeros and ones. When it is played back through the sound card, the sampled bits are used to reconstruct the sound wave. The more samples you have, the more accurate your reproduction of the original sound.

make, the more data you place into your computer. As a result, a highly sampled sound will be a larger file than a less well-sampled sound. The trick is to work out which sample rate is best for you, given your particular recording requirements.

Fortunately for radio monitoring purposes, the amount of sampling required to achieve excellent results is not as great as that needed for digitally recording a symphony orchestra. So you'll be able to save your audio recordings in files of reasonable size.

There are also a number of ways of dealing with the size of an audio file without changing the sample rate. This is done through the use of various data compression techniques, which I will cover in more detail in next month's column.

Next Month

Next month I'll outline the actual techniques used to record digital sounds with your personal computer. I'll show you how to properly set up sampling rates and other key settings using several digital recording software packages appropriate for radio monitoring, including some already available in your Windows operating systems.

Feel free to write to me with ideas, comments, and suggestions. My mailing address is "Computer-Assisted Radio Monitoring," C/O Joe Cooper, PMB 121, 1623 Military Rd., Niagara Falls, NY 14304-1745.

You can also e-mail me at my new address, carm_popcomm@hotmail.com. But please don't use the old one at joe@provcomm.net, because it is becoming unusable due to the amount of spam I receive each day (well over 100 junk e-mails). I'm finding that because of this spam I am missing important e-mails from my readers. The hotmail account offers some protection from that and it's a dedicated e-mail address for the column that makes it easy for me to sort through. Thanks in advance for your cooperation.

Don't forget that I can't answer general questions about computers, software, or operating systems, but I will do my best on any questions about the content of the columns or computer-assisted radio.

Thanks again and I hope that the information provided here helps you get more out of your computer and radio monitoring than you ever thought possible. ■

by Gordon West, WB6NOA

All The Buzz About Digital Selective Calling

Don't confuse the red Channel 16 button with DSC. DSC capability works on Channel 70.

Recreational boaters, commercial mariners, and shoreside rescue agencies all know the importance of marine VHF. Marine VHF channel 16 (156.800 MHz) is the international distress frequency and is monitored by federal and state emergency groups throughout the country, as well as by rescue agencies along the shorelines of the world.

The United States Coast Guard is rapidly deploying its "Rescue 21" Channel 16 seaside system, which will turn into a national automated "911" radio watch where Coast Guard Group stations will tie into computerized automatic VHF location capabilities. All incoming calls on channel 16 will allow instant playback; there should be no gaps in VHF coverage throughout most boating areas of the United States. Rescue 21 will completely cover the continental coastlines, up to 20 miles out, plus the Great Lakes, western rivers, Puerto Rico, Hawaii, Guam, and Alaska.

For longer range ocean voyaging, the Coast Guard also maintains high-frequency, long-range distress and working channel watches, too. But, on local boating waters, including popular inland lakes and rivers, marine VHF channel 16 is the recognized channel to call for help in an emergency. While there may be many boaters in the area with marine VHF turned on, their set may be on another channel and might miss the call.

Enter VHF Channel 70

Marine VHF Channel 70 (156.525 MHz), part of the February, 1992 Safety of Life at Sea (SOLAS) distress and safety telecommunications system, has come to the rescue. Channel 70 only carries data calls—no voice.

All modern marine VHF radios now contain digital selective calling (DSC) capabilities on marine VHF Channel 70. This was an FCC mandate several years ago on all new design marine VHF radios. Most buyers had no idea why their new marine VHF came with some sort of an emergency button.

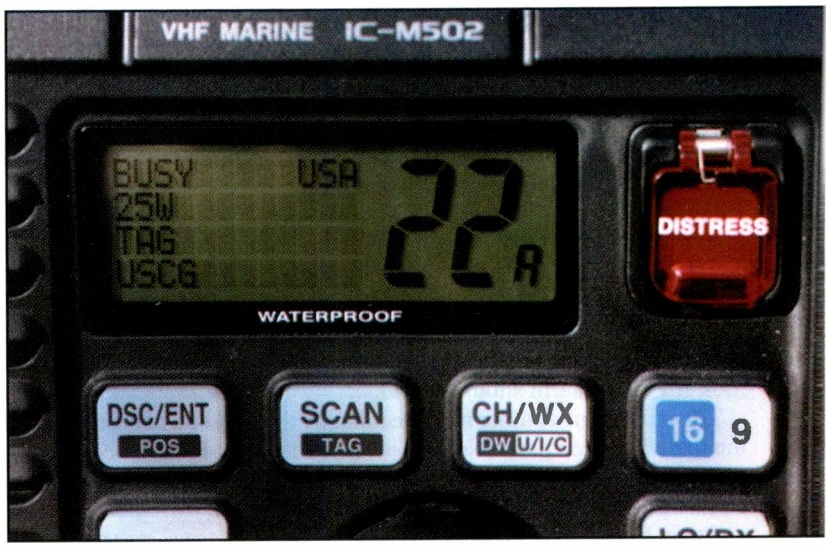
"Digital selective calling may reduce or eliminate the congestion problem on the VHF distress and calling channel, Channel 16," according to the Commandant of the United States Coast Guard. "Digital selective calling provides rapid receipt of a distress alert," adds the Coast Guard official release. "DSC provides a pre-formatted distress alert which includes vessel identification, location, and other vital information, which can be transmitted within a second or less. With this capability, vessel operators not having time to send a complete Mayday message over radio by voice could then send a complete DSC distress alert," adds the Coast Guard Commandant.

Unfortunately, while the VHF marine radios with added digital selective emergency calling capabilities are in place, most boaters have little or no idea of what it takes *ahead of time* to make their marine DSC VHF radio fully compatible with distress signaling.

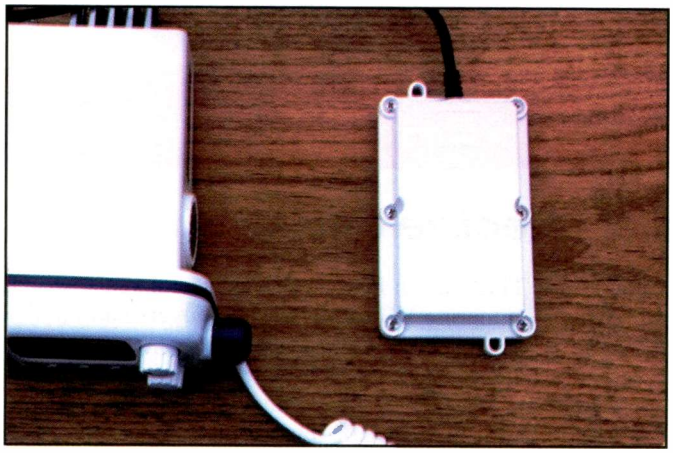
In An Emergency

The new marine VHF radio with a digital selective calling red distress button may indeed be capable of sending out a distress alert on marine VHF Channel 70 straight out of the box when hooked up to 12 VDC and any kind of an antenna system. But the sequence of pushing the buttons makes a big difference in whether or not the distress call ever goes out!

A quick push of the red button will do nothing. It takes five seconds of holding the button down before the radio is ready to



The DSC distress button is on the top right of this ICOM ICM502 marine transceiver.



The Uniden marine radio with 900-MHz wireless controller.

send out the distress. On some radios, after five seconds, the button must be released and then depressed again to set off the transmit alarm. In an emergency, it could be fatal if mariners don't know this and think a quick press of the red button is calling for help, when actually the radio doesn't do a thing.

When the distress button is properly depressed, the radio sends out an extremely loud tone. After about a second the transceiver drops back to receive, listening to an acknowledgment of the distress call on Channel 70. After five seconds, the transceiver automatically switches to Channel 16 for a voice contact with any other vessel.

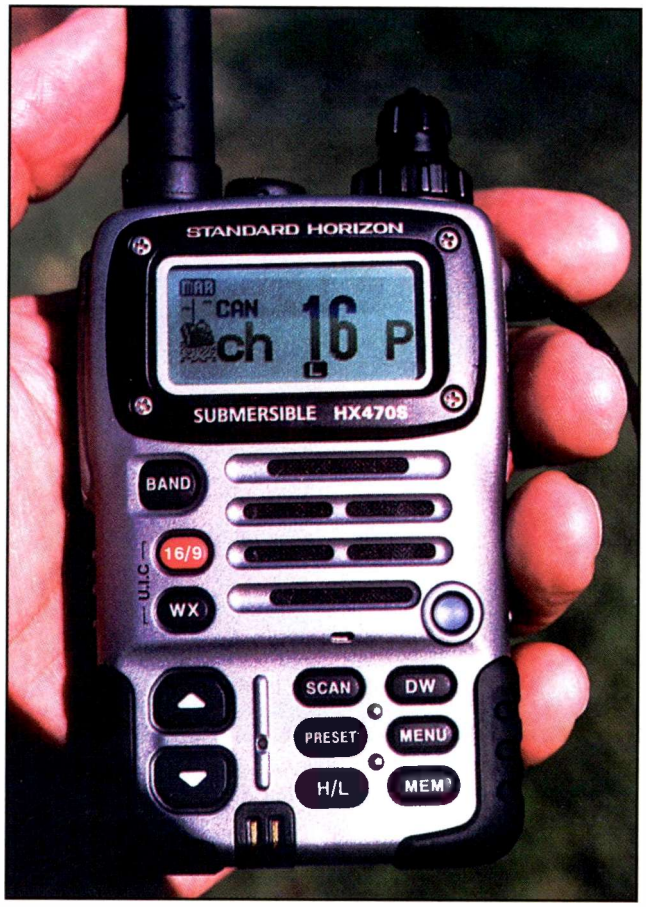
Other boats in the area with marine VHF digital selective calling will hear a very loud tone come out of their radio, and then notice that *their* radio magically switches to VHF channel 16. This would be the time for those boaters in the immediate vicinity to pick up their mics and ask for the boat in distress to pick up theirs and give some details about what's happening aboard.

Also, many new radio buyers may not realize that the distress alert requires several pre-event settings. The distress alert *could* and *should* contain a nine-digit Maritime Mobile Service Identity (MMSI) number. This is the DSC VHF radio "phone number" and identification. Numbers may be issued by the FCC when applying for a ship station license. But most mariners who cruise *domestically* don't require the FCC ship station license, so they can't get the number from the FCC!

Private industry, however, has circumvented this Catch 22 by making it easy to obtain an MMSI number by simply logging onto www.boatus.com or www.seatow.com. Navigate to their emergency equipment pages, then follow the instructions for your very own nine-digit MMSI number.

For ship stations, including little canoes and watercraft, the nine-digit number always begins with 36. This registered number is kept in a database that the United States Coast Guard can quickly retrieve in case of a distress alert with a nine-digit MMSI number. This lets the Coast Guard look up the information on your particular type of boat and have a better idea of what to look for if the alarm should sound.

This nine-digit number must be input by the radio owner *after* the radio has been purchased. It seems to me it would have been a lot easier to have radios already assigned with an electronic serial number, but it's up to the owner to obtain their own MMSI and then follow the steps in the instruction manual to assign that number to their marine VHF radio. BoatU.S. (Boat Owners Association of The United States) reports over 10,000 MMSI



The new, but not FCC-approved, marine VHF handheld from Standard Horizon with DSC capabilities.

numbers in the database, but expresses concern that the FCC may have also issued an MMSI number for that same boat if the owner plans to take it into Canada (requiring an FCC ship station license). The *FCC* MMSI number is what goes on record, not the BoatU.S. MMSI number.

Out of the 10,000 numbers issued, there is a question as to exactly how many radios actually have the number input into the distress circuit. By law, users only get two tries to input the number correctly; after the second try, the radio electronically blocks out any further MMSI number input. While inputting the numbers is not a brain-buster for the savvy radio operator, most boaters will probably wait until another day before they sit down with the instruction manual and give it a try. Then, when an emergency hits, the distress may go out, but not accompanied by an MMSI number within the distress datastream.

BoatU.S. is proposing to develop an online DSC radio tutorial for recreational boaters to show how to input the number on any VHF marine radio and how to use the distress button in an emergency.

The DSC radio will also take input from an activated GPS set, sending latitude and longitude within the distress datastream. This requires hooking up the onboard GPS to the marine VHF radio. In some cases, boaters would actually be required to do their own soldering of tiny wires onto microscopic pins—something totally out of the question for mariners not adept at micro-solder techniques. One prominent ham radio manufacturer with a top-of-the-line marine VHF with DSC requires this solder job—ridiculous! The GPS con-

nection should simply be a twisting together of two wires, or, alternately, everyone should agree on a common GPS input to their radio.

And there's a lot more than just twisting two wires together to get the radio to show GPS positioning. Often the GPS must be properly formatted to output the right data sentence structure for the marine VHF to show position on the screen. Again, most recreational users have little guidance on how to make this connection work.

One organization, called the Radio Technical Commission for Maritime Service (RTCM), has a task force to help disseminate information about the importance of having a marine VHF DSC radio properly registered and tied into an operating GPS (visit http://www.rtcm.org for more information). One of their best suggestions is a marine DSC VHF radio with a built-in GPS. I would go one step further and suggest a pre-assigned MMSI number as a sure way of improving on our new marine VHF distress safety system.

The United States Coast Guard will soon come online with a sophisticated Rescue 21 marine VHF monitoring system, including not only DSC, but also computerized direction-finding capabilities to triangulate any distress calls coming in from sea.

Get Onboard

No doubt many of you are already wondering what it's going to take to add DSC monitoring of distress datastreams on 156.525 MHz using a scanner and a DSC computer program. I've looked into this extensively and would suggest a marine VHF radio with DSC Class D capabilities, priced under $250 new and seen showing up at marine swap meets for under $99! Now you have everything built in, with capabilities to read DSC distress calls, plus MMSI and GPS coordinates if the distress radio signal has indeed been pre-programmed for this added capability. The Class D marine VHF has a constantly running receiver, separate from the main receiver, so you won't miss a call. Even the next class down, the SC-101 with minimal DSC capabilities, works well in a marine VHF.

Keep yourself safe and watch for distress signals to help others, too. ■

by Shannon Huniwell, melodyfm@dreamscape.com

Shannon's Broadcast Classics

a look back at radio & TV's golden years

Radio "Lingo" And Tower Talk

"There's a quick way to tell a real radio person from an ordinary citizen," my father announced as we slowly drove down a heat-baked dirt road. Dust kicked up from the Plymouth station wagon's big tires and began filling the car, but extending his arm out the fully opened window, he seemed happily oblivious to it. "There," Dad pointed to a tall red and white structure. "What do we call that?"

In my most scientific sounding junior high voice, I slowly guessed, "the antenna?"

"Well, okay," he encouraged, "at least you didn't identify it as an *aerial*, like some uniformed geezer might who doesn't keep up with modern professional broadcasting terminology."

His car door squeaked wide open and he motioned for me to walk with him to a dented chain-link fence. "Behind that gate," Dad instructed, "you've got your basic AM *stick*, otherwise known as the transmitting tower. But true radio folk know it as *the stick*."

I'd brought along my new Kodak 110 Instamatic camera, so snapped a shot of a whole row of the transmitter site's impressive "sticks," as Dad launched into an explanation about the "dog houses" or "tuning shacks" situated near each of those vertical radiators. Over successive summer vacations and family outings, we took many a detour to add more broadcast sticks to our have-seen list. Driving away after having inspected one, my father would watch me pencil a check mark next to the call letters in our dog-eared *Radio-TV Experimenter/Whites Radio Log*. "They are things of beauty, especially with beacons gently glowing in the early morning or around sunset!" Then he'd smile, "But, of course, not as pretty as you little lady." It probably represented the only father/daughter antenna scouting hobby team in America, and it provided me with tall memories. We developed favorites; Dad admired the generously guyed, svelte tubular sticks, while I liked the graceful stance of self-supporting towers. Three-faced guyed towers were the most common sights in our travels, though they still seem more exotic to me than do the ubiquitous cell phone "candelabra" structures that have popped up in recent years.

More Towers On The Air Than Any Other Brand!

Before electric lines reached into every hamlet and farming community, rural folk wanting current for powering work-saving appliances often secured voltage via wind generation. A leader in such generators and the towers needed to support those windmill-driven devices was the Wincharger Corporation of Sioux City, Iowa. When, circa 1930, broadcast engineers recognized that vertical radiation (and related ground systems) of AM radio signals could be more efficiently controlled than they were with the roof-mounted T-type wire arrays of the 1910s and 1920s, Wincharger was ready to adapt its tower technology to the task.

During the immediate post-World War II tsunami of radio station construction, Wincharger cranked out hundreds of sticks for new outlets and for existing broadcasters upgrading their facilities. FCC applications were used to request information on proposed tower types, giving us opportunity to look into Wincharger's success rates. During the winter of 1947, over half

When snapped at a Connecticut Top-40 outlet in the late 1970s, who would have guessed that the resulting photo would be saved, but all the towers shown would be history some 25 years later. The "dog house" (enclosing antenna tuning gear) in mid picture looked like the privy in back of our neighbor's rustic Adirondack summer cabin—except for being up on blocks!

The curved, ball-capped rod rising in gearshift lever fashion from this Wincharger brand tower's concrete base serves as the ground side of the antenna system's spark gap. An overload of current, from a lightning strike, for example, would jump from the tower ball to the grounding ball and into the earth instead of zapping away at the tuning devices, transmission line, and/or transmitter. That dark cone between the tower bottom and cement base is a glass insulator. It allows the entire tower to be electrically suspended in air.

the 761 broadcast station applicants planning to erect new towers indicated that they'd go with a Wincharger product. No doubt lots of these are still on-the-air over a half-century later.

Heated Competition

Other 1950-era broadcast tower makers included the likes of Ideco, a Columbus, Ohio outfit that gained good publicity by building WJR's triangular section 700-foot stick near Detroit in 1940. Ideco advertised, "triangular towers retain their shape regardless of the direction of wind loads...with no [shape] distortion and secondary stresses." Portland, Oregon's Fisher Towers touted its five-stick, 300-foot array for KCMO, and another five-tower (at 350 feet) system for cross-town Kansas City rival WHB. With a factory in Allentown, Pennsylvania, Lehigh Towers was known for its products at WCCO Minneapolis and KMPC Los Angeles. The Truscon firm, of Youngstown, Ohio, boasted of designing/erecting a 750-foot guyed antenna for WGN Chicago and a massive 927-footer at Yankton, South Dakota's WNAX. Stainless Incorporated promised "eye appeal" in their all-tubular steel welded sticks. The company's 1948 ad included the hand-lettered calls of its clients, which included a 1000-watter in Cortland and a small daytimer at Oneonta, both in New York State.

The Cadillac Of Vertical Radio Frequency Radiation

Headquartered in Pittsburgh's Farmers Bank Building was an organization responsible for some of the most quintessentially "radioish" towers ever to impress a skyline. The Blaw-Knox Company's antenna tower division became legendary with the installation of its "dual-cantilevered" (also known as "fat middle" or "diamond") vertical radiators. Essentially a pair of massive four-legged self-supporting Blaw-Knox towers joined at the bases (like mating two ice cream cones where the ice cream is supposed to be) and guyed at this intersection, some five installations have survived. Arguably, the most famous among this quintet is WLW's 747-foot version outside Cincinnati. Other visually noteworthy installations include WSM's Nashville stick (808 feet), a 350-footer near Manchester, New Hampshire (WFEA), a trio of 428-foot dual cantilevered towers for Charlotte's WBT array, and an installation at WBNS Columbus, Ohio.

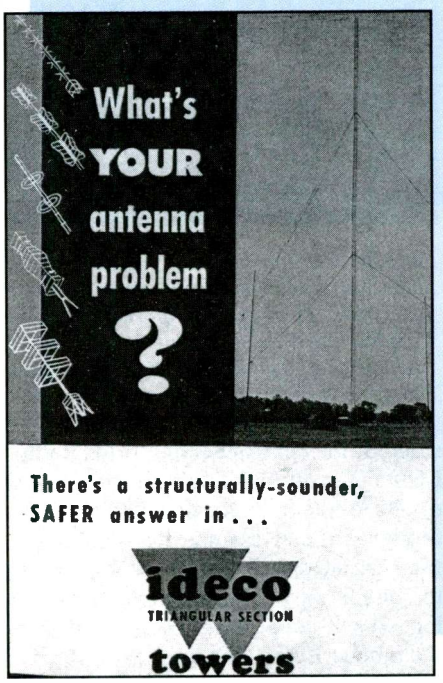
Blaw-Knox understood that only the most devoted radio people would spring the extra funding necessary to budget such a conversation piece, so it pushed its self-supporting towers to the broadcasting trade. With the advent of smaller, less expensive, but wind-loading proved triangular-faced guyed sticks, even Blaw-Knox's standard self-support model became a symbolic luxury few station owners decided to select. The firm, also known for its rugged road paving and forklift equipment, left the tower business in the late 1950s and was acquired by Ingersol-Rand.

Ancient Blaw-Knox broadcast towers, such as the 1932 stick at WSM, and vintage WBT array, revitalized after a serious bout with Hurricane Hugo, still send out quality signals and visually say "big time radio" to all but the most scatterbrained passersby. (See Jim Hawkins informative Blaw-Knox site at http://hawkins.pair.com/blaw-knox.html.)

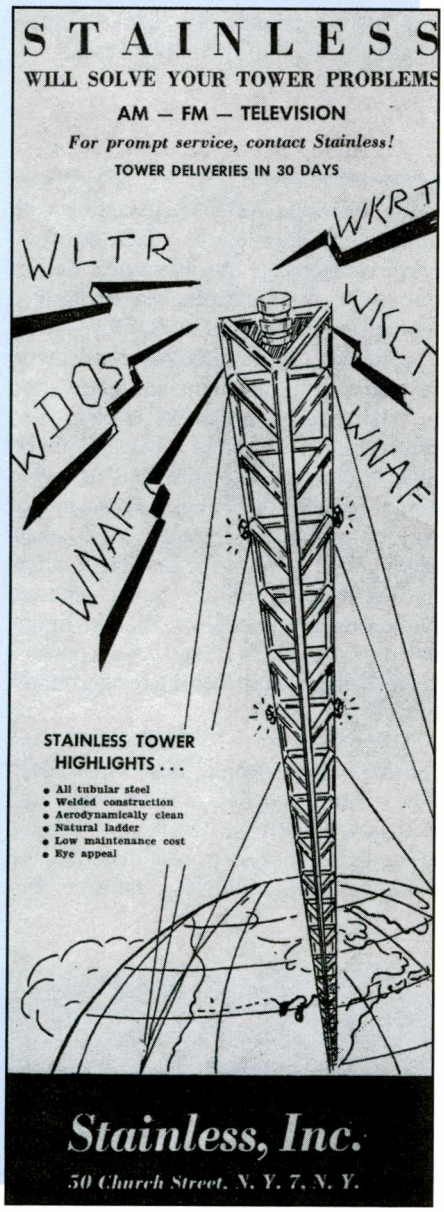
Lingo, "The 7th Wonder Of Florida Radio-Land!"

Interestingly, WBT's satisfaction with those fancy Blaw-Knox "diamond" towers didn't translate into a second order for one when the Charlotte station built a repeating transmitter at Shelby, North Carolina, to fill in a directional null there. Instead, WBT management called John E. Lingo & Son, Inc., the Camden, New Jersey maker of Lingo Vertical Tubular Steel Radiators. The antithesis of Blaw-Knox behemoths, Lingos consisted of welded piping held erect with copious guying. If it weren't for the bright, alternating red and white paint scheme, numerous guy insulators, marker lights, and top beacon, a Lingo might almost seem to disappear in certain backgrounds. Now that's a stick!

The president of WCLE Clearwater, Florida, showed up in Lingo's late 1940s advertising to say he was so impressed with how quickly his new Lingo stick and related ground system was installed and made operational that it should be con-



Seven-hundred feet of Ideco triangular section-type tower radiates WJR throughout Michigan and well beyond. This picture was taken by the installation crew. It's possible that the shorter "sticks" at the sides were part of the big Detroit station's former array.



Stainless Incorporated was just starting to make a dent in the broadcast tower business when this 1948 photo appeared in the Broadcasting Yearbook. *Note that WNAF is listed twice as a client in order to have three callsigns on each side of the antenna sketch.*

sidered "the 7th wonder of Florida Radio-Land." The official didn't note the names of the other half-dozen amazing sites, though we can assume he was simply flabbergasted at how fast—compared to the preparation time a three- or four-legged self-supporting tower required—the tubular Lingo shot up. Besides such a greatly reduced construction schedule, Lingo touted:

- Moderate initial cost
- Optimum performance (radiowaves only needed a small metal surface from which to leap)
- Low maintenance cost (poles were cheaper to re-paint than were multi-faced towers)
- Five years of insurance (apparently Lingo included a policy against financial loss due to a tower crash; this would be quite attractive to shoe-string start-up operations!)
- Fifty years of experience (in 1947, Lingo had already been working with steel tubing—originally in other applications—for five decades)
- Single responsibility

The last claim meant that Lingo's people would arrive on a broadcaster's unimproved (typically a former farmer's field) transmitter site and put in the requisite ground radials, concrete tower base, insulator, "dog (antenna tuning) house," transmission line, tubular radiator, and guying system.

To be sure, other companies offered this service, but Lingo gave free advice. Any would-be radio station operator could drop Lingo a line stating the anticipated station locale, power, and frequency. The Camden-based (RCA Broadcast Equipment Division was in that city, too) company would then design a ground system and recommended a particular size vertical radiator, on an estimate basis. Letters like the one containing WCLE owner's praise often beamed that Lingo's cost estimates exactly matched the final bill, though the job wasn't authorized until a year or so after the original estimation.

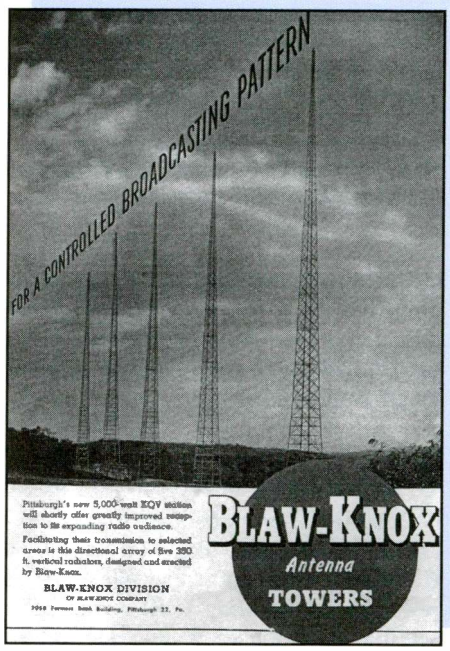
Lots Of Lingos Then...

By 1947, the following AM facilities were among the legion boasting Lingo antenna sticks: WWSW, Pittsburgh; WIBW Topeka, Kansas; WTAR Norfolk, Virginia; CJKL Kirkland Lake, Ontario; WBOC Salisbury, Maryland; WIBC Indianapolis; WSAV and WDAR Savannah, Georgia; WTON Staunton, Virginia; WARD Johnstown; WMAJ State College; WHUM Reading; WDAD Indiana; WBPZ Lock Haven; WPAM Pottsville (all Pennsylvania); WCTC New Brunswick, New Jersey; WWBZ Vineland New Jersey; WKNB New Britain, Connecticut; WACE Holyoke, Massachusetts; WAGM Presque Isle, Maine; WGAT Utica, New York; WRRN Warren, Ohio; WTHT Hartford, Connecticut; WRQN Vidalia, Georgia; WCSH Portland, Maine, and WOLF Syracuse, New York.

Though some of these operations have changed callsigns and a few are long gone (WTHT and WGAT are among the missing), several continue to use their Lingos. Until recently, WOLF's tubular radiator not only handled AM nicely, but also hosted other (high frequency) antennas. The Central New York landmark got replaced in the late 1990s only because a taller structure was needed by the AM's owner to accommodate FM, low power TV, and various communication-related purposes. Reportedly, when that Lingo's porthole cover was unbolted, a mound of rich iron sludge (the byproduct of years of water seepage) gurgled out like stub-born maple syrup. No matter, WOLF sounded healthy.

Lingo-Like, But Without A Single Guy Wire!

Three-thousand miles west of WOLF, in a California community where most residents never seemed sheepish about spending money, a slightly bent (near the top) tubular pipe pole tower holds a trio



Aaah, that's when a radio tower was a radio tower! A just-completed antenna array landscape publicity photograph of KQV's then-new directional system by tower manufacturer Blaw-Knox. Each of the four-legged quintets rose 350 feet and played a role in allowing the Pittsburgh 1410-kc AM to jump from 1 kW to 5 kW. Blaw-Knox's most beautiful sticks, the dual cantilevered models, were constructed by building one of the KQV-types upside down and then mating another to it right side up.

We don't know where this shot was taken, but it nicely shows the clean lines and simplicity of a Lingo tubular tower. The company erected these sticks to heights of "nearly 600 feet [to] withstand wind velocities over 100 mph." Engineering tests demonstrated "Lingo Radiators delivering within 3% of 100% maximum [transmission] efficiency."

of microwave receiving dishes—and an interesting story. Few of the upscale Santa Barbara gentry would ever guess that this stick is home to three of their community's very diverse AM signals. *Broadcast Pro-File* records show that the steel tubular antenna was erected in 1961 for what was then KDB (now KBKO) smack dab inside "a city maintenance yard just south of Santa Barbara's Montecito Street and U.S. Highway 101." It's doubtful that this one is a Lingo product, as none of the Camden Company's characteristic tee-pee of guys and insulators are present.

Santa Barbara's 3-in-1: KBKO, KIST, And KZBN

KBKO began as KFCR the day after Christmas 1926. The friendly 50-watter at 730 kilocycles emanated from a modest studio/transmitter set-up in a nook of the Santa Barbara *Daily News* building on State Street. The head of Lamb Auto Electric Company, C.F. Richardson, owned KFCR (the calls were sequentially picked by the government and didn't stand for anything particular). He oversaw a frequency change to 1420 kc in June 1927, as well as a spring 1928 studio/transmitter move to the Grenada Building and a doubling in power. That November, frequency reallocation rules caused another shift, this time to 1500 kc. By Christmas, KFCR was able to present programs from the new Don Lee Broadcasting System featuring shows originating at KHJ Los Angeles and KFRC San Francisco.

A west-coast radio pioneer, George Bowles, had joined KFCR as manager (and probably part owner) that fall. He'd come from KTM Los Angeles and had been immortalized when a San Diego station used his initials in their callsign, KGB. So, after getting comfortable in his new Santa Barbara job, Bowles asked his boss to seek Federal Radio Commission permission to honor his wife Dorothy by switching KFCR's calls to KDB. Around Labor Day 1929, KDB was associated with the Don Lee network and fledgling CBS.

Big Trouble In October!

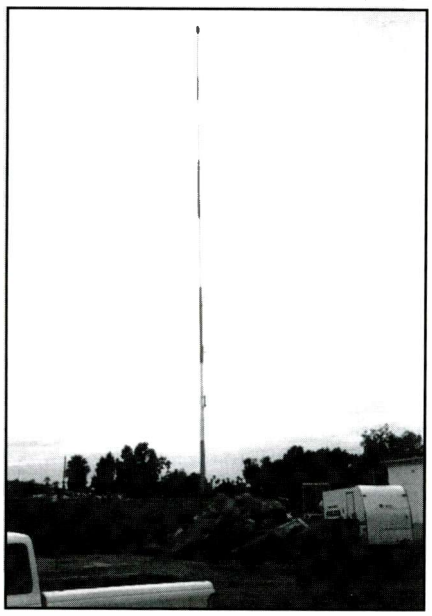
Besides the disastrous stock market crash that month, October brought a horrible communiqué from the FRC, voiding the station license and demanding that KDB go dark. At issue was a broadcast called "The Crusaders," in which the 18th Amendment (prohibiting intoxicating liquors) was sharply criticized. On October 31, 1929, a KDB announcer explained to the audience that the Santa Barbara station was about to become silent—and the transmitter was shut down. Little more than a month later, however, the FRC recanted due to "vigorous" pleas from the virtually defunct outlet's owners, and KDB signed on the coastal airwaves again.

The rebirth called for a celebration expressed in another studio/transmitter upgrade. This time, it went to the relatively new Faulding Hotel on East Haley Street, with a pair of 90-foot towers supporting a T-type wire antenna on the four-story hotel's roof. Catching glimpses of studio activity though the lobby's showcase windows, the hotel owner became increasingly intrigued with KDB and bought the station in April of 1930. It's possible that famed California Cadillac car dealer and broadcaster, Don Lee stayed in the hotel while negotiating to purchase 51 percent of the network affiliate (which had dropped CBS in favor of Mutual fare fed through the Don Lee chain) in 1931. He picked up the remaining 49 percent the following year. One hundred watts did okay for a local (AM) station in those days. Still, the Don Lee association meant progress, so the station got the go-ahead to raise day power to 250 watts in 1937 and 250 watts day/night by the time a 1941 North American frequency shift dictated KDB slide from 1500 to 1490 kc. Next came the 1948 relocation to a nice, mission-style radio campus, including a 250-foot self-supporting stick.

Lee's Exit And Lots of Subsequent Changes

Don Lee died of a sudden heart attack in the mid-1930s, leaving his heirs to run the broadcasting business. By 1951, they started selling off various assets, such as KDB. It went through several more owners, studio locales, and transmitter sites. At decade's end, network radio programming was pretty much kaput. KDB went all local with the help of an early Schafer brand taped automation unit from which a "good music" or "beautiful music" instrumental-focused format originated. KDB occupied a studio in what was dubbed "Radio Square" at 1050 De La Vina. (Jan Lowry of *Broadcast Pro-Files* notes that "Radio Square" still exists, though a "restaurant occupies the former KDB site.")

Our look back this time began by concentrating on a tubular steel antenna pole in that Santa Barbara city maintenance yard. KDB's transmitter went into a cement block building, there in the fall of 1961. It was likely a 1000-watt model, as the FCC let



Close inspection reveals that the top section of this tubular AM broadcast stick is a bent. Three microwave dishes are also visible. Each is pulling the studio feed from its respective Santa Barbara station tri-casting from the pole. Debris and other junk in the vicinity are attributed to the tower residing in a city maintenance yard. Listeners in the swanky community's upscale homes and expensive cars probably don't suspect their favorite station emanates from such a disheveled site. (Courtesy of Broadcast Pro-File *archive)*

KDB raise day power to 1 kW a few months later. Typical of small stations, KDB underwent regular ownership changes and, with them, studio and format modifications. These included All News, 1982; Classical Music, 1983; "Money Radio," 1988 (night power had been upped to 1 kW in 1985); Spanish Music, 1990, "Regional Mexican" Music (simulcast with KCQR-FM), 1994; and "Spanish Ranchero," 1995. KDB's heritage three-letter calls were dropped along the way to take on the moniker KSPE in 1995, and then KBKO two years hence.

A Short Course On KISTing

The second station on our Santa Barbara stick came into being during late September 1946. A former Columbia Broadcasting System Vice President built this KIST as a 250-watter at 1340 kc, with studios in the Benjamin Franklin (later called the Balboa) Building on State Street and self-supporting transmitting tower upon its roof. The station staked an early claim to fame when, in 1947, MGM used it as a backdrop for an Elizabeth Taylor film, *A Date with Judy*. The movie drew great reviews, had lots of stars, and featured a KIST mic on the promotional poster.

Though KIST was owned by a former CBS man, it offered NBC programming. That ended in 1959, a few months after the local AM was sold. The year 1960 saw daytime power increase to 1 kW and another ownership change. KIST headed into a contemporary music format, which it kept through additional owners until going "all oldies" during 1987. The following year, KIST was allowed to stay 1 kW day and night, a power it also transmitted in Motorola's C-QUAM stereo. A couple of potentially lucrative purchase offers/FCC transfer approvals fell through around 1990. Then, public fears that its classic downtown, roof-mounted antenna would cause "excessive radiation" to them while they shopped forced KIST to drop power to 675 watts and transmit from the stick in the city maintenance yard.

Dubbed "Oldies 1340," KIST found a financially qualified buyer and changed studio location around 1997. A call switcheroo to KLDZ ("oldies") occurred the following year, but was quickly modified to KXXT when Jacor Communications began operating the Santa Barbara outlet as a simulcaster to its Los Angeles sports station. In 2000, after Jacor merged with Clear Channel Communications, a new studio site was adopted, the sports programming nixed, and KXXT happily regained its original KIST name. A "Cool Oldies" format was adopted, allowing the little California AM's transmitter to air many of the same tunes that had made it a local radio favorite.

Buttoning Down #3 On The Stick

Happy endings are most wonderful when they can cause a person to look back and laugh at hardship. Perhaps that's the best way to describe KZBN, a decent little former daytimer with 122 watts to its credit at night and now with a famous comedian for an owner.

This story opens with a 1960 FCC construction permit for 500 watts of day power at 1290 kilocycles in Santa Barbara, the locally mnemonic call letters KSNB, and two partners. For some reason, perhaps connected to finances, the duo sold their construction permit (CP) for $9,500 before they had a chance to build. A request to the Commission had already been granted for a call change (to KACL) and modification of transmitter location.

KACL or "Castle" finally made it to the west coast airwaves on March 2, 1961, from "Radio Square," a site then-recently "vacated by KDB in late 1961." The station had a middle-of-the-road music, news, and weather format, typical of small independent daytimers of the era, representing KACL's benign output. There were ownership changes in 1964, 1967 (for a reasonable $80,000, most of which was considered as payment for the sellers not to compete against the new owners in any way), 1971, 1974, 1983 (twice!), and 1995.

We'll Have To Take Her Dark

During and between those landmark years for modest KACL, the studio was moved and call letters were modified to KKIO (1974) as it switched format to country. Studios got a venue upgrade in 1978. They flipped to KXXN in early summer 1982. The 1983 sale didn't go as planned when the new owners "had difficulties making payments...and by October silenced the station." *Broadcast Pro-File* chronicles this sad development by noting that in "December 1983, KXXN placed its two transmitters—a McMartin BA-1K, and Collins 20-V3, studio equipment, and 220-foot tower up for sale to raise funds to pay the former owners."

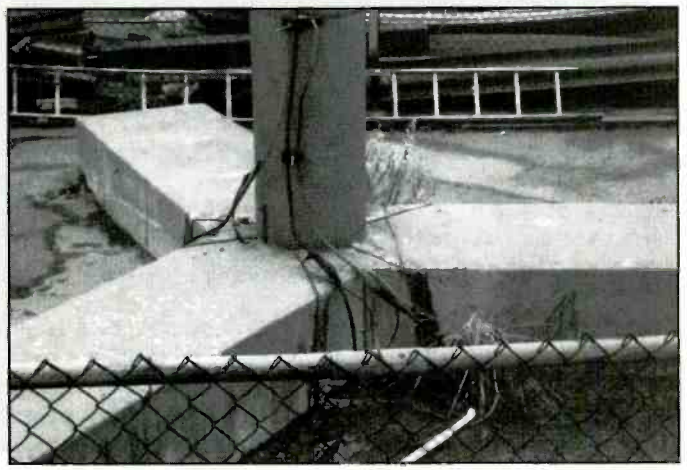
Twelve months later, a leaner daytimer, now called KESP, returned to the air from a different studio, and on that now-populous steel stick pole transmitter site in the unassuming city maintenance yard. A court-appointed receiver allowed for the purchase of some additional broadcast gear (including a C-QUAM stereo exciter), another studio change, and, in 1991, for the station to be reacquired by the former owners. At that time, call letters went from KXXN to KKSB (for Santa Barbara). Meanwhile, the FCC assigned KKSB a useful night power of 122 watts, so it could air country music around the clock. Studio location changed again in 1993.

Enter Bob Newhart

The "Button Down Mind" comedy record helped put Bob Newhart's universal humor on the map around 1960 and paved the way for his many TV sitcom successes. In early 1995, the well-respected Newhart got into broadcasting by pur-

A Spanish Mission-style transmitter shack hosts "boxes" or transmitters from KBKO, KIST, and comedian Bob Newhart's KZBN. (Courtesy Broadcast Pro-File *archive)*

chasing KKSB, finding new studios, opting to switch its call-sign to KZBN, and then aligning the now firmly footed outlet with a satellite-delivered "adult standards/big band" formatting. No doubt he monitors KZBN while driving around the Santa Barbara area. If small, local radio stations could dream, no doubt they'd wish for an owner (such as Bob Newhart, or one the few remaining mom & pop broadcasters) who truly cares about what goes out over the air. Now that's what actually defines a *real* radio person!



Jan Lowry of Broadcast Pro-File *took this close-up of the Santa Barbara steel pole AM tower base. Seen are some copper ground straps and microwave receiving transmission line. Somewhere in the tangle must be wires from the three transmitters enlivening the stick.*

Check It Out

As we sign-off this month, I want to remind you of the great radio resource available to you through *Broadcast Pro-File* histories of your favorite stations. Drop Jan Lowry a postcard to request a catalog: 28243 Royal Road, Castaic, CA 91384-3028.

And so ends another day of broadcast history at Popular Communications. See you next month! ■

Request a new broadcast history catalog from **Broadcast Pro-File**, 28243 Royal Road, Castaic, CA 91384-3028.

POPULAR COMMUNICATIONS

October 2003 Survey Questions

Over the past five years most of the Product Spotlights in Pop'Comm have been: (mark all that are appropriate)

Informative and useful 1

Interesting reading, but not very helpful 2

Very useful and informative, and helped me make a buying decision 3

Balanced and honest 4

The three main reasons I read Pop'Comm are to:

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Be informed and entertained 8

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Yes 12

No 13

Not sure 14

I have an emergency "Jump Kit" ready to go in the event of an emergency:

Yes 15

No 16

I have a few batteries and radios that are more or less charged and ready, but nothing packed in a box 17

Having an emergency "Jump Kit" doesn't interest me ... 18

I'm a licensed radio amateur and I read Pop'Comm:

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No 21

Sometimes, when I see an article that interests me 22

homeland security

power, and products

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

Essential Gear For Your Emergency "Jump Kit," And How To Hack-Proof Your Wi-Fi LAN

Occasionally I will encounter a piece of gear that I feel needs some exposure in this column. Starting with this installment, I'm going to introduce a new feature to the column dedicated to the gear you *really* need to have to be an effective emergency communicator. I call this "*Essential Gear*."

The object of "Essential Gear" is to showcase various pieces of communications and electronic equipment that will ultimately simplify and enhance your capabilities as an aware citizen or emergency communicator. The equipment I'll describe in this portion of the column will be gear I have personally used and evaluated and that would work in your Jump Kit or radio/monitoring installation.

Until recently, I had a love/hate relationship with scanners. That all changed with the events of 9/11/01. Suddenly, I viewed the scanner as a must-have piece of gear that could be a virtual life saver in the right situation. Accordingly, I added a scanner to each vehicle, fully loaded with the local frequencies I felt needed to be monitored. Since that time, my mobile scanners have yielded a wealth of traffic information that has allowed my wife and me to avoid traffic tie-ups while commuting. That alone was worth the effort of installing the scanners.

My daughter lives in Florida and we make at least one 2,400-mile round trip each year to see her and the grandkids. Total driving time is around 21 hours each way, with about one-third of the trip through Virginia, which has more highway patrol troopers per square foot than any other state I have ever driven through! Ergo, one must be mindful and vigilant of the speed limit when you're cruising Interstate 81, *especially* in Virginia. To add insult to injury, Virginia is one of only a couple of states that ban the use of radar detectors. The troopers even use radar detector-detectors to spot hidden radar detector installations in civilian vehicles.

Okay, so let's think about this for a moment: The cops can use electronic countermeasures (ECM) but we can't, and we pay their salaries with our taxes. Hmmm, sounds less than equitable to me, how about you?

If one wants to be within the limits of the law (as interpreted in Virginia), one must adopt an alternative means of watching the cops watch us. Can you say "scanner"? Sure you can!

Uniden's BCT-7 Scanner

Enter the Uniden Bearcat BearTracker 800 BCT-7 "Information" mobile scanner. While working on my "Ultimate Mobile Installation" I was in the market for a small scanner that would fit into the center console of my Nissan Frontier pickup truck. Believe it or not, there aren't a whole lot of really small scanners on the market (handheld units not withstanding). I'd asked several friends, who are a lot more involved with the scanner scene that I am, and they pointed me toward the BCT-7.

Uniden's Bearcat BCT-7 mobile scanner is a must-have for travelers.

I ordered my scanner from Communications Electronics, Inc., at 800-USA-SCAN (www.usascan.com), and received it in two days. Their price was $139.95 plus $20 shipping (two-day UPS). Okay, the price was acceptable, but the shipping was a bit steep, considering I could have waited a week as I was in no particular rush (there was no provision for less expensive shipping from this company).

At the USASCAN website I downloaded the BCT-7 manual (which they have available in PDF format) in order to become familiar with the operation of the scanner prior to its arrival. Frequency coverage is as follows: 29 to 50 MHz, 118 to 137 MHz (AM aircraft band), 137 to 174 MHz, 406 to 512 MHz, 806 to 956 MHz (cellular blocked), and all 40 Class D CB channels. These are arranged in seven banks, with six preprogrammed service banks and one user programmable bank of 25 channels. Scan rate is up to 100 channels per second, with a fixed scan delay of two seconds. Weight is 1 pound 11 ounces and over all dimensions are 1 5/8 x 5 1/5 x 6 15/16 inches (HWD). The scanner comes with a flexible mobile antenna, two DC power cords (one with a cigarette lighter adapter), a mobile bracket, telescoping whip antenna, AC adapter, frequency guide, and manual.

Initial power up gave me a bit of a jolt due to the cycling of the alert feature: a flashing bright red light on the front panel of the scanner and a *really* loud beeping from the speaker! Every time you power the BCT-7 up it goes through this initialization routine, so be aware.

This scanner is unique in that it has in excess of 7,000 preprogrammed frequencies loaded into firmware. These include 1142 Highway Patrol, 5185 local Police/County Sheriff, 459 DoT, 160 Fire/EMS, 178 News, and nine Weather (seven NOAA WX Service and two Canadian Coast Guard). It also offers 100 user-programmable channels, but, in reality, you only get one bank of 25 channels to program and independently scan. More on this later.

The main feature that sold me on this scanner was its ability to scan (100 channels per second) through all the Highway Patrol/State Police frequencies in its memory, within a few seconds. To do this you first select the state you are interested in by watching the LDC screen and pressing the STATE button repeatedly. Once the state is selected, then hit the HIGHWAY button, and the scanner starts looking through all the preprogrammed frequencies for that state's Highway Patrol/State Police. This is absolutely wonderful if, like me, you travel a lot through various states and don't want to have to reprogram your scanner for each trip.

The scanner can also tag the frequencies used by the Highway Patrol and/or police as "mobile extenders" or in-car repeaters. Many policing agencies use these mobile extenders to allow the officer to exit the patrol vehicle and still be able to talk to the dispatcher via his handheld radio. These mobile extenders (in ham radio we call them "remote base stations") are very short-range devices. When the BCT-7 detects activity on one of these frequencies, it alerts you via the bright red flashing light and loud beeping described earlier. This lets you know you're within roughly three miles of a mobile extender, and there is a good likelihood of a speed trap or traffic stop in the immediate area. Wow! My very own ECM! And, until some dorf in the Virginia legislature decides to sponsor legislation to the contrary, it's legal!

Does this mobile extender technology work? You betcha! Several trips on I-80 and I-81 have produced positive results with various police agencies working speed enforcement. This feature is worth its weight in gold when traveling interstate highways near airports (like Avoca, Pennsylvania) where the airport surveillance radar (ASR) sets off your radar detector with great regularity. On our recent trip to Florida, we received several false alarms on mobile extenders, but in the area of I-10, in Alabama, the mobile extender alarm functioned well. I-10 is loaded with police looking for drug traffic and speeders. They all use mobile extenders and we were able to deal with the situations as they arose.

The BCT-7's Downside

Alright, it's small, compact, tells you when the cops are working a speed trap (in 49 states, sorry no Hawaii!), but are there any down sides to this scanner? Unfortunately, yes there are. Like all gear, the BCT-7 has its quirks. First, and by far the most annoying, is the limited channel programming available to the user. While the literature says "100 user-programmable channels," as I previously mentioned in reality there are only 25 channels available to the user in the PRIVATE bank portion of the scanning memory. The other 75 channels are sprinkled through out the HIGHWAY, POLICE, FIRE/EMS, NEWS, WX, and DOT memory banks.

The real bummer is that you cannot sequentially scan these user-programmed channels in concert with the 25 PRIVATE user-programmed channels of your choice. What this means, essentially, is that you're limited to 25 of your favorite frequencies in one bank. There just are not enough user programmable channels. Fifty channels in the PRIVATE bank would be a good start, but 200 would be even better! I have a lot of frequencies that I want to monitor without having to manually switch banks, and 200 channels would be a nice round number for Uniden to provide. It certainly is possible to alter the firmware at the factory to accomplish this—if only they would.

The second major complaint I have with the BCT-7 is the totally user unfriendly way one must program the frequencies into the programmable banks. Notice the front panel of the scanner in **Figure 1**. There is no keypad with which to directly input frequencies. There is no DB9 connector on the rear of the unit to facilitate interfacing a computer to upload frequencies directly into the scanner. This makes loading up your "100" programmable channels a real experience.

In order to load the user programmable memory channels, you must first select a band using the BAND select button. Then start the unit, scanning either up or down from the band edge. When you get "close" to the desired frequency you want to enter into memory, hit the HOLD/SCAN RESUME button to stop the scan. Then, using the SEARCH DIRECTION KEYS move the frequency either up or down until the desired frequency is displayed on the LDC screen. *Then* you must press the PROGRAM key, select the bank where you want to store this frequency (Highway, DOT, Police, News, Fire, or Private), *then* press the SEARCH DIRECTION KEYS to select the desired channel in that bank, and *finally* press PROGRAM again to store the frequency. Then you can either start scanning again or press the BAND key to start the frequency selection process all over!

Once you get the hang of it, it becomes much less frustrating, but it is still an annoyance. The real treat comes when you have to reprogram some of these user programmable channels and must suffer through the entire operation all over again! Really, Uniden, you *could* have done a lot better!

The third pet peeve concerns programming, namely the lack of a computer I/O port to access the memory channels with a laptop computer. Why not?! The hardware can't cost more than a couple of dollars, and they do have a bunch of code writers at Uniden that could easily interface the memory/CPU to the I/O port via firmware. What a missed opportunity!

The Bottom Line

Okay, after saying all this negative stuff about the BCT-7, do I like it? Yup! Would I recommend this unit? Indeed, especially to scanning neophytes who aren't into "serious" scanning, but want a way to track the activities of law enforcement and fire/EMS units on a few local channels and while driving on the interstates. This is *not* a scanner for someone who wants to do some serious scanning. For that there are other units available that allow full access from 200 up to 1,000 channels via direct entry or a computer I/O port.

The BCT-7 is one of those scanners that's basically "idiot proof" in that all you do to follow the action is hook up the power and the antenna and turn it on. It pretty much can take care of itself, with little operator intervention. While you *can* program up to 100 channels into this unit, you don't *need* to do this to start enjoying VHF/UHF scanning. My wife loves this scanner. She is not a radio nut like her husband of 22 years; all she has to do is start the car and turn on the BCT-7 to hear what's happening locally or while on a trip. Life doesn't get much simpler than that.

All things considered, the Uniden Bearcat BearTracker 800 BCT-7 "Information" mobile scanner is a very good value for the money and I would highly recommend this unit to anyone needing a simple scanner with limited programming capabilities. If this scanner saves the owner just one speeding ticket, it has paid for itself.

Before you run out and buy a BCT-7 (or any mobile scanner for that matter) don't forget to familiarize yourself with your local, county, and state regulations regarding mobile scanning equipment in a vehicle. Remember, some states ban the use of mobile or handheld scanners in vehicles, so research the laws first before you buy. Neither I nor CQ Communications, Inc., will be held responsible for violations of the law or damage to your vehicle from the installation of radio gear described in this column.

802.11x Wi-Fi

One of the most important programs on television is Tech TV's *The Screen Savers*. Seriously, the program, which airs daily, contains a wealth of information regarding computers, computer security, "geekazoid" technical features, real-world communications and computer concerns, and, once you get past the two male hosts (Patrick and Leo), there's Jessica and Sarah. *The Screen Savers* is at the top of my must-watch list of television shows, which is how I came to finally "cut the cord" and go wireless on my PCs.

If you keep on top of computer/communications issues, you'll recognize the topic heading as the FCC nomenclature assigned to microwave wireless-fidelity (Wi-Fi) infrastructure, and 802.11a is 5-GHz broadband, while 802.11b is 2.4-GHz broadband. Simply, 802.11a & b are 10 Mbs data through-put. The new kid on the block is 802.11g, which is 2.4-GHz broadband transmission at 54 Mbs data through-put—over five times faster than either of the two other modes! Coupled with a DSL or cable modem, 802.11g offers the user the ability to interface several laptop computers along with a desktop computer into a high-speed wireless local area network (LAN). Imagine being able to remotely access the internet via your DSL or cable modem using your palm or laptop computer while sitting at pool side! Attractive, no?

Why are we addressing Wi-Fi in the "HOMSEC" column? Simply, computer security is a part of your total security package. With all the virus and Trojan horse programs running around on the Internet, if you don't use some type of virus checker/firewall, sooner rather than later, you'll get hit with a virus or a Trojan. Then comes the fun of trying to rid your computer of the offending software, rebuilding your hard drive, or any one of a number of other experiences associated with these destructive software packages. And then there is "wireless."

Security issues become paramount when dealing in a wireless computer environment. As we all know, anything that is transmitted over the air is open to interception and possible intrusion. Wi-Fi is no different. There are hackers who specialize in "War Driving." They travel through business and residential areas of a city with a vehicle loaded with RF detection gear and computers, trying to find "open" systems to hack into. By "open" we mean unprotected Wi-Fi systems that do not employ any form of intrusion protection, such as encryption.

Should a hacker find an open system, it is a simple matter to log onto your Wi-Fi LAN and gain access to the Internet through your system. Although this sounds relatively harmless, it is not. Once inside your system the hacker can then originate e-mail messages with your Internet ID causing you more problems than you'd ever believe possible. Enterprising hackers can even secretly load "spyware" onto your hard drive and gain access to your credit card and other sensitive personal and financial information. While Wi-Fi is fun to use and "really cool" it is not without numerous pitfalls that need to be addressed by the user.

Most Wi-Fi hubs come with software that must be loaded and implemented to secure your wireless LAN. The instructions contain specific things to do to ensure that your LAN remains secure. Things like changing passwords, enabling WEP (wired equivalent privacy), etc., all work to thwart potential hackers.

Most of us radio savvy hobbyists realize that antenna location and orientation can go a long way toward keeping the Wi-Fi signals localized to a specific area of your house or property. This is a *big* security move. Remember, we are dealing with microwave energy in Wi-Fi systems. Microwaves behave much like beams of light. Direct line-of-sight is necessary for maximum efficiency. Locating the wireless hub (the box that makes everything play together) in the basement or ground floor of your home will greatly reduce the RF energy that escapes your house. If the war driving hackers can't find the signal, they can't gain access to your wireless LAN.

Another thing to think about is the effect of metal siding on microwave signals. Aluminum-sided houses have a built-in Faraday Cage—the metal siding effectively shields the RF microwave energy, keeping it within the confines of the house.

Finally, moving the antenna polarization from vertical (the normal polarization) to horizontal (or somewhere in between) will effectively reduce the radiated energy by up to 20 dB! That is a lot of attenuation, especially at those microwave frequencies.

Putting all three techniques together (moving the wireless hub from an upper floors to the ground floor or basement, using the shielding of an aluminum sided house, and horizontal/angled polarization of the antennas) will do a lot to keep the RF energy from the wireless LAN inside the confines of your domicile. One more time: if the hacker can't find the RF source, he can't hack it.

WEP, the industry standard for Wi-Fi security comes standard on the software package boxed with the wireless hub. Turn it "on" and use it. It is *not* 100 percent effective for keeping out hackers and intruders, but it certainly goes a long way toward making it more difficult for a hacker to gain access. WDA (wireless digital assistant) is a new security standard up for adoption by the Wi-Fi community that will be extremely hard to hack. When it becomes available, don't forget to install and use it to increase the security of your wireless network.

Also, make sure to change the passwords to your wireless LAN software. Every hacker in the world knows that "ADMIN" is the standard password furnished with the Wi-Fi software from virtually every manufacturer. Once you load your Wi-Fi software, IMMEDIATELY change that password to maintain control and ensure the security of your Wi-Fi system.

One final thought: If you are really paranoid about being hacked when using a wireless system, turn it off when not in use. Unplug the router/hub. It's that simple. If you're not on the air, your wireless system can't get hacked.

There is a lot more to Wi-Fi than this column can hope to present. If you're serious about your computing, do some web searches on Wi-Fi and read all about it. It is the wave of the future, broadband over power line (BPL) not withstanding, and the equipment is definitely inexpensive enough to warrant the expenditure of funds to "go wireless." Besides, it's fun!

Until next time remember: preparedness is *NOT* an option. ■

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Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, $14.95. 5¼Wx2½Hx5¼D inches.

No Matter What™ One Year Warranty

You get MFJ's famous one year *No Matter What*™ limited warranty. That means we will repair or replace your MFJ *MultiReader*™ (at our option) *no matter what* for one full year.

Try it for 30 Days

If you're not completely satisfied, simply return it within 30 days for a prompt and courteous refund (less shipping). Customer must retain dated proof-of-purchase direct from MFJ.

Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a *"first-rate easy-to-operate active antenna ...quiet... excellent dynamic range... good gain... low noise... broad frequency coverage."*

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz-30 MHz.

MFJ-1024 **$139.95**

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and auxilary or active antenna. 6x3x5 inches. Remote has 54 inch whip, 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, $14.95.

Indoor Active Antenna

MFJ-1020B **$79.95**

Rival outside long wires with this *tuned* indoor active antenna. *"World Radio TV Handbook"* says MFJ-1020B is a *"fine value... fair price... best offering to date... performs very well indeed."*

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, $14.95.

Compact Active Antenna

MFJ-1022 **$49.95**

Plug this *compact* MFJ all band active antenna into your receiver and you'll hear strong, clear signals from all over the world, 300 KHz-200 MHz including low, medium, shortwave and VHF bands.

Detachable 20 inch telescoping antenna. 9 volt battery or 110 VAC MFJ-1312B, $14.95. 3⅛x1¼x4 in.

Eliminate power line noise!

MFJ-1026 **$179.95**

New! Completely eliminate power line noise, lightning crashes and interference *before they get into your receiver!* Works on all modes -- SSB, AM, CW, FM, data -- and on all shortwave bands. Plugs between main external antenna and receiver. Built-in active antenna picks up power line noise and cancels undesirable noise from main antenna. Also makes excellent active antenna.

MFJ Antenna Matcher

MFJ-959B **$99.95**

Matches your antenna to your receiver so you get maximum signal and minimum loss.

Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Select 2 antennas and 2 receivers. 1.6-30 MHz. 9x2x6 in. Use 9-18 VDC or 110 VAC with MFJ-1312, $14.95.

Dual Tunable Audio Filter

MFJ-752C **$99.95**

Two separately tunable filters let you peak desired signals and notch out interference at the same time. You can peak, notch, low or high pass signals to eliminate heterodynes and interference. Plugs between radio and speaker or phones. 10x2x6 in.

High-Gain Preselector

MFJ-1045C **$99.95**

High-gain, high-Q receiver preseletor covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Push buttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18 VDC or 110 VAC with MFJ-1312, $14.95.

CW, RTTY, ASCII Interface

MFJ-1214PC **$149.95**

Use your computer and radio to receive and display brilliant full color FAX news photos and incredible WeFAX weather maps. Also RTTY, ASCII and Morse code. Frequency manager lists over 900 FAX stations. Auto picture saver.

Includes interface, easy-to-use menu driven software, cables, power supply, manual and *JumpStart*™ guide. Requires 286 or better computer with VGA monitor.

High-Q Passive Preselector

MFJ-956 **$49.95**

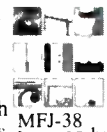
High-Q passive LC preselector boosts your favorite stations while rejecting images, intermod and phantom signals. 1.5-30 MHz. Preselector bypass and receiver grounded positions. Tiny 2x3x4 inches.

Super Passive Preselector

MFJ-1046 **$99.95**

New! **Improves** any receiver! Suppresses strong out-of-band signals that cause intermod, blocking, cross modulation and phantom signals. Unique Hi-Q series tuned circuit adds super sharp front-end selectivity with excellent stopband attenuation and very low passband attenuation and very low passband loss. Air variable capacitor with vernier. 1.6-33 MHz.

Easy-Up Antennas



MFJ-38 **$16.95**

How to build and put up inexpensive, fully tested wire antennas using readily available parts that'll bring signals in like you've never heard before. Antennas from 100 KHz to 1000 MHz.

MFJ Antenna Switches

MFJ-1704 **$64.95**

MFJ-1702C **$24.95**

MFJ-1704 heavy duty antenna switch lets you select 4 antennas or ground them for static and lightning protection. Unused antennas automatically grounded. Replaceable lightning surge protection. Good to 500 MHz. 60 dB isolation at 30 MHz. **MFJ-1702C** for 2 antennas.

World Band Radio Kit

MFJ-8100K **$69.95** *kit*
MFJ-8100W **$89.95** *wired*

Build this regenerative shortwave receiver kit and listen to signals from all over the world with just a 10 foot wire antenna. Has RF stage, vernier reduction drive, smooth regeneration, five bands.

21 Band World Receiver

MFJ-8121 **$39.95**

MFJ's new 21 Band World Receiver lets you travel the world from your armchair! Listen to BBC news from London, live music from Paris, soccer matches from Germany and more! Covers 21 bands including FM, Medium Wave, Long Wave and Shortwave. *Sony*® integrated circuit from Japan, multicolored tuning dial, built-in telescopic antenna, permanent silkscreened world time zone, frequency charts on back panel. Carrying handle. Operates on four "AA"s. Super compact size!

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Tech Help: (662) 323-0549

world band tuning tips

your monthly international radio map

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	95780	Radio Yugoslavia, Serbia-Montenegro	
0000	9495	Radio Sweden, via Canada	
0000	15385	Radio Exterior de Espana	
0000	7507	Armed Forces Network, Puerto Rico	
0000	17615	BBC Relay, Thailand	
0000	15475	Voz Cristiana, Chile	SS
0000	9500	Radio Bulgaria	Bulgarian
0000	6090	Caribbean Beacon, Anguilla	
0000	9440	Radio Prague, Czech Republic	
0000	9925	Voice of Croatia, via Germany	Croatian
0000	6025	Radio Amanacer, Dominican Republic	SS
0000	7205	Radio Sawa, USA, via Sao Tome	AA
0030	11950	UAE Radio, Dubai	AA
0030	6165	Radio Netherlands Relay, Bonaire	
0030	11690	Radio Vilnius, Lithuania	
0030	11795	Gospel For Asia, via Germany	
0030	13605	All India Radio	
0030	4940	Radio Amazonas, Venezuela	SS
0100	11825	Voice of Russia, via Vatican	
0100	9590	Radio Budapest, Hungary	
0100	11915	Radio Gaucha, Brazil	PP
0100	4717	Radio Yura, Bolivia	SS
0100	5010	Radio Cristal Int'l, Dominican Republic	SS
0100	9580	China Radio Int'l, via Cuba	
0100	15480	CPBS/CNR, China	CC
0100	4780	Radio Cultural Coatan, Guatemala	SS
0100	6190	Radio Slovakia Int'l, Slovak Republic	Slovak
0130	9440	Radio Slovakia Int'l	
0130	11655	RDP Int'l, Portugal	PP
0130	9650	Vatican Radio	
0130	9590	Voice of Islamic Rep. of Iran	AA
0130	6155	RTE, Ireland, via England	
0130	12050	Egyptian Radio	AA
0130	11780	Radio Nacional, Brazil	PP
0130	4919	Radio Quito, Ecuador	SS
0200	11885	Voice of Turkey	TT
0200	11750	Voice of Russia, via Moldova	RR
0200	4747	Radio Huanta 2000, Peru	SS
0200	13675	UAE Radio, Dubai	AA
0200	11675	RAI, Italy	II
0200	9795	Wales Radio Int'l, via England	
0200	4800	Radio Buenos Nuevas, Guatemala	SS
0200	3300	Radio Cultural, Guatemala	SS
0200	11725	Radio Cairo, Egypt	AA
0200	4765	Radio Educacao Rural, Brazil	PP
0200	11900	Radio Bulgaria	
0200	11710	RAE, Argentina	
0200	11920	RTV Marocaine, Morocco	AA
0200	7160	Radio Tirana, Albania	
0200	3250	Radio Luz y Vida, Honduras	SS
0200	4845	Radio K'ekchi, Guatemala	SS
0230	17670	Radio Free Asia	unid
0230	12040	Radio Ukraine Int'l	Ukranian
0230	6115	Radio Union, Peru	SS
0230	9570	Radio Budapest, Hungary	
0230	6105	Radio Liberty, USA, via Germany	RR
0230	6035	La Voz del Guaviare, Colombia	SS
0300	3240	Trams World Radio, Swaziland	Shona
0300	7290	VOA Relay, Sao Tome	
0300	5915	Zambia National Broadcasting Co.	
0300	4976	Radio Uganda	
0300	15495	Radio Kuwait	AA
0300	17675	Radio New Zealand	
0300	15565	Radio Vlaanderen Int'l, via Bonaire	
0300	5010	Radio Malagasy, Madagascar	vern.
0300	13580	Kol Israel	
0300	4832	Radio Litoral, Honduras	SS
0300	17510	KWHR, Hawaii	
0300	6940	Radio Fana, Ethiopia	Amharic
0300	4820	Radio Botswana	
0300	4800	Radio Lesotho	
0330	3320	Radio Sondergrense, South Africa	Afrikaans
0330	3255	BBC via South Africa	
0400	11625	Vatican Radio	unid
0400	12005	RT Tunisienne, Tunisia	AA
0400	4819	La Voz Evangelica, Honduras	SS
0400	5955	Channel Africa, South Africa	
0400	4950	Radio Nacional, Angola	PP
0430	4770	Radio Nigeria	
0430	5985	Radio Congo, Rep of Congo	FF
0430	12060	Radio Voice of Hope, via Madagascar	
0500	6250	Radio Nacional, Equatorial Guinea	SS
0500	5030	Radio Burkina, Burkina Faso	FF
0500	7210	ORTB, Benin	FF
0600	4845	Radio Mauritainie, Mauritania	AA
0600	4915	Ghana Broadcasting Corp.	

UTC	Freq.	Station/Country	Notes
0800	6350	Armed Forces Network, Hawaii	
0800	3290	Voice of Guyana	
0800	5970	Radio Itatiaia, Brazil	PP
0800	6105	La Candela, Mexico	SS
0800	7260	Radio Vanuatu, Vanuatu	
0900	6120	Radio Japan NHK, via Canada	
0900	4885	Radio Clube do Para, Brazil	PP
0900	4930	Radio Barahona, Dominican Republic	SS
0900	6020	Radio Victoria, Peru	SS
0900	5960	Caracol Villivencio, Colombia	SS
0900	3310	Radio Mosoj Chaski, Bolivia	SS
0930	4975	Radio del Pacifico, Peru	SS
0930	4785	Radio Brazil	PP
0930	6070	Voz Cristiana, Chile	SS
0930	4876	La Cruz del Sur, Bolivia	SS
1000	12020	Voice of Vietnam	
1000	12085	Voice of Mongolia	
1000	6185	Radio Educacion, Mexico	SS
1000	6020	Radio Australia	
1000	5040	La Voz del Upano, Ecuador	SS
1100	7260	Radio Thailand	unid
1100	5020	Solomon Is. Broadcasting Corp.	
1100	7260	VOA Relay, Thailand	unid
1100	4890	National Bcstng Commission, Papua New Guinea	
1100	9430	Trans World Radio, Guam	CC
1100	9600	Radio Rebelde, Cuba	SS
1100	3335	Radio East Sepik, Papua New Guinea	Pidgin
1100	3355	Radio Simbu, Papua New Guinea	Pidgin
1130	9885	Radio New Zealand Int'l	
1130	4605	Radio Republik Indonesia, Serui	II
1130	7320	Radio Rossii, Russia	RR
1200	9650	Radio Korea Int'l	
1200	9670	Radio Veritas Asia, Philippines	JJ
1200	9595	Radio Tampa, Japan	JJ
1200	4755	Radio Republik Indonesia, Makassar	II
1200	3305	Radio Western Highlands, Papua New Guinea	Pidgin
1230	9860	Radio Thailand	
1230	11605	Radio Taiwan Int'l	CC
1230	17670	YLE Radio Finland	Finnish
1230	11710	Korean Central Bc. Station, North Korea	PP
1230	11580	Far East Broadcasting Co., No. Marianas	CC
1230	11765	KNLS, Alaska	CC
1300	17560	Voice Int'l, Australia	
1300	15435	Radio Free Asia, via UAE	unid
1300	11730	Radio Veritas Asia, Philippines	Tagalog
1300	17575	RDP Int'l, Portugal	PP
1300	15545	Voice of Islamic Rep. of Iran	AA
1300	11805	VOA Relay, No. Marianas	
1330	15190	BBC Relay, Antigua	
1330	6150	Radio Singapore Int'l	
1400	7295	Radio Malaysia	
1430	11835	Radio Netherlands Relay, Madagascar	
1500	15345	RTV Marocaine, Morocco	AA
1500	13620	Radio Kuwait	AA
1500	17820	Radio Canada Int'l	
1500	9635	Voice of Islamic Republic of Iran	
1500	9335	Voice of Korea, North Korea	
1530	11705	Voice of Korea, North Korea	
1600	11570	Radio Pakistan	
1630	18940	Radio Afghanistan, via Norway	Pashto
1700	15265	Channel Africa, South Africa	
1700	17870	Channel Africa, South Africa	FF
1700	17705	Voice of Greece, via USA	Greek
1730	15715	Radio Africa Int'l, via Germany	
1730	15670	Voice of Democratic Eritrea (clandestine), via Germany	
1730	11690	Far East Bc. Assn, via Rwanda	unid
1800	15290	Voice of Russia	RR
1800	11620	All India Radio	Hindi
1800	15475	Africa Number One, Gabon	FF
1800	17630	Radio France Int'l Relay, French Guiana	SS
1900	9830	Radio Jordan	AA
1900	15190	Radio Pilipinas, Philippines	Tagalog
1930	15120	Voice of Nigeria	
1930	15640	Kol Israel	FF
1930	17895	VOA Relay, Botswana	
1930	9960	Voice of Armenia	unid
2000	11820	Broadcasting Service of Kingdom of Saudi Arabia	AA
2000	17605	Radio Netherlands Relay, Bonaire	
2000	15315	Radio Jamahiriya, Libya	AA
2000	15150	Voice of Indonesia	
2000	11860	Voice of Islamic Rep. of Iran	
2030	15110	Radio Exterior de Espana	SS
2030	15220	Swiss Radio Int'l, via Germany	GG
2030	17860	Deutsche Welle Relay, Rwanda	GG
2030	13610	Radio Damascus, Syria	
2030	15275	Deutsche Welle, Germany	GG
2030	17745	VOA, via Ascension Island	
2100	11770	Radio Mexico Int'l	SS
2100	11855	Radio Japan NHK, via Ascension	
2130	11905	Radio Tashkent, Uzbekistan	unid
2130	15435	Radio Jamahiriya, Libya	AA
2130	11955	Radio France International, via Gabon	FF
2130	15185	Radio Africa, via Equatorial Guinea	
2130	15185	HCJB, Ecuador	
2200	17820	VOA Relay, Philippines	
2200	9830	Voice of Turkey	
2200	2210	RTV Malienne, Mali	unid
2200	13670	Radio Canada Int'l	
2200	17795	Radio Australia	
2200	11600	Radio Prague, Czech Republic	
2230	15230	Radio Havana Cuba	SS
2230	21740	Radio Australia	
2300	11775	Radio Romania Int'l	
2300	9945	Norwegian Radio	NN
2300	11690	Deutsche Welle, Germany	GG
2300	6070	CFRX, Canada	
2300	9695	Radio Rio Mar, Brazil	PP
2300	13730	Radio Austria Int'l	
2330	9570	Radio Romania Int'l	
2330	7125	RTV Guineenne, Guinea	FF
2330	13680	China Radio Int'l, via Canada	
2330	9945	Danish Radio, via Denmark	DD
2330	9915	BBC Relay, Cyprus	

power up:
radios & high-tech gear

by Harold Ort, N2RLL

review of new, interesting, and useful communications products

AOR ARD9800 Digital Communications Modem Adds Digital To Your Transceiver

HF SSB is okay but it has its limitations. The ARD9800 Digital Voice System can dramatically improve your HF communications. The ARD9800 provides NEAR FM QUALITY audio using SSB. And, since the digital signals require LESS SIGNAL than analog, operations are possible under adverse band conditions. In fact, the ARD9800 lets normal analog communications pass through, but automatically recognizes digital communications from another ARD9800 unit.

Best of all, you don't need to make any changes to your HF transceiver! All you have to do is solder the connector to the cable for the mic input to your transceiver. An 8-pin round mic connector is provided with the ARD9800. (Optionally, you may also purchase a pre-made cable for most popular transceivers.) It's basically "plug & play."

The ARD9800 system uses digital tones confined to the normal voice audio spectrum. That means your transceiver should pass the digital signals as it would any normal voice communication. When you transmit normal SSB signals, your operations are the same as always. To transmit digital signals, you simply select the digital mode using a front panel switch on the ARD9800.

AOR has made the connection process as easy as 1-2-3. There are actually two simple connections to your transceiver: to the mic input jack of your transceiver and from the "speaker out" connection of your transceiver to the "speaker in" jack of the ARD9800. That's it!

The only other connection is to a 12-VDC power source.

Most transceivers have the pinouts for their microphone connections shown in their respective operator's manuals. Sometimes they are listed under packet radio connections. You can also check your radio manufacturer's website or other ham radio web sites. (AOR urges you to be sure the information is accurate before you proceed.)

Best of all you can use your existing station mic and external speakers. You may have to make an adapter for the pinouts of your mic to match the ARD9800's input, or resolder the pin connections on your mic's cable, but that's all. The ARD9800 comes with a mic, so you may not want to change your mic at all.

The ARD9800 has a "speaker out" jack for use with an external station speaker. Note that the ARD9800 also has an internal speaker and a volume control.

A commonly asked question is, "is it legal?" The ARD9800 uses an open, published digital protocol (G4GUO) per FCC rules. Think of the ARD9800 as a "wireless modem," similar to a Terminal Node Controller (TNC) like a packet radio unit that's capable of RTTY, AMTOR, etc. Those units use open, published protocols as well. ARD9800 transmissions use the normal audio pass band, so they are similar in bandwidth characteristics to a normal analog SSB voice signal.

AOR's new ARD9800 is a compact digital communications modem that adds digital to your existing HF transceiver.

The ARD9800 can be used in AM or FM modes; however, FM mobile operation could be prone to "picket fencing," which might result in the loss of data. Also, repeater "key-up" time could delay the passing of the ARD9800 digital "header" causing a loss of data. As such, AOR cannot make any warranty as to the dependability of the digital mode in every given situation. (Just as any manufacturer cannot warrant what band conditions will be at any given time.)

The ARD9800 prototype was demonstrated for ham audiences at Dayton, Ohio, and Friedrichshafen, Germany, and they absolutely loved it! The most asked question was, "When will it be available?"

If you're concerned about having to operate differently, don't be. AOR suggests that "CQ" calls in digital mode be kept short because a "digital header" is sent at the start of each transmission. This header allows other ARD9800 units to "lock on" to the digital transmission. Likewise, we suggest a pause of about one second at the beginning of each transmission to allow the header to clear. You might also consider calling "CQ Digital" in the analog SSB mode. A digital response from another AR9800 user will be automatically recognized by your unit.

You can speak with as many similarly equipped operators as you wish. The ARD9800 uses an FEC protocol that does not require acknowledgement. Therefore, you can communicate "one to one" or in a "round table" just as you do using SSB today.

Check the rules that apply in your country regarding station identification. In the United States it is acceptable to identify in the mode you are using, in this case, digital. You may also augment your ID using Morse tones or analog SSB.

With the *optional memory board* images can be easily transferred, similar to SSTV, but we believe the ARD9800 sends a higher-quality image. You can also send file transfers.

The ARD9800 has ports for composite video input and output. That means you can easily send an image captured from a video camera or digital camera that has a normal NTSC "video out" jack. Likewise, you can display and/or save received images on a monitor or storage device that uses a normal composite NTSC video input.

It's important to note that the ARD9800 signals CANNOT be encrypted. That would not be acceptable on the amateur radio bands. The G4GUO protocol is an open, published format that has been adopted for digital voice communications by AOR. It is not a form of encryption and there is no ability to activate encryption in the ARD9800.

AOR offers a commercial version called the ARD9900, which is intended for commercial users only on commercial bands. Encryption is a feature available on the ARD9900.

The ARD9800 is now available through AOR dealers. The following is included with each purchase:

- ARD9800 Modem unit
- Power cable for connection to 12 VDC
- Speaker connection cable (from speaker out on your rig to ARD9800 rear panel)
- 8-pin circular mic input connector (requires soldering for your rig's input scheme)

- Mic for connection to front of ARD9800
- Computer cable (from rear of ARD9800 to serial port of your computer)
- Operator's manual

You can also purchase the following accessories for use with the ARD9800:

- 12-VDC power cube
- Memory module VM9800 (needed for sending/receiving images)
- Pre-made mic jack input cables for most popular tranceivers

MSRP for the ARD9800 is $549 USD. Individual dealer prices may vary and are often lower than MSRP. And, remember, the ARD9800 adds an entirely new mode to your existing transceiver. For more information, contact your local amateur radio dealer or AOR USA at 20655 S. Western Avenue, Suite 112, Torrance, CA 90501; Phone: 310-787-8615; Web: www.aorusa.com. Be sure to tell them you read about it in *Pop'Comm*.

Tripp Lite's NewUltra-Compact Inverter

The new Tripp Lite PV375 power inverter is rated at 375 watts continuous output power and 600 watts of peak power.

Tripp Lite, a manufacturer of power protection equipment, has expanded its line of Ultra-Compact DC-to-AC PowerVerter inverters by adding the new PV375 Inverter (model #PV375). Featuring higher output power, a sleek new design, and attractive retail packaging, the PV375 has merchandising appeal and is an ideal mobile power source for operating laptops, cell phone chargers, printers, gaming systems, power tools, wireless equipment, and more.

The PV375 converts DC power to 120-VAC power to provide a safe, clean, and reliable power source with advanced, modified sine wave output—perfect for powering sensitive mobile office equipment. This stylish metallic-blue unit packs reliable technology into durable, lightweight aluminum housing small enough to store inside a glove compartment. The PV375 offers 375 watts of continuous output power and 600 watts of peak output power. Two AC outlets are included, along with easy, one-step installation. Simply connect the cigarette lighter plug to your vehicle's 12-V cigarette lighter/accessory outlet and connect your equipment. Business travelers can run laptop computers, phone/battery chargers, small printers, and other office peripherals. Family travelers can operate game systems, small TVs, phone chargers, and more. Multiple vehicle owners will enjoy the portability, carrying the PV375 from car to truck to trailer to boat and back.

"The PV375 packs more power capacity in an ultra-compact inverter. It is designed to meet the expanding requirements of mobile computing professionals who rely on their laptops for field applications," states Jim Kuziela, Tripp Lite's National Inverter Sales Manager. "Its practical value, unique casing, and attractive packaging is sure to appeal to corporate road warriors, campers, truckers, and many others..."

Tripp Lite's innovations include the world's first UPS system designed specifically for personal computers, and premium surge suppressors. The company has more than 1,000 different products, including UPS systems, surge suppressors, AC line conditioners, power inverters, cables, connectivity products, and network management accessories.

For more information, contact Tripp Lite at www.tripplite.com.

by Steve Douglass, webbfeat@1s.net

utility communications digest

news, information, and events in the utility radio service between 30 kHz and 30 MHz

Changes—And A New Columnist, New Column

I'm dating myself when I say this, but there is a popular '60s song by Bob Dylan that proclaims, "The times they are a changin'." How true it is. Since the beginning of the new century there have been drastic changes in the way the world turns. In the last few years we have all witnessed world events that have shaken us to our very marrow. I think it is safe to say that we all look at the world a bit differently.

Utility communications are in a constant state of flux, too. New digital modes are making casual monitoring that much more difficult. Recently, I received an e-mail from a friend who said that HF communications are going the way of the dinosaur. He told me he was actually thinking of getting rid of his HF gear because he could "find nothing to listen to anymore" and "because everything is going digital."

During the recent war in Iraq, it was true that the bulk of military communications took place via secure digital satellite links. Still, military monitoring hobbyists had plenty to listen to. Military pilots, friends of mine that I have talked with since the war, told me that the sheer volume of high-level communications taking place on satellites threatened to overload the system and, as a relief valve, non-classified communications were moved to HF. But, just because they were not classified, as many monitors will attest, they were anything but boring.

"Even if you disregard military monitoring, there are many, many utility stations to listen to!," I told my friend. "What about hurricane hunters plunging into the storm, the Coast Guard chasing drug smugglers, or international aviation?" I said just to name a few.

"All going digital in the next few year," he replied. "And I should know, because I'm a radio technician."

We continued to debate:

"As communications become more complex, they are also become more susceptible to problems, and the good (but old) analog HF systems, like the GHFS, become even more valuable during turbulent times," I said.

"True." He finally agreed, giving me a win in my column.

Pursuing my point, I cited a good example of how important it is to keep conventional communications systems alive. Recently, a tornado hit the small town of Happy, Texas, located 40 miles south of my hometown of Amarillo. Being a storm spotter for the city, naturally I was out storm-spotting on that fateful day. I can attest to the fact that when the city of Happy was hit the local cellular phone system became overloaded and completely useless, making it difficult at best to place any calls, let alone an emergency call for assistance. Meanwhile ham radio operators and official spotters, using analog two-way radio links, were able to get through to civil defense officials who sounded the tornado warning sirens which were credited with saving hundreds of lives.

I have to admit, change is inevitable, and in the future analog communications will be in the minority. Utility radio hobbyists, however, are up to the monitoring challenge.

Intrepid monitors experimenting with homebrew circuits and writing their own software such as those to log ALE (Automatic Link Establish) systems are breathing new life into HF monitoring hobby. When I first became interested in "UTE" monitoring, it was a solitary hobby. One twiddled with the dials in the dark, both literally and figuratively. We struggled to understand what we were hearing. There were few books on the subject. We didn't have organized networks to exchange information like we have today with the Internet. Talk about a change for the better!

Radio monitoring hobbyists were some of the first to embrace the Internet and realize its potential for bringing monitoring hobbyists together, thereby benefiting everyone. Today utility monitors function much like an intelligence network, sharing frequencies, callsigns, modes, and techniques. We radio hobbyists welcome change, but also are smart enough to not abandon the old, tried-and-true methods of the past.

Let us embrace change while keeping alive those techniques that have served us well, and let's pass those lessons learned on to the next wave of utility monitors. We just hope that radio manufacturers will listen to our needs and help us keep the hobby alive by continually introducing innovative products, like computerized receivers and software, that will aid us in our quest to listen in on this radically changing world.

So to my friend who thinks HF is dead, I say, "Stay tuned. You haven't heard anything yet."

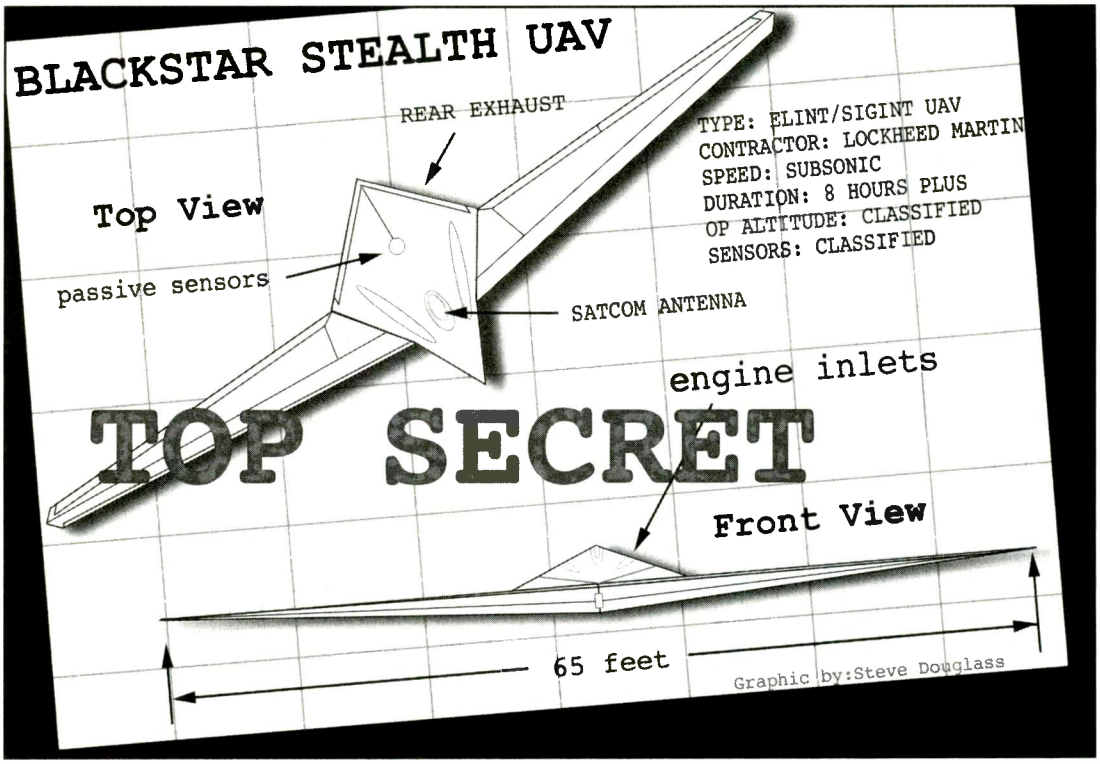
New Columnist!

Speaking of change, you may have noticed this column has changed title and authorship. I hope *Pop'Comm* readers will enjoy these changes and help the column grow in scope and depth. Joe Cooper did a wonderful job at the helm and will continue to do so with his "Computer-Assisted Radio Monitoring" column. I can't thank him enough for his help in getting me up to speed and making this transition as smooth as possible. Thanks again, Joe!

So Who Is This New Guy?

I began monitoring in earnest as a teenager when a friend of the family gave me a 10-band shortwave radio as payment for helping him move. Although the tuning was imprecise and the radio didn't have the best sensitivity, it worked well enough to open up a whole new world of excitement. Although I didn't understand half of what I was hearing, that cheap radio was the beginning of what would become an addiction to radio monitoring. Since then I have owned many, many radios. Some of those relics I still own and will never part with.

I began writing about radio back in the mid-'80s. Soon my words were being published in the few radio-oriented publications of the day. After college I got a job at the local newspa-



per as a photographer and soon established myself as the "go-to-guy" when it came to spot news. If anyone wanted information on frequencies and how to monitor the local police, fire, and emergency services, they came to me.

About that time, new receivers came on the market, which enabled me to monitor military communications. Always an aviation buff, I soon became a military monitoring fanatic, which led to my writing a book, the *Comprehensive Guide to Military Monitoring*, published by Universal Radio. A spin-off of my military monitoring was my reporting on "black projects": covert military aircraft flying out of not-so-secret bases, like Area 51.

While pursuing rumors of black aircraft, I developed many inside sources. Soon I was writing cover stories for *Popular Science* magazine and operating my "Project Black" website. I have a tendency to go on and on about covert military aircraft, so if I do just drop me a line and say "enough already!"

Although I am a near-rabid UTE hobbyist, I won't even pretend to be an expert. I am depending on *your* expertise to keep this column informative and accurate. You are the real experts and without your comments, questions, and criticisms, this column won't grow.

This column is changing, but it is up to you what those changes will be. Working together, we can continue to make *Pop'Comm* a great source of information for utility monitors!

Secret Radio Sky Spy Revealed

Speaking of secret aircraft: Imagine you are a U-2 spy plane pilot flying over war-torn Iraq. Your mission is to take bomb-damage assessment photos of downtown Baghdad. Far below the war wages on, but your U-2 is flying at 90,000 feet, so you are well out of harm's way.

Just as you make your final turn into the "I.P." you notice a slow-flying object very near your flight track and just above your altitude! Is it a UFO? Is it the enemy? You press on and hope the object does not approach, because your reconnaissance aircraft is unarmed and couldn't defend itself if attacked.

As you fly by, you get a better look at the craft. It is almost alien in appearance. Black, angular and with very long, thin wings. Its stealthy lines and advanced design indicate that it is probably of earthly origin and most likely the product of a secret American spy plane manufacturer, just like the U-2 you're flying in.

Thankfully, it doesn't attack, and as you make your way out of the target area, you grab the Nikon you keep stashed under the seat and take a few snapshots of the bird as it passes by.

On the way home, you radio your command post, via secure satellite link, with mission status and mechanical gripes. You also complain about your close encounter with the unknown black aircraft. Although you suspect it is one of your own, why wasn't your crew briefed, especially when it was operating dangerously close to your aircraft?

Although the voice on the other end of the radio has Above Top Secret clearance, he is as surprised as you were to hear about the unknown aircraft, not under their control, flying over Iraq in broad daylight!

Upon landing your aircraft is met by more than the usual support personnel. You are barely out of your pressurized flight suit and you find yourself being questioned by blue-suiters asking you all sorts of questions about the strange aircraft you saw.

You remark off the cuff that you took a few snapshots of the craft and soon your camera is confiscated and you are forced to sign a non-disclosure agreement and warned to keep silent.

But as intimidating as the blue-suiters are, pilots can't help but talk to other pilots, who talk to their crew chiefs who, in turn, yada, yada yada. Soon it's all over the base that a new top-secret black aircraft is flying over Iraq.

But it wasn't only U-2 pilots who saw the secret bird. Other military pilots, ground pounding grunts, and civilian journalists also saw the strange fragile-looking blackbird flying eight-hour orbits over Baghdad.

Soon, back home, the rumors are flying among aviation journalists and black project watchers (military enthusiasts) about this new secret aircraft. Could it have been Aurora, the almost mythical Mach 8 methane-breathing beast, known as the holy grail of black airplanes in stealth-stalker circles, or was this a new bird, rushed into service for the war?

The press began making inquiries and, in an unprecedented move, some senior Air Force officials began to talk. Although information about this new spy plane is still limited, this is what we know.

Flying high over Iraq during the war (and since) has been a unique, stealthy unmanned spy plane that we (until the official name is released) will call Blackstar. Built by those American stealth gurus at Lockheed Martin, this UAV (Unmanned Aerial Vehicle) may serve as the ultimate remote-controlled radio-intercepting reconnaissance aircraft. The aircraft is a stealth version of the cancelled Tier3-minus "Darkstar."

Described by insiders (but not yet confirmed) as an ELINT electronic-intelligence gatherer, it is rumored that Blackstar was a key instrument for eavesdropping on Iraqi cellular and satellite telephones used by high-ranking members of Saddam Hussein's government, including Saddam himself. Reportedly, there are two Blackstars and they orbit in shifts (for eight hours at a time) high above Iraq. Since they are undetectable on radar, an enemy would never know when one is up there.

Using antennas located on the back of the aircraft (belly sensors could be detected by ground based radars), Blackstar intercepts targeted communication links and instantly relays them (in real-time) directly to ground stations by line-of-sight or via satellite using undetectable data compression bursts. Using advanced computers on board, Blackstar can also pinpoint, within feet, the location of enemy transmitters.

These intercepted communications are quickly analyzed by National Security Agency supercomputers running advanced voice-recognition software, which compares these intercepts with voice samples on file. How these samples were obtained is probably an intriguing story in itself.

Once a match is made and the location of a wanted Iraqi official is pinpointed, other attack aircraft are instantly dispatched to the area to bomb (with GPS coordinates provided by Blackstar) the transmitter location.

In one case, when it appeared to be an intercept of Saddam Hussein himself using a satellite telephone, the time from voice print confirmation to relaying of the transmitter coordinates to an orbiting B-1 B took less than 10 minutes. Five minutes later the B-1 bomber was dropping GPS-guided bombs on the location, missing Saddam by several hundred yards. He had obviously moved to another, untargeted building in the compound.

Very similar in design to Darkstar, Blackstar is larger, has a longer time in orbit, and, although it is being used over Iraq now, is not considered operational. Possibly kept out-of-site in closely guarded hangars at Al Udedid Air Base, Qatar, the very low-observable UAV can fly 1,000 miles to the target while penetrating hostile airspace unnoticed. The project is thought to be operated by the Air Force but overseen by the National Security Office and the National Reconnaissance Office.

Reader's Logs

From the few logs I received this month it looks like most UTE monitors were away from their radios and probably outside enjoying the weather. Summer and fall are great for revamping your monitoring posts. Now is the time to replace that old coax or complete that antenna project you've been putting off until good weather. Winter is just around the corner and you'll want your gear to be in top-shape for the cold weather UTE monitoring season!

Perry Crabill, W3HQX, Winchester, Virginia, sent us the following note:

> I hope that you enjoy your stint as "Utility" column editor at *Pop'Comm*. I'd like to repeat a suggestion that I made to Joe Cooper about the information provided with loggings, to wit: With each report Joe listed the initials of the contributor, and at the end of the column he gave the person's name. However, some years ago he stopped providing the listener's geographic location. The reports would have been more meaningful to me if I knew in which part of the world the signals were being heard.

So let me know what you think of his suggestion. Would you like to know the UTE monitor's approximate location? If the majority is in favor, I'll consider (as print-space allows) listing the QTH in the utility logs.

As always, keep those posts coming, and please do me a favor: format your posts like they are listed here. It makes it *much* easier to understand and publish. Also, so it won't get lost in the ton of SPAM I get these days, make sure in the subject you list it as: POPCOM UTE LOG. Don't forget to let me know if you want credit!

Remember that all frequencies are in kilohertz, and times are Universal (Z).

0000: STATION, Anytown, USA, summary of traffic heard in MODE at 0000Z. (monitor)

323: GTN GEORGETOWN NDB, WASH DC. (RP)

332: DC OXONN NDB, WASH DC. (RP)

336: BDB ACCOMACK NDB, MELFA VA. (RP)

342: MTN MARTIN NDB, BALTIMORE. (RP)

355: CGE CAMBRIDGE NDB, CAMBRIDGE MD. (RP)

363: RNB RAINBOW NDB, MILLVILLE NJ. (RP)

371: FND ELLICOTT NDB, BALTIMORE. (RP)

385: GAI GAITHERSBURG NDB, GAITHERSBURG MD. (RP)

404: IUB INSTITUTE NDB, BALTIMORE MD. (RP)

3485: Radio Gander, Canada, 0520 SSB+. Aeronautical weather conditions for Newfoundland and surrounding areas. Definite ID at 0524. (WT)

4333.7: FUX: FN Le Port 1900 RTTY75/850 RY/ID/Testing. (RH2)

4490.0: AAT3BFMARS (Army Mars, Newark DE): 0003 USB/ALE sounding. Also sounding on 5711.0 at 0209. 11/07. (RP)

4490.0: RIC (Civil Air Patrol, Richmond VA): 1948 USB/ALE sounding. 10/07. (RP)

4490.0: AAT3BFMARS (Army MARS, Newark DE): 1623 USB/ALE sounding. Also sounding on this freq at 1720, 1818 & 2013. 10/07. (RP)

5006.0: GW1 (possibly Civil Air Patrol): 1733 USB/ALE sounding. Also noted sounding between 1733–1737 sequentially on 6806.0, 7602.0, 8012.0, 9047.0, 11402.0 & 14357.0. 10/07. (RP)

5696.0 CAMSLANT Chesapeake working N2Y who was reporting flight ops. (DS2)

6783.0: MGJ: RN FASTLANE 8145 RTTY75/340 Carbs. (RH2)

6806.0: SCT1 (possible Civil Air Patrol): 1559 USB/ALE TO WKN1 (possible Civil Air Patrol). Also noted on 5006.0 at 1600, 1700 & 2300 and on 9047.0 at 1757. 10/07. (RP)

6809.0: 441FEMAUX (FEMA Auxiliary station): 1141 USB/ALE TO FR5FEM (FEMA, Region 5 Battle Creek MI). 11/07. (RP)

6911.5: R26838 (VA NG UH-1/UH-60L helo): 0154 USB/ALE TO F2Z224 (2/224th Avn Btn, Byrd Field Richmond VA). 10/07. (RP)

6985.0: KMMTNG (1/151st Avn Bn, SC NG McEntire ANGS): 1829 USB/ALE sounding. Also sounding on 10818.0 at 1930. 11/07. (RP)

6985.0: KMMTNG (possibly McEntire ANGB, SC): 2138 USB/ALE TO R26656 (possible Army NG helo). KMMTNG also noted sounding on 6985.0 at 2319 and on 10818.0 at 2320. 09/07. (RP)

7508.0: ZSJ: SAN Silvermine 1550 FAX 120/576 Fax service resumed //13538.0 (much weaker!) 17/May/03). (RH2)

7598.0: IE20, Italian Army 1930Z LSB Radio check with ET32, IU42, EC34, IU43. (LA)

7777.0: DIAMANTE (Mexican Army): 0122 USB/ALE to JADE (Mexican Army). (RP)

7777.0: ZETA (Mexican Army): 0159 USB/ALE to GANZO (Mexican Army). (RP)

7778.6: WF1 (FBI Washington DC Field Office): 1744 USB/ALE sounding. Also sounding on this freq at 1944. 10/07. (RP)

7778.6: AT1 (FBI, Atlanta GA): 2017 USB/ALE TO ME1 (FBI, Memphis TN). 10/07. (RP)

8050.0: FC8FEM (FEMA, Region 8 Denver CO): 1250 USB/ALE sounding. Also sounding on 10588.0 at 1349. 11/07. (RP)

8050.0: VEK (unidentified): 0526 USB/ALE TO VDD (unidentified). 09/07. (RP)

8125.0: FAAZNY (New York ARTCC): 0623 USB/ALE sounding. 10/07. (RP)

8181.5: ASF1IL (Army Aviation Support Facility #1, Illinois): 0200 USB/ALE sounding. 10/07. (RP)

8181.5: KMMTNG (1/151st Avn Btn, McEntire ANGS, SC): 0020 USB/ALE sounding. 10/07. (RP)

8983.0: CAMSLANT Chesapeake working CG 1503. Radio check. (DS2)

8983.0: N2Y reporting vessel entering harbor without prior permission to CAMSLANT Chesapeake. (DS2)

8992.0: WEST COAST running phone patch for DARK 11. (DS2)

8992.0: YANKEE 82 reporting arrival info for YANKEE 81 and YANKEE 82 to LIGHTHOUSE Control via pp ANDREWS. (DS2)

8992.0: NAVY MF916 calling MAINSAIL for radio check. (DS2)

8992.0: OFFUTT reading 32 character EAM. (DS2)

9040.7: VTH1/5/7: IN Bombay 1625 RTTY 50/850 RY/ID/ RBSL/BNR. (RH2)

9145.0: 814368 (US Army 160th SOAR helo): 0118 USB/ALE sounding. Also noted sounding on 09068.5 at 0119. 009/07. (RP)

10444.0: TIERRA (Mexican Army): 2351 USB/ALE to MARTE (Mexican Army). (RP)

11018.0: SITIO20E (Colombian DEA): 0010 to SITIO18E (Colombian DEA). (RP)

10509.6: CLB (possibly French Navy, Brest): 0133 USB/ALE TO TLN (possibly French Navy). Also noted on this freq at 0415 & 0552. 10/07. (RP)

11018.0: FACA1E (Colombian DEA, Facatativa): 0010 USB/ALE to SITIO17E (Colombian DEA). (RP)

11018.0: SIT (Colombian DEA): 0130 USB/ALE to SITIO18E SAL (Colombian DEA). (RP)

11018.0: SITIO20E (Colombian DEA): 0032 USB/ALE to SITIO18E JIT & to SITIO14E (Colombian DEA). (RP)

11018.0: SITIO18E (Colombian DEA): 0112 USB/ALE to SITIO17E (Colombian DEA). (RP)

11018.0: SITIO18E (Colombian DEA): 0134 USB/ALE to SITIO17E (Colombian DEA). 01/05 (RP)

11018.0: SITIO13E (Colombian DEA): 0137 USB/ALE to SITIO18E SE5 SAQ (Colombian DEA). (RP)

10535.0: Unid: CIS Navrad 1853 36-50 50/240—No, not CFH Halifax! (RH2)

11090.0: KVM70: Honolulu Met 1134 fax 120/576 Fax Program Schedule (20/May/03). (RH2)

11018.0: SITIO13E (Colombian DEA): 0211 USB/ALE to SITIM1 (Colombian DEA). (RP)

11439.5: T1Z137 (1/137th Avn Btn, OHNG): 0151 USB/ALE sounding. Also noted sounding on 07650.0 atr 0220. 10/07. (RP)

11439.5: T1Z137 (US Army NG 1/137 Avn Btn, Akron-Canton OH): 1918 USB/ALE sounding. 09/07. (RP)

11637.0: FAAZJX (Jacksonville ARTCC): 1615 USB/ALE sounding. 11/07. (FP)

11637.0: FAAZID (Indianapolis ARTCC): 1613 USB/ALE sounding. 11/07. (RP)

11565.0: UNID YL with letters, no apparent grouping. USB at 2352Z. (CG)

12087.0: 1E (unidentified): 0007 USB/ALE sounding. 11/07. (RP)

12087.0 1E (unidentified): 2309 USB/ALE sounding. 10/07. (RP)

12191.0: SCLC501 (501st Battalion, Venezuelan Army): 2008 USB/ALE to PCRC5 (5th Infantry Division, Cuidad Bolivar). (RP)

12603.0: "Lincolnshire Poacher" numbers station: YL/EE with 5-figure groups, each given twice. Similar signal on 10426. USB at 2210Z. (CG)

12832.0: Unid: CIS Navrad 1555 36-50 50/. (RH2)

12603.5: SVO, Athens Radio, Greece with CW beacon at 2212Z. (CG)

13339.0: Aero Mexico Dispatch (O/M SS): 1314 USB w/flight 429 (O/M SS) w/wx for Monterrey, Mexico. (RP)

13475.0: MENEMAUROA (Venezuelan Air Defense site): 1000 USB/ALE TO CDDA (Venezuelan Air Defense Command, El Liberator Airbase). 09/07. (RP)

15750.0: GYA: RN WhiteHall 1616 RTTY 75/340 Carbs. (RH2)

16200.0: Unid: CIS Navrad 1603 36-50 50/. (RH2)

16324.7: RFTJD: FF Libreville 1607 Arq-E3 192/400 Betas. (RH2)

16360.0: CLB (possibly French Navy, Brest): 0238 USB/ALE TO TLN (possibly French Navy)—[AMD] 10/07. (RP)

17441.5: 5YE: Nairobi Met 1621 RTTY 100/850 Wx Groups. (RH2)

17982.0: Aircraft (O/M Portuguese): 1251 USB w/unheard station giving departure message. Probably Brazilian Air Force. (RP)

18183.4: 7RQ20: MAE Algiers 1645 Coq8 26.67 Msg\FF to Ambalg Nouackchott—"how goes the revolution." (RH2)

19036.5: Unid: Ambalg Accra 1634 Coq8 26.67 Msg\FF to MAE info Washington, Paris, Addis, Niamey & Ouga. (RH2)

19417.7: Unid: MFA Cairo? 1514 ARQ Msg\AA to unknown signed "KDLISF"—often seen but not sure of meaning? (RH2)

23525.0: Pirate op. 2000Z USB OM/SS prob. from South America with "roger bip" at tx end. (LA)

This month's UTE log contributors are Chris Gay (CG), Dwight Simpson (DS2), Joe Wood (JW), Robert Hall (RH2), Lupo Alberto (LA), and Ron Perron (RP3).

Thanks to all for your submissions. Each and every one of your contributions is appreciated.

Final Thoughts

As I finish up this first column, I can't help but get up on my soapbox and preach about how important I think it is to ensure the survival of our hobby by getting a new generation interested in utility monitoring. I know, it is very hard to pry the kids away from their Nintendos and DVD players and get them interested in anything that requires them to sit still and actually *listen* for a change, but the future of our hobby depends on it.

If you have ever watched the Tonight Show with Jay Leno, you have probably seen the segment called *Jay Walking* where Jay asks simple questions of young people on the street. They give embarrassingly wrong answers, which show just us how bad a job we are doing educating our children.

Utility monitoring is not only fun but educational as well (but don't tell your kids that!), and it will help improve a student's math, science, and geography skills. Your average teenager may not be able to find Monrovia on a map, but a young UTE monitor sure could.

So, instead of selling that old HF receiver you have in your closet on e-bay, clean it up, make sure it works well and give it to a kid! Introduce them to a world that is much bigger than them. Show them how cool it is to log a pirate station or intercept military communications. Instill in them a sense of wonder about the radio bands that is theirs to explore, and you will have done a good deed indeed! ■

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Operational Considerations Of Your GMRS Radio System

In the last couple of issues, we've looked at a unique GMRS base station installation—a GMRS *small base station*. This month, it's time we think about a more standard GMRS home base station configuration. My wife and I set up one example of a modest, but typical, GMRS base-mobile system at our home for our personal and business use.

We got the idea for our own particular GMRS system design from a friend who owns a home in another state. Our friend had been contemplating a system with home base stations for himself and his fiancée. His system was to include mobile units in his fiancée's car and in his sport utility vehicle. His main reason for having his own GMRS system was for emergency/disaster/backup communications should wireless telephone systems could fail. He also remains involved in Homeland Security matters, and wants to stay in close contact with his fiancée. Well, having just this sort of GMRS setup is a good idea, whatever the reason.

I set about assembling just such a GMRS mobile system for our own household. I had planned basically a three-piece system, consisting of a base station at home and two high-power mobiles, one in our car and SUV.

About a year prior, I had a GMRS mobile installed in my SUV just to try it out and to learn more about actual GMRS operations. Other than that, our only other GMRS equipment consisted of two consumer-grade "bubble-pack" GMRS handhelds. Using the handheld radios while shopping and out and about in the neighborhood turned out to be good practice for us. I used the mobile unit to do a lot of monitoring and to communicate with other local REACT members. We operated this way with this equipment during the first year of being GMRS licensees.

This can be an excellent learning period for new GMRS users, as well as a good confidence builder. Many of those using two-way radio in any form for the first time are just a bit microphone-shy. This especially applies to a disciplined service like GMRS, where there are a few rules to follow, including proper station identification. (My wife, however, turned out not to be a bit shy about talking!)

Eric Price, WPUI917, of Stewartstown, Pennsylvania, shows off the mobile electronics installation in his 4 x 4. Check out that cell phone, Uniden BCT-7 scanner, and stereo equalizer, along with a barely visible Midland 79-290 SSB CB, under a 110-volt inverter. Where does he stuff his handheld GMRS in there? The ladies ought to love those legs, Eric! (Photo courtesy of N3HOE)

My Station Setup

Our home is blessed with being located on a coastline with dead-flat terrain for literally well over a hundred miles in any direction. Additionally, there are very few structures over one story tall for many miles. Because of this, we can use a pole-mounted base station antenna of very modest height. I had a small and very lightweight Cushcraft antenna mounted atop 23 feet of an extendible TV antenna mast assembly, secured to the side of the house structure. I chose a Cushcraft AR-270 shorty amateur antenna that has been cut and meter-tuned for 462 MHz.

Such a modest base station antenna configuration wouldn't work for everyone's situation. If you live in an area with only moderately rolling hills, you may discover that you need something on the order of a 200-foot tower (or higher) just to get enough UHF range to cover your town.

If you live in a mountainous area, you might be fortunate enough to live at or very near a peak or summit. There, our modest antenna setup may give you excellent GMRS range, though possibly nothing more than a wide sweep in one direction, depending upon local terrain. If you live at or near the foot of a mountain range, you may or may not have moderate coverage of the valley floor. But you can forget about your signal reaching beyond those mountain crests. This antenna installation just won't be suitable or cost-effective in some situations. Challenging terrain situations often require tall towers, and likely *repeater* installations.

The GMRS system described here is designed to cover only a small city. Our home happens to be centrally located in our city, which certainly helps our coverage. Our primary (required) target coverage area, for base-to-mobile operation, stretches about three miles both north and west, four miles east, and five miles south.

Our secondary (optional) base-to-mobile coverage area would reach eight miles both north and south. If this secondary requirement can be met, our coverage will extend to two additional towns, equidistant north and south from our home base. We are still testing our secondary coverage reach, and have experienced coverage up to eight miles north, at least to some points. Interestingly, we *accidentally* made contact from one mobile unit eight miles north of home base to a handheld unit *inside an automobile* located one mile south of home base! Our coverage situation looks quite encouraging.

Our base station transceiver consists of an unremarkable old and well-used 10-channel Kenwood base/mobile unit running 25 watts, along with an Astron RM-50M rack-mount commercial power supply. Our two mobiles units are identical new Maxon SM-6000 series base/mobiles that were illustrated and described in this column in the March 2003 issue of *Pop'Comm*. And, we have three different consumer-grade "bubble-pack" handheld radios for varied uses.

Rather than go into detail about the physical installation and configuration of our station, let's instead focus on some important operational considerations. Much has already been written about land mobile radio base station and mobile unit installation and system design. Nearly every question I hear about GMRS system design deals with the physical facility. Consequently, almost no attention is given to operational design. To address this, we'll look again at our own system.

Monitoring First

Before selecting our GMRS "main" channel, I spent nearly a year monitoring the eight high-power GMRS channels to find the frequency with the least local activity, particularly in terms of repeaters, licensed high-power base stations like mine, and grandfathered commercial and organizational users. I also checked the Personal Radio Steering Group's (PRSG) *Repeater Guide* along with GMRS repeater listings on the Internet. I didn't find repeaters or other GMRS base-mobile systems on our chosen channel, nor were there any low-power handheld radio users heard in our immediate area. Perfect!

Then there's *Murphy*. My wife was visiting a neighbor one evening, handheld in hand, while I remained at home. Then it happened. What were the chances? Another neighbor's kid, a daughter, also dropped in to where my wife was visiting, and was also carrying a GMRS bubble-pack handheld. While there, the kid's mother called the child's radio to tell her daughter to come home. The transmission broke right through our receivers! My wife, hearing *something* (the mother/daughter call) coming *unexpectedly* through her own radio's speaker, became confused, and keyed up to ask me if I was calling her. Then the kid's mother came up on the air, speculating aloud to her child as to how it could be that anyone else was on their "private" channel?

Oh, brother! What galled me about this incident was not that I could have been simple and vain enough to presume that this was my very own channel. Nor was it Murphy's Law, particularly, that beat the better than one-in-570 odds against anyone else in the immediate vicinity having chosen the very same channel and CTCSS code that we had. It wasn't even the ironic timing in that for a whole year the channel went unused locally, while another user not 500 feet away started using the channel the very first month we did. No, what really irritated me was that the co-channel users in question here were evidently unlicensed—no callsigns were heard.

While the crux of the problem here may be unauthorized GMRS users, we must examine this problem in terms of the relative *security* of our communications. Given that our main concern here is preventing co-channel users from interrupting our own comms, our solution ought to be as simple as changing CTCSS tones, or switching to Digital Coded Squelch (DCS) signaling instead.

But, simply going over to DCS will not necessarily solve our problem. Quite a few consumer-grade GMRS and FRS radios come equipped with DCS in addition to CTCSS. Many of these cheap consumer handheld units can scan for signaling codes on a given frequency, or lock onto and change CTCSS and DCS on the fly. On the other hand, ironically, our commercial GMRS units need to be pulled from the mobiles and base station desk to be bench-programmed on a PC in order to make any changes. Therefore, we want a signaling code that, at a minimum, will not be stumbled upon by uneducated users.

A related and particularly annoying problem is that most, if not all, of these bubble-pack radios continuously display a channel number and a CTCSS or DCS code number for the frequency and signaling in use. This means that anyone can look over my shoulder and instantly determine our operating parameters and identically program his or her radio in order to communicate with us—whether we wish to do so or not.

Nevertheless, I did my homework and found that none of the bubble-pack consumer radios I had researched have the capability of accessing more than the original 38 CTCSS codes, and some don't have any more than 83 of the DCS codes. Conversely, my two Maxon mobiles can be set to quite a few *non-*

standard codes. My Kenwood base radio will do a limited number of nonstandard CTCSS or DCS codes with the optional upgraded signaling board installed by a previous owner. My simple plan then is to have these three radios on a nonstandard CTCSS or DCS code. For our own consumer-grade handhelds, we will have to use an alternate "channel," consisting of the same operating frequency with a different, standard CTCSS code.

As for the actual underlying co-channel traffic, all of it is apparently unlicensed users (no callsigns heard) on regular 2-watt consumer-grade handhelds. Consider, then, that we are running 25 to 40 watts transmit power in the base and mobile

Special Clip 'n' Keep—
Understanding Your GMRS-FRS Walkie-Talkie*

Are you among the hundreds of thousands of people who have purchased one of the most popular consumer electronic devices on the market, the **GMRS-FRS** handheld two-way radio? Your handheld communicator operates on two overlapping radio bands. Nearly all of these walkie-talkies operate on the **FRS** band. *FRS* stands for "Family Radio Service," and as its name implies, most people use these devices to stay connected to family, friends, and co-workers. There are 14 channels in the FRS band. Some, or all, of these 14 channels are used in small, handheld two-way radios like yours.

Many of these same small walkie-talkies also operate in the **GMRS** band. There are 15 GMRS channels available for these walkie-talkies. *GMRS* stands for "General Mobile Radio Service." This is a radio service for *licensed stations* only. It is used by individuals for their personal affairs and business activities. And, GMRS is often used by persons operating high-powered mobile two-way radios in cars and trucks. It is used for handheld radios by licensed persons, as well. Eight of these GMRS channels are used chiefly by high-powered base stations, high-powered mobile (car) radios, and special radio networks known as *repeaters*.

If you own and operate any sort of GMRS or GMRS-FRS two-way radio on GMRS channels YOU ARE REQUIRED TO HOLD A VALID **GMRS LICENSE** ISSUED BY THE FEDERAL COMMUNICATIONS COMMISSION (FCC). It is important that you not operate your walkie-talkie on any of the GMRS channels unless you hold the required license (Class "ZA") *and* YOU UNDERSTAND ABOUT HIGH-POWERED, LICENSED RADIO STATIONS THAT OPERATE ON THESE GMRS CHANNELS IN YOUR LOCALITY.**

In a number of areas, GMRS channels are licensed to public safety entities such as ambulance services, volunteer fire departments, and police department personnel. You *really* do *not* want to risk interfering with these officials! The FCC's recently created Enforcement Bureau has greatly heightened enforcement activities. Investigators locate and identify violators by means of automated triangulation and RF fingerprinting. You need to be aware that unlicensed operation carries surprisingly steep fines and other unpleasant sanctions. And adjudication of FCC rules violators turns out to be a regular, not rare, occurrence.

Some Common Questions and Answers:*

Q. How do I know if my walkie-talkie can operate on GMRS channels?

A. If your handheld two-way radio has only channel numbers 1 through 14 available, then it is likely a true FRS radio, with no GMRS channels. (Check your user manual to be sure.) You may operate on any and all of the 14 FRS channels without any license on an FRS-only radio.

Q. My walkie-talkie has 22 channels. Does this mean my radio has GMRS channels? I don't want to get a GMRS radio license. How may I operate this radio?

A. Most, if not all, of these 22-channel walkie-talkies are combination FRS-GMRS radios, where Channels 1 through 14 are the FRS channels. (Check your user manual to be sure.) In this case, you may operate on channels 8 through 14. These channels are allocated exclusively for FRS, so their use cannot *logically* require a GMRS license.

Q. So, may I use Channels 1 through 7 in this same 22-channel walkie-talkie, since these are also **shared-FRS** channels?

A. This is a highly questionable legality. FRS Channels 1 through 7 are shared with licensed GMRS operations. Whether using these shared channels in a combination FRS-GMRS walkie-talkie unit requires a **GMRS** license, remains to be adequately answered by officials at the FCC. To be safe, make sure you use only Channels 8 through 22 on this type of radio.** Whatever you do, IT IS IMPORTANT TO STAY OFF OF THE LICENSED HIGH-POWERED GMRS CHANNELS, 15 THROUGH 22 on this type of *22-channel* walkie-talkie.**

Q. I have a walkie-talkie that has 15 channels. What sort of two-way radio is this, and may I operate it without a GMRS license?

A. This sort of consumer electronic device is almost certainly a GMRS radio. (Check your user manual to be sure.) In this example, Channels 1 through 7 are shared with FRS Channels 1 through 7. However, these channels are only for licensed GMRS operations *on this type of radio*. To be certain you remain in compliance, do not use this type of radio, unless you go through the steps of getting a GMRS license.** Whatever you do, IT IS IMPORTANT TO STAY OFF OF THE LICENSED HIGH-POWERED **GMRS** CHANNELS, 8 THROUGH 15 on *this* type of *15-channel* walkie-talkie.**

**The information given in this document is not a substitute for competent legal advice from a licensed attorney. Contact a qualified attorney to verify and to clarify any and all of the information given here. You should also contact the Federal Communications Commission's consumer information service at 1-888-CALL-FCC.*

***These restrictions MAY POSSIBLY not be enforced against you if you must use your walkie-talkie to summon assistance in a life-threatening emergency, or other serious emergency, when no other means of calling for help is available. Once you have read this document, be sure to contact the FCC for specific information at 1-888-CALL-FCC.*

radios. You can imagine the consequences of neglecting to monitor the frequency before transmitting! Of course, we are always careful to watch out for other traffic on the channel. And we always give immediate priority to emergency traffic, whether from authorized or unauthorized users.

We can see now that *operational* consideration in system design relates to the impact to, and of, other users on the frequency, few and far between as they may be. A main consideration, therefore, is maintaining the relative security of the system from outside transmissions. Consider using nonstandard tones on your main operating channel, at least for the base and mobile radios. Contemplate carefully the potential impact of local FRS (or unlicensed GMRS handhelds) interference you may encounter right in your own neighborhood.

Here's Help You Can Really Use!

Are you a licensed GMRS user plagued by interference caused by neighbors or others nearby operating unlicensed bubble-pack GMRS and FRS-GMRS hybrid walkie-talkies? You may have wanted to speak to those individuals about their unauthorized radio use. You may even have attempted to do exactly that, but without documentation from a credible source, they probably thought you were joking with them. Many folks seem to believe that the FCC has deregulated everything. Show them a printed copy of the FCC's GMRS rules, still written in legalese, and watch them roll their eyes.

Well, help has arrived! Be sure to read and save this special "Clip 'n' Keep" section. It explains that many bubble-pack consumer handheld two-way radios require GMRS licensing and provides clues in determining which radios and channels do and which don't. Make copies of this easy-to-read section to leave with those disbelieving neighbors who have GMRS-capable radios. Be polite and help them understand this very serious requirement that their radios' manufacturers and vendors may have neglected to mention.

We'll see you again next month with more Personal Radio Services news. Remember, send your comments, ideas and questions to me at *Popular Communications*, "On-The-Go Radio," 25 Newbridge Road, Hicksville, NY 11801, or e-mail directly at wpuc720@juno.com.

v.i.p.

spotlight

how you got started in radio

Congratulations To Steve Clang, KA1BTI, Of Massachusetts

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 (no Polaroids, please) should be included.

Each month, we'll select one entry and publish it here. Submit your entry only once; we'll keep it on file. 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, letting us know if you're sending photos. Please print your return address on the envelope if using the postal mail system. Not doing so will delay your submission being processed. If you're e-mailing photos, please send them in a separate e-mail with your name in the "subject" line.

Steve Clang of Plymouth, Massachusetts, in his radio shack.

"My dad bought me a radio, a Heathkit HW-8, which got me started. To his amazement, I made contact with ZL2TX in New Zealand, which represented 3,717 miles per watt!"

Our October Winner: Steve Clang

Pop'Comm reader Steve Clang of Plymouth, Massachusetts, says,

Like many others I got involved in the communications hobby as a teenager in the mid-'70s during the "CB craze." I remember experimenting with antennas, climbing the highest tree in our yard to put a whip antenna in the top, and hooking it to my walkie-talkie—my earliest attempt at DXing.

As my interest grew, I decided to study for a Novice ham license. I knew a guy the next street over who had a 50-foot tower in his backyard, so I got up enough courage to introduce myself. After showing me around his station he gave me the code test! Later that evening, I came back to take the written exam. I received my license as KA1BTI a few weeks later.

My dad bought me a radio, a Heathkit HW-8, which got me started. To his amazement, I made a contact with ZL2TX in New Zealand, which represented 3,717 miles per watt! My wife recently got her Technician ticket. I've been active in just about everything you find between the pages of *Pop'Comm* and *CQ*, and I still have an antenna in the tree outside—the tallest one in the yard! Thanks for publishing two of my favorite magazines. ■

washington beat

Capitol Hill and FCC actions affecting communications

by Laura Quarantiello, lauraq@cts.com

On The Way—The Commercial Spectrum Enhancement Act?

It's all about spectrum these days: Who wants it, who's got it, and how to divide it up so everyone gets a slice. It's a complicated and expensive endeavor. To help defray the cost of sorting through the U.S. wireless spectrum, the House of Representatives has approved the Commercial Spectrum Enhancement Act (CSEA). This bill, if passed by the Senate, would create a trust fund fed by government sales of spectrum to commercial users. The funds generated from the sales will pay for the migration of federal agencies to new spectrum.

Bush Looks At Spectrum Use

Meanwhile, over at the White House, the Bush Administration has ordered a year-long review of how the government and the wireless industry uses spectrum. The review has fallen to the Commerce Department, which will set up a task force composed of two groups. One group will consist of government users who will study the problems, challenges, and solutions from their perspective. The second group will evaluate non-governmental use of spectrum. Shouldn't they have done this a long time ago?

Northrop Grumman Asks For More Spectrum

The FCC, which must be tired of hearing everyone whine about not having enough frequencies, is entertaining yet another request for more spectrum—this time from Northrop Grumman's information technology division. They're asking the Commission to set aside 10 MHz of spectrum in the 700-MHz band for use by the Department of Homeland Security and pubic safety agencies. Currently, television broadcasters use 700 MHz. According to Northrop Grumman's wireless project manager, spectrum in the 700-MHz band is "cleaner," can be used nationwide, and can enable public safety agencies to use high-capacity data, video, and voice transmissions. Television broadcasters are expected to oppose the Northrop Grumman proposal, which the FCC has not yet commented on.

Cell Tower Inquiry

Why do birds fly into cellular towers? The FCC wants to know and they have announced an inquiry into the effect that cell phone transmission towers have on the environment, historic sites, and Indian lands. As part of the environmental impact inquiry, the commission and the U.S. Fish and Wildlife Service will study why migratory birds fly into the towers. The commission will also undertake an effort to protect the environment and historical sites, including Indian historical, cultural, and religious sites, while accelerating the process of deploying necessary communications infrastructure. The wireless industry has expressed concern over the FCC plans, saying that the Commission is just delaying implementation of a historic preservation agreement. They did, however, praise the FCC's intent to improve coordination procedures with Native American groups, which could strengthen consultations and communications and eventually streamline tower-siting procedures.

Television Tech History

Remember the good old days when television was black and white and you didn't have to wade through 200 channels to find out what was on? Okay, maybe some of us don't remember. Just to remind us how far television has come, the FCC has opened a new Web page devoted to the history of television technology. Visit www.fcc.gov/omd/history/ for a look at how things were and how things will be on the small screen.

A $10,000 Fine

As the result of an investigation that began more than three years ago in May 2000, a Florida man has been ordered to pay $10,000 for unlicensed broadcast station operation. According to the FCC, Richard I. Rowland determined that Rowland operated an unlicensed radio station on 97.1 MHz from a Longwood, Florida address on "numerous dates in the year 2000."

U.S. Marshalls and Commission agents reportedly seized his radio station equipment in 2001. The $10,000 monetary forfeiture on Rowland is "for multiple violations of operating an unlicensed FM radio facility in violation of Title 47, United States Code, Section 301." The Commission news release states, "After Rowland refused to pay the forfeiture, the Commission filed suit for collection through the United States Attorney in federal district court. The case was brought by the United States Attorney's Office, Middle District of Florida, Orlando Division."

Chairman Powell To The Rescue

By now you're familiar with the recent uproar over broadcast media ownership rules, and the rules the Commission adopted on June 2. Well, now FCC Chairman Michael Powell has come out swinging, defending the FCC media rules.

In an official release dated July 23, he said, "We are confident in our decision. We created enforceable rules that reflect the realities of today's media marketplace. The rules will benefit Americans by protecting localism, competition and diversity."

Back on February 19, 2002 a federal court branded the previous Commission decision to maintain existing rules, including the 35 percent cap as "arbitrary and capricious and contrary to law." The new ownership rules – that took the FCC some 20 months to develop - came about after a proceeding mandated by Congress and the courts.

The FCC news release said, "Evidence in the FCC record showed that the TV networks provided more and better local news than other owners of TV stations. The FCC concluded that raising the national TV ownership limit will help the networks bring these benefits to more Americans." The news rules "would allow the licensees already over the 35 percent cap to purchase a handful of additional stations, approximately half a percent of stations nationwide."■

7 GREAT New Books from CQ

Heathkit - A Guide to the Amateur Radio Products

by Chuck Penson, WA7ZZE

1

This greatly expanded Second Edition is a must for collectors and Ham history buffs, but is a terrific trip down memory lane for any Ham who was there or wishes he had been. Pick up this 328-page volume and you won't be able to put it down!

Order No. HEATHKIT $29.95

The Short Vertical Antenna and Ground Radial

by Jerry Sevick, W2FMI

2

This small but solid guide walks you through the design and installation of inexpensive, yet effective short HF vertical antennas. With antenna restrictions becoming a real problem, this book could keep you on the air!

Order No. SVERT $10

Understanding, Building & Using Baluns & Ununs

by Jerry Sevick, W2FMI

3

The successor to the popular and authoritative *Baluns and Ununs*. Great deal of new tutorial material, also includes new designs not in his previous book, and crystal clear explanations of how and why they work.

Order No. 2BU $19.95

Ham Radio Magazine Anthologies

4

Introducing the first four of a new series of anthologies drawn from the pages of *Ham Radio* magazine. Now you can enjoy collections of the best material published in *Ham Radio* magazine, conveniently arranged by subject and by original publication date. Choose your interest, your time period, and choose your Anthology.

Homebrewing Techniques - This anthology brings together the most useful and practical advice and techniques for the person who wants to build anything from small solid state projects to beam antennas.

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5

Test Equipment & Repair Techniques - From building test gear to trouble shooting the rig, this anthology of the best articles on the subject has been carefully selected to meet today's needs. Includes techniques and devices that work and are easily duplicated, and gives today's Hams a much-needed helping hand at solving equipment problems on their own. **Order No. ATEST** $19.95

6

7

Ham Radio Anthology: Antennas - Carefully selected, these first two antenna anthologies cover all types of antenna designs and theory from 160 meters through microwaves. All articles have been selected to be as timely and valuable to today's Ham as they were to *Ham Radio* readers of the time. These first two volumes will be followed by two additional volumes.

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broadcast technology

terrestrial AM, FM–and satellite radio news

by Bruce Conti, baconti@aol.com

A Look Inside A Radio Broadcast Group

Radio enthusiasts attending the International Radio Club of America 2003 Convention in Maine got an inside look at Saga Communications' Portland Radio Group. Sara Dobbins, Promotions/Marketing Director, and 93.1 "MGX Scene Queen" personality, led one of two tour groups through the co-owned six-station facility consisting of 560 WGAN (news/talk), 970 WZAN (talk/sports), 1490 WBAE ("Music of Your Life"), 93.1 WMGX (hot adult contemporary), 100.9 WYNZ (oldies), and 101.9 WPOR (country).

"RJ" Rick Jordan, WPOR Program Director, was on the air at Today's Country 101.9 WPOR-FM, where everything is assisted by computer control. For example, RJ explained how music files are "sound coded" so that the entire on-air music selection process is sorted by computer. A Garth Brooks selection might be coded Garth, male, hat (he wears a cowboy hat), twang; in other words, each song on the playlist is tagged with any number of designations to define the sound. Once the ratio of male to female artists, twang, classic, modern, hat and hatless, etc. is entered, the computer determines the rotation, and the songs are all in order and ready to play by touch screen.

RJ was proud of two recent improvements at the radio group: an upgrade to "Omni 06" processing in the air chain of WPOR, and the installation of a new digital workstation in one of the production studios. The workstation is the Pro Tools Control 24 and features digital plug-ins, modeling classic analog compressors. Select one of the old compressors and its front panel pops up on the screen—very cool for those who might remember the old-fashioned compressed audio of Top-40 AM radio.

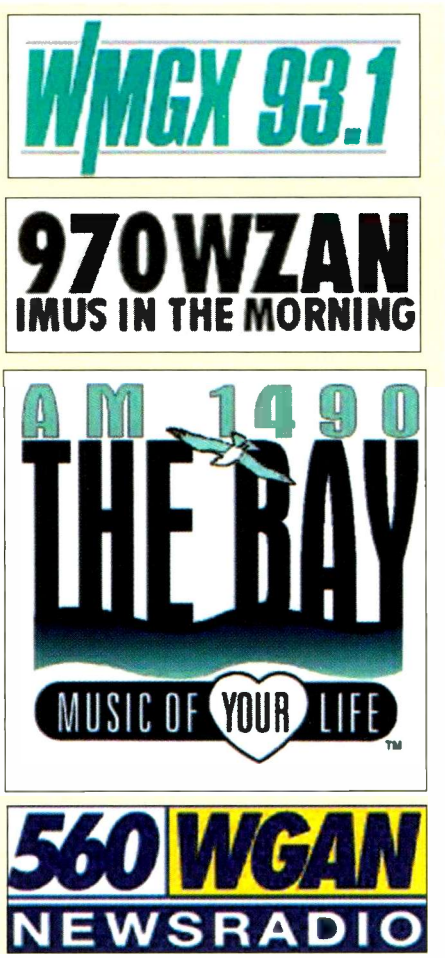
RJ was familiar with AM/FM DXing, and entertained the gang with old WPOR AM jingles resurrected for intros to classic country songs.

The Portland Radio Group has two news/talk operations: 970 WZAN and 560 WGAN. Station 970 WZAN is basically a walk-in closet studio/control room from which the syndicated talk and news programs are broadcast on auto-pilot. "Imus in the Morning," "Loveline with Adam and Dr. Drew," NASCAR coverage, and "Fox Sports Radio" are among the more popular national network programs carried on WZAN. The more elaborate and spacious 560 WGAN studio serves as the local news flagship of the radio group, with local news/talk during the morning drive and local news updates throughout the day while carrying syndicated talk including "Coast to Coast AM with George Noory" overnight.

The WYNZ Oldies 100.9 studio had been dedicated to honor longtime morning show host Bob Anderson, "The Duke of Portland," who passed away unexpectedly earlier this year. A memorial fund has been established for the construction of the Bob Anderson Memorial Recording Studio at Westbrook, Maine high school. Visit www.wynz.com for more info.

Rounding out the musical side, "The Bay" 1490 WBAE brings nostalgia to the airwaves with "The Music of Your Life" plus ABC News and Accuweather updates, while 93.1 WMGX local personalities keep listeners in tune with the latest happenings in and around the city. Despite all the controversy surrounding the FCC decision to further relax media ownership limits, Saga's Portland Radio Group is certainly a good example of how well a co-owned cluster of radio stations can serve its community.

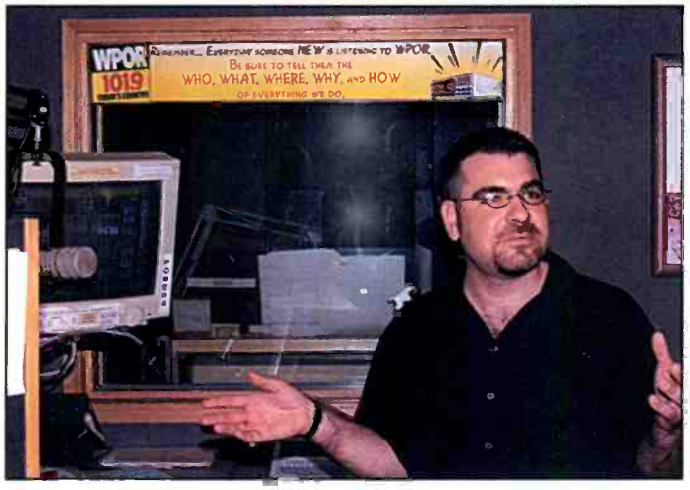
Convention host Mike Sanburn, KG6LJU, made all the arrangements for the radio station tour. The International Radio Club of America is a non-profit organization dedicated to the hobby of hearing distant stations on the AM broadcast band. Visit them at www.ircaonline.org for more information about the club and its activities.



Another Low-Power Broadcast Petition

We reported in the July edition of *Popular Communications* that the Citizens Broadcast Band Discussion Group (CBBDG) had petitioned the FCC for the creation of a new broadcast band reserved exclusively for private citizens and small community groups. Well now another proposal has been announced to create a new low-power AM service in the expanded band (1610 to 1700 kHz).

According to a press release, broadcast engineer Fred Baumgartner is petitioning the FCC to allow radio stations with 100 watts or less in the x-band, using an "easy and affordable" application process based simply on distance between stations without complicated directional facilities, critical power changes, or excessive technical requirements. Strict rules would be established to guarantee that a station operates in the best interest of the community it serves. Under the proposal, mul-



"RJ" Rick Jordan explains the computerized music system while on the air at WPOR FM.

"MGX Scene Queen" Sara Dobbins in one of the Portland Radio Group's production studios.

tiple station ownership would be prohibited, and as many as two stations might share time on a frequency to facilitate diversity. Citing the shortcomings of low-power FM, the petition says, "Low power AM in the expanded band proposes to provide the missing neighborhood owned and operated, community centered broadcast service."

Meanwhile, Kyle Drake, CBBDG Head and Director of Communications for the Amherst Alliance, reports that after some time in the FCC Media Bureau "holding tank," the petition for a new citizens' broadcast band was misplaced in FCC docket 99-325 under digital radio. Drake has been in contact with the Media Bureau to have the petition reassigned to a more appropriate docket. Drake is also involved with the proposed Kahn alternative to AM IBOC digital radio.

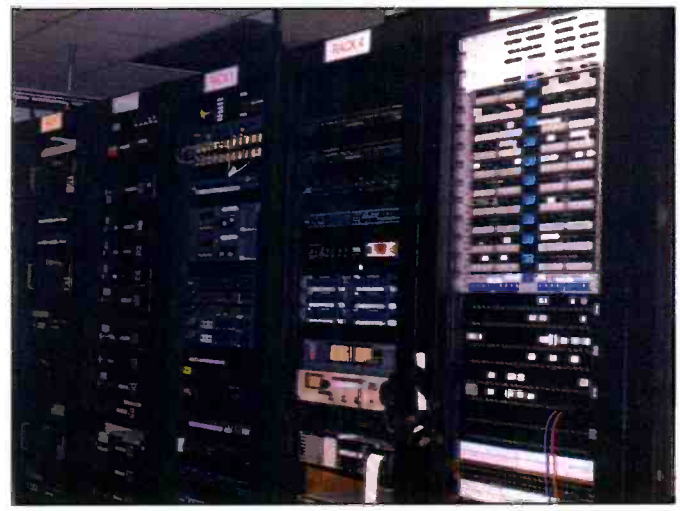
Digital Radio Update: FM Moves Forward, AM Under Test

More radio stations and manufacturers are signing on with in-band on-channel (IBOC) digital radio, or HD Radio. Bonneville's Classical 102.1 KDFC San Francisco is now broadcasting using HD Radio technology, teaming up with sister stations 96.5 KOIT and 95.7 KKDV FM. Upgrades to begin HD Radio broadcasting are in progress at Bonneville's Chicagoland stations, 97.1 WDRV and 101.9 WTMX.

Mitsubishi Electric has signed a license to develop products using iBiquity's HD Radio technology. Mitsubishi Electric's U.S. subsidiary, Mitsubishi Electric Automotive America, plans to integrate iBiquity's HD Radio technology into automotive receivers slated for availability to automakers around 2005. Mitsubishi supplies automotive electronic products to Daimler Chrysler, Mitsubishi Motors, Volvo, and other leading automakers.

While FM IBOC is moving forward, AM IBOC remains under test. Testing has been ongoing at 710 WOR New York. Now Clear Channel's 1530 WSAI Cincinnati is testing AM IBOC. Paul Jellison, Director of Engineering, overseeing the operations of WSAI, is interested in any and all feedback regarding IBOC operation of WSAI. Jellison has set up a special e-mail address for comments. "I encourage you to give your feedback, being as detailed as possible, stating your name, address and

Racks of equipment and patch bays in the Portland Radio Group engineering command center.



The 970 WZAN automated studio/control room.

location, and please be as detailed as possible in the information you give," requests Jellison. "I am specifically looking for the effect this operation is having on the other adjacent channel stations. The e-mail address is iboc@wsai.com." AM IBOC has received approval by the FCC for daytime operation only, pending a test report and recommendations for nighttime operation.

IBOC digital radio was developed specifically to allow for a smooth transition from analog to digital radio without making existing transmission and receiving equipment obsolete. In what is called the hybrid mode, analog broadcasts continue on the assigned AM/FM frequency, while the digital signal fills expanded bandwidth on both sides of the center frequency. iBiquity Digital is the sole developer and licenser of IBOC HD Radio technology in the United States.

QSL Information

860 KPAM Troutdale, Oregon, received their new QSL card in 5 days, signed Dave Biscoff, CE. Address: 888 SW 5th Ave #790, Portland OR 97204. (Martin, OR)

PENDING

New Call	Location	Freq.	Old Call
KZNT	Colorado Springs, CO	1460	KCS
WFLN	Arcadia, FL	1480	WZTK
WNNR	Fernandina Beach, FL	1570	WGSR
WMJG	Harvey, IL	1570	WBEE
WHCH	Rochester, NY	1460	WWWG
WVIX	Joliet, IL	93.5	WJTW
WPBX	Crossville, TN	99.3	WXVL
KLRW	Byrne, TX	88.5	KIAN

CHANGES

New Call	Location	Freq.	Old Call
WYDE	Birmingham, AL	1260	WLGS
WHAL	Phoenix City, AL	1460	WPNX
KNRC	Englewood, CO	1150	KCUV
KCUV	Littleton, CO	1510	KNRC
WTIR	Cocoa Beach, FL	1300	WXXU
WYNY	Cross City, FL	1240	WDFL
WDJA	Delray Beach, FL	1420	WFFL
WFLL	Fort Lauderdale, FL	1400	WFTL
WINK	Fort Myers, FL	1240	WTLQ
WFTL	West Palm Beach, FL	850	WDJA
WLAA	Winter Garden, FL	1680	WTIR
WNTX	Brookport, IL	750	WSBX
WOMN	Franklinton, LA	1110	WFCG
WBPS	Boston, MA	1150	WAMG
WAMG	Dedham, MA	890	WBPS
WDSS	Ada, MI	1680	WJNZ
WJNZ	Kentwood, MI	1140	WKWM
KPTO	Winchester, NV	1440	New
WQOR	Olyphant, PA	750	WAAT
WJQI	Clarksville, TN	540	WDXN
KALL	N. Salt Lake City, UT	700	KWLW
KWDZ	Salt Lake City, UT	910	KALL
WTOX	Glen Allen, VA	1480	New
WGEE	Superior, WI	970	KXTP
WQSI	Union Springs, AL	94.1	WSFU-FM
KKZR	Bryant, AR	93.3	KCDI
KHTS-FM	El Cajon, CA	93.3	KHTS
KQEI-FM	North Highlands, CA	89.3	KQEI
KPDO	Pescadero, CA	89.3	New
KWYL	S. Lake Tahoe, CA	102.9	KNVQ
KNTK	Weed, CA	102.3	KWHO
KBRS	Brush, CO	89.5	New
KPYR	Craig, CO	88.3	New
KΠQ	Limon, CO	93.7	KLIM-FM
WREH	Cypress Quarters, FL	90.5	WTSE
WKFA	St. Catherine, FL	89.3	New
WRAK-FM	Bainbridge, GA	97.3	WKGL
WRJY	Brunswick, GA	104.1	WSEG
WQXZ	Cordele, GA	98.3	WKKN
WEAM-FM	Cuthbert, GA	100.7	WMRZ
WMRZ	Dawson, GA	98.1	New
KISH	Agana, GU	102.9	New
KIHH	Keaau, HI	105.1	KHIK
KIPO	Honolulu, HI	89.3	KIPO-FM
KTPM	Franklin, ID	97.5	New
KPPC	Pocatello, ID	92.1	New
KWJT	Rathdrum, ID	89.9	New
KTWI	Twin Falls, ID	98.3	New
WRCV	Dixon, IL	101.7	WIXN-FM
WJEZ	Dwight, IL	98.9	WLDC
WJRE	Galva, IL	102.5	WHHK
WYEC	Kewanee, IL	93.9	WJRE
WTRX-FM	Pontiac, IL	93.7	WJEZ
WJZL	Clarksville, IN	93.1	WYBL
WIJY	Franklin, IN	95.9	WPZZ
WKBG	Clinton, KY	102.1	WYKL
WJZO	Shelbyville, KY	101.7	WIBL
WUUU	Franklinton, LA	98.9	WFCG-FM
KSUL	Port Sulphur, LA	91.5	New
WWCZ	Charlevoix, MI	90.9	New
WJOM	Eagle, MI	88.5	New
WJOG	Good Hart, MI	91.3	New
WJKQ	Jackson, MI	88.5	New
WMCQ	Muskegon, MI	91.7	WPQZ
WJOH	Raco, MI	91.5	New
WJIW	Greenville, MS	104.7	New
WHAL-FM	Olive Branch, MS	95.7	WHAL
KSEF	Farmington, MO	88.9	New
KZMN	Kalispell, MT	103.9	KOFI-FM
KADL	Imperial, NE	102.9	KJBL
KYWD	Sun Valley, NV	93.7	KWYL
WRDR	Freehold Twp, NJ	89.7	WPDQ-FM
WXXY-FM	Port Republic, NJ	88.7	WIBF-FM
WPPG	Fair Bluff, NC	105.3	WSIM
WJJE	Delaware, OH	89.1	New
KQUJ	Ada, OK	88.7	New
KICM	Healdton, OK	97.7	KNOR
KNOR	Healdton, OK	93.7	KICM
KWTU	Tulsa, OK	88.7	New
WCOZ	Laporte, PA	103.9	WQZI
WSIM	Bishopville, SC	93.7	WKHT
KQJZ	Hutto, TX	92.1	KQQQ-FM
KBZS	Wichita Falls, TX	106.3	KTLT
WJLZ	Virginia Beach, VA	88.5	WODC
KRWT	West Laramie, WY	89.9	New

1630 KNAX Fort Worth, Texas, after sending several reports to the station, I sent my report to the company headquarters based on a tip from DXer Terry Palmershein. Received QSL card and letter along with Lexington, Kentucky station stickers in 10 days for a report with a self-addressed stamped envelope, signed Dennis Blais, CE. Address: Mortenson Broadcasting Company, 3270 Blazer Parkway, Suite 101, Lexington KY 40509-1847. (Martin, OR)

1680 KTFH Seattle, Washington, partial-data letter and business card in 7 days, signed Monte Passmore, CE. Programming is Hindi from 1200 to 2400 (Pacific Time), otherwise parallel 1360 KKMO in Spanish. Address: 2815 Second Ave #550, Seattle WA 98121. (Griffith, CO)

2 CKBQ-TV Melfort, Saskatchewan, a very nice QSL letter in 30 days along with stickers for CTV, a great CTV tee-shirt, and coverage map, signed Janet Chenier, Executive Assistant. Address: 22 10th Street W, Prince Albert SK S6V 3A5. (Martin, OR)

Broadcast Loggings

Low-power AM transmitters are popping up everywhere on U.S. highways, providing construction and tourist information for travelers. Bryan Smith, W3INS, describes a couple of highway advisory radio services, typical of operations throughout the interstate system: "The Port Authority of New York and New Jersey has a rebroadcast of the National Weather Service on a frequency of 1700 kHz. Announcements indicate that 'this is a test and only a test for the Port Authority,' repeated every five seconds." Smith noticed that within the port of Newark and Elizabeth, New Jersey, there are traffic signs with lights that can be turned on to flash with a sign saying: "Tune to 1700 AM in Time of Emergency or when sign is flashing."

These low-power signals can be received over hundreds, sometimes thousands, of miles when propagation conditions are good, especially during sunrise and sunset. Most operate in the expanded AM band from 1610 to 1700 kHz.

The expanded AM band has become a popular spot on the dial for unlicensed Part 15 broadcasting as well, although some are likely operating above the 100-mW power limit. Chabad-Lubavitch Radio is widely heard at 1710 kHz broadcasting from the Lubavitch World Headquarters in Brooklyn, New York. Several Haitian Creole-language stations have surfaced on the x-band in Boston, some being received well into eastern Canada.

Pat Gormley, KK3F, reports,

There's a new station on 1671.80 kHz according to the voice synthesizer and digital display on my Kenwood TS850S. A sample of music heard was a cut by Shania Twain and a couple of smooth jazz-type selections, including Michael Jackson's "Rock with You" and some lesser known artists. The signal on 1670 identified itself as WDGS AM Frederick. Last year when I heard that station sending out gospel music programming, they disappeared as fast as they appeared, sometime around New Year's.

Now this month's selected logs, all times are UTC.

550 KMVI Wailuku, Hawaii, at 1245 very strong S9+10 dB, over KOAC with ESPN Sports. (Martin, OR)

590 KOMJ Omaha, Nebraska, at 0813

with oldies, "Magic 590" slogan, and CNN News, interference from WMBS. (Ressler, OH)

650 KHNR Honolulu, Hawaii, at 1257 very good with KSTE weak underneath, heard with CNN Headline News, "KHNR News Headline Update." (Martin, OR)

670 KPUA Hilo, Hawaii, at 1259 good with a "KPUA Sports" promo and ID as "The Big Island Home of ESPN Radio." (Martin, OR)

730 WKDL Alexandria, Virginia, at 0147 fair and in Spanish with Mexican music. (Ressler, OH)

910 CKDQ Drumheller, Alberta, at 1301 fair with Broadcast News and country music. (Ressler, OH)

990 CBW Winnipeg, Manitoba, at 0835 a good signal with "The Arts Today" on CBC Radio One. (Ressler, OH)

999 COPE Madrid, Spain, at 0343 fast Spanish talk by a woman; good. Almost no interference from 1000-kHz stations. (Connelly, MA)

1060 KHBC Hilo, Hawaii, at 1650 good with Hawaiian pop music, "With memories of long ago on KHBC." (Martin, OR)

1070 CBA Moncton, New Brunswick, at 0927 fair to weak with a Radio Netherlands rebroadcast, interference from WINA. (Ressler, OH)

1080 WWNL Pittsburgh, Pennsylvania, at 0025 a fair signal with contemporary Christian music, "Quality Christian Radio 1080, WWNL." (Ressler, OH)

1100 ZYK694 R. Globo, Sao Paulo, Brazil, at 0117 reverberated Portuguese talk by a man; well over WTAM and others. (Connelly, MA) At 0820 fair; excited talk in Portuguese with reverb, whistle sound effects, Radio Globo jingle, probably the best bet from this country while ZDK Antigua remains off the air. (Conti, ME)

Members of the International Radio Club of America gather outside the Portland Radio Group studios.

1130 WFXH Hilton Head, South Carolina, at 0039 a weak signal with ESPN Radio talk and ID as "The Fan." (Ressler, OH) Not to be confused with "The Fan" WDFN Detroit also carrying ESPN.

1170 R. Soleil Port-au-Prince, Haiti, at 0111 tentative; possibly R. Soleil here after WFPB sign-off with a woman in French, mushy audio, over a het from an off-frequency 1170.5-kHz Colombian station. (Connelly, MA)

1179 SER Santa Cruz de Tenerife, Canary Islands, at 0015 fair; the strongest of the Canary Island signals received at this time on 621, 837, 882, 1008, and 1179, while typically strong signals from Spain on 684, 855, 1575, etc. weren't coming in yet, making it reasonable to assume that this was indeed Canary Islands rather than any of the Spain synchros. (Conti, ME)

1180 CMBA R. Rebelde, Villa Maria, Cuba, at 0314-0321 heard a woman in Spanish followed by salsa music. A poor to nil signal with the remains of nulled WHAM only very slightly stronger due to auroral conditions. (Chiochiu, QC)

1206 France Info, Bordeaux, France, at 0228 showtunes, French talk by a woman, then piano music; good. (Connelly, MA) At 0230 good; news on the half hour, then French vocals. (Conti, ME)

1210 KZOO Honolulu, Hawaii, at 1243 presumed with talk in Japanese through the jumble of stations on the frequency. Haven't heard this in years. (Martin, OR)

1250 WKBR Manchester, New Hampshire, at 1011 weak with Real Country, interference from WEAE. (Ressler, OH)

1530 VOA Pinheira Sao Tome é Principe, at 0309 loud and clear burying WSAI with VOA news in English parallel 7290, 9575, and 9885 kHz. Signal lost under WSAI after 0345. Mediumwave country #89. (DeLorenzo, MA) The recent coup did not affect VOA operations.(Conti)

1700 KBGG Des Moines, Iowa, at 1137 a weak signal with "CNN Headline News," interference from KQXX and later WEUV. (Ressler, OH)

Thanks to Bogdan Chiochiu, Mark Connelly WA1ION, Marc DeLorenzo, Patrick Griffith N0NNK, Pat Gormley KK3F, Patrick Martin, Lawrence Ressler, and Bryan Smith W3INS.

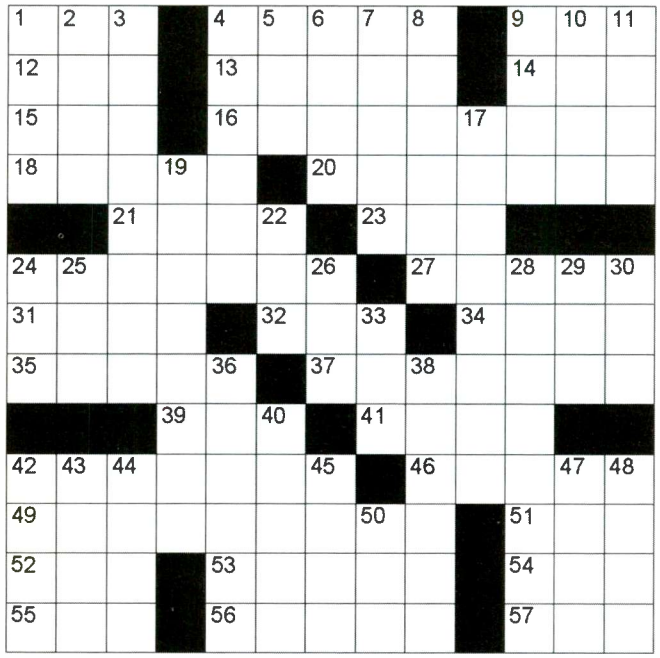
For now, 73 and Good DX! ■

the Pop'Comm puzzle corner

test your radio knowledge

by Eric Force, eric@dobe.com

(RevSp = Reverse Spelling – e.g. "SPELLING" = "GNILLEPS" in puzzle)



ACROSS

1 Usually associated with "Checker" or "Yellow".
4 Also called "Bracket" notation in Quantum Theory (RevSp)
9 CW abvr, "Very nice job"
12 Nostalgic Radio (abvr)
13 Area used for sports
14 Born
15 Airport, Hilo, HI
16 Gesture without speech
18 AM/BCB Freq 1230 KHz (FCC Channel Type)
20 Communications satellite
21 Signals to musicians
23 Radio for Peace International (Costa Rica)
24 X-Y Printing device
27 Undo a knot
31 Serbian folk dance
32 Abvolt
34 Transmits instructional information (service)
35 Freq change over time (RevSp)
37 Garment worn by dancers
39 Wire service
41 AM 790, Camrose, Alberta,CA
42 Using no fluid
46 Prohibited broadcast information (type)
49 Usually heard every hour (2 wds) (RevSp)
51 Airport, Los Angeles CA (Int'l)
52 Large flightless bird
53 Short for Nancy
54 "Tokyo Rose's" first name
55 Frequencies 30 GHz and above
56 Something special
57 Airport, Memphis, TN

DOWN

1 A.K.A. Inductor
2 Prefix 10E-18
3 Green flower vegetable
4 Oval-shaped tablet
5 Amateur Radio Association (abvr)
6 Large tear in a garment
7 Bury
8 To transfer a file from your PC to an online server (RevSp)
9 Phonetic "U" (U.S. Army 1916)
10 Uses 138.225 MHz (abvr)
11 Phonetic "B" (British Army 1927)
17 Property of X-rays (RevSp)
19 Gyroplane
22 Airport, Seattle, WA
24 CW abvr, Package
25 North-South Lines (alt. abvr)
26 Email spam filtering technique
28 1/1000 watt (RevSp)
29 Clearance needed for CLASS A Airspace
30 Lightning this
33 Volunteer Examiner Coordinator
36 Apply ointment
38 Difference
40 Lute of India
42 CW abvr, Addressee
43 Nickel Metal Hydride battery
44 CW abvr, Enough
45 Inhabitant of Denmark
47 Found on File Menu
48 Callsign, CAA Flight Examiners
50 Now called Class B airspace

(Solution on page 80)

THIS MONTH IN RADIO HISTORY "CW Code"

On October 5, 1921 ...("/" = Word Break)

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Solution: The World Series was broadcast on radio for the first time.

Pop'Comm Trivia...

I am a small military reference pamphlet, with diagrams and tables, for basic electronic formulas and information vital to electronic maintenance repair. Included are: Metric Terms, Resistor Color Code, DC Circuits, Symbols, AC Circuits, Capacitor, Inductor, Transformer Relationships, Series and Parallel Resonant Circuits Summary, and Using Meters.

What's my source and nomenclature?

Answer: The U.S. Army's GTA 11-02-006 "DC/AC Formula Data" Get yours at:
http://155.217.58.58/cgi-bin/atdl.dll/gta/11-02-006/110200610_top.htm

NEW! "Where's That Station" PC Program - Check It Out! - http://www.dobe.com/wts/

By Bill Hoefer, flacap388@hotmail.com

Trivia Question Update, And Shuttle Frequency News

Every so often a certain reader's comment catches my attention. April's trivia question asked about the lack of the 717 in the current Boeing number listings, and John Yaney of Massachusetts wrote me to correct my answer. In actuality, the 717 is the current designation for the McDonnell Douglas MD80 being manufactured by Boeing, but it is not the first use of the B717 designation. He wrote:

I just purchased the April 2002 issue of *Popular Communications* at a store and came across your trivia question regarding the Boeing 717. Your answer is only partially correct.

Back in the late 1940s and early 1950s, Boeing began studying the feasibility of producing a jet transport aircraft. In 1952, the Board of Directors of the company unanimously voted to approve the expenditure of $15 million to develop and construct a prototype aircraft. To keep the project under wraps, the aircraft was dubbed the Model 367-80 and was sometimes referred to as Project X. It is interesting to note that Model 367 was Boeing's internal designation of the piston-engine C-97 Stratofreighter family of aircraft, the military version of Boeing's civilian 377 Stratocruiser. Thus, Boeing wanted to disguise the true nature of what was being developed.

The prototype aircraft was produced as a jet transport with four jet engines slung under a swept-back wing. This particular aircraft was and is often referred to simply as the Dash 80 and has been preserved.

Based on the Dash 80 prototype, Boeing decided to designate the future production airline version as the Boeing Model 707. A limited number of 707 transports produced for the U.S. military were designated as the C-137. Perhaps the most famous of these were the VC-137s used to transport the President and other high ranking officials.

Boeing also developed a four-engine jet tanker at the same time, also based on the Dash 80 concept. Its dimensions were somewhat different from the Model 707, including a slightly smaller fuselage cross section. This tanker version was designated the Boeing Model 717. Its military designation was the KC-135 Stratotanker, of which over 600 were eventually produced.

It is perhaps unfortunate that when Boeing acquired McDonnell Douglas it chose to re-use the Model 717 designation. Presumably, Boeing believed that the general public was not aware that the 717 designation had been previously allocated to a project for the military. It can also be surmised that Boeing did not want to give the McDonnell Douglas-developed aircraft a 787 or 797 designation, preferring to reserve those designations for future projects to be developed by Boeing itself.

I hope that you find this information of interest. Much more detail can be found in Robert S. Hopkins III's book, entitled *Boeing KC-135 Stratotanker*, published by Aerofax.

Thanks for the historical update, John. I appreciate it. Just remember that we controllers only appear perfect and invincible. We do make mistakes. It's rare, but we do make mistakes.

Shuttle Repeater Frequency

In the May issue we talked about the Space shuttle *Columbia*'s demise and included a series of amateur radio frequencies. I'm good, but not perfect (see above). I do miss some frequencies.

The Beechcraft Starship currently goes for about $800,000.

Gerald Richmond, N5ZXJ, of Temple, Texas, also advised me that they have been carrying and relaying space-to-ground communications of the Space Shuttle, *Mir* and now the ISS since April 1994. The repeater, located not far from the Texas White House, is on 145.310 MHz. Thanks, Gerald. And the current information on the re-launch of the shuttle fleet indicates that it will be sometime between January and April of 2004.

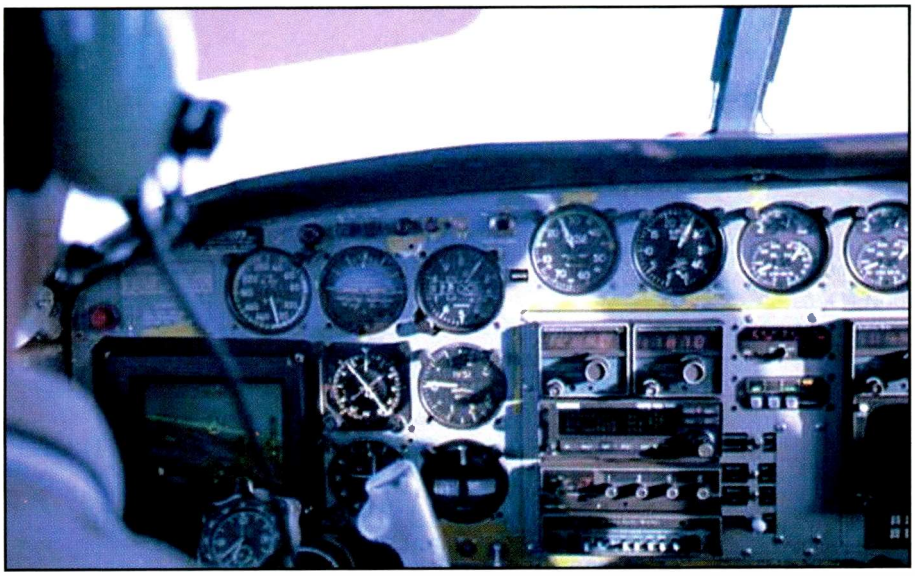
And in May I received a press release on an Australian project that may be just the ticket to prevent the tragedy of this past February. One can only hope.

Australian Team Plans Aircraft That Self-Repairs During Flight

The official news release says, "A team within Australia's premier research facility, CSIRO, is a step closer to perfecting 'smart spaces' that will revolutionize safe air transportation. Smart spaces technology will enable airplanes to diagnose and repair faulty components while still in the air, or allow a spacecraft to sense a cracked tile and repair itself without human intervention." According to CSIRO's Smart Spaces Project Leader, Dr. Geoff James, smart spaces are intelligent systems made up of a network of embedded devices that create an adaptive infrastructure with automatic flexibility to deal with unforeseen events. They permeate an environment with a multitude of diverse sensors, and react continuously and intelligently to a vast quantity of data. "They will self-configure, self-repair, and adapt to changing conditions or new requirements, so they can function effectively with minimal human intervention," he said.

According to Dr. James,

Smart spaces will supersede today's conventional massively engineered systems, where every increase in complexity presents fresh opportunities for failure that may be avoided with this new approach.



A view of the cockpit of the Beech QueenAir used in the initial testing of WAAS in Alaska. The left side of the panel shows a WAAS display unit.

A smart space is able to self-organize or reorganize into a new functioning whole. A consequence is that the smart space takes on a life of its own. Given freedom to follow its own strategies, it will find solutions that human engineers may not have thought of. The need for a new approach was tragically highlighted by the disintegration of the space shuttle *Columbia* in February, thought to be caused by the failure of a tile that was damaged by an unexpected impact.

This event demonstrates that even the most meticulous engineering practices and dedicated human endeavor cannot guarantee a flawless result. The new way of engineering complex systems accepts that human errors and unexpected events are inevitable, and builds in the flexibility to detect anomalies well before they lead to failure, creating truly smart spaces that can roll with the punches.

Smart spaces will control aircraft and spacecraft, manage factories and their processes, monitor livestock, crops, water, and soil, and integrate healthcare knowledge and response across a community. They will change radically the way people interact with their environment by allowing complex information to be gathered, shared, and used for making decisions. "CSIRO Smart Spaces has a focus on building real working systems, and using them to revolutionize industry practices," said Dr. James. "Our discoveries in smart spaces research will be transferred directly to the prototype industry systems, as and when the discoveries are ready for application."

Australia's Senior Investment Commissioner for North America, Robert Hunt, said CSIRO was one of the world's leading research establishments, with technology firsts such as the development of the wireless chip, which was later purchased by Cisco. He said CSIRO had drawn together a dynamic and diverse team of scientists and engineers to tackle the challenge of designing the first working smart spaces. This is already attracting interest and collaboration from potential future applications for smart space technology, including environmental/rural industries, aerospace, and health and community infrastructure. Hunt said, "Australia, with its leading research establishments and extensive collaboration between industry and academic institutions, presented a rich source of IP for U.S. investors."

What Is WAAS?

You may or may not remember that the GPS system found in many modern automobiles and airplanes was originally invented for the U.S. military to help guide our forces, ships, missiles, and bombs. It was designed for the military in the event that the ground-based navigation systems (VOR/TACAN/VORTAC/NDB/LORAN) fail, are damaged, or destroyed by foreign operatives.

GPS, as a stand-alone system, is very accurate, but a minimum number of satellites are needed for accurate positioning. The Department of Defense (DoD) can, and does, degrade the system periodically for security purposes. Accordingly, the location can be as much as 100 meters

NEW/CHANGED/DELETED FREQUENCIES

NEW

AL
Albertville, The Albertville Municipal, Thomas J. Brumlik Field (8A0)
AWOS-3 119.575

AK
Noorvik, Robert/Bob/Curtis Memorial Airport (D76)
CTAF 122.7
Scammon Bay (SCM)
AWOS-3 118.425

CA
Alturas Municipal (AAT)
ASOS 124.175
Byron (C83)
AWOS-3 123.775
Cloverdale Municipal (O60)
Sacramento Northern California TRACON 9NCT0
NORCAL TRACON Apch 125.85/323.0
Coalinga, New Coalinga Municipal (C80)
AWOS-3 119.275
San Diego, Miramar MCAS/Mitscher Field (NKX)
ATIS 352.0
CD 125.975
GC 128.625
Radar 133.625/266.8/270.35/307.9/328.4/348.75/350.275/373.575/379.125/380.3

CO
Aspen, Pitkin County/Sardy Field (ASE)
CD 123.75

FL
Homestead ARB (HST)
Apch 123.8/339.3
GC 121.75

IN
Crownpoint (4K4)
HUF AFSS 123.65
Indianapolis, Greenwoor Municipal (HFY)
AWOS-3 118.525
Kendallville Municipal (C62)
AWOS-3 119.925
Portland Municipal (PLD)
AWOS-3 126.675

KS
Norton Municipal (NRN)
AWOS-3 118.275
Sublette Flying Club Airport (19S)
CTAF 122.0

MD
Ridgely Airpark (RJD)
Potomac TRACON Apch 132.425/339.1

MS
Biloxi, Keesler AFB (BIX)
403 WG AFRC Cmd 311.1

MO
Kansas City International Airport (MCI)
Dep 132.95

NE
Lincoln Municipal (LNK)
NG Opns 259.6

NJ
Pedricktown, Spitfire Aerodrome (7N7)
Philadelphia Apch 119.75/269.25

NC
Banner Elk (NC06)
CTAF 122.8

PA
Monongahela, Rostraver (FWQ)
AWOS-3 118.475
Philadelphia, Wings Field (LOM)
AWOS-3 118.925

SC
Barnwell County (BNL)
AWOS-3 119.775

SD
Rapid City, Ellsworth AFB (RCA)
ATIS 120.625

TX
Stephenville, Clark Field Municipal (SEP)
AWOS-3 118.075

WI
Marshfield (MFI)
Green Bay AFSS RCO 122.55

BAHAMAS
Providenciales (PVN)
VOR/DME 115.6

CHANGED

AZ
Prescott, Ernest A. Love Field (PRC)
LC was 288.1, now 257.9

CA
Camarillo (CMA)
Oxnard (OXR)
Point Mugu NAS (NTD)
Point Mugu Apch was 325.0, now 307.725
San Diego, Miramar MCAS/Mitscher Field (NKX)
CD was 301.3, now 254.325
GC was 380.8, now 307.325
LC/P was 315.6, now 298.925
LC/S was 340.2, now 340.2
PMSV was 362.1, now 342.4
PTD was 306.7, now 335.625

CO
Eagle County Regional (EGE)
LC was 118.2, now 119.8

FL
Jacksonville ARTCC (ZJX)
St. Augustine RCAG was 119.775, now 134.575
Zephyrhills Municipal (ZPH)
Tampa Apch was 120.625, now 119.9

GA
Marietta, Dobbins Air Reserve Base (MGE)
LC was 397.2, now 370.875

MI
Lansing, Capital City (LAN)
CD was 120.4, now 123.675

MS
McComb (MCB)
Greenwood AFSS RCO was 121.1R, now 122.1R

MO
Kansas City International (MCI)
Apch was 132.95, now 120.95

NJ
Wrightstown, McGuire AFB (WRI)
LC was 236.6, now 257.8

OH
Cleveland Hopkins International Airport (CLE)
GC was 127.275, now 133.6

OR
Lakeview (LKV)
VORTAC was 116.95, now 112.0

TN
Memphis ARTCC (ZME)
Hot Springs AR Low RCAG was 118.85, now 127.825

TX
Fort Bliss/El Paso, Biggs AAF (BIF)
LC was 300.1, now 305.2

VA
Fredericksburg, Shannon (EZF)
Quantico Apch was 120.925, now 127.05

WI
Camp Douglas, Volk Field (VOK)
LC was 236.6, now 239.25

DELETED

CA
Oakland ARTCC (ZOA)
Mount Tamalpais Low RCAG 125.85/323.0

FL
Crestview, Bob Sikes (CEW)
Destin, Fort Walton Beach (DTS)
Mary Esther, Hurlburt Field (HRT)
Valparaiso, Eglin AF Aux NR 3 Duke (EGI)
Valparaiso, Eglin AFB (VPS)
Eglin Apch 119.0/269.375
Stuart, Witham Field Airport
Unicom 122.95

NC
Banner Elk, Elk River
CTAF 122.8

WY
Dubois (U25)
ASOS 118.275

NEW/CHANGED AIRPORT IDs/ABANDONED AND CLOSED AIRPORTS

NEW

AK
Noorvik, Robert/Bob/Curtis Memorial Airport D76
**see note in abandoned section below*

CA
Coalinga, New Coalinga Municipal C80

FL
Jay, Buchanan Airport 56FL
Lake Wales, David Wine's Airstrip Airport 62FL
Weston, Cleveland Clinic Florida Hospital Heliport FD13

IL
Athens, Wilcoxon Airport LL48

IN
Brazil, St. Vincent Clay Hospital Heliport IN48
Carthage, Small Field Airport IN81
Evansville, Plugger Airport IN36
Fort Wayne, Dupont Hospital Heliport 9IN5
Palmyra, Rusby Field Heliport 33IN

LA
Baton Rouge, La National Guard 04LS

ME
Naples Seaplane Base 06ME

MD
Leonardtown, St. Mary's Hospital East Heliport MD02

MI
Cassopolis, Taylors Flight Park Airport MI95

MT
Bozeman, Briar Creek Airport 2MT5

NH
New Boston, Lorden Heliport 19NH

NJ
Atlantic City, Sea Air Atlantic City Seaplane Base 1NJ3
Milford, Monk Heliport JY37

NY
Staten Island University Hospital Heliport NY52

PA
Collegeville, Wyeth-Ayerst NR Heliport 0PN3
Hazleton General Hospital Heliport PS22

SD
Sturgis, Mike Jacob Sturgis Heliport SD26

TX
Bulverde, Tips Jewels Heliport 67TA
Houston, Goodson Honda Heliport 9XS8
Mertzon, Creekside Airport 03XS
Mountain Home, Goebel Field Airport 4TS5
Old Ocean, Peterson Airport 08XS
Woodbine, Three Acres Airport 80XS

CHANGED

AL
Tuscaloosa (TCL)
Tuscaloosa Municipal, now Tuscaloosa Regional
Tuscaloosa, Crimson VORTAC was TCL, now LDK

FL
Estero (1FD4) was Schmidt Airstrip, now Corkscrew Trace Airpark

GA
Brooks (GA61) was Abernathy Field, now Kenley Field

MD
Frederick (3MD0) was Faux-Burhans, now Burhans Memorial

MO
Aurora (2H2) was Aurora Memorial Municipal, now Jerry Summers St. Aurora Municipal Airport
Maryville (EVU) was Maryville Memorial, now Northwest Missouri Regional

NH
Hampton (NH35) was Hampton ABEX, Inc., now Fisher Scientific Heliport

NJ
Dover (N33) was ARDC Picatinny Arsnela, now Picatinny AHP

OH
Piqua Airport Now Piqua Airport-Hartzell Field (I17)

OK
Ponca City (PNC) was Ponca City Municipal, now Ponca City Regional
Shawnee (SNL) was Shawnee Municipal, now Shawnee Regional

PA
Monongahela, Rostraver Airport was P53, now FWQ

TN
Grand Junction (6TN7) was Peterson Ranch, now St. Somewhere Airport

TX
Clarksville (LBR) was Clarksville-Red River County, now Clarksville/Red River County, J. D. Trissell Field
San Antonio (MDA) was Martindale AAF (Texas Army National Guard), now Martindale AHP

WAKE ISLAND (AWK) was Wake Island Army Airfield, now Wake Island Airfield

WV
Parkersburg (PKB) was Wood County Airport Gill Robb Wilson Field, now Mid-Ohio Valley Regional

WI
Franksville (62C) was Cindy Guntley Memorial Airport, now Cindy Guntly Memorial Airport
Kemmerer (WY67) was South Lincoln Medical Center, now South Lincoln Medical Center Airport
Oconto (OCQ) was Oconto Municipal, now J. Douglas Bake Memorial Airport

CLOSED/ABANDONED

AK
Noorvik, Robert/Bob/Curtis Memorial Airport (ORV)
**airport abandoned, but new one built with same name and different ID about five miles southeast*

CA
Loch Lomond, Paul Hoberg Airport (9CL6)
Napa, Moskowite Airport (03CL)

TX
Arlington, Action Aero Airport (85TA)
Dallas, Millennium Dallas Airport (7TX2)

VA
Merrifield, Mobil Heliport (1VI0)

(the length of a soccer field) off. For cars driving cross country, that is not much of a problem. However, with modern civilian, corporate, and airline aircraft relying on GPS for en-route information and instrument approaches, it was determined that the signal had to be as accurate as possible, especially for aircraft flying into known severe instrument meteorological conditions.

Enter WAAS. The Federal Aviation Administration describes it as follows:

The Wide Area Augmentation System (WAAS) is a GPS-based navigation and landing system that provides precision guidance to aircraft at thousands of airports and airstrips where there is currently no precision landing capability. Systems such as WAAS are known as satellite-based augmentation systems (SBAS). WAAS is designed to improve the accuracy and ensure the integrity of information coming from GPS satellites. The FAA is using WAAS to provide a Lateral Navigation/Vertical Navigation (LNAV/VNAV) capability with commissioning in 2003. Concurrently, the FAA will evaluate the approach to achieve Global Navigation Satellite System (GNSS) Landing System (GLS) capability in later years. WAAS testing in September 2002 confirmed accuracy performance of 1–2 meters horizontal and 2–3 meters vertical throughout the majority of the continental U.S. and portions of Alaska.

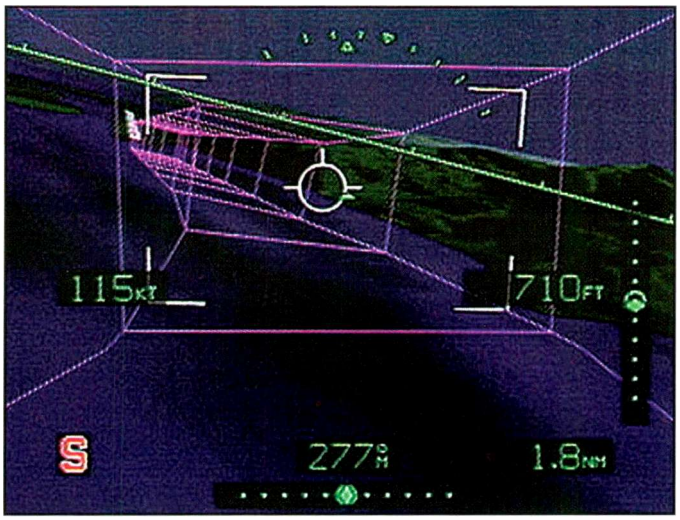
This will allow pilots to land their aircraft at small airports without "precision landing capability." All major air carrier terminals and many general aviation airports have "precision approaches," such as ILS and RNAV/GPS approaches. Very small and little-used airports and most private airports lack the capability to bring in pilots in what we call "zero/zero" weather. The new WAAS will allow approaches to airports where no approaches have been before. Now aviation enthusiasts monitoring Flight Service Station frequencies will understand what the new WAAS NOTAMs are all about.

Beechcraft Retires And Destroys Aircraft

A few of our readers are fortunate enough to be close to a very rare aircraft—the Beechcraft Starship. Those of you who can observe them may want to get photos now, as shortly they may be gone—forever.

The Starship, of which 50 were made between 1988 and 1995, never quite measured up to its planned performance specifications. Of these 50 production aircraft, 40 were either never sold, or were returned to Raytheon, the parent company of Beechcraft. These 40 are being flown to Pinal Air Park in Marana, Arizona, near Tucson. The aircraft, which were made of carbon fiber instead of the normal aluminum, are being cut up and then burned in an EPA-approved incinerator.

The carbon fiber was lighter, but stronger, than aluminum. It was intended that the Starship carry 10 passengers at 400 knots



A sample view of a WAAS approach on the cockpit panel.

The same view outside the cockpit of the Beech QueenAir as it turns on final to Juneau, Alaska (JNU).

(approximately 480 mph), but the price was a rather steep $3 million. However, after improvements in 1992, the aircraft weight was about the same as if it were made of metal, and could not fly faster than 335 knots (approximately 402 mph), which was far slower than the similarly designed Piaggio Avanti or Cessna Citation Bravo.

The fate of the remaining 10 Starships is uncertain as replacement/repair parts may not be available. A recent used airplane catalog advertised a Starship at about $800,000. While in most instances even the simplest aircraft appreciates in value, such is not the case with the unique Starship.

It has been my pleasure to control these unique birds a few times in my tenure as a controller. They will be sorely missed.

Your Input, Please

Until next month, thanks for stopping by and don't forget that your aircraft monitoring questions, frequencies, and tips are always welcome, either by e-mail at flacap388@hotmail.com or regular mail to *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801. ■

global information guide

listening to what your world says every day

by Gerry L. Dexter

European Shortwave Landscape Changes

The Austrian Radio International programming department has undergone the expected shrinking experience. The English "Report from Austria" feature stays on the air, but has been cut in half, down to a mere 15 minutes. For North America, this now airs at 1510 and 1540 on **15515** via Canada and 0115 and 0145 on **9870**.

Jonathan Marks, who hosted the superb Media Network program (now confined to the Internet) on Radio Netherlands for so many years, has resigned from the station to form his own media production company. He'll also serve as a consultant to the station (and likely give better advice than RN has been getting from some quarters!).

Radio Denmark is talking about hanging it up—again! Like termites in ties, the suits in Copenhagen have been eating away at Radio Denmark's shortwave service for decades now, first dropping English, reducing language usage to Danish only, allowing their in-country transmission facility to deteriorate, and finally closing down the transmitters entirely in favor of the Norway relay, and now looking at discontinuing the use of even those. For the most part, this means cutting off service to their own citizens since their shortwave audience is/was largely Danish.

And so long Sicily! The RAI station at Caltanisetta has been closed down by the Italian government broadcaster. RAI-Sicily carried domestic service broadcasts at various times on 6060, 7175, and 9515 and, in later years, proved to be a rather difficult catch as it's on-the-air "window" kept getting narrower thanks to continual cutbacks.

Mexican station **Radio Universidad** (XEQM) on **6045** seems to have been reactivated, albeit with very low power. With a couple of other Mexican reinstatements lately, are we seeing a revival in shortwave from south of the border?

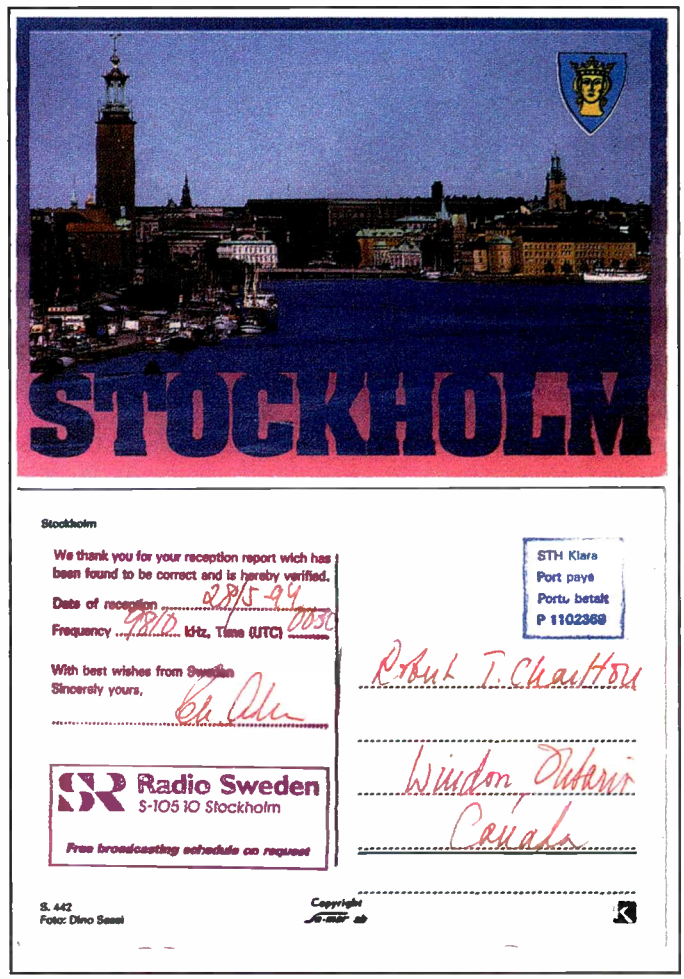
What's in a name? Once upon a time it was called the Voice of Free China. Then, a couple of years ago, that was changed to Radio Taipei International. Now they've shed that skin and have renamed themselves Radio Taiwan International.

And we also hear that Radio Yugoslavia may be phasing out that name. It's now also IDing as the "International Radio of Serbia-Montenegro."

Check **5910** for signals from **La Voz de Su Concencia** (Colombia). By now they should be using this dial spot for broadcasts in English aimed at North America. Presumably **6010** will continue in use for Spanish language programming.

If you're beginning to notice ham radio operators showing up on such oddball frequencies as 5332, 5348, 5368, 5373, and 5405, it's perfectly legit. The FCC in its collective wisdom has licensed these frequencies for ham usage, though power levels have to be kept to just 50 watts. And we can all rest easy in the certainty that all hams will adhere strictly to that limit.

The International Broadcasting Bureau, which acts as sort of a frequency traffic director for U.S. government broadcasters, has added **Jaszbereny, Hungary**, to the list of sites it uses. Initial usage is for **Radio Liberty** broadcasts from 1600 to 1700 on **9505**, 0300 to 0400 on **9760**, 0400 to 0500 on **11710**, and 0500 to 0600 on **11885**. Jaszberney is one of the transmitter sites used by Radio Budapest.

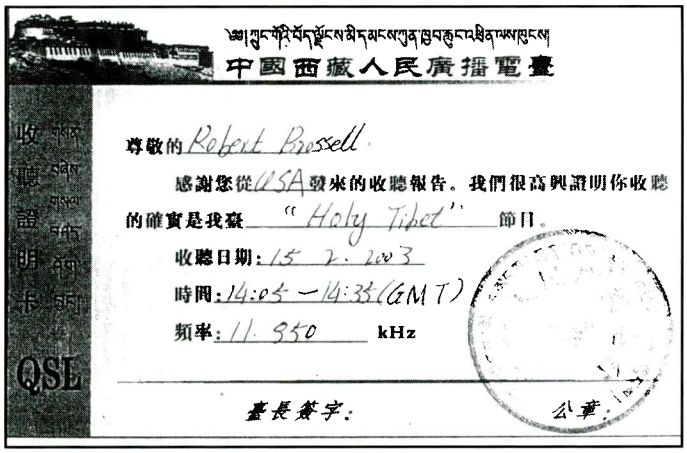


Robert Charlton got this colorful QSL from Radio Sweden.

Check out **6140** because it's again in use by **Radio Burundi**. That's got to be one of the most maddeningly difficult targets out there.

Our book winner this month is **Jack Linonis** of Pennsylvania. Jack receives a 2004 edition of *Passport to World Band Radio*, courtesy of Universal Radio. Your hobby bookshelf should contain a copy of the current Universal catalog because it contains a monster selection of everything from receivers to books to antennas and everything in between. To get your free copy just e-mail them at dx@universal.com, call (614) 866-4267, or drop a note to 6830 Americana Parkway, Reynoldsburg, OH 43068.

Now here's the call for logs: we want yours! Just be sure to list them by country, double space between each, and include



Robert Brossell sent along this neat QSL.

your last name and state abbreviation after each one. We're also on the lookout for spare QSLs, schedules, pennants, photos, and shack photos (!) for use as illustrations. Anything you can send to help out will be most appreciated!

On to your reports! All times are in UTC (GMT), which is 7 hours ahead of EST, 6 ahead of CST, etc. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 5 p.m. MST and 4 p.m. PST. Broadcast languages are abbreviated with a double capital (SS = Spanish, FF = French, AA = Arabic, and so on). If no language is specified you may assume the language used was English.

AFGHANISTAN—Radio Afghanistan, **19840** via Norway at 1451 in Tajik and Dari. (Ziegner, MA) 1641 in Pashto. (Charlton, ON)

ALASKA—KNLS, **11765** at 1235 in CC giving website as www.knls.com and ID as "New Life Station." (Brossell, WI)

ALBANIA—Radio Tirana, **6115//7160** at 0212. (Charlton, ON) Off at 0254. (Burrow, WA)

ANGUILLA—Caribbean Beacon, **6090** at 0022 with Dr. Gene Scott. (Charlton, ON)

ANTIGUA—BBC Relay, **5975** at 0103. (Charlton, ON) **6195** at 1006. (DeGennaro, NY) **15190** at 1430. (Paradis, ME)

ARGENTINA—RAE/Radio Nacional, **6060** in SS with news at 0958. (DeGennaro, NY) **11710** at 0200 "This is RAE Argentine Radio." Also **15345** in SS at 2304. (Charlton, ON) **11710** with political news at 0219. (Burrow, WA) 15345 at 0110 with SS talks and music. (MacKenzie, CA)

ARMENIA—Voice of Armenia, **9960** at 1940 in unid. language. (Charlton, ON)

ASCENSION ISLAND—BBC Relay, **12095** at 0131 and **17830** at 1807. (Jeffery, NY) **15400** at 2040. (Charlton, ON)

AUSTRALIA—Radio Australia, **5995** at 0916 with interview. (Montgomery, PA) **6020** in Pidgin at 1000. Also **9580** at 1122. (DeGennaro, NY) **9475** at 1111, **17580** at 0233, and **17795** at 2211. (Jeffery, NY) **9500** at 1230. (Northrup, MO) 12080 in Pidgin at 0930. (Ziegner, MA) **11650** and **11660** at 1303. (Charlton, ON) 17795 at 0005 with interview and ID at 0010. Parallel with **15240** and 17580. (MacKenzie, CA) 21740 at 2230. (Paradis, ME) Vision International, **13685** at 1058 with continuous pop tunes, news on the hour, several mentions of their Web address. (Montgomery, PA) **17560** at 1305. (Brossell, WI)

AUSTRIA—Radio Austria Int'l, **11905** at 2339 and **13730** in GG. (Charlton, ON)

BELGIUM—Radio Vlaanderen Int'l, **15565** (*via Bonaire—gld*) with news heard at 2228. (Miller, WA) 2252 answering letters. (Charlton, ON)

BENIN—ORTB, **7210.2** at 0500 with IS, national anthem, opening FF ID, previews, and FF pops. (Montgomery, PA) 2210 in FF and vernacular to 2300 close. (D'Angelo, PA)

Abbreviations Used In This Month's Column

//	—	Parallel frequency
ABC	—	Australian Broadcasting Corporation
AFRTS	—	Armed Forces Radio Television Service
AFN	—	Armed Forces Network
AIR	—	All India Radio
anncr	—	announcer
anmt(s)	—	announcement(s)
BSKSA	—	Broadcasting Service of the Kingdom of Saudi Arabia
CNR	—	China National Radio
GOS	—	General Overseas Service
ID	—	identification
Int'l	—	international
IS	—	interval signal
Lang	—	language
LSB	—	lower sideband mode
NBC	—	National Broadcasting Corporation
OA	—	Peru, Peruvian
PBS	—	People's Broadcasting Station
Pgm	—	program
RRI	—	Radio Republick Indonesia
sked	—	schedule
SIBC	—	Solomon Islands Broadcasting Corporation
TOH	—	Top of the Hour
unid.	—	unidentified
USB	—	upper sideband mode
vern	—	vernacular (any local dialect or language)
VOA	—	Voice of America
VOIRI	—	Voice of the Islamic Republic of Iran

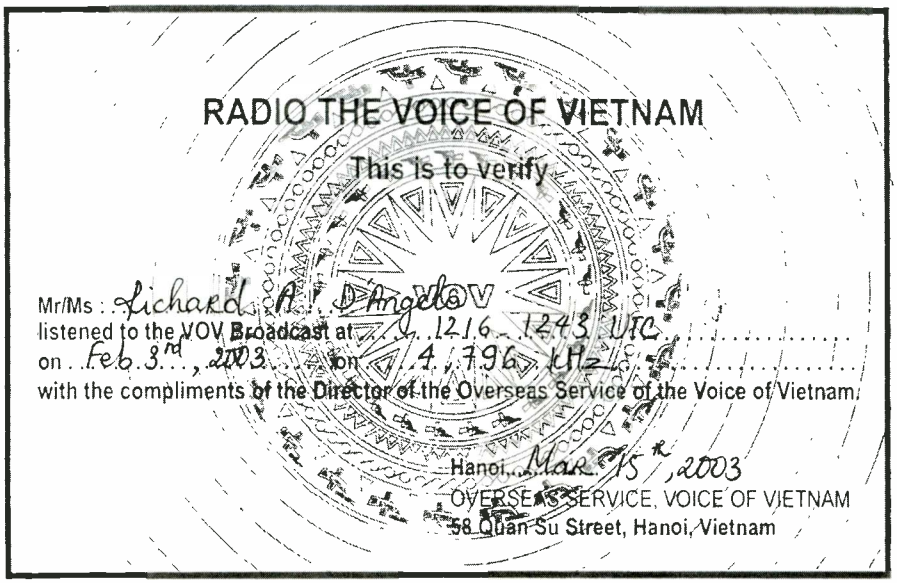
BOLIVIA—Radio Nueva Esperanza (p) on **6585** in SS at 1015. (Wilkner, FL) Radio Yura, **4716.8** in SS with ballads at 0134. (Strawman, IA) Radio Pio XII (t), **5952.5** at 0209 with man in SS, unusual music. Swamped by co-channel interference. Female with tentative ID at 0228, then man with mention of "Radio Pio" Off at 0230. (Montgomery, PA) La Cruz del Sur, **4786** in SS with messages at 0941. (DeGennaro, NY)

BRAZIL—Radio Nacional, **6180** in PP at 2320. (DeGennaro, NY) 0030. (Linonis, PA) 0037. (Charlton, ON) **11780** in PP at 0940. (DeGennaro, NY) 0130. (Linonis, PA) 0214. (Brossell, WI) 0237. (Miller, WA) Radio Senado, **5990** in PP at 0958. (DeGennaro, NY) Radio Gaucha, **11915** with PP talks, time pips, ID, news at 0300, and off by 0308. (D'Angelo, PA) Radio Clube Paranaense, **6040** at 2312 with PP talks and "A Voz do Brasil" program. (D'Angelo, PA) Radio Educacao Rural, **4755** in PP at 0330. (Miller, WA) Radio Nacional, Macapa, **4915** in PP at 0239. (Miller, WA) Radio Pioneira, **5015** in PP with music and talk at 0130. (Paradis, ME) Radio Brazil Central, **4985** in PP at 0234. (Miller, WA) Radio Rural, **4765** with music, //**4755**, anmts in PP. (Montgomery, PA) Radio Difusora do Amazonas (p) **4805** with PP talk and reverb at 0139. (Strawman, IA) Radio Difusora Acreana, **4885** with religious message in PP at 0928. (DeGennaro, NY) Radio Itatiaia, **5970** with vocal at 0823, long PP talk, ad string, jingle ID, and more talk. Time check at 0833. (D'Angelo, PA) Radio Rio Mar, **9695** at 2240 with man and woman in PP, "A Voz do Brasil" program. (D'Angelo, PA) Radio Brazil, **4785** in PP at 0923. (DeGennaro, NY) Radio Clube do Para, **4885** in PP at 0937. (DeGennaro, NY)

BOSNIA—Radio Yugoslavia, **9580** in Serbian heard at 0051. (Charlton, ON)

BOTSWANA—Radio Botswana, **4820** at 0250 with barnyard IS, choral anthem at 0259, ID, sign on anmts, and news. (D'Angelo, PA) VOA Relay, **9885** at 0317. (Jeffery, NY) **12080** at 2054, off at 2100. Also **17895** with times, frequencies at 1929. (Charlton, ON)

BULGARIA—Radio Bulgaria, **9400** in BB at 0000 with IS and ID. Also **11900** at 0209 with news and weather. (Charlton, ON) **9500** in



RADIO THE VOICE OF VIETNAM

This is to verify

Mr/Ms : Richard A. D'Angelo

listened to the VOV Broadcast at 1216 - 1243 UTC

on Feb.3rd, 2003 on 4,796 kHz

with the compliments of the Director of the Overseas Service of the Voice of Vietnam.

Hanoi, Mar 15th, 2003

OVERSEAS SERVICE, VOICE OF VIETNAM

58 Quan Su Street, Hanoi, Vietnam

The Voice of Vietnam sent a full-data QSL to Rich D'Angelo.

BB at 0000. (DeGennaro, NY) 11900 at 1747 with national news, economic report. Off at 1800. (Burrow, WA) 0220. (Brossell, WI)

CANADA—Radio Canada Int'l, **9515** with news at 1300. (Northrup, MO) **11920** heard at 2213, **13655** at 1458, **13670** at 2203, **15325** at 2004, and **17880** at 2219. (Charlton, ON) **17870** with mailbag program at 2008. (Wood, TN) CFRX, **6070** relaying CFRB at 2220. (DeGennaro, NY)

CHILE—Voz Cristiana, **6070** in SS at 0941. (DeGennaro, NY) **15475** in SS at 0000 with "Noticias Portuguesa" and several IDs, songs in PP. (Brossell, WI) **17680** in SS at 2209; also 21550 at 1438. (Charlton, ON) **21550** in SS at 1330. (Paradis, ME)

CHINA—CNR/CPBS, **11835** in CC at 1745. **15480** at 0107 with man and woman and CC talk, music. (MacKenzie, CA) CRI, **9570** via Cuba at 1710 to close at 1726. **//11600**. (MacKenzie, CA) **9580** via Cuba at 0113, **9790** via Canada at 0114, **22855** in CC at 1225 and **13680** via Canada at 2348. (Charlton, ON) Music Jammer, **13625** at 1916 against Radio Free Asia. Also noted on **11740**, **11955**, **15510** and **15680** at this hour. (MacKenzie, CA)

COLOMBIA—Caracol Villaviciencio, **5958** in SS monitored at 0915 with news and many Caracol IDs. (Alexander, PA) 0954 with local news in SS. (DeGennaro, NY) La Voz de Guaviare, **6035** in SS at 0932 with various Latin selections. (DeGennaro, NY) 0240 with Latin vocals. Off with anthem at 0257. (Montgomery, PA)

CROATIA—Voice of Croatia, via Germany, **9925** in Croatian heard at 0006. (Charlton, ON)

CONGO—Radio Congo, **5985** at 2155 with FF talks, many "Radio Congo" IDs. Began to get some co-channel QRM from 2230. (Alexander, PA) 2207 with FF vocals, anncrs. (DeGennaro, NY) 0428 sign on with woman anncr, ID, opening anmts over marching band music. Into high-life vocals. Fair to good before WYFR came on at 0455. (D'Angelo, PA) 0443 with vocal and guitar. (Strawman, IA)

CUBA—Radio Havana Cuba, **9600** in SS at 0015, **9820** in SS at 0058, **11600** in EE at 2213, **11760** in SS at 1223, **15230** in SS at 2238. Charlton, ON) Radio Rebelde, **5025** in SS at 0948 and **9600** at 1125. (DeGennaro, NY) 9600 in SS at 1109. (Charlton, ON)

CYPRUS—BBC Relay, **9410** at 0201. (Jeffery, NY) **9915** in AA at 2157. (Charlton, ON) 2340. (Strawman, IA)

CZECH REPUBLIC—Radio Prague, **7345/9440** at 0009 with weather report. (Charlton, ON) **9870** at 0314 with "History of Smell in Czech Republic," recollections of communist regime there. (Burrow, WA)

DENMARK—Radio Denmark, via Norway, **9945** in DD at 2339. (Charlton, ON) **11635** heard at 0130 with ID, news in DD. (Brossell, WI)

DOMINICAN REPUBLIC—Radio Cristal Int'l, **5009.8** at 0110 with SS pops, phone talks, off abruptly at 0114. (Alexander, PA) Radio Barahona, **4930** in SS with vocals at 0920. (DeGennaro, NY)

ECUADOR—HCJB, **6010** in GG at 1000, and **6125** in QQ at 0950. (DeGennaro, NY) **15115** at 1400. (Paradis, ME) **9745** at 0010 and **15185** at 2126. (Charlton, ON) Radio Quito, **4919** in SS at 0911. (DeGennaro, NY)

EGYPT—Radio Cairo, **9990** at 1914 with talk on culture. Also **15335** in FF at 2104. (DeGennaro, NY) **9900** at 2242 with next day program notes, ID, anthem, and off at 2245. (Burrow, WA) **11540** in AA at 2230 and **11725** with Koran in AA at 2307. (Charlton, ON) **11725** at 0200 with music, Koran, news and "Arabic by Radio." (Brossell, WI) **12050** in AA with Koran at 0140. (Linonis, PA)

ENGLAND—BBC **6110** in SS at 0035, **12095** at 0007, **17615** via Thailand at 0019 and **21470** via Ascension at 1435. (Charlton, ON) **6110** via Greenville in SS at 1123. (DeGennaro, NY) **15130** at 1410 and **15190** (via Antigua, gld) at 1410. (Northrup, MO) 15190, Antigua at 1347. (Miller, WA) Wales Radio Int'l, via England, **9795** at 0205. (Charlton, ON)

EQUATORIAL GUINEA—Radio Nacional, Malabo, **6250.3** at 2220 with SS talk, SS pops, and rap, ID, off with anthem at 2302. (Alexander, PA) Radio Africa, **15185** with talk about human rights and Cuba at 2144. (Charlton, ON)

ETHIOPIA—Radio Fana, **6210** at 0257 sign on with IS, man anncr with ID, music fanfare, ID by woman; sign on anmts in Amharic, then news. **//6940**. (D'Angelo, PA) 0259 with IS and sign on. Off for a minute suddenly at 0301. (Montgomery, PA)

FINLAND—YLE/Radio Finland, **17760** in Finnish at 1247. (Brossell, WI)

FRANCE —RFI, **9790** in FF at 2147, **15605** in EE at 1728. (Charlton, ON) **15515** in FF at 1315. (Northrup, MO) **17615** in FF with live sports event at 1752. (Jeffery, NY)

FRENCH GUIANA—RFI Relay, **11665** in FF at 0136. (Charlton, ON) **17630** with news in SS at 1800. (Jeffery, NY)

GABON—Radio France Int'l relay, **4890** in FF at 0400. (Paradis, ME) **11620** in FF at 2010, **11955** in FF at 2031. (Charlton, ON) 11955 in FF at 2130. (Miller, WA) Africa Number One, **15475** in FF monitored at 1809. (Charlton, ON)

GERMANY—Deutsche Welle, **6075** in GG at 0034, **9545** in GG at 0020, **9640** in GG at 0128, **9440** in EE at 2157, **11690** in GG at 2300, **11865** via Portugal in GG at 0101, 11865**//15205** in EE at 2108 and **15275** in GG at 2045. (Charlton, ON) 11865 in EE at 2117. (Miller, WA) Radio Africa Int'l, via Julich, **15715** at 1730. (Paradis, ME) 1756 with African music and request for letters. (Charlton, ON) Gospel for Asia, via Wertachtal, **11795** at 0029 sign on. Changes languages every 15 minutes. Also **11905** at 0018 in unid. Asian language. (D'Angelo, PA)

GHANA—GBC, **4915** heard at 2320 with continuous music to 2345 ID and news items to 2355; woman with religious talk and prayer, then anthem at 2357. Off 2359. (Montgomery, PA)

GREECE—Voice of Greece, via Delano, CA, **17705** in Greek at 2210. (Charlton, ON)

GUAM—Trans World Radio, **9430** in CC at 1122. (Jeffery, NY) **9500** in CC at 1255. (Northrup, MO)

GUATEMALA—Radio Cultural, **3300** with songs and anmts in SS at 0220. (Brossell, WI) 0255 ending SS, ID, and into EE Bible programs. (D'Angelo, PA) 0416 with EE ending at 0428 and back to SS. (Montgomery, PA) 1020 in SS. (Miller, WA) Radio Buenos Nuevas, **4800** with SS talk, marimba music at 0218. (Brossell, WI)

GUINEA—RTV Guineenne, **7125** at 2247 in FF with FF/US/Afro pops. Off at 0001. (Alexander, PA)

GUYANA—Voice of Guyana, **3291v** at

A special QSL card from Radio Australia.

0100 in EE and vernacular with pops, news, weather. (Linonis, PA) 0300 but too weak to ID. Noted again at 0840 with Hindi vocals. (Alexander, PA) Presumed this at 0825 with non-stop choral vocals, various talks and music types. (D'Angelo, PA)

HAWAII—KWHR, **17510** at 0053 with ID, religious program, and Patty Ellis with phone-in prayer line. (MacKenzie, CA) 0313. (Brossell, WI)

AFN, **6350** at 0808. (D'Angelo, PA)

HONDURAS—La Voz Evangelica, (p) **4819** with SS religious program at 0415. (Linonis, PA) Radio Litoral, **4832** with SS religious programming at 0400, EE "Searchlight" program at 0420. ID and closing anmts in SS at 0459. (Alexander, PA)

HUNGARY—Radio Budapest, **9570** at 0241 and **9590** at 0108. (Charlton, ON)

INDIA—All India Radio, Patna, **11620** at 0010 with open carrier, flute IS from 0014 and brief opening anmt. Mostly talk and some music, with breaks, perhaps a studio to transmitter feed problem. **//9595** was very poor. (D'Angelo, PA) (*Patna source was very temporary—gld*) 1824 in Hindi. (DeGennaro, NY) 2204 with EE news. Also **13604** at 0038. (Charlton, ON)

INDONESIA—Radio Republik Indonesia, Serui, **4604.9** in II at 1020. RRI Makassar, **4755** in II at 1218. (Miller, WA) Voice of Indonesia, **11785** in EE at 2035 and 15150 at 2020. (Charlton, ON)

IRAN—VOIRI, **7245//9635** at 1500 with anthem, schedule, Koran and interpretation, news. (Burrow, WA) **9590** with frequencies in EE at 0133 and into AA. (Charlton, ON) **11860** at 2010 with woman talk on smoking, ID at 2017, and different woman with talk. Off around 2026. (Montgomery, PA) **15545** in AA at 1310. (Ziegner, MA)

IRELAND—Radio Telefis Eireann, **6155** via England heard at 0132, **13640** via Canada at 1847 and **15585** via England at 1810. (Charlton, ON)

ISRAEL—Kol Israel, **11585** in HH at 0205, also **17535** in HH at 1308. (Brossell, WI) 11585 in HH at 2231, **11605** in FF at 1931 and **15640** in FF at 1943. (Charlton, ON) **11605//15615// 17545** at 1904 with interview, news, ID, headlines. (Burrow, WA) 11605 in FF at 1534. (DeGennaro, NY) **13580** at 0300. (Paradis, ME)

ITALY—RAI, **6060** in II at 2215 and **9675** in II at 0005. (DeGennaro, NY) 9675 at 0018, **11880** in II with IS at 2050 and **21520//21535** at 1441 with soccer at 1441. (Charlton, ON) **9875** at 0431 with IS. The rest was blocked by QRN. (Burrow, WA) **11765** via Ascension, **//11800** in II at 0215. (Brossell, WI)

JAPAN—Radio Japan/NHK on **6120** via Canada with news at 1114. (DeGennaro, NY) 6120 at 1113, **6145** via Canada at 0003, **11855** via Ascension at 2105. (Charlton, ON) **9505** at 1440. (Northrup, MO) **11680** in KK at 1730. (MacKenzie, CA) Radio Tampa, **9590** in JJ at 1225. (Northrup, MO) (*Do you mean 9595?—gld*)

JORDAN—Radio Jordan, **9830** at 1907 with AA music. (DeGennaro, NY)

KUWAIT—Radio Kuwait, **9855** in AA at 2149, **11990** in EE at 1904, **15495//15505** in AA at 1841. (Charlton, ON) 11990 at 1833 with news, ID. (Burrow, WA) **13620** in AA at 1554. (DeGennaro, NY) **15495** in AA at 0315. (Brossell, WI) 15505 in AA at 1930. (Paradis, ME)

LIBYA—Radio Jamahiriya/V of Africa, **11635** via France at 2000 with EE news at 2041 and 2123. Also one minute EE anmts at 2051 and 2129 asking for letters and giving address and phone number. Off abruptly at 2130. (Alexander, PA) **15315** via France in AA at 1923 with ID, EE news, FF news, one-minute EE anmt asking for letters and giving address, fax and phone numbers. **//15205**. (Alexander, PA) 2020. (DeGennaro, NY) 2023 in AA. (Charlton, ON) **15438** in AA at 2142. (Miller, WA)

LITHUANIA—Radio Vilnius, **9875** at 2300 with news and music. (Paradis, ME) 2340 with domestic economic news, local pops, mailbag program, ID at 2358. (Burrow, WA) 9875 at 2341 and **11690** at 0059 "This station comes to you from Radio Vilnius, Lithuania." (Charlton, ON)

MADAGASCAR—Radio Voice of Hope, **12060** at 0427 with ID and mission statement. (Burrow, WA) Radio Malagasy, **5010** at 0255 sign on with drum IS, local news at 0256, choral anthem at 0300, ID and into vernacular. (Alexander, PA)

MALAYSIA—Radio Malaysia, **7295** at 1539 with music dedications, "Radio 4" ID at 1542. (Burrow, WA)

MALI—RTV Malienne, **5995** in FF and vernacular at 2210 with discussion. (DeGennaro, NY)

MAURITANIA—Radio Mauritainie, **4845** in AA and some FF at 2330. (Linonis, PA)

MEXICO—Radio Mexico Int'l, **9705** in SS at 0019. (Charlton, ON) **11770** in SS at 2114. (Miller, WA) Radio Educacion, **6185**, in SS with instrumentals at 0947. (DeGennaro, NY) 0154 with SS songs. (Charlton, ON) 0315 with SS ballads. (Linonis, PA)

MONGOLIA—Voice of Mongolia, **12085** at 1000 with social activities in Ulaan Bator. (Ziegner, MA) 1013 with EE talk, local music and woman talk. EE closed at 1030. (Montgomery, PA)

MOROCCO—RTV Marocaine, **7185** in AA at 0015, **15345** in AA at 1817. (Charlton, ON) **11920** in FF at 0454. (Miller, WA) 11920 at 0225 and **15345** at 2050. (Brossell, WI) 15345 in AA at 1522. (Jeffery, NY)

NEW ZEALAND—RNZI, **17675** at 2236 with discussion about children and sports, domestic service ID. (Burrow, WA)

NIGERIA—Voice of Nigeria, **15120** at 2246 with news, ID. (Burrow, WA)

NORTH KOREA—Voice of Korea, **9335//11710** at 1513 with reunification news. (Burrow, WA) 11710 in KK at 1734, and **11735** in SS at 1740. (MacKenzie, CA)

PAKISTAN—Radio Pakistan, **11570** at 1558 with IS and weak EE talk. (Burrow, WA)

PAPUA NEW GUINEA—NBC, **4890** at 0814 with island vocals to ID and EE news at 0900. "That's NBC national news and sports." At 0912. (D'Angelo, PA) 0940 in mostly pidgin with Radio Macedonia, Peru in the background. ID at 0950 and into news. (Montgomery, PA) 1306 with news. (Miller, WA) Radio western Highlands, Daru, (t) **3305** in EE and pidgin with local news and weather. (Linonis, PA)

PERU—Radio del Pacifico, **4975** at 0225 with SS religious talk. (D'Angelo, PA) 0931 with SS and vocals. (DeGennaro, NY) Radio Union, **6115** with SS Andean music at 0243. (Miller, WA) Radio Victoria, **6020.3** at 0852 with religious service in SS, ID 0859. QRM from Radio Gaucha sign on at 0900. (Montgomery, WA) Radio Huanta 2000, **4746.8** with SS news at 0203. (Strawman, IA) Radio Andina, Huancayo, **4995.6** with children singing and Andean flutes. (DeGennaro, NY)

PHILIPPINES—VOA relay, **9545** in CC at 1225. (Northrup, MO) **17820** at 2138. (Charlton, ON) 2219 (Jeffery, NY) Radio Veritas Asia, **9670** in JJ at 1225. (Northrup, MO) **11730** in Tagalog at 1357. (Miller, WA) Radio Pilipinas, **11720//15190** at 1858 in Tagalog. (Burrow, WA)

PORTUGAL—RDP Int'l, **11655** in PP at 0129. (Charlton, ON) **17575** at 1302 with PP talk between man and woman. (Brossell, WI)

PUERTO RICO—AFN, **6458.5** with EE vocals. (Charlton, ON) (*Now replaced by 7507—gld*)

Radio Vatican's vast antenna site on one of their QSLs.

ROMANIA—Radio Romania Int'l, **9570** at 2345, ID 2344. Also **11940** in Romanian at 0015. (Charlton, ON) **11775** at 2300 with news and "Focus." (Paradis, ME) 2302 with news, ID at 2307 "You are tuned to Bucharest, Radio Romania International." //**11740**. (Wood, TN) **11940** at 0158 with IS, ID, schedule and news. (Burrow, WA)

RUSSIA—Voice of Russia, **9665** with news, mailbag at 0100. (Paradis, ME) 9665/**9725** at 0148, **11675** with EE/RR lessons at 1916, **11825** via Vatican at 0115, **15290** in RR at 1836, **15455** at 2017. (Charlton, ON) 11675 from Armavir with ID at 1815 and news. (Wilkner, FL) **11750** via Moldova in RR at 0205 and **15455** at 2055. (Brossell, WI)

RWANDA—Deutsche Welle relay, **15275** at 0115 in GG with classical music. (MacKenzie, CA) **17860** in GG at 1815. (Jeffery, NY) 2040. (Brossell, WI)

SAO TOME—VOA relay, **4960** at 0403 with ID during news. (Montgomery, PA) **7290** at 0301 with "Daybreak Africa." (Jeffery, NY) **9585** at 1220. (Northrup, MO)

SAUDI ARABIA—BSKSA, **9870** in AA at 2151, **11820** at 2144 and **15315/15435** in AA at 1541. (Charlton, ON) 11820 in AA at 1958. (Wood, TN) **15230** at 2047. (Brossell, WI) **17560** in AA at 1742. (Jeffery, NY)

SERBIA—MONTENEGRO Radio Yugoslavia, **9580** with EE talk at 0016. (Charlton, ON)

SOLOMON ISLANDS—SIBC, **5020** with BBC programming at 1307. (Miller, WA)

SLOVAKIA—Radio Slovakia Int'l, **9440** with religious songs at 0132. (Charlton, ON)

SOUTH AFRICA—Channel Africa, **5955** at 0400 with time pips, ID, Africa news. (Burrow, WA) **15265** at 1655 with ISS, EE and Afrikaans ID anmts prior to 5 + 1 time pips and EE program news. Poor under Taiwan until they signed off at 1700, then fair. (D'Angelo, PA) 1700 EE sign-on on this new frequency. Into news by woman. Into PP at 1730. (Montgomery, PA) **17870** in FF at 1702. (Charlton, ON) Radio Sondergrense, **3320** at 0110 with interview in local language. (Montgomery, PA) 0323 with mix of vocals and talks in Afrikaans. (D'Angelo, PA) BBC relay, **3255** at 0332 with news. (D'Angelo, PA)

SOUTH KOREA—Radio Korea Int'l, **9515//9870** at 1645 with feature on Korean gardens, ID at 1657, schedule and sign off. (Burrow, WA) **9650** at 1218. (Charlton, ON) 1225. (Northrup, MO) **15575** at 0104 in KK with talks by man. (MacKenzie, CA)

SPAIN—REE, **15110** in SS at 2053 and **15290** at 2015. (DeGennaro, NY) **15170** in SS at 1235 on 15290 in EE at 2023 and **15385** in EE at 0004. (Charlton, ON) 15290 in SS at 2049. (Brossell, WI)

SRI LANKA—SLBC, **4870** in Tamil with disco stuff at 1221. (Miller, WA)

SWAZILAND—Trans World Radio, **3200** at 0441 with talk between man and woman. (Strawman, IA) **3240** at 0253 with open carrier, hand bells, multiple EE IDs over the next five minutes to sign on in listed Shona. (D'Angelo, PA)

SWEDEN—Radio Sweden, **9495** via Canada at 0228. (Charlton, ON) 0230 with with pop program. (Brossell, WI)

SWITZERLAND—Swiss Radio Int'l, **17870** at 1755 in EE; into FF at 1800. (Burrow, WA)

SYRIA—Radio Damascus, **9885** in FF at 2212 and **15220** at 1829 in unid. Language. (Charlton, ON) **13610** at 2022 with news, ID, music. (Burrow, WA) **15220** in GG via Germany at 2045. (Brossell, WI) 2059. (DeGennaro, NY)

SYRIA—Radio Damascus, **13610** at 2027 with ID and EE news, then music and cultural program. (D'Angelo, PA)

TAIWAN—Radio Taiwan Int'l, **5950** via Florida in CC at 0011, **9680** (Florida) at 0212 and **12560** via Florida at 2205. (Charlton, ON) **11605** at 1230 in CC. (Brossell, WI) CBS (p) **15265** at 1638 with nonstop CC opera with apparent tape problems as there were numerous short breaks. Off at 1700 with no anmts. (D'Angelo, PA)

THAILAND—Radio Thailand, **9860** in EE at 1256, of in mid-sentence at 1259. (Strawman, IA) **15395** at 0300 with IS, ID "HSK9—Radio Thailand" and national news. (Burrow, WA) VOA Relay, **7260** at 1120 in unid. Language. Off at 1129. (Jeffery, NY) **11785** in unid. Asian language. (Brossell, WI)

TURKEY—Voice of Turkey, **9460** in TT with music at 1845 with Sufi music. (Ziegner, MA) 2355. (DeGennaro, NY) **9830** ending news at 2212 and **11960** at 2201. (Charlton, ON) 9830 at 2256 in unid. language. IS, IDs, time pips, and off at 2300. (Burrow, WA) **11885** in TT at 2338. (Miller, WA) 0220 in TT. (Brossell, WI)

TUNISIA—RT Tunisienne, **12005** in AA at 0231. (Brossell, WI) 0430. (Linonis, PA)

UGANDA—Radio Uganda, **4976** at 0300 with carrier only to 0307 when IS started, followed by anthem, woman in EE with station info, ID by man, birdcalls. (Montgomery, PA)

UKRAINE—Radio Ukraine Int'l, **12040** at 2300 in Ukrainian. ID and talk. (Burrow, WA) 0000. (Paradis, ME) 0016. (Charlton, ON) 0237. (Brossell, WI)

UNITED ARAB EMIRATES—UAE Radio, Dubai, **11950** at 0045 with western-style pops. (Linonis, PA) **13675** at 1558 in AA. (DeGennaro, NY) 0225 with Koran. (Brossell, WI) 0330 with news, ID, Islamic discussion, ID, anthem and off at 0348. (Burrow, WA)

UZBEKISTAN—Radio Tashkent, **9715** in RR with ethnic songs, off at 0159. (Charlton, ON) **11905** at 2030 with IS, ID, distinctive music bridge. (Burrow, WA) 2030 and 2130 to 2158 with EE news, comment, ID, local music. (Alexander, PA) 2130 in presumed Uzbek. (Linonis, PA, with thanks to Rick Barton)

VATICAN—Vatican Radio, **6020** at 2028 in EE with IS, bell tolling. (Miller, WA) **9650** at 0152. (Charlton, ON) **11625** with IS at 0330, opening in unid. African dialect. (Brossell, WI) 0405 sign on in possible Farsi. (Linonis, PA)

VIETNAM—Voice of Vietnam, **12020** from Son Toy, 1002 with EE news, ID, and news recap heard at 1009, ID 1010. (Montgomery, PA) 1417 in JJ. (Miller, PA)

ZAMBIA—ZBNC, **5915** at 0243 sign on with fish eagle IS, opening anthem, ID by man and woman and group signing. Slop from WBOH-5920. (D'Angelo, PA)

And that does it! A gazillion thanks to the following who came through for you this time: Stewart MacKenzie, Huntington Beach, CA; Robert Wilkner, Pompano Beach, FL; Bruce R. Burrow, Snoqualmie, WA; Ciro DeGennaro, Feura Bush, NY; Jerry Strawman, Des Moines, IA; Robert Montgomery, Levittown, PA; Robert Charlton, Windsor, ON; Jack Linonis, Hermitage, PA; Mike Miller, Issaquah, WA; Ray Paradis, Pittsford, ME; Mark Northrup, Gladstone, MO; Robert Brossell, Pewaukee, WI; Tricia Ziegner, Westford, MA; Dave Jeffery, Niagara Falls, NY; Joe Wood, Gray, TN and Brian Alexander, Mechanicsburg, PA. Thanks to each one of you! ■

the propagation corner

by Tomas Hood, NW7US,
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up-to-the-minute forecasts helping you get the most from the radio spectrum

Did He Really Do It?

In 1901, Marconi claimed to have bridged the Atlantic Ocean by radio. From time to time since then a challenge is made as to the validity of those first claims.

It is argued that Marconi could not have possibly heard those signals due to the time of day they were transmitted and the frequency of the transmission. It is speculated that the frequency was in, or near, the current AM Broadcast band, and was transmitted during sunlit hours. Because of this, the noise level alone would have masked any weak signal propagated. Some who have tried to model this with propagation software have concluded that the band would indeed be much too noisy.

The question is an interesting one. Marconi's pioneering work in radio has changed the nature of the human experience immeasurably, so whether or not he actually heard the signal that fateful day is beside the point now. Yet, did he hear—could he hear—a signal across the Atlantic Ocean back in 1901?

Marconi built the most powerful spark transmitter possible in 1901, at Poldhu, Cornwall, almost at the extreme western tip of England. He powered this spark transmitter by an oil engine generator, when all of the other existing spark-gap transmitters of the day used batteries. This provided a source of energy that would power his new transmitter for the unthinkable task of spanning the Atlantic Ocean. The farthest working range of existing equipment was hardly more than 250 miles.

The station that Marconi engineered included a massive antenna system, supported by a circle of very tall wooden masts. On the other end of his planned radio circuit, he constructed a similar antenna to receive the Poldhu signals. Murphy was ever present, however, and in September, the worst gale in living memory blew down the tall Poldhu masts. Then, in November, another storm blew down the antenna system at Cape Cod. Marconi was unstoppable, though.

He erected a new antenna between two 50-meter-high poles at Poldhu, then sailed with George S. Kemp, his assistant, not to Cape Cod, but to Saint John's in Newfoundland, somewhat closer to Cornwall. On December 12, 1901, with a rather primitive untuned receiver and a kite-flown wire aerial, he and his assistant listened. Through the static and noise, he heard the distinct sounds he so hoped to hear. His assistant confirmed what Marconi heard: the letter 'S' in Morse code (three short dots).

Very skeptical scientists whose calculations and speculations appeared to demonstrate quite conclusively the impossibility of such an accomplishment, of course, challenged his claims of success. Even today, skeptics argue, using modern calculations and models, that this first transmission could not have been heard across the Atlantic.

The other side of the debate, however, argues that because of the nature of the spark-gap transmissions used over a hundred years ago, it is quite possible that the frequencies transmitted were not confined to the AM Broadcast band, contrary to what critics of Marconi's first trans-Atlantic achievement claim. It is likely that many harmonics were propagated via the *F*-layer, spread out over much of the shortwave spectrum. Could it be that Marconi heard these harmonics, which arrived by way of sky waves?

Another point worth contemplating is one of record. If you look at the sunspot record of that year, and especially of that month in which Marconi conducted those experiments (December 1901), you will see an observed sunspot number of zero. Yes, you read correctly. Zero! The running average was a meager 3, smoothed over 12 months.

With no activity on the sun, the planetary A index (Ap) would be very low, perhaps even at zero. With no geomagnetic activity, and very little solar influence, combined with the fact that there was no man-made radio noise, it is easy for me to accept that signals could have been heard, even with the equipment of the day. It is quite likely, especially if some of the harmonics of such a spark transmission were refracted off the ionosphere somewhere near the rather low MUF of that day.

Wouldn't it be interesting to recreate today the same conditions that in 1901? I am sure many DXers would love to have a winter DX season that quiet!

Smoothed Sunspot Number Correction

Mike Stein wrote to me and asked about the smoothed sunspot numbers reported for October and November of 2002. They did not seem to be correct. He also noted that I did not report a smoothed sunspot number for September 2002.

Good call! The numbers I reported were those given by the SEC Space Weather Operations, instead of the S.I.D.C. Brussels International Sunspot numbers. Of course, I should have used the official numbers from the Royal Observatory of Belgium.

The correct smoothed sunspot numbers for October and November 2002 are 91 and 85, and the missing smoothed sunspot number for September is 95.

It's good to know there are alert readers! I appreciate your feedback.

MacKeand's Book Helps Us Understand

Crawford MacKeand, WA3ZKZ, has written a chapter in his book, *The Friendly Ionosphere*, in which he elaborates on some experiments using propagation modeling software and analysis tools to test the possibility of Marconi hearing the transmission on that eventful day in 1901.

The test was conducted on a hundred or so frequencies between 3 kHz and 16 MHz, each representing the center of a small frequency band, from the lowest effective frequency for atmospheric noise to well above the calculated Maximum Usable Frequency. Software models using the method of

Optimum Working Frequencies (MHz) - For October 2003 - Flux = 101, SSN = 47 - 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	21	19	16	13	13	12	11	11	11	10	10	10	10	13	19	21	22	23	24	24	24	24	24	23
NORTHERN SOUTH AMERICA	30	28	24	20	19	17	16	16	15	14	14	13	13	13	22	25	27	29	30	31	32	32	32	31
CENTRAL SOUTH AMERICA	29	27	23	19	18	17	16	15	14	14	14	13	13	16	24	27	28	29	30	31	31	31	31	31
SOUTHERN SOUTH AMERICA	31	30	27	23	21	20	18	17	16	15	15	14	14	13	20	25	28	30	31	32	32	33	33	32
WESTERN EUROPE	10	9	9	9	9	9	9	9	9	9	9	9	9	12	15	17	18	18	17	16	15	12	10	10
EASTERN EUROPE	9	9	9	9	9	10	10	10	9	9	9	9	9	9	13	14	14	14	13	12	10	9	9	9
EASTERN NORTH AMERICA	23	21	16	14	13	13	12	12	11	11	11	11	11	17	21	23	25	26	26	27	27	26	26	25
CENTRAL NORTH AMERICA	14	13	11	8	8	7	7	7	6	6	6	6	6	6	10	12	13	14	14	15	15	15	14	14
WESTERN NORTH AMERICA	7	7	6	6	4	4	3	3	3	3	3	3	3	3	3	6	6	7	7	8	8	8	8	8
SOUTHERN NORTH AMERICA	23	21	19	14	13	12	12	11	11	11	10	10	10	10	17	20	22	23	24	25	25	25	24	24
NORTHERN AFRICA	10	10	9	9	9	9	9	9	9	9	9	9	9	13	16	18	19	19	19	16	12	11	11	10
CENTRAL AFRICA	13	12	12	11	10	10	10	9	9	9	9	9	9	12	16	17	18	19	19	17	16	15	14	13
SOUTH AFRICA	21	19	14	13	12	12	12	11	11	11	11	10	10	17	21	22	24	24	25	25	25	25	24	22
MIDDLE EAST	9	9	9	9	9	10	10	10	9	9	9	9	9	9	14	16	17	16	12	11	10	10	10	9
JAPAN	21	20	20	19	17	15	11	11	10	10	10	9	9	9	9	9	9	9	9	9	14	17	19	20
CENTRAL ASIA	21	20	20	19	17	15	11	11	10	10	10	9	9	9	9	9	11	12	12	11	11	11	20	21
INDIA	14	14	14	14	13	10	10	10	9	9	9	9	9	9	9	9	9	10	11	12	12	13	13	13
THAILAND	20	20	19	18	17	14	11	11	10	10	10	9	9	9	9	9	12	14	13	13	12	12	12	16
AUSTRALIA	27	28	29	29	26	21	18	17	16	15	15	14	14	13	13	13	18	17	16	15	18	21	23	25
CHINA	19	19	19	18	16	14	11	10	10	10	9	9	9	9	9	10	9	9	9	9	9	14	17	
SOUTH PACIFIC	31	32	31	29	26	22	20	19	17	16	16	15	14	14	14	13	16	16	18	22	24	27	28	30

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	24	21	18	17	16	15	14	13	13	12	12	12	14	20	23	25	27	27	28	28	28	28	27	26
NORTHERN SOUTH AMERICA	27	25	22	20	19	17	16	15	14	14	13	13	12	18	21	24	26	27	28	29	30	30	30	29
CENTRAL SOUTH AMERICA	28	25	22	20	19	18	17	16	15	15	14	14	17	23	25	27	28	29	30	31	31	31	31	30
SOUTHERN SOUTH AMERICA	31	29	26	23	21	20	18	17	16	16	15	14	14	20	25	27	28	30	31	32	32	32	33	32
WESTERN EUROPE	10	10	9	9	9	9	9	9	9	9	9	9	15	17	18	19	19	19	18	17	16	13	11	10
EASTERN EUROPE	9	9	9	9	9	9	9	9	9	9	9	9	13	16	17	16	16	16	15	14	12	10	10	9
EASTERN NORTH AMERICA	16	14	10	10	9	9	9	8	8	8	8	8	9	15	17	18	19	19	20	20	19	19	18	18
CENTRAL NORTH AMERICA	8	7	6	4	4	4	4	4	4	3	3	3	3	5	7	8	8	9	9	9	9	9	9	8
WESTERN NORTH AMERICA	14	13	12	8	8	7	7	7	7	6	6	6	6	6	10	12	13	14	15	15	15	15	15	14
SOUTHERN NORTH AMERICA	16	14	12	10	10	9	9	8	8	8	7	7	7	10	14	15	16	17	17	18	18	18	17	17
NORTHERN AFRICA	12	11	11	10	10	10	9	9	9	9	9	9	16	18	19	20	21	21	21	21	15	14	13	13
CENTRAL AFRICA	13	11	11	10	10	10	9	9	9	9	9	9	16	18	19	20	21	21	21	19	17	16	15	14
SOUTH AFRICA	21	18	17	16	15	15	14	14	13	13	13	13	23	27	29	31	32	32	32	31	30	27	25	23
MIDDLE EAST	9	9	9	9	9	10	9	9	9	9	9	9	14	17	18	19	19	17	13	11	11	10	10	10
JAPAN	20	19	18	15	11	11	10	10	10	9	9	9	9	9	9	9	9	9	9	9	13	17	19	20
CENTRAL ASIA	19	18	17	15	11	11	10	10	10	9	9	9	9	9	9	13	12	12	12	11	11	11	19	20
INDIA	12	14	13	11	10	10	10	9	9	9	9	9	9	13	15	14	13	11	10	9	9	9	9	9
THAILAND	19	18	16	14	11	10	10	10	9	9	9	9	9	9	13	16	15	14	13	13	12	12	12	15
AUSTRALIA	27	28	28	24	19	17	16	16	15	14	14	14	13	13	13	19	17	16	16	15	18	21	24	26
CHINA	18	18	16	14	11	10	10	10	9	9	9	9	9	9	10	10	10	9	9	9	9	9	12	16
SOUTH PACIFIC	32	30	28	25	22	20	19	17	16	16	15	14	14	14	15	17	16	16	20	23	26	28	29	31

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	19	17	15	14	13	12	12	11	10	10	10	9	14	18	20	21	22	23	23	23	23	22	22	21
NORTHERN SOUTH AMERICA	24	23	21	19	17	16	15	14	13	13	12	12	15	18	20	22	24	25	26	26	26	27	26	26
CENTRAL SOUTH AMERICA	28	26	23	22	20	19	17	16	16	15	14	17	21	23	25	27	28	29	30	31	31	31	31	30
SOUTHERN SOUTH AMERICA	30	28	25	23	21	20	18	17	16	16	15	14	20	23	25	27	29	30	31	32	32	32	32	32
WESTERN EUROPE	10	9	9	9	9	8	8	8	8	8	12	16	17	19	19	19	19	19	18	17	16	13	10	10
EASTERN EUROPE	9	9	9	9	9	9	9	9	9	9	9	15	18	18	18	18	18	17	16	15	13	10	10	10
EASTERN NORTH AMERICA	7	5	5	5	4	4	4	4	4	4	4	4	7	8	9	9	9	9	10	10	9	9	9	8
CENTRAL NORTH AMERICA	17	14	11	10	10	9	9	9	9	8	8	8	10	16	18	19	20	20	21	21	20	20	19	18
WESTERN NORTH AMERICA	23	21	16	14	13	13	12	12	11	11	11	11	11	17	21	24	25	26	27	27	27	27	26	25
SOUTHERN NORTH AMERICA	19	16	14	13	12	11	11	10	10	9	9	9	10	16	19	20	21	22	22	22	22	22	21	20
NORTHERN AFRICA	13	12	12	12	11	11	11	11	11	11	17	22	24	25	26	27	27	26	24	22	18	15	14	14
CENTRAL AFRICA	14	13	13	12	12	12	11	11	11	11	17	22	24	25	26	27	27	26	24	21	19	18	16	15
SOUTH AFRICA	21	19	18	17	16	15	15	15	14	14	16	23	27	30	31	32	32	32	32	31	30	27	25	23
MIDDLE EAST	11	11	10	10	10	9	9	9	9	9	13	17	19	20	21	21	22	22	18	14	13	13	12	12
JAPAN	17	15	11	11	10	10	10	9	9	9	9	9	9	10	10	9	9	9	9	9	11	16	18	19
CENTRAL ASIA	17	14	11	11	10	10	10	9	9	9	9	9	13	14	13	12	12	12	11	11	11	11	17	18
INDIA	9	9	9	10	10	10	9	9	9	9	9	12	14	14	14	14	13	13	13	12	11	10	9	9
THAILAND	15	11	11	10	10	10	9	9	9	9	9	9	15	17	17	16	15	14	13	13	12	12	12	11
AUSTRALIA	28	26	22	19	18	17	16	15	15	14	14	13	13	19	20	19	17	16	16	15	19	22	24	26
CHINA	16	11	11	10	10	10	9	9	9	9	9	9	11	11	10	10	10	9	9	9	9	9	9	15
SOUTH PACIFIC	30	28	25	23	21	19	18	17	16	15	15	14	14	19	18	17	16	18	22	25	27	29	31	32

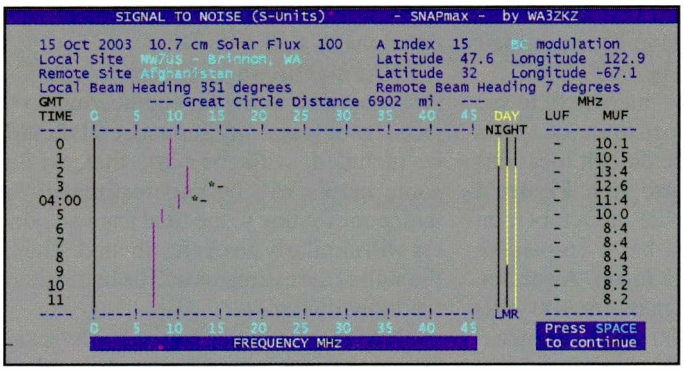

Figure 1. Signal-to-Noise Ratio graph for the path between Afghanistan and Brinnon, Washington, during October 2003. Note that 0300 to 0500 GMT are possible openings.

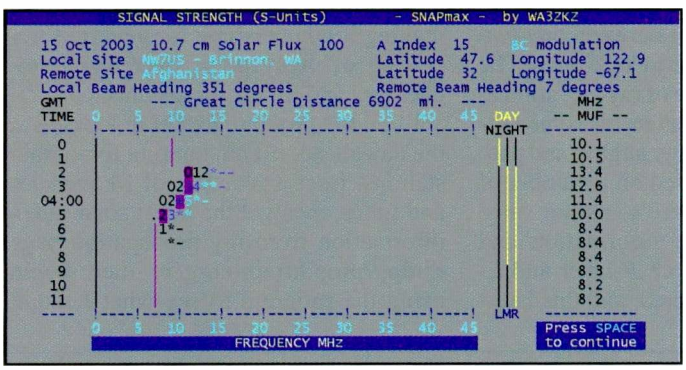

Figure 2. Signal strength graph in S units for the path between Afghanistan and Brinnon, Washington, during October 2003. The possible openings at 0300 and 0400 GMT suggest a possible S4 to S5 signal strength of a 50-kW broadcast.

moment simulated the antennas, and ray angles were determined from path calculations assuming *F*-layer propagation.

If you have a chance to pick up his book, read this chapter and you'll see how he came to conclude,

...it looks as if Marconi may very well have heard in Newfoundland in December 1901 the integrated effect of 5 to 15 MHz high frequency sky-wave signals propagated across the Atlantic Ocean from Poldhu in England in a band several MHz wide, just below the (MUF) Maximum Usable Frequency.

New Propagation Analysis Tool

MacKeand is a Chartered Electrical Engineer in the United Kingdom, and before his final retirement from consulting engineering, was a registered Professional Engineer in the State of California. His working life encompassed microwave radar and telecommunications from HF to audio, while his amateur radio experience is from the early 1950s to the present, and saw him licensed at various times as G4ARR, WA2ZVX, WA3ZKZ, and VP8CMY. He has written a propagation analysis tool called, "SNAPmax." SNAP stands for, "Signals, Noise, and Propagation." The version I evaluated is 5.01, which is a DOS executable with supporting files. It ran fine for me under a DOS window in Windows98. It might not run on newer operating systems that don't support true DOS.

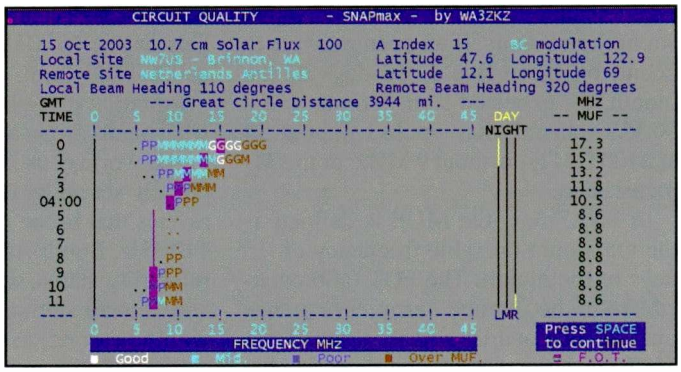

Figure 3. Circuit quality from a potential shortwave broadcasting station in the Netherlands Antilles, showing good reception around 15 MHz around 2400 GMT.

Installing it was rather simple. I obtained the software on a diskette, and followed the directions that had me copy the executable file, as well as the SNAP.QTH and SNAPxxx.ini files (xxx is replaced by the version, which in this case is 501), into a directory of my choice on my computer. I chose "C:\SNAPMAX." I renamed SNAP501.EXE to SNAPMAX.EXE, and then ran it with the command, "C:\SNAPMAX\SNAPMAX.EXE."

After the welcome screen, a menu with control options is displayed. The menu is simple, allowing you to modify the program's options such as the Solar Flux and A-Index values, the local and remote site coordinates, and other required settings. A useful feature of SNAPmax is the ability to select the Bandwidth and Modulation. From the main menu, selecting "B" will bring up a new menu that allows you to select your operating mode from PSK, CW, RTTY, TOR, SSB, AM, FM, and BCAM. The required bandwidth is automatically entered, as are the signal-noise requirements for Good, Median, and Fair signals. Once you have set all of the parameters and options, you simply press SPACE to start processing your analysis/forecast.

I selected 'BCAM' as my Bandwidth and Modulation setting, because I wished to analyze shortwave radio broadcast signals. I set my latitude and longitude, and then selected Afghanistan as the remote transmitting site, with a power level of 50 kW. I chose the Signal-Noise ratio (S units) shown versus Frequency and Time" mode ("M" on the main menu, "SN" on the submenu). I set the Solar Flux to "100," the A-index to "15," and the K-index to "3." I also chose a local noise level of "Suburban." Then, I hit the <SPACE> bar. The first of two pages of resulting calculations are shown in **Figure 1**.

A blank space means that there is not likely to be enough signal level for a useful QSO. A dot (.) says that signal/noise ratio is up to 1 S unit below noise. A number in any space, and its associated display color in that space will show by how many S units (which are arbitrarily set at 6 dB each) your desired received signal will exceed your local noise level. A plus sign (+) indicates that predicted signal level is more than 9 S units over noise. A star (*) shows that this signal (the level being indicated only by the color) is above the MUF and is probably present only 10 days in the month. A dash (-) shows signals probable on five days of the month.

It is clear that in October 2003, a 50-kW signal from a broadcast station in Afghanistan will be a rare catch, possible on very few days of the month. **Figure 2** shows the same radio path between my location in western Washington State and

Afghanistan, in terms of received signal strength in S units. If an opening were to occur, on those five to 10 days of the month, the expected signal strength of a 50-kW transmission would be about S4 at 0400 GMT, on about 9 MHz, or the 31-meter band.

In SNAPmax, the MUF is defined as the maximum operable frequency on 15 days of the month. The FOT (abbreviated from the French term "Frequence optime du travail," and is about 0.8 x MUF) is defined as likely to be operable on 27 days of the month, or 90 percent of the month. FOT is shown by a magenta background if a signal is likely to be present or by a narrow magenta stripe if no signal is predicted. The program completed this analysis rather quickly on my 400-MHz computer. The screen display is simple, yet functional.

I then chose the Circuit Quality analysis mode, picking the remote transmitter site as being located in the Netherlands Antilles (prefix PJ) and a transmitter power of 100 kW. **Figure 3** shows that a signal on 15 MHz would be good, while a signal around 9 MHz would be poor, between 0000 and 0200 GMT, with signals on the 15-MHz band becoming fair at 0200 and dying out by 0400 GMT.

I thought it might be interesting to see what bands might be open to various parts of the world. I used the default locations already set up by the program. **Figure 4** reveals that in the middle of October, on 11 MHz, South Africa has a 16-percent reliability status, while Japan, Australia, and Hawaii station signals (at 100 kW) would be good, at 0400 GMT. **Figure 5** shows another analysis, this time for 9 MHz. On this band, South Africa would not be heard, while some of the stateside locations would be open.

SNAPmax is flexible and easy to use. It presents the probable workability of an ionospheric radio path between any two sites, and ground wave to local sites. The analysis uses the angle of ray elevation to obtain realistic gain values for some typical antennas at those ray angles, and path attenuation values based on a number of sources. The software's author also includes auroral loss information and related algorithms. Both *F*-layer and *E*-layer paths are calculated, and this latest version includes some groundwave calculations as well.

SNAPmax uses a design concept familiar in cost estimating for engineering projects. It holds that any known trend should be included, with the basis that, while some inputs will be underestimated in their contribution to the final answer, others will similarly be overestimated. Thus, the sum of the estimates will be better than the individual parts.

SNAPmax is better suited for looking at current conditions (what the author calls, "nowcasting"). This is the prediction of the value of any given circuit today, based on today's best data. While you may select a date in the future (or the past), you only see one path's conditions, making it cumbersome for general forecasting of many paths over many frequencies and times, for instance.

I find the program useful in looking at the day ahead, if I am hunting for certain stations. I get a schedule of frequencies and times, then get the latest solar index information from my propagation page <http://prop.hfradio.org/>, then begin using the program to see what I might

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) means 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>.

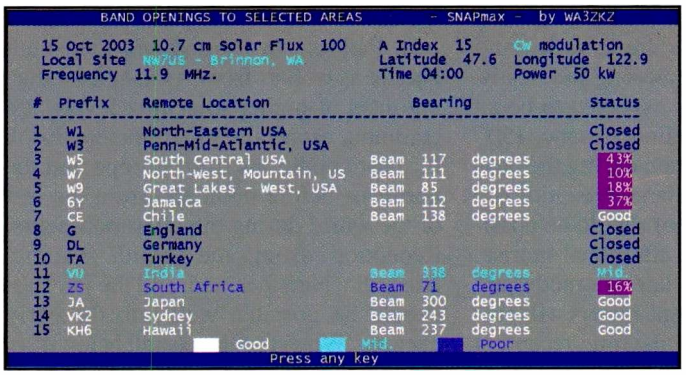

Figure 4. Band openings from various locations around the globe, on 11-MHz shortwave at 0400 GMT. The Pacific Region is wide open into the Pacific Northwest of the United States.

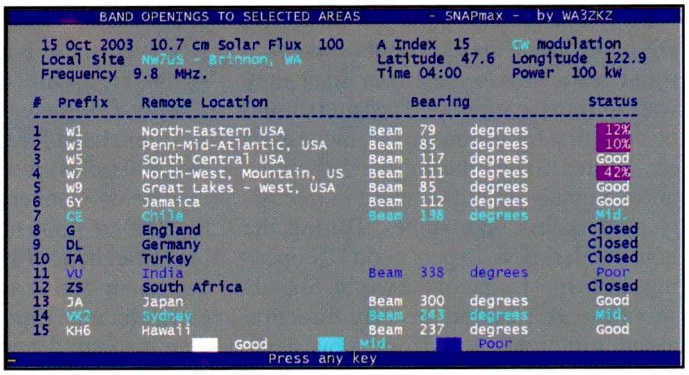

Figure 5. Band openings from the same locations, on 9 MHz at 0400 GMT, in Brinnon, Washington. Stateside broadcasts fare better at this hour on this band.

expect to hear that day. I usually choose 50 kW for the power, just to average out what most shortwave broadcasters might use for power. Of course, their antenna systems will have a lot more gain, so the signals might be much stronger than predicted by the software.

The best part of SNAPmax is the price. It is available free from several freeware sites, as well as from Tyndar Press, P.O. Box 236, Montchanin, Delaware 19710. To make it convenient for you, I have it available for download at my site, http://hfradio.org/softdown.html, under "Propagation Software." Don't forget to read the author's book, *The Friendly Ionosphere*, also available from Tyndar Press. The author, Crawford MacKeand, WA3ZKZ, may be contacted at tyndar @juno.com.

Solar Cycle 23 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-centimeter observed monthly mean solar flux of 129 for June 2003, compared to 149 for June 2001. This is up from May's 116. The 12-month smoothed 10.7-centimeter flux centered on December 2002 is 151, down from the 194 from December 2001. This is down several points from November 2002.

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports an observed monthly mean sunspot number of 77 for June 2003, compared with 89 for June 2002. This is up, however, from May's 55. The 12-month running smoothed sunspot number centered on December 2002 is 82, compared to 115 for December 2001, and only a few points down from November. The sunspot low for June 2003 was 38 on June 2. The sunspot high of 116 occurred on June 11.

The observed monthly mean geomagnetic Ap index for June 2003 is 24, considerably higher than the Ap of 11 for June 2002. The 12-month smoothed Ap index centered on December 2002 is 17; up from December 2001's smoothed Ap of 12.

A smoothed sunspot level of 51 and a 10.7-centimeter solar flux of about 106 are predicted for September 2003. The Ap index will rise a bit this month and through October, before slowly decreasing through the winter season. Overall, though, I predict a slow decline of the Ap until the cycle minimum.

HF Propagation

A change in propagation conditions in the northern hemisphere can be observed as we move away from the long sunlit days of summer into the longer hours of winter's darkness. However, the change in the length of daily darkness is not the only influence on the propagation of radio waves through the atmosphere. The amount and strength of radiation arriving and passing through our atmosphere varies from season to season, as well as from the solar cycle minimum to the solar cycle maximum.

During the northern hemisphere's winter months, the earth is closer to the sun than during any other time of its orbit. This makes the daytime ionization more intense than that of summer daytimes. During the longer winter hours of darkness, the ionosphere has more time to lose its electrical charge. These conditions cause a wide daily variation in the maximum frequency that can be refracted by the wintertime ionosphere. Many radio enthusiasts celebrate the arrival of the winter shortwave season for these reasons.

Signals below 120 meters are improving, with nighttime paths growing larger in the northern hemisphere. Seasonal static, which makes it difficult to hear weak DX signals, is starting to decrease as we move into winter. Expect a few DX openings during the hours of darkness and into the sunrise period. These openings will often be weak due to the relatively high signal absorption during the expected elevated geomagnetic storminess through the rest of this year. Look for openings from Europe and the south if you are listening in the eastern half of the United States, and from the south, the Far East, Australasia, and the South Pacific if you are in the western half of the country.

The best propagation aid is a set of sunrise and sunset curves, since DX signals tend to peak when it is local sunrise at the easterly end of the path in question. A good Internet Website featuring a grayline map display is found at http://www.fourmilab.to/earthview/. Follow the link, "map of the Earth" showing the day and night regions.

Seventy-five through 120 meters are coming alive in late October. Expect long-range DX on the low bands, starting close in right after sunset, and extending farther as the night develops. Signals here should peak from Europe and from a generally easterly direction around midnight. DX paths will move farther west through the night. By morning, openings from Asia should be common. For openings in a generally western direction, expect a peak just after sunrise. The band should remain open from the south throughout most of the night. Propagation in this band is quite similar to that expected on 41 meters, except that signals will be somewhat weaker on the average, noise levels will be a bit higher, and the period for band openings in a particular direction will be a bit shorter.

Forty-one meters should be the hottest DX band during the dark hours as the seasonal static levels are lower than they were during the summer. The band should be open first for European DX in the eastern United States during the late afternoon. Signals should increase in intensity as darkness approaches. During the hours of darkness, expect good DX openings from most areas of the world. Signals should peak from an easterly direction about midnight, and from a westerly direction just after sunrise. Excellent openings toward the south should be possible throughout most of the nighttime.

Paths on 31 through 19 meters are becoming ever more reliable between North America and Europe in the morning and between North America and Asia during the late afternoon hours. The strongest openings occur for a few hours after sunrise and during the sunset hours.

Thirty-one and 25 meters will often remain open into many areas late into the night and will open early in the morning, especially when part of the propagation path moves through sunlit regions. However, these bands are crowded and signals are usually very strong and steady. Twenty-five meters is expected to be an excellent band for medium distance (500 to 1,500 miles) reception during the daylight hours. Longer distance reception (up to 2,000 to 3,000 miles) should be possible for an hour or two after local sunrise, and again during the late afternoon and early evening. Thirty-one meters will provide medium distance daytime reception ranging between 400 and 1,200 miles.

Twenty-two through 19 meters compete with 16 for the best daytime DX band during October. They will open for DX just before sunrise and should remain open from all directions through out the day, with a peak in the afternoon. Nighttime conditions will favor openings from the south and tropical areas. Since the southern hemisphere has long daylight hours, DX paths on these bands from stations in the south will be common.

Sixteen through 13 meters will be open reliably during most days through October when flux levels reach above 120. Paths from Europe and the South Pacific as well as from Asia, at least during days of higher solar flux levels, are common, especially on 16 meters. Look for best conditions from Europe and the northeast before noon and from the rest of the world during the afternoon hours. Reception from the South Pacific, Australia, New Zealand, and the Far East should be possible well into the early evening. When flux levels fall below 120, though, these openings may be short.

Aurora is still a strong possibility during October and somewhat in November, both due to the seasonal increase in geomagnetic storminess, and the typical second peak found in a declining solar cycle. Those who are interested in long-range DX of VHF signals might be able to catch a few auroral openings these two months.

VHF Conditions

Conditions during October should start to become exciting, with a few possible F_2 openings in a north-south direction (United States into the Caribbean or Central America, and Western Europe into parts of Africa). Moderate levels of trans-equatorial propagation (TE) where stations in the southern states and parts of the Caribbean will be able to work into the northern areas of South America during the late afternoon are possible. During peak years of a solar cycle, October is one of the best months for TE activity, especially later in the month. Since we are in the middle of the decline from the current solar cycle's peak, these openings will be rarer than previous years, but some exciting opening might occur.

Sporadic-*E* (*Es*) activity is sparse during October in the northern temperate zone (where much of the United States is located). If an *Es* opening should occur and link with a TE or F_2 opening toward the south, expect a possible opening into Argentina, or even possibly into Australia and the South Pacific.

There is some possibility of extended tropospheric conditions during October because of the changing weather patterns. Higher VHF is the best frequency range to watch for this.

Let's Hear From You

Please write me an e-mail or drop a letter. I look forward to hearing from you. Enjoy the many signals coming your way this month. Until next month, 73. ■

Tuning In *(from page 4)*

committee, their almost instant thought is to require it only for those who wish to use the code below 30 MHz. One fellow even compared our current testing scheme to requiring model airplane enthusiasts to take a pilot's exam. Another spoke of requiring golfers to get licensed only after completing a course in aerodynamics and the History of Golf.

Personally, I have a problem with the age-old "it separates the men (or women) from the boys (or girls)" code justification. You've heard it, haven't you? It goes something like this, "You know, Old Man [perhaps that's part of the problem, right out of our own mouths] seems to me if these kids are serious about getting on HF they'll study and pass the code exam."

It's 2003, folks! And while there are countless operators who really do nothing on the radio except CW, there are countless others that do nothing except packet, sideband voice, one of the many *new* digital modes, contesting, nets, and a whole lot more.

I really don't think we'd be insulting those hams that have gone before us if the code requirement were eliminated completely. There's still the written portion. (And, please, don't say that once the code is eliminated it won't be long before they'll completely do away with testing). Hogwash. Even my cat knows that's phooey and so much eyewash double-speak meaning, "I got mine the hard way, so should you."

Once he was licensed for the road, Great-grandpa *had* to crank-start his car. It was either that or walk to the store. I'll bet there were quite a few choice words on a cold, wintry morning, don't you think? You know, if given the choice between turning an ignition key or cranking the beast, what do you think he would have preferred?

Fact is, if we're going to be totally honest, for *most* of us (based on what I hear from experienced hams—and even some *former* hams) trudging through the code-learning process for weeks and months was no picnic and didn't make us better operators when we finally got on HF. Just listen today. Those aren't No-Coders down there.

So, the old guard will likely continue to talk up the code here in America until the last person out shuts the door, turns off the power, and puts the proverbial key in the drawer. You know, I'll bet Great-grandpa would have loved using these new digital modes. ■

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loose connection

radio communications humor

by Bill Price, N3AVY, chrodoc@earthlink.net

Ratman Is In Trouble! Where's The Rat Signal?

Talk about your "communication humor." Today I was on a Rat Rescue mission (yes, really) where I drive a rat (a domesticated, tame, friendly rat) from a foster home or shelter to a new adoptive owner who lives far away and can't pick up the rat from the shelter.

I guess this needs some explanation: I have two pet rats and like them very much. In fact, I am of the opinion that *everyone* should have at least two pet rats (they get lonely if they don't have a companion), hence my volunteering for chauffeur duty and my membership on two pet-rat "lists" on the Internet.

So...I am to drive Benny, a lovely tan and white male, to his new home about 100 miles south of my own home. I picked up Benny on the way home from work—from his foster home—and kept him with me overnight, with the intention of making the trip on Saturday morning. Do you remember reading something about the best-laid plans of rats and men?

My car broke. Pinhole leak in a radiator hose. Where did it squirt? *Directly* onto the distributor. Steaming and sputtering before I was a half-mile from home, the Ratmobile and I made it back without too much fuss.

Now, what we had was a failure to communicate, Bennie's new mom and I. Our only communication so far was via e-mail, so I quickly e-mailed her and told her of the situation. She was near the computer, got the message, and everything was fine.

Being a ham and a guy, I am both a cheapskate and a hoarder. A year ago, I'd have said "packrat," but now I avoid derogatory phrases about my rodential friends. I still have several bottles of typewriter platen cleaner, which softens and takes the "dead" layer off most any rubber product, including my leaky radiator hose. Oh, did I mention that there are two other cars in our driveway, and that neither of them run either?

I clean the hose by washing with dishwashing liquid and hot water, inside and out, then with an evil chemical that probably caused the hole in the ozone layer over Antarctica. Then the typewriter-platen cleaner.

After that, a quick squirt of RTV (room-temperature-vulcanizing) silicone rubber sealant, and a "bandage" of gaffer tape, something that TV crews and rock-band roadies have known about for years and way better than traditional duct tape. Normally, I'd have followed this with a couple bands of nylon-cable ties, but alas, all of the tool bags in my car had their supplies of cable-ties depleted. There was not one in the car, or the house, or the neighborhood. I actually tied the bandage in place with two brand new shoelaces, which I found in one of my many junk drawers.

So the patch holds. My bandage is a medical success, though every screw and tool I own has fallen down into the abyss of an engine compartment and can neither be found nor retrieved. But the repair holds pressure. I pause for a cold drink, head to the computer (this very one), and e-mail Benny's new mom that the repairs have been made and I'm about to begin my journey. She is elated. Rat people get elated over the thought of getting a new rat. Yes, we have lives, but they're just a bit different from yours.

We exchange cell phone numbers. She is near a major city, I live in Cowfield County and have no cell service where I live, or for the first 10 miles of my daily commute to work. I am "served," if you'd care to call it that, by a company that has just registered a small part of their phone as a "trademark." No, I'm not saying which one.

I begin my drive with no phone service. Benny doesn't like riding in his makeshift transport cage and would prefer to be out. I have all the windows open and I'm a bit worried about Benny, because he might climb out a window. I give in anyway and put him on my shoulder. He cuddles (yes, pet rats *cuddle*!) against my neck and stays there, circling from the right side to the left side every 20 minutes or so. He clings safely to me for the entire trip, his short fur blowing in the 55 mph (and not a mile over) breeze.

I hear a familiar beep and note that my phone indicates that I have entered an area where I have phone service. The little lines next to the antenna are not there. This tells me I have the absolute minimum phone service, which gives me about one in every 10 words that Benny's mom says, and gives her the same from my conversation. We are disconnected when I lose even my minimal service. She has a good cell phone company. I have "Hitormiss Wireless." A CB radio would have done far better. A 2-meter ham transceiver with or without phone patch capability. Two cans and a string.

We call and call each other. My carrier charges me a minute of usage for every fraction of a minute (or even a fraction of a second) and every call is a minimum of one minute's usage. Neither of us knows where the other is. I don't know Benny's new address, as we don't put such things on the Internet, and as far as our cell phone communications, I may never know where he'll live.

I yield. I give up. Uncle. Don't pull my fingernails out, I'll tell you where the guns are buried. Do you know that pay phones cost 50 cents in these here parts? For a 10-cent phone call. I thought that when I got a cell phone, I'd never have to drop a dime again. I was right. It's two quarters now.

Benny's mom is surprised at the clear connection. "Sounds like you're on a regular phone. Oh." She knows the place whose pay phone I'm using. She and the family will meet me there, and they do. Benny is a hit and I hate to see him go. Just another day in the life of Ratman.

Tycoons and such can use their cell phones in major markets, but when I'm driving to East Armpit, I'm glad they still have pay phones. ■

Solution to Puzzle Corner on page 61

C	A	B	■	C	A	R	I	D	■	U	F	B
O	T	R	■	A	R	E	N	A	■	N	E	E
I	T	O	■	P	A	N	T	O	M	I	M	E
L	O	C	A	L	■	T	E	L	S	T	A	R
■	■	■	C	U	E	S	■	R	P	I	■	■
P	L	O	T	T	E	R	■	U	N	T	I	E
K	O	L	O	■	A	B	V	■	I	T	F	S
G	N	I	G	A	■	L	E	O	T	A	R	D
■	■	■	I	N	S	■	C	F	C	W	■	■
A	N	E	R	O	I	D	■	F	A	L	S	E
D	I	N	O	I	T	A	T	S	■	L	A	X
E	M	U	■	N	A	N	C	E	■	I	V	A
E	H	F	■	T	R	E	A	T	■	M	E	M

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