

45635

POPULAR COMMUNICATIONS

MAY 2005

Computers And Broadcasting: Inside Radio's High-Tech Stations!

- **Mystery Of The Last Zeppelin Raid**
- **Scanning For Beginners —
What You Do And Don't Need**



Tech Showcase: Clore Automotive's Jump-N-Carry power supply with an Alinco DJ-G5T transceiver. Pg. 16.

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144/430 MHz* Dual-Band
Submersible FM Transceiver

VX-6R

*222 MHz band @ 1.5 W included.

Actual Size

Submersible and Rugged

Magnesium rugged, feature packed top of the line



VX-7R/RB

50/144/430 MHz
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DUAL RECEIVE

5 W

Field-ready, compact, and easy to use



VX-6R

144/430 MHz
FM DUAL BAND

EAI
5 W

Ultra-Rugged

Rugged Dual-Band HT with EAI



FT-60R

144/430 MHz
FM DUAL BAND

EAI
5 W

Ultra Compact

Tiny yet tough, and feature-packed



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1.5 W

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

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ICOM



R10 The R10 is a wideband communications receiver you can hold in your hand. It covers .5 to 1300 MHz (less cellular) with 1000 alpha memories, bandscope and SSB/CW. It comes with four AA NiCad cells, charger, belt clip, strap and flex antenna. Visit our website for more photos and info.

Call for price.



R5 The R5 covers 150 kHz to 1309.995 MHz (less cellular gaps) in: AM, FM Narrow and FM wide. 1200 memories store: frequency, mode, step size, duplex direction and offset, CTCSS tone, tone squelch and skip settings. Other features include: attenuator, LCD lamp, AM ferrite bar antenna, auto power off, CTCSS decode, weather function and battery save. **Call for price.**



R3 The R3 tunes 500 kHz to 2450 MHz (less cellular) in AM, FM-W, FM-N and TV via a 2 inch **TFT color TV screen**. You can receive regular TV [NTSC], and you may be able to see certain video feeds and ham radio Fast Scan TV. A second mono LCD display that can be used to conserve battery life. You get: 450 alpha memories, 4-step attenuator, bandscope, video and audio outputs and auto power-off. Comes with Li-Ion battery, charger, belt clip and BNC antenna. **Call**



R20 The new R20 covers an incredible 150 kHz to 3304.999 MHz (less cellular) with 1250 alphanumeric memories, bandscope and SSB/CW. It has: two VFOs, dual watch, voice scan control, NB, large two line LCD and CTCSS/DTCS/DTMF. A built-in IC **audio recorder** can record 1, 2 or 4 hours of reception! This radio comes with charger, Li-ion battery, belt clip and wrist strap. **More info on website. Call**

R75 ✓ **FREE** from ICOM: UT-106 DSP Notch/NR Option Normally \$139.95, now **free** with R75 purchase.

✓ **FREE** from Universal Radio with your R75: "Shortwave Listening Guidebook" (\$19.95 value)



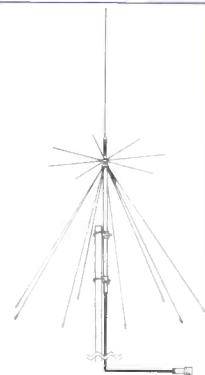
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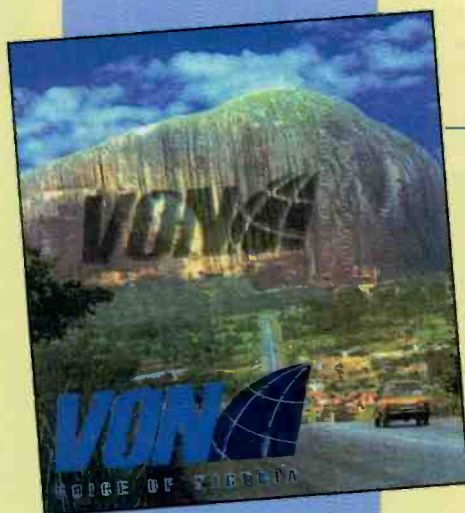
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On The Cover

Aimee Dio rocks the WHTG, 106.3 and WBBO, 98.5 airwaves in New Jersey. Gone are the turntables, cart machines and relics of the past; replaced with high-tech computer-controlled systems giving on-air personalities much more flexibility with what goes on the air, and when. Be sure to read this month's "Tuning In" by G.T. Tyson, and *Broadcast Technology* by Dave Schmidt for a special look inside a former station, and the new face of radio broadcasting, thanks to modern technology. (Photo by Harold Ort, N2RLL, Editor)



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There Used To Be A Radio Station Here

Editor's Note—Once again we've received an excellent, thought-provoking item that's more of an opinion piece than a feature. So this month I'll turn over the keyboard to G.T. Tyson for this "electronic postmortem" as he calls it. It's a little long, but well worth your reading time.

There is something about a recently vacated radio station building that's kind of creepy. As I write this, it is 6:30 a.m. on a Saturday and I am in the former studios of a locally popular AM and FM radio station. Rules about proprietary company information prohibit me from specifically identifying the station or its location, but most readers would recognize it if I did. The FM side is now operating from the company's new studio cluster building in another town. All of its stations will be emanating from there in a few more weeks. The building is scheduled for demolition shortly thereafter.

The AM station is the only thing still in the building because the transmitter is here, physically built into the framework of the building. Everything else on the FM side has been disconnected and removed. The control boards are gone, wires are hanging out, furniture and desks are gone, the black foam acoustic insulation is hanging in shreds, and the whole place is in bleak disarray. The computer I'm writing this on is the only one still active.

There is a certain poignancy, a weird sad vibe, about it. This building was constructed back in the days when radio stations could be identified by their architecture. Old pictures show it was built with bright colors with signage that boasted its 5000 watts. Three majestic towers in the swamp behind the studios beamed the signal to the listeners. There was a DJ booth on the roof where the announcers could wave at the listeners, who would enthusiastically honk their horns in reply. The station was one of the central fixtures of the city, broadcasting city council meetings, church services, and high school football games, and it had a direct hotline to the local newspaper for breaking news. This was back when AM stations actually had listeners, before everything migrated to FM in the 1970s and AM radio became the broadcast equivalent of the eight-track tape.

Times and technology have changed in major ways. For the last several years, this station has done no live local programming aside from a Sunday morning gospel music program. Everything else on its air is syndicated national programming from a satellite. The station does occasionally hit the lower reaches of the ratings, but this is mostly due to the loud rightwing talkshows in the daytime, which are also "satellited in." Due to an ongoing problem with the circuitry in one of the towers, the station has to drop to 250 watts at night, instead of its 1000 watts when everything is working right. This gives it a useful coverage of maybe five miles into the nearby river. Fixing the problem is not a high priority with the company. The engineers are pulling 16-hour days getting everything running in the new stu-

dio building and simply don't have time for it. One guy comes in every now and then to program the computer that switches between satellite feeds. The computer and the transmitter are the only things still active in the building.

When you think about it, the reasons for the mass audience shift from AM to FM are obvious. FM stations sound the same 24/7 and don't disappear at sundown. Most FM stations are stereo. Their signals don't get all crackly on cloudy days. FM has a good beat and you can dance to it. When digital radio settles on a standard, one station will be able to broadcast multiple formats on the same frequency...which brings me back to this AM station. They will be moving it shortly, too. It will likely be relegated to a space in back of the new building with similar computers running the company's other AM stations. All of the attention and promotional efforts will be focused on the FM stations, which is understandable because that's where the money is. Just set up the AMs to simply switch between satellite feeds at the correct time and insert the occasional local spot. Transmitter control will be done remotely over phone lines. The station's engineers will set up an inconspicuous "doghouse" at the former site to contain the transmitter.

When all that is in place, this building will be quickly razed. The "FOR SALE" sign is already up on the property. The only thing remaining will be the three towers in the swamp out back. I'm not quite sure how to explain it in words, but this whole thing gives me a weird sense of loss somehow. An architectural tradition is dying right before our eyes. This is one of two local structures I can think of that specifically LOOKS like a radio station. The other one, the green building on West 5th Street in Greenville, South Carolina, out near the hospital, is the former studio of WGTC, Greenville's first radio station way back in the day when tobacco ruled (the call letters stood for World's Greatest Tobacco Capitol).

Before FM became dominant, radio stations held a place of importance in the community second only to the courthouse or church. They advertised their function by the style of the building, with curved glass brick walls and round windows, a look termed "retro-techno" by today's stylemeisters. You knew something electrical and high tech was going on in there. The station equipment looked like Dr. Frankenstein's stereo, with large meters and no-nonsense knobs that could only be touched by an FCC-licensed professional engineer. (If you want to see a good example of this style and ambience, rent "American Graffiti" and watch closely when Richard Dreyfus's character seeks out Wolfman Jack in the little station outside town). They simply don't build them like that any more.

Most stations nowadays are tucked away in visually unexciting shopping malls or nondescript office buildings, indistinguishable from any other cubicle farm. The functions that formerly took up entire rooms have been reduced to simple

(Continued on page 78)

OUR READERS SPEAK OUT

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

A Shame

Dear Editor:

Regarding your March article, "Speaking With One Voice," I say it's a shame and a disgrace American soldiers, sailors, marines and airmen have to buy their own personal CB radios to keep themselves in contact during convoys and deployments.

John Silvers,
Maryland

Bob: Pointing To A Need

Dear Editor:

Thank you for your article on soldiers needing CB radios. My father was an Air Force Medical Supply officer for 34 years and took his job very seriously. Later, as an Air Force medic myself, I learned that if people don't have what they need people die.

Your article wasn't about Rumsfeld. It was about our troops in harm's way needing radios. Some might call you adversarial or anti-government. I think you're just telling the truth and pointing out a need. You are showing the relevance of radio, which most people overlook. What a service project for radio clubs across the country. What a golden PR opportunity for radio manufacturers.

Bob Sturtevant, KD7KTS

A Rabid Rag?

Dear Editor:

Popular Communications appears to be turning into just another rabid rag singing the blue-state blues. The March 2005 edition devoted a fourth of the page to the Honorable W.J. Tauzin's fundraising. What's that got to do with radio, Homeland Security-Computers & Radio-Family & Hobby Comms? Take a look at the sub-headline on page 8: "Ordinary Americans Doing Donald Rumsfeld's Job: Helping Soldiers in Iraq get CB Radios to Stay Safe." This isn't news. This is blatant political whining.

John Gentry, AB0VA
Colorado Springs, CO

Dear John:

Well, you're certainly all fired up. And that's a good thing, as they say. But unfortunately you missed the point in your attempt to do what so many folks today do: diminish the problem of soldiers not having radios, proper

equipment, etc. First, Tauzin's track record with the radio community shows a blatant disregard for the average guy like you and me. Remember the ECPA should be your battle cry. But how easy it is to forget. The fact that Tauzin continues in the same vain is "news" — admittedly not first-page radio news, but news, regardless.

Perhaps you said it best without realizing what you were saying when you said about our title "Helping Soldiers In Iraq Get CB Radios To Stay Safe," with the words, "This isn't news." You're right, John, it's not news — not anymore. News flash for you, though: What happens in the Hallowed Halls of the Pentagon and on paper at command level doesn't always work in practice. The boots on the ground in combat must do what's best for them at that moment in time, and if that means using "unauthorized" radios they'll do it. Granted, it might not be the best solution, but when faced with comms or no comms, REAL troops — not paper pushers and policy makers — will do what they need to do.

I'm sorry, but not for printing an article that many folks find disturbing, but that there are still people that aren't directing their anger where it should be in order to get the authorized military radios to our troops. All it takes is a phone call or letter to your elected representatives; that is, if you think it's worth the call.

Something Is Wrong

Dear Editor:

I read with great interest your article in the March *Pop'Comm* and have also heard other reports of our soldiers in Iraq and Afghanistan not having radios for their convoys. In many cases they also don't have other basic supplies. I personally find this extremely disturbing. We're paying our leaders, and trusting them with our soldiers' lives and they deserve more than a public relations spin from those same leaders talking about how using "unauthorized" radios allows the enemy to find our troops easier than if they were using encrypted "official" equipment. My question is: What are our troops supposed to do while they wait for the government to get this equipment to them — use smoke signals and tin cans with string?

Jerry Stevens,
Houston, TX

Dear Jerry:

Thanks for putting it in terms that other folks can understand. Well done!

POPULAR COMMUNICATIONS

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Offices: 25 Newbridge Road, Hicksville, NY 11801. Telephone (516) 681-2922. FAX (516) 681-2926. Web Site: <http://www.popular-communications.com/> Popular Communications (ISSN: 0733-3315) is published monthly by CQ Communications, Inc. Periodical class postage paid at Hicksville, NY and additional offices. Subscription prices (payable in U.S. dollars): Domestic—one year \$28.95, two years \$51.95, three years \$74.95. Canada/Mexico—one year \$38.95, two years \$71.95, three years \$104.95. Foreign Air Post—one year \$48.95, two years \$91.95, three years \$134.95.

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Printed in the United States of America.

Postmaster: Please send change of address to Popular Communications, 25 Newbridge Road, Hicksville, NY 11801.

News, Trends, And Short Takes

"This Week In Amateur Radio International" To Air On SW Station WBCQ

"This Week in Amateur Radio," North America's premier amateur radio newsmagazine of the air, announced that a new version of its weekly news service will air on Becker Broadcast Systems' shortwave station WBCQ. Becker Broadcast Systems, based in Monticello, Maine, will air the program each Saturday afternoon at 4 p.m. eastern, or 21:00 GMT, on its main transmitter on 7.415 MHz. WBCQ, The Planet, broadcasts 50,000 watts, and serves North, Central, and South America, and the Caribbean.

The new program, tentatively called "TWIARi—This Week in Amateur Radio International," will cover all the latest ham radio news as well as special features, such as "Leo Laportes Technology News," "The Ancient Amateur Archives with Bill Continelli," W2XOY, "The Random Access File with Bill Baran, N2FNH," and many others.

"This Week in Amateur Radio," based in Averill Park, New York, now in its 12th year of service to the ham radio community, is heard in over 120 cities across the United States and Canada on local ham radio repeaters. The news service is produced by volunteers from all across the United States.

WBCQ's Dr. Scott Becker, KB5MDH, and radio host Alan Weiner, have joined station's on-air talent as news anchor and segment producers. WBCQ is now one more way everyone can access the weekly news and information service. Other methods include Internet distribution via the program's Website (<http://www.twiar.org>), RSS/MP3 podcast, and via the WOKIE Satellite Radio Network.

Museum Of Broadcast Communications Receives \$500,000 Donation From Disney

DisneyHand, worldwide outreach for The Walt Disney Company, WLS-Channel 7, WLS-AM (890), WZZN-FM (94.7), WMVP-AM (1000) and WRDZ-AM (1300), has committed \$500,000 in cash and public service airtime to the Museum of Broadcast Communications (MBC). The donation will support the development of the new Museum of Broadcast Communications in downtown Chicago, scheduled to open in 2006. Disney's support will ensure that the new MBC is a cultural destination and educational resource for Chicago's students. The 70,000-square-foot facility will enable the MBC to accommodate an increased number of school groups and extend its educational outreach. The new facility will provide a range of educational spaces that are critical to the MBA's mission. These spaces include a media-equipped education center for orientation and teaching, a 500-seat center for screenings and lectures, interactive exhibits, and working television and radio studios.

"Our expansion plans will create a dynamic gateway for students throughout Chicago and the region to learn about how television and radio have influenced their lives and explore a

variety of careers in broadcasting," said MBC President Bruce DuMont. "Visiting students will be able to participate in guided exhibition tours and hands-on workshops in the television and radio studios and access the Museum's media collection for research and study," DuMont added. Emily Barr, president and general manager of WLS-Channel 7, said, "The Museum of Broadcast Communications (MBC) is a wonderful source of broadcast history right here in Chicago. We are delighted to help kick start this new chapter in the Museum's history."

The DisneyHand donation follows a recent \$1 million donation from Paul and Angel Harvey, a \$250,000 grant from The Oprah Winfrey Foundation, and a \$250,000 grant from the Polk Bros. Foundation. The DisneyHand grant brings the total raised to \$10.8 million of a \$20 million campaign goal.

DisneyHand, worldwide outreach for The Walt Disney Company, is dedicated to making the dreams of families and children a reality through public service initiatives, community outreach, and volunteerism in the areas of compassion, learning, the arts, and the environment. For more information on DisneyHand, please visit <http://www.disneyhand.com>. The Museum of Broadcast Communications is one of only three broadcast museums in the United States. Currently, it is building a new home in downtown Chicago.

New Search Engine Launched For Radio/TV Programming

A new Internet search engine, which allows the user to search news, sports, and entertainment programming on TV, has been launched in beta form. Blinkx TV has indexed the TV and radio programs from 20 international broadcasters, including the BBC, ITN, Sky News, National Public Radio, and the Voice of America. These programs are fully searchable, and because Blinkx captures and indexes the entire video stream, users can get straight to the exact clip they want. Blinkx TV is free to use at <http://www.blinkx.tv>.

APCO International Conducts Innovative Test

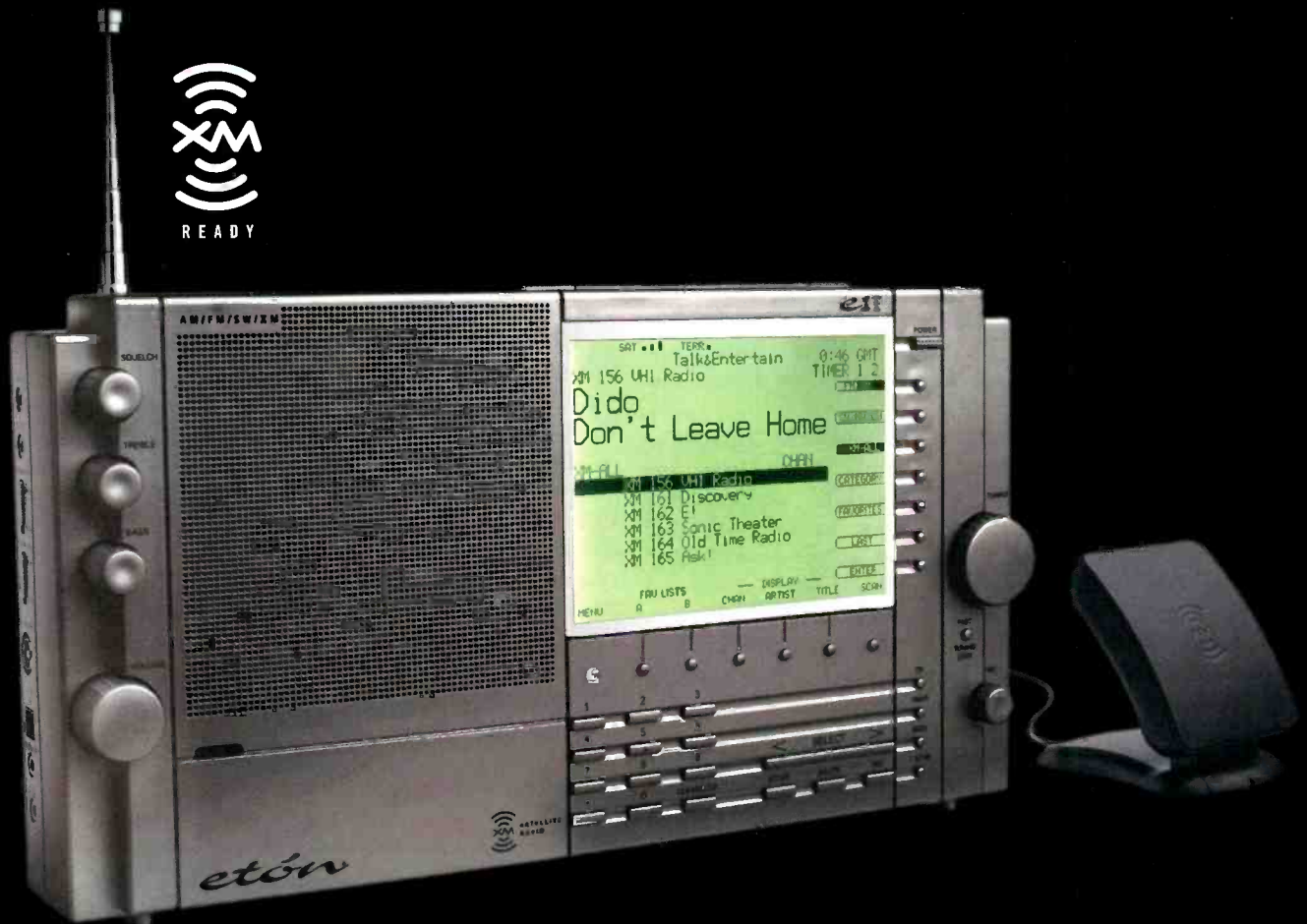
The Association of Public-Safety Communications Officials (APCO) International and The Consultant Registry, in collaboration with the Georgia Public Safety Training Center (GPSTC), has conducted an innovative test related to how background sounds, which are important to 9-1-1 call-takers, are transmitted over a Voice over Internet Protocol (VoIP) system.

VoIP is a new, lower-priced method of making business and residential telephone calls that is quickly gaining popularity in the United States and elsewhere. VoIP does not handle 9-1-1 calls in the same way that traditional telephony does and, therefore, represents potential problems for dealing with calls for assistance. The test was conducted in an office and included

(Continued on page 77)

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E10

AM/FM/Shortwave

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- Memory page customization
- Manual & auto scan
- Direct keypad frequency entry, ATS
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- Sleep, timer, snooze, and functions

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Keeping Your Home Antennas Up!

What Goes Up Doesn't Have To Come Down—If You're Prepared

by Gordon West, WB6NOA

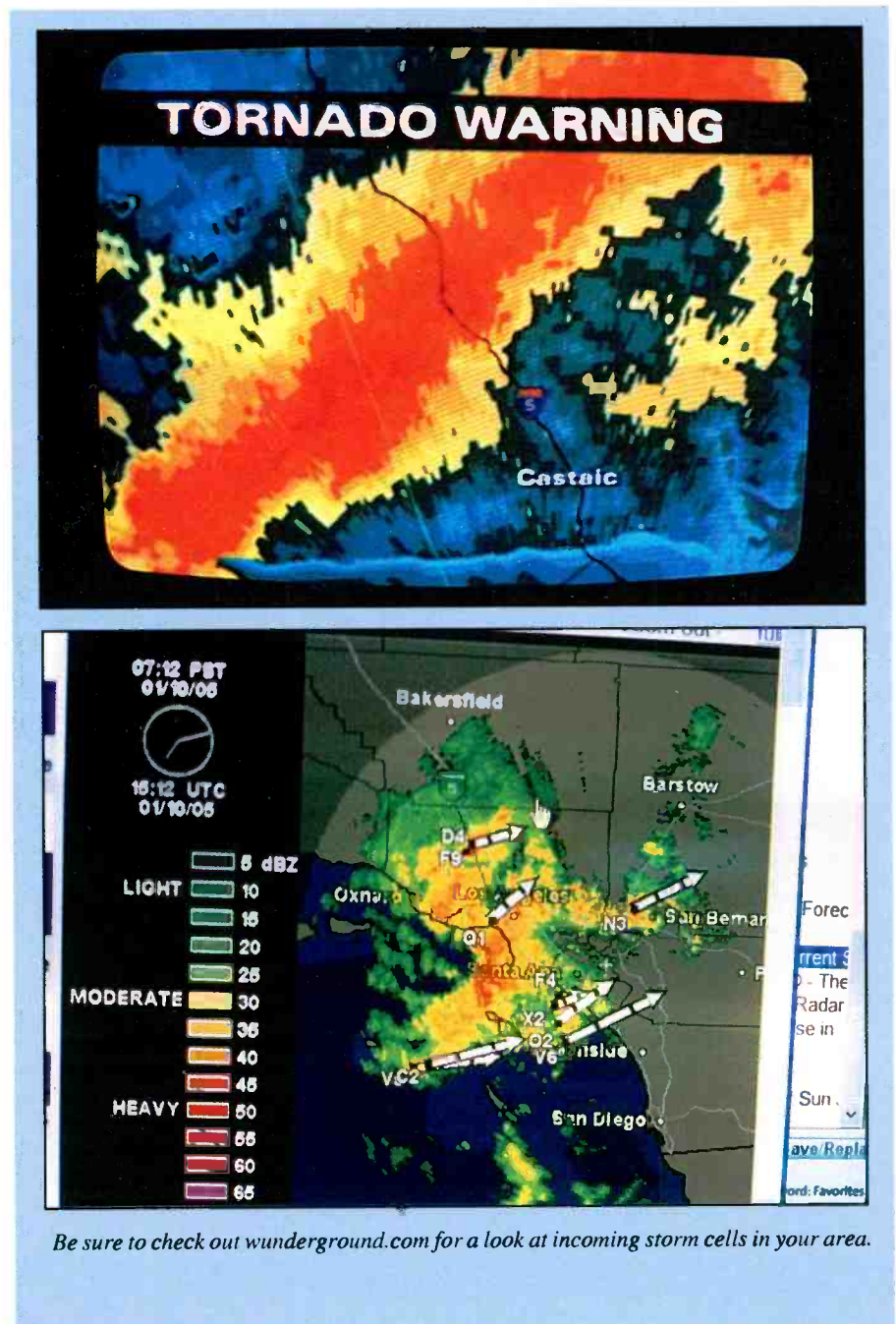
Recent Florida hurricanes took out thousands of radio operators' rooftop antennas. Hundreds of ground-mounted towers also came down. Midwest snowstorms and ice storms also wiped out many well-planted antenna systems. Even if the antennas didn't actually come down, many stations went off the air when water got into the coax. And here in Southern California, who would have thought a waterborne tornado would pay my roof a visit and strip it nearly clean of shingles and my aluminum? It happened to me, and it can happen to you!

In surveying the owners of the toppled antennas from coast to coast, I learned that many seasoned radio operators had many things in common that may have contributed to the tower or mast failure, and they also made some "discoveries" as to why their antennas were not performing as well as they should *before* the storm. Based on these findings and my own experiences, here are some tips to consider when putting up new antenna systems, or refurbishing what was left standing after the big blow.

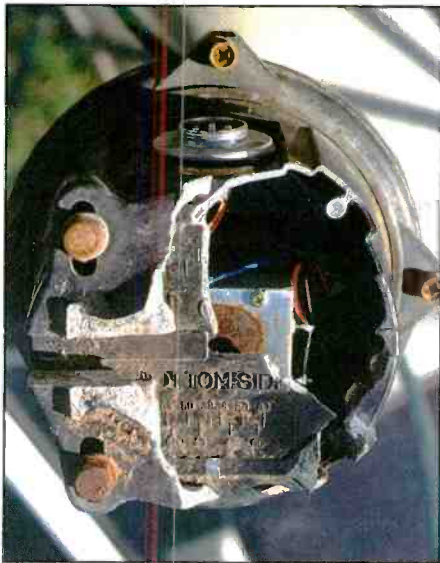
Freaky Weather!

The old adage, "If it didn't come down in the wind, your antenna system wasn't tall enough," was often heard on the airwaves in the aftermath of the nasty weather. In hurricanes, nearly everything in a wide path becomes damaged. Same thing is true with ice storms. But in tornados, you could lose everything on the roof, yet the house across the street remains unscathed.

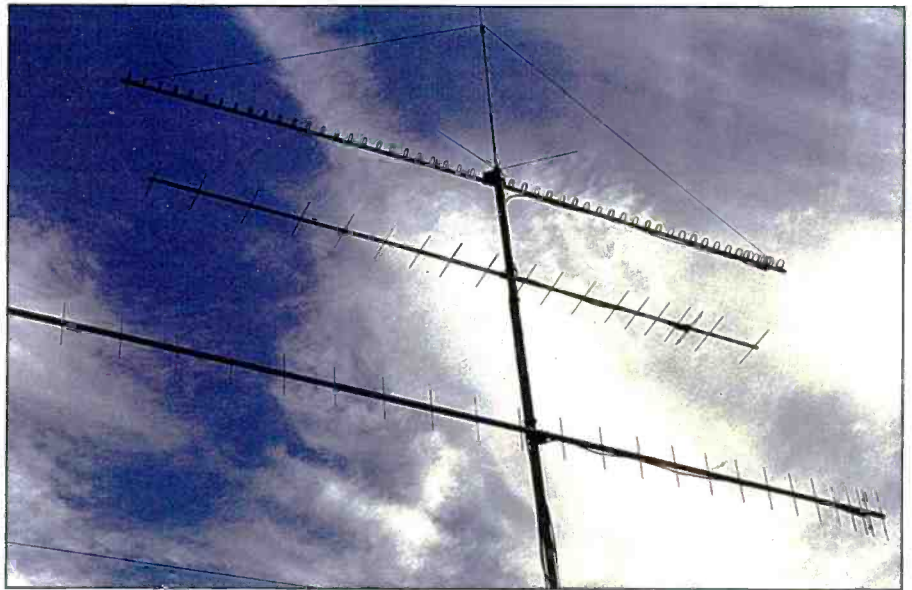
Good emergency communicators were back on the air *despite* their antenna losses. Lightweight dual-band and tri-band VHF/UHF antennas from Diamond and NCG Comet most likely survived if directly mounted to a vent pipe sticking



Be sure to check out wunderground.com for a look at incoming storm cells in your area.



The mast held up fine, but the rotator failed and this is the result.



Here's the antenna stack before the storm, and...

out of the roof. If these lightweight fiberglass antennas were on a mast, the mast may have failed, but the antenna still continued to perform. Both Comet and Diamond antenna companies reported little storm-damage to their lightweight, fiberglass base antennas.

Commercial-quality, single-band base antennas looked “shaggy” after the storms. Shakespeare Antenna Company tells me this is due to the ultraviolet breakdown of the antenna’s thin layer of fiberglass cloth and should not compromise the structural integrity of the inside copper elements, which are held securely by fiberglass. I solved my outside fiberglass shaggy-look with a thin coat of polyurethane. It looks nearly new.

If you were affected, was your PL-259 or N connector properly sealed up against the wrath of Mother Nature? Universal Radio Coax Seal is the perfect solution to seal out water and keep your exposed connections bright and shiny. It pulls off easily for inspection of the connector, which you should do periodically. Simply putting black electrical tape over outdoor PL-259s is not a solution as it begins to fail after about six months in the sun. The tape becomes brittle, and ultimately your connections will leak. Water inside a PL-259 may significantly attenuate scanner reception and could dramatically raise SWR on any transmit signal.

How's Your Base—Tower Base, That Is?

If you have a ground-mounted tower, now's the time to inspect the base. If the



...here it is afterward.

base has been covered with soil, your tower legs may be nearly non-existent. Failure of the legs at ground level may cause the tower to collapse under any amount of wind or ice loading. Microwave enthusiasts running loop Yagi antennas may find the individual loop elements damaged but the boom intact. These can be easily straightened out to nearly identical performance before the Yagi was blown down.

It's also time to check your crank-up tower cable, pulley, and eye-bolt attachment. If any of these components (responsible for keeping your tower cranked up) have rusted, it's time for an immediate replacement.

And speaking of rust, many radio enthusiasts inspecting their downed antenna systems were surprised to find rusty hardware and rusty “stainless steel” hose clamps. When purchasing new hardware, bring along a magnet and make sure the magnet *doesn't* attract anything metal, INCLUDING the hose clamp screw itself. I was disappointed to find a premium rotator impossible to remove because rusty nuts (that were shipped *with* the rotator clamp assembly) were frozen on the unrusted bolts. I should have checked the nuts before I put them out in the Southern California salt air. After piling all my aluminum up for my final autopsy, I regularly spotted nuts, bolts, and



Spring is a good time to check your coax runs.

screws rusted nearly beyond recognition. When assembling your new station, do *everything* you can to purchase non-rusting stainless steel hardware!

A Storm Survivor

And speaking of rotators, the physically heavy Hy-Gain Taitwister survived our Southern California F0 tornado without a fracture on the outside of the tower. The quarter-inch wall mast holding the twin weak-signal 2-meter beams made the big bend. Yet a significantly lighter

weight mast with *less* antenna wind-loading came crashing down when a significantly lighter weight aluminum housing rotator splintered.

“The clamps used in this rotator are an aluminum casting and are very strong, light in weight, and resistant to the effects of weather. However, the clamps do not have the ability to bend to the same degree as steel clamps might,” explains the “IMPORTANT NOTICE” that comes with this manufacturer’s rotator. If you are using an aluminum shell rotator, be careful not to over-tighten any hex-bolts



Brush on a clear coating of fiberglass repair resin to reseal your commercial antennas.



If your tower is in the ground, check for rust! This base fell apart in the storm.



If you use your home's fascia as a tower brace, it's best to reinforce it so it won't split like this one did!

Nobody wants a rusty nut, so be sure to check your clamps and hardware.



An imported beam didn't use stainless steel hardware.

to the point that they could inadvertently overstrain the housing and fracture in a gust of wind.

Keeping Your Elements Straight

If your antenna system is made up of aluminum elements, the inside elements should first be coated with an electrical joint compound to prevent anti-seizing. I use Penetrox. I found I could slip the inside treated aluminum elements out easily, even though the antenna had been up for 15 years in the salt air. But one element I *didn't* treat was hopelessly frozen. And, with a continuity tester, it was making and breaking contact as I flexed it back and forth. Frozen aluminum antenna elements don't necessarily mean an improved RF contact; many times, it's quite the opposite.

If you're assembling a new beam antenna with traps, make absolutely sure all trap holes are pointing straight *down* when the antenna is *up*. These drain holes are essential for keeping rainwater from standing inside the traps, ultimately weakening the aluminum. As for the black trap end protectors that keep out spiders and insects, I'm amazed that manufacturers can't come up with a better material that won't instantly crack in the UV rays and become worthless for keeping out the varmints.

Is your antenna tower or mast's upper portion supported by a fascia board? Don't expect that fascia board to stand up against the punishment of a hurricane or tornado. It will instantly splinter unless you have put a *second* board behind it to double the strength. Adding additional support *behind* your tower's

fascia board may improve your tower's chances of withstanding the big blow.

Final Comments

Finally, If you have plenty of antennas and towers, investigate your homeowner's personal property insurance. Will they be covered? If not, the American Radio Relay League offers specific antenna and tower insurance.

And no matter what, as an emergency communicator, have a couple of failsafe antenna back-ups to get you back on the air after the big blow or tornado strikes. Even though it may have taken down your hardware, we still have a job to fulfill by getting back on the air with whatever it takes to get the signal out there and help our communities, whether you're monitoring the airwaves or providing essential two-way comms!

And remember, if you're prepared and forewarned, you're in the best position to help others, so always have that NOAA All Hazards receiver programmed and operating, and check out the many online resources available, such as www.wunderground.com, to keep you warned about incoming weather. ■



Loop antennas can sometimes be straightened if you're patient with the process.

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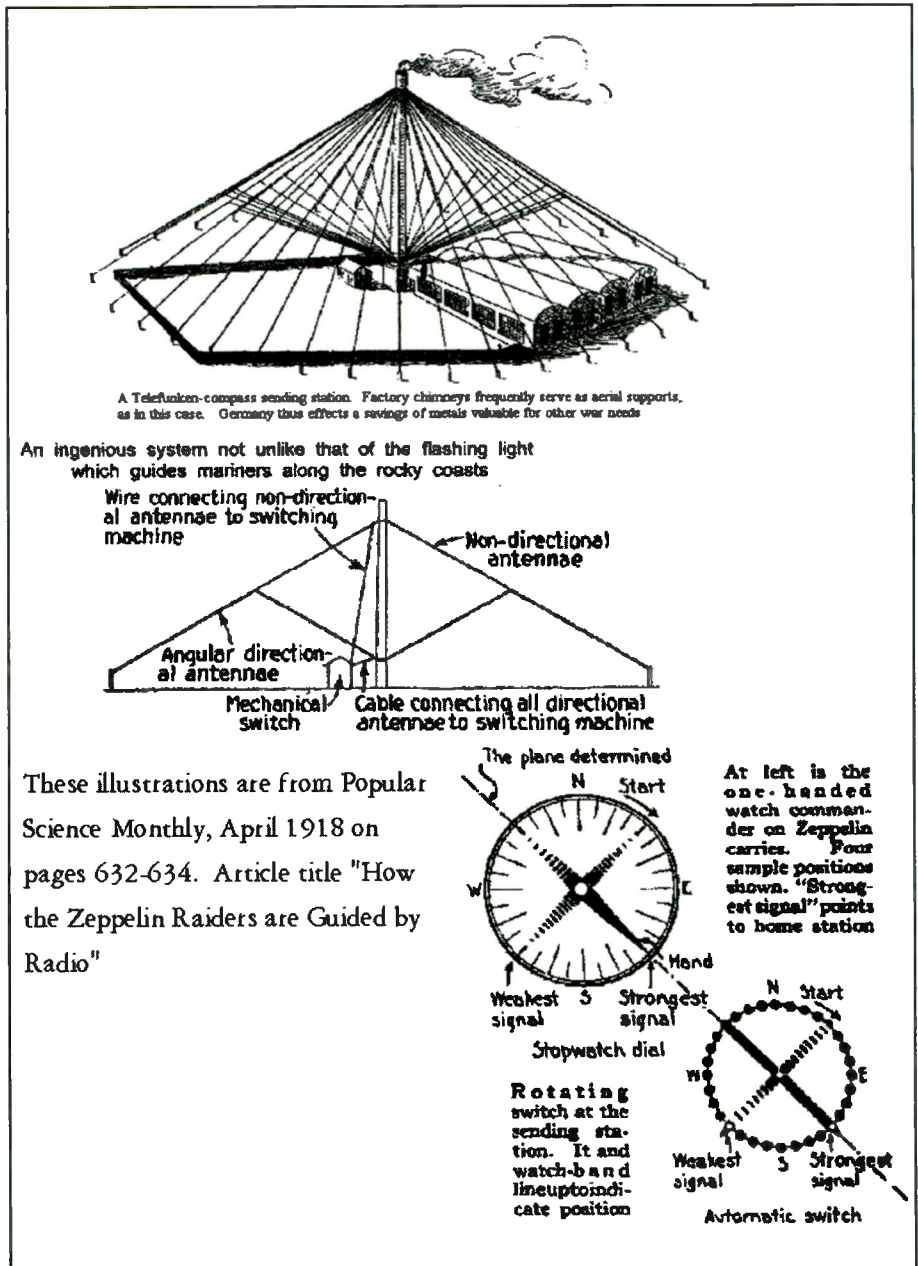
Once The Allies Understood German Codes, It Was All Over!

by R.B. Sturtevant, KD7KTS

As Germany entered World War I, its military was extremely confident because of their competitive nationalistic people and their supremacy in technology. Nowhere was this supremacy more evident than in their celebrated Zeppelins. The giant airships were the pride of all Germany. In fact, when Count Zeppelin ran out of funds for his invention, the German people came to his rescue with their Pfennigs and marks to help him build his wonderful flying machine. Their pride was justified. In the three years before the war, 37,250 passengers had been carried over 100,000 accident-free miles.

Even before the war broke out, military strategists were working on military applications for the Zeppelins. As early as August 1914, the German Navy was talking about bombing enemy capitals with the airships. Locations in Belgium and the city of Paris were bombed early in the war. At the beginning of the war, however, Zeppelins did not have sufficient power to reach London. That was to change.

Building larger gas bags and installing bigger engines was not really the entire answer, however. Zeppelins, because of their great size and lack of weight, are very susceptible to winds. In an airplane, if you know your compass bearing, speed, and how long you've been flying, you've got a pretty good idea of where you are. In a Zeppelin, however, if you have a 40-mile-an-hour cross wind, you'll be blown a long way off course and not even know it. Flying at night, through fog or storm, and even over water, Zeppelin navigators couldn't know with any degree of accuracy where they were. The huge overhead gas bag would block out the stars, and moving at up to 70 miles per hour made celestial navigation too difficult for any accuracy, anyway.



These illustrations are from Popular Science Monthly, April 1918 on pages 632-634. Article title "How the Zeppelin Raiders are Guided by Radio"

This illustration from a 1918 Popular Science Monthly shows how the Zeppelins were guided by radio.

Believing in the supremacy of technology, though, the Germans came up with an answer using another modern invention: radio navigation. Radio transmitter sites were built with a tall tower in the center. Thirty-two very long, slanted radio antennas were placed from the top of the tower to the ground. A mechanical switch controlled the antenna's signal. The switch would rotate around all 32 antennas, letting a single "dit" be transmitted from each antenna. At the beginning of the cycle (true north) the station would send out an ID signal and begin the rotation again. The Zeppelin navigator would tune his receiver to the correct frequency and wait for the correct ID, then listen for the loudest "dit" in the cycle. By timing the dits with a special 30-second stop watch, which he started as the ID was transmitted, he would listen to which of the 32 compass points was loudest. It would be closest to his bearing from the known transmitter location. Doing that twice with different stations, then seeing where the lines crossed on his map, would give him his current location.

Mixed Results

Beginning in January 1915, the Germans successfully bombed London almost every time they tried. Of 159 sorties, 139 Zeppelins successfully reached England. Bad weather and contrary winds, along with frozen gasoline in the engines, were among the reasons for mission failure. In time, the British did learn to shoot the monster airships down.

But the Zeppelins weren't able to hit high priority targets. To get away from airplanes with 2,000-foot ceiling limits, the Zeppelins flew as high as four and a half miles, which necessitated the crews having to work with oxygen masks on. Several died from faulty masks or freezing. Bombing, even from lower altitudes, was hardly an exact science in those days, and some raids dropped their bombs in open fields, rivers, or the sea. Nevertheless, in 1915 and 1916, the Zeppelins raided England 52 times, with 73 tons of bombs dropped, 857 people killed, and 2,058 injured. The raids also kept thousands of troops, hundreds of artillery pieces, airplanes, and ships close to England to protect the major cities and their approaches. But, actually, these were mere pinpricks if you consider that the German High Command wanted to hit the Bank of England as well as the Royal

Mint, thereby collapsing the British economy. The Royal Arsenal, which made all the artillery shells destined for France, was plainly marked on maps of London but was never bombed.

A Mystery...Or An Intelligence Coup?

One great mystery of the Zeppelin raids was what happened on the last one. On October 20, 1916, 11 Zeppelins sortied to raid London and southern England. It was to be the biggest raid on England yet. Up to 10,000 feet in altitude, winds were light, above that the winds were 40 miles an hour. Above 20,000 feet there was a full gale blowing. Though starting at a relative low altitude, the airships had to climb to avoid British airplanes, which were now very adept at shooting down Zeppelins. After dropping their bombs, four of the airships were blown over France and were shot down by French anti-aircraft artillery, Allied planes, or just plane crashed. One of the huge gas bags, which had lost its gondola and crew, was last seen floating over the Mediterranean with French planes in chase. At least that is what the British public was told.

In November 1919, the American magazine *Electrical Experimenter* quoted a press report from Berlin. In the report, one Gordon Stiles stated that he had met a French radio officer who had worked on the Zeppelin problem for French intelligence. The French had compiled a vocabulary of over 400 German code words, which meant they could understand Zeppelin communications. They had also designed and built wireless stations like the German ones, but in France. The French "arranged" for technical difficulties to take the German stations off the air. Consequently, when the Zeppelins set their return course for Germany they wound up in France. French Intelligence was even able to telephone their anti-aircraft artillery batteries to tell them when the Zeppelins would be coming overhead. Allied night flyers got a similar heads up and were waiting for their German guests.

Whichever story you choose to believe, the German High Command judged that the Zeppelin raids were too expensive due to the loss of so many airships, crews, and the small amount of damage the bombing was actually doing. No more Zeppelin raids were ordered over England. ■

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Clore Automotive's Jump-N-Carry 2000 Peak Amp 12-Volt Jump Starter

It's large, a little on the heavy side, and smacks of heavy-duty throughout. The Clore Automotive Model 950 Jump-N-Carry, 2000 peak amp 12-volt battery system is a beefy 34-amp-hour battery that I found ideal for portable radio operation and emergency lighting.

I've been putting this portable power unit through its paces for a few months. It's one of those things that needs to be used extensively, and then reported on fairly so you get a good idea of its capabilities. Clore Automotive has this to say about its model 950: "It's the largest 12 Volt Jump-N-Carry unit we manufacture. With 2000 Peak Amps of starting power, it will spin the starters on all class 1-6 commercial trucks. Plus, the 34-amp hour battery satisfies the most aggressive portable power users. Its onboard automatic charger can provide up to 24-hour/365-day continuous charging."

That's a pretty hefty claim, so I decided to see if it measured up in one rigorous test after another. First—although I'll admit, it's not directly related to a radio test—I decided to see if it would indeed spin a starter on a big truck. Tom, a local radio friend, has a Ford F350. Now, I don't know what class vehicle that is, but it's big, at least to me. I wanted to see if the Clore 950 power unit would crank it. At his garage we disconnected the vehicle's battery and clamped the heavy-duty battery cables and gave it a crank. Without hesitation, the starter cranked like a charm! I can honestly say that if I were stuck out in the wilderness or even the wilds of a big city, I'd rather have the Clore 950 Jump-N-Carry than some wimpy, lightweight jump-starter! But since we're primarily concerned about powering our radios, either in an emergency or on a weekend camping trip, I brought the Clore 950 along for some rather extensive real-world tests.

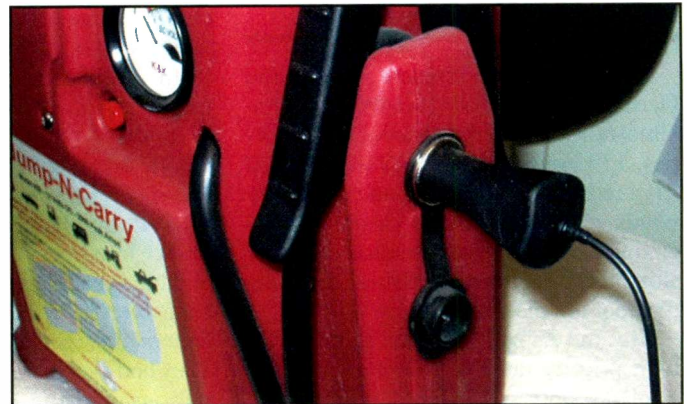
The instructions say you can leave the unit plugged in all the time, which is what I've done now for months. There's a small analog meter on the front of the unit that reads DC volts and operates with the simple push of a button. It's quite accurate! I measured the voltage at the DC receptacle and it was within .25 VDC of the meter's reading.

My Alinco DJ-G5T handheld ham transceiver that I sometimes use as a grab-and-go scanner draws so little on receive it's not worth measuring. I rarely use the high-power (5-watt) setting, preferring instead to use the radio on 1.5 and sometimes 3.5 watts (it conserves battery power and works just fine). So using the DJ-G5T on the 3.5-watt setting with a listen/talk ratio of about 5:1, I only had to recharge the unit because it seemed like the right thing to do. Before placing the unit on charge again, I checked the meter—it had *barely* moved, meaning I had hardly consumed any of the unit's power! This was after a full weekend (all day Saturday and Sunday) of "playing radio" using the Clore 950 as my only power source.

This also means that a simple handheld CB radio, which draws even less, would operate from the Clore 950's 34-amp-hour battery for close to an eternity—well, not quite, but you get the idea! During the past couple of months I've used a 12-VDC fan for about three hours before charging the unit (although it didn't indicate a charge was necessary), and a 12-VDC utility light for about one and a half hours.



Push the button for a quick meter reading that gives you an instant status of the unit's battery power.



The 12-VDC receptacle is located on the side of the Clore 950. It's contained securely on the unit and doesn't turn or move when you insert and remove a 12-VDC plug.

There's nothing super fancy about the Clore 950 power supply. Its single 12-VDC receptacle (center pin, positive) is located on the side, and two battery cables also fit securely there. It's got plenty of power to get you through the toughest times, which, after all is why you buy one of these beefy (14.75 inches tall, 34 pounds) power units in the first place. If you're powering AC devices you'll have to buy an inexpensive power inverter, but if you're looking for 12-VDC emergency or jump-start power, you should give the Clore Jump-N-Carry 950 serious consideration! It carries a one-year limited warranty and at a suggested retail price of \$369.88.

More information can be found at the company website (www.cloreautomotive.com). If you contact Clore Automotive by phone at 800-328-2921, be sure to tell them you read about the Clore 950 in *Popular Communications*. ■

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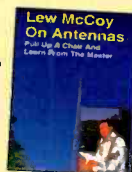
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Capitol Hill And FCC Actions Affecting Communications

Fines Mount Against Alleged Jammer

The Federal Communications Commission has proposed an additional \$21,000 fine against a California man it alleges interfered with a U.S. Coast Guard rescue operation in October 2004. Jack Gerritsen, who previously held the amateur radio callsign KG6IRO, now faces a total of \$52,000 in imposed or proposed fines. The latest proposed forfeiture, announced in January, is an upward adjustment from a base fine of \$7,000 for causing interference to licensed stations, according to the FCC. The Commission had already affirmed a \$10,000 fine against Gerritsen for interference with amateur radio communications. Citing more allegations of interference to amateurs, the Commission proposed an additional \$21,000 fine in December. "Gerritsen's apparent willful and malicious interference with the radio communications of the Coast Guard Auxiliary officer who was attempting to communicate (on amateur frequencies) with a ship in distress is egregious," wrote Catherine Deaton, district director of the FCC's Los Angeles District Office. "According to the evidence, Gerritsen knowingly operates, without a license, radio transmission equipment." During the rescue operation, the FCC alleges Gerritsen, of Bell, California, continued transmitting "despite repeated warnings and requests to vacate the frequency."

RFID Technology To Be Tested At The Borders

The U.S. government will be testing radio frequency identification (RFID) technology at border crossings in Arizona, New York, and Washington by midsummer, Homeland Security Undersecretary Asa Hutchinson announced. The RFID technology is expected to reduce waiting time at the border while simultaneously providing authorities with more information on those people coming into and leaving the United States. People and vehicles will still be required to stop, but if their identification data does not raise any alarms, they'll move more quickly through the checkpoints following a cursory check. Identifying information will be stored on a chip placed on the ID. In varying forms, RFID has been used for many years in systems for highway toll collection, transportation tracking, merchandise tagging, and pet identification. The specialized chip does not need to be scanned in order to collect information. It merely must be within an approximate 18- to 30-foot transmission range. Testing is expected to be conducted in Nogales, Arizona, Alexandria Bay, New York, and the Pacific Highway and Peace Arch in Washington State. Both warm and cold weather locations were selected for the field test.

Tenure Of FCC's Powell Gets Mixed Review

The announcement of Michael Powell's resignation as chairman of the FCC in January was greeted with a mixture of sadness and relief. Greg Ballentine, president of the Association of Public-Safety Communications Officials International, said the

organization was sorry Powell was stepping down. "He has been a strong supporter of public safety," Ballentine said, "and his leadership has been an asset for our nation's first responders and the public they serve." Powell received the Leadership in Advancing Communications Policy Award from APCO in April. American Radio Relay League chief executive officer David Sumner, K1ZZ, however, called Powell's performance as FCC chairman "a deep disappointment." "It's no secret that we thought Chairman Powell was going entirely in the wrong direction on BPL (broadband over power line) and dragging the other commissioners and FCC staff along—willing or not—because he was, after all, the chairman," Sumner said in the League's ARRL Letter. "A new chairman might be a chance for a fresh start." The ARRL has strongly opposed the implementation of the BPL initiative over concerns about interference to communications in the amateur radio frequency spectrum.

Companies Sign On To HD Radio

Twenty-one radio ownership groups have signed with The iBiquity Digital Corp. to convert 2,000 AM and FM stations nationwide to HD technology. HD radio signals will be broadcast simultaneously beside traditional AM and FM signals, allowing listeners with HD radios to hear higher-quality audio. Text information can also be sent with the digital signals to the new receivers. Announced at the International Consumer Electronics Show in Las Vegas in January, the companies include ABC Radio, Beasley Broadcast Group, Inc., Bonneville International Corp., Clear Channel Communications, Inc., Cox Radio, Inc., Cumulus Media, Inc., Emmis Communications Corp., Entercom Communications Corp., Entravision Communications Corporation, Greater Media, Inc., Infinity Broadcasting, Jefferson-Pilot Communications Co., Journal Broadcast Group, Liberman Broadcasting, Inc., NextMedia Group, Inc., Radio One, Inc., Regent Communications, Inc., Saga Communications, Inc., Sandusky Radio, Susquehanna Radio Corp., and Univision Radio, Inc. A matching grant has also been established by The Corporation For Public Broadcasting for more than 150 Public Radio stations to move toward HD Radio.

New Line Of Public Service Radios Unveiled

Expanding a product line platform that was launched in 2002, RELM Wireless Corp. has introduced a new RELM RM Series of mobile radios. The six mobiles, engineered for a wide range of business and industrial applications, operate in one of three frequency ranges: 136 to 174 MHz VHF, 430 to 470 MHz UHF, or 470 to 512 MHz UHF. There are high power 45-watt units and low power 25-watt units. The devices have already received FCC type acceptance and Industry Canada certification. "The product strategy and competitive advantages of these new RELM RM Series mobile radios and their counterpart RELM RP Series portable radios are quite simi-

the Sweet Sounds of Shortwave



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RX-350 is a full-featured HF DSP receiver for today's demanding shortwave listener. 100 kHz-30 MHz. Modern IF-DSP architecture accommodates 34 built-in bandwidth filters, DSP automatic notch, and DSP noise reduction. Flash ROM updateable via Internet file downloads. Large LCD graphics panel for display of all receiver functions. Selectable sideband/Sync AM, SAM, AM, FM, CW, and SSB modes. Momentary SWEEP function shows band activity on LCD screen. 1024 memories. Timer and squelch activation circuitry. 12/24-hour clock. Hi Z and Lo Z antenna inputs. 115/230 VAC or 13.8 VDC operation.

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302R REMOTE/ENCODER KEYPAD

Allows armchair tuning of the RX-350. Function buttons allow operation of various receiver controls. Direct frequency entry via keypad.

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lar to those for our high-specification RELM BK Radio products geared to homeland security and public safety users," RELM President and CEO David Storey said. "That is, our entire range of radio products provides outstanding performance and audio clarity, rock-solid reliability, robust features and smart software, all at lower cost than competitors with comparable product offerings."

RELM Wireless Corp., of West Melbourne, Florida, has manufactured and marketed high-specification two-way communications equipment for more than 50 years "for use by public safety, homeland security and government agencies, as well as radios for use in a wide range of commercial and industrial applications, including fleet and project coordination, on-site communications and corporate disaster recovery," the company said in a statement. "Revolutionary advances include new low-cost digital portable two-way radios compliant with APCO Project 25 technical specifications. Products are manufactured and distributed worldwide under the BK Radio and RELM brand names."

Nextel Shifting Spectrum To Quell Interference

A plan by federal regulators to end interference by cell phones to public safety communication systems in hundreds of communities was accepted in early February by Nextel Communications. The FCC will give Nextel a new piece of broadcast spectrum, allowing it to shift away from emergency services frequencies. The company will absorb the cost to reconfigure the frequencies it currently occupies. Cell phone inter-

ference has in some cases disrupted police, fire, and other public safety communications in the 800-MHz band. In the plan, Nextel will gain new spectrum in the 1.9-GHz band, where other wireless carriers are located. "Nextel made a choice in the best interests of its shareholders and in the best interest of the American people," outgoing FCC Chairman Michael Powell said, applauding the company for "exercising well its custodianship of the public spectrum and for its leadership in advancing a solution to this difficult problem." Nextel President Tim Donahue said the agreement was the right thing to do for first responders, homeland security, and for the company. Transition is expected to take about three years.

Commission Denies Indecency Complaints Against Veteran's Day Broadcast Of "Saving Private Ryan"

The Federal Communications Commission has issued a *Memorandum Opinion and Order* denying complaints alleging that various television station licensees affiliated with the ABC Television Network aired indecent and profane material during the November 11, 2004 presentation of the film "Saving Private Ryan."

The Commission noted that the film contains numerous expletives and other potentially offensive language generally as part of the soldier's dialogue. In light of the overall context in which this material is presented, the Commission determined that it was not indecent or profane. The Commission also said that while some complaints referenced the violence depicted in the film, the FCC's indecency and profanity prohibitions are not applicable to violent programming. ■

Reviewing Propagation And Space Weather Terms—Part IV

The Ionosphere

Earth's atmosphere is a mixture of gases held to the surface of the Earth by gravity. These gases vary in density and composition as the altitude increases above the surface. As the atmosphere extends outward from Earth, it becomes thinner and blends with the particles of interplanetary space.

The first 60 miles of Earth's atmosphere consists of a homogeneous mixture of various gases. This region is called the *homosphere*. Above the homosphere, where gases are no longer uniformly mixed, lies the *heterosphere*. Relatively more of the heavy gas molecules, such as N₂ and O₂, are found near the bottom of the heterosphere, while relatively more of the lighter gases, such as hydrogen and helium, are found near the top.

The atmosphere is also divided into four regions according to temperature trends: the *troposphere*, *stratosphere*, *mesosphere*, and the *thermosphere*. The lowest region is the troposphere and it extends from the Earth's surface up to about six

miles. The gases in this region are heavier than those in higher altitudes, and include molecular oxygen (O₂) and molecular nitrogen (N₂). The highest mountains reach into this region and it is where the high-altitude jet stream flows. Weather is confined to this lower region and it contains 90 percent of the Earth's atmosphere and 99 percent of the water vapor.

The atmosphere above the troposphere is called the stratosphere and starts at about six miles out. Gas composition changes slightly as the altitude increases and the air thins. In this layer, incoming solar radiation at wavelengths below 240 nanometers creates ozone, a molecule of oxygen consisting of three oxygen atoms (O₃). This gas reaches a peak density of a few parts per million at an altitude of about 16 miles.

At an altitude above 50 miles, the gas is so thin that free electrons can exist for short periods before being captured by a nearby positive ion. The existence of charged particles at this alti-

The Ap Index And Understanding Propagation Terminology

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

Classification of A-indices is as follows:

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

Solar Flux (SF1): 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>.

tude and above marks the beginning of the *ionosphere*, a region having the properties of both gas and plasma.

Above the ionosphere exists the *magnetosphere*, a vast region of charged particles formed by the interaction between the solar wind and the Earth's magnetic field. The magnetosphere begins at about 600 miles above the Earth's surface. It extends to a distance of about 40,000 miles on the side facing the sun and to even greater distances on the far side of the Earth, away from the sun.

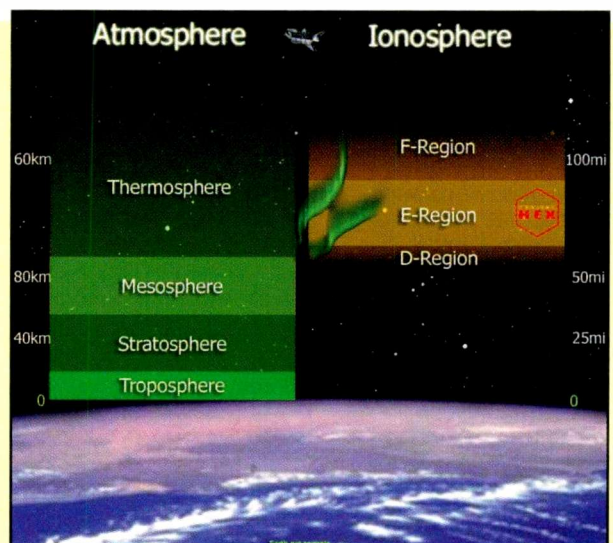
How Is The Ionosphere Formed?

Much of the energy from the sun that reaches our atmosphere is absorbed. Thankfully, nearly all the hazardous ultraviolet radiation, gamma rays, and x-rays are blocked before they reach Earth's surface. While most of the radiation from the sun is absorbed, some of it penetrates deeply into the atmosphere. Atmospheric ozone in the ozone layer is the greatest absorber of ultraviolet radiation, protecting virtually all life forms on Earth. Solar radiation at ultraviolet and shorter wavelengths is considered to be "ionizing" since photons of energy at these frequencies are capable of dislodging an electron from a neutral gas atom or molecule during a collision. We measure solar activity at the 10.7-centimeter frequency since it's close to the ultraviolet range and because the stronger the energy at that frequency, the more ionization occurs. This measurement is called the "solar flux reading."

Atoms in the ionosphere absorb the incoming solar radiation, causing them to become highly excited. When an atom is bombarded with enough of this energy, an electron may be knocked away from its orbit, producing free electrons and positively charged ions. At the highest levels of the Earth's outer atmosphere, solar radiation is very strong but there are few atoms to interact with, so ionization is low. As the altitude decreases, more gas atoms are present, so the ionization process increases. At the same time, however, an opposing process begins to occur. In this process, called *recombination*, a free electron is "captured" by a positive ion if they get too close to each other. As the gas density increases at lower altitudes, the recombination process accelerates since the gas molecules and ions are closer together.

Because the composition of the atmosphere changes with altitude, the ion production rate also changes, leading to the formation of several distinct ionization regions, known as the *D*, *E*, *F*₁, *F*₂, and *F*₃ layers. (Yes, an outer *F*₃ layer has been discovered, and so far it seems that when present, it is most dense over the equatorial region during the peak of day). The breakdown between layers is based on the density of ions and what wavelength of solar radiation is absorbed most frequently in that region.

The *D* region is the lowest in altitude and absorbs the most energetic radiation, known as hard x-rays. The *D* region doesn't have a definite starting and stopping point, but includes the ionization that occurs below about 56 miles. This region absorbs high frequency (HF) waves between 3 and 30 MHz or wavelengths between 100 meters and 10 meters. It refracts frequencies in the range of 3 to 30 kHz, or very low frequencies (VLF). The *D* region is a daytime layer because it takes the full energy of the sun to keep the very dense layer of gases ionized. Once sunlight is removed, the free electrons quickly recombine with the gases and molecules that are so densely packed, and the ionization nearly disappears.



The layers of Earth's atmosphere. Note that aurora occurs mostly at the height of the E region, which is why propagation of radiowaves off the ionized clouds formed during active aurora acts somewhat like sporadic-E. (Source: HEX)

The next highest layer, the *E* region of the ionosphere, extends from about 56 miles to about 65 miles. The air in this region is considerably thinner than below it. Because of the thinness this air, there are fewer collisions of ions and electrons, resulting in a population of molecular ions. The *E* region absorbs soft x-rays. This layer is highly variable from day to night, and takes longer to recombine than the *D* layer.

The highest layer is the *F* region, which is the largest part of the ionosphere. It extends from about 65 miles up through the end of our atmosphere. Since particle densities decrease as you travel away from Earth, it is difficult to say exactly where our atmosphere ends. Since it is such a large region, the *F* layer is divided into two main sections: the daytime layer, *F*₁, and the denser *F*₂ region, which exists both during the day and night. A third layer has been discovered, the *F*₃ region, which appears to occur during the peak solar cycle years over the equatorial region during the middle of the day.

In the *F* region, gravity's affect on particles creates different layers, depending on their mass. The heavier particles sink to the bottom of the *F* region and the lighter ones rise to the top. Along the day/night meridian electron numbers rise and fall. At sunset, electron numbers decrease and recombination of these particles with ions occurs throughout the night. On the sunrise meridian, electron numbers increase as neutral molecules and atoms are energized by solar radiation, again causing ionization.

Radio Waves In The Ionosphere

As an electromagnetic wave enters the ionosphere at the *D* layer, the energy sets electrons in a vibrating motion (at the frequency of the radiowave). Because this layer is so dense, there's a high probability that the energy will be absorbed in a collision with nearby molecules. The electromagnetic energy is turned into kinetic energy (heat) and, as far as radio propagation is concerned, lost. The higher the frequency and the short-

Optimum Working Frequencies (MHz) - For May 2005 - Flux = 81, SSN = 22- Created by NW7US

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
TO/FROM US WEST COAST																									
CARIBBEAN	22	22	22	21	19	18	16	15	14	13	12	11	12	14	16	17	18	19	20	21	21	22	22	22	
NORTHERN SOUTH AMERICA	29	28	28	26	23	21	20	18	17	16	15	14	14	17	19	22	23	25	26	27	28	28	28	29	
CENTRAL SOUTH AMERICA	28	25	23	21	19	18	17	16	15	14	14	16	16	18	21	23	25	26	27	28	29	30	30	29	
SOUTHERN SOUTH AMERICA	24	18	16	16	15	14	13	13	13	12	12	12	12	15	18	20	22	24	26	27	28	28	28	26	
WESTERN EUROPE	12	11	10	10	9	11	13	12	11	11	10	14	16	17	18	19	20	20	20	19	19	18	17	15	
EASTERN EUROPE	9	9	9	9	13	15	13	11	11	10	10	10	14	16	18	19	19	19	18	17	16	14	10	10	
EASTERN NORTH AMERICA	26	25	25	24	23	22	20	18	17	16	14	14	16	18	20	21	23	24	24	25	25	26	26	26	
CENTRAL NORTH AMERICA	14	14	14	14	13	13	12	11	10	9	9	8	8	9	11	11	12	13	13	14	14	14	14	14	
WESTERN NORTH AMERICA	8	8	7	7	7	7	7	6	6	5	5	4	4	4	5	6	6	6	7	7	7	7	8		
SOUTHERN NORTH AMERICA	23	23	23	23	22	21	19	18	16	15	14	13	12	13	16	17	19	20	21	22	22	23	23	23	
NORTHERN AFRICA	16	15	13	12	12	12	14	13	12	11	12	15	17	18	19	19	20	20	21	21	20	20	19	17	
CENTRAL AFRICA	17	16	15	14	13	14	13	12	11	11	10	14	16	18	19	19	20	20	21	21	21	21	21	19	
SOUTH AFRICA	16	15	14	14	13	13	15	17	16	15	14	16	18	20	21	22	23	24	24	23	21	19	18	17	
MIDDLE EAST	13	12	12	13	15	15	12	12	11	10	10	12	15	17	18	19	20	20	20	19	18	17	16	14	
JAPAN	20	20	21	20	20	20	19	18	18	16	15	14	13	13	14	14	13	12	12	14	16	17	18	19	
CENTRAL ASIA	20	20	20	20	20	19	19	18	17	16	15	14	13	13	15	16	17	16	15	14	14	15	17	19	
INDIA	18	18	18	18	18	17	15	13	11	10	10	9	9	10	9	9	9	8	8	11	14	15	16	17	
THAILAND	17	19	20	20	20	19	19	18	17	15	14	12	12	12	15	16	18	17	16	15	14	13	13	15	
AUSTRALIA	29	30	30	30	30	30	29	28	26	24	22	20	18	17	16	15	15	14	13	13	16	22	25	27	
CHINA	19	20	20	20	19	18	17	16	14	13	12	11	12	15	16	15	15	16	15	13	12	14	16	17	18
SOUTH PACIFIC	29	30	30	29	28	26	24	18	16	15	15	14	13	13	13	12	12	12	21	25	27	28	29		
TO/FROM US MIDWEST																									
CARIBBEAN	25	25	24	24	21	20	18	16	15	14	13	13	14	17	18	20	21	22	23	24	24	25	25	25	
NORTHERN SOUTH AMERICA	26	26	25	23	21	19	18	16	15	14	14	13	14	16	18	20	22	23	24	25	25	26	26	26	
CENTRAL SOUTH AMERICA	28	25	23	21	19	18	17	16	15	14	14	15	17	20	22	24	25	26	27	28	29	29	29	29	
SOUTHERN SOUTH AMERICA	23	18	17	16	15	14	14	13	13	12	12	12	15	18	20	22	24	25	26	27	28	29	28	26	
WESTERN EUROPE	15	13	12	11	10	11	13	12	12	14	16	17	18	18	19	19	20	20	20	20	19	19	18	17	
EASTERN EUROPE	10	9	9	9	9	13	12	12	11	11	14	16	18	19	19	20	20	19	19	18	17	16	14	10	
EASTERN NORTH AMERICA	18	18	18	17	16	15	14	13	12	11	10	10	12	13	15	16	16	17	18	18	18	18	19	19	
CENTRAL NORTH AMERICA	9	8	8	8	8	7	7	6	6	5	5	4	5	6	6	7	7	8	8	8	8	8	9	9	
WESTERN NORTH AMERICA	15	14	14	14	14	13	12	11	10	9	9	8	8	9	10	11	12	13	13	14	14	14	14	15	
SOUTHERN NORTH AMERICA	16	16	16	16	15	14	13	12	11	10	9	9	9	10	11	13	13	14	15	15	16	16	16	16	
NORTHERN AFRICA	20	18	17	16	14	14	14	13	12	13	15	16	18	19	19	20	20	21	21	21	21	21	21	21	
CENTRAL AFRICA	17	16	15	14	13	13	14	13	12	13	15	17	18	19	19	20	20	21	21	21	21	21	21	19	
SOUTH AFRICA	15	15	14	13	13	13	13	19	18	17	16	18	21	23	25	26	28	28	26	22	20	19	17	16	
MIDDLE EAST	14	13	12	12	14	15	13	12	12	14	16	17	18	19	19	20	20	20	20	20	19	18	16	15	
JAPAN	20	20	20	19	19	18	18	17	15	14	13	13	15	16	15	14	13	12	12	15	16	18	19	19	
CENTRAL ASIA	20	20	20	19	19	18	17	16	14	13	12	12	15	16	17	18	18	16	15	14	14	15	17	19	
INDIA	12	14	16	16	16	15	12	12	11	10	10	14	16	17	16	15	14	12	10	9	9	8	8	8	
THAILAND	17	19	20	19	18	17	16	14	13	12	11	12	15	16	18	19	19	18	16	15	14	13	13	15	
AUSTRALIA	29	30	30	30	29	28	25	23	21	19	18	17	16	16	15	14	14	13	13	17	23	26	28	28	
CHINA	19	20	20	19	18	17	16	14	13	12	11	12	15	17	18	16	15	14	13	13	14	16	17	18	
SOUTH PACIFIC	30	30	29	28	27	25	22	16	15	14	14	13	13	12	12	12	12	12	13	23	26	27	29	29	
TO/FROM US EAST COAST																									
CARIBBEAN	20	20	19	18	16	15	14	13	12	11	10	10	12	14	15	16	17	18	19	19	20	20	20	20	
NORTHERN SOUTH AMERICA	23	23	22	20	18	17	15	14	13	12	12	11	13	15	17	19	20	21	22	22	23	23	23	23	
CENTRAL SOUTH AMERICA	27	25	22	21	19	18	16	15	15	14	14	16	19	21	23	24	25	26	27	28	28	29	29	29	
SOUTHERN SOUTH AMERICA	21	18	17	16	15	14	14	13	13	12	12	12	17	20	22	23	25	26	27	28	28	29	27	25	
WESTERN EUROPE	16	15	14	13	12	13	12	11	11	13	15	16	17	18	19	19	19	19	19	19	18	18	18	17	
EASTERN EUROPE	11	10	10	9	9	14	13	12	13	15	17	18	19	19	20	20	20	20	19	19	18	17	15	12	
EASTERN NORTH AMERICA	9	9	8	8	7	7	6	6	5	5	5	5	6	7	7	8	8	8	8	9	9	9	9	9	
CENTRAL NORTH AMERICA	19	19	19	18	17	16	14	13	12	11	11	11	13	14	15	16	17	18	19	19	19	20	20	20	
WESTERN NORTH AMERICA	26	26	25	24	24	22	20	18	17	16	15	14	16	18	20	21	23	24	24	25	25	26	26	26	
SOUTHERN NORTH AMERICA	20	20	20	19	18	16	15	14	12	12	11	11	12	14	15	16	17	18	19	19	20	20	20	20	
NORTHERN AFRICA	20	18	17	16	15	14	15	14	15	18	20	21	22	23	24	25	25	26	25	25	25	24	22	22	
CENTRAL AFRICA	17	16	15	14	13	13	15	15	14	15	18	20	21	22	23	24	25	25	25	25	24	23	21	19	
SOUTH AFRICA	15	15	14	13	13	13	13	17	16	15	17	19	21	23	25	26	27	28	26	22	20	19	17	16	
MIDDLE EAST	17	16	15	14	14	14	13	12	12	14	16	17	18	19	20	20	21	21	21	21	21	21	21	19	
JAPAN	20	20	19	18	17	15	14	13	13	14	16	17	16	15	14	13	12	13	15	17	18	19	19	19	
CENTRAL ASIA	19	19	18	18	17	16	15	13	13	14	16	17	17	18	19	19	18	17	16	15	14	14	17	19	
INDIA	9	9	9	9	14	14	13	13	13	15	17	18	18	19	19	19	18	18	17	16	14	11	10	9	
THAILAND	16	18	18	17	16	14	13	12	12	15	16	17	18	19	19	20	20	19	17	16	15	14	13	14	
AUSTRALIA	30	30	30	29	28	26	23	21	20	18	17	16	16	16	15	14	14	13	13	13	18	23	26	28	
CHINA	18	19	18	18	17	15	14	13	12	14	16	17	18	18	18	17	16	14	14	14	15	16	17	18	
SOUTH PACIFIC	29	29	29	28	26	24	20	15	15	14	13	13	12	12	12	12	12	17	23	26	27	28	29		

er the wavelength, the higher the energy, but also the fewer collisions between free electrons and gas molecules than at lower frequencies. As a result, lower frequency signals are attenuated far more than are those at higher frequencies. It is possible that the lowest frequencies are completely absorbed, while higher frequencies will make it through to the *E* layer.

Since the *E* layer is less dense than the *D* layer, electrons are not so quickly recombined with neighboring atoms, so losses are lower. Because these electrons are not as quickly bound with other atoms, losing energy, the electromagnetic wave is re-radiated. Because the signal is traveling in an area where electron density is increasing, the farther it will go.

At the same time, the wave is bent away from the denser, and higher, area of electrons. The amount of bending, or *refraction*, is dependent on the frequency of the wave and the density of the ionosphere the radio wave is traveling through. Think of how a pencil might look if you place it into a glass of water. When you view the pencil through the side of the glass, it appears to bend right at the boundary between the air and the water. This is caused by the same phenomenon. Light is being refracted by the difference in density of the mass it is traveling through.

The higher the frequency, the more energy that wave has, making it more likely to pass through to the next higher region. When an electromagnetic wave enters the *F* layer, the same thing takes place. The radio signal rides the free electrons of this layer, and if the frequency of the signal is high enough, it will pass through the layer out into space; otherwise, it will be gradually refracted back, away from the higher and denser layers of electrons, to be sent back toward Earth.

Those frequencies that are refracted back to Earth have to then pass again through the lower ionospheric layers. *D*-layer absorption will attenuate the signal some more. If there is enough energy in the signal, the wave may bounce between the ionosphere and Earth multiple times, greatly extending the distance it can travel. Other times, it might be absorbed to such a degree that no communications are possible. Yet at other times, a radiowave will enter the ionosphere, bounce off the *F* layer, but then refract back up away from the *E* layer, doing so over multiple hops until it can punch back through the *E* layer and back to Earth.

All this depends on how ionized the gases become in these various layers, and how dense each layer is, as well as on the

strength, angle of incidence, and frequency of the radio signal. Ionization depends on direct energy from solar radiation. Would all of the layers of the ionosphere perform identically if they each received the same amount of solar energy? No, because of the different gases found in each layer and the density of those layers.

When we look at the daily measurements of the 10.7-centimeter solar flux, we find that the higher the index, the more ionized these various layers become, making it possible for higher shortwave frequencies to propagate by refraction over great distances. When the flux is low, the ionosphere is weaker and only the lower shortwave frequencies will be propagated. Of course, there are many variations during the day, between regions in daylight and darkness and from season to season.

Current Cycle 23 Progress

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada, reports a 10.7-centimeter observed monthly mean solar flux of 102.4 for January 2005, up from 94.6 for December 2004. The 12-month smoothed 10.7-centimeter

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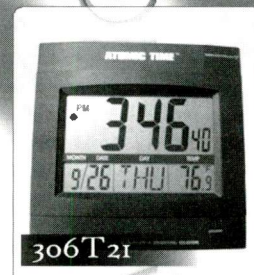
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flux centered on July 2004 is 105.9, just down from June's 107.2. The predicted smoothed 10.7-centimeter solar flux for May 2005 is about 81, give or take about 19 points.

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for January 2005 is 31.3, a nice jump up from December's 17.9, yet still down from November's 43.7. The lowest daily sunspot value during December, recorded on January 8, was 10. The highest daily sunspot count was 65 on January 16. The 12-month running smoothed sunspot number centered on July is 40.2, down from June's 41.7 (adjusted). A smoothed sunspot count of 26 to 32 is expected for May 2005 by the SIDC (Solar Influences Data analysis Center). The Space Environment Center predicts the sunspot count to be 18, give or take about 12 points.

The observed monthly mean planetary A-Index (Ap) for January 2005 is 22, quite a jump from December's 11. The 12-month smoothed Ap index centered on July 2004 is 13.8, about the same as for June. Expect the overall geomagnetic activity to be quiet to active during most days in May, with some isolated periods of storm level activity.

HF Propagation

As we move away from the winter shortwave season into the longer days of summer, the overall trend in shortwave propagation is the opening up of the higher frequencies into many areas of the world. However, these openings can be variable in strength, subject to fading, and could be short-lived. The cause of this change is complex. The length of daylight over a region of the ionosphere, the intensity of the solar radiation, and the density and height of the various layers of the ionosphere all affect the propagation of the shortwave frequencies we're interested in. Winter daytime propagation over a given path could sustain higher frequencies than the same path can during the summer daytime, while the summer nighttime frequencies will be higher than the winter nighttime frequencies on that same path.

On the higher HF frequencies (16 through 11 meters), fairly good daytime openings should be possible on north/south paths during May. Sixteen meters will be the best bet out of the higher bands, not only because of propagation, but also because more international broadcasters will still use this band around the clock.

Most DX signals, and the strongest signals, will be found on the middle and lower HF bands. When the 10.7-centimeter flux is high, especially above 100, conditions on 19 (and sometimes on 16) meters are great. However, since we're getting close to the end of the current solar cycle, the flux won't get above 100 very often. Instead, most signals will be found on the 15-MHz band or below.

Look for peaks in signals around the hours of sunrise, and again just before sunset, and into the late evening. Daytime paths are best when they terminate in areas where it is night. This enhances propagation to remote parts of the world and lengthens the DX window. Twenty-five and 22 meters will have more stable signals than those on 19 meters, especially on north/south paths, again around the hours of sunrise and sunset. Thirty-one meters again becomes one of the strongest and most reliable bands, though you will find it congested. Look for Europe and Africa early in the morning through late morning, then north/south openings during the day if the solar activity is low (otherwise the D-layer absorption will wipe out the

band). As sunset approaches, look for the South Pacific, then Asia as the sun sets.

During the night, 41 through 60 meters should provide good openings from Europe, Africa, and the East. Some DX should be possible on 75 through 120 meters, but signals are expected to be mainly weak and covered by seasonal noise. Static levels also increase noticeably during May, and signals may sound weaker on DX openings during the daylight hours.

VHF Ionospheric Openings

Possible transequatorial (TE) propagation and occasional sporadic-E (*Es*) propagation will keep the VHF enthusiast happy. *Es* ionization is expected to increase considerably during May, and fairly frequent VHF meteor-scatter short-skip openings should be possible. These are likely to occur over distances of approximately 1,000 to 1,400 miles. Although *Es* openings can take place at just about any time, the best time to check is between 10 a.m. and 2 p.m. and again between 6 p.m. and 10 p.m. local daylight time.

A seasonal decline in TE propagation is expected during May. An occasional opening may still be possible on VHF, however. The best time to check for VHF TE openings is between 9 and 11 p.m. local daylight time. These TE openings will be north/south paths that cross the geomagnetic equator at an approximate right angle.

Auroral activity is generally lower than March and April, due to the change in the orientation and position of the Earth and magnetosphere in relation to the solar wind. Watch for Kp values above 6, which occur on days when we see coronal holes affecting space weather or the arrival of coronal mass ejections a few days after any major solar flare.

One meteor shower, the **Eta Aquarids**, will occur in May. The Eta Aquarids peak at **2400 UTC, May 5**, but start around April 19, 2005. This shower has a peak rate of up to 60 visuals per hour. This year, the shower will be best viewed from the tropics or in the Southern Hemisphere. The current thinking is that the next big occurrence of this shower will be sometime between 2008 and 2010, with enough of an increase in activity to make an exciting event in the Northern Hemisphere. Nevertheless, if you're in the Northern Hemisphere, look for TV and FM broadcast pings (short bursts of signals, refracted off the ionized trails from the burning meteorite) during these events. If you're an amateur radio operator, look for 6- and 2-meter openings off the ionized meteor trails.

I'd Like To Hear From You

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

Please don't hesitate to write and let me know about any interesting propagation you've noticed. Do you have any questions about propagation? Send them in, too. I look forward to hearing from you. Happy signal hunting! ■

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The Antenna File

RSGB, ©2001. 288 pages. \$34.95.

Order: RSTAF

50 HF antennas, 14 VHF/UHF/SHF antennas, 3 receiving antennas, 6 articles on masts and supports, 9 articles on tuning and measuring, 4 on antenna construction, 5 on design and theory, and 9 Peter Hart antenna reviews. Every band from 73kHz to 2.3GHz!

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Amateur Radio

Mobile Handbook

RSGB, 2002 Ed., 128 pages.

The Amateur Radio Mobile Handbook covers all aspects of this popular part of the hobby. It includes operating techniques, installing equipment in a vehicle and antennas, as well as maritime and even bicycle mobile. This is essential reading if you want to get the most out of your mobile station.



Order: RSARMH **\$21.00**



HF Antenna Collection

RSGB, 1st Ed., 1992. 233 pages.

A collection of outstanding articles and short pieces which were published in Radio Communication magazine during the period 1968-89. Includes ingenious designs for single element, beam and miniature antennas, as well providing comprehensive information about feeders, tuners, baluns, testing, modeling, and how to erect your antenna safely.

Order: RSHFAC **\$16.00**

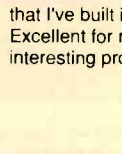


Practical Projects

Edited by Dr. George Brown, M5ACN

RSGB 2002 Ed. 224 pages

Packed with around 50 "weekend projects," Practical Projects is a book of simple construction projects for the radio amateur and others interested in electronics. Features a wide variety of radio ideas plus other simple electronic designs and a handy "now that I've built it, what do I do with it?" section.



The Antenna Experimenter's Guide

RSGB, 2nd Ed., 1996. 160 pages.

Takes the guesswork out of adjusting any antenna, home-made or commercial, and makes sure that it's working with maximum efficiency. Describes RF measuring equipment and its use, constructing your own antenna test range, computer modeling antennas. An invaluable companion for all those who wish to get the best results from antennas!

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Backyard Antennas

RSGB, 1st Ed., 2000, 208 pages.

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Order: RSBYA **\$30.00**

IOTA Directory - 11th Edition



Edited by Roger Balister, G3KMA.

RSGB, 2002 Ed., 128 pages

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RSGB, © 2001, 320 pages.

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HF Amateur Radio

RSGB, 2002 Ed.

The HF or short wave bands are one of the most interesting areas of amateur radio. This book takes the reader through setting up an efficient amateur radio station, which equipment to choose, installation, and the best antenna for your location and MUCH more.

Order: RSHFAR **\$21.00**

Radio Communication Handbook



Edited by Dick Biddulph, G8DPS

and Chris Lorek, G4HCL.

RSGB, 7th Ed., 2000, 820 pages.

This book is an invaluable reference for radio amateurs everywhere. It also provides a comprehensive guide to practical radio, from LF to the GHz bands, for professionals and students.

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RSGB Prefix Guide

By Fred Handscombe, G4BWP.

RSGB, 6th Ed., 2003. 48 pages.

This book is an excellent tool for the beginner and the experienced hand alike. Designed with a "lay flat" wire binding for ease of use the new "Prefix Guide" is a must for every shack.



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Australia From The UK, And China Relays From Chile!

This relay business gets messier by the month and more and more difficult to keep track of. Everybody seems to be relaying everybody else these days, and rarely do the on-air IDs tell you who or what's coming from where. Take Radio Australia, for instance. It wasn't that long ago that all of their transmitter sites were in-country. Now Radio Australia can be coming from Taiwan, Singapore, two sites in the UK, and the IBB (VOA) site in the Northern Marianas, as well as their three in-country sites at Shepparton, Darwin, and Brandon!

But Australia is a piker compared to China Radio International, which is now using *six* transmitters, of 150 kW each, from the Cerrik, Albania, site. The current broadcast schedule also has it on from Santiago, Chile! This outlet was first mentioned a season or two ago. It's now scheduled in Portuguese from 1100 to 1200 and 1200 to 1300 in Chinese, 1300 to 1400 in English on **17625**, and from 2100 to 2200 in Portuguese on **11720**. So far we haven't heard any of these, nor have we seen any reports, but it is likely just a matter of time. Even more startling is the news that CRI will be (perhaps already is) using VT Merlin facilities to improve its coverage of Southern Africa, Brazil, and Mexico. We haven't yet seen any specific schedules, but it looks to be a major increase in China Radio's effort to be well received no matter where on earth you happen to be.

New Clandestine Program

A new clandestine program is KVTO's **The Sound of Hope**, beamed to China via Taiwan and Russia. Its initial schedule had it via Taiwan from 1600 to 1700 on **11765**, on **9635** from 2200 to 2300, and **7310** via Irkutsk from 2300 to 0000.

Another new one is **The Voice of Delona**, aimed at Eritrea and using **15650** from 1500 sign on and (probably) running until just 1530. Info on this is very hazy so far but we're guessing that it's going out via Julich, Germany, and that the broadcasts may not be daily.

More Shortwave News From Around The World

La Voz de tu Conciencia in Colombia now has its long-planned second frequency in use at **5910**. Its second transmitter should also be active now. In an unusual approach, the operators plan to program one frequency for the unconverted and devote the other to programs to teach and reinforce those who already believe. They describe it as pre and post-evangelism.

Hold on! The return of **Radio Centrafrique** (a.k.a. R. Bangui) from the Central African Republic on **9590**, which we mentioned last month, might not be coming via the Issoudun, France, transmitter site after all. Some are theorizing that it might be via Africa Number One in Gabon. As this is written,



Japan's Radio Tampa has become Radio Nikkei, which means a new QSL design. (Thanks Rich D'Angelo, PA)

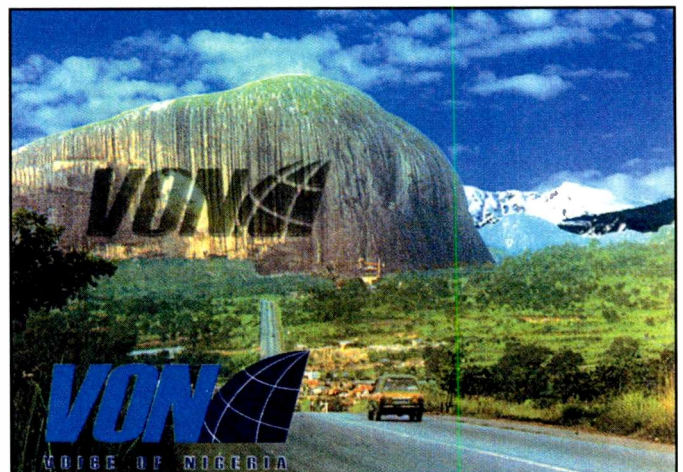
no one seems to know for certain, but we still believe Issoudun to be the best bet.

It seems that **RFO-Guyane, 5055**, from French Guiana, is off the air. While it's probably gone for good, these days you never really know.

Now you can hear a domestic FM station from New Delhi. "FM Rainbow" on 102.6 there is being carried on AIR's 11585 frequency, airing from 0030 to 1730, mostly in Hindi.

Djibouti Is Back?

The return of Djibouti to shortwave may very well have occurred by now. A 50-kW transmitter supplied by the United States is in the installation process now and was thought by some



The new QSLs from The Voice of Nigeria are a lot fancier than those of old. (Thanks Rich D'Angelo, PA)

Help Wanted!

We believe the "Global Information Guide" consistently presents more short-wave broadcast loggings than any other monthly SW publication! (This month we processed just under 400 loggings!) Why not join your fellow SWLs and let us know what you're hearing? You'll become eligible for our monthly shortwave book prize as well! Send your logs to "Global Information Guide," *Popular Communications*, 25 Newbridge Rd., Hicksville NY 11801-2953. Or e-mail them to Editor Harold Ort at popularcom@aol.com, or directly to your "Global Information Guide" columnist at gdex@genevaonline.com. Please see the column text for basic formatting tips. We look forward to hearing from you!

that it could be active by March. Years ago, when Radio Djibouti was last active, it used **4780** with an 0300 sign on but was always subject to severe interference from FEMA transmissions.

Reader Logs

Here are this month's logs. All times are in UTC, wherein 0000 equals 7 p.m.

EST, 6 p.m. CST, 5 p.m. MST, and 4 p.m. PST. Double letters (SS, RR, AA, PP, etc.) are language abbreviations (Spanish, Russian, Arabic, Portuguese, etc.). If no language is specified, the broadcast is assumed to have been in English (EE). For other abbreviations see the sidebar elsewhere in this column.

Remember, your shortwave broadcast loggings are always welcome. But please,

please be sure you list them by country and include your last name and state abbreviation after each log. We also have a continual need for illustrative material, whether QSLs (good copies or originals you don't need returned), as well as general station news and information, pen-nants, schedules, etc. And, last but not least, a picture of you at your monitoring position. Why be so shy? Would you mind? Just reach down and pull out that bottom drawer...

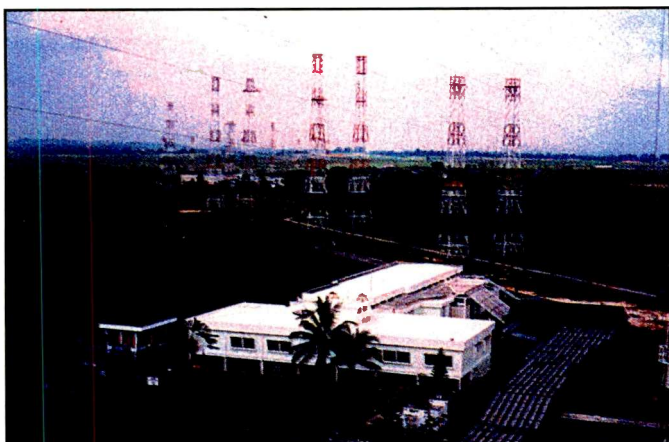
ALBANIA—Radio Tirana, **6115** with FF talk at 2015. Also **6205** in Albanian at 2230 (Brossell, WI) **6115/7160** with EE opening at 0330 to 0358 close. (Burrow, WA)

ANGOLA—Radio Nacional, **4950** at 0320 in PP with male DJ, IDs at 0355 and 0400, into news. (D'Angelo, PA) 0355 with ID and song in PP. (DeGennaro, NY)

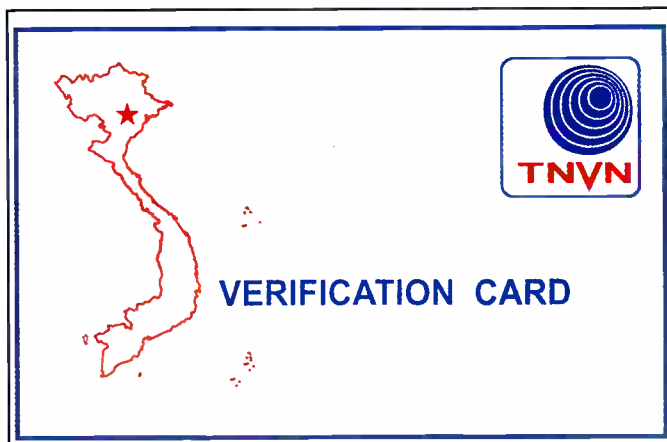
ANTIGUA—BBC Relay, **11965** in PP to Brazil heard at 2150. (DeGennaro, NY) **15190** with news brief and "Art of Singing." (Paradis, ME)

Abbreviations Used In This Month's Column

(p)	—	presumed	LV	—	La Voz
(t)	—	tentative	NBC	—	National Broadcasting Corporation (Papua New Guinea)
//	—	parallel	ORTB	—	Office de Radiodiffusion et Television du Benin
AA	—	Arabic	PBS	—	People's Broadcasting Station (China)
AFN	—	Armed Forces Network	PP	—	Portuguese
AFRTS	—	Armed Forces Radio TV Service	PSA	—	public service announcement
AIR	—	All India Radio	QQ	—	Quechua
anmt(s)	—	announcement(s)	RCI	—	Radio Canada International
anner	—	announcer	Rdf	—	Radiodifusora, Radiodiffusion
AWR	—	Adventist World Radio	REE	—	Radio Exterior de Espana
BSKSA	—	Broadcasting Service of the Kingdom of Saudi Arabia	RFA	—	Radio Free Asia
CC	—	Chinese	RFE/RL	—	Radio Free Europe/Radio Liberty
co-chan	—	co-channel (same) frequency	RNZI	—	Radio New Zealand International
comm1	—	commercial	RR	—	Russian
CP	—	Bolivia, Bolivian	RRI	—	Radio Republik Indonesia
CRI	—	China Radio International	RTBF	—	RTV Belge de la Communaute Francasie
DD	—	Dutch	relay	—	site not owned by broadcaster
DJ	—	disc jockey	Relay	—	owned/operated by the broadcaster
DW	—	Deutsche Welle/Voice of Germany	s/off	—	sign off
EE	—	English	s/on	—	sign on
f/by	—	followed by	SIBS	—	Solomon Is. Broadcasting Corp.
FEBA	—	Far East Broadcasting Association	sked	—	schedule
FEBC	—	Far East Broadcasting Company	SLBC	—	Sri Lanka Broadcasting Corp.
FF	—	French	SS	—	Spanish
GBC	—	Ghana Broadcasting Corp.	TC	—	time check
GG	—	German	TOH	—	top of the hour
HH	—	Hebrew	TT	—	Turkish
HH	—	Hungarian	TWR	—	Trans World Radio
HOA	—	Horn of Africa	unid	—	unidentified
ID	—	identification	USB	—	upper sideband
II	—	Italian; Indonesian	UTE, ute	—	utility station
Int	—	International	v	—	variable
IRRS	—	Italian Radio Relay Service	vern	—	vernacular (local language)
IS	—	interval signal	VOA	—	Voice of America
JJ	—	Japanese	VOIRI	—	Voice of Islamic Republic of Iran
KK	—	Korean	ZBC	—	Zambian Broadcasting Corp.
LSB	—	lower sideband			



This is the BBC Far Eastern Relay Station at Kranji, Singapore. (Thanks Rich D'Angelo, PA)



Blue, and red, and lots of white space. A recent QSL from the Voice of Vietnam. (Thanks Rich D'Angelo, PA)

ARMENIA—Voice of Armenia, **9965** ending news at 1939, ID, music. (Burrow, WA)

ARGENTINA—RAE, **15345** with SS talk at 2213. (Brossell, WI)

ASCENSION ISLAND—BBC Relay, **7160** with news at 0300. (Paradis, ME) **12095** with ID, news at 1600. (Brossell, WI) **15400** with "African Sports Roundup" at 1837. (Wood, TN)

AUSTRALIA—Radio Australia, **6020** to the Pacific at 1107, **9475** to Southeast Asia at 1248, **9590** in Pidgin at 1036, **11650** to the Pacific at 2130, and **11880** to the Pacific at 1956. (DeGennaro, NY) 6020 with news at 1101. (Jeffery, NY) **9580** with U.S. country at 1240, //9590. Also **11550** via Australia with EE language lesson at 2248. (Brossell, WI) **9710** relaying ABC National Radio with music program at 1610. (Barton, AZ) **11660** with news at 1500, (Paradis, ME) **21740** at 2240, //13630, 17795. (MacKenzie, CA) HCJB-Australia, **11750** at 0947. (Foss, Philippines) 1030 with ID and religious program. (DeGennaro, NY)

AUSTRIA—Radio Austria Int., **6155** in GG at 2243. (Brossell, WI) **13730** in GG with Mozart heard at 1753. (DeGennaro, NY)

BANGLADESH—Bangladesh Betar, **9550** in presumed Urdu to Europe at 1922. (DeGennaro, NY)

BELGIUM—RTBF, **9970** with FF news and talks at 1639. (DeGennaro, NY)

BOLIVIA—Radio Santa Cruz, **6135** at 1014 with talk by woman in Aymara, religious vocals and talk. ID at 1033. (D'Angelo, PA) Radio Yura, Yura, **4716.8** at 1000 with woman and man in SS, ID at 1015. (Wilkner, FL)

BOTSWANA—VOA Relay, **6035** at 0338 and **9885** at 0332. (Brossell, WI)

BRAZIL—Radio Nacional Amazonia, **6185** at 0907 with schedule, news, commercials. Frequency given as **6180** and **11780**. 1115 on 11780 with phone-ins. (DeGennaro, NY) 6185/11780 at 0750 with PP talk, IDs, phone-ins. (Alexander, PA) 11780 in PP at 2300. (Brossell, WI) Radio Aparceida, **6135** with news and commls in PP at 0900. Radio Brazil Central, Goiania, **4985** at 2336 with religious music and talk in PP (Wood, TN) 0920 with ID, commls, and anmts. (DeGennaro, NY) Radio Nacional, Macapa, 0350 with music and PP talk. Sort of nightclub style. (DeGennaro, NY) 0411 with songs and PP anmts. (Brossell, WI) 0509 with music and PP talk. (Jeffery, NY) Radio Difusora Roraima, Boa Vista, **4875** at 0221 with PP talk by woman, man. (Jeffery, NY) 1051 with music. (DeGennaro, NY) 2346 with languid PP ballads. Wiped out by heavy RTTY QRM at 2350. (Wood, TN) Radio Pioneira, Teresina, **5015** at 0710 with PP pops, talk, ID. (Alexander, PA) Radio Difusora, Pocos de Caldas, **4945** with vocals and PP talks at 0204, sometimes also female with "Radio Difusora" IDs. (D'Angelo, PA) Emisora Rural, Petrolina, **4945** at 0242 when it began mixing with Pocos de Caldas (above), eventually covering it. Seeming religious vocals and mention of "A Voz do Sao Francisco"

slogan. (D'Angelo, PA) Radio Clube do Para, **4885** with pop vocals hosted by man in PP. ID and frequency anmt at 0426. (D'Angelo, PA) Radio Mundial, Sao Paulo, **3325** at 0525 with mostly long PP talks. (D'Angelo, PA) Radio Anhanguera, Goiania, **4915** at 0915 with religious message over music. (DeGennaro, NY) Radio Sonado, Brasilia, **5990** with songs and PP commls at 1034. (DeGennaro, NY) Radio Nova Visao, Santa Maria, **9530** at 1034 with religious message in PP. (DeGennaro, NY) Radio Difusora, Londrina, **4815** at 0031 with ID and frequency schedule, music and commercials in PP. (DeGennaro, NY) Radio Educacao Rural, Campo Grande, **4755** with two men conversing in PP at 0023. (DeGennaro, NY) Radio Clube Paranaense, Curitiba, **6040** at 0850 with sports talk, football results. (DeGennaro, NY) Radio Cultura Onda Tropicais, Manaus, **4845.2** at 1001 with PP talk on health. (DeGennaro, NY) Radio Rural, Santarem, **4765** at 0957 with religious message in PP, background music. (DeGennaro, NY) Radio Guarujá Paulista, Presidente Prudente, **5045** at 0358 with songs in PP. (DeGennaro, NY) Radio Educacao Rural, Tefe, **4925** at 1045 with time check, PP commls, music. (DeGennaro, NY)

BULGARIA—Radio Bulgaria, **5800** to Europe in EE at 2100. (Rossetti, MA) 2205 with various news features, ID 2230. //7500 with 5800 much better. (Wood, TN) 7500 at 1830 with IS, ID, news. (Paradis, ME) **9400** in RR at 1559, into another Slavic-type language at 1600. Also **11700** in GG at 1154. (DeGennaro, NY) **9700** at 0300 with IS, ID, schedule, news. (Burrow, WA)

BURKINA FASO—RTV Burkina, **5030** at 0600 sign on with light instl. music, opening anmts in FF at 0601, and local folk music. (Alexander, PA) 2140 with lively high-life music hosted by man in FF. ID by woman at 2200 and into news. (D'Angelo, PA)

CANADA—Radio Canada Int., **5850** via Sweden at 2103 with news, commentary, interviews. Also **9390** via Sweden at 2042 with news, schedule. (DeGennaro, NY) CFRX relay CFRB-Toronto, **6070** with "news talk 1010" ID at 0700. (Barton, AZ)

CENTRAL AFRICAN REPUBLIC—Radio Ndeke Luka, **11785** via UAE in FF heard at 1850 with music and talk. ID at 1905. (DeGennaro, NY)

CHAD—Radiodiffusion Nationale Tchadienne, **6165** via France in FF at 0530, just as Croatian Radio also began fading in, FF talk and highlife vocals. Obliterated by Radio Netherland opening at 0558. (D'Angelo, PA)

CHILE—Voz Cristiana, **9780** in SS with religious songs and messages in SS at 1054. Also **17680** at 2155. (DeGennaro, NY) **17660** at 2019 with usual SS format. (Jeffery, NY)

CHINA—China Radio Int., **7150** in unid language at 1138. (Foss, Philippines) **7290** (Xi'an) in RR at 1124, **9600** (Beijing) in EE to Europe at 2106, **9640** (Kashi) in SS to Western Europe at 2129. Also **11640** via Mali at 2125, **11850** via French Guiana in PP to Brazil at 0024 and **13630** via Mali in EE at 2040. (DeGennaro, NY) **9570** at

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VOICE OF AFRICA

Dear friends :- DAVID .W. WERONKA.

We have received your letter.

voice of Africa and also your notices.

We hope bridges of ties to be continued between us, welcoming your
Opinions and contributors.

With best regards

Researches and studies section
Listeners affairs
Voice of Africa

Address: Radio voice of Africa
Tripoli- Alfateh Street
p. O. Box (4677-4396-2009)

طرابلس هاتف: 4449109-4449108-4449209-4449208-4440112-4677-4396-ميرقي: 20540

بنق: لزي هاتف من: 91112 إلى: 91115 من: 274-9061-ميرقي: 60807

David Weronka got this reply from the Voice of Africa.

2358 going into EE program at 0000. (Burrow, WA) **9580** via Cuba at 0130 with business news. (Rossetti, MA) 11640 via Mali with African news at 2018. (Brossell, WI) 11885 at 1325. (Northrup, MO) **17730** via Cuba at 1500. (Paradis, ME) China National Radio/CPBS, **6175** in unid Asian lang, with talk about Macao at 2219. (Brossell, WI) **9455//9885** in CC at 2020. (Barton, AZ) 9455-Lingshi in unid lang. at 1613. (DeGennaro, NY) **11660** in CC at 1305. (Northrup, MO) Xizang PBS, Lhasa, **4905** at 1134 in presumed Tibetan with man-woman talking and short music breaks. (DeGennaro, NY) Guangxi PBS, Nanning, **5050** in CC at 1300. (Barton, AZ) 1521 with pop/rock in CC. (Foss, Philippines) Voice of the Strait, Fuzhou, **4900** at 1230 with non-stop music to 1300 time pips and ID. (Brossell, WI) 1242. (Strawman, IA)

COLOMBIA—La Voz del Guaviare, San Jose de Guaviare, **6035** at 0956 with Latin music from the '40s and '50s. (DeGennaro, NY) Ecos del Atrato, Quibdo, **5015** at 1118 with SS talks, many commls. (DeGennaro, NY) La Voz de su Conciencia, Puerto Lleras, **6009.8** at 1040 in EE/SS with religious messages and music. (DeGennaro, NY)

CLANDESTINE—Radio Free Asia, via Tajikistan, **7540** in CC at 2030 fading in and out over China music jammer. (Paradis, ME) 0455 via Saipan in CC at 1600. (Northrup, MO) **11540** in unid language at 1242. (Brossell, WI) Radio Solh (to Afghanistan) **17710** via England at 1512 with regional music, talks in Dari. (D'Angelo, PA) Voice of the People (to North Korea) **3912** at 1320 with woman anncr, vocal music. Reported jammer not noticed. (Barton, AZ) Voice of the Tigray

Revolution, **5500** at 0356 sign on with IS, echo ID and HOA music. Woman with opening anmts in Tigrinya and news. // **6350**. (D'Angelo, PA) 0440 with fast-talking anncr. (DeGennaro, PA) Radio Biafra Int., **7380** at 2130 with anti-Nigeria programming. (Paradis, ME)

CROATIA—Voice of Croatia, **6165** at 2220 with music and slow ballads in Croatian. (Brossell, WI) **7285** via Germany at 0300 with "Croatia Today." (Paradis, ME) 0308 with features on "Croatia Today." ID at 0312 and schedule. (Burrow, WA) 0443 in Croatian to WCNA. (DeGennaro, NY)

CUBA—Radio Havana Cuba, **6060** in SS at 0352, **6140** with Castro speech at 0317, **9505** in EE at 2242 and **9550** in SS at 2100. (DeGennaro, NY) Radio Reloj, **5025** in SS at 0925 and **11655** in SS at 1120. (DeGennaro, NY) 5025 at 2330. (Wood, TN)

CYPURS—BBC Relay, **9410** with news at 2113 and **9915** in AA at 2235. (Brossell, WI) 9915 at 2231 in AA to North Africa, DeGennaro, NY)

CZECH REPUBLIC—Radio Prague, **6200** at 0410 with news, **5930** at 2112, experiments with news, electronic music. **9880** to Europe in GG at 1115 and **11665** via Ascension in GG at 2136. (DeGennaro, NY) **9435** in Czech with jazz selections. Man with phonetic address at 2254 with language change. (Wood, TN)

DOMINICAN REPUBLIC—Radio Amanacer, Santo Domingo, **6025** with SS religious music and phone talk at 0330 to 0402 close with NA. (Alexander, PA)

ECUADOR—HCJB, **3220** in QQ at 0933, **6050** in SS at 0349 and **12025** in AA to North Africa at 2158. (DeGennaro, NY) La Voz del Napo, Tena, **3279/3280** in SS with religious program for children at 0940. (DeGennaro, NY) 0343 in SS. (Brossell, WI) Radio Buen Pastor, Saraguro, **4815** with SS religious programming at 1048. (DeGennaro, NY)

EGYPT—Radio Cairo/Egyptian Radio, **7260** in SS to America heard at 0100, **9760** to West Africa in AA at 2108, **9990** in GG to Europe at 2017 and **12050** in AA to Europe at 2009. (DeGennaro, NY) 9990 in EE with intermittent music, poorly modulated talk at 2121. Time pips and tentative ID at 2130 with mentions of Egypt. (Burrow, WA) 12050 in AA at 1600. (Paradis, ME) 1610 in AA. (Northrup, MO)

ENGLAND—BBC, **5995** at 0420, **6110** via Greenville in SS to Central America at 1113, **9410** to Western Europe at 1606 and **9625** in EE at 1103. (DeGennaro, NY) 9410 with news at 1605. (Northrup, MO)

EQUATORIAL GUINEA—Radio Nacional, Bata, **5005** at 0540 with SS talk, "Radio Bata" ID, Afro-pops, (Alexander, PA)

ETHIOPIA—Radio Ethiopia, **7110** with local music at 1830. (Paradis, ME) (t) **9560** at 1633 with U.S.-accented anncr and news, tentative IDs at 1640, possible interview and mentions of Ethiopia to 1653 when contemporary music and blocked by new signal. (Burrow, WA)



This could be an early model Czech-made radio, or maybe it's a time machine! (Thanks Robert Charlton, ON)

FRANCE—Radio France Int., **4890** Gabon Relay in FF at 0408. (Brossell, WI) **11615** in EE to Middle East at 1650. Off at 1652, **11705** in FF to Southern Africa at 1917 and **11965** in PP to Central and Southern Africa at 2033. (DeGennaro, NY) **15160** via South Africa with news in EE at 1606; also **15365** at 1612. (Jeffery, NY) **17710** via Japan in FF at 2310. (MacKenzie, CA)

FRENCH GUIANA—Radio France Int. Relay in FF to Central America at 1109. (DeGennaro, NY)

GABON—Africa Number One, **9580** in FF with local vocals at 2113, and **15475** with music at 1820. (DeGennaro, NY)

GERMANY—Deutsche Welle, **7200** via Portugal in presumed Bulgarian at 0500 and **11865** via Portugal in EE at 1924. (DeGennaro, NY) **15410** with “Focus on Folk” at 2130. (Rossetti, MA) Bayerischer Rundfunk, **6085** in GG at 1844 with jazz and blues. (DeGennaro, NY) Voice of America, via Julich, **9680** heard at 1942 in Farsi with phone-ins. Closing anmts and EE ID at 2000. No sign of Christian Voice via Sofia, which was supposed to be here at this hour. (D’Angelo, PA)

GREECE—Voice of Greece, **5865** in Greek to Western Europe and the Atlantic at 0133, **7475** in Greek with talk and phone-ins, **9420** with Greek songs and **12105** with music at 2048. (DeGennaro, NY) Radio Makedonias, **7450** in Greek with music, phone-ins at 2049. (DeGennaro, NY)

GUAM—Adventist World Radio, **17880** in CC at 2253. (MacKenzie, CA)

GUATEMALA—Radio Cultural, Coatan, San Sebastian, **4780** in SS at 1030 with opening SS anmts. ID at 1035 and into local religious programming. (Alexander, PA) 1040. (DeGennaro, NY) SS ID and music at 1200. (Brossell, WI) Radio Buenas Nuevas, **4799.8/4800** in vernacular with occasional SS words and hymns heard at 1105. (DeGennaro, NY) 1215 in SS. (Brossell, WI) 2350 with SS news, jingles between items, ID at 0001. (Wood, TN) 0127 in SS with QRM from All India Radio. (Mirabel, PR) Radio Verdad, **4052.5** at 0210 with listener’s letters about stamp collecting in “Club de la Amistad y Filatelia.” (Mirabel, PR)

GUINEA—RTV Guineenne, **7125** with news in FF. Signs off at 2359. (DeGennaro, NY) 2234 in FF with highlife instls. (Brossell, WI)

GUYANA—Voice of Guyana, **3291** at 0900 with “Hotel California” and inspirational message by man at 0958, time pips at 1000. (Wilkner, FL) 0350 with U.S. pops. (Brossell, WI) 0944 with religious message preceded by Hindi-style music. (DeGennaro, NY)

HAWAII—WWHR, **9930** at 1303 with Dr. Jack Van Impe program on the Illuminati. (Brossell, WI)

HONDURAS—Radio Luz y Vida, **3250** in SS heard at 0113. (Mirabel, PR) 0320 with Bible teachings in EE. (Brossell, WI) 1115 in EE and SS. (DeGennaro, NY)

HUNGARY—Radio Budapest, **6025** in GG heard at 2046 and **9825** in HH at 2238. (Brossell, WI)

INDIA—All India Radio, **5010**-Thiruvananthapuram in Hindi or other local language at 0126 with presumed news, **9425**-Bangalore in Hindi at 1357, **6165** at 1238 in HH to South Asia, **10330**-Bangalore with sign off anmts in HH at 1158, **11620**-Bangalore in RR to East Europe at 1656 and **11717**-Panaji (Goa) at 2127 in EE to Australasia. (DeGennaro, NY) **7115**-Panaji at 1800. (Paradis, ME) **9690**-Bangalore at 1343 ending commentary, General Overseas Service ID and into HH vocals. (D’Angelo, PA) **10330**-Bangalore with sub-continental music and HH talks. Also **11585** in HH at 1230. (Brossell, WI) 11585 relaying “Rainbow FM” with drama or soap opera. (Strawman, IA)

INDONESIA—RRI-Serui, **4605** in II at 0955 with slow-tempo, soft rock and country-style thing, all in presumed II. (Foss, Philippines) 1220, // **4750**-Makassar, **4790**-FakFak and **4925**-Jambi. 4790 and **4925** broke away at 1230. (Wilkner, FL) RRI-Palangkaraya, **3325** at 1125 in unid lang, then music. // **4925**. (Wilkner, FL) RRI-Makassar, 4750 in II at 1238. (Brossell, WI) RRI-Pontianak, **3975** in II with lively music monitored at 1115. (Barton, AZ) RRI-Cimanggis, **9680** at 0047 with pop/rock sung in II. (Foss, Philippines)

IRAN—VOIRI, **6120** with “Voice of Justice” EE program at 0218 and **6180** in FF to Europe at 1849. (DeGennaro, NY) **7205** in AA with ID, news, Koran. (Paradis, ME) **9905** in SS at 0027, IS, ID at 0030. (Burrow, WA)

ISRAEL—Kol Israel, **6280** at 2000 on upcoming joint military exercise. (Paradis, ME) **9345** in Hebrew at 2039, **9390** in SS at 2045 and **11605** in unid language at 1646. (DeGennaro, NY) 9390 with “Weekend Report” heard at 2014, ID 2024. Transition into FF at 2030. (D’Angelo, PA)

ITALY—RAI Int., **6010** at 2047 with bird IS, ID in II at 2100. (Brossell, WI) **6110** via Ascension in II at 0207, **9840** with discussion on Italian film industry at 0202, **11670** in AA with Italian pops, **11880** in PP to Africa at 2058 and **15250** at 1807 with various talks in II. (DeGennaro, NY) **9760** at 2200 with opening in possible GG. (Burrow, WA)

JAPAN—Radio Japan/NHK, **9505** at 1350 with feature on Japanese martial arts. (Northrup, MO) **9660** via UK in GG to Europe at 1109 and **11710** via UK at 1158 with news in RR. (DeGennaro, NY) **17605** via Bonaire in JJ at 2317. Also **17810** in Indonesian at 2303 and **17825** in JJ at 2255, // **11910**. (MacKenzie, CA) **15590** in JJ at 0928. (Foss, Philippines)

JORDAN—Radio Jordan, **9830** in AA at 2012 and **11690** at 1440 with music and woman DJ. (DeGennaro, NY) 11690 at 1400 carrying local 96.3 FM with western pops. (Paradis, ME) 1607 with pops, EE ID, more pops. (Burrow, WA) **11810** with music and DJ heard at 1320. (Northrup, MO)

KAZKHSTAN—Deutsche Welle via Almaty **9395** in GG at 1240. (Brossell, WI) 1335 in GG with sked and address. (Strawman, IA)

KUWAIT—Radio Kuwait, **9855** in AA to Europe and NA at 2213 and **9880** in AA at 2115. (DeGennaro, NY)

LIBYA—Radio Jamahiriya, **9485** via France with EE news and ID at 1820 to 1823, // **11635**. 11635 in EE at 2032 to 2035 with ID, news. Into FF at 2035. (Alexander, PA) 9485 in AA at 1855 with close at 1857 and **11715** in AA to East Africa at 1805. All frequencies via France. (DeGennaro, NY)

LITHUANIA—Radio Vilnius, **9875** at 2357 with ID and closing of EE segment and into unid language. (Burrow, WA)

MADAGASCAR—RV Malagasy, **5010** at 0302 with woman and news in Malagasy, instl music, talk by man, more music and ID by woman at 0310. Fading rapidly. (D’Angelo, PA) Radio Netherland Relay, **7120** at 1900 with feature on Quaker beliefs. (Paradis, ME)

MALAYSIA—Radio Malaysia, **4895** with local vocals heard at 1027. (Foss, Philippines) **7295** at 1600 with news, “Radio 4” ID and into Muslim moral lesson before pops. (Burrow, WA)

MALI—ORT Malienne, **4787v** at 2310 with FF talk, FF pops. Off with NA at 2359. Weak, and poor-weak on // **5995**. Also noted about seven hours later on **4782.9** and 5995. (Alexander, PA)

MAURITANIA—Radio Mauritanie, **4845** with two men in AA at 0035. (DeGennaro, NY)

MEXICO—Radio Mil, **6010** in SS with romantic ballads at 1315.

(Barton, AZ) XEXQ/Radio Universidad, San Luis Potosi, **6045** with classical music at 1320. (Wilkner, FL) Radio Transcontinental, Mexico City, **4810** with SS songs at 1229. (Brossell, WI) Radio Huayacocotla, **2390** at 2355 with woman and SS ID, music. (Wilkner, FL) Radio Educacion, **6185** beating out Brazil with SS programming heard at 1049. (DeGennaro, NY)

MOLDOVA—Voice of Russia via Moldova **7125** in RR to ECNA at 0418 and **7180** in EE heard at 0416. (DeGennaro, NY)

MOROCCO—RTV Marocaine, **5980** in AA to North Africa at 0458 and **15335** with conversation in AA at 1121. (DeGennaro, NY) 15345 with two men in AA and mentions of "Allah" at 1830. (Wood, TN) VOA Relay, **15240** with "Africa News Now" at 1800. (Paradis, ME) Radio Medi-Un, **9575** with news and comment in FF heard at 1148. (DeGennaro, NY)

NETHERLANDS—Radio Netherland, **5955** in DD to Western Europe monitored at 1046 and **11655** in EE to Europe at 1910. (DeGennaro, NY) **13700** with news in DD at 1700. (Barton, AZ)

NETHERLANDS ANTILLES—Radio Netherland Bonaire Relay, **11675** with "The Week Ahead" at 1233. (Brossell, WI) **17810** with "Research File" at 1909. (Jeffery, NY)

NEW ZEALAND—RNZI, **9870** with news at 1302. (Brossell, WI) 1310. (Northrup, MO) 1607 with marine weather and news items. Also **15265** with "Pathways to Adventure" at 1944 and **15720** with domestic programming from National Radio at 0604. (Burrow, WA) **9885** with music to 1059 when they switched to **15530**. (DeGennaro, NY) **17675** at 2315 with comments on current events. (MacKenzie, CA)

NIGERIA—Voice of Nigeria, **7255** at 2000 with news and a program on education. (Paradis, ME)

NORTH KOREA—Pyongyang Broadcasting Station, **6250** with KK talks at 1250. (Brossell, WI) **6398.9** in KK at 1152. (Foss, Philippines) Voice of Korea, **9345** with revolutionary opera at 0318. (Burrow, WA)

NORTHERN MARIANAS—KFBS-Far East Broadcasting, Saipan, **9465** in RR to Asia heard at 1401. (DeGennaro, NY)

PAKISTAN—Radio Pakistan, **11570** at 1558 with IS and opening broadcast but too weak to copy. (Burrow, WA)

PALAU—KHBN/Voice of Hope, **15725** with woman in unid language at 0937. (Foss, Philippines)

PAPUA NEW GUINEA—NBC, **4890** at 1125 with rap and other U.S. styles. (DeGennaro, NY) 1234 with prayers and hymns. (Brossell, WI) Radio Sandaun, Vanimo, **3205** at 1034 with program on education in PNG. (Foss, Philippines) Radio East New Britain, Rabaul (t) **3385** at 0930 with music and talk. Barely above the static level. (Barton, AZ)

PERU—(All SS) Radio Melodia, **5939.3** at 0750 with SS talk, ID at 0759. (Alexander, PA) Radio Ancash, Huaraz, **4990.9v** at 1000

with echo chamber ID, "Radio Ancash en Peru." (Wilkner, FL) Radio Tarma, Tarma, **4775** at 1037 with flutes & drums, anmts in SS. (DeGennaro, NY) Radio Tacna, Tacna, **9504** with two men conversing at 1054. (DeGennaro, NY) Radio Victoria, Lima, **6020** with religious talk at 0846. (DeGennaro, NY)

PHILIPPINES—VOA Relay, **9760** with "News Now" format at 1245. (Jeffery, NY) **17740** with news items heard at 2308. // **15185, 15205, 15290**. (MacKenzie, CA)

PIRATES—Crystal Ship, **4070** at 0130 with ID and rock tune. (Wood, TN) **6852.9** at 2351 with anti-Bush program. (Zeller, OH) WEAK, **6925 USB** at 2356 with entire program of rock from the '50s and slogan of "Chicago's own WEAK." (Zeller, OH) Grasscutter Radio, **6925 USB** at 2225 with classic rock, "broadcasting from the ionosphere." Gave an apparently new e-mail address of grasscutterrado@yahoo.com. (Zeller, OH) KIPM, **6925 USB** at 0030 sign on with Alan Maxwell and typical complex existential drama. (Zeller, OH) Sunshine Radio, **6925 USB** at 2152 sign on. Mostly old rock with a young boy giving occasional ID between songs. (Zeller, OH) Mystery Radio, **6219.9** at 2140 with continuous U.S. pops. (Alexander, PA) Ground Zero Radio, **6925.6** at 2056 opening with trumpet fanfare and into the old "Duck and Cover" song. (Zeller, OH) Take It Easy Radio, **6925 USB** at 0208 sign on replaying a 1944 episode of the Kraft Music Hall and later a Crosby/Hope special from a military base in June, 1944. (Zeller, OH) WMPR, **6955** at 0010 with techno stuff and ID. (Wood, TN) XERV relay, **6925 USB** at 2132. Apparently a relay of a Los Angeles mediumwave station, which uses those call letters for their 1090 MW in LA. Also uses "Radio North America" as a slogan. Oldies rock format. (Zeller, OH) Undercover Radio, **6925 USB** at 2241 opening "broadcasting from the middle of nowhere." Mostly rock with frequent IDs by Dr. Benway who gave Merlin, Ontario, address for postal reports and undercoveradio@mail.com for e-mail reports. Off at 2255. (Zeller, OH) 2231 opening to 2241 close and 2244 opening to 2250 close. (D'Angelo, PA) Ironman Radio, **6925 USB** at 2222 with mainly blues, some rock. Anncr "Scruffy Swab" gave Belfast address for reports and asked for postings on the Free Radio Network for any loggings. (Zeller, OH) Radio Malaisi, (Europirate) on **6310** at 2130 with Euro and U.S. pops, canned IDs. (Alexander, PA) 2203 with numerous IDs and pop program. Gave an address in Germany for reports (not caught). (D'Angelo, PA)

ROMANIA—Radio Romania Int., **7130** with news and commentary at 1800. (Paradis, ME) **7140** in SS to Western Europe at 2028. (DeGennaro, NY)

RUSSIA—Voice of Russia, **5900** in SS ("La Voiz de la Russia") to South America at 0140, **7150** (Moscow) at 0410 soliciting advertising through their financial news, **7350** via Vatican to North America at 0454, **7390** (Samara) in PP to Brazil at 0011 and **11510**

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via Armenia in EE to Europe at 1950. (DeGennaro, NY) **6205** in unid Asian language at 1247, also on **9800** at 1300. (Brossell, WI) **7300** at 2130 with news brief, classical music. (Paradis, ME) **9770** (Irkutsk) in RR to SEA and Australia at 1325. Very commercial sound. (Strawman, IA)

RWANDA—Radio Rwanda, **6055** at 2035 with live request program, anncr with African dialect and FF pops. I can't remember the last time I heard this station! (Brossell, WI) 2038 with pop vocals and man in FF talk. Covered by another station sign on at 2100. (D'Angelo, PA) Deutsche Welle Relay, **6180** in EE at 0427 and **11945** in GG to South Africa at 2144. (DeGennaro, NY) **9545** with "Newslink" program at 0413. Also **11690** at 2157 open with IS, ID and into GG program. (D'Angelo, PA) **9870** in GG at 0325. (Brossell, WI)

SAO TOME—VOA Relay, **4960** with news at 0311. Also on **6035** with solid gold hits at 2043. (Brossell, WI)

SAUDI ARABIA—BSKSA **9870** in AA at 2207. (Brossell, WI) 2227 with AA talk, music. (DeGennaro, NY)

SINGAPORE—Mediacorp Radio, **7170** with woman in Tamil at 1132. (Foss, Philippines) BBC Relay, **9740** with "World Briefing" at 1106. (D'Angelo, PA) 1300 with news. (Brossell, WI)

SLOVAKIA—**7345** in FF at 2043. (DeGennaro, NY)

SOLOMON ISLANDS—SIBS (p) **5020**

with mix of lively music at 1045. (Barton, AZ)

SOUTH AFRICA—Channel Africa, **3345** at 0259 sign on with “You are tuned to the English Service of Channel Africa broadcasting from Johannesburg, South Africa.” Then brief drum, another ID, choral anthem and news. (D’Angelo, PA) **7390** at 0315 in EE/AA, closing at 0356. (Yohnicki, ON) **15285** to West Africa at 1700 with Africa news and sports (Burrow, WA) 1812 on tourism’s value to South Africa. (DeGennaro, NY) Radio Sondergrense, **3320** in Afrikaans at 0328. (DeGennaro, NY) BBC Relay, **3255** with news at 0320. Also **11765** at 0332 (Brossell, WI) **6190** at 0342 with GMT TCS, multiple IDs at 0359 before time pips and news at 0400. Fair until co-channel CRI opened. (D’Angelo, PA). Adventist World Radio (via) **15295** with talk on Jesus at 2016. (Brossell, WI)

SOUTH KOREA—Radio Korea Int., **5975** at 1612 with news, ID. (Burrow, WA) **11795** via Canada in SS with news from East Asia. (DeGennaro, NY)

SPAIN—Radio Exterior de Espana, **9595** in FF to Africa at 1950, **9630** with futbol matches in SS at 2116 and **12035** in AA to Middle East at 2005. (DeGennaro, NY) **9680** with “Day by Day” program at 2000. (Paradis, ME) 2036 with various features, ID and sked at 2055. (Burrow, WA)

SRI LANKA—VOA Relay, **9335** in unid language monitored at 0057. (Foss, Philippines)

SWEDEN—Radio Sweden, **9490** with news and comment in Swedish monitored at 1127. (DeGennaro, NY) **15240** at 1430. (Barton, AZ)

SWAZILAND—Trans World Radio, **3200** in African dialect at 0320, //**3240**. (Brossell, WI) 3240 with tribal vocals, m/w in listed Ndebele, ID and address at 0329, EE ID at 0330 and into listed Nda. (D’Angelo, PA) **9500** at 1729 with IS, ID and next program. (Burrow, WA)

SUDAN—Republic of Sudan Radio, **7200** in AA at 0420 with talks and presumed news. (DeGennaro, NY) Sudan Radio Service (via UK) **15530** at 1500 sign on to 1659 close. IDs, sked, contact info including fax number “You are listening to Sudan Radio Service dedicated to peace and development in Sudan.” Program preview and EE news about Sudan, Afro-pops and “Our Voices” program at 1515. Into AA and vern at 1545. VOA uses this transmitter prior to 1500. (Alexander, PA)

SURINAME—Radio Apinte, **4990** in DD at 1013. (DeGennaro, NY) **4991** at 0144 with soft pop/rock. (Mirabel, PR) 0325 fading up with pops and then taking a dive by 0350. (Strawman, IA)

TAIWAN—Radio Taiwan Int., **5950** (via Florida—gld) and **15320** at 0319 with “Top Stories.” (Burrow, WA) **15440** (via Florida—gld) opening at 2000 and into FF. (Barton, AZ) CBS, **11710** at 2252 with questions in EE, answers in CC. (Brossell, WI)

TAJIKISTAN—Voice of Russia (via) **11500** in listed Hindi at 1245. (Brossell, WI)

This Month's Book Winner

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

Our book winner this month is **Cero DeGennaro** who must have 10 sets of ears. How else could he bag so much stuff every month? Universal Radio has sent Cero a copy of *Joe Carr’s Receiving Antenna Handbook* to help him hear even more. If you don’t have a copy of Universal’s latest catalog in your listening post, you’re ignoring a great resource! Before you turn your receiver on again, request your free copy by calling the company at 614-866-4267, e-mailing them at dx@universal-radio.com, or by sending a note to 6830 Americana Parkway, Reynoldsburg, OH 43068.

TANZANIA—Radio Tanzania, **5050** in Swahili at 0400, ID at 0401 and into conversation. (DeGennaro, NY)

THAILAND—HSK9/Radio Thailand, **5890** via Greenville at 0033 with report on Thai food vendor safety, ID and feature on gambling in Thailand. (Burrow, WA) 0136 in Thai. Also **9535** with news items at 2040. (DeGennaro, NY) **9570** with news, weather at 0021. (Jeffery, NY) **9810** with news at 1237. (Brossell, WI) VOA Relay, **9645** at 1330 with “Today in History” feature. (Strawman, IA) 1335 with program on Wes Montgomery and program ID as VOA Jazz America. (D’Angelo, PA)

TUNISIA—RT Tunisienne, **7190** in AA at 0412 and **9720** at 2005, also in AA. (DeGennaro, NY) **7225** in AA at 1800. (Paradis, ME) **12005** in AA at 1800. (Wood, TN) 2030. (DeGennaro, NY)

TURKEY—Voice of Turkey, **5980** in TT at 2050. (Brossell, WI) **7155** in FF at 2034, **7300** in TT at 0449 and **11905** in TT at 1531. (DeGennaro, NY) **7295** in presumed Kazakh (scheduled for this time) with IS, time pips and presumed ID at 1600. Then buried by Radio Malaysia. (Burrow, WA) **15155** with “Magic of Nature” program at 1330. (Paradis, ME) 1400 with “Turkish Sport in the Republican Era.” (Foss, Philippines)

UKRAINE—Radio Ukraine Int. **5910** in EE to ECNA at 0150. (DeGennaro, NY) **7440** at 0438, ID 0456 and sked. (Burrow, WA)

UNITED ARAB EMIRATES—Emirates Radio, **13650** in AA at 1400. (Paradis, ME)

USA—WWRB, **3185** at 0300. Unlisted here. (Brossell, WI) WHRI, new **5860** heard at 1046. Off at 1058. (Jeffery, NY) AFN/AFRTS, **5446.6 USB** at 1140 on cosmetics. (Mirabel, PR)

UZBEKISTAN—Radio Tashkent, **9715** at 1347 with music and “You are listening to Radio Tashkent” at 1348. Close at 1359, IS and opening in Urdu. (D’Angelo, PA) 1415 in unid language. (DeGennaro, NY)

VATICAN—**11625** in Latin to West Africa at 1957 and **15570** in vernacular to

West Africa at 1825. (DeGennaro, NY)

VIETNAM—Voice of Vietnam, **6175** (via Canada—gld) in SS at 0325. (Burrow, WA) **9840** in EE to SEA at 1238. (DeGennaro, NY)

VENEZUELA—Radio Amazonas, Puerto Ayacucho, **4939.7** at 1050 in SS with “Llanero-style” music. (DeGennaro, NY) YVTO time station, **5000** with SS time anmts at 1057. (DeGennaro, NY)

YEMEN—Republic of Yemen Radio, **9779.6** at 1831 with EE news and ID, U.S. pops, program on local agriculture at 1840, more pops, news at 1856, closing anmts at 1858. (Alexander, PA)

ZAMBIA—ZNBC Radio 2, **4500** at 0350 with pop vocals in EE, TC at 0355 and 2 + 1 time pips f/by ID and news. Also **4910** at 2149 with highlife music and phone-ins. (D’Angelo, PA) 0338 in unid language. (DeGennaro, NY) **6165** with Fish Eagle IS at 0240 sign on, anthem at 0250. Barely audible under Radio Nederland. Not //4910. (Alexander, PA)

ZIMBABWE—ZBC, **3306** with hymns and choral selections at 0313. Annoying QRM. (Brossell, WI)

And once again, order is restored. Let sound a thousand trumpets in a fanfare of thanks to the following folks who did the good thing this time: Joe Wood, Venore, TN; Brian Alexander, Mechanicsburg, PA; Bruce R. Burrow, Snoqualmie, WA; Rick Barton, Phoenix, AZ; George Zeller, Cleveland, OH; Lou Rossetti, Arlington, MA; Dave Jeffery, Niagara Falls, NY; Robert Brossell, Pewaukee, WI; Stewart McKenzie, Huntington Beach, CA; Ray Paradis, Pittsfield, ME; Michael Yohnicki, London, ON; Robert Wilkner, Pompano Beach, FL; Rich D’Angelo, Wyomissing, PA; Marty Foss, Guinayangan, Philippines; Mark Northrup, Gladstone, MO; Jerry Strawman, Des Moines, IA, and Alvin Mirabel, St. Just, Puerto Rico. ■

May 2005 Pop'Comm Survey Questions

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 Newsstand2
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 Supermarket4
 Convenience store5
 Drug store6
 Subscription7

Finding Pop'Comm on the newsstand in my area is relatively easy.

Yes8
 No9

When I get Pop'Comm, I spend the following amount of time with the magazine:

Less than a half-hour10
 One-half to one hour11
 One to two hours12
 Two to three hours13
 More than three hours14

I've purchased a product as a direct result of reading a Pop'Comm equipment review:

Yes15
 No16

I've purchased a product as a direct result of reading a Pop'Comm advertisement:

Yes17
 No18

During the past 12 months I've used a CB radio about this much time:

I haven't19
 Once or twice20
 Three or four times21
 Several times daily22
 About once a week23
 Once a month24

I would purchase a Best Of Alice Brannigan or Shannon Huniwell book if it were available.

Yes25
 No26

During the past 12 months I've used GMRS radio about this much time:

I haven't27
 Once or twice28
 Three or four times29
 Several times daily30
 About once a week31

During the past 12 months I've used a ham transceiver about this much time:

I haven't32
 Once or twice33
 Three or four times34
 Several times daily35
 About once a week36

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The Times, They Are A-Changin'— But Not Overnight

My taste in music is very eclectic. I have music from the '40s to today, including classical, rock, rockabilly, jazz, sacred, country, and folk. I currently have over 700 records, plus cassettes, reel-to-reels, CDs, and mp3s, and even some 8-tracks hidden somewhere, too. I've never been a big Bob Dylan fan, but the title of one of his songs from the early '60s says it all: "The Times, They Are a-Changin'."

Over the next two years the biggest change in air traffic, since the PATCO strike of 1981, will occur as 34 of the 54 current FSSs (see "Glossary") in the United States and Puerto Rico will be closed and/or consolidated with others around the country. The stations in Alaska are not involved in this consolidation.

On February 1 it was announced that the U.S. government had awarded a five-year contract with Lockheed-Martin to run the nation's FSSs (see "Glossary"). Of the 2,000-plus controllers, many will work for the contractor, some will retire, many will attempt to transfer to other air traffic facilities at one of the centers or approaches or towers. And most others will try to find jobs in other parts of the federal government. Most pilots may not see major changes in the way they contact FSSs for briefings. The remote communications outlets should remain in use, but will be rerouted to another FSS.

Before I get into describing some of the new equipment that will be involved, let me give you the facilities that will remain in operation. Over the last couple of years, air traffic has gone from 10 or 12 regions to three service areas: Western, Central, and Eastern. The new FSS system will have one hub in each service area plus three to nine additional facilities per hub. The Western Service Area, which serves Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming, will have its hub in Prescott, Arizona (NPR will be the new ID), with additional facilities in Oakland, California (OAK), San Diego (SAN), Honolulu (HNL), Seattle (SEA), and Denver (DEN).

The Central Service Area, which serves Arkansas, Iowa, Kansas,

Louisiana, Oklahoma, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, South Dakota, and Texas, will have its hub in Fort Worth, Texas (NFT). The facilities that will remain open are Columbia, Missouri (COU), Albuquerque (ABQ), and Princeton, Minnesota (PNM).

Finally, the Eastern Service Area will be hubbed at Leesburg, Virginia (NDC). This area will serve Alabama, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin, as well as the District of Columbia, Puerto Rico, and the U.S. Virgin Islands. The FSSs that will be servicing these states and territories include Nashville (BNA), Raleigh (RDU), Islip, New York (ISP), St. Petersburg, Florida (PIE), Macon, Georgia (MCN), Miami (MIA), San Juan (SJU), Kankakee, Illinois (IKK), and Lansing (LAN).

Currently the FSSs use a computer



This aircraft is an AT6 Texan, a primary trainer used during WWII and Korea. It looks incredibly like a Japanese WWII Mitsubishi Zero so many war films use the Texan as Zeros.

system called Model One-Full Capacity (M1FC). The company that made this system, over 20 years ago, no longer exists so parts are quite scarce. Had the FSSs remained in the FAA, all would have received a system called OASIS, but many bugs had yet to be worked out. The 20 stations under the control of Lockheed-Martin will have a new system that will be interlaced throughout the country. This system, referred to as FS21, will be using off-the-shelf computers and monitors that will tie into each other. This gives all the FSS controllers the ability to



On the flight line, these odd looking aircraft with the noses on the ground are Rutan Vari-E-Zs. They are one of the most popular homebuilt aircraft, most seating one or two and with cruise speeds for some reaching into the high 100s/low 200s.

Glossary Of Terms And Acronyms

ARTCC (Air Route Traffic Control Center)—A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight.

ATC (Air Traffic Control)—Means what it sounds like.

DUATS (Direct User Access Terminal System)—A service that allows pilots to receive alphanumeric preflight weather data and even file domestic VFR and IFR flight plans.

FSS (Flight Service Station)—Air traffic facilities that provide pilot briefing, en route communications and VFR search and rescue services. They also assist lost aircraft and aircraft in emergency situations, and relay ATC clearances.

ICAO (International Civil Aviation Organization)—Headquartered in Montreal, Canada, this agency of the UN develops the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth.

IFR (Instrument Flight Rules)—A set of rules governing the conduct of flight under instrument meteorological conditions.

ILS (Instrument Landing System) Approach Plate—Diagram published by the FAA and privately that depicts the procedure pilots need to follow to execute an ILS approach.

NOTAM (Notices To Airmen)—A notice of information that contains timely data concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) which is essential to personnel concerned with flight operations.

UNICOM—An aeronautical advisory station primarily for private aircraft.

VFR (Visual Flight Rule)—A set of regulations that a pilot may operate under when weather conditions meet certain minimum requirements. They are to be followed when there is sufficient visibility for aircraft to be seen and avoided.

VORTAC—The VOR system is the backbone of air navigation in the US and most other countries. It is composed of usually round buildings, about 30-feet in diameter, with a cone sticking out of the top. Many are painted in a red and white checkerboard pattern. VOR is an acronym for Very high frequency Omni Range. VORTAC is the same with TAC, standing for TACAN, a military designation for its distance information on a VOR signal.

WSI (Weather Services International)—Headquartered in Andover, Massachusetts with offices in Birmingham, England, WSI provides weather-related products and information to professionals in the energy, aviation, and media markets, as well as multiple federal and state government agencies.

pull up a flight plan from anywhere in the country, even those filed under DUATS.

An Example

Today, if a pilot is currently in Omaha, Nebraska, and has filed a series of flight plans across the country, only a controller at the station where the pilot filed can access his or her flight plan. And there's no way a controller can retrieve a flight plan filed with DUATS. With the FS21 system, however, controllers can retrieve, modify, and re-file, if necessary, any flight plan from any point in the National Airspace System, including those filed with DUATS. In addition, a pilot using a specific Web Portal will be able to see the weather map the controller pulls up when the pilot is given his briefing.

These things will not happen overnight,

though. The target date to have all affected FSSs closed and the FS21 up and running, as well as the three hubs and 17 legacy facilities, is sometime in the spring of 2007, some 18 months after Lockheed-Martin takes over the FSS system.

I'll pass on more information as it comes in.

Sun 'n Fun Fly-In At Lakeland Linder Regional Airport, Florida

This month is the 31st annual Sun 'n Fun fly-in at Lakeland, Florida's (LAL) airport. Each year since 1975 the air show has grown in attendance, with perhaps the exception of the 2002 show, a scant seven months following the terrorist attacks of 9/11. Each show seems to outdo the previous one, and I expect it to be no different

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<p>Other Frequencies Of Interest In The Area</p>	
<p>Avon Park (AVO)</p> <p>UNICOM 122.8</p> <p>Bartow ATCT (BOW)</p> <p>LC 121.2</p> <p>GC 121.9</p> <p>MacDill AFB ATCT (MCF)</p> <p>LC 123.7/294.7</p> <p>GC 121.65/275.8</p> <p>ATIS 133.825/270.1</p> <p>St. Petersburg-Albert Whitted Airport ATCT (SPG)</p> <p>LC 127.4/257.6</p> <p>GC 121.8</p>	



"Sizzlin' Liz" is a flight line of P-51 Mustangs, undoubtedly the most popular fighter of WWII, and probably the fighter most dangerous to the Axis powers during the war.

this year. And, for the first time since the 2002 fly-in, I get to go back to work as a controller at the Lakeland Temporary FSS. (As of this column I don't know the future of the Temporary FSS under the leadership of Lockheed-Martin. I'll endeavor to keep you updated as soon as I know something.) The frequencies, I believe, will be the same as previous years (see box).

I trust that you will enjoy the Sun 'n Fun fly-in if you're in the area. It is a scanner enthusiast's dream. And the flying ain't bad, neither. Stop in at the Temporary FSS, and say hello. I'll be there most days, just ask for "HR."

See You In Two

Until the next "Plane Sense" column in June (remember, we're a bimonthly column now), keep fresh batteries in your scanners and enjoy listening! ■

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Copies most standard shifts and speeds. Has MFJ AutoTrak™ Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, \$12.95. 5 1/4x2 1/2xHx5 1/4D inches.

No Matter What™ 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.

Eliminate power line noise!



MFJ-1026
\$179⁹⁵

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

Matches your antenna to your receiver so you get maximum signal and minimum loss. MFJ-959C 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, \$12.95.

High-Gain Preselector

High-gain, high-Q receiver preselector 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, \$12.95.

Dual Tunable Audio Filter

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 inches.

MFJ Shortwave Headphones



MFJ-392B
\$199⁹⁵
New!

Perfect for shortwave radio listening for all modes -- SSB, FM, AM, data and CW. Superb padded headband and ear cushioned design makes listening extremely comfortable as you listen to stations all over the world! High-performance driver unit reproduces enhanced communication sound. Weighs 8 ounces, 9 ft. cord. Handles 450 mW. Frequency response is 100-24,000 Hz.

High-Q Passive Preselector

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 in.

Super Passive Preselector

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 loss. Air variable capacitor with vernier. 1.6-33 MHz.

MFJ Shortwave Speaker

This MFJ ClearTone™ restores the broadcast quality sound of shortwave listening. Makes copying easier, enhances speech, improves intelligibility, reduces noise, static, hum. 3 in. speaker handles 8 Watts. 8 Ohm impedance. 6 foot cord.

MFJ All Band Doublet

102 ft. all band doublet covers .5 to 60 MHz. Super strong custom fiberglass center insulator provides stress relief for ladder line (100 ft.).

Authentic glazed ceramic end insulators and heavy duty 14 gauge 7-strand copper wire.

MFJ Antenna Switches

MFJ-1704 \$69⁹⁵ MFJ-1702C \$24⁹⁵

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.

Morse Code Reader

Place this pocket-sized MFJ Morse Code Reader near your receiver's speaker. Then watch CW turn into solid text messages on LCD. Eavesdrop on Morse Code QSOs from hams all over the world!

MFJ 24/12 Hour Station Clock

MFJ-108B, \$19.95. Dual 24/12 hour clock. Read UTC/local time at-a-glance. High-contrast 5/8" LCD, brushed aluminum frame. Batteries included. 4 1/2x1Dx2H inches.

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

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

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

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	5930	Radio Prague, Czech Republic		0330	9885	VOA Relay, Botswana	
0030	9905	VOIRI, Iran		0330	7160	Radio Tirana, Albania	
0030	9335	VOA Relay, Sri Lanka	unid	0330	6035	VOA Relay, Botswana	
0030	4755	Radio Educacao Rural, Brazil	PP	0330	6940	Radio Fana, Ethiopia	
0030	7365	FEBA via Armenia	Tamil	0330	5025	Radio Rebelde, Cuba	SS
0030	6798	Ondas del Rio Mayo, Peru	SS	0400	4890	Radio France Int., via Gabon	FF
0100	7260	Radio Cairo, Egypt		0400	7190	RTT Tunisienne, Tunisia	AA
0100	4979	Crystal Ship - pirate	irregular	0400	4991	Radio Apinte, Suriname	DD
0100	9345	Kol Israel	HH	0400	5500	Voice of Tigray Revolution, Ethiopia	vern
0100	12015	Voice of Korea, N. Korea		0400	6180	Deutsche Welle Relay, Rwanda	
0130	4799	Radio Buenas Nuevas, Guatemala	S	0400	7180	Voice of Russia, via Moldova	
0130	5865	Voice of Greece	Greek	0400	4950	Radio Nacional, Angola	PP
0130	9580	China Radio Int., via Cuba		0400	3340	Radio Misiones Int., Honduras	SS
0130	5910	Radio Ukraine Int.		0400	4750	Radio Peace, Sudan	
0130	5890	Radio Thailand, via USA	TT	0400	7210	Radio Minsk, Belarus	various
0200	3250	Radio Luz y Vida, Honduras	SS/EE	0400	9515	Radio Sultanate of Oman	AA
0200	4052.5	Radio Verdad, Guatemala	SS	0430	5980	RTV Marocaine, Morocco	AA
0200	6110	RAI Int., Italy	II	0430	7440	Radio Ukraine Int.	
0200	6120	VOIRI, Iran		0430	7300	Voice of Turkey	TT
0200	4875	Radio Difusora Roraima, Brazil	PP	0430	7200	Republic of Sudan Radio	AA
0200	11700	Radio Bulgaria		0430	7350	Voice of Russia, via Vatican	
0200	11710	RAE, Argentina	SS/EE	0430	5985	RTV Congolaise, Congo (Rep)	FF
0200	6973	Galei Zahal, Israel	HH	0500	6185	Radio Educacion, Mexico	SS
0230	4810	Radio Transcontinental, Mexico	SS	0500	9575	Radio Medi-un, Morocco	FF
0300	6140	Radio Havana Cuba	SS	0500	6165	RN Tchadienne, Chad	FF
0300	6025	Radio Amanacer, Dominican Republic	SS	0500	7255	Voice of Nigeria	
0300	6175	Voice of Vietnam, via Canada	various	0530	5005	Radio Bata, Equatorial Guinea	SS
0300	6165	Radio 2, Zambia		0530	4777	RTV Gabonaise, Gabon	FF
0300	3306	Zimbabwe Broadcasting Corp.		0600	7125	RTV Guineenne, Guinea	FF
0300	3240	Trans World Radio, Swaziland	vern	0600	4845	Radio Mauritania, Mauritania	AA
0300	3345	Channel Africa, South Africa		0600	5030	RTV Burkina, Burkina Faso	FF
0300	7285	Voice of Croatia, via Germany		0600	4760	ELWA, Liberia	
0300	4960	VOA Relay, Sao tome		0600	7490	Radio Ukraine Int.	UU
0300	3320	Radio Sondergrense, South Africa	Afrikaans	0630	6010	Radio Mil, Mexico	SS
0300	4915	Radio Nacional, Macapa, Brazil	PP	0700	6070	CFRX, Canada	
0300	9870	Deutsche Welle Relay, Rwanda	GG	0700	4783	ORTM, Mali	FF
0300	9345	Voice of Korea, North Korea		0700	7365	Radio Marti, USA	SS
0300	9700	Radio Bulgaria		0730	11600	Radio Bulgaria	
0300	4965	Christian Voice, Zambia		0800	5940	Radio Melodia, Peru	SS
0300	7105	Radio Farda, USA to Iran via Greece	Farsi	0800	7345	Radio Slovakia Int.	
0300	7110	Radio Ethiopia	vern	0800	5035	Radio Aparecida, Brazil	PP
0330	7390	Channel Africa, South Africa		0800	7365	KNLS, Alaska	
0330	11765	BBC Relay, South Africa		0830	6020	Radio Victoria, Peru	SS
0330	6050	HCJB, Ecuador	SS	0830	6040	Radio Clube Paranaense, Brazil	PP

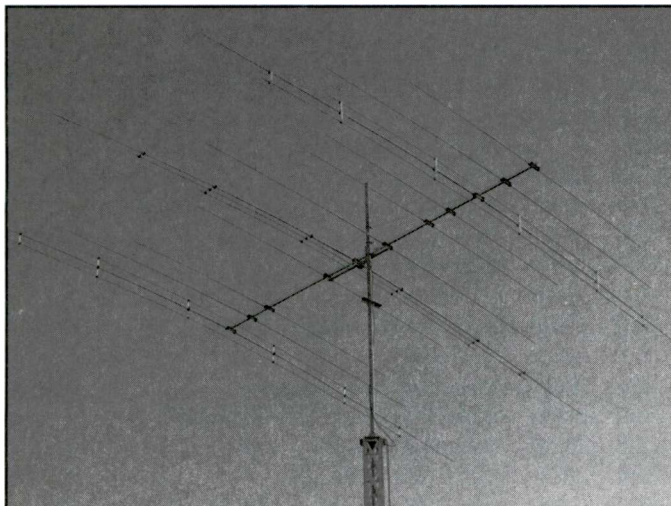
UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0830	4815	Radio Difusora Londrina, Brazil	PP	1400	9465	KFBS - Far East Broadcasting Co., N. Marianas	RR
0930	3291	Voice of Guyana	EE/Hindi	1400	9775	Voice of Greece, via USA	GG
0930	3279	Radio Maria/LV del Napo, Ecuador	SS	1430	15240	Radio Sweden, via Canada	
1000	6035	La Voz del Guaviare, Colombia	SS	1500	15530	Sudan Radio Service, UK	
1000	4990	Radio Ancash, Peru	SS	1500	17710	Radio Solh, to Afghanistan	Dari
1000	4875	La Cruz del Sur, Bolivia	SS	1500	9370	Trans World Radio, Guam	CC
1000	6135	Radio Santa Cruz, Bolivia	SS	1600	15160	Radio France Int., via South Africa	
1000	4717	Radio Yura, Bolivia	SS	1600	11570	Radio Pakistan	
1000	4870	Catolica Cultural/Voz del Upano, Ecuador	SS	1600	9455	Radio Free Asia, USA, via Northern Marianas	CC
1030	4789	Radio Cultural Coatan, Guatemala	SS	1600	15420	BBC Relay, Seychelles	
1030	4939	Radio Amazonas, Venezuela	SS	1600	11810	Minivan Radio, UK to Maldives Is.	vern
1030	6009v	La Voz de tu Conciencia, Colombia	SS	1630	11605	Kol Israel	unid
1030	4775	Radio Tarma, Peru	SS	1700	9970	RTBF, Belgium	FF
1030	11750	HCJB - Australia		1800	15475	Africa No. One, Gabon	FF
1100	5050	Guangxi PBS, China	CC	1800	15250	ERAI Int., Italy	II
1100	9490	Radio Sweden		1800	15240	VOA Relay, Morocco	
1100	11795	Radio Korea Int., South Korea, via Canada	SS	1830	15570	Vatican Radio	vern.
1100	5020	Solomon Is. Broadcasting Corp.		1830	9780	Republic of Yemen Radio	AA/EE
1100	4815	Radio Buen Pastor, Ecuador	SS	1830	9485	Radio Jamahiriya, Libya via France	AA
1100	5015	Ecos del Atrato, Colombia	SS	1830	15345	RTV Marocaine, Morocco	AA
1100	15460	VOIRI, Iran		1830	11785	Radio Ndeke Luka, Cent. Af. Rep, via UAE	FF
1100	15665	Italian Radio Relay Service	Fri	1900	11655	Radio Nederland	
1130	3205	Radi9 Sanduan, Papua New Guinea	Pidgin/EE	1900	9695	Trans World Radio, via South Africa	vern
1130	4605	Radio Republik Indonesia, Serui	II	1930	11865	Deutsche Welle, Germany, via Portugal	
1130	5446.5	AFRTS, USA		1930	9680	Voice of America, via Germany	Farsi
1130	3325	Radio Republik Indonesia-Palangkaraya	II	1930	11510	Voice of Russia, via Armenia	
1130	7170	Mediacorp Radio, Singapore	Tamil	1930	15265	Radio New Zealand Int.	
1130	4895	Radio Malaysia		1930	9965	Voice of Armenia	
1130	9945	Radio Vlaanderen Int., Belgium, via Russia		2000	9830	Radio Jordan	AA
1130	4905	Xizang PBS, Tibet, China	CC	2000	15440	Radio Taiwan Int., via Florida	FF
1130	12085	Voice of Mongolia		2000	15295	Adventist World Radio via South Africa	
1130	9520	Radio Veritas Asia, Philippines	CC	2000	12050	Egyptian Radio	AA
1200	9840	Voice of Vietnam		2030	11635	Voice of Africa, Libya, via France	EE/FF
1200	6250	Pyongyang Broadcasting Station, N. Korea	KK	2030	13630	China Radio Int., via Mali	
1200	3385	Radio East New Britain, Papua New Guinea		2030	12005	RTT Tunisienne, Tunisia	AA
1200	7375	Far East Broadcasting Co., Philippines	various	2030	9390	Radio Canada Int., via Sweden	FF
1230	9810	Radio Thailand		2100	9580	Africa No. One, Gabon	FF
1230	11500	Voice of Russia, via Tajikistan	Hindi	2100	9630	Radio Exterior de Espana	SS
1230	9760	VOA Relay, Philippines		2100	9885	Radio Kuwait	AA
1230	4900	Voice of the Strait, China	CC	2130	7380	Radio Biafra Int., South Africa to Nigeria	
1230	4890	NBC, Papua New Guinea		2130	17680	Voz Cristiana, Chile	SS
1230	9475	Radio Australia		2130	11715	All India Radio	
1230	9170	CPBS, China	CC	2130	11965	BBC Relay, Antigua	PP
1300	9740	BBC Relay, Singapore		2130	11665	Radio Prague, Czech Rep., via Ascension	GG
1300	10330	All India Radio	Hindi	2200	9855	Radio Kuwait	AA
1300	17775	Radio Free Afghanistan, via Kuwait	Pashto/Dari	2200	9870	BSKSA, Saudi Arabia	AA
1300	7180	Voice International, Australia	various	2200	6175	CPBS, China	unid
1330	9395	Deutsche Welle, Germany, via Kazakhstan	GG	2230	17880	Adventist World Radio, Guam	CC
1330	9505	NHK/Radio Japan	JJ	2230	9915	BBC Relay, Cyprus	AA
1330	9715	Radio Tashkent, Uzbekistan		2230	9825	Radio Budapest, Hungary	HH
1330	15155	Voice of Turkey		2230	11550	Radio Taiwan Int., via Australia	
1330	9690	All India Radio	EE, Hindi	2230	6155	Radio Austria Int.	GG
1400	11690	Radio Jordan, local FM relay	EE	2300	17675	Radio New Zealand Int.	
1400	13650	Emirates Radio, UAE	AA	2300	11780	Radio Nacional Amazonia, Brazil	PP
				2300	5815	World Music Radio, Denmark	
				2330	9875	Radio Vilnius, Lithuania	
				2330	6135	Radio Romania Int.	

New, Interesting, And Useful Communications Products

OptiBeam Announces New Series Of Multiband Antennas

Many hams have requested an antenna with the following characteristics: one single full-size Yagi covering 20, 17, 15, 12, and 10 meters, which has full resonant directors for all bands and which acts like five separate optimized three-element monoband Yagis; is fed by a single 50-Ohm coax cable through a broadband low-loss multiband driver feed system; has immediate band switch, no tuning, no switching; and has sturdy, long-term reliable construction with solid elements, no moving parts, no sensitive electronics, and no weak mechanics. OptiBeam calls its approach to this ultimate five-bander the "Hidden Sleeve Element Technique." Solving the Yagi director sensitivity issues, this antenna allows directors and reflector elements to be in the same positions, but hidden from the critical coupling issues by another non-critical element. The company's five-band Yagi is compact, robust, and visually attractive. The boom length is 20 feet, and it has three elements on 20 meters, three elements on 17 meters (hidden sleeve elements), three elements wide spaced on 15 meters, three elements wide spaced on 12 meters (hidden sleeve elements), and five elements on 10 meters (acting like a four-element monobander). According to OptiBeam, the performance on the test range tower and on-the-air tests shows excellent results on all five bands, low SWR, extremely clean patterns, high f/b for enhanced DX performance on five bands.

OptiBeam plans additional models, having more elements, longer booms, and including 40 meters. In North America OptiBeam is exclusively represented by Jay Terleski, WXØB, of Array Solutions (www.arrayolutions.com). Please tell Jay you read about the OptiBeam in *Popular Communications*.



The new OptiBeam is exclusively represented by Jay Terleski of Array Solutions. Its boom length is 20 feet.

PowerMaster Wattmeter From Array Solutions

The specs of the new PowerMaster, which is available in two models (1–3 kW and 1–5 kW) include accuracy of 5 percent from 1.8–54 MHz; temperature and frequency compensation, ensuring accuracy over temperature and frequency range; peak hold modes programmable for fast, medium, and slow for CW, SSB; 10-bit A/Ds with auto ranging software for improved resolution and accuracy; and separate display and coupler/sensor (sensor can be remotely located at your amp or in your mobile unit). You also get VSWR alarm (programmable trip point, LED and relay); power alarm (also with programmable trip point, LED and relay); bar graph that operates in two modes (Auto Ranging Power and VSWR); large vacuum fluorescent display that's easy to read even in bright sunlight; programmability from front panel or via RS232; and much more, including a talking interface for blind hams.

The new PowerMaster wattmeter, which will be available in April, comes with your choice of connectors (SO239, Type-N, and 7/16 DIN). Be sure to visit Array Solutions at the Dayton Hamvention—and tell them you read about it in *Pop'Comm*!



The TrimTrac locator has been redesigned in a water-resistant housing.

Trimble Introduces New Version Of The TrimTrac Locator

Trimble has just introduced a new version of its TrimTrac locator. Redesigned in a water-resistant housing, the new TrimTrac locator has an expanded feature set that includes on-demand polling, motion-based or scheduled reporting, and other enhanced query functions. With its low cost, small size, new housing and features, the TrimTrac locator is a complete end-

user device that allows location-based service providers and system integrators to provide personal vehicle monitoring services to a broader range of subscribers.

The TrimTrac locator enables cost-effective automatic position reporting for personal vehicle monitoring, security, and theft recovery. The device can also support select roadside assistance and concierge services with application server and call center capabilities provided by third-party service providers.

The TrimTrac is a compact end-user device slightly larger than a white board eraser. It can operate on four AA alkaline batteries or be connected to vehicle power with an adapter module. It is packaged in a new, durable, water-resistant housing that weighs only 7.2 ounces without batteries. Inside, a Global Positioning System (GPS) receiver and tri-band Global System for Mobile Communications (GSM) modem are integrated onto a single board and controlled by a common microprocessor. This high level of integration enables the device's small footprint, low cost, and enhanced functionality. The TrimTrac locator can be placed almost anywhere inside a vehicle passenger compartment—in a glove box, under the rear window package shelf, or similar discrete location. The device requires no external antennas or connections, unless the optional vehicle adapter module is used to connect to vehicle power. This flexibility greatly reduces or eliminates the need for expensive installations.

The new TrimTrac locator has successfully completed the PTCRB (PCS Type Certification Review Board) requirements governing the release of new GSM 1900-capable wireless communications products in the North American market. For additional information visit www.trimtrac.com or www.trimble.com/trimtrac.html.

Saratoga Offers EZ-PSK USB Transceiver-To-Sound Card Interface With USB Interface

Saratoga Amateur Radio Products, manufacturer of the EZ-PSK and PowerPanel family of products, has announced the EZ-PSK USBTM, a transceiver-to-sound card interface that uses a computer's USB port. This product is designed for the user who wants to connect to the computer's USB port rather than its serial port, answering the demand created by the popularity of digital mode operation and the USB interface. The EZ-PSK USB utilizes the computer's USB port for the Push-to-Talk (PTT) function and to provide rig control (optional cable is required). The EZ-PSK works with *all* sound card applications and *all* digital modes and is designed to work with your rig out of the box. The EZ-PSK has no jumpers to set; simply plug it in, load your favorite software, and begin to operate on digital modes. Additionally the EZ-PSK is designed to operate with no external power, making it ideal for portable operation. It's also small and lightweight (less than 7 ounces). Versions are available for ICOM, Yaesu, and Kenwood transceivers. Ten-Tec is available on request. The EZ-PSK ships with a CD containing a selection of software.

All Saratoga Amateur Radio Products come with a one-year warranty and are made in the USA. The EZ-PSK USB has suggested retail price of \$75.95 and is widely available at ham radio stores, including Ham Radio Outlet. For more information on the EZ-PSK, PowerPanel, and other Saratoga Amateur products, please visit <http://www.saratogaham.com/> or call the company at 888-676-4426.

The new EZ-PSK from Saratoga Amateur Radio Products has a suggested retail price of \$75.95 and is available through ham radio stores. ↓



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Solar Power: Is It For You? And Planning *Before* The Chips Are Down

Welcome back! As luck would have it, due to scheduling changes at work and the inability to make ends meet with other parties, the promised column last month, namely the Black Diamond ATV Club, will have to be rescheduled for a later edition of "Homeland Security." That said, on to our current topic.

Last year we discussed several types of alternative energy sources, including solar, or photovoltaic, power generation. Imagine my surprise when, upon gazing out my shack window, I spied that a whole bunch of solar panels had suddenly sprouted on my neighbor's roof! Since my neighbor's work schedule is highly erratic and so is mine, it took a while for me to make contact and get the story about what was going on with all the solar panels!

Apparently, one very well-kept secret with Pennsylvania Power and Light (PP&L) is its plan to offer selected PP&L customers the option of having photovoltaic power generation equipment installed at minimal cost, with the proviso that the customer sells back any unused energy to PP&L. There are more than a few conditions to be met before the customer qualifies for this multi-thousand-dollar solar panel/charge controller/battery bank/inverter installation. However, the potential benefits to the customer and to PP&L are enormous. For instance, using current photovoltaic panels, my neighbor's house has the capability of producing approximately 1500 watts of DC power! Now, at approximately \$5 to \$6 per watt, this is quite a hunk of change in just the solar panels alone! Add the charge controller circuitry, a huge battery bank to store the DC energy generated by the photovoltaic panels, and the DC-to-AC inverter that converts the DC power into useable AC power for the rest of the house, and you get a pretty nice picture of exactly what the overall costs of this type of installation. Add to this the fact that the entire installation is professionally done and the overall cost is well into the thousands of dollars.

Lots Of Power!

Fifteen hundred watts of solar power is nothing to sneeze at. That amount of solar power generation would adequately run a 2,000-square-foot house quite well during power outages caused by inclement weather, natural or manmade disasters. So what's the "down side" to all this?

First is the amount of surface area needed to set up all these photovoltaic panels. My neighbor's west-facing roof is pretty well covered with solar panels. Now, as far as this geekazoid is concerned, all those photovoltaic panels are really "pretty." However, normal urbanites might have a very different idea on the resulting drop in the aesthetic value of their home by addition of 10 to 15 solar panels on the roof! Beauty is in the eye of the beholder, though, I always say.

Second, there is a commitment that the consumer has to the power company, namely to sell back the unused power produced by the installation. Not a bad deal, really. But what if the con-

sumer never has any overage in power to sell back? Does the utility company come and take everything back?

Third, what impact, if any, does this huge installation have upon the resale value of your home? Does it also impact the surrounding property values? Are local zoning regulations/covenants/restrictions going to possibly restrict this type of installation?

There are some things to think over and investigate *prior* to jumping onto the photovoltaic power production bandwagon, that's for sure. As I find out more about my neighbor's solar power generating station, I'll provide this info in an upcoming edition of "Homeland Security."

Back To "The Sandbox"

As far as my attempts to get some Midland X-tra Talk GXT-400 GMRS radios into the hands of some friends at the 109th Infantry Division, Mechanized, prior to their departure for Iraq, I haven't decided whether they resembled an episode of the Three Stooges or the Keystone Cops! Edsel Murphy certainly had his hand in that affair, to be sure.

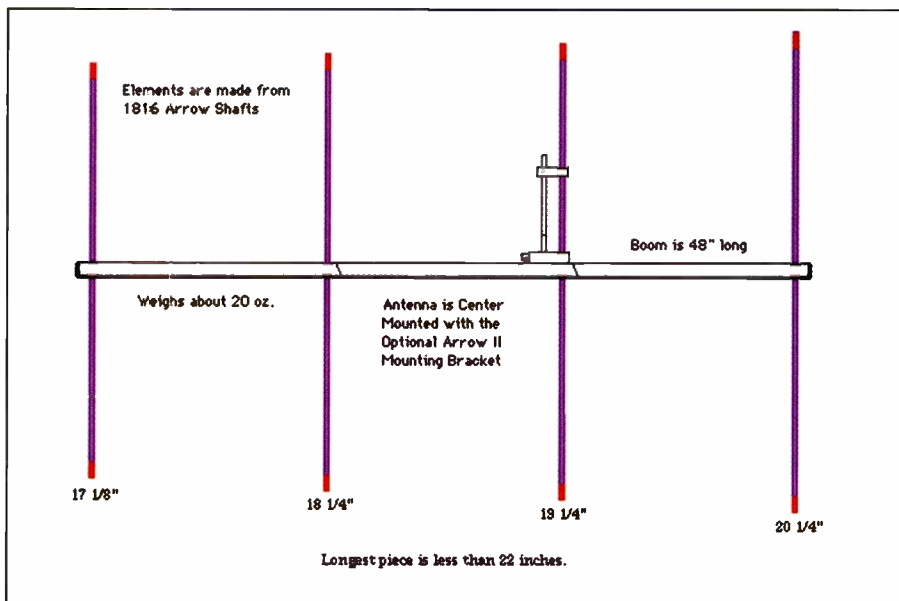
I think this entire ordeal falls under the heading of "no good deed goes unpunished!" As you will recall from last month's column, I had managed to procure some of these handheld radios for my friends in the 109th ID, Mech. The need for tactical, short-range, low-power, instantaneous voice communications is paramount in Iraq, and I wanted to be sure my buddies had what they needed in terms of comms. That's when things started falling apart.

First, there was the mix-up of what gear and how much of it was to be provided. I had originally contacted Midland Radio and asked for four radios. However, thanks to the generosity of Chris Oehlert, the Marketing & Communications Manager at Midland Radio, four *sets* (a total of *eight* radios), plus accessories, were donated to the guys at the 109th by Midland Radio! Now, that is patriotism in action!

Then there was the "overnight delivery" SNAFU! Yes, folks, Edsel Murphy works for one of the biggest parcel deliver agencies in the world. Chris sent the box with the radios, hands-free headset/mics, battery chargers, and other "stuff" to me overnight, with a Saturday delivery specified. Saturday arrived, the box from Midland didn't. After some investigating, I found that while the box had arrived in our area it would not be delivered the next day. Finally, the box arrived on Tuesday, four days *after* SFC Jack Rose and his band of Merry Men had departed for training in Mississippi!

Midland authorized me to resend the box "overnight delivery" to the location where the 109th was training prior to leaving for "The Sandbox." I did. Four days later it arrived! Am I missing something, or does "overnight delivery" translate into "four days from today?" These are the things that make you go "HMMMMMM..."

At any rate, the radios showed up on site and Jack and the



Arrow Antenna's portable Yagi breaks down for portability. At only \$55, it's a great antenna for emergency use.

guys are now busy testing them out. One thing I insisted upon was that the guys document their successes/failures with these radios and provide both Chris and myself with this info. We'll be "in the loop" for the results on an on-going basis over the next 12 to 14 months, and I'll be sure to share that information in my column. One thing is for certain: these Midland X-Tra Talk GXT-400 GMRS handhelds are going to get a real workout. My money is on the GXT-400s surviving the ordeal in fine style, and when they do, you'll be assured of getting a tough, thoroughly tested GMRS handheld should you decide to purchase one or more for your emergency communications kit.

What If...?

It's one thing to plan and participate in emergency training exercises, but it's quite another to be involved in an actual emergency with little or no warning. Typically in emergency disaster training scenarios, there is a "ramp-up" time and everyone knows when and where the exercise will take place and what their basic duties are. Things go smoothly thanks to this "anticipatory thinking."

In the real world, however, we're seldom accorded any "ramp-up" time. All too often we (I am using the collective "we" for emergency communicators) are thrust into a situation practically before we know it. There is only time to react, and our initial reactions must be correct if we are to be useful during an emergency.

In the various military and civilian survival manuals I have in my library, it's stressed that the first few things you do—your initial reactions to the emergency/disaster—can mean the difference between life and death for you and others. Knowing what to do and taking the time to think things through will enable you and those you're responsible for to survive, whether we're talking about responding to a communications emergency or finding shelter during a tornado or earthquake, or reacting to terrorist actions such as those of 9/11. Confidence in your abilities and training, coupled with your ability to critically analyze and react properly to a dangerous situation or multiple situations, will be your best weapons against terrorism or natural/manmade disasters.

Confidence comes from training—realistic training, to be specific. Unfortunately, as we've discussed in "Homeland Security" in the past, realistic training is very hard to accomplish, especially when working with volunteers who have lives. So how do we simulate "realistic training"?

One of the best methods I can think of is to read, read, and read some more about actual emergencies and disasters, keeping a critical eye toward evaluating how the responders and participants did their jobs and reacted to the various situations that arose. I've always been told "you'll never know how you'll react until you are faced with a similar situation." How true that statement is! However, you can mentally condition yourself to respond in a

given way if you put your mind to it. Training is a series of routines and sub-routines that are designed to help you cope with various situations. Combat training is designed to keep you alive in an extremely hostile environment. Disaster/life-threatening emergencies are very similar to combat, and, going back to what my good friend MSgt. Sonny Womelsdorf, U.S. Army Special Forces (Ret.), is fond of saying, "What you do in training you'll do in combat."

All that being said, take time to look over your home, vehicles, "go-bags," comm gear, survival gear, etc. Be critical in your assessment because, as our old friend, Edsel Murphy says, "Anything that can go wrong will go wrong, at the most inopportune time." And Edsel lives for disasters and emergencies.

Time is a critical factor, and when the chips are down, you'll never have enough...time, that is. Make lists of the things you *need* and the things you *want* to take on an emergency response. Keep these lists current and have a master list that details where *everything* is so you can know at a glance where to procure the various response items without stumbling around and wasting valuable time.

You Can't Always Get What You Want...

Realize one thing: unless you are exceptionally wealthy, you won't be able to have everything you need or want for an emergency response. This means that you will have to develop an overall game plan to allot money out of your family budget to procure the things you need for your emergency kits. Always keep an eye open for sales and for various items that will make life as an emergency communicator a little easier.

For instance, paint poles, like those found at major home improvement stores, make great portable antenna supports. During a recent trip to Fortress Meade, Maryland, I packed an old ICOM IC-202 2-meter SSB/CW rig and portable 2-meter Yagi antenna. Dave Benson, K1SWL, from Small Wonder Labs (www.smallwonderlabs.com) sold me his old IC-202 and it arrived the morning I departed for Ft. Meade. I also had a four-element Yagi, model 146-4BP, from Arrow Antennas out in Wyoming (www.arrowantenns.com).

The Yagi elements are constructed from aluminum arrow blanks that unscrew allowing the entire antenna to



Yaesu calls its FT-817 the “ultimate backpacker” transceiver—and it’s perfect for emergency comms.

be broken down and stowed inside the one-inch square antenna boom, which is only about four feet long. This boom length is just a little too short to act as a walking stick, but I am working on that idea (more to come in an upcoming column). This portable Yagi has become my primary 2-meter antenna for portable fixed-station use on trips or during disaster communications work, since it will cover both the low end (DX/contesting portion) and the high end (FM portion) of the 2-meter band.

Heading For The Hardware Store

Once firmly ensconced in my portable shack, I assembled the Arrow beam, set up the IC-202, and was on the air in fine style. Unfortunately, I did not have any way to support the beam antenna, so I headed for Lowe’s home improvement store to find a paint pole at reasonable cost. I procured a 12-foot collapsible pole for about a dollar per foot and headed home. Once back at the “shack,” I affixed the Arrow Yagi horizontally on the paint pole and proceeded to have some very interesting QSOs with some of the locals and one comparatively “long-haul” contact with a fellow in Southern Virginia. Not bad for a 25-year-old radio radiating a mere 3 watts PEP on VHF sideband!

Another time our local Home Depot store was offering several different models of LED flashlights at terrific savings. I found a nice little multiple LED “headlamp” that had a very high-intensity white beam for distant work, a red output to use at nighttime (which will not destroy your night vision), and a diffused white output for reading and working at close range. I immediately purchased it and, during another trip to Fortress Meade to see my kids and grandkids, my son-in-law saw it and I almost didn’t get it back! Since he was headed to “The Sandbox” and his birthday was only a couple of days away, we went to a nearby *Home Depot* store and I bought him an LED headlamp of his very own. Now he’s content and I got my LED headlamp back! By the way, using one of these LED headlamps is an excellent way to provide all important localized emergency lighting while leaving both hands available to work, log, and play radio.

What If...? Part Deux

Do you have a plan? I mean a plan in case you’re caught in an emergency. You should, you know. After all, your survival

and the survival of your family could hinge on what you do should you become directly involved in a disaster/emergency/terrorist act.

Do you have an emergency communications contingency plan? We all have radio shacks just chock full of gear and equipment, but what if you’re caught without access to your shack? What will you do? Can you get on the air, monitor local VHF/UHF comms and communicate with your fellow emergency communicators in keeping with your commitment with your served agency without direct access to your radio gear in your shack? Now’s the time to think about things like this.

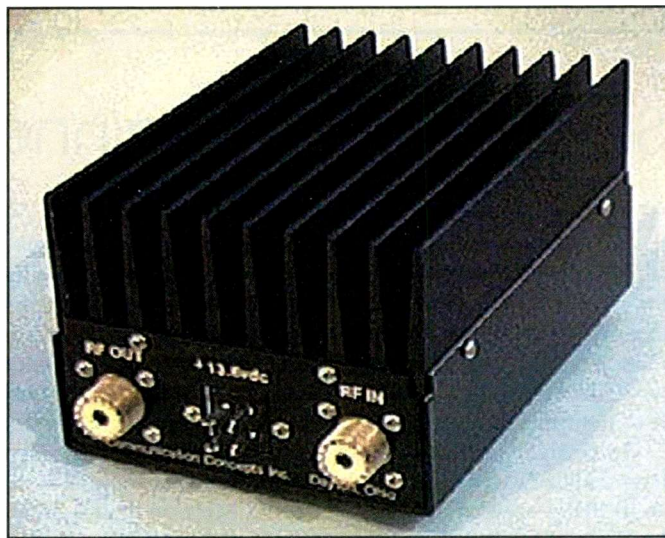
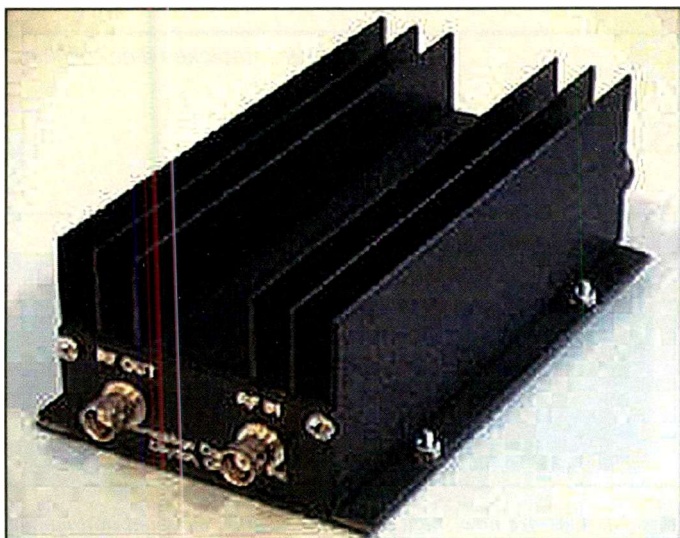
Speaking Of Radio Gear...

Long time readers of this column know that I’m a dedicated QRPer, that is low-power communicator. For over 40 years I’ve used 5 watts or less on a daily basis to participate in ham radio, DX, contest, ragchew, and, in general, have fun with the radio hobby. I have carried my QRP philosophy over into the emergency communications arena. While some may argue that a 5-watt radio is inadequate for EmComm service, I contend that, all things being equal, 5 watts is more than up to the task of providing emergency communications. Not only that, QRP rigs use less power, which is an important factor when power generating equipment is overtaxed or nonexistent. The fact that I’m a devoted QRPer means that I have honed my operating skills well beyond the average ham radio operator, including DXers and contesters.

With QRP, one gives up approximately 13 dB of RF power. That means that your signals are slightly more than two S units *lower* than the “normal” signals from a 100-watt radio (on the HF bands). This is where effective antennas and superior operating skills come into play. Without superior operating skills, you won’t be successful on low-power. With low-power skills, however, a “normal” ham radio operator becomes an exceptional ham radio operator.

My personal preferences aside, without a doubt absolutely the best radio for emergency communications currently on the market today is the Vertex Standard (Yaesu) FT-817 HF/VHF/UHF SSB/CW/AM/FM/Data transceiver. *WHEW!* This little black wonder box covers all HF ham bands from 160 meters through 10 meters, all of 2 meters, and 70 centimeters, and has a wide-band receiver capable of receiving between 100 kHz and 30 MHz, 88 and 108 MHz (the standard FM broadcast band), civilian Air Band (108 to 136 MHz), and high-band public service VHF and UHF frequencies. The rig has a built-in battery pack and can run off external power, too. Its small size (smaller than a cigar box), exceptional frequency coverage, and mode agility make this *THE* radio to own for emergency communications.

There is also a host of add-on OEM and after-market accessories to augment this extremely advanced, but tiny, radio. The HF Pack folks (www.hfpack.com) offer a 40-watt 160- to 10-meter linear amplifier kit to boost the output of the FT-817 up to within about 3 dB of a 100-watt HF radio on the HF ham bands. In addition, Communications Concepts (www.communication-concepts.com) offers 35- and 75-watt 2-meter linear amplifier kits that will work with SSB/CW/FM and data modes for \$80 and \$120 respectively. If you prefer not to build your own gear, Mirage (MFJ) offers several high-power dual-band (VHF/UHF) class C amplifiers that will work with CW/FM modes to get the power into the 35- to 80-watt region. Keep in mind, though, as you increase your RF output power, the power requirements for your rig and linear amp also increase propor-



The Communication Electronics VHF amplifier is available as a kit or preassembled.

tionally. This is a classic example of the QRP mantra “less is more” in action.

The FT-817 provides the frugal ham operator a one-radio solution to all his or her EmComm radio needs. The current price for a new FT-817D (audio DSP included) is around \$695. A used FT-817 can be picked up for a paltry \$350 to \$400 if you shop around. Don’t forget to watch for dealer/maker incentives, which enable the smart shopper to save even more money.

Take an FT-817 and add a laptop computer, I/O interface, and cables and you can turn your FT-817 into a full-blown comm center with the ability to transmit and receive error-free HF and VHF packet radio transmissions, extremely narrow band PSK31 data transmissions, RTTY, etc. As you can see, this one radio and a handful of add-on accessories greatly simplify your RF requirements when it comes to emergency communications.

As with all things, the FT-817 has some warts, namely the multipurpose display is very small and can be difficult to read under certain conditions. If CW operation is desired, then the optional Collins 500-Hz CW filter is an absolute must. The built-in CW memory keyer takes some getting used to and is a bit of a pain to program. The FT-817 relies on stacked menus, which allow many functions to be programmed onto only a few front panel buttons. This plethora of memories requires some kind of “cheat sheet” in order to remember which button does what. The stock Yaesu microphone needs a bit of help in the form of a Heil HC-4 or HC-5 replacement mic element. I have an old speaker/mic from a 2-meter handheld that I modified for use

with my FT-817. I removed the speaker and mic element and added a Heil HC-4 DX element. The improvement in audio quality is astounding. While some may not like the truncated audio frequency response of the HC-4 (it is tailored to heighten the mid-range audio frequencies while attenuating the highs and significantly rolling off the lows), it certainly cuts through the QRM and band noise to deliver some outstanding audio to the distant end station. The HC-4 has what I call an “aggressive” audio response, but it def-

initely does the job. Remember it’s about communications, *NOT* “hi-fi.”

Whose Job?

That’s a wrap for this month, gang. Remember, the time to define and address your EmComm requirements is now. When the emergency/disaster/terrorist act occurs it’s a bit late to worry about details. With that, let me just say “get involved.” Homeland Security is *EVERY-ONE*’s job. ■

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Scanning For Beginners!

People who find their way into scanning one way or another have a lot to learn. There was even a fair amount way back when our Editor, Harold, got started (like how long the puff of smoke should be to indicate a dash, and what kind of wood makes the best smoke). Today, there is a lot more information and it can be a bit overwhelming to the beginner. Since we've been dealing with some more advanced topics the past few months, I thought it might be a good time for a refresher.

Some folks are just joining the radio hobby, while others have decided to find out why their shortwave receiver dial stops at 30 MHz, or what happens above 148 MHz on their 2-meter handheld. If you have some experience with non-broadcast radio, it will help quite a bit, but scanning has some unique issues all its own. Either way, with a little patience, you're in for a lot of fun.

People are attracted to scanning for a variety of reasons and are interested in a variety of scanning opportunities, but most of us have at least a passing interest in public safety communications. Aviation, commercial, ham, and many other types of communications are also available to listen to and each has its followers. For now I'll focus mostly on public safety scanning since it has such broad appeal and also has some special requirements for the radio. Almost any scanner, as long as it covers the frequency range you're interested in, will work for the other services.

What Kind Of Scanner Do I Need?

One question that never seems to get answered completely is "which radio should I buy?" We've all been through this dilemma at least once. If you're getting started, you've come to the right place!

Scanners generally get split into three categories (well, sort of). Portable scanners are easy to carry around, are generally small, and don't need much space. Base and mobile scanners these days are pretty much the same thing. The only question is do you want to mount it in the car or plug it in at home? The third type is the communications receiver generally reserved (and recommended) only for those people who need peak performance from the receiver itself. If you're just getting started, I don't recommend these at all. Having said that, it's worth noting that some of today's portables approach "communications receiver" price and performance.

Probably the first question you should ask before you go shopping is "what am I going to do with this radio?" Do I want a portable that's convenient to carry around, or would a base or mobile unit serve your needs better? All factors being equal, you should get slightly better performance from a base or mobile. The key word here is "should." In theory, because of the additional power available, and a steadier source of power, as well as the possibility of better performance from the antenna system, it "should" work that way. The reality, though, is that there are many handhelds that can perform just as well as, or better than, their base/mobile counterparts. It probably shouldn't be much of a factor in your decision making process.



Base stations are now small enough to also be mounted in a mobile installation. Many of them can scan trunk as well as conventional systems.

Concentrate on how you want to use the radio, and then make your selection accordingly.

Trunking?

Probably the next question you need to answer is about trunking. Trunking may be the single most difficult thing for new scanner users, simply because it's more complicated than conventional scanning. Unfortunately, if you live in an area where the things you want to listen to use a trunking system, you'll



Handhelds come in all shapes and sizes and with many features. Of course if you need trunking or digital your choices will be more limited, but do shop around to see what features and prices are available.



Communications receivers like this R-8500 from ICOM feature several scanning methods just under the numeric entry pad. You can scan all memories, selected memories, memories with a certain mode, and several other combinations. Despite this, they often make poor scanners because they're really built for communications monitoring—one channel at a time. These are not really recommended, or priced, for beginners. Wait until you've got enough experience to know that you really want, or need, many of these features.

need a trunking scanner or you won't get much enjoyment out of scanning. Increasingly this is becoming a key factor in picking that new radio. It's probably also responsible for many folks already into scanning to start searching for new receivers.

Trunking is a way of managing frequencies with a computer system in both the transmitter and the receiver in order to give an agency the appearance of having many more channels than it actually has at its disposal. It is important to understand that this is controlled on the *transmitter* end and is *not* under your control. Trunking systems are very difficult to listen to *unless* your scanner can follow that particular type of system. Trunking comes in about three flavors, most, but not all of which, can be followed by today's trunktracking receivers.

How can you tell if you need trunking? The best way is to ask another listener who's been at it for a while. If you can't find anyone to ask, there are a couple of ways to get at least an indication of whether or not you should be thinking about a trunked scanner. First, get a list of frequencies (buy a copy of *Police Call* at your local RadioShack if you can't find a proven list from a local source). Look up the city you're interested in listening to and check out its frequencies. *Police Call* can sometimes tell you which frequencies are used for police/fire/ambulance activity, but sometimes it does not have that information. If the frequencies are in the 861- to 869-MHz range (designated as output frequencies for trunked systems), there is a strong possibility of trunking. At this time, if the frequencies are in other ranges, you're probably safe—for now, anyway. If they're in the 800- to 900-MHz range, and if there is a group of them (5–60 will be listed in *Police Call*), there's a very good chance that the system is trunked. Now you'll have to find someone to ask, or make sure you buy your scanner someplace that will accept a return if it's not compatible with your local system.

The other thing to realize is that not all trunking systems are the same. The most common systems in use are the Motorola (type I and II), Astro, Ericson's EDACS system, and Johnson LTR. Johnson LTR is very rarely used for public safety, although that seems to be changing, albeit slowly. Motorola type I and II can be followed with a limited number of radios. There are other combinations of radios, computer interfaces, and software that will also accomplish the task, but you'll have to know enough to assemble all the pieces and make it work. If you don't have a trunking system in your area to contend with, your choices are much more extensive. But don't rule out the trunktracker scanners just because you don't have a trunking system in your area yet. They're all above-average conventional scanners as well, and if a trunking system ever arrives, you'll be all set. Sooner or later, trunking will be authorized on the other bands as more and more systems switch to trunking operation because of its frequency-saving capabilities.

Digital

Just to make matters more complicated, any of the trunking systems can also be digital. New scanners from Uniden and RadioShack are available with digital decoding for the APCO 25 system. What's APCO 25? It's an agreed-upon system for encoding voice transmissions into digital for transmission by radio and that meets some special requirements of the public safety community. APCO, which stands for the Association of Public Safety Communications Officers, got behind putting the standard together so radios from one company could talk to radios from another company. This becomes very important when you start thinking about all the interagency operations that take place in today's security-minded world.

Digital can be used without trunking, but it's rare. In those cases, it's often not APCO 25 (the "everything else" category). None of the other types of digital can be received and decoded by today's digital scanners, and are unlikely to ever be. Those systems are judged proprietary and, as such, illegal to decode under the Electronic Communications Privacy Act. If you're unlucky enough to live in an area where these are used, you'll have to determine if there's enough other stuff on the scanner to keep you interested.

Other Features

If you live in an "an RF-rich environment," an area with a lot of radio users around you, the selectivity and dynamic range of the radio will be important considerations. With the proliferation of pagers and cell phones, there aren't many places left in any decent size city that aren't RF rich. Out in the country, it's better, but still not RF free! (Of course, if it was really RF free, there wouldn't be anything to listen to!)

What all this means in English is that if you don't want to listen to a bunch of interference from pagers, commercial users, and cell phones, you'll want a radio that's fairly high end. On the extreme, you'll need something called CTCSS or DCS to cope with the interference. These are not-so-complicated encoded tones that allow you to selectively eliminate interfering stations so you only hear the one you want.

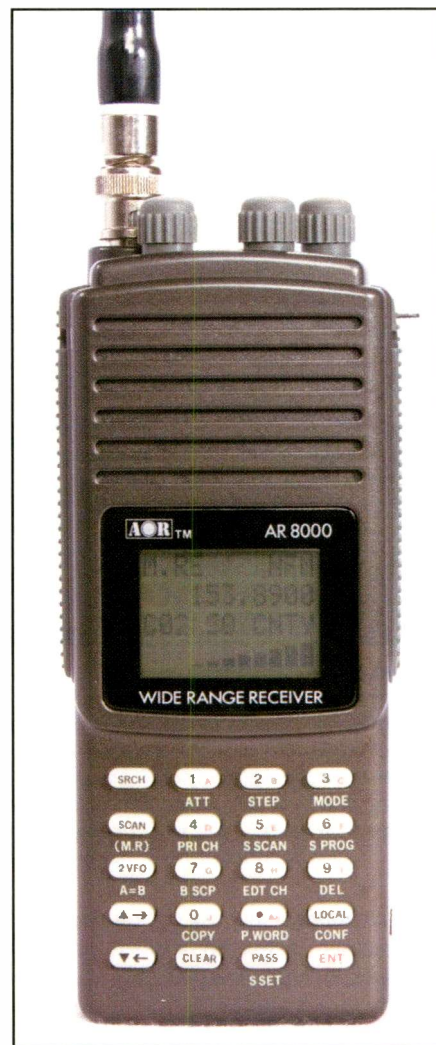
How high end? Well, that's a difficult question to answer. In fact, while the high-end scanners tend to be built a little better and are more resistant to interference, it might be that in your particular situation, some other radio works better for some rea-

son. If you're unsure, it's best to buy from someone who'll let you return it in a few days if necessary. Take it home, do some actual scanning, and determine how interference-prone your area really is. If that radio doesn't work quite right, try another model. Design differences often allow one model to perform well in one place while another model might be much better only a few blocks away.

Of course, the more expensive the radio, the less likely you are to have the problem in the first place. It's also worth

noting that there is no "perfect receiver" that won't get interference at any time on any frequency. Don't waste your time looking; just find something that's acceptable to you on the frequencies you listen to and enjoy the hobby.

Generally speaking, more memories are a good thing, but there is a point of overkill. Really, it's not memories we need as much as *banks*. Banks help to organize groups of frequencies that belong together. All the police, or all the fire channels, or perhaps all the south side



This handheld is really a communications receiver in a small box. The AOR AR-8000 series has long been a favorite of scanning enthusiasts looking for that something extra. Great receiver, but no trunking or digital yet. This is the original AR-8000, but there have been two or three more recent versions with some substantial improvements.

and all the north side can be grouped together for easy switching in and out of the scan list. Most scanners on the market today (except for the very few that have less than 100 channels) will be divided into at least 10 banks. A 200-channel scanner is likely to have 10 banks of 20 channels each. A 1,000-channel radio is likely to have 10 banks of 100 channels, which is not as convenient as 50 banks of 20 each. That's probably enough for most applications. Twenty banks of 10 channels would be more versatile than the 10-bank system we were discussing, but you can't always have everything at a price you're willing to pay.

Frequency coverage is another thing to watch, particularly on the introducto-

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Frequency Of The Month

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Our frequency this month is **156.600**. Let me know what you hear, or don't hear, and we'll enter your name for our subscription drawing. Send your results, or any questions you may have, to me via e-mail at radioken@earthlink.net, or via more traditional methods to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126-2220.

ry models. Most of the high-end radios will include the standard VHF-Lo, High, UHF, and 800-MHz ranges. Some offer continuous coverage from the shortwave bands through 1 or 2 GHz. However, some of the introductory models leave out an area or two, usually at the high or low end, to cut costs. It's also worth noting that we will begin to see some public safety frequencies being assigned in the 700-MHz and 764- to 806-MHz range in the not too distant future. The allocation has been approved by the FCC and a few stations have been licensed. In many areas of the country, it is simply a matter of waiting for an existing service to relocate. Currently, only the continuous coverage scanners include this range. It's also likely that trunking will be the normal mode of operation in this range, although conventional operation is also permitted. No doubt, new models will appear as soon as the band becomes common, but if a service you're interested in moves, that won't be much help.

Some of the newer radios include the ability to store an alphanumeric label (or alpha tag, as it's called) with some or all of the memories. This feature tends to appear mostly on the higher-end models, but can be well worthwhile in a larger scanner. Remembering what frequency within 500 or 1,000 channels goes with what service is downright difficult, even if you have a good memory. It's also available on computer systems for any of the computer-controlled scanners, which makes data entry much easier.

Another extremely useful feature is selectable delay. Almost all scanners

today have a delay function that will cause the radio to pause for a few seconds before continuing the scan to see if a reply is received on that same channel. On many radios, this feature is either on for all channels or off for all. On the high-end units, however, you can turn this feature on and off per channel, so you can customize your scanning to the agencies you're listening to and your preferences.

Antennas

Once you've got the radio, don't forget the other important piece of the puzzle: the antenna. How much antenna you need depends largely on where you're located and what you're trying to listen to. It's beyond the scope of this column to explain much in the way of antenna theory or even specific recommendations, but I can give you a few things to experiment with.

If you're located in an "RF-rich" environment and already having trouble with overload or interference, increasing the antenna performance will only make things worse. The first thing you should do, particularly if you're just getting started in scanning, is see what the radio can do right out of the box. Almost all scanners, even base units that are intended to be used with larger antennas, come with some sort of small, easily attached antenna. Sometimes these mount right on the back of the radio and are easy to set up. Give it a try. You can always upgrade your antenna situation later if you're not hearing the things you want to.

Of course, most handheld radios come with an antenna from the manufacturer. On most radios you'll do well to *replace* it. The manufacturer includes the antenna as a convenience, not as a performance enhancement, and the antenna is likely to work across the range of frequencies that the scanner covers—equally poorly. If

you only listen to frequencies in one or two of the bands, replace the antenna with something more specific to those bands, or with a better grade of "all-band" antenna. I put all-band in quotes because there is no such thing as a truly all-band antenna. You'll have to do some experimenting to see what works best on the frequencies you listen to and on your particular radio. Once in a great while, you'll find out that the antenna that came with the radio does in fact perform better than the aftermarket ones.

Mea Culpa

Oh, the stuff I get blamed for... *Pop'Comm* reader Avery wrote,

Well, it is all your fault. I could not get the 800-MHz Frequency of the Month programmed into my scanner because it was an older Bearcat model. After seeing your write-up in the November *Pop'Comm* on the RadioShack PRO-96 and Win-96, I ran down to my nearest RadioShack store and purchased a PRO-96. It is all your fault that I now have a really up-to-date, do-everything (almost) scanner. I can even plug in that 800-MHz Frequency of the Month now. I have to agree with all you have said about it and I am happy to have it. Sooner or later I will get WIN-96 or a similar program so I can program it using this computer. I really enjoy *Pop'Comm*. Keep up the Great Work! And perhaps some other good stuff will be all your fault. Thanks again for all the GREAT INFORMATION!"

My pleasure, Avery. Enjoy your new radio!

Let's talk. Let me know what radio you've recently purchased and how it performs at your home or on the road. Remember, photos (and captions, of course) of your radio installations are always welcome! See the "Frequency Of The Month" box for contact information.

Until next time, good listening! ■



REACT Month Arrives!

May means REACT Month is upon us again. This is the time when REACT Teams make a special effort to let people know about their volunteer safety radio services. So watch for REACTers in your travels this month. You may spot REACT safety displays at malls or other public sites in your area. Speakers from a REACT Team may appear at meetings you attend. You may be lucky enough to come upon a REACT "Safety Break" at a rest area along the highway you travel on Victoria Day weekend in Canada or Memorial Day weekend in the United States.

Wherever you meet up with them, stop and visit for a moment with these REACT volunteers who help to make our communities safer places to live. Talk with them about the possibilities of joining and adding your own radio skills to their Team. They're always looking for additional members to make their Teams more effective. Give them a word of encouragement or appreciation for their year-round safety efforts, too.

Would You Believe...?

The reports you read here last time are typical of the ways in which REACT Teams assist law enforcement and support community projects. This time you'll read of the broad variety you'll find in REACT service. These stories are only "the tip of the iceberg." REACT Teams in every area of the United States and worldwide are busy helping out in similar ways. I'll try to bring you some of these stories in future columns. Meanwhile, you can get in on action yourself as a REACTer. Think about the possibilities while you enjoy these tales of service.

Keeping Fit

Exercise is good for you. Comal County REACT (Texas) found that out lately. The county's Emergency Operations Center's officials conducted a SET (Simulated Emergency Test) recently. They assigned REACT to staff the EOC's brand new radio room, as well as its Incident Command Vehicle (ICV) for the two-day exercise.

REACTers manned the shiny new 2-meter and 440-MHz radios around the clock as the equipment got its first workout. At one point, officials declared that all telephones and computers had gone down. Now, the only communications left was through REACT. The Team passed traffic to the ICV as well as to stations in Austin and San Antonio without problems. The ICV had no radio facilities so REACTers used their own equipment to establish a temporary station. It linked the municipal offices with the EOC throughout the SET. County officials now know that their new radio system works well and that REACT operators were able to keep them in contact with their EOC and the outside world.

What to Do?

What do you do when no rest area is available for your Safety Break? South Point REACT (Connecticut) called the cops, and Connecticut State Police, Troop E, told them, "Come on down."

The Team hosted its very first holiday Safety Break right at the police barracks. Tobacco Valley and Pioneer Valley REACT Teams gave South Point an assist. REACTers served hot cof-

fee, donuts, and other comestibles to travelers so they could continue their journeys refreshed and alert. MADD helped out, too, by providing the Team with safe driving materials for visitors. South Point and the Eastern Connecticut Chapter of MADD have developed a memorandum

of understanding in which they work together on safe driving education to save lives. The Team also provided REACT leaflets on the correct use of CB Emergency Channel 9. REACT is striving to improve the success rate among CB distress calls in its efforts to save more lives.

South Point found out just how valuable friends are—especially when they have a prominent location on a busy highway. With all the help it received, South Point is confident about planning its next Safety Break. A true success story!

Sharing Is Nice

Tri-State REACT (New Jersey) is fortunate enough to own several repeaters, including ones on the amateur, GMRS, and commercial bands.

Recently, the Team signed a memorandum of understanding with Bayonne Fire Canteen, which will allow the canteen to use the Tri-State repeaters for dispatching and coordinating its members. Often, Teams must rely on the generosity of other organizations, which allow REACT to share their repeaters. Tri-State is in a position to extend a similar hand to the canteen



Ten to 15 million plastic grocery bags carried this REACT safety message to shoppers across southern Ontario. About 75 food stores in the major chain issued the REACT bags over a two-week period, just prior to the busy Labor Day holiday weekend.

group, and it's really great to see them doing so. Bayonne Fire Canteen's emergency role is to provide food, beverages, and shelter to firefighters at major fire scenes. Like a number of REACT Teams, Bayonne responded to the WTC disaster on 9/11 and during its aftermath. This is just another find example of cooperation where everyone benefits!

By the Millions

REACT Teams in Ontario, Canada, got a terrific boost last summer for their safety efforts from Zehrs Food Markets, a major food retailer. All 75 or so supermarkets in the chain issued plastic grocery bags with a REACT safety message.

Between 10 and 15 million REACT grocery bags streamed out of the food stores during a two-week period. When police and fire safety officers learned of the REACT bags, they began seeking a supply from store managers for use in their community safety programs. The REACT bags focussed on cell phone safety, since cells are really radios in disguise. However, the information is valid for any other type of two-way radio as well. It seems that 9-1-1 dispatchers' reports of high failure rates among emergency cell phone calls prompted REACT to initiate the safety project. REACT speakers also took the bags and the safety message to women's groups and other community organizations. Hopefully, REACT and Zehrs will be able to mount a repeat performance this summer. We hear that plans are in the works as you read this column.

How About It?

Would you like to be part of a REACT Team and help out in some of the ways you've been reading about here? Remember, these reports are only a sampling of the things REACT Teams are doing. A REACT Team in your town can bring similar volunteer safety communications to your area. Visit www.react-intl.org and click on the Team and Council Directory to learn where the nearest REACT Team is located. If there is no Team nearby, you can find details on how to form a Team on the REACT website.

I welcome your input about ways REACT Teams may have helped you at some point. Feel free to drop me a note at react@react-lake-simcoe.org. Thanks for stopping by to spend a few minutes. I trust it has been enjoyable and informative. See you right here in June! ■

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PSK31—A Digital Mode That's Lots of Fun!

We've come a long way from the clunky teletype machines of yore. And I should know. As a Kleinschmidt, a distant relative of mine gave us the Kleinschmidt Perforator, a mechanical teleprinter about the size of a compact car—and just as loud! Old-timers still give me hell about that thing! Luckily, thanks to the personal computer boom that is now starting to span *generations* of hams, enjoying the digital modes is easier than ever.

Not too many years ago we might have started monitoring shortwave RTTY and fax stations with a variety of equipment, ranging from cheap two-diode PC serial interfaces to expensive HAL or Universal terminal units. In the late 1980s, multimode terminal units from Kantronics and AEA were the rage, pushing aside the more venerable RTTY-only gear made by TONO and HAL. During this time, RTTY itself saw competition from the various error-correcting “handshaking” modes (AMTOR, packet, PACTOR, G-TOR, CLOVER, and so on), and I couldn't help feeling that an era was coming to an end. RTTY was still around, but it wasn't exactly the “in” thing unless you were a ham radio digital-mode contester.

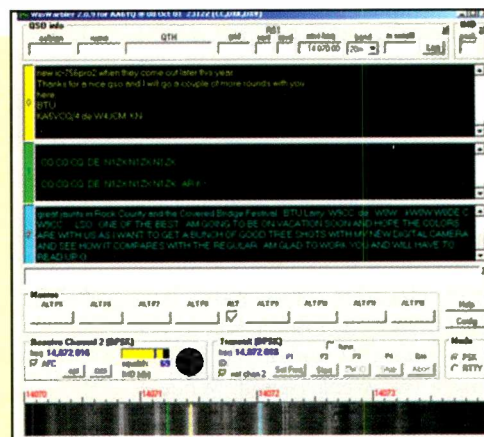
The error-correcting modes were fun for a while, but I found that working other stations via AMTOR, which keeps chirping away until all data is correctly transmitted and acknowledged, was too much like using the Internet. It didn't feel like *radio*, where our ability to copy ebbs and flows according to the whims of propagation.

What we needed was a new digital mode that *might* incorporate some means of error correction without requiring back-and-forth chirp-chirping to ensure copy. Well, friends, that mode is called PSK31. It's here, fully entrenched, and it isn't going away anytime soon. The neat thing is that you probably have everything you need to operate this exciting new mode right in your shack!

Introduced in the late 1990s, PSK31 zoomed to the digital forefront and is now a major player on the world stage. It's the digital mode of choice for an ever-increasing number of hams who've never worked the keyboard modes before. If you've always wanted to get started in RTTY but lacked the hardware, or the fortitude, to mess with it all, PSK31 is for you!

PSK31

Peter Martinez, G3PLX, the whiz-kid who came up with AMTOR, also developed PSK31, the mode that's well on its way to making conventional RTTY a thing of the past. PSK31 uses the DSP brains of your IBM-compatible computer's sound card (16-bit) and free (open source, like *Linux*) software that runs in Windows 95/98/NT/2000/XP. If your present sound card is an old 8-bit model, don't worry, a new 16-bit card can cost as little as \$9 at a computer parts store or flea market. The hardware required to connect your PC's sound card to your radio, and to make an optional PTT connection between your PC and your rig, can be built from junk-box remnants or purchased from any RadioShack store for less than \$10. That's as close to free as you can get nowadays!



Although there are literally dozens of decent PSK software packages available nowadays—and most are free for the downloading—my favorite is still WinWarbler, by Dave Bernstein, AA6YQ. As part of the excellent DXLab suite of cutting-edge ham radio programs, WinWarbler can send and receive PSK31, PSK63, and RTTY. In PSK mode it can decode several separate conversations simultaneously and features three live chat windows for the multitaskers in the crowd! Check it out at www.qsl.net/dxlab.

And if you want an affordable ready-made interface, check out the Rigblaster series at West Mountain Radio (www.westmountainradio.com). It's the Cadillac of PC sound card interfaces and a real pleasure to use. It's also relatively easy on the pocketbook. MFJ and several other manufacturers also make sound card interfaces. They're practically everywhere.

The “PSK” in PSK31 stands for Phase Shift Keying, the space-age modulation technique used to transmit an entirely new digital code. The “31” refers to the data rate, or baud rate, of the transmitted signal. It also represents the bandwidth occupied by a PSK31 signal—a paltry 31 Hz! A newer variant, PSK63, can sling characters at 100 wpm and takes up twice as

Where To Find Those PSK Signals

PSK31's distinctive droning signals can be found in most parts of the digital subbands, especially near 14,070 kHz. In PSK's early days, 20 meters was the only hot spot. Now, however, when the band is open, PSK activity spreads out, centering mostly around the following frequencies. Remember, with such a narrow signal bandwidth, a lot of PSK31 transmissions can share a crowded band. Some ops report that 100-Hz channel separation is sufficient for interference-free copy! Look for PSK31 signals here (in MHz):

1.838.150	10.142.150	21.080.150
3.580.150	14.070.150	24.920.150
7.080.150	18.100.150	28.080.150

much bandwidth as PSK31 (hence the name PSK63). PSK63 offers faster contest exchanges and improved performance on radio paths that travel over the poles. For all practical purposes, the two modes use the same hardware, software, etc.

The digital code itself is called *Varicode*, a term coined by G3PLX because each character is made up of a varying number of data bits, just like Morse code! And just like Morse code, commonly used letters have fewer bits, while rarely used characters have a whole bunch.

So what does this mean in practical terms? PSK31 takes up almost no precious bandwidth, its weak-signal performance is comparable to that of Morse code (a definite improvement over RTTY), and it will likely cost you less than a night at the bowling lanes to get started. And QRP ops take notice: PSK31 is so efficient that it works famously while running low power. Neat! (Actually, there are other nifty PSK31 features, but I don't have the space to explore them here!)

Getting Started

Steve Ford's excellent introductory article in the May 1999 issue of *QST* ("PSK31...Has RTTY's Replacement Arrived?" on page 41) is still an excellent way to get started. If you don't have access to a copy of the issue, point your web browser to www.qsl.net/wm2u/psk31.html. You'll find free-to-download PSK31 software, detailed info about PSK31, build-them-yourself hardware interface schematics, and excellent links to related sites.

Assuming you have a 486-or-better PC running Windows 95, 98, NT, 2000, or XP, you'll need a 16-bit sound card, the downloadable software, a fairly stable HF SSB rig (USB is the ad hoc standard for PSK31) and a set of cables to interconnect the components. Like I said, you probably have all this stuff in your shack.

Hot Spots

Once you have your software and hardware up and running, tune around the digital subbands (especially on 20 meters) and look for PSK31 signals. They're distinctive, so you won't have much trouble finding them. PSK31 signals don't *deedle-ee-dle* like RTTY, and they don't *chirp* like AMTOR, they *warble* like a science fiction mind-control

"The "PSK" in PSK31 stands for Phase Shift Keying, the space-age modulation technique used to transmit an entirely new digital code."

machine, or like a synthesizer played underwater. Once you've heard a PSK31 signal, you won't mistake it in the future.

Because the signals are so narrow, it's best to forget about "tuning them in" with your radio's tuning knob. Instead, tune your radio to one of the designated PSK hotspots (see "Where To Find Those PSK Signals") and take a look at your software's "waterfall" display. Simply click your mouse on one of the displayed signals and your software starts decoding it! From then on you can simply use the software's "automatic frequency control" to track your QSO partner if he or she drifts up and down in frequency. Once the desired signal is locked and you're seeing text flow across your screen, PSK31 QSOs proceed pretty much like regular RTTY.

Thousands of PSK31 ops are singing its praises. They're also mentioning that the mode can be a bit eerie at times. For example, thanks to PSK31's extreme

sensitivity and exceptionally narrow bandwidth, signals that fade to the point of being inaudible often produce perfect copy!

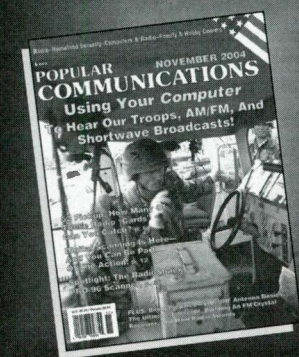
Time To Retire RTTY?

Will PSK31 replace RTTY over time? It just might happen. In fact, it's already happening! PSK31 offers all the benefits of Baudot RTTY and adds the weak-signal performance of CW. The gear is inexpensive, widely available and works better than the most expensive dedicated RTTY terminals made only a few short years ago.

The first PSK31 contest took place in April of 1999, and the new mode is now showing up in DXpeditions, Field Days, and Special Events. Check it out!

As always, send your QSL cards, questions and letters to Ham Discoveries, 25 Newbridge Rd, Hicksville, NY 11801. See you in the waterfall! ■

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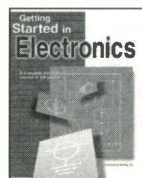
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Computers And Broadcasting—A Fine Mix!

In the past 15 years computers have become a very big part of what we hear on the radio. Previously, someone always had to be in the radio station studio to get programs, music, news, commercials, etc. on the air. There would be a full office staff where one person would handle scheduling, one person would handle sales orders, and another would be at the desk answering the phone. Things have changed—drastically!

It's safe to say that better than 90 percent of the AM and FM stations in the United States, both commercial and non-commercial, operate some type of computer system at their station. On the air, the music that you're listening to is more than likely stored on a heavy-duty hard drive, which can hold up to (and probably more) than 3,000 selections!

Computers can also be interfaced with satellite music networks and, through a system of on "cue" functions, can be told to play commercials at certain scheduled breaks and air local "liners," which add the local identity to the station with a slogan or call letters. Timed breaks can also be scheduled for network news. If the timing is done right, a station can be made to sound local even if it's run by a computer and the programming is coming from thousands of miles away.

When programming is done locally, this gives the station more flexibility in what goes on the air. When not tied to a satellite network, the station can take a feed from a news source, record it, and then play it back at a later time. For example, WWDL 104.9 in Scranton, Pennsylvania, takes a feed from the ABC network, setting up its computer system to record it at 45 minutes past the hour. The network sends a cue, the computer records the network feed, and then plays it back during their top-of-the-hour newscast. The station also sets a record time for a traffic report that's phoned into the computer system. It's then played back during the newscast a few minutes later. The computer can also be set up to give the time and temperature!

The Music

The music you hear is set up on a daily schedule. Via a computer screen, an



Radio One's WIZF FM Program Director and midday air talent Terri Thomas uses the Scott SS32 touchscreen system from Scott Studios.



Spanish Broadcasting Systems' Miami stations use Scott's SS32 touchscreen system for live-assist digital automation. WZMQ is the first Spanish FM station in Miami; pictured are hosts Frank Falleon and Mayi Salza.

hour's worth of musical selections can be viewed, as well as the commercials, weather reports, news, and "voice tracks" also scheduled for that hour. Voice tracks are pre-recorded by a local announcer who can talk about a subject of local interest and also tell listeners what music is coming up. The screen basically says, "Insert voice track here," then the computer will record the voice track and insert it at its scheduled break time. A voice track can also be set up for a "talk over" where the announcer talks over the instrumental beginning of the song. How long does something like this take? Well, a six-hour air shift could be done in less than two hours, an overnight show can be done during the day, and weekends can be covered during the week (who wants to go into work at 6 a.m. Sunday morning on a snowy day!). This frees up valuable time for the staff at the station so other things can be done.

If the station is using a computer system and has a live person on air, the computer system can be operated via a "touch screen." The schedule, or "log," is brought up on the screen and, when the announcer wants to start a certain item, all that's needed to get things going is a finger on the "Start" marking on the screen. This also lets the announcer incorporate special effects, such as laughter or crowd noise. Taking a phone call? A screen can be brought up to record off the phone, with the ability to cut out certain unwanted (or unairable) portions of the call.

Commercials

The making of commercials has also come in to its own in the computer age. Whereas a station used to have four or five reel-to-reel tape recorders and cartridge machines, a single computer can now be set up as a four-track recorder! Basically, the voice might go on the first track, music or a jingle on the second, and effects on the remaining tracks. Editing can also be done



Here's Lisa Anderson, at the "Breeze" studios of WWZY, 107.1 using state-of-the-art computer studio equipment.

more quickly. In the days of recording tape, editing had to be done by indicating on the tape with a grease pencil where you wanted to start and end the edit, removing the tape, cutting it with a razor blade on an editing block, putting the spliced tape on, and praying that you got it right. Editing via a computer is simply a matter of getting the voice pattern on the screen, marking the edit points with a marking function in the program, and pressing delete—and it's gone. Once the commercial is done, it can then

FCC News

Call Letter Changes

Old Call	New Call
1360 WCKY Cincinnati OH	WSAI (Sports)
1530 WSAI Cincinnati OH	WCKY (Talk)
680 WJCE Memphis TN	WWTQ (Talk)
1310 WGH Newport News, VA	WCMS (another 3 letter call gone)
1260 KFGQ Boone IA	KFFF
1050 WCMS Norfolk VA	WVXX
1310 WXDX Dearborn, MI	WDTW
1420 KXOW Hot Springs AR	KBHS
950 WBKH Hattiesburg MS	WHSY
970 KUPL Portland OR	KCMD (Comedy format)
Ch. 9 WIXT Syracuse NY	WSYR TV

Other News

WSMN-1590 Nashua, NH, has gone off the air. Owners of station sold property that their three-tower directional antenna system was located on for development (housing).

American Samoa has been granted CH. 30 with the call KKHJ-LP (Low Power TV station, a good catch!)

WTRI-1520 has returned the air, calling itself "Vegas Radio."

WKYE-95.5 and WMTZ-96.5 have swapped formats.

WBBO-98.5 Ocean Acres, NJ, is now simulcasting WHTG 106.3 Eatontown, NJ; A new application on 1450 has applied for 5000 watts day and night. This may be the first application of this type on what is known as a "graveyard" frequency.

WQTH-720 Hanover, NH, has requested a new application for 50,000 watts day, 2500 watts night and 50,000 watts during critical hours from a new location of Claremont. Station will use three different patterns for each power level and beam the signal north; station is not on the air at this time.

An application for a new station on 750 in Duluth, MN, has requested 7000 watts day/500 watts night and 5000 watts during critical hours with separate directional patterns on all three power levels.

WPFL-1250 Montrose, PA, has a pending application to move to 800 kHz with 1000 watts day and 135 watts night.

WGGT-960 Golden Gate, FL, has been granted a city of license change to West Palm Beach.

WMCW-1600 presently located in Harvard, IL, has requested to move its station to Weston, WI, with a frequency change to 1180 with 6500 watts daytime and 2500 watts critical hours. This move is over 200 miles.

WYRE-810 Annapolis, MD, has requested a move to Essex, MD, with 240 watts.

New applications for stations have been requested for South Boston, VA, on 1400 with 1000 watts day and 1000 watts night, and Middlethian, VA, on 1410 with 360 watts day and night.

An application has been submitted for a new station on 1590 kHz with 10,000 watts day and night from Hilo, HI.

CHUC-1450 Colbourg, ON, has applied to move to 107.9 MHz FM. If granted and when the FM station gets on the air, the AM will then have three months left on the air. CHUC was widely heard when it conducted DX tests back in the '80s.

WRIB-1220 is still conducting a daily DX test from 0255-0305 EST where a code ID is run at the station daytime power.

be put into the station master system, which is tied in with the system used on the air—and it's done! Commercials can be saved in the computer system for as long as needed for playing at a later date. Previously, a master tape system was used. This required a huge area where original tapes, or masters, could be stored.

Commercial scheduling, known as "traffic," is another area that has been greatly changed. For example, if a commercial has to be scheduled, an entry must be made in the computer specifying what time it has to be played. The scheduling screen is brought up and entries made of the name of the sponsor, that dates and times the commercial is to be played, and how many commercials are to be played during the day. The computer then schedules times automatically! At the end of the day, a printout can be made showing what was played during the last 24-hour period, which is then verified against what was scheduled. At the end of the month, the bills can be generated. Manually, this could take one person days, but the computer can generate bills for a month within a few hours!

The Transmitter

Computers used for transmitting are also a big part of any station these days. Remote control systems can be accessed and operated by regular phone lines (the same as in your home), allowing station personnel to accomplish a multitude of tasks. Through codes over a standard push-button phone (known as DTMF), a series of numbers can be entered and you can find out what a transmitter is doing. If something goes wrong, the computer can be set up to *call* a certain phone number (that of the chief engineer, for example), to alert someone that a voltage is out of tolerance, or a tower light is out, or that the station is completely off the air! Also, with a programmable remote control, the auxiliary transmitter can be set up to run on a specific day of the week for a specific time. Readings that have to be taken can be sent to a printer at a specified time each day or they can be sent to any location, via a phone line, that has a modem and printer available. This is a common practice with group owners, where multiple transmitter sites call in to a specific location to advise on metering. The computer even takes care of power or pattern changes, which can be set up for a full year at a time.

So when you listen to your favorite station, remember that the computer has changed the roles of everyone involved!

Spotlight On Radio Clubs

As a semi-regular feature, as space permits, we'll shine a quick spotlight on a radio club and some of the interesting things it's doing. This month we'll look at the **National Radio Club**.

The NRC was started in September 1933 and is devoted to the to the mediumwave (AM band) DX hobby. The club's publication, *DX NEWS*, is offered 30 times a year, published weekly during the prime AM DX listening months of October through February. *DX NEWS* offers up-to-date FCC information, loggings of stations heard by both domestic and foreign members, as well as information on sports networks, contests, and its fine line of other publications, such as the *NRC Logbook* (now in its 25th year). The NRC also operates The DX Audio Service, which offers 90-minute audio cassettes, mailed monthly, of information published in *DX NEWS* as well as some very entertaining and informative "programs," such as station identifica-

tions from a certain frequency on the dial from around the country. If you'd like to see *DX NEWS* for yourself, send \$1 for a sample copy to PO Box 5711, Topeka, KS 66605-0111. For information on the DX Audio Service, send \$1 for a sample to PO Box 5031, Lima, OH 45802-05031. Tell them you saw the information in *Popular Communications*!

If your club would like a mention, please feel free to send along information on it either to our PO Box address or e-mail address (at end of article). I will make this a semi-regular feature as an aid to helping you hear more DX!

Broadcast Loggings

And now onto this month's loggings.

1130 WWBF Bartow, FL, 2/13 0030. Oldies, 5 over S9 with a steady signal. "Oldies 1130, WWBF." (IEN-GA)

1130 WISN Milwaukee, WI, 2/13 0100. Local news, sports and weather, then into Coast to Coast AM. 15 over S9 with slight splatter from KMOX in St. Louis, MO, on 1120. "Newstalk 1130, WISN." (IEN-GA)

1280 WANS Anderson, SC, 2/12 1600. Religious programming. 10 over S9 with splatter from WJJC in Commerce, GA on 1270. "1280 AM, WANS, Anderson, South Carolina." (IEN-GA)

1360 WELP Easley, SC, 2/12 1730. Religious programming. 30 over S9 with fading and electrical noise. "Radio that changes the way you live, WELP, Easley, Greenville." (IEN-GA)

1550 WIRV Irvine, KY, 2/12 2200. Oldies. Weak signal buried in the static that would fade often. "You're listening to the TriCity AM Network...1550 Irvine." (IEN-GA)

1270 WCGC Belmont, NC, 2/13 1928. Bluegrass gospel. Good signal, but faded often. "AM 1270, WCGC" & "Carolina Christian Connection." (IEN-GA)

1480 WPFJ Franklin NC, 2/12 1815. Religious music. Weak signal mixed in the static that faded in and out. "1480, The Dove." (IEN-GA)

710 WROM Rome, GA, 2/15 0750. Local weather forecast and ad for Cingular Wireless Store in Cedartown, GA. Weak, but steady. "Your WROM Forecast..." (IEN-GA)

680 WINR Binghamton, NY. Very strong daytime signal with "Music Of Your Life" and IDs, gets out very well since power increase a few years ago. (DS-PA)

Contributors: Ira Elbert New, III (IEN-GA) of Watkinsville, using a Drake R8B with a 135-foot N/S wire, and mobile with 2002 Nissan Sentra GXE In-Dash Audio System/SANGEAN ATS 909. And, of course, yours truly (DS-PA).

We Need Your Input!

Next month we'll take a look at FM DXing and offer some tips which may help you hear a few more stations. We'll also have some reader contributions on items of radio interest in their areas. And we'd like to hear from you! As always, we invite input from our readers in the form of loggings, verifications you have received, or just general comments of things going on in the radio world in your area. However, we ask that you include your name and location, especially when sending in loggings. It really helps the reader determine his or her chances of hearing a particular station.

You can send along your DX items and radio news anytime. We appreciate hearing from you at TheRadioColumn@aol.com or by mail at *Popular Communications*, "Broadcast Technology," 25 Newbridge Road, Hicksville, NY 11801. Until next month, good DX to YOU! ■

Radio Fun And Going Back In Time

Q. What kind of communications problems did our military encounter during the Vietnam War among our European-based forces?

A. Things got pretty grim in Europe when all the best equipment was going to support the War in Vietnam. One young artillery captain arriving from Fort Sill, Oklahoma, to take charge of a six-gun, self-propelled howitzer battery in Germany found he had no radios. Radios were all assigned to the Armor and Mechanized Infantry units, which traveled faster and formed the base of our European Defense Doctrine. Artillery, which moved much slower, would just have to try to keep up and get there as best as they could. They were also reduced to using flags to communicate within the battery.

Using his own initiative and a \$400 personal loan from the credit union, the captain bought 10 new CBs from Sears. He equipped all the battery elements with the CBs. There was one for himself, each of his guns, his Executive Officer, the Fire Direction Center, and the battery First Sergeant. During the next maneuvers his battery was able to redirect their route after an accident blocked the road ahead. As fast as the news of the detours came in on the Command Net they went out to everyone in the battery over the CBs. They kept up with the "Fast Movers" and surprised everyone; they arrived *with*, not behind the squadron's tanks. What? You thought Tommy Franks got those four stars in a poker game?

Q. Martha Stewart was released from Alderson Federal Prison for Women in West Virginia in March. Have there been any other famous "guests" at Alderson?

A. Yes there have been. Mildred Sisk who broadcast as "Axis Sally" and Ikuko Toguri who was "Tokyo Rose" are both alumna. Both women were American citizens and were convicted of treason in 1949. Sisk was released in 1961 and Toguri was pardoned in 1977. Stewart plans to return to broadcasting. Sisk and Toguri did not.

Q. In all the war movies they have people listening to the BBC and picking up "Personal Messages." How did that work?

A. One of the most famous ways the Allies got information into occupied Europe was by coded messages transmitted over the BBC during its foreign language broadcasts. After the news every night there would be a group of messages made up of nonsense phrases like "John has a long moustache," or "The cow needs milking," in the language of the transmission. These pre-arranged messages would tell specific groups or agents that a special message was coming for them, whether air drops would take place or had been cancelled, what to expect in the next air drop (like cash, arms, or equipment), or specific sabotage targets to hit. They were also used to blackmail managers of companies who were cooperating with the Germans. Suppose you got a visit from a member of the resistance who advised you to have an "accident" in your factory bad enough to stop production or it might be bombed. Then he told you to listen to BBC in two nights for a special message. Two nights later a message came through, saying something like, "Charles says John had better be a good boy." If your name was John, you'd know you just got a personal message from DeGaulle.

Q. Ham radio operators are always saying 73s. What is the origin of the phrase and what does it really mean?

A. In 1859 the Western Union Co. started using the Phillips Code. To shorten messages, certain words and phrases were adopted to reduce the time it took to send a message. Many of the abbreviations of the Phillips Code are still used on CW. Specifically, 73 (not 73s) was the number assigned to "Warmest Regards," often used to end a telegraph message. We also sometimes hear 88, which on the Phillips Code stood for "Hugs and Kisses."

Q. International law governing radio is established by international conferences that set up and change the rules governing the use of the radio spectrum. When was the first one on radio held and why?

A. The International Wireless Telegraph Conference was held in Berlin in 1903. It was attended by representatives from Germany, Great Britain, Austria-Hungary, Italy, Spain, and the United States. The heavy hitters of the day met to deal with a disagreement between the liner *Deutschland* and exclusive rights to use wireless claimed by the Marconi Company. It appears that employees of the Marconi Company had "accidentally" jammed the *Deutschland's* signal, coming from Telefunken equipment. The decision was that Marconi had discovered how to use the airwaves but he didn't own them. The 1906 Madrid Conference ratified the decisions of 1903. It was also decided that SOS would be the international call for distress and the term radiotelegraphy was first used at this time.

Looking Back...

Five Years Ago In Pop'Comm

Grundig was advertising its new Satellit 800 worldband receiver with its 70 user-programmable memories, dual clocks, and "superior audio quality." Much to the chagrin of would-be small town community broadcasters, the FCC news back in May 2000 was its authorization of the LPFM (Low Power FM) broadcast service on a non-commercial basis. Build this antenna: The late Joe Carr gave us plans for a Six-Shooter, a variation of a broadside array—its considerable gain made it all worthwhile!

Ten Years Ago In Pop'Comm

The talk of the town was AOR's new AR3030 general coverage receiver with 20- to 30-MHz coverage and a Collins mechanical filter. And Yaesu's new entry was the FRG-100 with 50- to 30-MHz coverage and 50 memory channels. New on shortwave from Paraguay was Adventist World Radio's broadcast center in Asuncion. And new on the stateside broadcast scene the simultaneous broadcast on FM and the Internet of the campus radio station at the University of North Carolina, Chapel Hill.

Twenty Years Ago In Pop'Comm

Top-of-the-line at Kenwood was the new R-2000 receiver, which covered 150 kHz to 30 MHz and carried a typical street price of under \$500. Cuba topped our shortwave news in May 1985 with word that Radio Rebelde, a Cuban mediumwave station, was operating on 5025 kHz. The ever-popular Sony ICF-2010 was being sold by one radio dealer for \$279.95.

Back To Basics—Part V Mid-Range Shortwave Receivers, Plus *Code Names* Spills The Beans

This month we continue our series on shortwave receivers both *new* and *old school*. In this issue I'll be taking a look at the newest mid-price range radios as well as some vintage receivers that we old crows swear by. Keep in mind I'm concentrating on HF-only capable radios and not the all-band (DX-to-daylight) receivers. Let's do, so let's get to it!



The venerable Realistic DX-300 was one of the first SW radios to feature digital frequency tuning. Although vintage, a DX-300 in good condition makes an excellent receiver for a novice or for use as a backup receiver.

Old School: Realistic DX-300

A very popular radio when it was introduced in the late 1980s, this was the first Realistic general coverage receiver to have a digital frequency readout. Although a nice triple-conversion receiver and a favorite of UTE monitors of the day, the DX-300 had the tendency to drift off frequency and required constant dial tweaking. Also, early models had poor image rejection, so channel splatter from adjacent powerhouse broadcast stations could be a problem. The DX-300 is a good vintage receiver to use as a backup or for a novice. Mint units can be found on e-Bay and other online auction sites running from \$150 to \$200.

New School: Sangean ATS 909

A worthy successor to Sangean's long line of economical HF receivers, the ATS 909 is compact yet surprisingly good performer. A great portable to take out camping or on a vacation, the ATS 909 is a good entry-level receiver, sporting 306 station memories, SSB capabilities, and even FM stereo reception. It sells new for around \$250.

Old School: Panasonic RF 4800/4900/9000

When I was a young man (just getting into radio monitoring in the 1970s) Panasonic introduced its *RF Series* of general coverage receivers, and the three radios listed above were considered top of the line. Although I was working at a consumer electronics store at the time (and as part of the perks had a healthy employee discount), I still couldn't pay rent, eat, drive a car, go

to college, and still afford to buy one of these great radios. However, since my job as a salesman entailed hands-on sales of radio equipment, I considered it a bonus to be able to demonstrate these radios for those who *could* afford to take them home. I sold dozens of these Panasonics, as well as quite a few of Sony's (then) state-of-the-art radios.

Of all these radios, my favorite was the Panasonic RF-4900, not because it was a better receiver than Sony's but mainly for its unique and robust design. To me it looked like a piece of military equipment, with its huge band-spread display, large cool green-blue digital frequency readout, clunky big operating knobs, and silver rack handles. I promised myself that one day I'd be able to afford one of these great looking radios. Years later (after I'd long forgotten about the RF-4900), I stumbled on one for sale on e-Bay. Seeing the radio awakened long dormant memories, and I decided I just had to have one. I paid \$260 dollars for a mint-condition RF-4900, which is about half of what it went for in 1978.

That was five years ago and the radio has been left on ever since. It is a good performer, but compared to today's receivers it is lacking in features we now take for granted. It's not really stable and I have to tweak the frequency dial from time to time to keep it on station. It has no memories and can only receive one frequency at a time. It does not scan (other than via my fingers turning the large VFO through the bands), there's no spectrum display and it's about as portable as a small microwave oven. Still, it's my favorite radio because it is so sensitive and can pull out of the static signals my WinRadio can't even begin to hear.

The RF-4800 is basically the same as the RF-4900, but sports a red LED frequency display and does not have the RF-4900's



A Panasonic classic receiver, the author's RF-4900 combines stylish design with good performance. But as great as it looks its features can't compare with today's modern receivers. (Photo by Steve Douglass)

somewhat better (upgraded) circuitry. The Panasonic RF-9000 was (then) the ultimate Panasonic SW receiver, with touch-button keypad tuning for direct frequency entry and an LCD display. It was not produced in large numbers and is today considered highly collectable. Even a good used radio will go for about \$1,000 on e-Bay.



ICOM's IC-R75 was, and continues to be, one of the best general coverage receivers made. (Photo courtesy ICOM America)

New School: ICOM IC-R75

The ICOM IC-R75 is a modern SW radio that any UTE monitor would do well to own. Rock-solid performance combines with advanced features like 99 memory channels (F/M), two band-edge memories, squelch, direct-entry keypad, noise-blanker, automatic gain control, FAST/SLOW/OFF-tuning, synchronous detection, scan and sweep, and add-on accessories like filters, audio DSP notch/NR option, control software, high-stability VFO, and even a voice synthesizer. The IC-R75 is a triple-conversion receiver that rejects out-of-band noise quite well and can be computer controlled. New units run about \$700; good used units fetch about \$400.

Old School: ICOM IC-R72

The ICOM IC-R72 isn't *exactly* old or new school, but quite handsomely bridges the gap between vintage digital radios and newer computer-controlled receivers. The precursor to the IC-R75, the IC-R72, is still such a great performer that it's in very high demand, yet good used units can be found for about \$300. It's simple enough for the novice but packed with enough advanced features (like 99 channel memories, tone, preamp, squelch, attenuator controls, locking keypad, scan, sweep, 24-hour clock-timer, and three tuning speed rates) that old pros will enjoy it, too.

Available accessories include filters, DSP unit, voice synthesizer, level converter, high-stability crystal unit, DC kit, and mobile bracket.

New School: Drake R8/R8A

There's an old Seinfeld episode where they repeat over and over, "You gotta love the Drake." That couldn't be more true of the Drake R8 or R8A general communications receiver. Drake makes a nice, uncomplicated, clean-looking unit that's a real champ at digging the DX out of the dirt. An optional VHF converter enables reception of the 35- to 55- and 108- to 174-MHz VHF bands. The R8A is an updated version of the R8 with improved features like alphanumeric memories, faster scanning, improved AGC, improved notch, improved display, easier mode and bandwidth selection, tilt-bar, enhanced tone control, detachable line cord, and expanded RS-232 command set.

Standard features include PBT, preamp, IF notch, AGC, BFO, 440 alphanumeric memories, synchronous detection, tone, dual clock timers, RF gain, remote recorder activation, RS232 port, scan, sweep, keypad, squelch, dual VFOs, speaker switch, line output, and attenuator. New units can be had for just over \$1,000, with good used units netting about \$700.

Old School: Sony CRF330K

This is another one of those vintage general coverage receivers that I lusted over when I was a kid. This radio just looks cool. In fact it looks like something you'd see a spy using, or maybe in a rack on a B-52 bomber on nuclear alert with the operator awaiting the go-code. Of late 1970s vintage, this radio features large LED frequency readout, S/battery meter, bass, treble, RF gain, dial lamp, clock timer, NB, dial adjust, local-DX switch, carry handle, record jack, aux input jack, muting, slide-out cassette recorder, antenna trimmer, and built-in microphone. Finding one in good working condition can be a challenge as the 330K suffered from a design flaw (as it ages the nylon tuning gears become brittle and can be easily broken, making tuning impossible) and there are not many surviving units. Their rarity is why the Sony CRF330K is so collectable, and if you find a mint condition unit for less than \$1,500 consider it a steal.

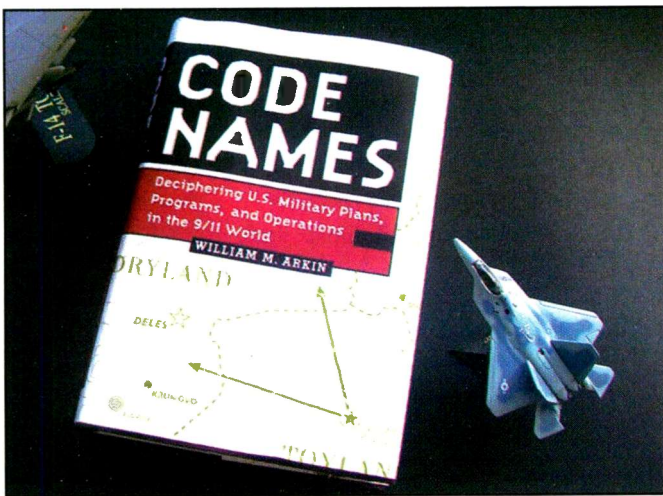


Another classy looking radio from the past, Sony's CRF330 may have been a great looking radio of the day, but it did have a construction flaw that plagues collectors even today. (Photo courtesy Sony)

Next month we'll look at the modern dream machines, those high-dollar receivers that cost as much as an economy car. I also want to know what you use. What works for you and what do *you* believe are the best shortwave receivers, both past and present?

Code Names Spills The Beans

I've been reading an amazing book that all UTE and MIL-COM monitors should rush out and buy. Keep this on your shelf as a great resource book that will greatly enhance your database of monitoring knowledge. The book is *Code Names, Deciphering U.S. Military Plans, Programs and Operations in the 9/11 World* by William Arkin. As you might expect, it has



Code Names, by William Arkin, has the Pentagon frantically looking for leaks.



The author's artistic exercise in what a modern receiver (designed to look retro) might look like. (Steve Douglass)

Pentagon and intelligence agency insiders hopping mad because it reveals many of the covert operations, programs, and systems that they've spent millions of dollars trying to protect from spying eyes. In fact, the book has so troubled Washington that the Joint Staff at the Pentagon ordered an investigation into the compromise of several programs that were revealed in the book.

To quote a *Washington Times* article by Bill Gertz,

According to a Jan. 25 cable from the Joint Staff to 14 military units, most of them involved in special operations, Air Force Gen. Richard B. Myers, chairman of the Joint Chiefs of Staff, has asked for an "opsec" or operational security assessment of possible national security damage to special access programs and other "operational compromises" in the book, "Code Names."

The U.S. Special Operations Command will be the lead agency in reviewing the compromise of special access programs called Power Geyser and Footprint, along with other secret programs and activities.

Power Geyser is a special counterterrorism commando group, and Footprint is another commando counterterrorism activity.

At least one Pentagon security official was outraged that nothing was done for months to try to identify the source of the compromises. The official said Mr. Arkin was linked to a senior Pentagon official but that the Office of the Secretary of Defense protected the official. "So just let the secrets hemorrhage," the official said. "God bless America."

In the book you'll find over 3,000 code names and definitions of secret (and some not at all secret) military and intelligence plans, exercises, operations, and special access programs

that the government would rather you not know about. Some see Arkin as a traitor, but liberals see the author as one of the few who can provide the American taxpayers an honest look at what their hard-earned tax dollars are paying for.

According to Arkin, "Among other things, this book will help readers gain a clearer picture of the political and diplomatic machinations that underpin the global counterinsurgency campaign that is the "war on terrorism" and help reveal to American citizens initiatives and strategies being implemented around the globe by their leaders in their name."

No matter your political persuasion, you'll find *Code Names* a revealing and amazing book that will help you immensely in your UTE and MILCOM monitoring expertise.

For a small taste of the mountains of information that can be found in *Code Names*, see "Sample Code Names And Definitions From *Code Names*." For still more information, point your browser to codenames.org.

A Correction, And A Black Patch Response

I received a couple of letters regarding the publishing of a photo of the mystery patch that may be associated with a black-aircraft program known as Excalibur. One reader, H.M. Bumgardner, Jr., noticed that I incorrectly listed Northrop Grumman as the parent company of Phantom Works, when in actuality Boeing is the parent company.

It's funny how the brain works sometimes, and as many times as I've reported on Boeing's Bird of Prey program, you'd think a detail such as who the Phantom Works belongs to would be etched on my brain! As Homer Simpson would say, "Doh!" I stand corrected.

Also regarding the patch, reader Tony, K2AF, writes,

I always look forward to your column! As an aerospace engineer, private pilot, scanner enthusiast and ham radio operator, I find the stuff you write about very interesting! Several years ago I used to subscribe to your newsletter, which I really enjoyed too!

In your column this month (Feb 05), the picture of the mystery patch is very interesting.

My thought is that Merlin is holding (and ready to toss?) a "sigma," not a "Q." Sigma is the symbol used for radar cross section.

The presence of the T-38 (?) is interesting too, perhaps it's part of the cover story for the program, such as the F-117 pilots used to fly A-7s? At first I thought that the group of stars on the left side of the patch might have been the constellation Orion (the hunter), which would have been a good place for the sword to be stored, but the stars making up the belt are angled the wrong way.

This patch also reminds me of the case of the cocktail napkins that were used at the unveiling of the B-2 bomber, I've always wondered if they had to have them made in a classified napkin factory since they included the then classified shape of the B-2.

More 9/11 Report Fallout

The letters concerning my review of the *9/11 Commission Report* just keep on coming in. Kyle Accardi, of Portland, Oregon, writes,

The problem with questioning 9/11 is that the implications are too terrifying for most sane people to want to get near. That, and being labeled a "conspiracy theorist" can ruin a public career.

I have not read the *Commission Report*. I have not wrapped myself in the paranoid angst that drips from so many websites. If e-mail addressed to me bounces, something bad happened...that is to say, I think I'm fairly sane and levelheaded.

If you can believe that for a moment, allow me to recommend a book, *The New Pearl Harbor*, by David Ray Griffin (http://www.interlinkbooks.com/BooksN/New_Pearl_Harbor.html).

It's short, it is heavily referenced and I think the author succeeds in his mission of posing crucial questions derived from major media reporting without skewing the narrative too much. He does interject here and there, but lets the reader know when. Quite readable and a great jumping-off point for anyone that wants to do research for themselves.

Among the things that bug me are the following:

Aside from the Pentagon being the biggest office building in the world, it is probably the most heavily protected, and I don't mean by thick walls.

Osama is still at large. If the entire United States military cannot find one man, they aren't looking very hard.

Your February column was the first I'd heard of the communication breakdown between the Pres & VP. Is it really necessary to ask the President before a hostile aircraft is shot at? I'd be surprised if fighter pilots didn't have open permission, given the right circumstances.

And if you haven't relegated me to the nut-jar yet, suppose you are a government with dirty secrets and you want to discredit the critics. Perhaps you put up a website or two, print a couple facts (hell maybe tell the whole truth). As long as you put in the flying dinosaurs, you can respond to anyone who asks a pointed question and say, "I've got time for one more. Yes, you in the back, Dinosaur Boy."

Sample Code Names And Definitions From Code Names

ABLE: NATO Allied Command Europe (ACE) nuclear weapons exercise first word. **ABLE ALLY** is an annual highly classified nuclear weapons exercise held in November and December.

ACER GABLE: Air Force code word for unknown project or weapon.

AMALGAM: NORAD exercise first word.

AMAZON: NORAD Cheyenne Mountain exercise first word.

APOLLO: STRATCOM exercise first word. Exercises in this series included Apollo Endeavor, Apollo Fury, Apollo, and Force.

BABYLON: DARPA TIAP (Terrorism Information Awareness Project) developed rapid two-way, natural-speech translation interfaces for use by soldiers in the field for force protection, refugee processing, and medical triage. The PDA-sized Babylon devices initially provided speech translation in Arabic, Chinese (Mandarin), Dari, and Pashto.

BIG PHOTO: General callsign used to contact aircraft capable performing airborne electronic attack.

BLACK LIST ONE: Saddam Hussein.

BLIND EAT: Special relay of Emergency Action Messages by the FAA.

BLUE: Coast Guard operations first word.

BLUE HORIZON: Air Force Intelligence.

BRIDGET, FARRAH, MARILYN, RAQUEL: All ELINT "ferret" satellite code words.

BRILLIANT EYES: Air Force Strategic Defense Initiative program.

BULLS EYE: Network of huge circularly disposed antenna arrays (CDAAs) including up to two rings of dipole antennas and two reflector array screens to a diameter of 800 feet. The first of the CDAAs, in the Hybla Valley in Alexandria VA, was used to track Sputnik in 1957. Today's BULLS EYE network control system is located on Skagg Island, CA.

BUSTOUT: Unclassified nickname used to notify NORAD and STRATCOM of SIOP Positive Control Launch and dispersal of nuclear-loaded aerial refueling and reconnaissance aircraft.

CARNIVORE: FBI e-mail monitoring system.

COBRA: Air Force Intelligence first word. For example, a well-known Air Force intelligence program was *Cobra Ball*: Specially configured F-135 for collecting ELINT/SIGINT/OPINT data.

COVERED WAGON: Air Force up-channel security police report informing higher headquarters incident, probably or actually hostile has occurred at an installation or dispersed site.

CRIMSON: First word preceding USAFE Emergency Action Messages.

ECHELON: UK, US, Australia, Canada, and New Zealand signal intelligence system of strategic (national-level) communications interception.

FEATHERED: NORAD 23rd region first word.

FEDERAL: NORAD Southeast sector first word.

FELIX: NORAD Northwest sector first word.

FLAMING ARROW: Europe-based dedicated nuclear weapons UHF communications network.

FLUENT: CIA program that searches foreign-language websites without requiring skills in the site's native language.

GIANT: STRATCOM (and predecessor SAC) first word. For example, GIANT TALK was the old HF/SSB radio network upgraded under SCOPE SIGNAL.

HAMMER: Air Force Communications code word. For example, HAMMER ACE is a rapid response special-purpose communications team that provides support in the event of nuclear and aircraft mishaps, disasters, and civil relief operations.

HELPING HAND: Tactical report of possible hostile action. (For example, during the attacks on 9/11, some MILCOM monitors reported hearing the code word HELPING HAND broadcast on STRATCOM channels.—sd)

ICON: Post 9/11 AFOSI project to conduct tactical terrorist reporting, fusion, analysis, and production for analysis and dissemination.

LINCOLN GOLD: DOD special operations capabilities involving the retrieval and neutralization of stolen nuclear weapons and improvised nuclear devices.

OMEGA: Possible Air Force special access program. (OMEGA has been associated with a hypersonic aircraft program.—sd)

PANTHER: Air Force cyber weapons first word.

PEARL: CIA classification (for instance, Top Secret/Pearl) used for national-level intelligence findings and covert action.

PF: Classified Advanced Concept Technology Demonstration, 2004. (This could be associated with the *Advanced Manned Concept (stealthy aircraft) program*.—sd)

POLAR MOON: Classified special operation, 1995 to present.

SCIENCE: Air Force space-related code word. (For example, *SCIENCE MEDIA* is a classified Air Force R&D project that could be related to a secret mini-space plane project.—sd)

SCOPE: Air Force Communications first word. For example, SCOPE COMMAND was the high-frequency modernization completed in 1997 replacing SCOPE CONTROL.

SENIOR: Air Force special access program first word. (For example, last month Pop'Comm reported on SENIOR PEG, which was Lockheed's development program to build a stealth bomber to compete with Northrop's B-2.—sd)

SHARK: Morse Code intercept program introduced in 1999. (Playback software allows instant playback (TIVO-like) of intercepts while still in collection mode. NSA program.—sd)

SLY: First word associated with a set of clandestine surveillance programs that have been deployed with SOF in the war on terrorism. (For example, *SLY VIPER* is a sensor suite comprised of remote cameras and seismic and sonic sensors deployed in the hunt for Osama Bin Ladin in Afghanistan.—sd)

SUCCESS: Radio SIGINT system.

WHITE KNIGHT: Communications/encryption system used for special access program materials.

Finally, I enjoyed the SETI series as well. Can't recall if you covered this, but wouldn't a civilization whose communication technology evolves such that it doesn't travel so far (digital, as you say) realize that if they too wanted to be found they'd need to beacon with an appropriate technology? (The same way a hiker might carry a cell phone and a whistle).

Kyle, you might want to check out the website at http://www.abovetopsecret.com/pages/911_pentagon_757_plane_evidence.html. The author takes an unbiased, scientific, and serious look at the conspiracy claims and (in my opinion) lays many of them to rest. As always, all letters (both pro and con) are welcome. Send them to the e-mail address listed at the top of the first page of the column.

Final Thoughts

If you have been following my series on HF receivers, you've probably noticed I have voiced what I think is a lack of imagination in the look of today's modern equipment. Long gone are the days of the cool-looking radio sets of my youth, complete with clunky knobs, rack handles, and backlit displays. Except for some novelty radios, today's receivers are just plain boring to look at, with most of them being black boxes adorned with off-the-shelf switches and displays.

Although today's computerized gear is much more sophisticated (and I wouldn't trade any of their features just for looks), still it would be nice to find a radio that doesn't look like it was designed to be a piece of lab equipment. Even virtual radio interfaces (like my WinRadio 1550e) may indeed be state-of-the-art and versatile, but their look is anything but artistic.

Receiver designers take note, automobile designers have tapped into the likes and dislikes of baby boomers and have

designed modern cars that are *retro* in style. Chevrolet's PT Cruiser and the new Ford Mustang are good examples of how Detroit has learned that "retro" means increased sales. That said I would like to see a modern receiver that looks like the old Hallicrafter and Collins receivers of my youth. Form does follow function, but that form doesn't have to be boring.

As a design challenge, I decided to try to illustrate what a modern, but retro, receiver could look like. I've based the look on a variety of the old tube-type radios I grew up with, but still incorporated modern features. My exercise in radio design is not at all ergonomically or logically laid out and its design elements were selected just because they looked cool. It's printed here for your enjoyment and to solicit your comments on what receivers (both present and past) you consider winners in the *style-only* category. Forget about how badly some of the boat-anchors of the past worked, I'm talking about fashion, folks! Again, send your comments to my e-mail address.

Reader's Logs

As always, it's now time to share our Readers Logs. And, once again, thanks to our faithful contributors.

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

3167.4: 3TZ and LOU in Link-11 coordination net in JAX OPAREA at 0234. (MC)

3290.5: KYAASF (Army Aviation Support Facility, Frankfort, KY): 1053 USB/ALE sounding. (RP)

4369.0: WLO, Mobile AL with sign-off of broadcast using synthesized female voice. USB at 0023 Z. (CG)

4372.0: Z5X, N6Y, Y7N, M4L, and FRANCHISE in Link-11 coordination net at 2239. (MC)

4469.0: SOUTHEAST CAP 47 as NCS in Southeast Region CAP Net taking check-ins from SOUTHEAST CAP 43, SOUTHEAST CAP 44, IOWA CAP 4, FLORIDA CAP 90, RED ROBIN 194, TEXAS CAP 321, FLORIDA CAP 1004 at 0100. (MC)

5066.5: USAIS1012 (US Army Intelligence & Security Command (INSCOM), Ft Belvoir VA): 1535 USB/ALE TO USAMD1010 (US Army Space & Missile Defense Command (SMDC), Arlington VA). (RP)

5320.0: RESCUE 1503, Group Atlantic City, USCGC DEPENDABLE, USCGC MAKO and fishing vessel PROVIDER in comms during SAR at 2230 Z. (MC)

5422.5: RADIO PARADISE, MI, RADIO CONWAY, SC, RADIO CHOPTANK, MD, RADIO HUNTINGTON, WV, RADIO MEDIA, RADIO WINONA in USCG Auxiliary net at 0132. (MC)

5696.0: J5F passing contact report on Go-fast smuggling vessel to CAMSLANT at 1407. (MC)

5696.0: CAMSLANT diverts CG 2109 to the F/V PATRIOT with 7 POB with heavy smoke in the engine room at 2320. (MC)

5732.0: PANTHER wkg 18C to pass position of grounded vessel at 2220. (MC)

6501.0: NMN, Portsmouth VA (USCG) with WX forecast using synthesized voice. USB at 2303 Z (CG).

6604.0: New York Radio with aviation WX for Midwest and Eastern US cities in USB at 2140 Z (CG).

6761.0: REACH 139 clg SOONER CONTROL with no answer at 2354. (MC)

6855.0: UNID SS YL with 5-figure groups. Had some QRM from UNID EE OM. USB at 2120 Z (CG).

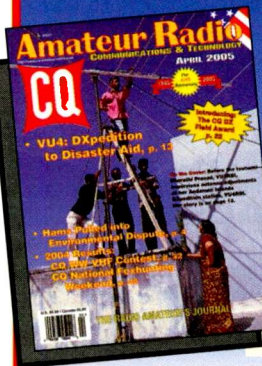
6930.0: UNID EE YL with "SYN2" repeated phonetically over and over. USB from 2146-2150 Z (CG).

6911.5: KYAASF (Aviation Support Facility, Frankfort KY): 1335 USB/ALE sounding. (RP)

6911.5: KYAASF (Army Aviation Support Facility, Frankfort KY): 2024 USB/ALE sounding. (RP)

6948.0: UNID, string of continuous dits. 2155 Z (CG).

6985.0: KFMHNG (probably 3/126th Avn MANG, Otis ANGB



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MA): 1906 USB/ALE sounding. Also sounding on 06985.0 & 08171.5. (RP)

6985.0: USACE1010 (US Army Corps of Engineers, Washington DC): 1634 USB/ALE sounding. (RP)

6985.0: USAIS1012 (US Army Intelligence & Security Command, Ft Belvoir VA): 1545 USB/ALE TO USADA1010 (unidentified US Army Command). (RP)

6985.0: USACE1010 (US Army Corps of Engineers): 1752 USB/ALE sounding. (RP)

7360.0: PIZ131 (1/131st Avn, ALNG, Birmingham AL): 0213 USB/ALE sounding. Also sounding on 08040.0 (RP)

7313.5: AFF2FL Florida, AFF2T Florida, and AFT2IU in USAF MARS Region 2 training net at 1408. (MC)

7448.5: USADA1010 (unidentified US Army Command): 1740 USB/ALE TO USAFC1220 (US Army Forces Command (FORSCOM), Ft McPherson GA). Also noted on 06767.5 & 07510.0. (RP)

7617.0: RM4 (HQs, 4th Military Region, Monterrey, Mexican Army): 2301 USB/ALE TO CAMALEON3 (Mexican Army). (RP)

7633.5: REACH 252 p/p via AFA1MH at 1922. (MC)

7635.0: HILL CAP 49 as NCS taking check-ins in CAP National Daytime Net from KITTY HAWK 30, HILL CAP 604, RED ROBIN 8 at 1729. (MC)

8040.0: PIZ131 (1/131st Avn ALNG, Birmingham, AL): 0237 USB/ALE TO R23277 (prob UH-60, 1/131st Avn). (RP)

8047.0: HQ703N (probably Nat'l Guard readiness Center, Arlington VA): 0435 USB/ALE TO H090IN (Nat'l Guard, Hawaii). (RP)

8047.0: HQ703N (probable Nat'l Guard Readiness Center, Arlington VA): 0020 USB/ALE TO N070EN (Nat'l Guard, Nebraska). (RP)

8047.0: HQ703N (probably Nat'l Guard readiness Center, Arlington VA): 0430 USB/ALE TO G090UN (Nat'l Guard, Guam). (RP)

8056.0: CLS (probable 160th SOAR, Sabre AAF, Ft Campbell KY): 1534 USB/ALE TO CLH (probable 3/160th SOAR, Hunter AAF, Savannah GA). (RP)

8060.0: CORE7 (Commander, Venezuelan National Guard Region 7): 0706 USB/ALE TO CUFAN3 (unidentified sub-element of Unified Command of National Armed Forces, Venezuelan Army). (RP)

8060.0: CRC2M (Regional Communications Center-Mobile, 2nd Military Region, Venezuelan Army): 0324 USB/ALE TO CLC25M (Local Communications Center-Mobile, 25th Inf Bde, Venezuelan Army). (RP)

8171.5: 86OPS (86th Medical Co, VTNG, Colchester/Burlington VT): 1832 USB/ALE sounding. (RP)

8171.5: T5Z101 (5/101st Avn, Ft Campbell KY): 0117 USB/ALE TO T101 (101st Abn Div, Ft Campbell KY). (RP)

8161.5: TA7158 (Coy "A," 1/158th Avn, Ft Hood TX): 1339 USB/ALE sounding. (RP)

8301.6: Sector San Juan wkg STINGRAY 39 (HU-25) to request ETA to CGAS Borinquen at 2306. (MC)

8912.0: CHARLIE OSCAR ECHO (US Army Corps of Engineers, Mobile, AL) taking check-in from CHARLIE 26 after authenticating them at 1605. (MC)

8971.0: WAFER 21 (P-3C) wkg GOLD-ENHAWK requesting to know if LK 01 is on their freq and reporting they are not receiving plain text messages at 1809. (MC)

8980.0: CG 2136 (HU-25) p/p to District 7 Command Center regarding a 406 EPIRB they are receiving at 2114. (MC)

8992.0: REACH 5033 (KC-10A) p/p via Puerto Rico HF-GCS to Barksdale AFB CP at 1722. (MC)

9007.0: CANFORCE 2652 wkg TRENTON MILITARY for WX at Providenciales Airport and Hato, Curacao at 2139. (MC)

9025.0: BOLT 31 HEAVY (KC-135) radio check with HF-GCS at 1434. (MC)

9081.5: P5Z101 (5/101st Avn, Ft Campbell KY): 0208 USB/ALE sounding. Also noted on 05785.0; 06911.5; & 08171.5. (RP)

9145.0: CLH (probably Hunter AAF, Savannah GA): 1553 USB/ALE TO 832186 (poss MH-60L # 89-26186, 3-160 SOAR HUNTER AAF GA). (RP)

9145.0: 832410 (poss MH-60L # 26410, 3/160TH AVN HUNTER AAF GA): 1556 USB/ALE TO CLS (possibly Ft Stewart, GA). (RP)

10816.5: A3Z (unidentified, probable Nat'l Guard entity): 1649 USB/ALE sounding. (RP)

10993.6: CG 1712 (HC-130) position report to Sector Key West at 1300. (MC)

11175.0: CACTI 51 p/p via Puerto Rico HF-GCS to RED BARON reporting buckling and warping near the wing root. They are scheduled to RTB Keflavik after the AR. RED BARON advises to continue offload to get to landing weight, then recommends RTB Mildenhall at 1139. (MC)

11175.0: SHARK 66 p/p via Offutt HF-GCS to Davis Monthan AFB Meteo for WX at Soto Cano AB followed by p/p to DUSTY OPS, Soto Cano AB at 2349. (MC)

11175.0: SAM 8459 p/p via Andrews HF-GCS to SAM COMMAND at Andrews AFB at 1925. (MC)

11205.0: SWEET 71 (C-130H, 95 AS/440 AW) check-in with SMASHER. Deploying to TJSJ (Luis Munoz Marin, PR) and requests they pass to OAK OPS their 1825z ETA. Current position 100 miles northwest of Grand Bahama at 1535. (MC)

11205.0: SHARK 66 check-in with SMASHER. Departed Soto Cano AB en route to Charleston at 1809. (MC)

11205.0: SMASHER (SouthCom Flight Watch, Key West FL): 1401 USB w/Shark 89 (prob C-130-very weak) w/position report. SMASHER passes WX for Managua, Nicaragua, at 1530 Z and advises Shark 69 that they will contact Managua. (RP)

11220.0: AIR FORCE 7 (C-20C # 86-0403, 89 AW) p/p via Andrews HF-GCS to CONTROL at Andrews AFB. Attempts secure comms radio checks with no joy at 1817. (MC)

11232.0: SENTRY 60 p/p via TRENTON MILITARY to FUZZY OPS at Niagara Falls JARS, NY at 1608. (MC)

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11232.0: Trenton Military: 2121 USB w/Canforce 49 (CC-150 # 15001, 437th Sqn Trenton ON) with WX for Keflavik & Prestwick, Scotland and SELCAL check (AS-CQ). (RP)

13200.0: CACTI 51 p/p via Puerto Rico HF-GCS to Keflavik for WX at 1155. (MC)

13927.0: RAZOR 32 (E-8 JSTARS) p/p via AFA1RE Maine to PEACHTREE for WX and active runway at 1820. (MC)

14408.0: REACH 304 p/p via AFA3HS Kansas at 1617. (MC)

14761.5: RUH960 (probable UH-60A helo, 1/228th Avn Bn, Soto Cano AB Honduras): 1617 USB/ALE TO SKYWAT (US Army Flight Following Service (AFFS), Soto Cano AB, Honduras). (RP)

15025.0: LV 595 (P-3C, VP-66) ops normal report to SMASHER. Passes ETA to Comalapa, El Salvador at 1902. (MC)

15025.0: SMASHER (SouthCom Flight Watch, Key West FL): 1517 w/Evergreen 423 (contract aircraft) w/departure report. Departed Hato, Curacao enroute to Panama (MPMG) w/ 0 pax and 0 cargo. (RP)

17458.5: ISXNGB (unidentified Nat'l Guard Bureau): 1521 USB/ALE TO HQ INGB (Nat'l Guard HQs, Arlington VA). (RP)

19103.5: SKYWAT (Skywatch, US Army Flight Watch Center, Soto Cano AB, Honduras). 1450 USB/ALE sounding. (RP)

This month's star contributors are Mark Cleary (MC), Ron Perron (RP), and Chris Gay (CG). ■

Vacuum Tubes: What You Need To Know!

I'm often asked about what parts a beginner should have to fix up old radios and what tubes should be kept on hand. Alas, this is a very hard question to answer, and there is no simple answer. Tube technology rapidly evolved from the battery set era of the 1920s, the early AC sets of the mid and late '20s, the early 4-, 5-, 6-, and 7-pin-based tubes used before 1935, to the development of the metal and glass octal-based varieties introduced in 1935. In the 1940s, locktal tubes were popular. Finally the 7- and 9-pin miniature all-glass tubes appeared on the scene.

Do You Need Them?

Here's my opinion: unless you're opening a vintage repair shop, investing in a large stock of old tubes will not pay off over the long haul. You'll end up with tube types that are seldom used, and you'll also find that sorting, storing, and keeping track of several hundred tubes can be a daunting task!

There's a common misconception that old radios usually need a new tube or two to get them running again. Not true; in fact, I seldom find bad tubes in old radios. The usual culprits are bad capacitors—especially caused by age-related electrolytic filter capacitor failures—and perhaps a resistor or two that has drastically changed value or opened. Many of my radios still have the original factory tube compliments in place!

Having said that, what tube *is* most likely to fail? Usually rectifier tubes, or audio output tubes, run the hottest and near full ratings. If given one tube types I would most want on hand, it would be the ubiquitous type 80 full-wave rectifier tubes! These were used in radios from the 1920s and probably into the early '50s. The first versions were the so-called globe types, followed by ST shaped bulbs, and finally the tubular GT style. Did you know that the popular 5Y3 rectifier with an octal base is really a type 80 tube? You could build a simple adapter to use the 5Y3 to replace a type 80, but the GT types are still relatively inexpensive, so it's probably not worth doing so, unless an emergency arises.

Vacuum Tubes Sources And A Top-40 List

Where can you find old tubes? Well, I've compiled a list of vintage tube vendors (see "Resources"). There are many other honest tube dealers out there, but these are the ones I'm familiar with. As always, shop around for the best deal. Most of these dealers will stand behind what they sell, but ask first about return policies should a problem arise. Also, Paul Dietenberger¹ kindly shared his "Top-40" tube list with us, which is shown in **Table 1**. While it provides a good starting point, keep in mind that it's far from complete!

Reference Books

Here's something else to consider: get yourself a good tube substitution guide. My vintage *Rider Tube Caddy Tube Substitution Guidebook*² provides a list of possible direct substitutions. For example, it indicates that the 6C6, 77, and type 78

Table 1

Here's Paul's "Top 40" list of the most commonly used vintage radio tubes. I've added few choices of my own, so the count is slightly higher.

27	42	6F5	12BE6
24A	5Y3	6SK7	12AV6
35/51	6A7	6SA7	35C5
45	75	6SQ7	50C5
47	6J5	6V6	80
76	6J7	12SK7	5Y3
77	6K7	12SA7	6X5
6C6	6F6	12SQ7	35Z5
78	6A8	35L6	35W4
6D6	6Q7	50L6	
41	6H6	12BA6	

tubes are excellent substitutes for each other, and even that a 6D6 will sub for a 6C6 in a pinch. As another example, a 6J5 and 6C5 will *sub* for each other. A good feature to look for is information regarding foreign-to-U.S. tube type interchangeability.

Another worthy tube substitution book is the more extensive *Rider Receiving Tube Substitution Guidebook*³. This book is more ambitious in scope and even shows how to make tube



Photo A. The Hickok 800 is a versatile and popular tube tester. It can test a majority of the tube types used in early radios. The Hickok obsolete tube data booklet accompanied this tester; it shows how to set up the device to test early obsolete tube types.

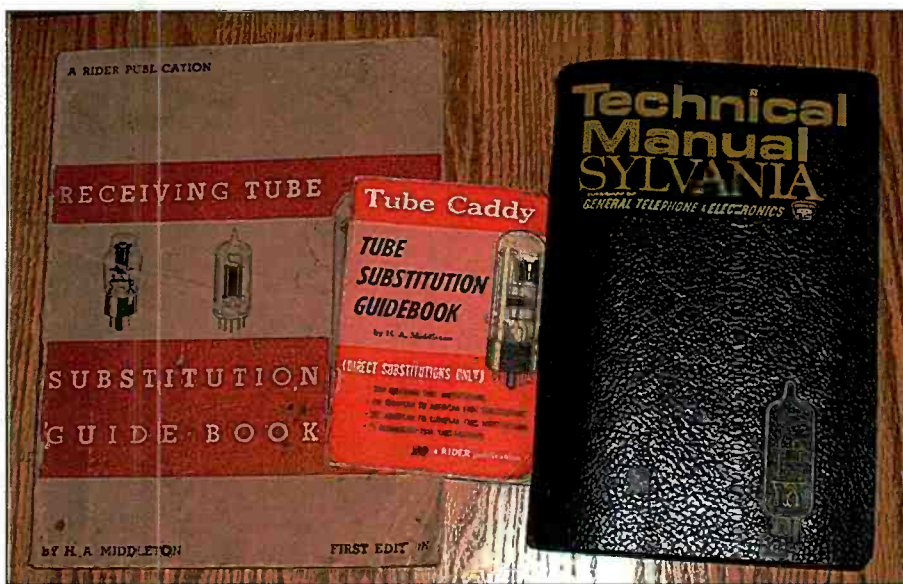


Photo B. Tube substitution books, and a good tube reference manual, are indispensable additions to your reference library.

adapters, changes to socket wiring, and how to accommodate more ambitious substitutions. A good tube manual is also a good investment. Reprints are readily available from vintage electronic supply houses.

Is It Really Bad?

It's a good idea to keep some of the more popular tube types on hand to aid troubleshooting. The best way to determine if a tube is really bad is to swap it out with a *known* good one! Even if a tube tests weak, it still may deliver and have many hundreds of hours of useful service life. This often depends on the particular radio, where the tube is in the circuit, and the operating parameters for any particular circuit. Again, the best test is how the tube performs in the radio. If you're going to resell a radio for a substantial price or profit, you will probably want it to leave your shop with a set of new tubes, or at least a set of old tubes that test on the higher end of the tester's scale. Keep weak, but useable, tubes on hand for your own radios, or for use in common or inexpensive sets. Few of these tubes are still being made, and the day will come when even a weak, but serviceable, tube will be valuable.

So is a tube tester another worthwhile investment? Only if you're going to be doing a lot of restoration work, otherwise it's just a costly doorstop if it doesn't get used enough to pay for itself. For a beginner, who just needs to know if a tube is good or not, a basic, inexpensive emissions tube tester is a good start. These

testers evaluate the tube by measuring its cathode emission; the tube is configured as a simple diode during the test. The meter gives a general **Bad-?-Good** reading, and most models allow some testing for shorts between elements or gassy tubes.

A fancier name for the emissions-type tester is Dynamic Conductance; don't confuse Dynamic Conductance with

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Mutual Conductance tester (Gm)-type tube testers! Mutual Conductance testers measure the AC gain of a tube under simulated real-world operating conditions. The Gm testers are more costly, and you can expect to pay \$200 and up for the better models. Certain models of the better high-end testers have a cult following among audio hobbyists, and those folks will pay thousands for a “desirable” clean, calibrated high-end tester! My Hickok model 800 is a Mutual Conductance tester that is often available for between \$200 and \$400. Otherwise, consider starting with something inexpensive, such as the commonly available Heathkit model TC-2 emissions tester. It’ll do the job and a good, clean working unit usually can be had for under \$50. Make sure all the literature is with it, and check that the roll chart works freely and completely across its full travel. It’s probably a good idea to test a few tubes to ensure that it is working properly.

Regardless of which type of tube tester you end up with, it’s also a good idea to test every tube in a newly acquired radio to weed out potentially bad ones. Subbing a known good tube against the questionable one will show if replacing it provides any worthwhile improvement.

I’ve been told that a tube *checker* is usually used when discussing Dynamic Conductance (emission) testers, while a tube *tester* is used to best describe a Mutual Conductance-type tester.

Tag Sale Bargains...Or One Man’s Trash

Often you’ll find boxes of tubes turning up at flea markets and tag sales. What should you pay for a bushel basket of tubes? Thousands of old radio and TV shops have closed up and gone out of business, and these are, or were, major sources of stockpiles of tubes or good used test equipment. Many tube vendors rely on such sources to replenish their stock. If you find a trove of old tubes, are they worth buying? It depends. Are they new or used? Are they in the factory boxes, and are the original tubes still residing in those boxes? Are the tubes useful, or are they oddball TV-types of little use to the radio hobbyist? In general, used, unboxed tubes with useful numbers are worth about a nickel each. Unless you find a rare or valuable tube (type 45, 50, etc.) in the pile, don’t pay too much for them.

Remember, you will have to test them before using them. They may all be good pulls, or even new tubes that have lost

their boxes. They could also be all duds, or culled weak tubes. If you enter the deal expecting to end up throwing a large number of them in the trash, you probably won’t go wrong. Also consider the time involved in testing each tube, and the wear and tear on your tube tester sockets and switches. The good ones then have to be boxed, or otherwise protected for storage, inventoried, and stored in a logical manner so you can find what you need when you need it. There’s nothing worse than having 5,000 tubes scattered about unsorted in boxes and having no idea what you have on hand when you’re looking for a particular tube! Hams and radio collectors are natural packrats, and things can get out of hand pretty rapidly, unless you’re disciplined and blessed with good organizational skills.

A More Comprehensive List

Table 2 is a more comprehensive list of tubes that were commonly used in vintage radios. Paul Dietenberger also compiled this table and was gracious enough to allow us to reproduce it here. Again, it isn’t complete, but it will provide a good guide to help you separate the wheat from the chaff when evaluating a batch of tubes for potentially useful types. What about boxes of NOS (new old stock) tubes that appear to be radio related? Here again, how many of the tubes are useful to you? To make it worthwhile, figure on paying a fraction of what the dealers are selling theirs for. Chances are you’ll end up using only a small percentage of them, and you’ll probably have a hard time disposing of the remaining ones. Batches of tubes that have been *cherry picked* (the most desirable types have already been removed) aren’t well looked upon by potential buyers.

A Realistic Approach

Inventory your radios, make a list of the tube types used in those radios, and stock a few of those that are most prevalent. For example, if you collect large Philco tombstone radios, you might discover a large number of type 42 audio tubes in the radios, and that they also use type 80 rectifier tubes. Having a few spares of each tube on hand makes sense. To begin with, though, don’t go overboard. When the opportunity arises to increase your useable tube cache, at a price you can’t walk away from, that’s the time to reach for your wallet. Most tubes are still readily available, and for prices that are probably cheaper in today’s dollars than what they sold for when new. You’ll find dealers set up at most of the larger radio shows, and they usually offer decent discounts to show attendees.

See You In June

Until next time, keep those soldering irons warm, tubes glowing, and your letters, comments, and photos coming in. See you again next month! ■

References

1. Here’s the URL for Paul’s webpages, <http://personalpages.tds.net/~pdieten>
2. *Tube Caddy Tube Substitution Guidebook*, by H. A. Middleton, John F. Rider Publisher, Inc., 1960, Library of Congress catalog number 60-13393.
3. *Receiving Tube Substitution Guidebook* 1st Edition, by H. A. Middleton, John F. Rider Publisher, Inc., 1950.

Resources

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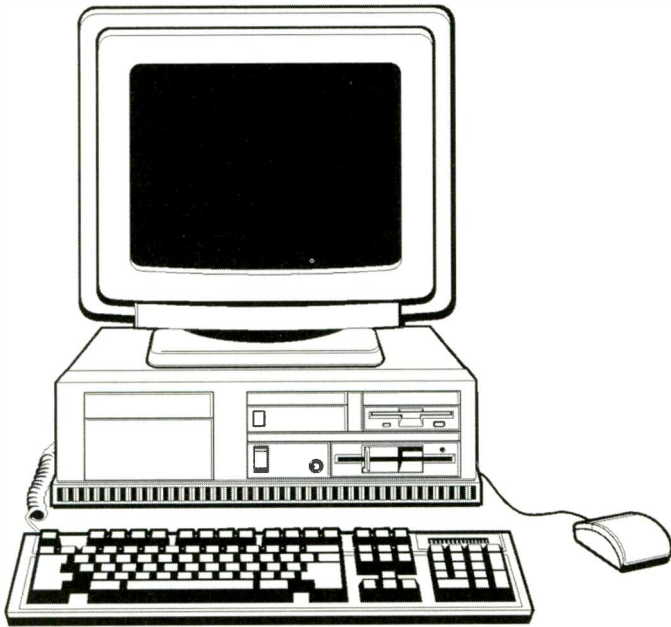
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Trends In Computer-Assisted Tuning Software



I think it's fairly safe to say that most mid- to high-end monitoring radios sold today are designed to be controlled by an optional external software package. I'm not talking about "black box" radios that absolutely require such software control, but about most "regular" desktop monitoring radios that have all of the conventional knobs and buttons and that have been a regular feature of radios since Marconi sold his first commercial sets.

Frankly there is still a lot of resistance to the whole notion of hooking up your compatible monitoring radio to your computer, despite the obvious advantages of doing so. And, believe it or not, it's not just the average consumers who "don't get it," and are thus missing out on a lot of hidden potential in their monitoring radios; also a lot of *manufacturers* are just as guilty of holding onto this particular "old school" attitude.

There are many electronic engineers and software developers out there who'd love to bring even more innovative ideas to their designs but can't because there are too many managers of radio manufacturing companies who still hold the belief that a consumer defines a good radio by the number of knobs and dials they see, not by what goes into the "innards" of the radio.

In this month's column I'm going to take a look at some of the trends in today's computer-assisted tuning (CAT) software design, and I'll discuss a few packages to illustrate my points.

The "Old School" Radio Attitude

This attitude is so prevalent that even when you use a CAT software package, all too often you'll be looking at a "radio under glass" when you view it on your computer monitor. Rather than making the best of the potential of today's computer pro-

gramming, many software packages display a virtual a radio, complete with knobs and dials, using high-resolution computer graphics. As a result you end up twiddling knobs and turning dials with your mouse pointer rather than your finger. Now where is the value in that? Why should I waste my time "pre-tending" to run a radio through my computer when I could do it directly? It's no wonder that once the novelty wears off many people go back to controlling their radios exactly the same way people did during the 1940s.

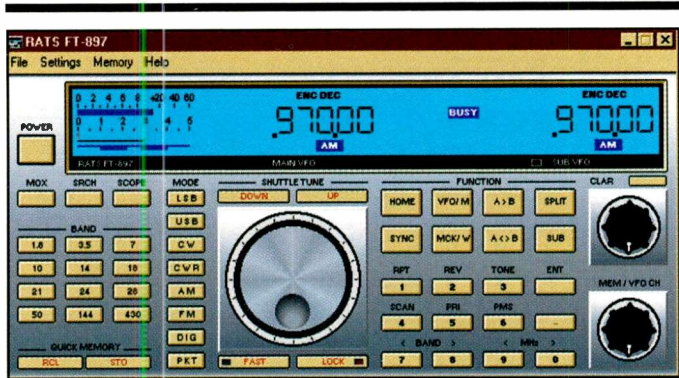
The truth is that there are a great many advantages to using a good software package to operate your compatible monitoring radio or scanner. The primary one is that when you use a computer you have access to multiple lists of frequencies, along with easy-to-manage logging features. Better still, these lists can be used to directly control the computer, allowing you to scan through customized ranges of frequencies with ease. You can also gain better access to many of the internal features of the radio through simpler controls. Likewise, you have access to a range of additional tools, such as those found on the Internet (databases, frequency lists, direct contact via e-mail, and so on) that are simply not available through a radio.

The Problem With Software For Radios

Far too often today when you buy a monitoring radio you'll find that computer cable and control software are generally sold separately. I cannot understand why a computer cable cannot be *included*, especially given that even cables with specialized plugs do not cost very much, and a standard 15-foot serial cable can be had for around \$7.50 retail (I'm sure the wholesale price is far less).

To complicate things even further, many radio manufacturers don't even *offer* a control software package for their radios. Instead you must purchase one from a third-party manufacturer in order to control their sets with your computer. Frankly I can understand that, having been in the software field for over 10 years; developing software takes a lot of time, and very expensive time at that. What's worse is the amount of even more expensive time it then takes to support that software, as many users are still failing to learn the basics of computer operation. The truth is that margins on software are so low that if you take one support call from one customer you've lost all of the profit on the software you sold to him or her.

So, while it's understandable why some radio manufacturers are reluctant to get involved in software development, it's not understandable why it's often very difficult for third-party developers to get the information they need from those manufacturers in order to write their software. The problem is that some manufacturers are simply not used to sharing with "strangers" what they may view as proprietary information; others are afraid that if they give away *too much* information, other radio manufacturers may be able to reverse-engineer some of their features into their own designs. Others still simply don't like the idea of



Here's the user interface for the RATS FT-897, published by Kingsmith Software and written by Mark A. Smith, KB5KYX. The design follows the "radio under glass" philosophy, which can help those users who may find the small knobs and buttons of today's radios a bit hard to manage.

giving away information for "free" that the software developer can use to make money from.

The Dilemma Facing Computer Programmers

I don't really think that most people who purchase or download software from a software developer really understand the steps involved between concept to execution simply to create a working piece of software, let alone distribute it in the marketplace. The two biggest issues facing the software developer are time and money. Two very important things, indeed, and which are generally in short supply. Frankly the radio monitoring market is so small that it's not even on the radar of the big software developers. As a result most of the software available to us is thanks to a small but dedicated group of hobbyists and entrepreneurs. A lot of it is a mix of freeware or relatively inexpensive commercial ware.

The truth is that a number of software packages have come into existence simply because someone in the radio monitoring or ham radio hobby had the computer programming skill to create it. More importantly, a lot of these software packages have been distributed for free simply because the software developer would make so little money after trying to support it that it's not worth the effort. I don't think that enough credit has been given to many of these software developers for their efforts. Face it, the hobby community doesn't hand out awards for their efforts, nor do we see a lot of people saying publicly how much enjoyment they derived from those efforts. If anything, they're taken for granted as we merrily download their products off the Internet.

A good example of this is the HamComm software program developed by W.F. Schroeder, DL5YEC. This was a DOS-based Radio Teletype (RTTY), AMTOR, and Morse Code (CW) software program that used a simple modem that plugged directly into a computer's serial port in order to operate. It was a favorite of both ham radio and shortwave listeners because it worked so well. The problem was that, unlike today's Window-based software, the DOS software could not be set up to turn itself off after a suitable evaluation period. Also, the software was created at a more trusting time, so it was distributed using the "honor system."

Specifically that means that, upon downloading HamComm, Schroeder simply asked the user to consider the first 30 days of its use an evaluation period. If the user wanted to continue using

it, he would send along a money order to the address provided. If he didn't like the software, or did not wish to pay for it, he was respectfully asked to delete it. The only thing Schroeder could actually do to *somewhat* enforce this was to add a "nag line" that would appear when the software was turned off. A long scrolling message would ask you to please register the product so it seemed to take forever for the software to turn off. Unfortunately, most people were willing to live with that and few honored the contractual agreement. As a result, Schroeder simply stopped further development and support of the product.

Thankfully, Schroeder is still out there making a living as a software programmer and has recently released a new Windows-based program called SkySpy that decodes (Aircraft Communications Addressing and Reporting System) transmissions. (ACARS is a digital network used by airlines to report flight statistics to their dispatchers over VHF frequencies; see <http://www.pervisell.com/ham/skyspy.htm> for more details.) However, he learned a lesson and now you have to buy the software outright in order to use it.

The point of all this is that unfortunately Schroeder's experience in developing software for a hobby market is typical of what was happening in the 1990s. Most people will simply not buy software if they have the opportunity to use it for free. As a result, the honor system for payment pretty much disappeared, along with MS-DOS based programs.

Today, there are a variety of software distribution methods that ensure that the programmer gets proper credit and reward for his or her work, and that the software gets into the hands of those people who want it. What's interesting is how a new set of priorities is shifting the value of the work being done by software programmers off of the software itself, and into support and upgrade tasks.

An Example Of Modern Software Distribution

So how do the experiences of the past 10 years apply to today's software development and distribution for the radio monitoring hobby? A good example can be seen in my own recent experiences. I'd been using the Yaesu FRG-100 as my primary monitoring receiver for a number of years and decided to update my station this year. In addition to a good monitoring radio, I also wanted to update my ham equipment as well.

Since the FRG-100 was essentially the receiver section of the Yaesu FT-840 ham transceiver, and because I've always been pleased with their products, I decided to stay with that brand. Prior to that, my main HF monitoring receiver was the FRG-7700, which was introduced in 1981 and is still a great choice for AM SW broadcast stations. I'd also received a lot of pleasure from owning a Yaesu FT-101B that dates from the early 1970s (which was then sold as a "portable" transceiver—a bit contradictory as it weighed in at 35 pounds! But I digress...)

Anyway, I purchased a new Yaesu FT-897D, which not only provides full coverage of all of the ham bands from 160 to 70 centimeters, plus general coverage from .1 kHz to 56 MHz, 76 to 108 MHz, 118 to 164 MHz, and 420 to 470 MHz (so you get 10 MHz above and below the 70-centimeter band). All modes are covered, including FM, digital (AFSK), and packet. There are far too many bells and whistles to list here, but suffice it to say that with the right antennas and a minimal number of accessories, you can have an excellent HF/VHF/UHF ham and monitoring station that weighs well under 10 pounds. On top of all that, you get 200 built-in memories with scanning capability,

along with some built-in management tools. The management tools let you create a database of memories on the FT-897D, but that requires a number of steps that are, frankly, tedious.

Luckily, there's a better approach to be found in the radio's ability to access a CAT software program. This allows you to set up the frequency list using spreadsheet software specifically designed for that task and to then download the memory information directly from the computer into the radio via the special CAT cable (which you can purchase separately for about \$30). Rather than writing such software itself, Yaesu contracted with RT Systems of Falkville, Alabama, to create data management software that they re-sell for about \$35.

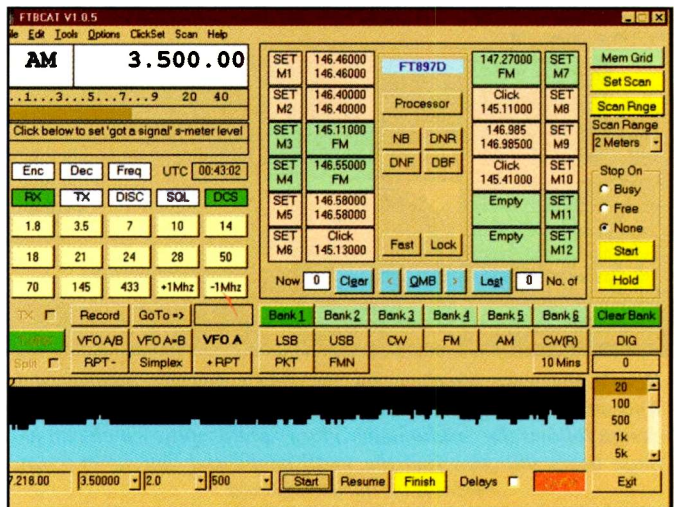
The software in question is called "ADMS-4B" (for Advanced Data Management System Programmer for the four models of Yaesu transceivers, version B) and it will work with all versions of the FT-857 and FT-897. Simply, the software provides an easy means of downloading frequencies into the transceiver's 200 odd memories as required. Its stated purpose for existence is to 1) make it easy to put frequency data into the radio, and 2) make a back-up list of frequencies in the event that the data in the radio is accidentally lost. Beyond that, it does nothing (such as directly control the radio by changing modes or adjusting other features).

Given the convenience of this little software program (more of a utility really), why hasn't Yaesu simply thrown it in with the radio, along with the CAT cable? The only reason I can see for not doing so concerns technical support. RT Systems provides that, and despite being a relatively small company, it does so at a level you would normally associate with a much larger company, maintaining a webpage, technical support e-mail address, and dedicated telephone line—all of which takes time and money. So, by putting the cable and software into the box with the radio, users might too easily get themselves into trouble, not really being prepared to connect their computers to the radios. By adding a separate decision step in the process, maybe people will stop and think before they buy, or at least take a moment to talk to the sales person to educate themselves.

Some Small Business Models For Software Developers

While it's great just to be able to easily upload a long list of frequencies into your radio's memories, having further control over the radio via computer software is very convenient as well. This is true whether you're into ham radio, HF radio monitoring, or scanning. And, very simply, a good software program is one that does not simply reproduce the controls of a radio on the computer screen, but instead offers something unique. A good program should add something synergetic to the original design so that something entirely new results, say a new process or procedure not even anticipated by the radio's designers.

So when I went looking for some alternative CAT controller software, I found two entrepreneurs who seemed to have achieved this ideal. More importantly, they also developed a unique approach to marketing and distributing their software that overcomes some of the limitations earlier software designers faced. One of the companies is run by G.R. (Bob) Freeth, G4HFQ, under his own name (<http://www.g4hfq.co.uk>). The other, Kingsmith Software (<http://www.kingsmith-software.com>), is run by Mark A. Smith, KB5KYX, and his wife Rose. (I find myself wondering if they know about each other. Why? Well Bob likes cats very much, as evidenced by his featuring a picture of his late cat, Floyd, on his website and product, and



This is the user interface for G.R. (Bob) Freeth, G4HFQ's FTBCAT software program. As you can see, it's a very different design from RATS FT-896 in that it's goal is to optimize functions rather than emulate a radio dial. It provides more open access to memory management and a spectroscope. Here the spectroscope, seen as the blue graph at the bottom of the screen, has plotted all activity on the 80-meter ham band. You can go to a "hot" frequency by pointing and clicking on a spike on the graphic.

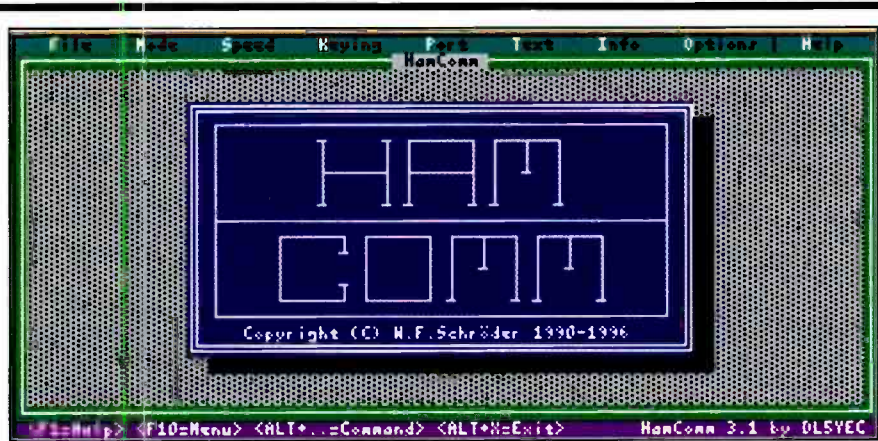
he refers to his control software as FTBCAT. So is it a coincidence then that Mark refers to his competing software as RATS, or Radio-Assisted Transceiver Software?)

Mark makes a very good argument for computer-control software on his website. He points out that if you're already using your computer to do certain tasks, such as logging contacts and demodulating digital signals, why jump between the computer and the radio. When you go with *complete* computer control, you perform all your tasks from one operating position, reducing fatigue and increasing enjoyment. Mark also points out that today's radios are squeezing more and more features into smaller packages. So, while new radios are "feature rich," they're also harder to control because of the reduced size of the knobs and buttons—particularly for older user whose eyesight may be a little weak. Speaking of which, why must radio manufacturers use black buttons on a black faceplate with recessed lettering; that makes it next to impossible to see even if you have *good* eyes.

Mark And Bob's Software Philosophies

Mark's argument for using computer control is simple: all your controls are located on the computer screen and in a size you can see properly. That philosophy also applies to Bob's version of the program; however there are several significant differences in the two approaches to software design.

For instance, Mark has chosen to follow the "radio under glass" approach to software design and provides a "virtual" radio interface that mimics the "real" one on the radio. Bob, on the other hand, has developed a user interface that focuses on displaying features, many of which are of his own unique design. Mark's argument follows the "make it what they're used to" school, which has merit because it is intuitive so users can leverage their previous experience to get the software running. Bob's, on the other hand, does have a bit of a learning curve because you have to learn the features of his software from scratch. However, once you do you'll find that Bob has created a num-



An example of "the good old days" of radio monitoring/ham software. This is the opening screen for HamComm, one of the first "digital" mode (RTTY and CW) demodulation software packages that really worked well. It did not require a sound card to operate, but used a simple modem which was made from about \$15 worth of parts that could be bought at any electronics store. You can still download the software for free via the Internet, as well as buy the modem for a reasonable price, or get the building plans for free.

ber of features that enhance the original design of the radio, making certain tasks, such as scanning, easier.

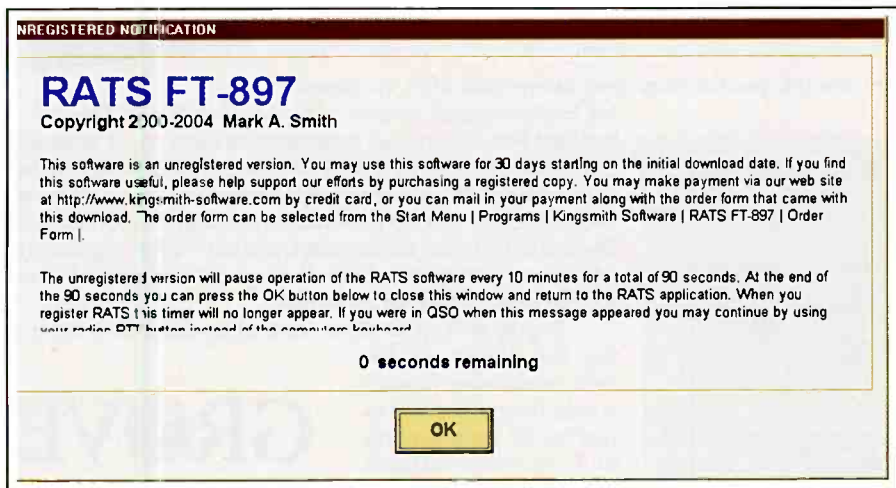
What is especially interesting is how both designers have developed a unique way of protecting their investments and encouraging people to actually *pay* for the program. Mark has chosen to build in a timer system whereby every 10 minutes the program is replaced by a nag screen that pops up for 90 seconds while program stops working. Once you register the program that screen stops appearing. Bob decided to give his controller program away for free. So you can use the program, and even get technical support, for as long as you want to. However, if you want to have full memory management, you have to buy it as a separate module for \$18.50; Mark provides that as part of his program

at no extra charge (though with the aforementioned nag screen).

The bottom line for both software programs is that you can do a true evaluation on both before deciding if you want to make a purchase. Really, it's almost impossible to sell a software program today merely by describing it or showing screen shots. Most people want a demo of some sort, which is not unreasonable. The fact is that a software program that works perfectly for one person may be a total dud for another, and the only way to know is to actually use it.

The Lesson Learned

The point of this month's column is simple: If the monitoring hobby is going to realize the utmost potential of the mar-



This is what you see every 10 minutes if you don't register Mark Smith's software by paying for it. This screen stays up for 90 seconds, with a countdown shown. You then click on the OK button to return to using the software. It's a good strategy; otherwise Mark would most likely never see any return on his investment.

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riage between radios and computers, it will be through our own efforts. The experiences of W.F. Schroeder, Bob Freeth, and Mark Smith show us that there's room for the small developer who is entrepreneurial enough to make a go of it. If you've a mind, you just might be able to launch and develop a good-sized company like RT Systems. There's an opportunity to turn your hobby into a part-time or even full-time business, simply by investing in yourself.

As I've pointed out in previous columns, a lot of people have developed their own software for a particular receiver they purchased because they either didn't like what they found on the market, or simply wanted to have a project for their programming skills, or maybe even just to learn computer programming. It's getting pretty hard to wire your own radio equipment like you used to back in the 1950s, '60s, and '70s. Even today's accessories are mostly chip-based and use DSP technology. If you don't want to be simply an appliance operator, computer programming is one of the few "hands-on" projects still available. So from time to time as we continue, I'm going to take a closer look at some programming skills. I've already covered BASIC in previous

columns. Now it's time to look at the next level, which is Visual Basic. You might think this is a bit of a leap, but it's not.

And remember, even if you don't become a computer programmer by reading this column, having a better understanding of what goes into making a good software program will help you truly value what you're paying for. People like Bob and Mark, plus a host of others supporting the radio monitoring hobby, need to be better recognized for their work.

Next Month

I'm going to be continuing my exploration of CAT software programs and looking at other examples, particularly those created for the scanner market. I'll also discuss sources of frequencies that can be plugged into those programs and copied into your scanner's memory banks. You'll be surprised by how much you do with your scanner using these software tools.

As always, I'm interested in any pictures you may have of your own computer-assisted monitoring station or stories about how you have built and run it. You can contact me via e-mail with any submissions or questions at [\[comm@hotmail.com\]\(mailto:comm@hotmail.com\). While I can't answer general questions on computers, I'll be more than happy to help you with any issues raised in the columns. You can also write to me at "Computer-Assisted Radio Monitoring," PMB 121 - 1623 Military Rd., Niagara Falls, NY 14304-1745. Also, on my personal webpage \(\[www3.sympatico.ca/joe_in_ey\]\(http://www3.sympatico.ca/joe_in_ey\)\) you'll find a list of the columns I've done over the past two years, along with a summary of the content, and instructions on how to purchase back issues of *Popular Communications*. Remember that I cannot release previously published material as *Pop Comm* owns the copyright.](mailto:carm_pop-</p>
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See you again next month! ■

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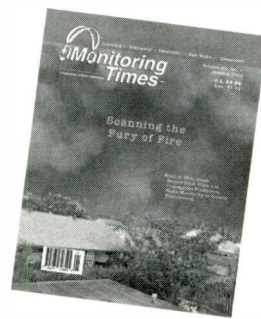
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sounds such as normal human speech, gunfire, and residential fire alarms. Three simultaneous calls were placed to the Monroe County (Georgia) Public Safety Answering Point (PSAP) via a traditional telephone, a wireless phone, and a VoIP phone using a widely available commercial VoIP service. All three calls were recorded at the PSAP using standard PSAP equipment and then transferred to computer disks.

While the impact of VoIP on public safety continues to be debated, the VoIP 9-1-1 Sounds Test is an important step in determining the true impact on the front line call-taker and on the general public. Key policy and regulatory issues remain to be addressed and APCO International renews its call for the FCC to take decisive action to ensure that 9-1-1 calls from VoIP providers are routed to the correct answering center and are delivered with the appropriate location information.

Air Force Moves Away From Wideband Toward Narrowband Radios

As the demand for radio frequencies continues to grow, so does the need to increase efficiency. Air Force Communications Agency officials at Scott Air Force Base, Illinois, have helped create more capabilities by providing the roadmap for moving the Air Force away from wideband to narrowband radios.

Land mobile radio systems enable military forces to quickly establish command, control, and other critical communications during training and deployed operations, and they are critical components of the global information grid, officials said. In 1995, National Telecommunications and Information Administration officials mandated that federal agencies operating radios in selected UHF and VHF frequencies move from a wider emission band of 25 kHz to a narrower emission band of 12.5. Radios accessing the 162- to 174-MHz frequency range were given until January 1 to move. Radios accessing other frequencies have until 2008 to move. Air Force officials were left with the challenge of converting 151,600 radios in its inventory. Not doing so could affect mission-critical radio communications support,

officials said. The Air Force manages its radio inventory at the base level, and it turned to agency officials to develop a plan to transition the entire decentralized radio fleet to the narrowband configuration. Agency officials said they worked with the Air Force Frequency Management Agency, major commands, direct reporting units and other field operating agencies to take the first steps and keep security forces and first responders in business.

The conversion plan broke down radio equipment into three categories: mission-critical, mission-essential, and mission-support. Mission-critical radios included force protection, medical response, and airfield operations. Mission-essential equipment covered activities such as transportation and supply logistics. Mission-support assets encompassed activities that contained base services.

“What the Air Force is doing is replacing radios and infrastructures or reprogramming equipment for narrowband compliance,” said Master Sgt. Reginald Sanders, of the communications agency. “Each radio can then be programmed by the base (radio) manager. The amount of labor depends on how many pieces of equipment need to be replaced and programmed.”

TELEFUNKEN Presents DRM In Spain

A TELEFUNKEN DRM transmitter has been installed in Arganda near Madrid, Spain. TELEFUNKEN, following various successful installations in Germany, the Netherlands, Luxembourg, Great Britain, Czechoslovakia, and Spain, has commissioned a successfully functioning DRM system.

Partners in the project are Radio Nacional de España (RNE), the University of the Basque Country in Bilbao, and TELEFUNKEN SenderSysteme Berlin and its local representative in Spain, Vide Medios, Madrid (VIMESA). RNE will begin regular digital radio transmissions, becoming a pioneer of the DRM system. RNE explained that from now on digital and analog transmissions would share the same frequency. According to RNE, the innovative character of digital technology on mediumwave has made it necessary to conduct a series of tests and putting into operation an experimental DRM system on mediumwave, allowing the system's

possibilities to be explored further. A collaboration agreement was signed between RNE, the University of the Basque Country, and VIMESA, for the accomplishment of these tests.

The DRM transmissions are coming from the Arganda transmitting center, with 10-kW power on 1359 kHz.

Radio Netherlands Voted Best International Radio Station

The Mexican Journalist's Association has awarded the prize for Best International Radio Station to the Latin American department of Radio Netherlands. They decided to award the prize to Radio Netherlands for its impartial reporting, in which freedom of speech is fully respected. The Latin American department reports on events in Latin America and the rest of the world, not only through news bulletins but also through in-depth analysis. In the judgment of the Mexican Journalist's Association, the coverage of controversial events, such as the strike in Venezuela or the referendum on President Chávez, was very impartial.

The Mexican Journalist's Association was set up 52 years ago, and annually awards journalistic prizes in various categories with the aim of stimulating objective journalism. The Association is independent, and receives no subsidy from the state or political parties. This is the first time that the Association has awarded a prize for the best international radio station.

China Radio International Signs New Contract With WRN

China Radio International (CRI) has renewed and extended its agreement with WRN (World Radio Network), the London-based international broadcaster and transmission service provider, for the extensive provision of global broadcast services. WRN has worked closely with CRI for more than six years since signing a Collaboration Agreement in Beijing in 1999. WRN works on CRI's behalf, distributing its daily programs to reach listeners around the world using AM and FM transmissions that augment CRI's traditional shortwave broadcasting from China. ■

TUNING IN (from page 3)

software programs that can run on any desktop computer. The increase in reliability and decrease in price is hard to argue with, but tuning around on a radio and finding an actual live local human on the air today is easier said than done. That is the fate which has claimed the radio station I am standing in today. It won't be here much longer.

Another Ghost Of The Past

I've been in one other dead radio station in my time, a small AM/FM combo in Plymouth, North Carolina. Word had it that the owner encountered unforeseen money problems a few days earlier and marched into the building one summer morning to inform everyone it was all over; the station was out of business, turn everything off and go home. The signals went silent and that was that. However, the station I worked for at the time heard about it and made inquiries about leasing the Plymouth station's signal for a simulcast, which would have been the first of its kind in the area. So we trucked on down there to look it over.

From the appearance of the place when we arrived, the staff complied and left everything exactly as it was when they cleared the building. Coffee cups were still sitting on desks, records were still on turntables, and unfiled paperwork was tucked in its various receptacles awaiting actions that would never be taken.

The Plymouth station, like the ones mentioned earlier, also showed signs of once having been the town's main media center. The lobby and reception area had been tastefully decorated and resembled a church anteroom. The actual studios in back were the typical radio zoos, with various items of equipment jerry-rigged into some form of functionality. This place had obviously been assembled in the days before a radio station could be reduced to a computer and a satellite dish. The station's transmitter looked to be 1940s vintage and was notorious for being ornery. A yellowed sheet of typewritten instructions pasted on its side detailed the procedure for turning it on and putting it on the air. Apparently they had to tune and calibrate everything "just so" before placing it on the air or the thing would immediately shut itself off, leaving the DJ to pace the floor while it recycled and came back up to speed.

Out back, one look made it obvious that the station had been in dire straits even when it was on the air. Looking straight up at the tower from its base, a severe bend about two thirds up gave evidence of the damage it had sustained during a hurricane some years earlier. Professional tower crews refused to climb it. The tower base was not fenced in at all, which was a potentially deadly situation if someone wandered up and chanced to touch it while it was "hot." A transgressor would have pulled back two baked potatoes for hands.

Nearby, another small structure resembling a garden shed was nearly invisible beneath a massive spread of vines. We hacked our way inside and found a huge hunk of rusty, oil-leaking, obviously inoperable machinery. At first we couldn't figure out what it was, but a faded sign on the door gave us a clue. This station was once assigned duty as the central information source for Washington County's Civil Defense organization during the height of the Cold War, a function many small-town stations performed proudly back when America's military might was forever on guard against the Russians and the possibility of a nuclear Armageddon raining down on our heads. There was a system called CONELRAD, a forerunner of today's Emergency Alert System, designed to keep the public informed if such a doomsday scenario actually came to pass. It would have been activated by officials at one of the nearby military bases, effectively taking over the station. The old orange Civil Defense logo on the door was revealed once I pushed more vines aside. The ancient rusty machine was an old diesel generator, built to keep the station on the air in case a nuclear missile took out the coastal power grid. Residents of Washington County would listen in their fallout shelters for "further instructions," whatever they might have been in a post nuclear world. I don't know what the station's personnel were supposed to do. Just stay at the mic until they dropped dead from radiation poisoning, I guess. But citations framed on the lobby wall indicated the station's personnel took their Civil Defense duties seriously. During those days, one never knew.

The machinery and the people who make the sounds that come out of your radio have undergone some serious evolution in the past decade. Repeal of the FCC ownership limits have made it pos-

sible for one or two companies to dominate markets with clusters of stations, most of which are operated from central locations, not necessarily within the cities of license. DJs can work in more than one market via a technique called voice tracking, which allows them to pre-record their on-air raps and send them out with specific references to each city to maintain the locality of each station. The fellow you hear announcing the tunes on your favorite station may not even be in your state.

Running On Autopilot

Apparently audiences are accepting all this, because techno-nerds such as me appear to be the only voices of dissent. And it undoubtedly saves money because the companies and their stockholders seem happy with the returns on their investments. But as a listener, I find that radio stations that are more or less running themselves on autopilot, especially in the late night hours, lack a certain human organic quality. Automation systems cannot make spontaneous wisecracks on the air. They don't have that live groove, or rhythm, if you prefer. It's hard to explain it in words, but you notice when it's not there. I prefer listening to a live human in the studio doing a show, playing his or her stuff in real time. There are stations that still work live at least part of the day, but they are becoming fewer in number as technology progresses.

There will come a time when everybody can "be" his or her own radio station, but my take on that will have to wait for another time. AM radio is in its twilight years, and FM may soon outlive its usefulness in the same way. Satellite radio, Internet radio, and the Ipod-ization of the world are all taking a bite out of the pie. Digital broadcast radio will transform the whole game yet again. It will be interesting to see where it all ends up.

But this particular studio won't be a part of it. It's a relic, a container of benign ghosts, and the source of good memories for the people who toiled here through the years to make radio, before the inevitable happened and video killed the radio star, like the song says. But everybody knows the only constant thing in life is change. Who knows where it will be in another 30 years?

I turned off the lights and locked the door behind me. ■

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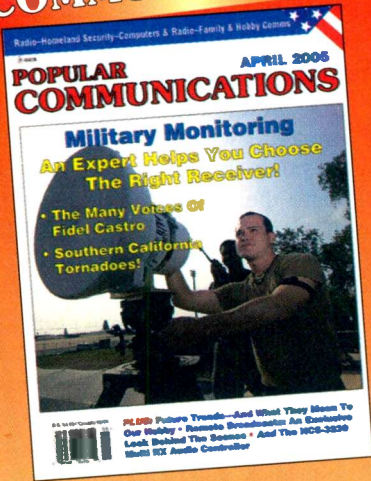
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Why You Never Hear Bill On The Bands

When I was a wee lad, even before I went to kindergarten, I loved my radios. My favorite was a Philco AM with a built-in 78-rpm phonograph beneath it. You just put in the record, closed the door, and the arm lowered itself onto the disc and found the groove. My "Little Orly" records played quite nicely. And I listened to Don McNeil's "Breakfast Club," Phil Sheridan (with Danny the Drowsy Dragon) and "Amos 'n' Andy." I'm sure I listened to other shows, too, but those are what I remember so vividly. Once, my mother lied about my age and took me to a live broadcast of the "Breakfast Club" in Philadelphia, and outside the studio, Johnny Desmond had two soft pretzels and gave me one of them.

While I was reaching into the back of that set, I got my first 117-volt shock, and thought surely I would die from it before I could get my hand out of there. I did not die. A great myth was shattered, though. I never told my folks, but when they told me that smoking would stunt my growth. I knew that was a lie, too, just like the one about getting killed by electricity. Although I knew that the electricity hadn't killed me, I still never had the nerve to touch it again (at least, not on *purpose*).

Today I wish I had paid far more attention to broadcast radio when I was young, but I am lucky that one of the PBS stations in Washington D.C. (WAMU) plays old time radio on Sunday nights and lets me relive those great moments, which I've otherwise lost forever.

"Today I would rather spend an evening with an old Allied Catalog than with a top-notch receiver."

One thing I haven't been able to reconstruct is my first Allied Radio Catalog. Talk about a wish-book! Every so often my dad would bring home an Allied catalog for me and I would wear it out. I would stare at the pictures of all the great shortwave receivers that many of you seek out at flea markets every year. After a while, I found myself falling into the pictures, turning the dials, and hearing the signals from those great radios. Today I would rather spend an evening with an old Allied Catalog than with a top-notch receiver. At that time in my life I did have a BB gun, and actually shot the same type of porcelain/metal sign that Ralphie did in *A Christmas Story*, and the BB actually did come back and hit me in the forehead, but I didn't wear glasses at the time, and fortunately did not shoot my eye out. I didn't tell my parents about that incident either.

I eventually got a nice receiver for Christmas, and the BB gun went into the closet. Never did a kid enjoy a present as much as I enjoyed that radio. For at least two years my parents always knew where I was.

And the promise my dad made to me when he handed me the Novice License Manual couldn't be beat. "Pass your test, get your license, and I'll get you a transmitter." What a deal. But it was about 20 years later when I actually took and passed

the novice test. I was already married, and I wouldn't dare ask my dad for a transmitter. By then I had done four years in the Coast Guard (as a radioman) and even though I only took and passed the novice test, I was copying 20-wpm Morse code clean.

Ham radio was just not what I'd hoped it would be. I had become accustomed to commercial radio operators with their speed and slick procedures, the sweet sound of a code sent with a "swing" on a Vibroplex bug, and I was up against a wall on the novice bands. I couldn't stand waiting for the next letter to be transmitted at one or two wpm, and I couldn't get onto the "big boys" bands with my Novice license. Eventually, I took another test and got my Tech license (hence my N3AVY call-sign), and shortly after that upgraded to my Advanced license and kept the callsign.

But the radios were solid state. I could no longer smell the dust burning on the hot tubes. The interesting conversations I'd with the radios in my Allied catalog were replaced by talk of antennas, weather, and rigs. Try as I might, I could not find one contact who shared an interest in anything except ham radio.

"So now I am back to listening to shortwave radio instead. It is still as interesting as before, but easier."

I had always heard of "nets" which would meet on a certain frequency at a certain time and discuss things of common interest, but I never quite found one. So now I am back to listening to shortwave radio instead. It is still as interesting as before, but easier.

I tried and tried to enjoy ham radio. Poor Norm would have done anything to get me active in the hobby once again, but at least I did work toward getting others into the hobby. I remember giving a code test to a co-worker by calling him on the intercom phone and pressing one of the touch tone dials to send him his 5 wpm code test. And at least I've given radios to a bunch of interested people—and not always kids, either. But today, I have built my own computer, and on it I contact people all over the world with common interests. There are at least five major groups dedicated to harmonicas, and one specifically devoted to *chromatic* harmonicas. But deep inside, I know that I'm disloyal to ham radio, and I am not just a little upset with myself for that. On the other side of the coin, more than most people I still enjoy *listening* to radio—all kinds, from AM through the high end of the scanner bands. And at least I'm not cluttering up the ham bands with my signals. In fact, I'd bet an autographed copy of Norm's book about ham radio (which I wrote with him) that no one can even find anyone who has one of my extremely rare QSL cards. Of course, winning that prize would mean that you'd know who Norm really is, and, well, while we wouldn't have to kill you, we *would* have to have the "Men In Black" come and flash that thing in your eyes. ■

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SR2000

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