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APRIL 2013

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Who Will Fall Silent Next?

**Radio Canada International:
In a Troubling Pattern,
Another Giant Fades Away**

PLUS:

- **Gordo's 'Radio Walk' @ the CES in 'Vegas, p. 10**
- **Nature's Excitement: A NOAA Weather Radio Primer, p. 15**
- **Your Guide to Pop'Comm's 'GIG-Speak,' p. 68**
- **New Life for the Heathkit SB-220 Amplifier, p. 78**

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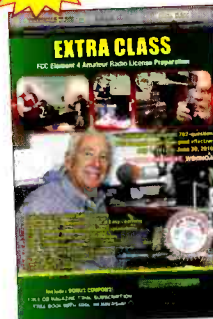
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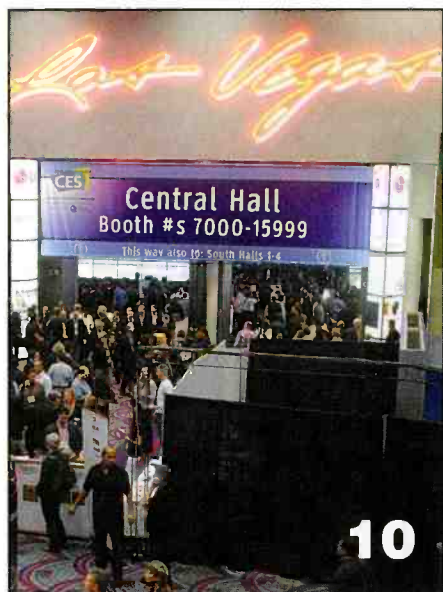
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POPULAR COMMUNICATIONS CONTENTS

APRIL 2013
VOLUME 31, NUMBER 8



FEATURES

- 10 **In Review: A Radio Walk in 'Vegas @ the 2013 Consumer Electronics Show**
by Gordon West, WPC6NOA/WB6NOA
- 15 **A NOAA Weather Radio Primer: Your Wireless Gateway to Nature's Excitement**
by Joseph Pasquini, N2NOU
- 68 **A Guide to GIG-Speak (Revised, Revised, Refreshed)**
by Gerry Dexter, WPC9GLD

FEATURED COLUMNS

- 46 **Monitoring**
FOI: Who Will Silence the Next Shortwave Broadcaster? Follow the Money . . .
by Thomas Witherspoon
- 50 **Monitor of the Month**
WPC4FJT, Knoxville, Tennessee
by James Trame, WPC4FJT
- 61 **Global Information Guide**
On the Short Waves, Taking the Good with the Bad
by Gerry L. Dexter, WPC9GLD
- 78 **The Wireless Connection**
A New Lease on Life for a Vintage Heathkit SB-220 Amplifier for the Radio Amateur
by Peter Bertini, K1ZJH



ON THE COVER

Radio Canada International's worldwide shortwave voice went silent on December 1, 2012. An epidemic? "True, shortwave radio is not a comprehensive replacement for the Internet any more than it is for mobile phone service," writes Thomas Witherspoon, K4SWL, host of *The SWLing Post*, <<http://swling.com/blog>>. "It lacks the peer-to-peer connectivity of either medium. But it is interactive and accessible." Page 46. (Photography by Thomas Witherspoon. Cover Design by Liz Ryan, Pop'Comm Art Director)

COLUMNS

- 8 **Horizons**
How 'Connectedness' Is Changing Our Lives
by Rob de Santos
- 22 **Broadcast Technology**
Understanding 'Fighting Modulation,' And a DXing Challenge
by Bruce A. Conti, WPC1CAT
- 29 **Plane Sense**
Monitor the Bouncing Flight Path — IFR in the L Region
by Bill Hoefler, KPC4KGC/KG4KGC
- 38 **Ham Discoveries**
Most 'Low-Loss' Coaxial Cable is Anything But . . .
by Kirk Kleinschmidt, KPCØZZ/NTØZ
- 42 **World Band Tuning Tips**
World News, Commentary, Music, Sports, And Drama At Your Fingertips
- 45 **Power Up**
New, Interesting and Useful Communications Products
by Jason Feldman, WPC2COD
- 55 **The Propagation Corner**
Low-Band DXing By the Light of the Full, Silvery Moon
by Carl Luetzelschwab, K9LA
- 71 **Shannon's Broadcast Classics**
AM Gone But Not Completely Forgotten
by Shannon Huniwell, WPC2HUN
- 84 **The Loose Connection**
'He's a WHAT?'
by Bill Price, N3AVY

DEPARTMENTS

- 4 **Tuning In**
An Editorial
- 5 **Newsworthy**
Unwired, InfoCentral, And Washington Beat
- 20 **Spurious Signals**
- 35 **Reader Survey**
- 36 **Across the Spectrum**

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Rival outside

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EDITORIAL

Tuning In

Pop'Comm @ 30: Two Handheld Radios That Helped Hold Off the Soviets

by Richard Fisher, KPC6PC/KI6SN
<editor@popular-communications.com>



Thirty years ago this month, *Pop'Comm* Founding Editor Tom Kneitel, K2AES/WPC4A (SK), and CQ Communications Publisher Dick Ross, K2MGA/WPC2A, hit the jackpot when they got permission to run a cover photograph from the Soviet war in Afghanistan.

Pop'Comm was just eight months old. The war was in the fourth of its 10 years. The exclusive picture was compliments of *Soldier of Fortune* magazine.

"In one dramatic photograph, (*SOF* photographer) Jim Coyne captured one half of the entire Mujahideen communications system — that being a commercially made American 49-MHz handheld transceiver," Tom wrote. "The other half of the rebel communications network cannot possibly be located more than a few hundred yards into the distance since that's the communications distance offered by the system."

Under the headline "Afghanistani Rebel Communications: Unsophisticated, But Obviously Effective," April 1983's cover story focused on the valiant struggle rebel forces waged against Soviet invaders, and the remarkable role radio played. (*IN DEPTH: Read about the Soviet-Afghan war at* <<http://bit.ly/11ieD5g>>. — KPC6PC.)

Communication was a far cry from the handheld VHF radios, repeaters, and Internet capabilities found in the region today — under much-different circumstances.

"As far as known, the two handheld units (in 1983) consist of the total communications capabilities of the Mujahideen forces in Afghanistan — presumably operating on 49.86 MHz," Tom said.

"It's not that (the Mujahideen) don't realize that they require communications — it's that they are so unfamiliar with communications techniques and how to use the equipment, that their communications potentials are unusually primitive. When you consider how effective their military tactics have been, it's all the more surprising how well they've done with what they have."

The picture was taken when *SOF's* Editor/Publisher Robert Brown accompanied Coyne to Afghanistan where they were "able to live with these (Mujahideen) fighters in the mountains and witness their operations."

"Sure, (the Mujahideen) captured Soviet communications equipment," Tom wrote, "but it doesn't do them much good. They can't read any of the instruction manuals, they can't figure out how to service the equipment (nor do they have the replacement parts), and even the equipment they can get operating is set up on Soviet frequencies. Those guerrilla bands, that include members who can understand the Russian language, have the advantage of being able to use that equipment to eavesdrop on the Soviets, but since few of the Mujahideen guerrilla bands have such members, even that ability is severely limited."

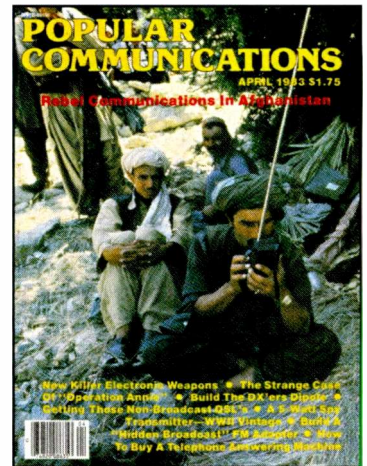
Amazing, isn't it, how valuable *even a little bit* of communications capability can be? Recognizing their efforts were futile, Soviet troops began withdrawing in February 1989. And the Mujahideen carried on.

Join the Pop'Comm-WRO IRS Tax Return Eve Online Chat

We hope you can join in on the *Pop'Comm-WRO Live Online Chat* on Sunday, April 14 beginning at 8 p.m. Eastern time (0000 UTC). We're dubbing it *the IRS Tax Return Eve Gaggle*. As always, the hour-long session promises to be casual, friendly, and laid back.

So, put aside your calculator and at chat time visit the *WorldRadio Online* blog at <<http://www.WorldRadioOnline.blogspot.com>>. Click on the *Cover It Live* box. You'll be linked right into the chat. We hope to see you there. *Many happy returns!*

— Richard Fisher, KPC6PC/KI6SN



The Weirder Side of Wireless, and Beyond

Compiled by
Richard Fisher,
KPC6PC

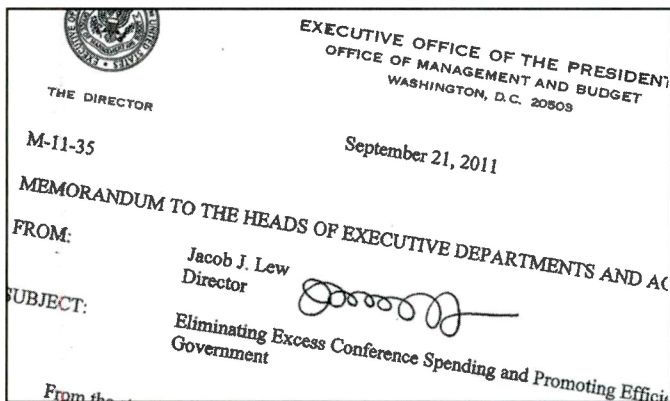
RETRACTION: Pop'Comm Duped On BBC Story

On April 1, a call for retraction was received by *Popular Communications* regarding a previously published story reporting White House Chief of Staff Jacob "Jack" Lew (2012 to 2013) would defect from the U.S. to take the reins of the British Broadcasting Corporation. Our source offered as "proof" a cupcake bearing Mr. Lew's signature which she alleged was served at the BBC's "Welcome Jack, It's a Fact" party in London. **Photos A and B.** None of this is true. *Pop'Comm* has great confection for truth, and regrets the error. – *Urban Bates, YJPC1UB, Pop'Comm Ombudsman*



Photos A and B.

A cupcake, left, alleged to bear the signature of Jack Lew, was cited as proof that the 2012-2013 White House Chief of Staff was jumping to head the BBC. *Pop'Comm* has learned the story is false. The magazine does admit, however, the cupcake handwriting is eerily similar to Mr. Lew's official signature.



CBer Nailed for Broadcasting Misinformation

A man who broadcast a woman's address and phone number over Citizens Band radio as a place of ill-repute has been ordered by Queensland's Civil and Administrative Tribunal to pay her compensation.

According to a report from Jim Vinton, VK3PC, published by *Southgate ARC News*, after the man's antics on an Australian CB repeater, truck drivers began arriving at the Queensland property and calling the woman, who is in her 60s.

The Queensland Tribunal found that that the harassment had occurred since 2008. It ordered the defendant to pay the woman \$10,000 in compensation.

"The man also put pictures on YouTube," Linton said. "In an earlier court case he was ordered to remove the offending YouTube material, keep the peace toward the woman, and put on a good behavior bond."

Boeing Uses Spuds to Test Aircraft Wi-Fi

The BBC reports U.S. aviation giant Boeing is using potatoes to test the propagation characteristics of Wi-Fi on a passenger aircraft.

"Passenger seats on a decommissioned plane were loaded with huge sacks of the tubers for several days as signal strengths were checked," the BBC reported. "The company's researchers say that potatoes 'interact' with electronic signals in a similar way to humans." **(READ: The full BBC News report at <<http://bbc.in/11dmm10>>.** – *KPC6PC*.)

Radio and CW Flow Across the Big Screen

Producer Steven Spielberg has used amateur radio or Morse code in three of his last four movies, according to published reports:

- *Super 8* (2011), the story of a group of teenagers who are filming their own Super 8 movie in a small town when a train derails, releasing a dangerous presence.
- *The Adventures of Tintin* (2011), about a young reporter named Tintin who, with his loyal dog Snowy, find themselves in a world of high adventure after discovering a ship carrying an explosive secret.
- *Lincoln* (2012), in which U.S. President Abraham Lincoln struggles for passage of the landmark constitutional amendment which bans slavery from the United States.

Reports are that Spielberg leaned heavily on radio aficionados for advice, to which we say: *Dit, dit.*

Cheerio, Ye UK Pirate FMers

A recent survey of the FM broadcast band in London (87.5-108 MHz) showed the capital city had 28 pirate radio stations broadcasting on regular schedules. The United Kingdom's communications regulator is Ofcom. To see what it *does* and *does not* do, visit <<http://bit.ly/14vgfXb>>.

LEDs in Sweden Jam City Bus VHF Radios

LED lighting in shop windows at Punkt House in Västerås, Sweden have been jamming the city bus VHF radio system at 167.0375 MHz, according to published reports.

The light-emitting diodes (LEDs) causing the problem were spotlights, which were determined to be outside regulations on Electromagnetic Compatibility (EMC). They are being replaced.

"It's all about the lighting that is newly inserted in the shop windows," according to the website vlt.se <<http://bit.ly/WFQqhv>>. "The contractor had not checked out what frequency they were at . . . we are in contact with all parties involved."

Communications News, Trends and Short Takes

Compiled by
Richard Fisher, KPC6PC

Stamps Issued to Commemorate UN Radio Anniversary

In celebration of World Radio Day, February 13 — the date on which United Nations Radio was launched in 1946 — a series of postage stamps depicting UNR's history is being issued.

"Since its establishment, UN Radio has used its multilingual programs carried by media outlets around the globe to tell the story of the international community's efforts to meet the challenges of building a better world," according to UN officials

(*VISIT: The UN Postal Administration at <<http://bit.ly/WDrVEL>>. For the UN Radio website: <<http://bit.ly/WjYKXT>>. – KPC6PC.*) (Source: United Nations)

New Tour of BBC Broadcasting House Opens this Month

An updated tour of the BBC Broadcasting House launches this month, "bringing to life the work of the (broadcaster's) brand new, state-of-the-art, multimedia broadcasting center in the heart of London," officials said.

"On a tour some of the things you're likely to experience include a camera's eye view via a big screen into some of the studios broadcasting to the nation such as the *Six O'Clock News* and Radio 1," they said, "as well as hearing about the rich history of the building and the BBC."

The tours last about an hour-and-a-half and are conducted seven days a week. For more information, visit <<http://bbc.in/VB4kTP>>. (Source: BBC)

Report: Zimbabwe to Jam VOA and Others

The South African nation of Zimbabwe thinks it should jam shortwave broadcasts coming from outside its borders.

Newzimbabwe.com reports that at "a recent Zanu PF party conference it was proposed to jam the signals of foreign-based radio stations such as Voice of America's Studio 7, Radio Voice of the People, and South West Radio Africa that ruling party officials accuse of pushing a Western-backed regime change agenda in Zimbabwe."

According to *Newzimbabwe.com*, critics "argue that President Robert Mugabe's party wants to continue its domination of the airwaves in order to maintain the status quo. But Zanu PF officials maintain these radio stations are breaking the Zimbabwe law and should be jammed."

(*IN DEPTH: For more information, visit the New Zimbabwe website <<http://bit.ly/VzVgSD>>. (Source: Newzimbabwe.com)*)

Attention All Brass-Pounding Speed Demons

The Bulgarian Federation of Radio Amateurs (BFRA) is inviting High-Speed Telegraphy (HST) teams, individual competitors and visitors from all over the world to 11th World HST Championship, September 22-26.

The Championship will be held in Borovets, which is about 45 miles south of the Bulgarian capitol of Sofia and about 35 miles from Sofia Airport.

"Borovets is one of the well-known Bulgarian mountain resorts at about 4,000 feet above sea level. (*INFORMATION: Visit the BFRA website at <<http://www.BFRA.org>>.*) (Source: BFRA)

Broadcast Radio Assists in Search for Missing Singapore Child

Four stations under the Star Radio Group in Singapore earlier this year joined in the search for a missing child.

Suria FM, 988 FM, Red FM, and Capital FM ran public service announcements every alternate hour asking their combined 4.3 million listeners to join in the search.

Star Radio Group Deputy Chief Broadcasting Officer Kudsia Kahar said, "the only way to locate (the child) is to cast a wide net," according to *Amateur Radio Newslines* and *Asia One*.

Tragically, the child's lifeless body was found shortly after the search was launched, <<http://bit.ly/1tZ2Ka>>. (Source: *Amateur Radio Newslines, Asia One*)

FEMA Says IPAWS Use is On the Rise

According to news reports, a growing number of emergency managers are using FEMA's Integrated Public Alert and Warning System (IPAWS) to send emergency alerts.

IPAWS now has 148 operational users, 93 of which have the authority to send an alert to the public using the FEMA-IPAWS Web-based message origination system via the Commercial Mobile Alert Service or the Emergency Alert System. With Commercial Mobile Alert Service on board, major and rural cellphone carriers tie into IPAWS to send 90-character text-based alerts.

According to the latest figures, some 20 messages were sent over the Commercial Mobile Alert Service and 81 were sent using EAS. Of the EAS messages, many of those were required weekly or monthly tests also known as the R-M-T. (Source: *Amateur Radio Newslines*)

CQ Magazine Adds 'CQ Worldwide' to Monthly Columns

Tom Smerk, AA6TS, has been named International Editor of *CQ*, a newly-created position at the amateur radio-focused magazine.

"A growing number of our readers and our fans on social media are from outside the United States," noted *CQ* Editor Rich Moseson, W2VU, "particularly with the addition of our digital edition, which eliminates the high cost of international postage."

"We'll be calling the (monthly) column *CQ World Wide*, and our goals will be to both better serve our international audience and to bring more news of ham radio activities around the world to our prime reader base in the U.S."

(*NOTE: Radio amateurs with news of events and activities outside the United States are urged to contact AA6TS at <aa6ts@cq-amateur-radio.com> - W2VU.*) (Source: *CQ magazine*)

Capitol Hill And FCC Actions Affecting Communications



Compiled by
Richard Fisher,
KPC6PC

FCC Issues 'Gigabit City Challenge' Across the U.S.

Broadband providers and local governments are being urged by the Federal Communications Commission to provide high-speed Internet services that offer subscribers speeds of 1 gigabit per second.

Earlier this year, the Commission launched the "Gigabit City Challenge," in which it is calling for at "least one community in all 50 states to offer residents speeds of 1 Gbps by 2015," according to a report posted at *FierceCable.com*.

FCC Chairman Julius Genachowski unveiled the initiative at the U.S. Conference of Mayors. He said the FCC plans "to hold workshops for broadband providers as well as municipal and state leaders to drive the 'Gigabit City Challenge' and that the commission will also create an online clearinghouse of best practices for lowering the cost and increasing the speeds for broadband deployments nationwide," the story noted.

(READ: The full text of the FCC news release at <<http://bit.ly/WJaQsJ>>. - KPC6PC.)

"If we build it, innovation will come," Genachowski said. "The U.S. needs a critical mass of gigabit communities nationwide so that innovators can develop next-generation applications and services that will drive economic growth and global competitiveness." *(Source: FierceCable.com)*

Derecho Report Cites Glitches in 911 While Applauding Broadcasters

Citing unnamed FCC sources, John Eggerton reports on the *Multichannel News* website that "the chairman's office has circulated to the other commissioners a draft of the commission's investigation into communications failures during the Derecho storm last summer that hammered the East Coast."

The report focuses on 911 outages, according to Eggerton's sources, "while giving broadcasters credit for being an information lifeline during those troubles." *(READ: The full story at <<http://bit.ly/YpU2GC>>. (Source: Multichannel News)*

Court Strikes Down FCC Rule, Siding With Dish

A rule that had been issued by the FCC to allow customers to watch cable and satellite TV on "plug and play" televisions — replacing set-top boxes — has been struck down by the U.S. Court of Appeals for the District of Columbia Circuit.

According to *Reuters*, Dish Network Corp., "objected to the rule because it included (constraints) on encrypting programming that prevented Dish and others from, for example, making deals with studios to play new movies on a pay-per-view basis."

Following a Dish request, the DC U.S. Court of Appeals struck down the rule issued in 2003 by the FCC.

Called the "plug and play" order, the FCC rule "set stan-

dards that allowed customers to buy televisions that could plug into cable and satellite networks without using a set-top box," the *Reuters* story said. "In its objection, Dish argued that the FCC lacked authority to impose the standards on satellite providers. The court agreed." *(Source: Reuters)*

Report: Commission Figures Show Growth of FM Since 1992

There are 4,085 more FM stations on the air in the United States than there were 20 years ago — a growth in licenses of 64 percent since 1992 — according to statistics gathered for an online story posted at *RadioWorld.com*, "and that's not even including the explosive growth in translators in that time, nor the many hundreds of low-power stations that hold licenses (a category that's about to grow further)."

"We dug out comparative data from 10 and 20 years ago," reports Paul McLane, "and the resulting (numbers) columns reflect overarching trends in our business."

A comparative chart shows that from 1992 to 2012, the number of:

- AM stations has dropped 4 percent
- FM commercial stations has risen 38 percent
- FM educational stations has risen by 143 percent
- FM translator-boosters has risen 211 percent

There were 809 low-power FM stations in 2012.

"Evident here are not only big growth in the number of commercial and educational FM outlets at the end of the 20th Century and opening of the 21st, but also a flat or slowly declining base of AM licenses, and the big spike in translators." *(READ: The full story at <<http://bit.ly/11e6LSe>>. - KPC6PC.) (Source: RadioWorld)*

First Responders: Let LP AMs Broadcast Emergency Information

Hurricane Sandy and the shootings in Newtown, Connecticut, have invigorated an initiative by emergency responders to expand a low-power AM radio service used to give travelers traffic information.

Public-safety officials are asking the FCC to allow them to expand the information they can broadcast on these stations beyond traffic reports.

According to a report in *Politico*, Frank Jazzo, an attorney for the American Association of Information Radio Operators, which represents Travelers' Information Service (TIS) operators, said, "prior to and during emergency situations like superstorm Sandy and the Newtown, Connecticut school shootings, TIS outlets need the utmost leeway broadly to broadcast information to protect life and property."

Politico said that according to letters from public-safety officials, the service is underused. *(READ: The full Politico story at <<http://politi.co/11e8WoN>>. (Source: Politico)*

How 'Connectedness' Is Changing Our Lives

By Rob de Santos
 <commhorizons@gmail.com>
 Twitter: <@shuttleman58>

“What does the future look like in a world where connectedness — in our home, car, workplace — is the rule instead of the exception”

How many ways are you connected to the Internet? How many wireless devices do you have? I'm betting that if you haven't counted lately, the number has increased significantly in the past year or two.

This has been a topic discussed in this column in the past. (*SEE: “The Internet of Things,” March 2011 Pop'Comm, page 9. — K8RKD*). At that time, I estimated I had 10 connected devices. The number now is at least 15 and the others in my household probably double that number.

Looking to the future, it's clear that more and more everyday items in our homes, cars, and workplaces will be connected in some fashion. Let's take a look at what that means for our communications futures.

If there is any device in the house where “connectedness” is changing it is TV. An “Internet-ready” TV has become the standard and TV manufacturers are rushing to join the “app revolution” by giving their products “app” interfaces, links to online app stores, and connections to the outside world. Augment that by Internet connected AV (audio-video) receivers, Roku and Boxee devices, and connected Blu-Ray players and your TV becomes just another portal to the online world.

For you, this might be unneeded, but for many viewers it's a way to get to YouTube, Netflix, Pandora, and other services. You can bet your cable or satellite provider or Internet provider has noticed.

Video now accounts for more than half of all Internet traffic. Most cable and satellite companies are already planning for the day when they deliver most of their video to you by IP (Internet protocol) and no longer by the traditional methods.

One way they are doing this is to make it possible for you to access most of their channels via an Internet-based service or application rather than through the traditional set-top box. For the company, this is not as bad as you might think. The typical DVR box used by TV providers costs hundreds of dollars to purchase, maintain, replace, and so on. With the speed at which technology is moving and the capital cost in the boxes, they are more than happy to let you bear the burden.

Other impacts of connectedness are in the areas of education and security. The classroom is being transformed, as students no longer expect to have big bulky textbooks to lug around and to be in classrooms where the highest tech device is a whiteboard. That's not an unreasonable expectation if you spend your free time using

smartphones and tablets, do all of your schoolwork on laptops, and can “text” faster than you can type.

Textbook companies and school districts have been slow to go the ebook route and the financial challenges of many schools have held back investments in technology, but not for much longer.

Security for all of this connectedness remains a problem. The less savory members of society are rapidly moving from email and websites as their primary means of stealing money and identities. They're now shifting to smartphones, tablets, and anything else they can infiltrate. Some forecasters think that biometric security is the near-term solution as the traditional password method continues to fail. Secure software is a major issue and you can be sure that the first time a virus infects your car or your TV it won't be a pleasant experience.

Service reliability has a new meaning. For many, their Internet service is every bit as important as any other utility. It's easy to see why: if you're highly connected, many of your household and daily devices fail without it.

If you want to get people up in arms, the trigger used to be just loss of water or electricity. Now it includes a means of communication, too.

Among the tremendous changes in health care in the U.S., we must include electronic medical records. As more medical data exists only electronically and not on paper, the access and security of medical data becomes more important. The issue of having access to your medical data brings us yet again to where and how you are connected. And for security, you want to know it is only accessible to the people who should be able to access it.

The devices that connect us are also evolving as older devices — such as desktop PCs and laptops — are replaced by smaller devices with new user interfaces. The inconsistency between devices and interfaces remains a problem. (*SEE: “The Next Revolution in Cable TV, Parts I and II in Pop'Comm's November and December 2011 editions respectively, page 10. — K8RKD.*) We are forced to learn and relearn how to use each device with each generation.

How many ways are you connected? Is the number growing and what does it mean to your hobby? You can connect to me by many different ways so drop me a line with your thoughts. I look forward to hearing from you.

Spring

SPECIALS

Spring

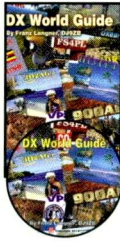
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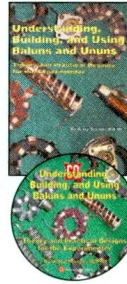


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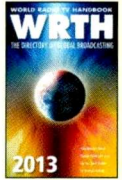
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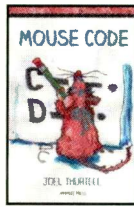


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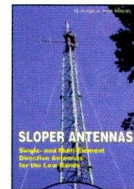
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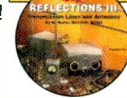
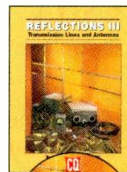


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Photo A. This year's Consumer Electronics Show in Las Vegas broke records for both attendance and exhibitors, according to CES officials. Gordon West, WPC6NOA, made his annual "radio walk" of the show floors — a combined 1.92 million square feet. (Photography courtesy of WPC6NOA)

In Review: A Radio Walk in 'Vegas @ the 2013 Consumer Electronics Show

COMMENTARY

By Gordon West, WB6NOA/WPC6NOA

It can take a lot of walking to discover radio gear and new technologies that may impact the communications hobbyist. I'm reminded of this each year when I take in the Consumer Electronics Show at the Las Vegas Convention Center — on the hunt for *trends* in two-way and shortwave/scanner radios.

There was no lack of people or goodies. CES 2013, January 7-10, broke both attendance and exhibitor records!

- 150,000 attendees (35,000 from more than 170 countries)
- 3,250 exhibitors
- 20,000 new products spread across 1.92 million square feet of space, **Photo A.**

During my four-day radio walk, I could see clearly the changes and additions in the consumer electronics marketplace.

Overall Impressions

There were a mind-boggling number of cell phone case exhibits. (*NOTE: I bet there were more than 1,000 designs — from sparkling with sequins to gurgling with submergibility. — WPC6NOA*)

There were very few 3-D television demonstrations, but over at LG, the multi-screen 3-D TV demonstrations had us all ducking for cover.

“The radios and accessories we use today will have a much different look in years to come. The 2013 CES gave us a window into the future.”

AA rechargeable batteries are still topping out at 2800 mAh. So, sadly, there has been no improvement over last year. But everyone seemed to have AA multiple-cell smart battery chargers.

The CES floors were *quiet*. I always liked the intense sounds coming from the stage shows. You know the type: the person who misses slot machine coins jingling in the coin catchers. *Gone are the sounds.*

C.Crane Shows Off the CC Pocket and Solar Observer

C.Crane, the radio and illumination company, always attends the CES show with gusto, meaning a complete line of radio receivers. LED light sources, Wi-Fi active antenna extender systems, and a host of other radio-related products. Some have been years in design.

C.Crane President Bob Crane, **Photo B**, brings his entire show team. Members demonstrate the radio products live and field comments and questions from users of C.Crane radio receivers and other products.

New this year is the *CC Pocket*, a shirt pocket-sized receiver for AM, FM stereo, and sensitive weather-band monitoring with weather alert. For the travelers among us, the *CC Pocket*, **Photo C**, includes a clock, alarm, and even a narrow AM filter to tighten up AM radio reception when conditions are challenging.

The C.Crane team demonstrated the *CC Solar Observer*, **Photos D and E**, as well: an AM/FM, plus weather band and weather channel receiver, with both a rechargeable battery pack and common AA cells.

If the battery system should die during a major storm, the hand crank recharges the built-in rechargeable batteries and you are back on the air. And yes, there is even the provision for the *CC Solar Observer* to give a cell phone a recharge.

It's always a pleasure seeing the C.Crane crew. Members are active radio enthusiasts and having the spirit of Bob Crane, are always looking to develop new radio gadgets. I'm sure they will continue to dazzle with great radio and



Photo B. Bob Crane, president of the well-known C.Crane Co., is an annual fixture at the Consumer Electronics Show. He brings a full team of company representatives to help the literally thousands of people who visit the booth over the four-day event. (Internet screen grab <<http://bit.ly/1130AjY>>)

lighting products. Visit: <<http://www.CCrane.com>>.

Scanning the Scanner Scene

At CES, the buzz was that **Uniden's Home Patrol** scanner continues to be one hot seller. Obviously, what buzzes in 'Vegas doesn't stay in 'Vegas. (**WATCH and LISTEN:** To a video demonstration of the *Home Patrol* scanner <<http://bit.ly/14oB7QN>>, **Photo F**. – WPC6NOA.)

Cobra had a major radio display. Once again, I tried to understand how advertised FRS/GMRS radio range estimates seem to get higher as the price gets higher. *Puzzling.*

I do agree that the little palm-sized toy FRS radios can't really punch through like larger FRS/GMRS handhelds — even though their power is the same and the antenna looks almost identical. The physically-larger radios have more pleasant sounding transmit audio, and they have nice loud receive audio for hearing over crowd noise.

Radar Detectors Meet Smart Phones

In a clear case of “something old, something new,” radar detectors are now getting a tie-in with a smart phone application. You zip over a hill, the detector goes off to alert your smart phone, and it somehow alerts other drivers with the same app that radar is being used in the area. (**NOTE:** Sorry not to have more details. I



Photo C. The *C.Crane CC Pocket* receiver is an AM/FM stereo receiver featuring narrowband AM and a weather alert function. Also: a clock, auto off, and an alarm. “Great audio!” says WPC6NOA. “Very compact and great reception with stereo top-quality earphones included.”

think the product is still in the early stages of development. – WPC6NOA.)

Updates: Alinco and GRE America

Alinco Inc. <<http://www.Alinco.com>> was showing a new line of *land mobile* handheld radios, and spokesman Raj Gounder, K6GRE, was quick to point out that Alinco USA and its amateur radio line, **Photo G**, are here to stay.

Alinco products are sold through GRE America <<http://www.GREAmerica.com>>, whose Japanese counterpart has been experiencing financial problems in production of its popular scanners.

When I asked about the status of GRE, Gounder said Alinco USA will try to continue to provide support and service for those owning GRE scanners. K6GRE is Director of Sales for GRE America.

I couldn't get anyone — including Raj — to say anything about the future of GRE products from Japan. (**NOTE:** To read a GRE America statement regarding the product line's status, visit <<http://bit.ly/XG7ao7>>. – WPC6NOA.)



Photo D. The C. Crane Solar Observer features AM/FM radio reception, plus seven weather channels. For power, it has a hand-crank dynamo power generator, solar power generation, regular AA battery power, and a rechargeable power pack. It can charge cell phones, as well.



Photo E. On the rear side of the C. Crane Solar Observer, users find the radio's solar panel and battery compartment. They are among a slew of power options.

So, for now, if you are a GRE scanner owner, Alinco USA is still your point of service.

Las Vegas Strip Show

At CES 2013, I saw one large, flexible LED light strip seller — CableJohn, from Ontario, California, <<http://www.CableJohn.com>>. The company sells only to dealers. For an emergency command post, these warm white and blue-white, flexible LED strips draw almost no current and really pump out the lumens.

Meanwhile, Wired Communications <<http://www.wiredco.com>> has dimmers, in addition to LED strips and LED systems. So, you dial in just the amount of LED lumens you want

from the dimmer. (**CAUTION:** Only the submersible “50-50” strips can withstand outside applications in the sun or freezing cold. The other strips become brittle, and ultimately fracture with prolonged UV exposure. — WPC6NOA.)

Wired Communications includes mounting hardware for its outdoor submersible strips because the sticky backing gives up the ghost just about as soon as you peel away the protective cover.

FCC Chairman Speaks About 2.4-GHz Congestion

At the 2013 CES, Federal Communications Commission Chairman Julius Genachowski acknowledged that we are get-

Photo F. The Uniden Home Patrol scanner is still a big hit among scanner dealers at the 2013 CES in Las Vegas.

ting close to hitting the *Wi-Fi Wall* at 2.4 GHz — nearing saturation.

Plans are for the Commission to launch proceedings to set a whopping 195 MHz of bandwidth twice as high in frequency — on the 5-GHz band — for Wi-Fi use. The Chairman believes this will ease the congestion down at 2.4 GHz.

For the radio amateurs using microwave on 5.6 GHz, let's hope *they* don't lose any frequencies that hams are currently under utilizing — big time — at 5 GHz.

Cell Jammers Incommunicado

This year there were no cellphone jamming devices seen on the CES display floor. Word has it that the FCC initiated a \$25,000 forfeiture proceeding against a company for marketing cellphone jammers in the United States. To see that the FCC means business on cell jammers and GPS jamming devices, visit <<http://fcc.us/YzuSt1>>.

W6TWT Makes the Scene

Leo Laporte, W6TWT, host of the popular Internet webcast *Ham Nation*, worked the show <<http://twit.tv/hn>>. And, like me, he was not disappointed in this year's CES adventure — a journey of four full days to cover all the venues.

Weather . . . Or Not

Over at La Crosse Technology, I had a lengthy conversation with the top brass on some of the unique ways that a smart phone can keep track of high and low tem-



Photo G. Alinco, whose products are sold in the U.S. through GRE America, told booth visitors it will continue to produce its popular line of amateur radios, plus new land mobile products.

peratures (or maybe a water leak) when the user is away from home. La Crosse is well known for its full line of wireless weather products <<http://bit.ly/11n3bk>>, which sure beats having to string wires between your home weather station and the wind cups up on the tower.

I asked: "What is La Crosse customers' biggest *service need*?"

Answer: Batteries! That's the first suspect when their equipment fails to work properly.



Photo H. La Crosse Technology's solar-powered window time-and-thermometer's translucent display is illuminated by two LEDs, which get charged via a tiny solar panel during the day.



Photo I. Jason Gant, W6AUX, of Long Beach, California, holds a land mobile/amateur radio, on display at the Consumer Electronics Show in January.



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Photo J. While there were no major breakthroughs announced in solar panel outputs, lots of emergency solar products were on display at CES.

I am a big fan of La Crosse's solar-powered window thermometer, **Photo H**, with twin LED backlights, Model 306-605 <<http://bit.ly/111n3bk>>. *It's really cool at night!* The translucent display is illuminated by two LEDs, which get charged via a tiny solar panel during the day.

(ON A PERSONAL NOTE: I have several of these solar-powered window thermometers, but only one works. I explained to La Crosse representatives my six-month experience in trying to reach a live person in its customer service department, only

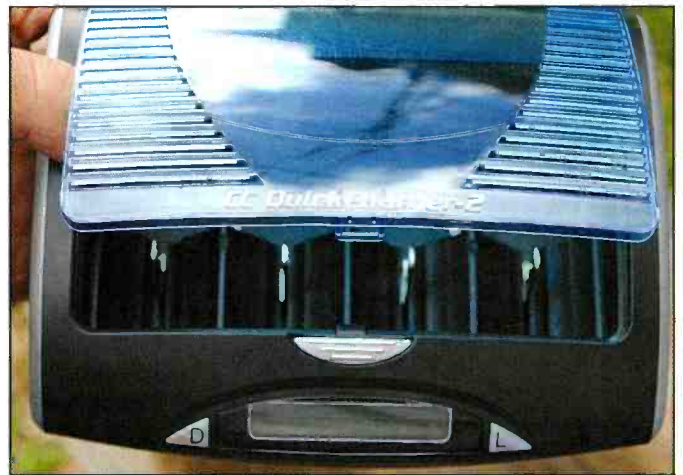


Photo K. Several manufacturers of rechargeable battery charger/conditioners — extending the life of most rechargeable chemistries — were present at the show. This one, the CC QuickCharger-2, is from C.Crane — and works well, according to WPC6NOA.

to receive an email that is not much more than the standard reply to recheck my batteries. Getting immediate help from any company's Customer Service Department can go a long way to improve their overall sales and satisfaction. They listened attentively to my complaint. I've since been assigned a La Crosse customer service specialist who will carry my paperwork directly to a technical specialist. Now, that's service. — WPC6NOA.)

In Summary

Although there wasn't too much Richter-scale-rocking news for communications hobbyists at the 2013 CES, **Photos I** through **L**, as always, it was a great event that showed how advancing technologies in many areas can — *and will* — have an impact on electronics *in all areas*.

The radios and accessories we use today will have a much different look in the years to come. The 2013 CES gave us a window into the future.



Photo L. About 150,000 people — 35,000 of them from 170+ countries — attended the 2013 CES, held January 7-10 at the Las Vegas Convention Center.

A NOAA Weather Radio Primer: Your Wireless Gateway to Nature's Excitement



By Joseph Pasquini, N2NOU

One of the best uses of our federal taxpayer dollars — and of interest to communications hobbyists and the general public alike — is NOAA Weather Radio (NWR).

More and more general coverage radios and scanners produced today are capable of receiving at least the audio transmissions from its VHF-based informational and early warning radio service, **Photo A**.

With advances in technology, the format and the scope of this National Weather Service (NWS) offering has evolved and matured over the years in order to better serve its listening audience. Thanks to such improvements as enhanced RADAR imaging and analysis <<http://bit.ly/Oqi9nB>>, the leveraging of SKY-WARN® spotters <<http://skywarn.org>>, and the implementation of computer synthesized broadcasters, NWS forecasters are more prepared than ever to deliver potentially life-saving information in a more timely and efficient manner.

What is NOAA Weather Radio?

Best defined by the National Oceanic and Atmospheric Administration itself, NWR is an all-hazards public warning



Photo A. There are many radios today that have the capability to receive NOAA Weather Radio broadcasts, as well as receivers solely dedicated to NWR frequencies, such as this Midland WR-100 SAME Digital Weather/All Hazards Alert Radio. (Internet screen grab <<http://bit.ly/UAn06W>>)

“NWS forecasters are more prepared than ever to deliver potentially life-saving information in a more timely and efficient manner — via NWR.”

system that broadcasts forecasts, warnings, and emergency information 24 hours a day directly to the general public. Weather messages are repeated every 4 to 6 minutes and are routinely updated every 1 to 6 hours unless rapidly changing events warrant more frequent updates.

Recognized as the “Voice of NOAA’s National Weather Service,” NWR is comprised of a nationwide network of radio stations broadcasting continuous weather information and is offered by NOAA as a free public service. Each National Weather Service office is assigned an area of responsibility, and local NWR stations broadcast warnings, watches, special statements, forecasts, and other hazard-related information 24 hours a day throughout its coverage area. (**SEE:** A comprehensive map of NOAA Weather Radio Stations at <<http://1.usa.gov/Wrxh2>>. Click on states to get a view of specific area coverages, **Photo B. LISTEN:** To live streaming audio of NWR broadcasts at <<http://bit.ly/T5ISym>>. — JP.)

Today, NWR includes more than 1,000 transmitters covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories.

In the 1950s, the old Weather Bureau — the precursor of the modern National Weather Service — began broadcasting aviation weather across two stations. During the 1960s, stations were added for marine users. By the late 1970s, the system spanned more than 300 stations and increased to more than 600 transmitters by 2001, **Photos C and D**.

Choosing a Radio for NOAA Weather Broadcasts

There are lots of receivers with NWR capability on the market today. The National Weather Service has tips on how to choose a receiver that will meet your needs. In addition to giving an overview of possible features, NOAA also provides a comprehensive list of radio manufacturers that produce weather radios. (**IN DEPTH:** For more details on receivers, visit the



Photo B. A U.S. map of NOAA Weather Radio stations can be found at <http://1.usa.gov/Wrxh2>. NWR stations are shown by clicking on each state — in this case, California. (Courtesy of NOAA)

NOAAs site at <http://1.usa.gov/1lawxFS>. Scroll down the page for links to weather radio manufacturers. – JP.)

NWR broadcasts are a great way to get young people interested in hobbyist communications, weather technology, and a whole range of scientifically-oriented subjects, **Photo E**. Weather radios are relatively inexpensive and are a gateway to a wireless world of wonderment for a young person.

NWR Frequencies

There are seven frequencies used throughout the NWR network: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550 MHz. Each station is licensed to broadcast on one of these frequencies.

By design, NWR stations have a typical range of 40 miles, but coverage varies by terrain and conditions. Depending upon your location, you may be able to monitor more than one station. In order to receive the most pertinent information, you should try to listen to the NWR station that specifically serves your area.

Sounding the Alarm

During an emergency, NWS forecasters interrupt routine NOAA Weather Radio broadcasts and send a special tone intended to trigger capable local weather radio receivers.

*(WATCH and LISTEN: To a NOAA Weather Radio severe thunderstorm warning broadcast in central Michigan. http://bit.ly/X4LH8g, **Photo F**. – JP.)*

When the 1050-Hz tone is received by the weather radio, the receiver is activated so that the broadcast can be instantly heard by the listener. Though this method was functional and undoubtedly saved many lives, it also became a nuisance to some lis-

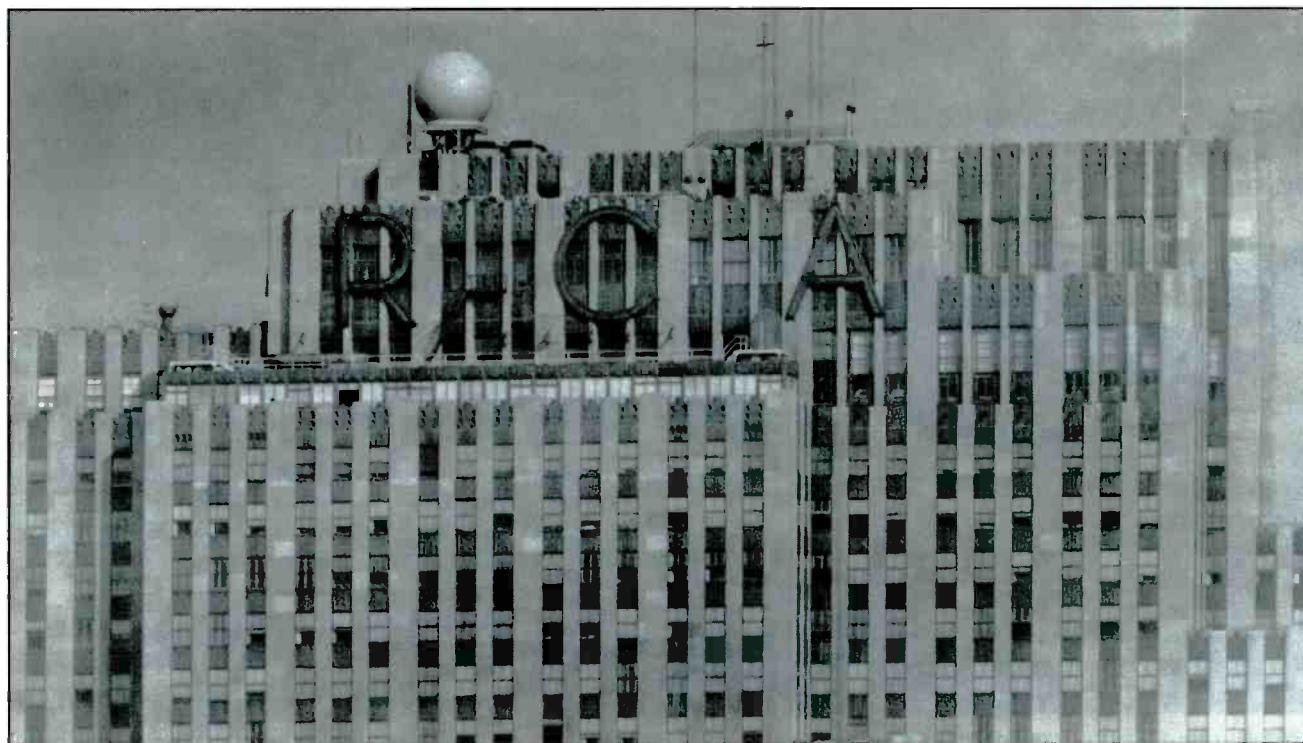


Photo C. National Weather Service offices have a long and distinguished history. There was an NWS office in midtown Manhattan on the mezzanine level of the RCA-GE building until October 25, 1993, before its relocation. The ball-shaped object on top of the building housed the RADAR unit. NOAA Weather Radio antennas are also pictured and still reside atop 30 Rock. (Courtesy of Wikimedia Commons)

teners due to the radio being activated for events often many counties away from the listener.

As a result, early-model radios were often turned off by their owners in exchange for a good night's sleep. While the alerts had their benefits, it was clear that a mechanism designed to target alerts toward a specific audience needed to be developed if the broadcasts were to be most effective.

Now, it's All the SAME

In 1994, NOAA began broadcasting coded signals using its SAME (Specific Area Messaging Encoding) protocol. The SAME format contains coding which represents the type of message as well as the county or counties affected.

Rather than turning off their radios in order to ignore alerts for distant areas during the middle of the night, NWR listeners could instead leave their SAME-capable receivers turned on all of the time, content in the knowledge that their weather radio would only awaken them if an alert was issued for the county or counties in which they were interested in monitoring. As a result, overall broadcast effectiveness was increased.

Each digitally-encoded SAME alert contains information about the type of alert, as well as the specific geographic locations affected by the alert along with the expiration time of the message. The SAME burst is then followed by a 10-second broadcast of the standard 1050-Hz warning alarm tone. Once the tone is sent, an audio feed composed of additional information is then received.

While many VHF receivers and transceivers are capable of picking up the audio portion of NWR broadcasts, a NOAA weather radio receiver or scanner is required to monitor alert broadcasts.

An appropriately programmed NWR SAME receiver will then turn on for that message, with the listener hearing the 1050-Hz warning alarm tone as an attention signal, followed by the broadcast message.

Depending on the characteristics of the receiver, the digitally encoded SAME transmissions may be heard as a very brief static burst by the listener. At the end of the message, listeners may hear another brief static burst that indicates an end-of-message. Following the broadcast, the NWR station may either resume its normal programming or preempt it with special statements regarding the situation if it is ongoing.

The geographic locations are designated using Federal Information Processing System (FIPS) codes. Each county or similar political division in the US and its territories are assigned a FIPS code.

In addition, certain special regions and wildcard settings can be assigned. In order to program a SAME capable receiver, you need to know the six-digit code for the county or counties whose alerts you want to monitor <<http://1.usa.gov/TRD1r8>>. Once you have that information, program your NWR SAME receiver following the directions supplied by the manufacturer.

Narrowing Focus: Finding Your FIPS Code

FIPS codes are available from NOAA's website <<http://1.usa.gov/WvehDA>> or by telephone at (888) NWR-SAME ((888) 697-7263).

FIPS codes are in the format SSSCC, where:

- SS: The state code
- CCC: The county code

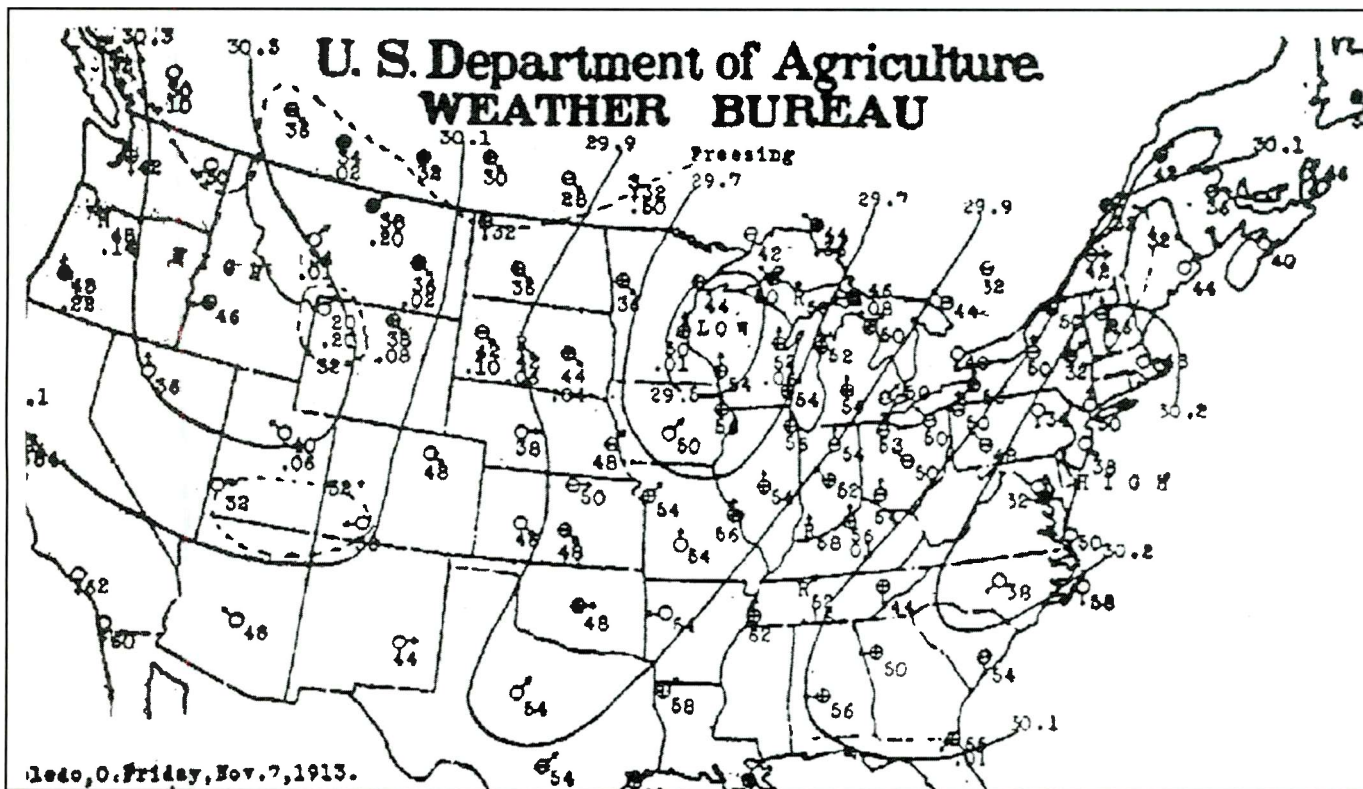


Photo D. Weather forecasting and communications have come a long way since this Weather Bureau map was made, showing weather conditions for Friday, November 7, 1913. (Courtesy of Wikimedia Commons)

For example, Schoharie County in New York is assigned a FIPS code of 36095.

- 36 indicates the state of New York
- 095 indicates Schoharie County

County codes are typically assigned in alphabetical order starting with 001 and incrementing by a count of two. As a result, a buffer zone is created between each code designation allowing for future growth caused by county or sub-county designation changes.

Event Filtering

In addition to the FIPS information, SAME transmissions include information detailing the type of event, **Photo G**. In May of 2002, the FCC amended the EAS rules in order to allow for additional alert types. The NWS added numerous new civil emergency, weather and natural disaster event code types in 2004 as a result of the changes in rulemaking, **Figure 1**.

While many NOAA weather radios and some scanners and communication receivers offer SAME decoding using the coun-

ty FIPS codes, a few high-end NOAA weather receivers also feature the ability to filter received messages by both the FIPS regional code and the event type.

Not All Broadcasts Are Weather Related

The National Weather Service is considered the primary communications medium for the Federal Communication Commission's (FCC) Emergency Alert System (EAS) and Homeland Security's National Response Plan.

The purpose of the EAS is to broadcast official emergency information to the general public within a specific region; the National Response Plan establishes a comprehensive "All-Hazards" approach designed to enhance the ability of the United States to manage domestic incidents. In keeping with this all-hazards mantra, NWR is capable of disseminating information regarding a litany of hazards well beyond those that are weather related. The types of scenarios that may trigger such a broadcast include:

- Natural (severe weather, floods, earthquakes, volcanic activity, forest fires)

NWR: A Menu of What You Might Hear

Warnings, watches, and statements that may activate the NWR SAME system include, but are not limited to:

Weather-Related Events

Blizzard Warning
Dust Storm Warning
Flash Flood Statement
Flood Statement
Hurricane Watch
Severe Thunderstorm Watch
Special Marine Warning
Tornado Warning
Tsunami Watch
Winter Storm Warning

Coastal Flood Watch
Flash Flood Watch
Flood Watch
High Wind Watch
Hurricane Warning
Severe Thunderstorm Warning
Special Marine Statement
Tropical Storm Watch
Tsunami Warning

Coastal Flood Warning
Flash Flood Warning
Flood Warning
High Wind Warning
Hurricane Statement
Severe Weather Statement
Tornado Watch
Tropical Storm Warning
Winter Storm Watch

Up to the Minute . . .

For Weather Event Updates, visit: <<http://1.usa.gov/Wvi0kz>>

Non Weather-Related Events

Avalanche Watch
Civil Danger Warning
Evacuation Immediate
Law Enforcement Warning
Nuclear Power Plant Warning
Volcano Warning

Avalanche Warning
Civil Emergency Message
Fire Warning
Local Area Emergency
Radiological Hazard Warning

Child Abduction Emergency
Earthquake Warning
Hazardous Materials Warning
911 Telephone Outage Emergency
Shelter in Place Warning

Administrative Transmissions

Administrative Message
Required Weekly Test

Practice/Demo Warning

Required Monthly Test

Source: NOAA Weather Radio

Figure 1.

Photo E. NWR is a natural gateway for getting young people interested in meteorology and radio communications. Artist Jack Elrod has included NOAA Weather Radio in his *Mark Trail* newspaper cartoon plot lines for many years <<http://1.usa.gov/Wt1FhQ>>. (Internet screen grab)

Photo F. This YouTube video of an NWR Severe Thunderstorm Alert gives a sense of the excitement when things are getting whipped up meteorologically — and NOAA wants everyone in the area to know about it <<http://bit.ly/X4LH8g>>. (Internet screen grab)

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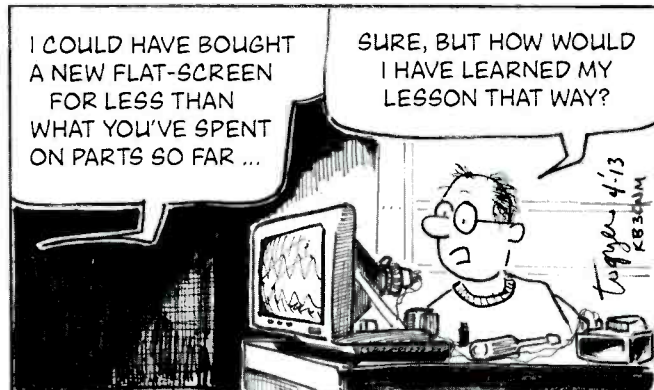
Photo G. Not many parts of the nation experience dust storms, but this *haboob* certainly made a nuisance of itself as it blanketed Phoenix, Arizona in August 2003. No doubt, NOAA Weather Radio was *all over it*. (Courtesy of JuneBug172 via Wikimedia Commons)

SPURIOUS SIGNALS
popcommcomic.blogspot.com

By Jason Togyer KB3CNM



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- Environmental, whether accidental or intentional (chemical spills, nuclear incidents, and so on)
- Law enforcement and other local emergency support activities (Amber alerts <<http://www.amberalert.gov>>, bridge collapses, terrorist attacks)

According to the NWS, the radio network may be used to disseminate non-weather related emergency messages when the information originates from an official government source, time is of the essence, and the public safety is at risk.

When governmental officials want to broadcast a non-weather message on NWR, the officials provide text information about the hazard along with any other associated instructions directly to the local NWS offices. In order to facilitate the process, NWS offices typically have pre-arranged agreements in place with the various governmental entities. Such agreements will vary from region to region.

All in All . . .

For the average listener, monitoring NOAA Weather Radio on a quiet, uneventful day may not be very exciting. But, when severe weather or other emergencies strike, not only is the information interesting — it more importantly has the potential to save both lives and property. For radio enthusiasts, however, NWR offers more than weather and other hazard information. It offers an often interesting and exciting source to monitor during turbulent events. And, even if you don't take advantage of the radio services offered by the National Weather Service, monitoring more distant NWR stations makes an excellent means of determining VHF propagation.

Joe Pasquini, N2NOU, is an avid amateur radio operator as well as shortwave and scanner listener with a career spanning more than 15 years in the fields of Information Security and Systems Management.

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Understanding 'Fighting Modulation,' And a DXing Challenge

by Bruce A. Conti,
WPC1CAT
<contiba@gmail.com>

“Major Armstrong purchased land atop 500-foot Englewood Cliffs overlooking the Hudson River. There he would build a new FM field laboratory”

It was some 80 years ago when inventor Major Edwin H. Armstrong first experimented with frequency modulation of radio signals. However it took another 40 years before FM radio would begin to gain popular acceptance over AM.

For one thing, the circuitry was inordinately complex compared to AM. Then the reassignment of the FM broadcast band from 42 to 50 MHz to the current 88 to 108 MHz made early receivers obsolete. Perhaps more importantly, the early development of FM was stunted by parallel experimentation with television in addition to competition with AM.

Why invest additional time and money into FM when AM radio was doing well enough and the prospect of television held so much promise?

Maybe FM should stand for *Fighting Modulation* because it was such a time-consuming and grueling battle to get to where it is today.

Fractured History of FM

In 1933, Armstrong began conducting FM experiments in the RCA labs at the top of the Empire State Building, the highest point in New York City. At the same time it was becoming clear to Armstrong that fellow experimenter David Sarnoff and corporate sponsor RCA weren't really interested in FM. They wanted to invest in the development of television, and RCA believed FM was a threat to its AM radio business.

Sure enough, in 1935 Armstrong was evicted



Photo A. The unique Armstrong Tower is designed with three cross arms to maximize horizontal and vertical space for antennas. (Courtesy of WPC1CAT)



Photo B. Major Edwin Howard Armstrong, Father of FM (Courtesy of Wikimedia Commons)



Photo C. David Sarnoff, who would go on to head RCA, battled Armstrong on the development of FM because of its threat to AM broadcasting.

Tower” and laboratory building are still standing today.

The self-supporting steel lattice tower measures 400 feet tall with three 150-foot crossbars designed to maximize available vertical and horizontal space for antennas on the tower, making it quite unique. In April of 1938, W2XMN signed on the air for the first time from the new site at 43.7 MHz with a power of 600 watts, but it wasn't until 1941 when the FCC officially set aside 40 channels between 42 to 50 MHz for the FM broadcast band where W2XMN was assigned 42.8 MHz.

Soon the FCC identified the need to allocate more spectrum for FM radio, but the current band was being squeezed by television. So in 1945, after months of deliberation including push-back from Armstrong, the FM broadcast band moved to an expanded 100 channels between 88 and 108 MHz, making old FM radios obsolete by 1948 when low-band FM was terminated.

from the Empire State Building due to both personal and professional conflicts of interest with Sarnoff. So Armstrong purchased land atop the 500-foot Englewood Cliffs in Alpine, New Jersey, near one of his favorite DXpedition spots overlooking the Hudson River, across

from his hometown of Yonkers, New York. There he would build a new field laboratory to continue FM development.

Armstrong completed construction of an antenna tower in 1938 at his Alpine site to accommodate experimental FM radio station W2XMN. The “Armstrong

FM 101: Understanding the Mode

FCC 47 CFR 73.681 defines FM as “a system of modulation where the instantaneous radio frequency varies in proportion to the instantaneous amplitude of the mod-



Photo D. The historic Armstrong site remains an active communications facility today, so public access is restricted with the area secured by a barbed wire-topped fence.

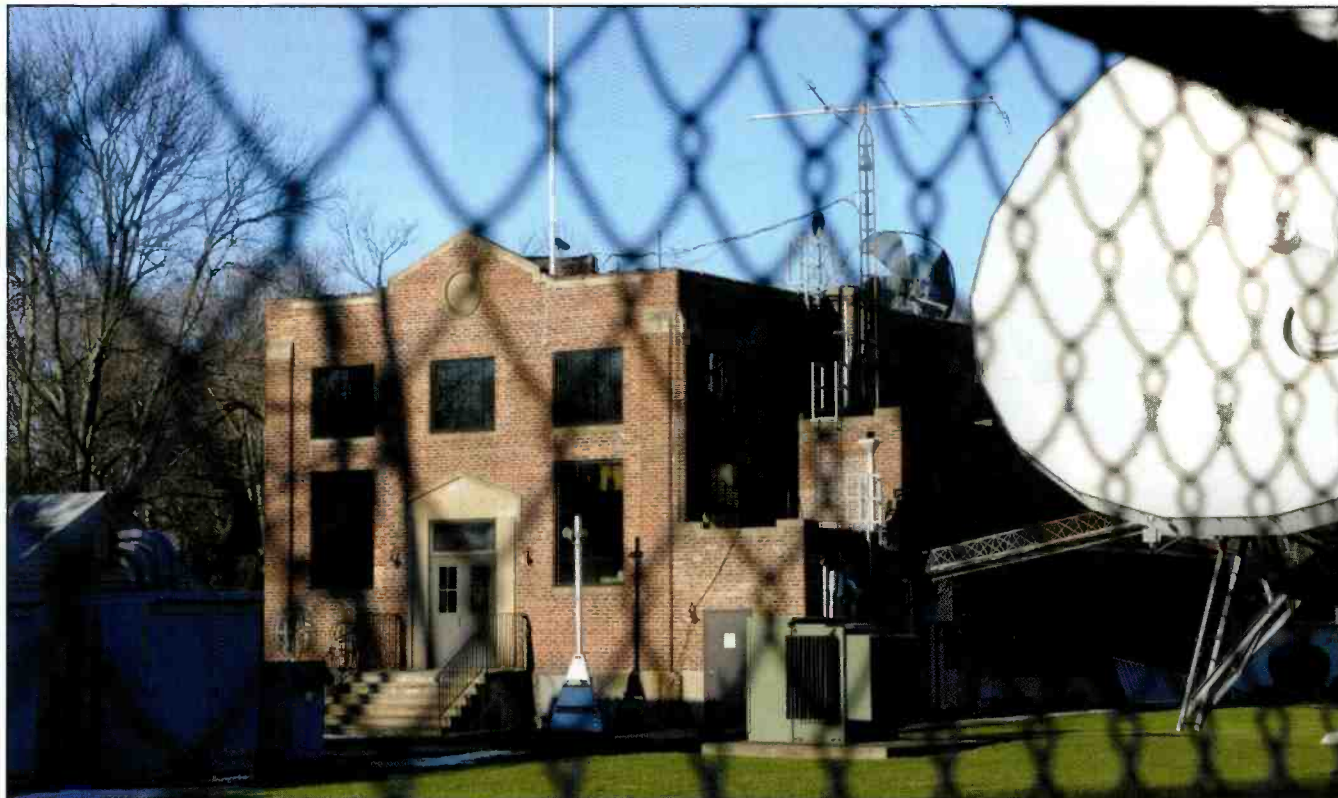


Photo E. Although the old W2XMN building is said to house a small Armstrong museum, there's no regular public access beyond the fence surrounding the site. (Courtesy of WPC1CAT)

ulating signal and the instantaneous radio frequency is independent of the frequency of the modulating signal." Let's try to break it down into simpler terms.

Frequency modulation is the imposition of an audio signal on a carrier frequency such that it causes the frequency to vary proportionately. As the audio frequency changes, so does the carrier frequency.

In theory, an RF carrier is frequency

modulated by an audio signal such that it causes the carrier frequency to change. This is a major difference between FM and amplitude modulation (AM) where the carrier frequency does not change. In other words, when an AM receiver is tuned to a station on 900 kHz, the received carrier frequency does not vary. When an FM receiver is tuned to a station at 100.1 MHz, although the receiver remains tuned to that

frequency, the actual transmission frequency is varying proportionately with the audio frequency.

So, for example, if a 15-kHz tone was used to modulate the 100.1-MHz carrier, then the resulting FM frequency would be 100.115 MHz (100.1 MHz + 15 kHz). An FM receiver tuned to 100.1 MHz would detect the difference between the tuned frequency of 100.1 MHz and the received signal at 100.115 MHz, converting or demodulating that difference back to a 15-kHz tone.

In reality, the implementation of wide-band FM is far more complex. Something called the *modulation index* is used with frequency multiplication to improve audio performance and stability. The modulated carrier frequency actually starts out at a lower frequency which is then multiplied until the desired carrier frequency is reached.

The modulation index is the ratio of the frequency deviation to the frequency of the modulating wave. In the earlier example, the carrier frequency deviation from 100.1 to 100.115 MHz is the same as the modulating audio signal of 15 kHz, so the ratio is 1. However this represents only 0.015 percent deviation, a very small number. Now let's frequency modulate 20.02 MHz with the same 15-kHz audio

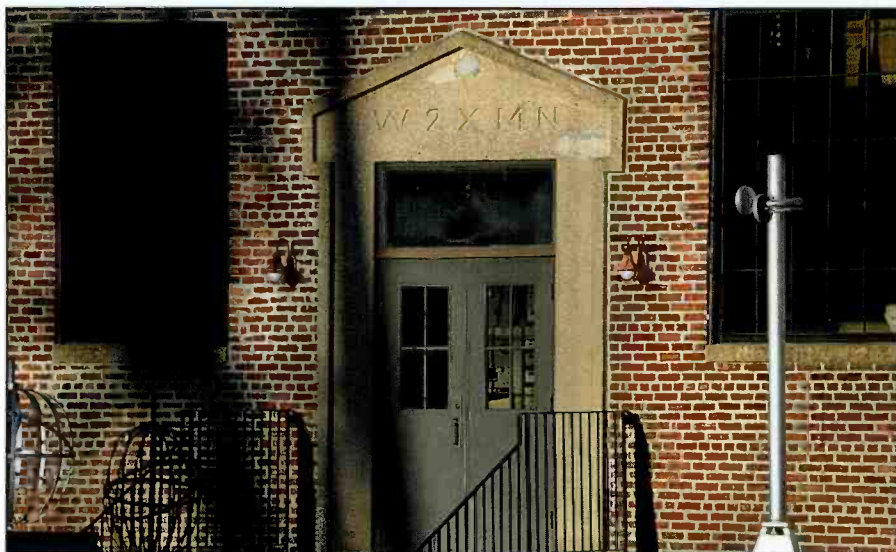


Photo F. The W2XMN call sign is literally etched in stone above the front entrance to the Armstrong building. (Courtesy of WPC1CAT)



Photo G. The Armstrong Tower stands tall over a nearby neighborhood of million-dollar homes in Alpine, New Jersey. (Courtesy of WPC1CAT)

signal, then multiply 20.02 MHz by a modulation index of five which gives us 100.1 MHz. Accordingly the modulation is also multiplied by five resulting in a frequency deviation of 75 kHz so the actual FM signal is now 100.175 MHz. This results in 0.075 percent deviation, still a small number, yet providing significantly more working headroom and improved efficiency.

It's important to note that while the carrier frequency varies when modulated, the amplitude of the FM signal remains constant. Thus a strong signal swamps out any co-channel interference, so only one signal at a time is received. Furthermore most man-made and natural random noise sources are amplitude modulated, so frequency modulation as we all know is immune to noise.

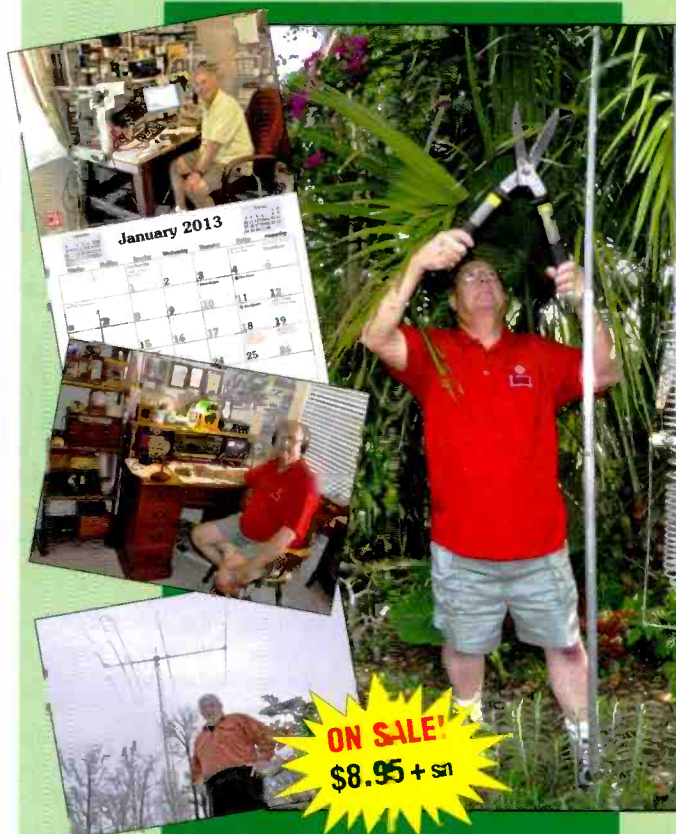
However, white noise or hiss on an FM radio can occur when tuned to a weak signal. A signal must be strong enough to overcome a noise threshold to receive clean audio. Anything below the threshold is like falling off the FM version of the fiscal cliff. The same noise can also be caused by tuning off-frequency.

Using the example of an FM station at 100.1 MHz, if the receiver is tuned off-frequency to 100.09 MHz then the 10-kHz offset is demodulated into noise. Noise caused by frequency drift was a monumental challenge for FM designers, eventually solved by the development of the phase-locked loop.

By the way, 15 kHz is selected for the audio signal in this example because for FM radio that's the maximum audio frequency limit, and 75 kHz is the maximum frequency deviation

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allowed for transmission of the audio information. This also basically explains the 200-kHz spacing between FM channels to prevent adjacent signals from overlapping. Bandwidth above and below the center carrier frequency is also used for multiplexing stereo and subcarrier information including RDS display, SCA channels, and now HD digital.

FM Development Path

The carrier frequency of an FM radio signal is modulated through an exciter. The frequency stability of the earliest FM exciters was difficult to maintain. Mechanical L-C tank circuits were used for frequency control until Armstrong developed a method of applying phase modulation and frequency multipliers to frequency modulate the carrier frequency, which allowed for crystal control of the fundamental frequency prior to multiplication to reduce frequency drift.

This frequency multiplication method is now referred to as indirect FM. The complexity of the circuitry required to perform this task was further reduced by the development of the GE Phasitron vacuum tube which became the standard in the early days for crystal controlled indirect FM exciters. *(IN DEPTH: Link to Dave Hershberger, W9GR's, Phasitron Website <<http://www.w9gr.com/phasitron.html>> for more on the phasitron tube. – WPC1CAT.)*

As technology rapidly evolved with the development of multiplexed FM stereo,

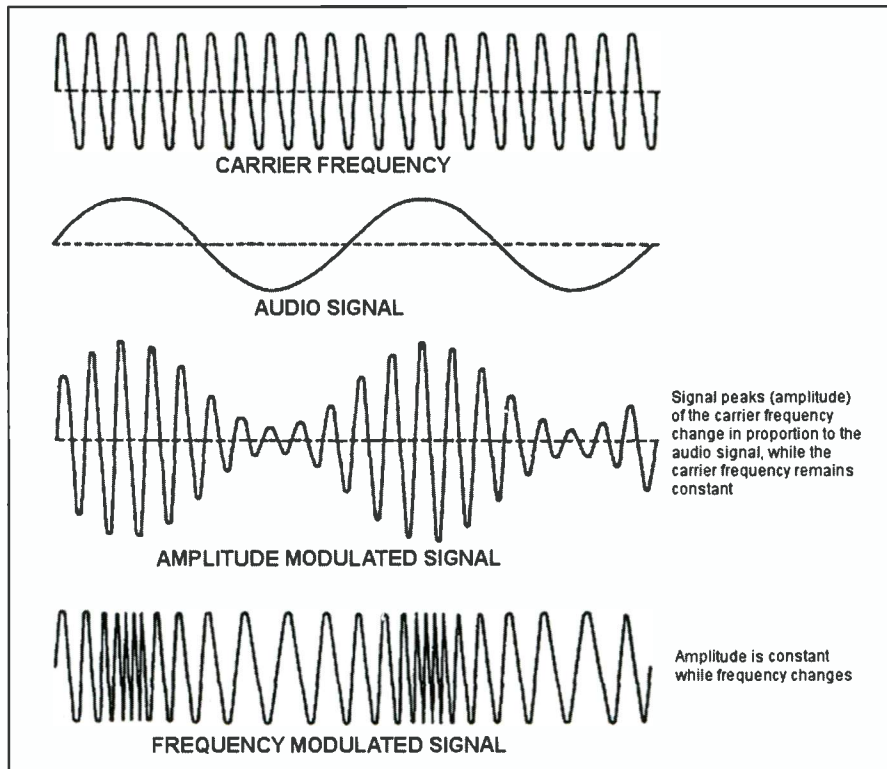


Photo H. This diagram shows the relationships between a carrier frequency and audio signal with amplitude and frequency modulation. *(Courtesy of WPC1CAT)*

the Phasitron soon became obsolete although many monophonic Phasitron transmitters continued to operate into the 1970s.

After the Phasitron, the Serrasoid exciter was the next major technological advancement for indirect FM, using the spikes of a sawtooth wave to carry the

audio information. Introduced in the 1940s, the Serrasoid improved distortion specifications, and represented a significant reduction in the size and scope of transmitter circuitry, quickly becoming the new industry standard.

The Serrasoid is considered a predecessor of digital sampling techniques.

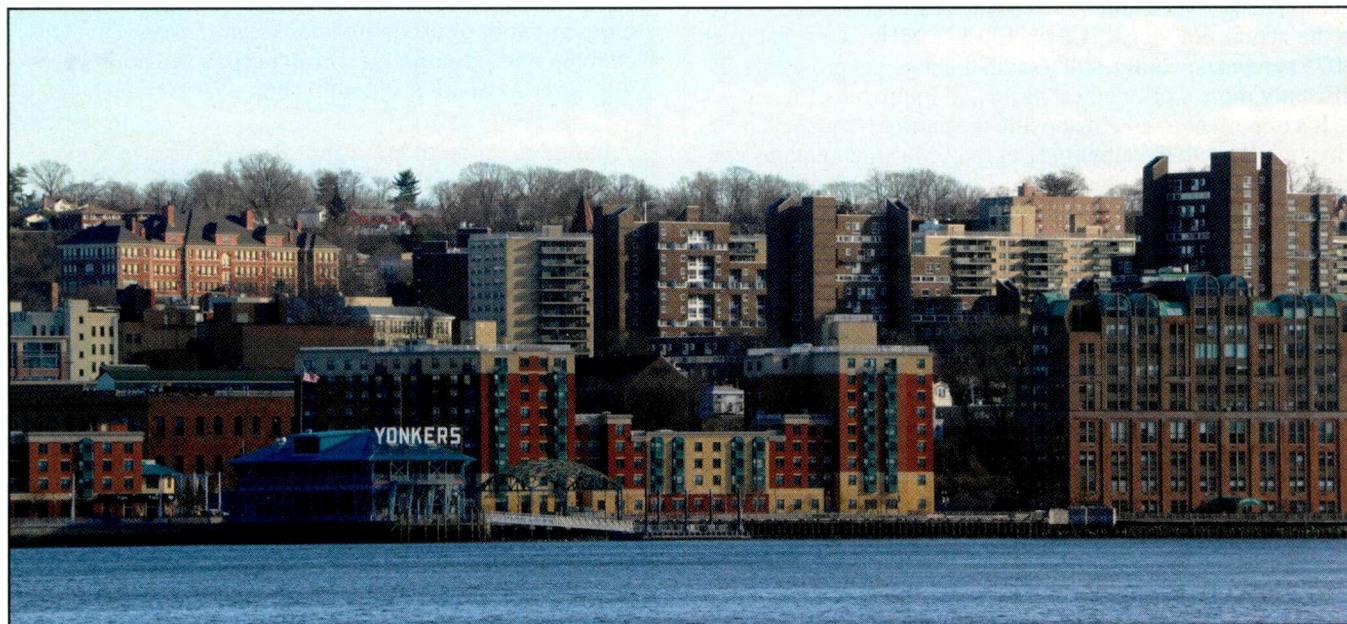


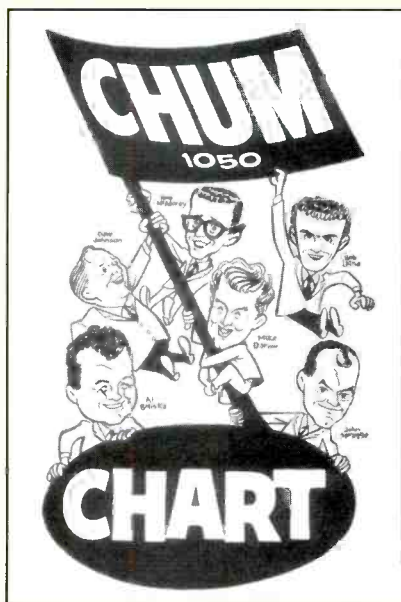
Photo I. Armstrong's hometown of Yonkers, New York can be seen across the Hudson River from the Englewood Cliffs antenna site near Alpine, New Jersey. *(Courtesy of WPC1CAT)*

This Month in Broadcast History

75 Years Ago (1938): The BBC televised the first live coverage of a football (soccer) match in its entirety. England vs. Scotland from Wembley Stadium. Meanwhile, here in the U.S., inventor E.H. Armstrong began testing experimental VHF FM radio station W2XMN on 43.7 MHz with an output of 600 watts from his lattice tower in Alpine, New Jersey. (**NOTE:** See *Broadcast Technology* for details, and visit <<http://bit.ly/TIEGiH>> to see pages of the original W2XMN logbook. – WPCICAT.)

50 Years Ago (1963): The soap opera *General Hospital* premiered on ABC television. (**WATCH:** A “*General Hospital*” promo from 1963 at <<http://bit.ly/XKGRxH>>. – WPCICAT.) “I Will Follow Him,” by Little Peggy March, <<http://bit.ly/X2uxZ1>> led Toronto’s 1050 CHUM Hit Parade.

25 Years Ago (1988): 104.1 WKIR Jackson, Tennessee personality Dan Baxter lost his job after an April Fools snowy weather forecast caused listeners to panic and got the attention of the Highway Patrol and Civil Defense authorities. – WPCICAT



Fifty years ago this month “I Will Follow Him,” by Peggy March led Toronto’s CHUM 1050 Hit Parade. (*Internet screen grab*)

However frequency drift remained a problem for FM, and the Serrasoid provided only about 40 dB of stereo separation. A better system was needed to handle the demands of FM stereo and subcarrier multiplexing.

Phase-Locked Loop to Today

The introduction of the phase-locked loop (PLL) was yet another major advancement for FM, improving both

transmitter and receiver frequency stability. While the development of PLL circuitry dates back to 1932 with the design of a direct-conversion receiver, the technology was primarily limited to television horizontal and vertical sweep lock applications. Remember adjusting the horizontal and vertical controls of an analog TV to get rid of those black bars sweeping across the picture tube? That was PLL circuitry in action. The introduction of PLL integrated circuits in 1969 made the circuitry easier to implement and more cost effective

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Photo J. From near the Armstrong antenna site, a view of lower Manhattan can be seen from the New Jersey side of the Hudson River beneath the George Washington Bridge.

for RF applications. PLL advancements gave us automatic frequency control (AFC) on FM radios in the 1970's.

Fast forward to today and the development of the high-power, on-carrier phase-locked direct FM exciters. Direct frequency modulation (DFM) inserts the audio information directly to a voltage-controlled oscillator such that the frequency deviation of the oscillator is directly controlled by the modulating signal. Frequency multiplication is still required in the final stages to produce a carrier frequency in the 88 to 108-MHz range and provide an efficient modulation index. But, unlike the indirect FM method that is limited by crystal control, an automatic frequency control loop improves the frequency stability of direct FM while allowing for greater frequency deviation to accommodate FM stereo and multiplexing.

Epilogue

Today the Armstrong Tower continues to be part of an active communications antenna site maintained by CSC Management <<http://www.csemt.net/history.php>> located off Route 9W in Alpine, New Jersey. The building that served as the Armstrong laboratory still has the old experimental FM call sign W2XMN etched in stone above the main entrance. Although part of the building is preserved as an

Armstrong museum of sorts, there is essentially no regular public access to this historic building and tower site, which is surrounded by barbed wire fence.

The main driveway is guarded by a security gate and cameras, and a gated side entrance is impassible, blocked by fallen trees and debris. The site is occasionally opened for re-enactments of W2XMN broadcasts in the VHF band to commemorate important anniversaries. WA2XMN is licensed by the FCC to broadcast on 42.8 MHz under a Special Temporary Authority (STA) for such special events. Past events have been simulcast on 89.1 WFDU FM, the voice of Fairleigh Dickinson University, which also transmits from an antenna on the tower. Subscribe to an email reflector at <<http://www.wa2xmn.ar88.net>> for notification of upcoming broadcasts.

Armstrong was a student and later a faculty member at Columbia University in New York City where much of his original FM research took place. Philosophy Hall on the Columbia campus is recognized by the National Register of Historic Places and designated a National Historic Landmark as the birthplace of FM radio.

A plaque posted outside the labs in 2003 proclaims the landmark designation: "This building possesses national significance in commemorating the history of the United States of America.

Edwin H. Armstrong developed a series of advances in wireless communications technology in his second floor laboratory between 1913 and 1954. These contributions, which included FM radio, had an important impact on the history of communications." To learn more about the story of Armstrong at Columbia University, visit <<http://bit.ly/XKCpz>>.

Assignment: FM DX

Attempting to explain FM without getting too technical is a challenge. Hopefully you've gained a better understanding of FM, at least conceptually, if your eyes didn't glaze over along the way.

Now your homework assignment is to attempt FM broadcast DXing in honor of Armstrong. Some of the best FM DX conditions occur from late spring into the summer. Tropospheric ducting can propagate loud and clear FM broadcast signals over hundreds of miles. Check out the VHF propagation map at <<http://bit.ly/WvC2sj>> for an indication of tropo conditions in real time. Also take a look at <<http://www.dxmaps.com>> for real-time mapping of propagation phenomena, covering everything from E-skip and tropo to auroral QSOs on VHF frequencies. Then be sure to let us know what you're receiving.

– 73 and Good DX! – WPC/CAT

Monitor the Bouncing Flight Path — IFR in the L Region

By Bill Hoefler,
KPC4KGC/WPE4JZZ/
KG4KGC
<flacap388@gmail.com>

MMy mom gave me my first GPS for my car about six years ago. I was amazed by how it could lead me quickly, and somewhat efficiently, from where I was to where I wanted to go. But a GPS unit, no matter what company it came from, is not 100 percent accurate. My unit has been known to take me down dead end roads.

Eventually my daughter acquired the unit as I have six GPS programs in my iPhone. And that's just for driving.

I have eight programs in the same phone for hiking and biking. But anyone who uses a GPS knows sometimes there's nothing better than a paper map in their hands, especially when you can't get a good signal or you just run out of power.

A GPS in an airplane sometimes fails. Many airplanes, especially smaller or older planes just

"This month we look at low-altitude — or 'L' charts — which are extensively used in Instrument Flight Rules (IFR) aviation. Where should we tune our scanners? Read on . . ."

don't have a GPS, or it's only been certified for visual flight use — not for instrument flights. Many, but not all, small aircraft used in flight training don't have a GPS installed. These pilots, when flying under instrument rules, use VORs (short range VHF omnidirectional navigation) and NDBs (non-directional beacon) that I discussed in my first couple of columns. (**NOTE:**

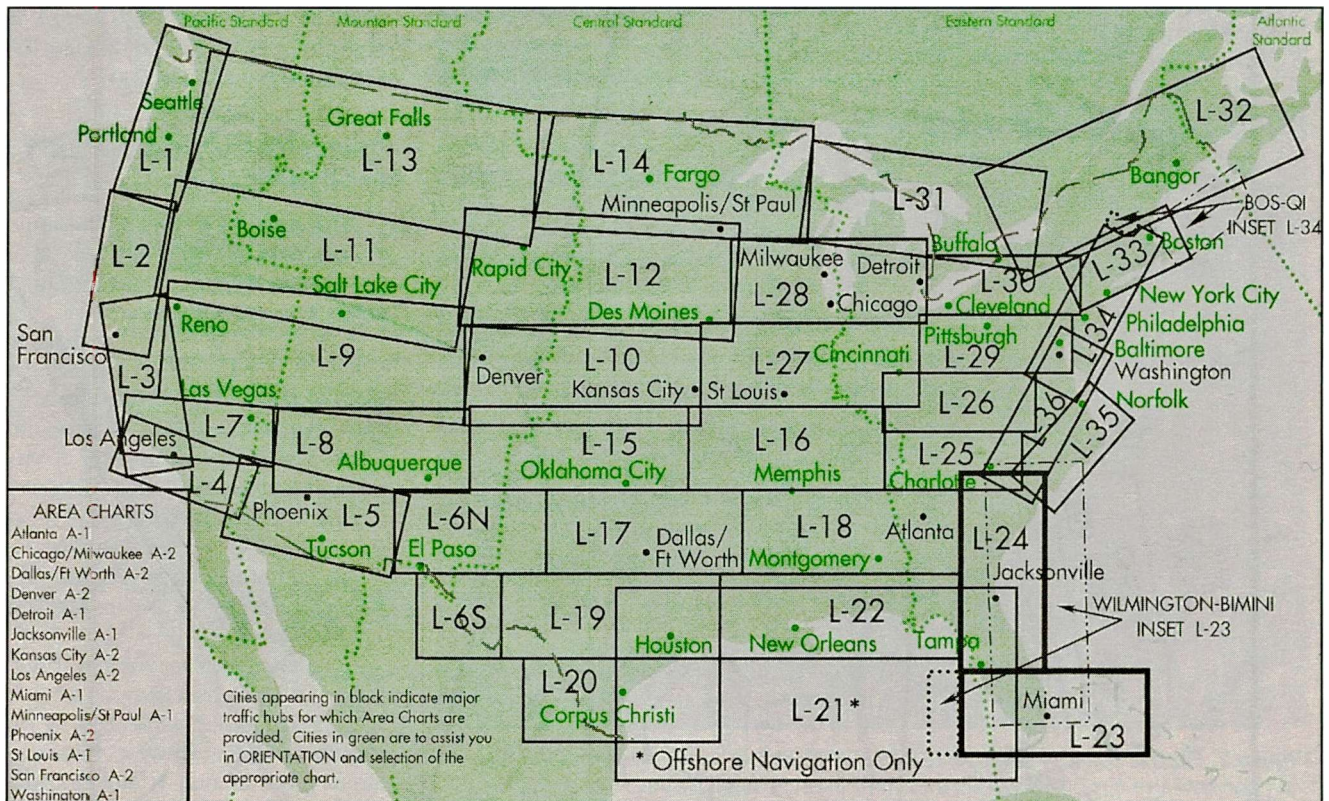
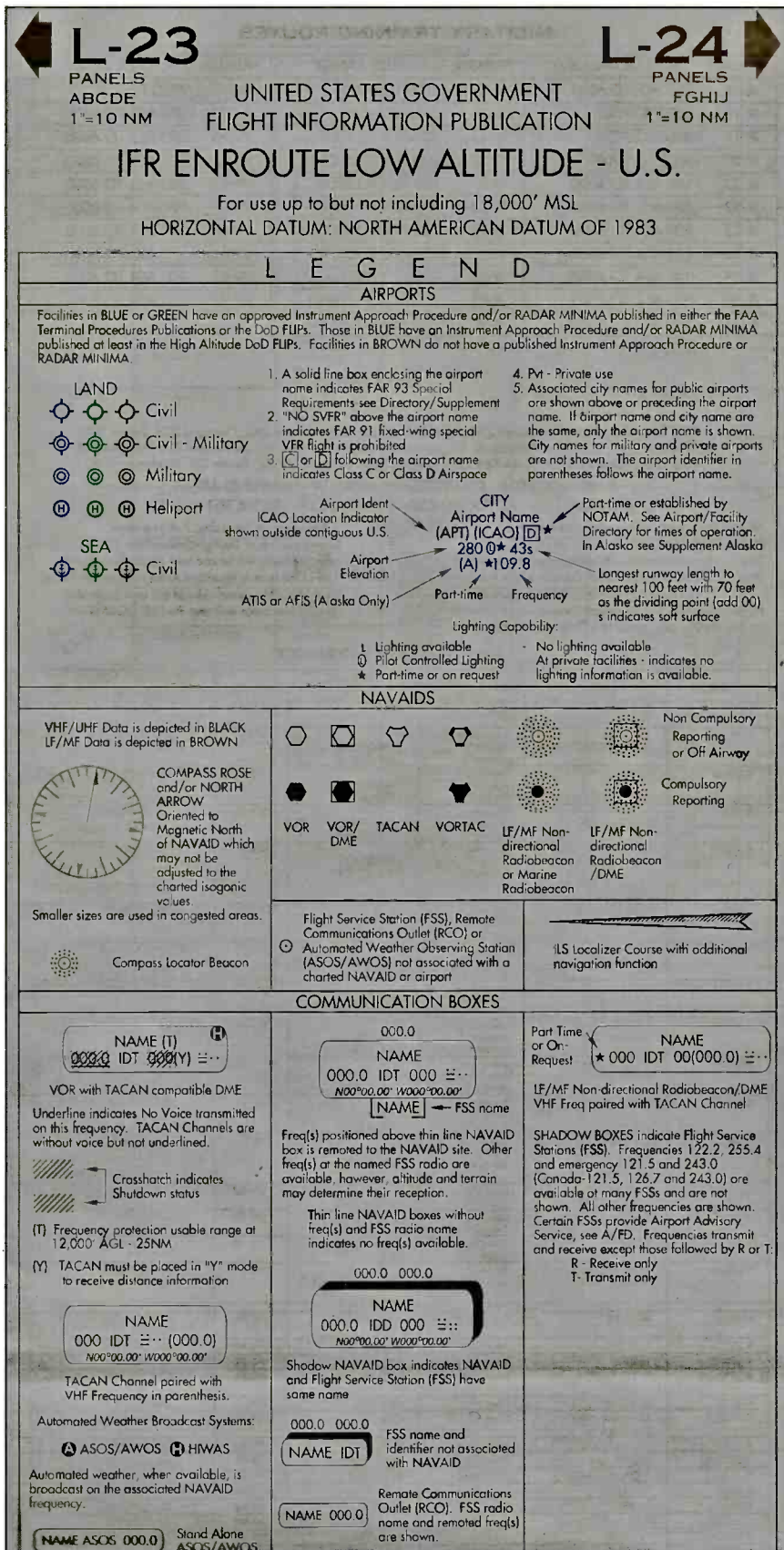


Figure 1. There are 36 IFR Low charts for the lower 48 states — printed double sided. (Courtesy of KPC4KGC)



Pilots should not learn to fly under instrument flight rules — IFR — unless they know how to fly with a VOR or NDB first. If you learn to fly with the more rudimentary instruments, flying with GPS is a piece of cake. Such as learning to drive a manual transmission car, then graduate to automatic transmissions. — KPC4KGC.)

Without GPS, How Do You Get Around?

If we don't have GPS in a car, to find our way we get advice from local people, such as a gas station attendant. You can follow road signs.

Of course, up-to-date paper maps will also do the trick. Last month we focused on sectional charts under VFR — visual flight rules. Look out the window and compare it to what you see on the map.

These pilots use the current sectional chart and take their own responsibility to find out where they are and to maintain separation from other aircraft. Those flying under instrument flight rules give up some of that responsibility to air traffic controllers while flying en-route.

Pilots flying under IFR (instrument flight rules) use maps that are instrument charts and come in two primary scenarios — low altitude (for aircraft flying from the surface to 17,000 feet MSL) and high altitude (18,000-60,000 feet MSL — or flight levels 180 to 600).

Using Instrument Charts Just for the 'L' of It

This month we look at low-altitude — or 'L' charts. The high-altitude 'H' charts are similar, but will be covered in greater detail in a later column.

For the lower 48 states there are 36 charts, printed double sided. For example, L-1 and L-2 are printed back to back and cover the coasts of Washington and Oregon with the California coast from just south of the San Francisco area north, **Figure 1**. L-23 and L-24 cover the peninsula of Florida and the Bahamas.

Last month we covered sectional maps for VFR pilots — all in the scale of 1:500,000.

That's not the case for low IFR charts. L-23 and L-24, for example, are 1 inch to 10 nautical miles while L-9 to L-14 in **Figure 1** in the northwest contain a much larger piece of real estate. Both the terrain and the numbers of flights in the areas, of course, dictate the scale.

Figure 2. Here is the IFR ENROUTE LOW ALTITUDE — U.S. information page. Just beneath the airport legend is information on NAVAIDS. And beneath that, COMMUNICATION BOXES, which shows where to find frequencies on the actual chart. (Courtesy of KPC4KGC)

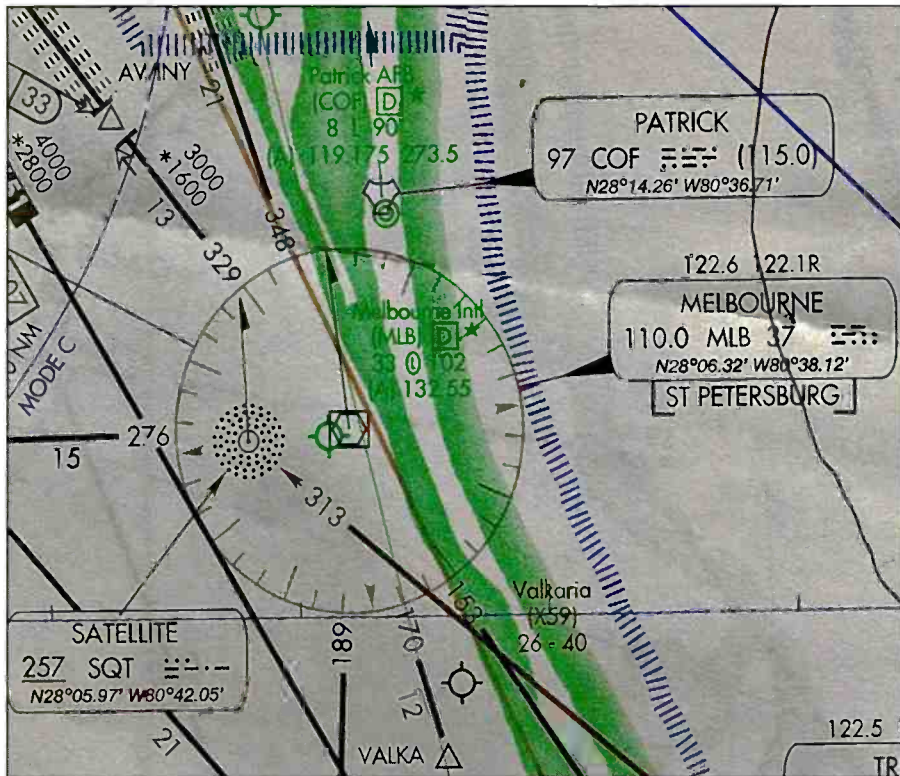


Figure 3. This close-up shows information for Melbourne (KMLB) and Patrick AFB (KCOF) on the eastern coast of Florida. At Melbourne airport the frequency of the VOR is 110.0 MHz and St. Petersburg FSS (flight service station) RCO (remote communications outlet) frequencies of 122.6 and 122.1R. (Courtesy of KPC4KGC)

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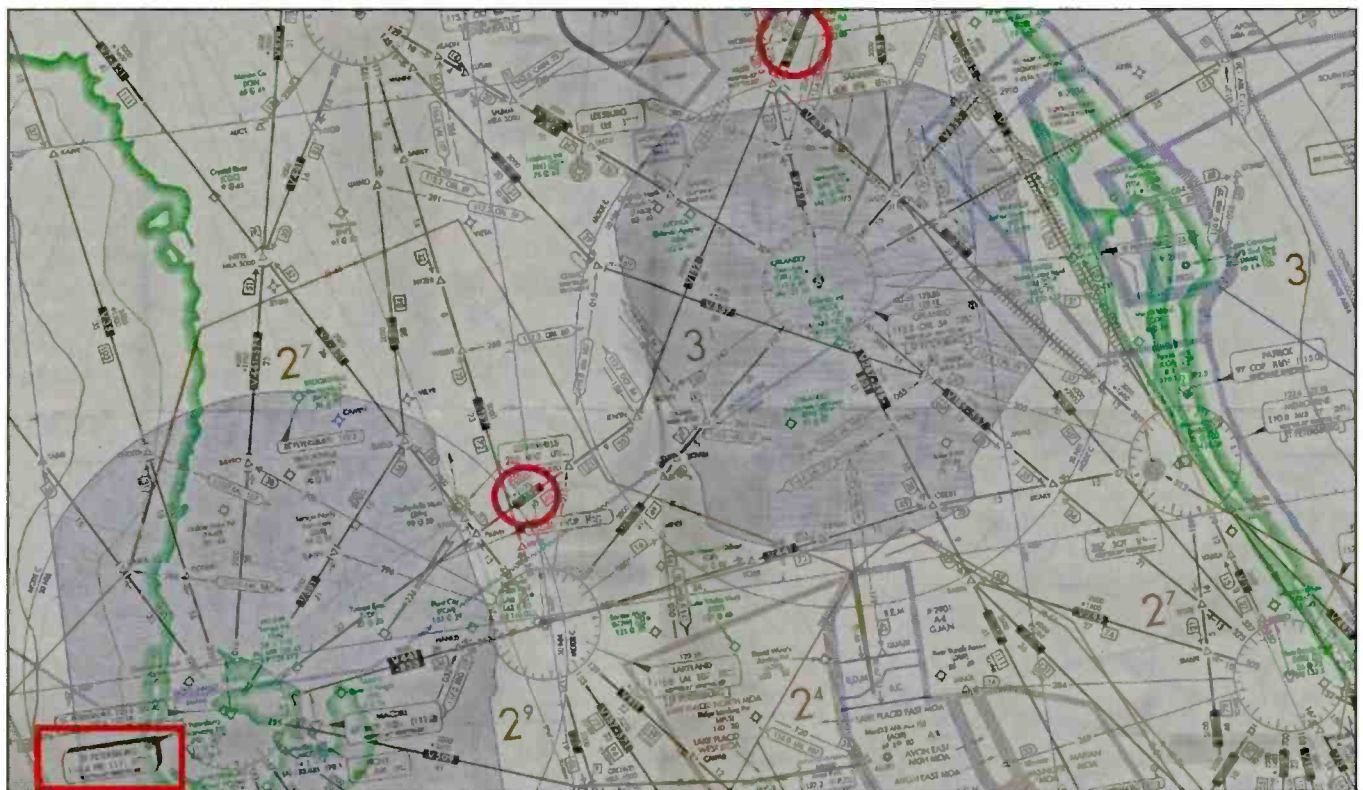


Figure 4. Here is the low-altitude structure of central Florida from the Tampa-St. Petersburg area through Orlando to the Space Coast. Refer to the text for a flight route out of St. Petersburg toward Orlando. Red areas have been added to help the reader with navigation. (Courtesy of KPC4KGC)

Grab Your Scanner and Listen 'Up!'

While we're getting into *what* you'll likely be hearing, here's a little tutorial on *where* to listen.

To find aviation frequencies specific to your local airport you'll need a scanner that covers from 118.0 to 135.975 MHz.

If you'd rather listen online, you're in luck. There are many websites from which to choose. Here are a couple to get you going: <<http://www.liveatc.net>> and <<http://www.radioreference.com>>.

Often, you'll need to know the ARTCC (Air Route Traffic Control Center) code for the airport you're interested monitoring. A comprehensive list of codes for facilities around the world can be found at <<http://bit.ly/MGUk8P>>. Use the IATA Code (International Air Transport Association) search function to find the ARTCC code for the airport you're seeking.

Here are some basic frequencies in MHz to keep handy:

- 121.5 – Emergency (Pilot voice communications and emergency locator beacons)
- 122.750 MHz – General aviation air-to-air communications
- 123.025 MHz – Helicopter air-to-air communications
- 123.450 MHz – Airlines air-to-air communications
- Scan 122.0-123.65 – Unicom (uncontrolled airports) and air-to-air communications
- Scan 128.825-132.000 – For call-ahead frequencies for airlines, corporate aviation, and general aviation for fuel, parking, and other requests

An excellent source for local scanning is the FAA publication *Airport/Facility Directory (A/FD)*. There are seven pub-



Photo A. If you don't have a scanner, you might be able to monitor local police aviation communications via RadioReference.com <<http://www.RadioReference.com>>. Helicopter air-to-air communications is on 123.02 MHz. (Courtesy of Nachoman-au via Wikimedia Commons)

lished by the FAA covering the lower 48 states, Puerto Rico, and the U.S. Virgin Islands. There are two orange books, as well: One for Alaska and another for Hawaii.

They are published every eight weeks and while each edition updates its frequencies, there's really no need to get each one as printed. Each one currently sells for \$5.30. You can get them at most airports that have pilot training. Larger airports, such as Atlanta Hartsfield, Denver International, John F. Kennedy International, and so on, don't carry them. – KPC/KGC

Since all the VFR sectionals are the same scale, you *could* piece together a complete map of the U.S. and all be on the same scale. Low-altitude charts don't have that luxury. Fortunately a few of the maps are of the same scale and can be assembled for your area — such as L-23 and L-24. Again you'd have to purchase a minimum of two maps for such a project.

Figure 2 is the IFR ENROUTE LOW ALTITUDE — U.S. information page. The top section describes the airports — civil, military, joint civil/military, heliports, and seaplane ports. Not all airports can be shown — mainly the major civilian airports, the military and a handful of heliports. Some private airports are depicted, but few.

Just beneath the airport legend is information on NAVAIDS. And beneath that, COMMUNICATION BOXES, which shows where to find frequencies on the actual chart.

In **Figure 3** we see information on Melbourne (KMLB) and Patrick AFB (KCOF) on the eastern coast of Florida.

At Melbourne airport the frequency of the VOR is 110.0 MHz and St. Petersburg FSS (flight service station) RCO (remote communications outlet) frequencies of 122.6 and 122.1R.

Communications with the FSS is simplex on 122.6 or duplex as the pilot will transmit on 122.1 and turn up the volume on the VOR of 110.0. The local control frequency is published as 132.55 MHz. Just west of the airport is the Satellite NDB (SQT) — frequency of 257 kHz, but there is no voice transmitted over it — indicated by the 257 being underlined. Just north of Melbourne is Patrick AFB with the tower frequencies of 119.175 (MHz) for civilian and military aircraft and 273.5 MHz covering just military. Latitude/longitude is found in each block for the NAVAIDS.

Figure 4 shows the low-altitude structure of central Florida from the Tampa-St. Petersburg area through Orlando to the Space Coast. Shown in this illustration are not only the airports, but the airway structure and the frequencies of the

NAVAIDS that form the airways. Example: V152 (Victor One Five Two, circled in RED) running from St. Petersburg (PIE, in RED square) northeast toward Orlando (ORL), takes a more northerly turn at the JENSN (pronounced Jensen) intersection to the KIZER (pronounced Kaiser) intersection where it joins with V437 (circled in RED) and continues up to the Ormond Beach VOR (OMN).

A pilot flying southwest to northeast would initially navigate off the PIE VORTAC for 55 nautical miles to JENSN. The aircraft is flying on a heading of 067 degrees magnetic with a minimum altitude of 4,000 MSL. The 2500G is the minimum altitude of 2,500 MSL, but with specific navigation equipment.

The pilot turns northeast at JENSN tuning in the OMN frequency of 112.6 MHz and flies another 66 nautical miles. His VOR receiver should show the 211-degree radial and a "TO" indication. He knows if it shows 210 or less, he's just to the right of course or 212 or more to the left of course.

The pilot should always be aware of any changes to minimum altitude. Looking above the V152-437 block between KIZER and OMN there's a left arrow next to 5,000 and a right arrow following 3,600.

In this case aircraft flying to OMN have a minimum flight altitude of 3,600-foot MSL, while those flying from OMN have a minimum altitude of 5,000. Like road intersections, many routes can cross each other. At KIZER you can see the intersections of V152, V267, and V437. South of KIZER at the ORL VORTAC you can have aircraft navigating off V533, V159, V267, V295, V531, and V533. Also international routes can come off these NAVAIDs. Northeast from ORL on the 070 radial is AR6, or Atlantic Route 6 going well out into the ocean.

Snapshot: IFR 'H' Maps

The upper route maps, called *IFR Enroute High Altitude* charts, are similar with a few exceptions: all altitudes are from 18,000 to 60,000 MSL (flight levels 180 to 600) and the routes start with 'J', instead of 'V' or 'T'. However they are phonetically expressed "Jay" — not "Jet." And, unlike the low-altitude charts, they are all the same scale.

My 'Cold War ATC' Reunion

During the Cold War, I worked air traffic control into and out of West Berlin, Germany with the U.S. Air Force and in concert with members of the British RAF and French Air Force.

We worked out of Tempelhof Zentral-flughafen in the Tempelhof area of West Berlin. With the Berlin Wall's demise in 1989 and reunification of East and West Berlin and Germany in 1990 we did not need to be there any longer.

In May we're having our first-ever unit reunion of the 1946th Communications Squadron, along with at least one of the French controllers, and hopefully a Brit controller or two and our squadron commander. My best friend in the USAF, Ken Nesbit, and I will be putting this together. I'll tell you all about it in an upcoming column.

Until Next Month

Keep listening *up* and please tell me what you're hearing. We'll share your monitoring experiences with other readers. By the way, I'm planning an article in the next few months on just what you *aviation scanners* are sending me.

Pop'Comm April 2013 Reader Survey

Your feedback is important to us at *Pop'Comm*. It helps guide us to make the magazine even more valuable to you each month.

Please take a few minutes to fill out this month's Reader Survey Card and circle the appropriate numbers corresponding to the questions below. We'll pick a respondent at random for a year's free subscription or an extension of an existing subscription as thanks for your participation — so don't forget to fill in your mailing address and other contact information.

We encourage your comments and suggestions in the space provided, as well. Thank you.

Last, but not least: You can now take this survey online. See details below.

As a communications hobbyist, what sources do you use to be informed on the equipment you buy? (Choose all that apply.)

| | |
|---|---|
| Word of mouth | 1 |
| Print advertising | 2 |
| Online advertising | 3 |
| Vendors at swap meets and hamfests | 4 |
| Published equipment reviews in magazines, periodicals | 5 |
| Other | 6 |

What advertising do you focus on in *Pop'Comm*? (Choose all that apply.)

| | |
|--|----|
| Receivers from major manufacturers | 7 |
| Radio accessories from major manufacturers | 8 |
| Books and other resource material | 9 |
| Antennas and accessories | 10 |
| High-frequency shortwave receivers | 11 |
| VHF/UHF scanners | 12 |

What most influences your buying decisions?

| | |
|-----------------------------|----|
| Advertising | 13 |
| What others say | 14 |
| Published reviews | 15 |
| No one source | 16 |

What magazines or periodicals do you rely upon most for print or digital edition advertising? (Please use the comment line.)

Take This Reader Survey Online

You can now participate in this reader survey via the Internet. Simply go to *Pop'Comm On the Web*: <<http://www.popcommmagazine.blogspot.com/>> and click the link to the *Pop'Comm March 2013 Reader Survey*. It's quick and easy.

And the Winner Is . . .

For participating in the *Pop'Comm Readership Survey*, the winner of a free subscription or extension is **John Cooper**, of **Lebanon, Pennsylvania**, who writes that he's "new to the hobby and loves tuning into distant stations," and has "just started QSL requests." *Good going, John. Welcome, and good hunting! Please keep us posted on your SWLing activities.* — KPC6PC

This Month's Feedback from Pop'Comm Readers

Pop'Comm appreciates and encourages comment and feedback from our readers. Via email, please write: <editor@popular-communications.com>. Our postal service address is: Editor, Popular Communications, CQ Communications, Inc., 25 Newbridge Rd., Hicksville, NY 11801-2953 USA. – Richard Fisher, KPC6PC/KI6SN

SWL QSLing: Ask and You Will Not Likely Receive ☹

Editor, *Pop'Comm*,

In response to your request for *Pop'Comm* Monitoring Station Awards Program ideas, might I suggest an award for "Spurned Correspondent?" This would recognize the enormous amount of money, time, and effort put forth by SWLs and DXers in their attempt to receive station verifications via postal mail — only to receive *diddly* in return.

The award could either be structured geographically or endorsements could be added to a standard award reflecting the number of unanswered reception reports in incremental levels.

This is not a joke. High-frequency broadcast stations no longer respond to reception reports as they did 30 years ago, **Photo A**.

DXers are highly snubbed, slighted, and even ripped off for IRCs, currency, and trinkets. It is high time that our 21st century stalwarts were acknowledged and duly ascribed.

Neither would I be adverse to a *Pop'Comm* Hall of Shame — a periodic feature spotlighting non-QSLing broadcasters. I can assure you that you would not lack for submissions to such a column, and publicity might even persuade offenders to change their ways.

– Dr. Richard W. Parker, KB2DMD,
Pennsburg, Pennsylvania

(Doc: Thank you for raising the issue of the abysmal SWL QSL Return Ratio (SWLQSLRR). I'm sure you're

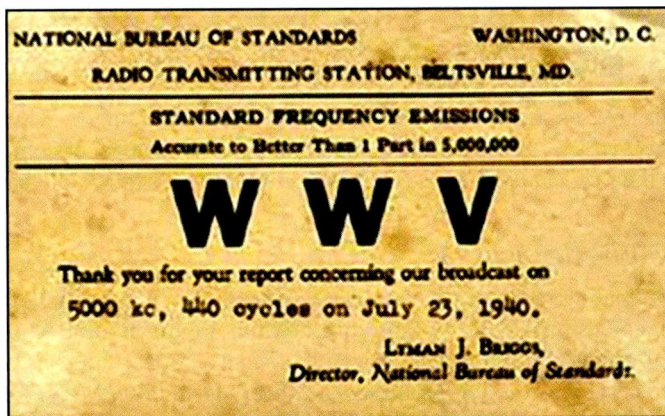


Photo A. Here's a classic card from WWV in Beltsville, Maryland, dated July 1940. National Bureau of Standards time station QSL cards are on listening post walls all around the world. (Courtesy of Wikimedia Commons)

not the only communications hobbyist it's bugging. Although I'm not sure the Pop'Comm Monitoring Station program is quite ready to take on a "Hall of Shame," I can certainly understand your motivation for suggesting such a thing. Several months ago I QSL'd Radio Romania. To date: No joy. Let's put out a call to Pop'Comm SWLers and scanner monitors: Do you have any secrets for successful QSLing? Or is this endemic? Please let us know at <editor@Popular-Communications.com>. – Richard Fisher, KPC6PC)

AM Radio's Demise: Look No Further than Your Car

Editor, *Pop'Comm*,

I found Rob de Santos, K8RKD's, recent *Horizons* column — about the medium wave broadcast band (AM) — very interesting and it addressed some issues I had been thinking about. (*SEE: "There's a Crisis Brewing in U.S. AM Radio," November 2012 Pop'Comm, page 10. – KPC6PC*)

I was reminded of when I took my car in for repair maybe 10 years ago, and I said besides the necessary work, I'd like them to deal with an AM radio noise problem. The young man writing up the work order declined this last item, telling me that only a few older people had ever requested anything to do with the AM radio, basically hardly anyone listened to AM radio any more, and so on, and that was that. (*WATCH and LISTEN: To a vintage 1981 Delco AM car radio in action <<http://bit.ly/Vr6Lq8>>. Photo B. NOTE: Comments on the talk radio stations tuned are suited for a mature audience. Listener discretion is advised. – KPC6PC.*)

In my little coastal town, the Coast Guard broadcasts on the AM band a 24-hour continuous "bar report" on sea conditions for boaters wanting to cross the dangerous bar from the breakwater into the open Pacific. Now, I'm not a boater at all, but I have never spoken to a boater who used this broadcast, or even knew it existed. I listen in on the VHF band, and every boat instead calls in on Channel 16 and asks the Coast Guard for the same information that's on the AM broadcast.

I personally will miss the fun of long distance night listening for unusual and quirky programming, such as Native American pop music out of Window Rock, the Hare Krishna station, or the Northwest indie music station out of Portland, the all-comedy stations, and so on. What I won't miss, and in fact will gloat about, is the decline in the venues and market share for the

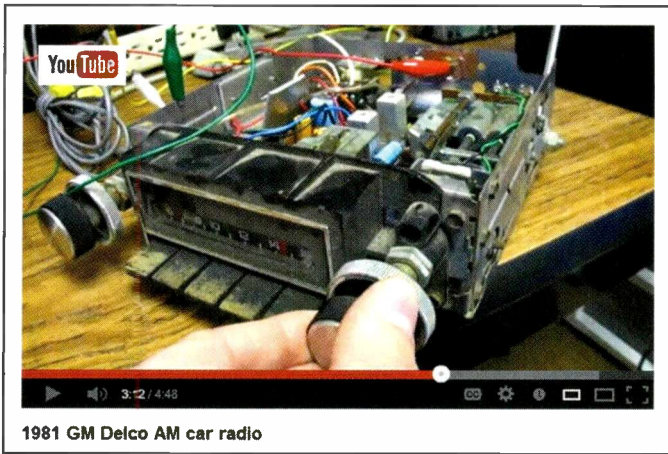


Photo B. AM-only car radios, such as this Delco from 1981, are few and far between these days. Many vintage vehicle restorers order after-market radios that no longer work — just to make the dashboard look authentic. Watch the Delco in action at <http://bit.ly/Vr6Lq8>. (**NOTE:** Comments on the talk radio stations tuned are suited for mature audiences. Listener discretion is advised. — KPC6PC.) (Internet screen grab)

sky-is-falling talk show propagandists. Even though I'm of the generation they supposedly appeal to.

You are *right on* with the issues you raise about the future of AM broadcast. The trend is inevitable, but I'm sure many of us will see this with regret. I think I'd maybe better hurry up and get my new AM crystal radio project finished!

— Hue Miller, K7HUE,
Newport, Oregon

(Hue: Thanks for writing. I appreciate your thoughtful message and I agree with your sentiment. Yes, I will regret the loss of the AM band if it comes about. From the many messages I have received about the column, apparently many other readers of *Pop'Comm* will, too. We probably can't change the tide of history here but I'm sure that there will be other valuable uses of the band found. No frequency goes unloved for long. — Rob de Santos, K8RKD)

Déjà vu: Let's Hear It for the Opposition

Editor, *Pop'Comm*,

I really enjoy *Poplar Communications*. I have been a licensed radio amateur — K5EKH — and an SWL since 1955 and still love to listen to shortwave. My main interest is in trying to listen to opposition broadcasting <http://bit.ly/11oo5yn>.

Many years ago when radio magazines could easily be found on newsstands, I would buy *Pop'Comm* each month just to read Gerry Dexter's "Clandestine Communique." He always had the up-to-date clandestine and opposition news. I would like very much to have that information brought back to the magazine each month.

I am not aware of any magazine or Internet site that keeps monitors up to date on happenings of opposition broadcasting.

Mr. Dexter also showed clandestine QSL cards and gave contact information for many of them — as well as the opposition broadcasters. I would sure enjoy reading "Clandestine Communique" in *Pop'Comm* again.

— Eddy Matney, K5EKH,
Fort Worth, Texas

(Eddy: You have a good memory. "Clandestine Communique" was written by Gerry Dexter, WPC9GLD, circa 1986. It is true that *Pop'Comm* does not currently have a full-blown column devoted to clandestine and opposition radio. But that does not mean such a regular feature wouldn't be considered for addition to the magazine's smorgasbord. In fact, we'd love to hear from others who share your desire for such coverage. Thank you for raising the issue, and we'll pursue feedback from readers: Should *Pop'Comm* give "C&O" coverage a higher profile? Please let us know by writing editor@Popular-Communications.com. — Richard Fisher, KPC6PC/K16SN.)

Morse 101: Three Cheers for Tertiary Logic

Editor, *Pop'Comm*,

Regarding Bill Price, N3AVY's, recent edition of *The Loose Connection*, having studied a bit of Nietzsche <http://bit.ly/WBvf3t> in college, to me *ultimate* is not the highest accolade. "Super" or "supreme" might be a better adjective. (*SEE: "My Adventures with Morse... Of Course," Pop'Comm, January 2013, page 84, Photo C.* — KPC6PC.)

In addition to Jean Shepherd http://en.wikipedia.org/wiki/Jean_Shepherd, I have been greatly influenced by Robert Heinlein <http://bit.ly/WitoAQ>. As an engineer and Naval officer, he put *real science* into his science fiction.

In a digression in one of his later works, he argued for the superiority of *tertiary logic* over the various binary codes virtually all computers use today. (*IN DEPTH: For a brief explanation of tertiary logic, visit <http://bit.ly/111PDJp>.* — KPC6PC.)

When I was at Comark, the Apple Macintosh that Thomson-LGT insisted I have for technical writing frequently crashed the company's HP-600 mini-mainframe. Eventually my Mac was banished from the network. There was a very long cable run from my office to the HP-600. Although the RS-232 signals from the Mac were within specifications, the voltages were low and the HP interface did not meet them.

As it turned out, *all* there are no-null ASCII codes, so like a hundred monkeys banging on a hundred typewriters, eventually — frequently, actually — the noisy signal from my Mac would create an illegal command and shutdown the system.

Short story long, Morse Code is a true tertiary protocol — *dit, dah and space* — and would not have caused this problem.

I'm sure the computer industry will learn its lesson any day now and switch from ASCII to Morse Code . . .

— Dave Barnett

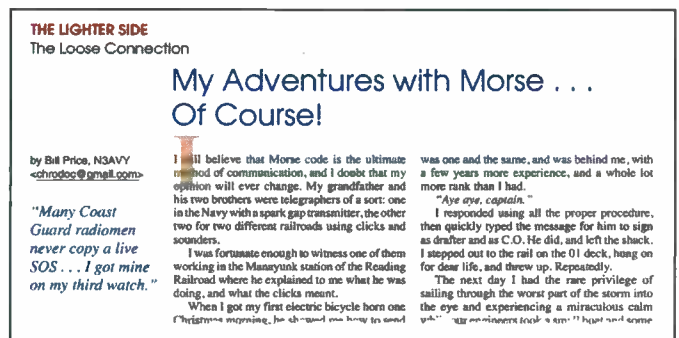


Photo C. Bill Price, N3AVY's, installment of *The Loose Connection* in January's *Pop'Comm* recalled his experience as a Morse operator. "Many Coast Guard radiomen *never* copy a live SOS . . . I got mine on my third watch," he wrote.

Most 'Low-Loss' Coaxial Cable is Anything But . . .

by Kirk Kleinschmidt,
NTØZ, KPCØZZZ
<kirk@cloudnet.com>

“How can classic 100-year-old feed line outperform even the best, most expensive modern coaxial cables? It's easy in a parallel universe”

A couple of my ham radio buddies were recently discussing the monster-size coaxial cables used by FM and TV broadcast stations, and they were marveling at the amazing low-loss properties of cables they'll never likely afford.

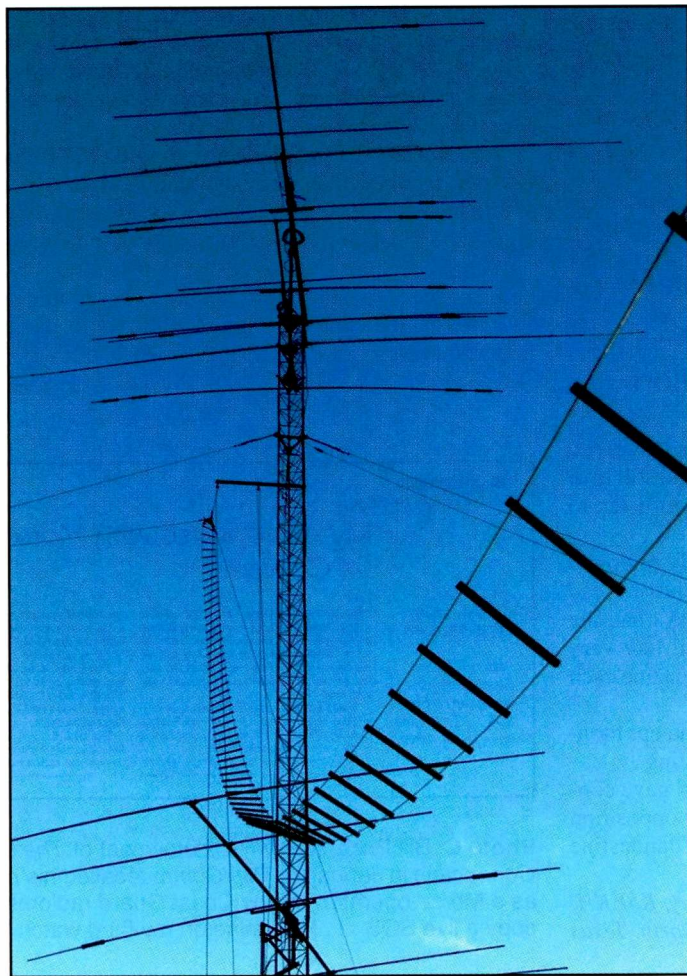
Three-inch to 9-inch hard line — perhaps nitrogen filled — sells for \$50 to \$500 per foot, and the connectors on each end are priced commensurately!

I found that out in the late '90s when I installed the first wireless Internet system in my hometown. I was lucky enough to score a free 75-foot piece of 2-inch hard line (50-ohm coax with a semi-rigid outer copper sheath) that had been freshly removed from a cell tower that had to be moved. The cable was free (saving many hun-

dreds of dollars) but the connectors were \$175 each, plus installation labor.

Heck, the tool to prep the cable ends cost nearly \$1,000 by itself! The donated cable got the job done, however, and was the only practical solution at the time. It fed our 100-mW, 2.4-GHz signal up the tower with minimal feed line loss.

If I still owned that lovely cable I wouldn't hesitate to use it to feed VHF/UHF antennas on a typical tower — low-loss cable is low-loss cable. But coaxial cable in general is a modern amateur radio convenience that doesn't always serve us well. In fact, it frequently lets us down, and many hams — beginners and veterans alike — don't really know when to use it, how to use it, and when to use something else entirely.



Parallel Universe: Looking Back

Even as technology marches on, some *antique* technologies can still dramatically outperform their present-day equivalents. Open-wire line, ladder line, and even TV twin-lead — all variations on the same theme — are just such technologies, **Photo A**.

How can classic 100-year-old feed line outperform even the best, most expensive modern coaxial cables? Well, it mostly comes down to the fact that modern hams, like modern people in general, are often victims of their own need for convenience. If it's new, sleek, shiny, easy to use, and easy on the pocketbook, it's gotta be good, right? *Well, not always! And not when it comes to coax.*

From the discovery of radio through the end of World War II, hams used balanced (two parallel wires) or single-wire feed lines. If you peruse any radio or antenna handbook from that era

Photo A. George Portell, Jr., W8QBG, of Mesa, Arizona, built this run of eight-inch spread ladder line from urethane-coated dowels and 10-gauge stranded wire. You won't find ladder line this big in any shop! W8QBG assembled 250 feet of the 800-ohm line to feed various antennas on one of his backyard towers. George, a ham since 1951, sits atop the DXCC Honor Roll, having worked every available DXCC entity. If ladder line is good enough for him, you might want to give it some serious consideration. See more at <<http://bit.ly/TSQtLF>>. (Courtesy of W8QBG)

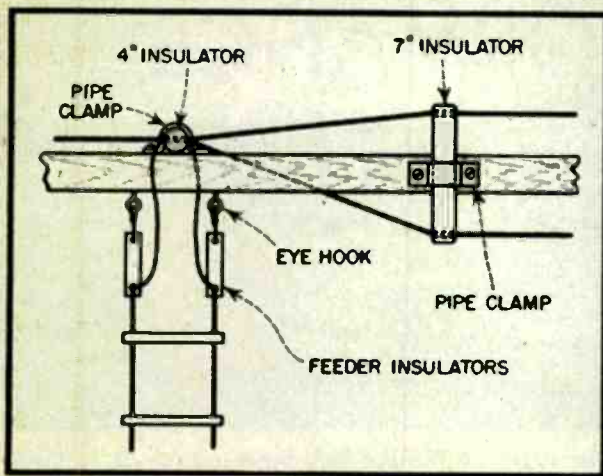


Fig. 3. Wiring detail explaining feeder support and connections

insulators which will support the open wire line or matching stub, if the latter is used. Mount a 7" insulator against the 2" side of the spreader in a

handle, the following method of measuring and cutting was used by the author. Fasten one end of the wire securely around a tree or post. Reel off about 32' and fasten that end to the bumper of a car. Push the car slowly until the wire is taut and then apply the brake. This method will allow accurate measuring and cutting of the four 30' and two 9' lengths. When cutting allow sufficient excess for tying to the antenna insulators.

After the wires are cut, attach each end of the 30' lengths to the eight remaining 7" insulators. Remove the enamel coating with sandpaper for a distance equal to the excess length allowed for insulator tying. Slip the ends of the wires through the holes in the insulators and wrap around the antenna wire at least five times and solder. Make sure a good soldered connection is obtained. Attach one end of each wire to a staple plate on each of the two end oak spreaders. Use #12

Photo B. Open wire feeders were featured in a March 1946 *CQ Amateur Radio* "how to" article by David F. Lewis, W2IYO, headlined "Constructing the 8JK Beam." (Courtesy of CQ)

you'll find dozens of illustrations depicting those early feed lines in all of their "non-coaxial" glory, **Photo B**.

Thanks to a flood of Uncle Sam's surplus electronics, including receivers, transmitters and miles of newfangled 50-ohm coaxial cable, things changed after World War II. With its unparalleled ease of installation (pun intended) and its shiny black jacket, coax quickly became the amateur radio standard. It was flexible, inexpensive, and easier to install compared to the open-wire lines it all but replaced. But in many ways — especially when it comes to SWR losses — coaxial cable was a major step backward. In fact, even to this day, for typical hams with single backyard HF antennas, coaxial cable can be a truly horrible "signal killer!"

Coax Can Kill My Signals?

Having grown up with coax, I was completely surprised when I learned that coax wasn't a great choice for many antenna applications, and that open-wire line, 450-ohm "ladder line," or even antiquated TV twin-lead can work a lot better in certain common applications.

Typical hams have only a fuzzy understanding of how coax works and when to use it. And technical jargon relating to impedance, velocity factors, and phase relationships only make that understanding fuzzier.

Coaxial cable is ubiquitous and readily available, and it usually gets our radio signals from rig to antenna, but it's often used improperly.

Feeding a single wire antenna on multiple bands, whether dipole, 'V,' or loop, with coaxial cable is probably the worst way to use it. Coax works best for matched antennas at low frequencies with relatively short cable runs.

For multiband wire antennas — especially those "tuned" by shack-mounted antenna tuners — coaxial cable can ruin your day.

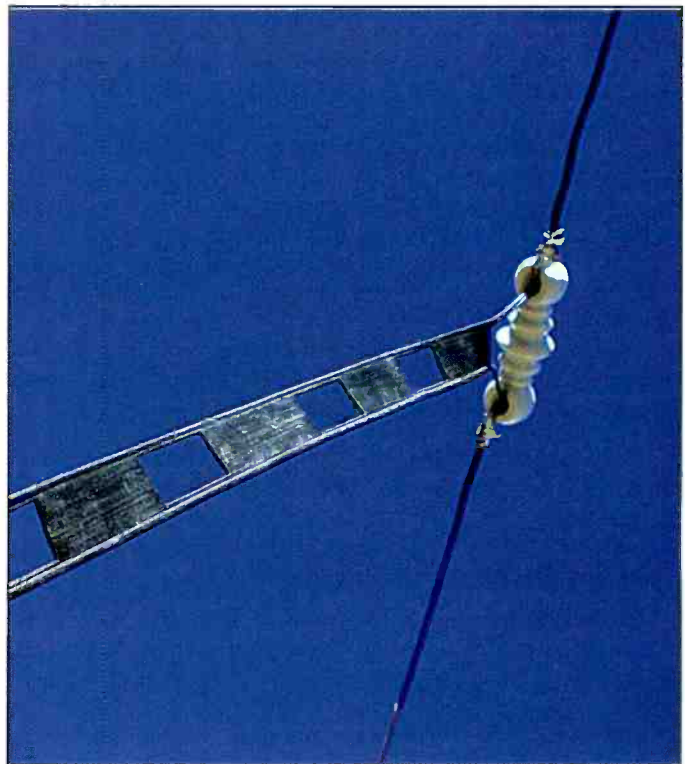


Photo C. One simple way to connect 450-ohm window line to your antenna's feed point is with an old ceramic "dog-bone" insulator with smooth, well-rounded corners. The feed wires on Roger Wendell, WB0JNR's, dipole go up and through the holes at each end of the center insulator to help relieve flexing stress, which can break soldered connections that aren't secured. (Courtesy of WB0JNR <<http://bit.ly/Vu940Q>>)

The popular multiband dipole, for example, is traditionally fed with a random length of 50-ohm coax through a shack-mounted antenna tuner. The thought is to put up a single antenna and let the tuner worry about matching it on various bands. Even on bands where the system's SWR losses are quite high, at least some RF energy will be radiated. This is mostly true, but the losses on some bands may turn your antenna into a real dummy load <<http://bit.ly/YCiW9W>>.

For example, a standard 40-meter dipole (about 66 feet overall) fed with 75 feet of average-quality coaxial cable will tune up on all bands, 40 through 10 meters. Tuning on some bands might be a bit critical, but you can make contacts and even work some DX. *So far, so good.*

According to the manufacturer, our beefy coaxial cable (RG-8 type) has 1.5 dB of loss per 100 feet at 100 MHz (loss increases with cable length and frequency), so our losses with a mere 75 feet should be minimal, right?

Not necessarily. And here's the fly in the ointment:

Published loss figures are for matched, resonant antennas only. With high feed line SWR conditions, a lot of power (or most of the power) can be lost between your antenna tuner and your antenna. *How can that be?*

The low SWR produced by the antenna tuner really only exists on the cable that runs between your rig and your antenna tuner. The cable that runs between your tuner and your antenna almost certainly has a much higher SWR, and much higher resulting losses.

In coaxial cables, no matter how good the quality, losses increase with frequency and SWR, with a 3-dB loss representing a whopping 50 percent reduction in transmitted signal strength.

As we "tune" our standard dipole on various frequencies with our shack-mounted antenna tuner:

- On 40 meters, our 66-foot dipole is a great match, and the antenna system wastes only about 0.2 dB. *Not bad!*
- On 15 meters, an odd harmonic of 40 meters, the match is also pretty good, sporting an acceptable 0.8-dB loss.
- On 80 meters, however, because of the high SWR on the coax between the tuner and the antenna, feed line losses approach 14 dB.
- And on 160 meters, losses total a staggering 27 dB! If we start with 100-watts output, we'll radiate about 3 watts on 80 meters and less than a half a watt on 160.

That's an easy way to turn 100 watts into milliwatts. When used in this "traditional way," coaxial cable really can kill your signals.

The Open-Wire Alternative

One way to reduce feed line losses with multiband, non-resonant antennas is to place the antenna tuner at the antenna feed point — an autocoil. This keeps feed line losses low on all bands.

Another option is to replace our coaxial cable with open-wire line, ladder line, or TV twin-lead — the latter is recommended only for low-power and/or portable operation.

These terms used to describe balanced feed lines — parallel wires separated by plastic "spreaders" or ladder-like insulating material — are interchangeable. The size of the wires, the distance that separates them and the specific insulating material determine the exact impedance of the feed line — and can impact its resistive and SWR losses to some extent.

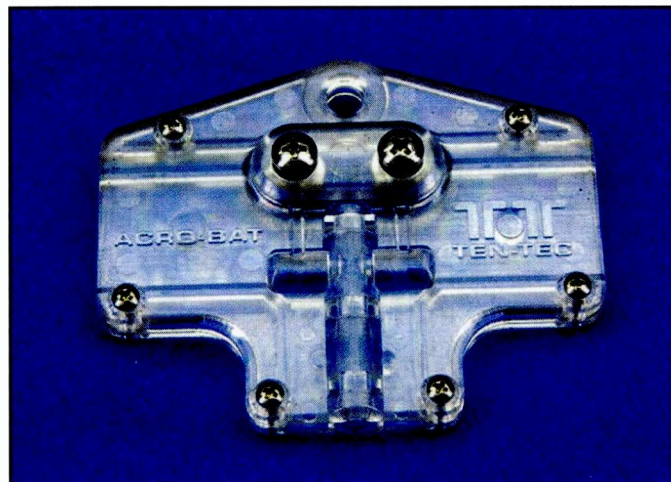


Photo D. The Ten-Tec Acro-Bat is a handy center insulator for dipoles fed with open-wire feeders.

(Courtesy of Universal Radio <<http://bit.ly/WsmqbK>>)

Open-wire line, ladder line, or window line has a typical conductor spacing of 2 to 4 inches and is rated at 450 to 600 ohms. TV twin-lead, with conductors spaced at one-half to three-quarters of an inch, is typically rated at 300 ohms. Two-conductor "lamp cord," used to wire table lamps, is often rated at 75 ohms or so. Because it has close-spaced conductors and continuous insulation (no air gaps like the other balanced lines), its losses are much higher and it should really only be used in communication emergencies.

When used with an antenna tuner to feed a multiband wire antenna, the exact impedance of a balanced feed line is really irrelevant. The benefit is the line's low SWR losses, and as long as we're using a wide-range antenna tuner, the exact impedance of the balanced line doesn't matter much.

Ladder line isn't as convenient as coaxial cable, but when used with an antenna tuner designed to handle it (most are, although some a much better than others), feed line losses for the 66-foot dipole described stay blissfully below 0.3 dB on all bands, 40 through 10 meters. On 80 and 160 meters — essentially unusable when fed with coax — losses total 1.5 and 8.5 dB, respectively. That's a spectacular improvement.

For a great multiband wire HF antenna, simply install the longest center-fed dipole (or horizontal loop) that's practical (make each dipole leg the same length) and feed it with enough ladder line to comfortably reach your station. With a decent antenna tuner (the beefier the better), you'll put out a nice signal on a variety of bands — something you can't do with a coax-fed antenna in a similar situation.

Ladder line has its own quirks and *gotchas*, but for many users the trade-offs are worth the performance boost.

Open-Wire Dos and Don'ts

When attaching balanced lines to masts, towers, houses, and structures, keep the feed lines at least several inches away from metal objects. If the lines get too close, electrical balance can degrade and losses can increase. Make or purchase stand-off insulators to keep feed lines spaced properly. I usually make mine from plexiglass or PVC tubing. Bringing the line into the house is a bit tricky, but where there's a will, there's a way.

Make sure your antenna tuner is sufficiently beefy. High feed line SWRs on balanced lines don't cause much loss, but they

can create very high RF voltages inside your tuner. Resulting arcs and sparks can damage expensive equipment.

Snow, ice, and rain can affect (unbalance) open-wire feed lines, so keep your feed lines free of the frozen wet stuff for best results, and be ready to readjust your antenna tuner settings if necessary.

Antenna tuners designed specifically for open-wire lines usually work better than their coax-oriented counterparts. The problem is usually the balun transformer that's required for conventional unbalanced tuners (coaxial cable is unbalanced) to handle balanced feed lines. Typical antenna tuners have voltage or current baluns at the tuner output. These are often wound on toroidal cores and are prone to saturating and arcing, even at relatively low power levels. Plus, tuner output baluns usually don't work well over a wide frequency range. They may work well on a band or two, but not in the "dc to daylight" service desired by most hams.

Because of their specialized designs, most balanced tuners put the balun transformer on the tuner input, where it performs better in every meaningful way. You can build a balanced tuner or you can purchase off-the-shelf models from MFJ Enterprises <<http://www.MFJEnterprises.com>>, Palstar <<http://palstar.com/>>, and others.

Making connections at the antenna feed point is straightforward and rather "coax-like," **Photo C**. Just make sure that the ladder line isn't left swaying in the breeze where it's soldered to the antenna elements or the connection will probably fatigue and break rather quickly. You can make a center insulator that minimizes "flex fatigue" or use one designed for ladder line such as Ten-Tec's Model 3003 Acro-Bat — for 450-ohm window line only <<http://bit.ly/Wsmqbk>>. **Photo D**.

Open-wire lines of any variety are often difficult to find locally. Several national vendors stock these feeders, so check online and in magazines for wire and cable suppliers. A top commercially made balanced line is available from <<http://www.trueladderline.com>>.

Other varieties, including 450-ohm "window" line and 300-ohm twin-lead (plus dedicated center insulators), are available from <<http://www.universal-radio.com>> and elsewhere.

Open-wire feed lines perfectly illustrate the adage "everything old is new again." If you can't (or don't want to) put an autocoiler at your antenna's feed point, ladder line is where it's at.

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This listing is designed to help you hear more shortwave broadcasting stations. The list covers a variety of stations, including international broadcasters beaming programs to North America, others to different 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 | 9455 | China National Radio | Mandarin | 0300 | 6165 | Zambia National Broadcasting | |
| 0000 | 14400 | "Firedrake jammer, China | | 0300 | 6015 | ZBC Radio, Zanzibar | |
| 0000 | 11780 | Radio Nacional Amazonia, Brazil | PP | 0300 | 6010 | Radio Mil, Mexico | SS |
| 0000 | 9490 | Radio Republica, (to Cuba) | | 0400 | 11620 | All India Radio | Urdu |
| 0000 | 13745 | Radio Thailand | | 0400 | 7250 | Channel Africa, South Africa | |
| 0000 | 7375 | Voice of Croatia | | 0400 | 9705 | La Voix du Sahel, Niger | AA |
| 0000 | 7475 | Voice of Greece | Greek | 0400 | 6010 | La Voz de Concencia, Colombia | SS |
| 0100 | 9870 | All India Radio | | 0400 | 5910 | Radio Alcaravan, Colombia | SS |
| 0100 | 9450 | Mighty KBC, Neth., via Bulgaria | | 0400 | 7255 | Radio Belarus | Belarus |
| 0100 | 7460 | Radio Aap ki Dunya, USA | Urdu | 0400 | 6165 | Radio Chad | FF |
| 0100 | 19000 | Radio Australia | | 0400 | 7120 | Radio Hargeisa, Somalia | Somali |
| 0100 | 5040 | Radio Havana Cuba | SS | 0400 | 11690 | Radio Okapi, Congo, via S. Africa | FF |
| 0100 | 6105 | Radio Panamerica, Bolivia | SS | 0400 | 11895 | Tartarstan Wave, Russia | RR |
| 0100 | 9640 | Voice of Vietnam | | 0400 | 7175 | Voice of Broad Masses, Eritrea | Tigrinya |
| 0100 | 5110 | WBCQ, Maine | | 0400 | 7385 | WHRI, Indiana | |
| 0200 | 11815 | Radio Brazil Central | PP | 0400 | 4960 | VOA. Sao Tome Relay | |
| 0200 | 4825 | Radio Cancao Nova, Brazil | PP | 0500 | 5865 | Radio Algerienne, Algeria | AA |
| 0200 | 4915 | Radio Difusora Macapa, Brazil | PP | 0500 | 6185 | Radio Educacion, Mexico | SS |
| 0200 | 9430 | Radio Farda, USA to Iran | Farsi | 0500 | 4950 | Radio Nacional Angola | PP |
| 0200 | 4747 | Radio Huanta 2000, Peru | SS | 0500 | 7220 | Radio Romania International | |
| 0200 | 15285 | Radio Pilipinas, Philippines | | 0500 | 9885 | VOA, Sao Tome Relay | |
| 0200 | 5025 | Radio Rebelde, Cuba | SS | 0600 | 4885 | Radio Clube do Para. Brazil | PP |
| 0200 | 9570 | Radio Tirana, Albania | CC | 0600 | 5995 | RTV Malienne, Mali | FF |
| 0200 | 4055 | Radio Verdad, Guatemala | SS/EE | 0600 | 7250 | Vatican Radio | various |
| 0200 | 7200 | Sudan Radio TV | | 0600 | 15120 | Voice of Nigeria | |
| 0200 | 11775 | University Network, Anguilla | | 0600 | 4895 | Radio Novo Tempo, Brazil | PP |
| 0200 | 4775 | Radio Tarma, Peru | SS | 0700 | 5970 | Radio Itatiatia, Brazil | PP |
| 0300 | 6140 | BBC, via South Africa | | 0900 | 4990 | Radio Apinte, Suriname | DD |
| 0300 | 4780 | Radio Djibouti | AA | 0900 | 4765 | Radio Rural, Brazil | PP |
| 0300 | 9855 | Radio Liberty, USA | Uzbek | 0900 | 6135 | Radio Santa Cruz, Bolivia | SS |
| 0300 | 5010 | Radio Madagasikara, Madagascar | Malagasy | 0900 | 4717 | Radio Yura, Bolivia | SS |
| 0300 | 7200 | Radio Omdurman, Sudan | AA | 0900 | 6060 | Super Radio Deus e Amor, Brazil | PP |
| 0300 | 9490 | Radio Republica, via F. Guiana | SS | 0900 | 4755 | The Cross, Micronesia | |
| 0300 | 7320 | Radio Rossii, Russia | RR | 0900 6050 | | HCJB Global, Ecuador | SS |
| 0300 | 4826 | Radio Sicuani, Peru | SS | 1000 | 3330 | Ondas del Huallaga, Peru | SS |
| 0300 | 13600 | Radio Sultanate of Oman | | 1000 | 5035 | Radio Aparecida, Brazil | PP |
| 0300 | 9530 | Trans World Radio, Swaziland | Amharic | 1000 | 6135 | Radio Fides, Bolivia | SS |
| 0300 | 7505 | WRNO, Louisiana | | 1000 | 5039 | Radio Libertad, Peru | SS |
| 0300 | 5050 | WWRB, Tennessee | | 1000 | 3310 | Radio Mosoj Chaski, Bolivia | SS |

| UTC | Freq. | Station/Country | Notes | UTC | Freq. | Station/Country | Notes |
|------|-------|-----------------------------------|----------|------|-------|-----------------------------------|----------|
| 1000 | 3380 | Radio Municipal, Brazil | PP | 1500 | 15760 | Kol Israel | Farsi |
| 1000 | 4700 | Radio San Miguel, Bolivia | SS | 1500 | 9575v | Radio Medi Un, Morocco | FF |
| 1000 | 4775 | Radio Tarma, Peru | SS | 1500 | 11620 | Radio Romania International | AA |
| 1000 | 6173 | Radio Tawantinsuyo, Peru | SS | 1500 | 15735 | Radio Romania International | Romanian |
| 1000 | 4940 | Voice of the Strait, China | CC | 1600 | 7390 | Denge Mesopotamia | Kurdish |
| 1100 | 2325 | ABC No. Territory Svc., Australia | | 1600 | 15345 | Radio Cairo, Egypt | |
| 1100 | 9280 | Family Radio, USA via Taiwan | | 1600 | 12105 | Radio Dialogue FM, to Zimbabwe | |
| 1100 | 4815 | Radio El Buen Pastor, Ecuador | SS | 1600 | 9705 | Radio Ethiopia | |
| 1100 | 4781 | Radio Oriental, Ecuador | SS | 1600 | 6050 | Radio Kuwait | AA |
| 1100 | 11520 | Radio Taiwan International | Tagalog | 1600 | 11600 | Radio Libye, Libya | AA |
| 1100 | 4790 | Radio Vision, Peru | SS | 1600 | 11725 | Radio Tirana, Albania | AA |
| 1100 | 9835 | Sarawak FM, Malaysia | Malay | 1700 | 12035 | Radio Farda, USA to Iran | Farsi |
| 1100 | 5020 | Solomon Is. Broadcasting Corp. | | 1800 | 15720 | Radio Japan, via Madagascar | |
| 1100 | 12085 | Voice of Mongolia | | 1800 | 15445 | Radio Japan, via Germany | JJ |
| 1200 | 6070 | CFRX, Canada | | 1900 | 15190 | Radio Africa, Equatorial Guinea | |
| 1200 | 9400 | Far East Broadcast, Philippines | unid | 1900 | 15340 | Radio Havana Cuba | FF |
| 1200 | 9430 | Far East Broadcast, Philippines | Mandarin | 2000 | 9445 | All India Radio | |
| 1200 | 9770 | KBS World Radio, South Korea | CC | 2000 | 11810 | BBC, Ascension Is. Relay | |
| 1200 | 9615 | KNLS, Alaska | | 2000 | 9410 | BBC, Seychelles Relay | |
| 1200 | 6130 | Lao National Radio | Laotian | 2000 | 11625 | Vatican Radio | |
| 1200 | 9580 | Radio Australia | | 2000 | 15580 | VOA Botswana Relay | |
| 1200 | 5995 | Radio Australia | | 2100 | 6885 | Galei Zahal, Israel | HH |
| 1200 | 5740 | Radio Marti, USA to Cuba | SS | 2100 | 9395 | Radio Algerienne, Algeria | AA |
| 1200 | 6055 | Radio Nikkei, Japan | JJ | 2100 | 7105 | Radio France International | FF |
| 1200 | 4750 | Radio Republik Indonesia | II | 2100 | 15476 | Radio Nac. Arcangel, Antarctica | SS |
| 1200 | 7310 | Radio Rossii, Russia | RR | 2100 | 6090 | Voice of Russia | PP |
| 1200 | 9720 | Radio Thailand | | 2200 | 9580 | Africa No. One, Gabon | FF |
| 1200 | 7110 | Thazin Radio, Myanmar | Burmese | 2200 | 7550 | All India Radio | |
| 1200 | 9455 | Voice of Russia | RR | 2200 | 9555 | BSKSA, Saudi Arabia | AA |
| 1200 | 9840 | Voice of Russia | RR | 2200 | 6090 | Caribbean Beacon, Anguilla | |
| 1200 | 5885 | Voice of Russia, via Tajikistan | | 2200 | 6160 | CKZN, Canada | |
| 1300 | 5875 | BBC, Thailand Relay | | 2200 | 6100 | Intl. Radio of Serbia, via Bosnia | |
| 1300 | 11670 | All India Radio | Dari | 2200 | 3955 | KBS World Radio, South Korea | |
| 1300 | 9610 | Deutsche Welle, via Singapore | Mandarin | 2200 | 7495 | Radio Algerienne, Algeria | AA |
| 1300 | 9680 | KNLS, Alaska | Mandarin | 2200 | 21740 | Radio Australia | |
| 1300 | 5940 | Radio Australia | | 2200 | 7580 | Radio Farda, USA to Iran | Farsi |
| 1300 | 9965 | Radio Australia, via Palau | | 2200 | 6180 | Radio Nacional Amazonia, Brazil | PP |
| 1300 | 9360 | Radio Liberty, USA, via Saipan | RR | 2200 | 15345 | Radio Nacional, Argentina | SS |
| 1300 | 9595 | Radio Nikkei, Japan | JJ | 2200 | 11605 | Radio Taiwan International | JJ |
| 1300 | 7460 | Radio Thailand | Thai | 2200 | 7345 | Radio Tunisienne, Tunisia | AA |
| 1300 | 15630 | Voice of Greece | Greek | 2200 | 7450 | Radiofonikos Makedonias, Greece | Greek |
| 1300 | 9525v | Voice of Indonesia | | 2200 | 11860 | VOA, Philippines Relay | |
| 1300 | 5950 | Rado New Zealand International | | 2200 | 7255 | Voice of Nigeria | |
| 1300 | 15105 | Bangladesh Betar | | 2230 | 7290 | Radio PMR, Moldova | |
| 1400 | 17615 | BSKSA, Saudi Arabia | AA | 2300 | 4319u | Armed Forces Net., Diego Garcia | |
| 1400 | 9420 | China National Radio | KK | 2300 | 9795 | Far East Broadcast, Philippines | |
| 1400 | 9635 | Intl. Radio of Serbia | | 2300 | 7290 | IRRS, via Romania | |
| 1400 | 15760 | Kol Isreal | Farsi | 2300 | 8989 | Pescador Preacher, Nicaragua | SS |
| 1400 | 11660 | Radio Australia | | 2300 | 9855 | Radio Australia, via UAE | |
| 1400 | 11850 | Radio Liberty, USA, via Germany | RR | 2300 | 7520 | Radio Farda, USA, via Sri Lanka | Farsi |
| 1400 | 15560 | Radio Sultanate of Oman | | 2300 | 5960 | Voice of Turkey | |
| 1400 | 9975 | Trans World Radio, Guam | Mandarin | 2300 | 9665 | Voz Missionaria, Brazil | PP |
| 1400 | 11605 | Radio Free Asia, USA, via Taiwan | VV | 2300 | 5950 | Voice of Turkey | |
| 1500 | 11955 | Adventist World Radio, Austria | Turkish | 2300 | 4955 | Radio Cultural Amauta, Peru | SS |
| 1500 | 15255 | AWR, via Sri Lanka | | | | | |
| 1500 | 15505 | Bangladesh Betar | | | | | |
| 1500 | 9345 | Far East Broadcast, Philippines | Mandarin | | | | |

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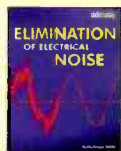


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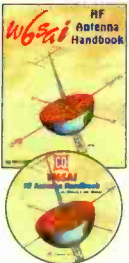
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Kenwood's New Flagship TS-990 Released

Introduced during the 2012 Dayton Hamvention®, Kenwood's newest flagship transceiver, the TS-990, has been approved by the FCC and is set to hit dealerships by the time you read this.

Kenwood has stuffed the TS-990 with dual receivers to enable simultaneous reception of two different bands. The main receiver employs full down conversion and features a new mixer and narrow-band roofing filters. Kenwood said that it results in a third-order intercept point of +40 dBm.

In addition, Kenwood has added triple, 32-bit floating point DSPs and an original IF AGC circuit featuring DSP technology.

Also aiding reception are an adjustable-passband IF filters, simple IF filter switching (A/B/C), IF notch, band elimination, digital and analog noise blankers (NB1/NB2) to reduce pulse noise and noise reduction.

On the transmit side, Kenwood used a push-pull circuit utilizing VRF 150MP 50-volt MOSFETs to deliver a stable output of 200 watts on all bands. The TS-990 covers 160 to 6 meters.

An internal automatic antenna tuner is preset and Kenwood said that it is capable of tuning even during reception.

Externally the TS-990 features the world's first dual TFT displays. The main display is 7 inches and provides basic information on frequencies and modes as well as meters and the on/off status of key functions. There are a variety of display modes to choose from including a waterfall display.

The smaller, 3.5-inch TFT sub display is located above the main tuning knob and is capable of showing the frequency and demodulated signal audio spectrum.

Operating the TS-990 will be easy, according to Kenwood. The new frequency function that previously switched between VFO A and VFO B is now used to switch between main and sub bands. The sub receiver RX key located above the main dial is used to switch the sub receiver on/off, while the TX key enables switching between simplex and split operation. LEDs show the operator what the current operating mode.

The TS-990 features 120 memory channels and with dual-channel memory, the operator can access memory while receiving two frequencies simultaneously.

Remote PC operation is controlled with ARCP-990 radio control program. It is available for free and can be downloaded at Kenwood's website <<http://www.kenwoodusa.com>>.

The rear panel offers a variety of I/O options including analog audio, USB audio, and digital optical interfaces. The front panel features two USB ports and firmware updates can be made via a flash drive or through a USB cable.

Optional equipment for the TS-990 includes an external speaker which has built-in filters, two inputs, a mute function, and weighs 2.8 kgs.



Photo A. Kenwood's newest flagship transceiver, the TS-990 features the world's first dual TFT displays, which show off a wealth of information including the ever-popular analog S-meter. (Courtesy of Kenwood USA)

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FOI: Who Will Silence the Next Shortwave Broadcaster? Follow the Money . . .

On the Same Day: Syria Blocks the Internet While Canada Quits Shortwave

COMMENTARY

By Thomas Witherspoon

“Shortwave radio is, in a very real sense, an arm of the foreign press and diplomacy, one that still reaches out to the citizens of oppressed countries.”

Late in 2012 I found the coincidence a bit much to take:

On one hand, there was Syria, a highly volatile country struggling for stability. On the other, there was . . . Canada? Each, on December 1, performing media shut downs.

No doubt, most every Syrian with Internet access knew their access had been shut down, while very few Canadians at the time knew their international radio voice had been silenced. In both cases, the government was mostly to blame — though in Canada the Canadian Broadcasting Corporation (CBC) was left holding the knife.

In both cases, we have a travesty against Freedom of Information — FOI.

The Venerable, Vulnerable Internet

I’ve mentioned numerous times how vulnerable the Internet is to simply being shut off.

In most cases, this happens because those in power are attempting to control free speech and communications.

Unfortunately, it’s not an infrequent occurrence. If anything, it’s trending. In a story on National Public Radio broadcast December 1, <http://n.pr/YGxZPZ> **Photo A**, Andrew McLaughlin, former White House adviser on technology policy, said:

“The pattern seems to be that governments that fear mass movements on the street have realized that they might want to be able to shut off all Internet communications in the country, and have started building the infrastructure that enables them to do that.”

Not good. And as unethical as it sounds for Syria (or Egypt or Libya or the Maldives or China or Burma) to have shut down the Internet, the UN’s World Conference on International Telecommunications (WCIT-12) in December 2012 deemed actions such as Syria’s blackout a

Shutdowns Counter The Idea Of A World-Wide Web
 by TOM GJELTEN
 December 01 2012 3:32 AM

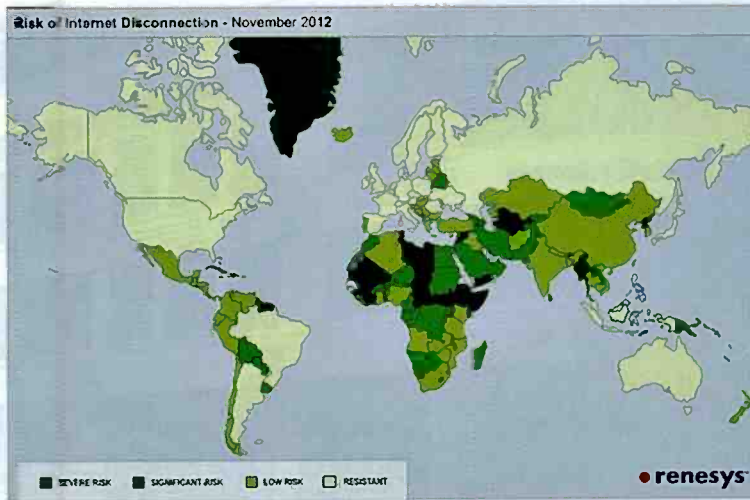
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Night falls on a Syrian rebel-controlled area on Thursday, the same day an Internet blackout struck the country. The cause is still unclear, but many claim the Syrian government was responsible.

Photo A. A National Public Radio story quoted former White House Adviser on Technology Policy Andrew McLaughlin that, “the pattern seems to be that governments that fear mass movements on the street have realized that they might want to be able to shut off all Internet communications in the country, and have started building the infrastructure that enables them to do that.”
*(Internet screen grab *

from the telecoms regulator. ... Here's a map of the world, with countries colored according to the Internet diversity at the international frontier. We did a census, from our own view of the global Internet routing table, of all the domestic providers each country who have direct connections (visible in routing) to foreign providers.



As a first cut at a diversity metric, this makes a lot of sense; it's easy to compute, and fairly objective (an ISP either has a foreign transit provider visible in the routing tables, or it doesn't). You can think of this, to first approximation, as the number of phone calls (or legal writs, or infrastructure attacks) that would have to be

legally supported scheme for every country in the world.

So what countries are technically vulnerable to this sort of shut down? It depends to a great extent on the diversity of a state's communications infrastructure, and the number of its service providers that are connected to the rest of the world.

Syria, sadly, is among the most vulnerable. James Cowie, at the Web monitoring firm Renesys was recently quoted in the *Washington Post* describing just how easy this shutdown process is:

"Make a few phone calls, or turn off power in a couple of central facilities, and you've (legally) disconnected the domestic Internet from the global Internet,"
Photo B.

Information of Last Resort

Radio Canada International's Sackville transmission site went off the air December 1, **Photos C and D.** In January 2011, Egypt, too, shut down its Internet service. Radio Netherlands Worldwide (RNW) responded by adding shortwave broadcasts targeting Egypt. Since then, RNW has been silenced.

I would like to think that if RNW, with its once-powerful human rights and free

Photo B. This Renesys map shows vulnerable Internet networks by country. Note that most of the countries with low risk are those who have — or had — a strong international broadcasting presence on shortwave. Threat levels range from dark green (severe risk) to lighter green (significant risk) and pale green (low risk). The lightest areas are designated "resistant."
(Internet screen grab <<http://bit.ly/XLVwYN>>)



Photo C. Radio Canada International's Sackville transmission site in New Brunswick went off the air December 1.
(Courtesy of Rootwoplusone via Wikimedia Commons)



Photo D. In 2010 CBC Radio agreed to sell its building on the corner of Sackville and South Park streets, in Halifax, Nova Scotia, Canada to developers — whose plan was to demolish it in favor of condominiums. Radio operations were moved to an expanded CBC Television building on Bell Road. (Courtesy of Halifax, Nova Scotia, Canada via Wikimedia Commons)

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Photo E. "Satellite TV, like the Internet, is much easier to jam or block," writes Thomas Witherspoon. "Shortwave radio is the only broadcast medium that streams at the speed of light across borders with no regard for those in power." (Courtesy of David R. Tribble via Wikimedia Commons)

press missions, were still around the organization would have leapt to the aid of the Syrians. *Alas, where are they now?*

True, shortwave radio is not a comprehensive replacement for the Internet any more than it is for mobile phone service. It lacks the peer-to-peer connectivity of either medium. But it is interactive and accessible.

Indeed, recent history proves that, when all other communications systems are shut down, information still leaks from a country via various means. This very information is often broadcast by international voices over every medium, including shortwave radio. So there exists an intimate interaction between those living under a repressive regime and the foreign press that is impossible to deny. Shortwave radio is, in a very real sense, an arm of the foreign press and diplomacy, one that still reaches out to the citizens of oppressed countries.

What About Satellite?

To be fair, did Egyptians seek out shortwave radio when their country's Internet went down? Not all, but quite a number did. In truth, satellite TV is king in many growing countries, and the

information found on satellite was still flowing freely. Therefore, many turned to satellite, **Photo E.**

So is shortwave radio still needed? *Of course.* Satellite TV, like the Internet, is much easier to jam or block. Shortwave radio is the only broadcast medium that streams at the speed of light across borders with no regard for those in power, that requires no subscription or expensive equipment, and is 100 percent untraceable — provided you listen through headphones.

Lessons Learned

I'd like to think that even the UN or similar state networks would consider pooling funds to keep shortwave radio broadcasters on the air to protect this valuable resource. Still, it's those countries with the wealth, the stability, and the democracy that feels shortwave is so dispensable. When budgets are being cut, governments view their foreign broadcast service as a quick chop. They don't realize that an international radio voice is actually the most reliable, most cost-effective arm of foreign diplomacy — especially in areas of the world where information does not flow freely. In such regions, they have a captive audience at pennies a head.

So, what will be next country to shut down its Internet services and leave its citizens in the dark? Follow the headlines. And who will silence the next shortwave broadcaster? Follow the money.

Thomas Witherspoon, K4SWL, a veteran shortwave listener and writer, hosts the website "The SWLing Post" <<http://swling.com/blog>>. He lives in Swannanoa, North Carolina.

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MONITOR OF THE MONTH

Listening, Around the World

WPC4FJT, Knoxville, Tennessee

I QSL'd Radio Havana . . . and Was Hooked!

James Trame, WPC4FJT, Photo A, fell prey to the short waves almost 50 years ago when he happened to hear his neighbors' "huge German radio." As you can see, he's put together a beautiful listening post of equipment — both vintage and new — and has in recent years taken the plunge into amateur radio as W4FJT. Today he has the parallel Pop'Comm Monitoring Station identification sign WPC4FJT.

Like WPC4FJT, you, too, can be featured as a Pop'Comm Monitor of the Month. Please send us a photograph of your listening post and tell us about your monitoring experience. We'd be happy to include you in our pages. Write to Pop'Comm Monitor of the Month at: <PopCommMonitor@gmail.com>.

— Richard Fisher, KPC6PC

By James Trame,
WPC4FJT

In 1966 we had a neighbor with a huge German radio, a Saba I think, that I first listened to short-wave broadcasts. I QSL'd Radio Havana and I was hooked. I still have my old QSL cards.

Originally I was SWL monitoring station WDX4JT and started SWLing 47 years ago on a Lafayette HA63A. I still have it up and running in tip-top shape. (*IN DEPTH: For details about the HA-63A, visit <<http://bit.ly/VnNNAP>>.* — KPC6PC.)

My layout today, Photo B, features a Realistic 2020 scanner monitoring the local repeaters,



“Originally I was SWL monitoring station WDX4JT and started SWLing 47 years ago on a Lafayette HA-63A”

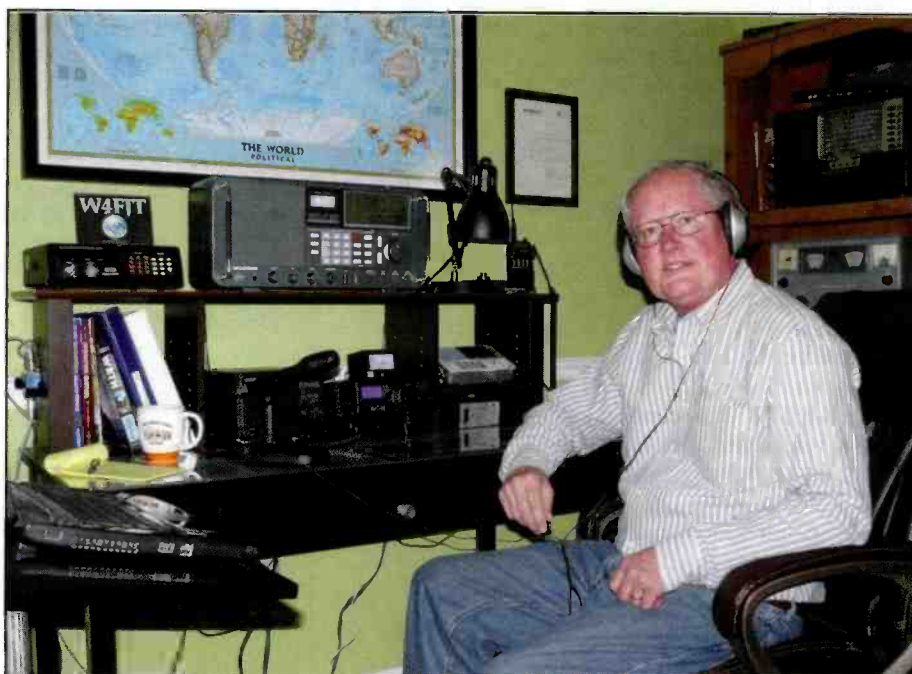


Photo A. James Trame, WPC4FJT/W4FJT, combines SWLing and amateur radio at his coolly efficient operating position in Knoxville, Tennessee. (Photography courtesy of WPC4FJT)



Photo B. Pop'Comm Monitoring Station WPC4FJT has a number of portals to the short waves. For details on the equipment at his listening post, see his story.

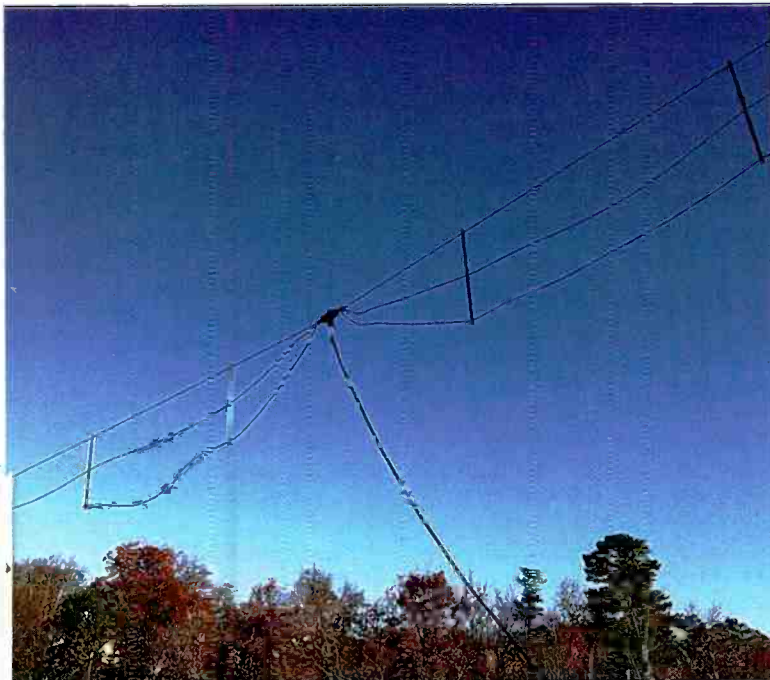


Photo C. This 20-10-6 meter homebrew parallel dipole is used for amateur radio and shortwave listening at WPC4FJT.

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Published: September 4, 2007 5:01 a.m.

'Mr. WOWO' Bob Sievers dies

Colleagues recall way he cared for others

Megan Hubartt | The Journal Gazette

Legendary morning radio personality Bob Sievers, known as "Mr. WOWO," died Monday.

Sievers, 90, retired from his morning show on WOWO 1190 AM radio in 1987 after more than 50 years at the station.

During his five decades with WOWO, he earned the title of "Mr. WOWO" as host of the regular morning show



Sievers

Photo D. WPC4FJT's monitoring Station ID and amateur radio callsign are "the Southeast version of W9FJT that belonged to Bob Sievers, famous WOWO morning DJ." (Internet screen grab <<http://bit.ly/X8jspf>>.

Low-Band DXing By the Light of the Full, Silvery Moon

By Carl Luetzelschwab,
K9LA

“What we really need to look at is how much radiation at ionizing wavelengths is reflected off the Moon.”

The November 2001 issue of *CQ* included an interesting article titled “80 Meter DX — The Moon Effect” by Donald Anderson, W7DD, **Photo A**. In his opening paragraph he wrote:

Many years ago I noticed a phenomenon on the 80-meter band when working DX. It seemed that one night each month the band would be incredibly good.

EDITORS NOTE: Filling in this month for Tomas Hood, NW7US/WPC7USA is award-winning propagation expert Carl Luetzelschwab, K9LA, Propagation columnist for WorldRadio Online magazine. This piece appeared in the September 2012 edition of *WRO*. — **KPC6PC**



MYSTERY: “. . . We still don’t know why the Moon — specifically, the Full Moon — would cause enhanced low-band propagation,” writes *WRO Propagation* columnist Carl Luetzelschwab, K9LA, but it’s certainly fun to think about. (Courtesy of NASA)

From Arizona I would work 30 to 50 Europeans in one evening. A few days before and after that day would also be above average. As this time period passed, the following weeks would be back to the normal poor band conditions I had learned to expect.

W7DD Figures A and B in his article certainly suggest a correlation between his DX QSOs to Europe and the Full Moon. I should mention that this is not the first observation of a possible correlation between the Moon and propagation.

For example, the earliest observation I’m aware of was in the 1930s by American astronomer and physicist Harlan Stetson. And more relevant to our amateur radio operations, Stew Perry, W1BB, a 160-meter pioneer, felt that 160-meter propagation was influenced by the phase of the Moon.

So let’s review the many hypotheses for enhanced low-band propagation and the phase of the Moon. Be advised that no definite conclusion will be forthcoming. In other words, we still don’t know why the Moon — specifically, the Full Moon — would cause enhanced low-band propagation. So, listen up!

Hypothesis 1:

Sunlight Reflects Off the Moon and Causes More Ionization

This is the hypothesis offered by W7DD in *CQ*. There are two problems here. The first is that we have to be very careful when we say *sunlight*.

Visible light has nothing to do with ionization, so all that moonlight is irrelevant to our radio endeavors. What we really need to look at is how much radiation at *ionizing wavelengths* is reflected off the Moon.

K9LA Figure C is a plot of the Moon’s reflectivity — *albedo* — at various wavelengths (from G. R. Gladstone, et al, *EUVE Photometric Observations of the Moon*, *Geophysical Research Letters*, Vol. 21, No. 6, pages 461-464, March 15, 1994). Also indicated on the plot are the wavelengths that ionize the F₂ region, the E region and the D region, and the wavelengths of visible light.

The data says that reflected radiation at wavelengths that ionize the F₂ region is but 0.06 to 8 percent of the incident radiation. This amount of

reflected radiation is not enough to affect the nighttime F₂ region ionization.

We can confirm this by looking at nighttime ionosonde data. **K9LA Figure D** plots a month's worth of foF₂ data (the ordinary wave F₂ region critical frequency) from the Narrssassuaq (Greenland) ionosonde centered on the January 21, 2000 Full Moon date. The year 2000 timeframe for which W7DD presented data in his article.

This ionosonde is on the Arizona to Europe path. The red line is the 24-hour moving average. Although foF₂ appears to be a bit higher for several days prior to the Full Moon, it's down a bit on the day

of the Full Moon and on the day before and after. **K9LA Figure E**.

Plots of other months do not show this anomaly, so I think we are just seeing the day-to-day variation of the ionosphere. Anyway, I don't believe *more* ionization is what is needed for enhanced low-band propagation. (**CLIFFHANGER 1: More on this in the last paragraph of this section.** — K9LA)

Also note from **K9LA Figure C** that the albedo for radiation at wavelengths that ionize the E and D regions is less than .01 percent — that's 0.0001 of the incident radiation; so low that I didn't plot it.

I see no need to discuss the E and D

regions in terms of reflected radiation. Thus it doesn't appear that any ionizing radiation reflecting off the Moon has anything to do with the enhanced low-band propagation.

The second problem with the hypothesis in the **CQ** article is that the low bands are generally dependent on absorption, which is tied to *more* ionization. Thus the assumption that the Full Moon enhances low-band propagation by *increasing* ionization is highly suspect. It makes more sense that *less* ionization enhances low-band propagation.

Hypothesis 2:

Lunar Tides

There, indeed, are lunar tides of gravitational origin — as there are solar tides of thermal origin. But the consensus of physicists is that the effect on the E region is extremely small — on the order of a couple kilometers variation in the height of the maximum E region electron density. And any *major* change in the F₂ region due to lunar tides would be expected to show up in ionosonde data — which it doesn't.

Hypothesis 3:

Geomagnetic Field Activity

With the solar rotation period being so close to the lunar orbital period, one has to wonder if the enhanced low-band propagation is simply due to recurrent quiet geomagnetic field conditions. One way to assess this is to look at the planetary A index (A_p) for one year to see if quiet conditions fall around Full Moon dates. This data is presented in **K9LA Figure E** for the year 2000.

The first half of the year suggests that Full Moon periods were quiet in terms of geomagnetic field activity. But the last half of the year suggests the opposite — several Full Moon periods had relatively

Is it possible that the light of a full moon can enhance DX on 80 meters? Before you laugh, go check your logs and see if they match up with what W7DD discovered.

80 Meter DX—The Moon Effect

BY DONALD L. ANDERSON,* W7DD

Many years ago I noticed a phenomenon on the 80 meter band when working DX. It seemed that one night each month the band would be incredibly good. From Arizona I would work 30 to 50 Europeans in one evening. A few days before and after that day would also be above average. As this time period passed, the following weeks would be back to the normal poor band conditions I had learned to expect.

I wondered for years why this was happening. It was not tied to any propagation indicator I knew of. Well, it happened again on December 11, 2000, and as usual, I wondered why. I went to bed, and at about 2 AM I awoke to find an amazing amount of light in the bedroom. I jumped up and looked out the window and was met by a giant, very bright moon. It was a full moon. I thought to myself, "I could easily walk through the desert without hitting a bush or a cactus with this light."

While thinking about the sight I had just witnessed, I began to wonder if it could have had any bearing on the wonderful evening of DX I had just finished two hours earlier. I quickly went into the ham shack and checked my logs going back several years and then got on the internet and checked the moon phases. Wow . . . They matched the full moon dates perfectly! I decided to double check this by looking at the "DX Summit" archives. I checked spots put out on me on "DX Summit" for the year 2000 from Europe using the short path. This also matched the full moon dates.

Now that I had the timing matching perfectly, I wondered why this was happening. Could this be moonbounce? No, I thought, that couldn't be, because the signals were coming from the correct direction. I have 12 Beverage receiving antennas and find directions to

*4325 W. Ironwood Hill Dr., Tucson, AZ 85745
e-mail: <w7dd@arrl.net>



Globe aligned and centered showing Europe to Arizona enhancement area. View as if seen from a full moon in winter.

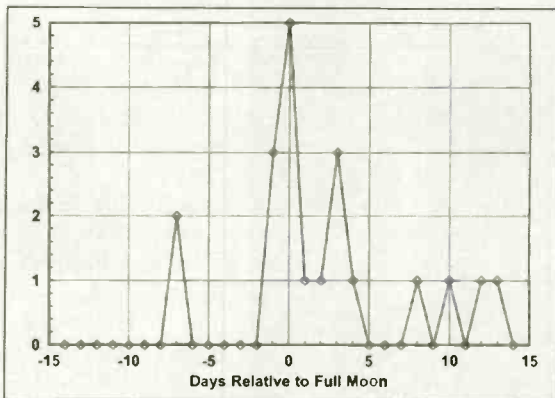


Fig. 1—DX spots from "DX Summit" archives for the year 2000. Short-path spots for W7DD posted by Europe.

Full Moon Calendar, 2013

| | |
|--------------|-----------------|
| January 26 | Wolf Moon |
| February 25 | Snow Moon |
| March 27 | Worm Moon |
| April 25 | Pink Moon |
| May 25 | Flower Moon |
| June 23 | Strawberry Moon |
| July 22 | Thunder Moon |
| August 20 | Sturgeon Moon |
| September 19 | Harvest Moon |
| October 18 | Hunter's Moon |
| November 17 | Beaver Moon |
| December 17 | Cold Moon |

(From multiple sources)

Photo A. Donald Anderson, W7DD's, November 2001 **CQ** article *80 Meter DX — The Moon Effect* was the catalyst for **WRO's** Carl Luetzelschwab, K9LA, to examine theories on this mysterious phenomenon. (From **CQ** magazine archives)

high geomagnetic field activity. For what it's worth, there is an interesting — but quite old — technical paper (H. L. Stolov, et al, *Variations of Geomagnetic Activity With Lunar Phase*, Goddard Institute for Space Studies, 1964) that concluded that there's a broad decrease (about 4 percent) in geomagnetic activity for seven days preceding a Full Moon.

This does bring up an interesting question — do *all* Full Moon periods result in enhanced low-band propagation?

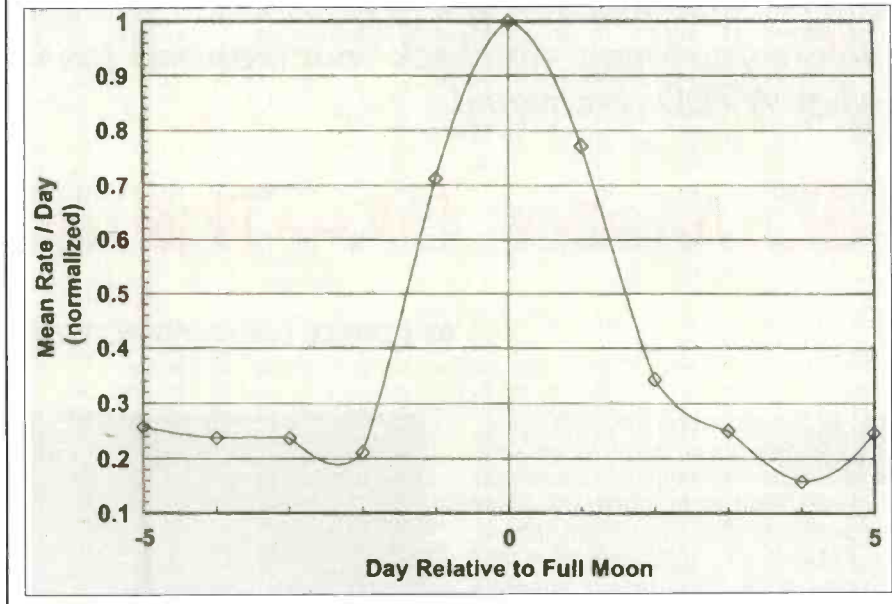
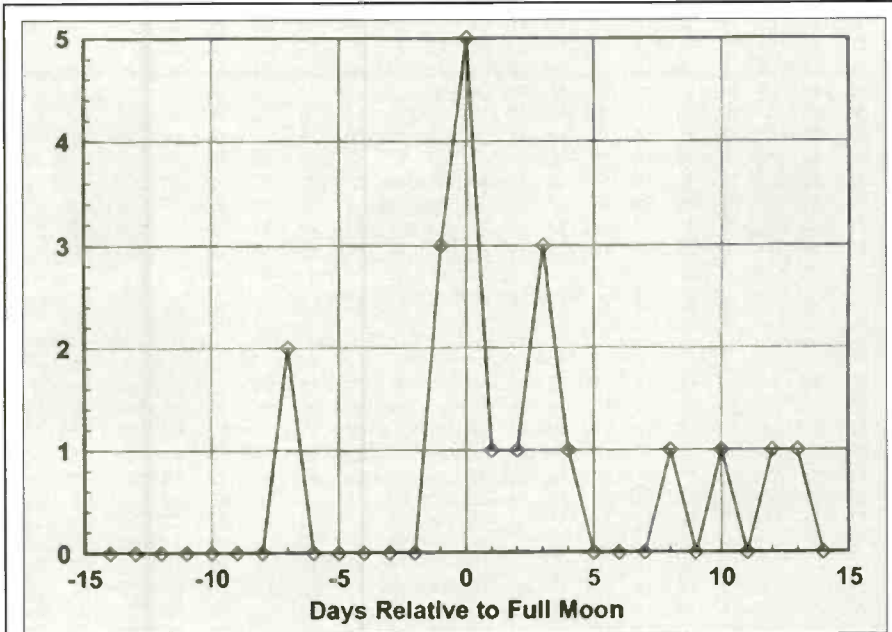
(*CLIFFHANGER 2: I'll add a comment on this at the end of this column. — K9LA*)

Hypothesis 4:

Reflection Off the Moon

Could the enhanced low-band propagation not be of ionospheric origin? In other words, could the Full Moon be in the correct position for signals to reflect off the Moon?

There would have to be a *hole* in the



W7DD Figures A and B. In W7DD's November 2001 article, **Figure A**, top, showed "DX spots from *DX Summit* archives for the year 2000 — short path spots for Tuscon, Arizona posted by Europe." Meanwhile, **Figure B**, bottom, is a correlation chart "showing the QSO rate based on Full Moon days. The data spans one year and shows QSOs with Europe from Arizona on short path. (From *CQ* magazine archives)



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Optimum Working Frequencies (MHz) - For April 2013 - Flux = 136, Created by NW7US

| UTC TO/FROM US WEST COAST | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| CARIBBEAN | 27 | 27 | 26 | 25 | 22 | 20 | 19 | 17 | 16 | 15 | 14 | 13 | 13 | 16 | 19 | 21 | 23 | 24 | 25 | 26 | 27 | 27 | 28 | 28 |
| NORTHERN SOUTH AMERICA | 35 | 34 | 34 | 31 | 28 | 26 | 24 | 22 | 20 | 19 | 18 | 17 | 17 | 19 | 23 | 26 | 28 | 30 | 31 | 32 | 33 | 34 | 35 | 35 |
| CENTRAL SOUTH AMERICA | 35 | 32 | 29 | 26 | 24 | 22 | 21 | 20 | 18 | 18 | 17 | 19 | 18 | 21 | 26 | 29 | 31 | 33 | 35 | 36 | 36 | 36 | 36 | 36 |
| SOUTHERN SOUTH AMERICA | 33 | 30 | 26 | 24 | 22 | 21 | 20 | 18 | 18 | 17 | 16 | 16 | 17 | 18 | 21 | 25 | 28 | 31 | 32 | 34 | 35 | 36 | 37 | 35 |
| WESTERN EUROPE | 18 | 15 | 12 | 11 | 15 | 18 | 13 | 12 | 11 | 11 | 13 | 18 | 20 | 21 | 22 | 23 | 23 | 23 | 23 | 22 | 22 | 21 | 20 | 19 |
| EASTERN EUROPE | 11 | 11 | 11 | 10 | 15 | 18 | 18 | 16 | 12 | 11 | 15 | 18 | 19 | 20 | 21 | 22 | 22 | 21 | 21 | 20 | 18 | 17 | 12 | 12 |
| EASTERN NORTH AMERICA | 31 | 30 | 29 | 27 | 24 | 22 | 20 | 19 | 17 | 16 | 15 | 15 | 17 | 22 | 25 | 27 | 29 | 30 | 31 | 31 | 32 | 32 | 32 | 31 |
| CENTRAL NORTH AMERICA | 17 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 9 | 8 | 8 | 10 | 13 | 14 | 15 | 16 | 17 | 17 | 17 | 18 | 18 | 17 |
| WESTERN NORTH AMERICA | 9 | 9 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 6 | 7 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 |
| SOUTHERN NORTH AMERICA | 29 | 28 | 28 | 27 | 25 | 23 | 21 | 19 | 18 | 16 | 15 | 14 | 14 | 15 | 19 | 22 | 24 | 25 | 27 | 28 | 28 | 29 | 29 | 29 |
| HAWAII | 24 | 24 | 24 | 24 | 24 | 23 | 22 | 20 | 19 | 17 | 16 | 14 | 14 | 13 | 12 | 12 | 14 | 16 | 18 | 20 | 21 | 22 | 23 | 24 |
| NORTHERN AFRICA | 16 | 15 | 14 | 13 | 13 | 12 | 13 | 12 | 12 | 11 | 11 | 17 | 20 | 21 | 22 | 23 | 24 | 24 | 25 | 24 | 23 | 21 | 19 | 18 |
| CENTRAL AFRICA | 20 | 18 | 17 | 16 | 15 | 16 | 13 | 12 | 11 | 11 | 12 | 18 | 20 | 21 | 22 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 23 | 21 |
| SOUTH AFRICA | 22 | 20 | 19 | 18 | 17 | 17 | 18 | 16 | 15 | 15 | 14 | 14 | 20 | 24 | 26 | 28 | 29 | 30 | 30 | 30 | 31 | 28 | 26 | 24 |
| MIDDLE EAST | 13 | 12 | 12 | 13 | 18 | 19 | 17 | 14 | 12 | 11 | 15 | 18 | 19 | 21 | 22 | 22 | 23 | 23 | 22 | 20 | 18 | 16 | 15 | 14 |
| JAPAN | 25 | 25 | 25 | 24 | 24 | 23 | 21 | 19 | 15 | 14 | 13 | 13 | 12 | 12 | 11 | 14 | 13 | 12 | 12 | 16 | 19 | 21 | 23 | 24 |
| CENTRAL ASIA | 25 | 25 | 25 | 24 | 24 | 23 | 21 | 19 | 15 | 14 | 13 | 13 | 12 | 11 | 11 | 18 | 20 | 18 | 17 | 16 | 15 | 16 | 21 | 24 |
| INDIA | 20 | 20 | 20 | 20 | 21 | 20 | 19 | 18 | 16 | 12 | 11 | 15 | 15 | 11 | 11 | 10 | 10 | 10 | 13 | 16 | 17 | 18 | 19 | 19 |
| THAILAND | 21 | 23 | 24 | 24 | 23 | 22 | 21 | 19 | 16 | 13 | 13 | 12 | 12 | 11 | 15 | 19 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 17 |
| AUSTRALIA | 33 | 35 | 36 | 37 | 37 | 35 | 34 | 31 | 28 | 26 | 24 | 22 | 21 | 19 | 18 | 18 | 19 | 18 | 17 | 17 | 19 | 24 | 28 | 31 |
| CHINA | 23 | 24 | 24 | 24 | 23 | 22 | 21 | 19 | 16 | 13 | 12 | 12 | 11 | 11 | 16 | 15 | 14 | 13 | 12 | 12 | 12 | 18 | 20 | 22 |
| SOUTH PACIFIC | 37 | 37 | 37 | 37 | 36 | 35 | 33 | 30 | 26 | 24 | 22 | 21 | 19 | 18 | 17 | 17 | 16 | 16 | 16 | 25 | 30 | 33 | 35 | 37 |

| UTC TO/FROM US MIDWEST | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
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| NORTHERN SOUTH AMERICA | 32 | 32 | 31 | 28 | 25 | 23 | 21 | 20 | 18 | 17 | 16 | 16 | 15 | 19 | 22 | 24 | 26 | 28 | 29 | 30 | 31 | 31 | 32 | 32 |
| CENTRAL SOUTH AMERICA | 35 | 31 | 29 | 26 | 24 | 22 | 21 | 19 | 18 | 17 | 17 | 18 | 20 | 24 | 27 | 30 | 32 | 33 | 35 | 36 | 36 | 36 | 36 | 36 |
| SOUTHERN SOUTH AMERICA | 33 | 29 | 26 | 24 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 16 | 17 | 21 | 24 | 27 | 30 | 31 | 33 | 34 | 35 | 36 | 36 | 35 |
| WESTERN EUROPE | 16 | 12 | 12 | 11 | 11 | 13 | 12 | 12 | 11 | 11 | 17 | 19 | 21 | 22 | 23 | 24 | 24 | 24 | 24 | 23 | 22 | 22 | 20 | 19 |
| EASTERN EUROPE | 12 | 11 | 11 | 11 | 13 | 13 | 12 | 12 | 11 | 11 | 17 | 20 | 21 | 22 | 23 | 23 | 23 | 22 | 22 | 21 | 20 | 19 | 17 | 12 |
| EASTERN NORTH AMERICA | 22 | 21 | 20 | 19 | 17 | 16 | 15 | 13 | 13 | 12 | 11 | 11 | 14 | 16 | 18 | 20 | 21 | 22 | 22 | 23 | 23 | 23 | 23 | 23 |
| CENTRAL NORTH AMERICA | 10 | 10 | 10 | 9 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 5 | 5 | 7 | 8 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 10 |
| WESTERN NORTH AMERICA | 17 | 17 | 17 | 16 | 15 | 13 | 12 | 11 | 10 | 10 | 9 | 9 | 8 | 10 | 13 | 14 | 15 | 16 | 17 | 17 | 18 | 18 | 18 | 18 |
| SOUTHERN NORTH AMERICA | 20 | 20 | 19 | 18 | 17 | 16 | 14 | 13 | 12 | 11 | 11 | 10 | 10 | 12 | 14 | 16 | 17 | 18 | 19 | 20 | 20 | 20 | 20 | 20 |
| HAWAII | 28 | 29 | 29 | 28 | 27 | 25 | 23 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 14 | 16 | 19 | 22 | 24 | 25 | 26 | 27 | 28 | 28 |
| NORTHERN AFRICA | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 13 | 12 | 12 | 15 | 19 | 21 | 23 | 24 | 25 | 25 | 26 | 26 | 26 | 26 | 25 | 25 | 23 |
| CENTRAL AFRICA | 20 | 19 | 17 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 15 | 19 | 21 | 23 | 24 | 25 | 25 | 26 | 26 | 26 | 25 | 24 | 22 | 22 |
| SOUTH AFRICA | 22 | 20 | 19 | 18 | 17 | 17 | 17 | 21 | 20 | 19 | 18 | 21 | 26 | 29 | 32 | 34 | 35 | 37 | 35 | 33 | 31 | 28 | 26 | 23 |
| MIDDLE EAST | 14 | 13 | 12 | 12 | 14 | 13 | 12 | 12 | 11 | 11 | 17 | 20 | 21 | 23 | 24 | 24 | 25 | 24 | 23 | 21 | 19 | 17 | 16 | 15 |
| JAPAN | 25 | 24 | 24 | 23 | 22 | 20 | 16 | 14 | 13 | 13 | 12 | 12 | 11 | 15 | 14 | 13 | 13 | 12 | 12 | 16 | 19 | 22 | 23 | 24 |
| CENTRAL ASIA | 25 | 24 | 23 | 23 | 21 | 19 | 16 | 14 | 13 | 12 | 12 | 11 | 12 | 18 | 20 | 21 | 20 | 18 | 17 | 16 | 15 | 16 | 21 | 24 |
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| THAILAND | 20 | 23 | 23 | 22 | 21 | 19 | 16 | 13 | 12 | 12 | 11 | 11 | 17 | 20 | 21 | 22 | 23 | 21 | 19 | 18 | 17 | 16 | 15 | 17 |
| AUSTRALIA | 34 | 35 | 37 | 36 | 35 | 33 | 30 | 27 | 25 | 23 | 21 | 20 | 19 | 18 | 19 | 20 | 19 | 18 | 17 | 17 | 20 | 25 | 29 | 32 |
| CHINA | 23 | 24 | 23 | 22 | 21 | 19 | 16 | 13 | 12 | 12 | 11 | 11 | 17 | 19 | 15 | 14 | 13 | 13 | 12 | 12 | 11 | 17 | 20 | 22 |
| SOUTH PACIFIC | 37 | 37 | 37 | 36 | 35 | 33 | 30 | 27 | 24 | 22 | 21 | 19 | 18 | 17 | 17 | 16 | 16 | 15 | 20 | 28 | 32 | 34 | 36 | 37 |

| UTC TO/FROM US EAST COAST | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| CARIBBEAN | 25 | 24 | 23 | 21 | 19 | 17 | 16 | 15 | 14 | 13 | 12 | 12 | 15 | 17 | 19 | 21 | 22 | 23 | 24 | 24 | 25 | 25 | 25 | 25 |
| NORTHERN SOUTH AMERICA | 28 | 28 | 26 | 24 | 22 | 20 | 18 | 17 | 16 | 15 | 14 | 14 | 15 | 18 | 21 | 22 | 24 | 25 | 26 | 27 | 28 | 28 | 28 | 28 |
| CENTRAL SOUTH AMERICA | 34 | 30 | 28 | 25 | 23 | 22 | 20 | 19 | 18 | 17 | 17 | 18 | 22 | 25 | 28 | 30 | 31 | 33 | 34 | 35 | 35 | 36 | 35 | 35 |
| SOUTHERN SOUTH AMERICA | 32 | 29 | 26 | 24 | 22 | 21 | 19 | 18 | 17 | 17 | 16 | 16 | 20 | 24 | 26 | 29 | 31 | 32 | 33 | 34 | 35 | 36 | 36 | 34 |
| WESTERN EUROPE | 14 | 13 | 12 | 12 | 11 | 11 | 12 | 11 | 11 | 14 | 18 | 20 | 21 | 23 | 23 | 24 | 24 | 24 | 23 | 23 | 22 | 21 | 19 | 17 |
| EASTERN EUROPE | 15 | 12 | 11 | 13 | 14 | 13 | 12 | 12 | 11 | 16 | 19 | 21 | 23 | 23 | 23 | 23 | 23 | 22 | 22 | 21 | 20 | 19 | 19 | 17 |
| EASTERN NORTH AMERICA | 11 | 10 | 10 | 9 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 6 | 7 | 8 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 11 |
| CENTRAL NORTH AMERICA | 23 | 22 | 21 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 15 | 17 | 19 | 21 | 22 | 23 | 24 | 24 | 24 | 24 | 24 | 24 |
| WESTERN NORTH AMERICA | 31 | 30 | 29 | 27 | 24 | 22 | 21 | 19 | 18 | 17 | 16 | 15 | 17 | 22 | 25 | 27 | 29 | 30 | 31 | 32 | 32 | 32 | 32 | 32 |
| SOUTHERN NORTH AMERICA | 25 | 24 | 23 | 22 | 20 | 18 | 17 | 15 | 14 | 13 | 13 | 12 | 13 | 16 | 19 | 20 | 22 | 23 | 24 | 24 | 25 | 25 | 25 | 25 |
| HAWAII | 31 | 31 | 30 | 28 | 26 | 24 | 22 | 20 | 19 | 17 | 16 | 15 | 15 | 16 | 16 | 15 | 18 | 21 | 23 | 25 | 27 | 28 | 30 | 30 |
| NORTHERN AFRICA | 22 | 20 | 19 | 18 | 16 | 16 | 15 | 16 | 15 | 16 | 21 | 24 | 27 | 29 | 30 | 31 | 32 | 32 | 32 | 31 | 30 | 29 | 26 | 24 |
| CENTRAL AFRICA | 21 | 19 | 18 | 17 | 16 | 15 | 17 | 16 | 15 | 16 | 21 | 24 | 27 | 29 | 30 | 31 | 31 | 31 | 30 | 29 | 27 | 24 | 22 | 22 |
| SOUTH AFRICA | 22 | 20 | 19 | 18 | 17 | 17 | 17 | 20 | 19 | 18 | 19 | 23 | 27 | 29 | 31 | 33 | 35 | 36 | 35 | 33 | 30 | 28 | 25 | 23 |
| MIDDLE EAST | 18 | 17 | 16 | 15 | 15 | 14 | 13 | 12 | 12 | 15 | 19 | 21 | 23 | 24 | 25 | 25 | 26 | 26 | 26 | 26 | 26 | 23 | 21 | 20 |
| JAPAN | 24 | 23 | 21 | 19 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 16 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 16 | 20 | 22 | 23 | 24 |
| CENTRAL ASIA | 23 | 22 | 21 | 19 | 15 | 14 | 13 | 12 | 12 | 11 | 14 | 18 | 21 | 22 | 23 | 22 | 20 | 18 | 17 | 16 | 15 | 15 | 20 | 23 |
| INDIA | 11 | 10 | 10 | 10 | 14 | 13 | 12 | 12 | 11 | 14 | 19 | 21 | 21 | 21 | 21 | 20 | 20 | 19 | 18 | 16 | 13 | 12 | 11 | 11 |
| THAILAND | 19 | 21 | 19 | 16 | 14 | 13 | 12 | 12 | 11 | 12 | 18 | 20 | 22 | 23 | 24 | 24 | 24 | 22 | 20 | 19 | 17 | 16 | 15 | 15 |
| AUSTRALIA | 35 | 36 | 36 | 34 | 32 | 29 | 26 | 24 | 22 | 21 | 19 | 18 | 18 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 21 | | | |

ionosphere on each end — for example, foF₂ values less than about 3 MHz for 80-meter operation or listening to allow higher-angle electromagnetic radiation through. This is possible after perusing maps of foF₂ along the Arizona to Europe path during the night.

A quick way to further assess this is to calculate the free space path loss for a path from the Earth to the Moon and back, assuming an electromagnetic wave at 3.8 MHz would be 100 percent reflected, which could be extremely optimistic.

This works out to a -113 dBm signal at the receive end with 1 kilowatt at the transmit end and quarter-wave verticals over average ground (less than -6 dBi gain at elevation angles higher than 60 degrees), which would put it around S1 at best on an S-meter. This doesn't sound like *enhanced propagation*, so our cursory analysis says this is not a viable explanation.

Hypothesis 5:

The Full Moon is in the Earth's Magnetosphere

An interesting, but perhaps not well-known fact is that the Moon during a Full Moon period is in the Earth's magnetosphere. This is the result of the Sun's solar wind on the Earth's magnetic field. **K9LA Figure F**, which is not to scale, shows the orientation of the Sun, the Earth, and the Moon — the red dot — during a Full Moon period.

Note that the Moon intercepts the Earth's magnetic field during the Full Moon period. The thought here is that the Moon may block those electrons that are bouncing between the Earth's hemispheres, which would be electrons on field lines arriving at the high latitudes.

The resulting reduction in electrons

would be beneficial to low-band propagation via less absorption.

This is a pretty radical hypothesis, and as expected there's not a lot on this topic in the technical literature. The only paper I found even remotely related to

this scenario is one that discusses the impact on the nighttime ionosphere of electrons arriving from the sunlit ionosphere in the other hemisphere (A. F. Nagy, et al, *The effect of conjugate photoelectron impact ionization on*

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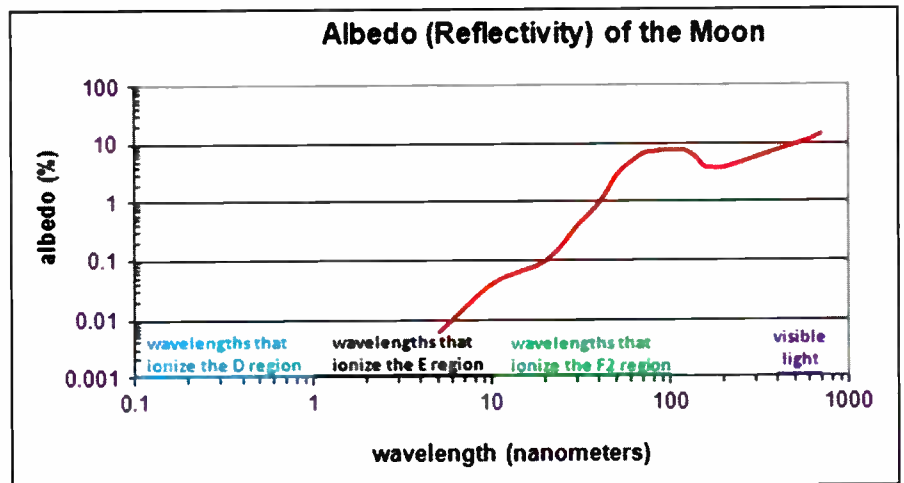


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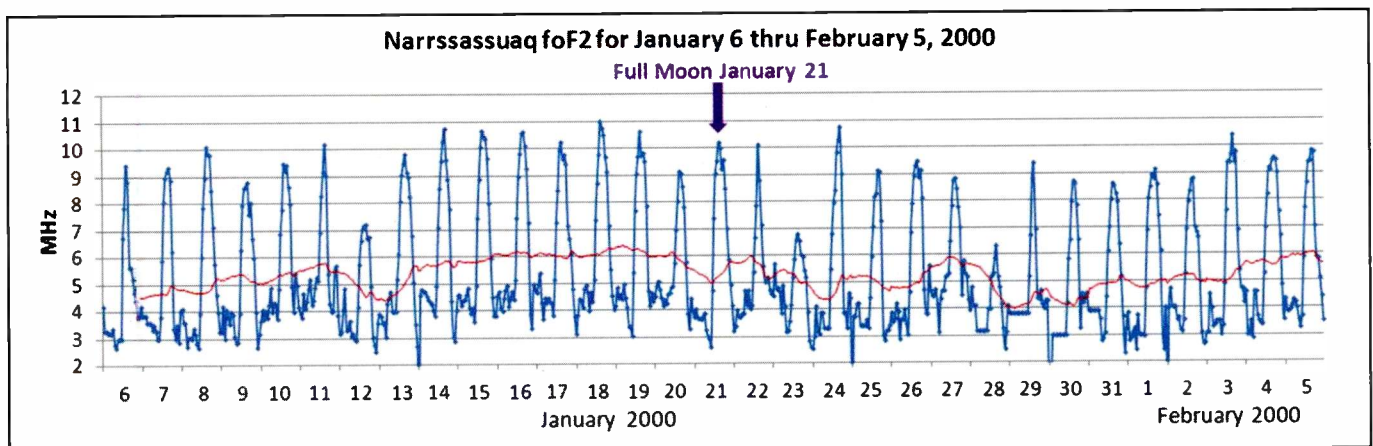
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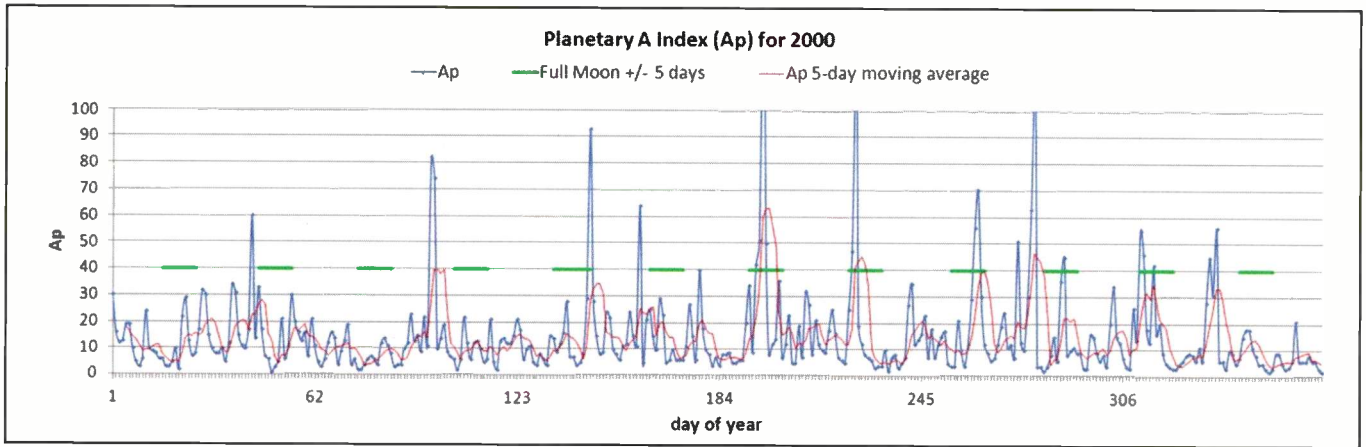
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K9LA Figure C. The Moon's Albedo.



K9LA Figure D. Narssassuaq Ionosonde Data for January 2000.



K9LA Figure E. A_p Index for January 2000.

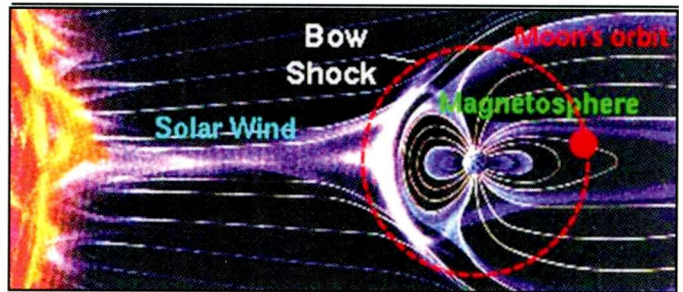
the pre-dawn ionosphere, *Journal of Atmospheric and Terrestrial Physics*, 1973, Vol. 35, pages 2289-2291).

This hypothesis requires more investigation — especially in the “is this even feasible?” category.

Hypothesis 6:

Mid-Latitude Trough

The mid-latitude trough is a depletion in F_2 region ionization on the equator-ward edge of the nighttime auroral oval.



K9LA Figure F. Moon, Sun, and Earth at Full Moon.

Typically this trough is a detriment to low-band propagation because of low maximum useable frequencies in the trough and skewing (off-great circle paths) from the walls of the trough.

Could the Full Moon somehow negate the adverse effect of the trough? That’s an interesting question that needs further investigation.

Summary

In summary, three of the hypotheses (1, 2, and 4) are not considered to be viable for reasons tied to ionospheric physics issues.

The other three (3, 5, and 6) need further investigation. And more than likely there are other hypotheses out there of which I am not aware. Regardless of the hypothesis, it should have a basis in ionospheric physics and it will likely be tied to an advantageous change in electron density.

Finally . . .

In the discussion of Hypothesis 3, I wondered if enhanced low-band propagation occurred only during Full Moon periods. If it doesn’t, then the Full Moon may have nothing to do with it. Or there may be more than one mechanism that provides enhanced low-band propagation.

We have to watch out, as well, for the Full Moon becoming a self-fulfilling prophecy — if we only get on or listen to the low bands during a Full Moon expecting enhanced propagation, then we’d buy into the concept but we’d miss other possible nights with enhanced propagation.

It seems to me the best way to sort this out would be to continuously monitor — and record — a low-band beacon 24 hours a day, seven days a week for a full year.

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On the Short Waves, Taking the Good with the Bad

by Gerry L. Dexter,
WPC9GLD
<gdex@wi.rr.com>

“UBC Radio in Uganda is back on 4976 with a good signal, but Croatian Radio and Christian Voice have gone kaput.”

WWe are in a good news-bad news conundrum this month. I don't know which you normally prefer in such situations but I'll take a guess and choose the good news first . . .

The happier news comes in the form of the return of **UBC Radio** in Uganda <<http://www.ubconline.co.ug>> has not been on shortwave in quite a few years. The station suddenly reappeared in late December, returning to its old haunts on 4976, *perhaps* refreshed by a new transmitter, replacing the old 10-kilowatt unit. It's being reported with a hefty signal up until 2107* closing. It's also being heard around 0400 so, with conditions cooperating, you should get to enjoy either end of its broadcast schedule. *Welcome back UBC!*

Now for the bad news: Unfortunately, it's a disappointing double dose.

Croatian Radio has tossed in the towel. Its daily broadcasts via Deanovic and Wertachtal (Germany) were discontinued effective on January 1.

Also notifying us of a cessation was **Christian Voice**, which closed its Zambia operation on December 31. That's a blow, because it was very well heard in North America. But we were not Christian Voice's real target which, according to its figures, had largely moved to the use of FM radio and mobile devices. I suspect its "research" was a bit faulty.

Sadly, goodbye to both. I'm afraid neither of you will not be much missed.

VOA Special English from Myanmar

In the world of weird here's an item that would certainly put a bump in your burger: the **Voice of America** <<http://www.voa.gov>> has signed an agreement that has **Myanmar Radio** (Burma) carrying some of the VOA's Special English programs!

Not only that, but the VOA will engage in providing training for Myanmar Radio employees aimed at advancing their technical skills. I wonder what the next step will be: Maybe a VOA relay in Nay Twi Paw?

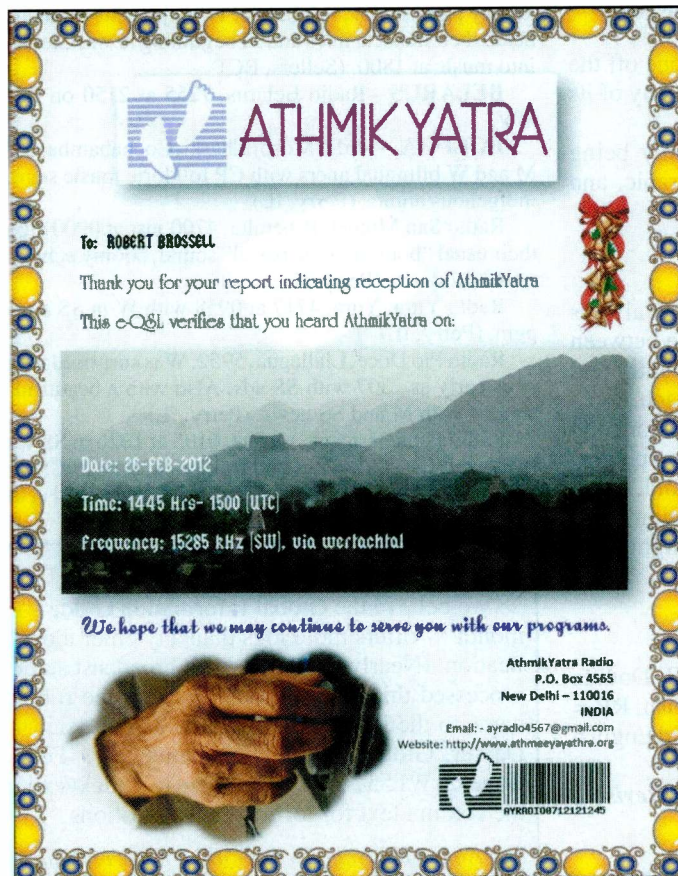
More for the Opposition

Yet another opposition broadcaster took the air last November. The name **Radio Free Kenyalang** has nothing to do with that African country. But, rather, is believed to be associated with the Sarawak Workers Party (Malaysia).

Initial broadcasts were heard on 15650 around 1245-1315 but may have been on the air before 1245 and later than 1315. As yet the transmitting site remains un-located.

A Spin Around the Dial

- The **Far East Broadcasting Association**, based in England, is now using the Yerevan (Armenia) site on 9400 and 12125
- **Deutsche Welle** is using the BBC's Ascension Island Relay for some of its broadcasts in Swahili.
- **Radio Nederland**, having closed down its Bonaire Relay, now uses WHRI for Spanish language broadcasts to the Americas



Bob Brossell got this full page QSL from Athmik Yatra Radio, based in India and relayed by Wertachtal.



The Mighty KBC, based in the Netherlands and relayed by Bulgaria, issued another QSL to Rich D'Angelo.

- **Radio Havana Cuba** has stopped using 6050 and replaced it with 6165 (hopefully it won't conflict with Radio Chad). Havana has also begun using 15340 for Europe around 1900.
- **Radio Cairo** has begun to use 9720 for its North American Service, running from 0045 to 0330.
- You might expect better reception from the **Voice of Korea** by now. As I noted earlier, it has replaced the transmitters at Kangyye with new, Chinese-made units. Apparently the same holds true for broadcasts on the domestic channels from Pyongyang and from another unit in Guang County, North Pyongan Province.
- It seems as if **Thazin Radio** in Myanmar has gone off the air, at least temporarily, as nothing is being heard on any of its frequencies.
- **Radio Omdurman/Voice of Sudan** is suddenly being heard on new 9505 from 0400-0700 in French, Arabic, and Swahili — a sort of "international service."

Calling All SWL Logs and More

Remember, your shortwave broadcast station logs are always welcome. But *please* be sure to double or triple space between the items, list each logging according to its home country and include your last name and state abbreviation after each.

Also needed are spare QSLs you don't need returned (or good copies), station schedules, brochures, pennants, station photos, and anything else you think would be of interest. And, come on! How about sending a photo of you at your listening post? It's your turn to grace these pages! In fact, it's high time. *Delinquent! Past due!*

GIG-Speak: A Translation Situation

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

Don't miss "A Guide to GIG-Speak (Revisited, Revised, Refreshed)" this month on page 68.

ALGERIA—Radio Algerienne, 9395 via France at 2116-2220* with AA vocals, M with AA talks, ID and frequency anmts at 2155 and 2157. (D'Angelo, PA)

ANGOLA—Radio Nacional Angola, 4950 at 0250 with music, time pips and ID at 0200, then into hiflife music. (Rippel, VA)

ANGUILLA—University Network, 6090 at 1830 with Melissa Scott, 11775 at 2145. (Maxant, WV)

ARGENTINA—Radiodifusion Argentina al Exterior, 11710 at 0203 with *The English Connection*, pgm highlights and W with news briefs. (Coady, ON) 15345 at 0230 with W and into SS talks by M. (Rippel, VA)

ASCENSION ISLAND—BBC-South Atlantic Relay, 9855 signing on at 2200, f/by news. (Sellers, BC) 9915 at 2144 featuring today's hits in Britain. (Sellers, BC) 12095 with world news at 2100. (Brossell, WI)

AUSTRALIA—Radio Australia, 6140 9500 at 1938 with an interview, 9710 at 1922 with a stand-up comic on the *Australia All Over* pgm, and 11880 at 1931 with *Australian Country Style* pgm. (Coady, ON) 6140 via Singapore at 1139 with *Saturday Night Country*. (Sellers, BC) 9580 with a discussion between M and W. (Rippel, VA) 9580 at 1900 with a news item, 11945 on coal exports, news from Barton McClain at 1400, and 21740 on red rock in that country. (Maxant, WV) 11660-Shepparton at 1646 with lively studio banter between the host and a singing couple in between songs, and 15230-Shepparton at 2321, but poor in PP under RHC. //15415, 9855 with 2200 sign on and into news. (Sellers, BC) 5995-Brandon at 0804 with W and EE news. (D'Angelo, PA) 11945 at 0647 with *Album of the Week* f/by *Sports Wrap* at 0625. (Miller, GA)

ABC Northern Territory Service, VL8A-Alice Springs, 4835 at 1300 with CODAR QRM talk and into music at 1328. (Rippel, VA) 1420-1515. (Rasmussen, CA) 1607 with a book review. (Sellers, BC) 2325-VL8T-Tennant Creek, weak at 1616, //4835 and 5025. (Sellers, BC) 5025-VL8K-Katherine, at 1613 new on this frequency, //2325, 4835. (Sellers, BC)

HCJB Australia, Kununurra, 11750 with a preacher at 1835. (Maxant, WV)

BANGLADESH—Bangladesh Betar, 4750 at 1210 with a music variety pgm. (Perry, IL) 7250 at 1746; just missed their EE sign on but heard their musical intro and M beginning news, later commentary and into music at 1800. (Sellers, BC)

BELARUS—Radio Belarus, 7255 at 2150 on Europe. (Maxant, WV)

BOLIVIA—Radio Mosoj Chaski, Cochabamba, 3310 at 0935 with M and W bilingual ancrs with CP folkloric music segments in SS and indigenous anmts. (Perry, IL)

Radio San Miguel, Riberalta, 4700 just at 0900 sign on in SS with their usual "bottom of the barrel" sound, boomy echo and info CP-flavored folkloric. (Perry, IL)

Radio Yura, Yura, 4717 at 0958 with W in SS and apparent news pgm. (Perry, IL)

Radio Pio Doce, Llallagua, 5952. Was surprised to find this in nicely as early as 2307 with SS ads. Also with a beautiful signal at 1010 sign on with M and SS news. (Perry, IL)

Radio Panamericana, La Paz, 6105 at 1026 in SS with a big signal. Piano and ID/TC, haynos and folklorica. Best in USB. (Perry, IL)

Radio Santa Cruz, Santa Cruz, 6134.8 was loud at 0953 with criol-

Help Wanted

We believe the Global Information Guide — month after month — offers more logs than any other monthly SW publication. (Nearly 350 shortwave broadcast station logs were processed this month!) Why not join the fun and add your name to the list of GIG reporters? Send your logs to Gerry Dexter, Global Information Guide, 213 Forest St., Lake Geneva, WI 53147 or email them to <gdex@wi.rr.com>. See the column text for formatting suggestions.

**Not all logs submitted are used. There are usually a few which are obviously inaccurate, unclear, or lack a time or frequency. Also discounted are unidentified, duplicate items (same broadcaster, same frequency, same site), and questionable logs. — WPC9GLD*



REPUBLIC OF SOMALILAND · RADIO HARGEISA

The recently reactivated Radio Hargeisa, Somililand, QSL'd Rich D'Angelo for his reception on 7120.

lo music and ID near top of the hour. On a Sunday had CP folkloric music, non-SS indigenous language, and a possible radio novella. They must have signed on at 0900 and with a big, lusty signal. (Perry, IL)

Radio Fides, La Paz, at *0945 sign on with a canned ID mentioning AM, FM, and onda corta. Nice, clear ID and into the morning show in SS. They don't believe in xmtr warm up and, as a result, the signal improves over the first few minutes as the transmitter settles in. (Perry, IL)

BOTSWANA—VOA Relay, Mopeng Hill, 4930//9885 at 0316 on the movie-making industry in New York. (Coady, ON) *0259 with sign on, IS and news at 0300. (D'Angelo, PA) 1611 with a report on the rebel campaign in the D.R. Congo. (Sellers, BC) 9815 with FF talks at 2018. (Brossell, WI)

BRAZIL—(all in PP – gld)

Radio Municipal, Sao Gabriel Cachoeira, 3375 at 1015 with very good LA pgm and M with ID. (Perry, IL)

Radio Imaculada Conceicao, Campo Grande, 4755 at 0900 with morning news show, by 0901 with Sunday morning pgm with choir, Christian pops and short inspirational comments. (Perry, IL)

Radio Cancao Nova, Cachoeira Paulista, 4815 at 0248 with W talks and ID. (Perry, IL)

Radio Caiari, Porto Velho, 4785 with plucked/strummed guitar selections and M with local vocals from 0910, ID at 0941. Running to past 1100. (Perry, IL)

Radio Daqui, Goiania, 4915 at 2343 with Brazilian ballads, love songs, and M with echo chamber anmts. (Coady, ON)

Raddio Iguatemi (t), Sao Tome, 4975 at 2315 with MOR songs, M with bassy anmts. (Perry, IL)

Radio Brazil Central, Goiania, 4985//11815 at 2348 with Brazilian ballads and M with excited anmts. (Coady, ON) 2316 with pop vocals hosted by M, 11815 at 0242 with pop pgm hosted by M with IDs and some jingles. No 60-meter signal tonight. (D'Angelo, PA)

Radio Aparecida, Aparecida, 5035//9630 and 11855 at 2214 with M and "gentle" religious talk. (Coady, ON)

Super Radio Deus e Amor, Curitiba, 9565 at 0850 with M, anmts and preacher, //6060, 6120, 11765 with 25 meters doing the best. (Perry, IL) 9565//11895 at 0414 with rapid-fire W preacher. (Coady, ON) 11765 at 2136 with various M in conversation, several anmts, more discussion, and music from 2300. (D'Angelo, PA)

Radio Itatiaia, Belo Horizonte, 5970 at 2214 with fast-talking M ancr, ID and jingles, talks by several people. (D'Angelo, PA)

Radio Inconfidencia, Belo Horizonte, 6010 at 0133 with M and inspirational talk. Also, 15191.5 at 2205 with M preaching. (Coady, ON)

Radio Bandeirantes, 9645.4 with M/W talk and mentions of "Brazil" and "Sao Paulo." Also, 9645//11925 with two M and echo chamber anmts at 0515. (Coady, ON)

PPE, Observatorio Nacional, 10000 with M and time checks and a single pip every 10 seconds. (Coady, ON)

Radio Nacional Amazonia, 11780 at 0440 with Brazilpops and talks, //6180. (D'Angelo, PA)

In Times Past

Here's your "blast from the past" for this month:

Radio Sandino, Managua, Nicaragua on 6200 in SS on March 22, 1984, operated by the leftist/communist Sandinista Party.

CANADA—CFRX, Toronto, 6070 at 0105 with a commercial for Toyota. (Maxant, WV) 1845 with *The City* phone-in pgm. (Fraser, ME)

CKZN St. John's (Newfoundland), 6160 at 0228 with an interview on fashion shopping in the UK. Slight QRM from Vancouver. (Sellers, BC) 1845 on the dismantling of Sackville's transmitters. (Maxant, WV) *Cross Country Check-Up* taking phone calls at 2233. (Coady, ON)

CKZU, Vancouver, monitored at 0231 with ID and *As It Happens*. (Sellers, BC)

Bible Voice Broadcasting, 7395 via Wertachtal at 0114 with closing anmts and 0115 off. Scheduled Sat/Sun 0100-0115. (Sellers, BC)

CHU, Ottawa 3330 with time checks at 0815, 14670 with time checks at 2116. (Maxant, WV)

CHAD—Radio Tchadienne, 6165 at 2208 with M and news in FF, many correspondent reports, into African hilife at 2215. (Sellers, BC) 2216 with FF talks and hilife music, (Brossell, WI) 1012 with balafon music at 2023. (Perry, IL) 2148 in FF with Afropops, African hilife and into news. (Coady, ON) 0800 on domestic violence and ID as "CBC Radio One." (Miller, GA)

CHINA—China Radio International, 5955 with *Heartbeat* pgm and a feature on protecting traditional Chinese villages, and 9600-Kashi discussing pop music albums. (Sellers, BC) 5965-Xi'an in (I) KK at 1328, 7445-Beijing in (I) Mongolian at 1328 and 9600-Kashi on Internet shopping at 2124. (Brossell, WI) 7285 via Albania at 2016 with EE features on Christmas in Scandinavia. (D'Angelo, PA) 9760-Kunming at 1201 with British-accented M reading *CRI News*, then *People in the Know*. (Coady, ON)

China National Radio at 6165 at 1118 in (I) Hakka with light pops. (Coady, ON) Qinghai PBS at 1500 with Tibetan singing. (Rasmussen, CA) Xizang PBS-Lhasa (Tibet), 4905 at 1600 with W and ID of "This is Holy Tibet beginning this English program." Also 7255 in Tibetan at 1320. (Brossell, WI) Voice of the Strait, Fuzhou, 4940 in CC at 1215. (Brossell, WI) Xinjiang PBS, Urumqi, 5060 at 0053 in CC, 0100 time pips and another stream of anmts. (Sellers, BC)

Firedrake music jammer, 13850//14750 at 0245. (Rasmussen, CA)

COLOMBIA—Alcaravan Radio, Puerto Lleras, 5910 at 0356 with Colombian vocals hosted by M in SS. (D'Angelo, PA) 0453 with rancho-like vocals and brief talk between songs. (Coady, ON)

CONGO (D.R.)—Radio Okapi, 11690 via South Africa at 0422-0459* with W in FF doing news, several IDs, jingles, remote reports, and brief segments of instl music. (D'Angelo, PA) 0425 in FF with W talk and "Okapi" sung by a W. (Coady, ON)

CROATIA—Croatian Radio, 7375 via Nauen (Germany) in EE at 0300 with *Croatia Today* pgm. Heard the next night after which the transmission was cancelled. (Sellers, BC)

CUBA—Radio Rebelde, 5025 at 0320 with *Todo Musica* LA music pgm. (Coady, ON)

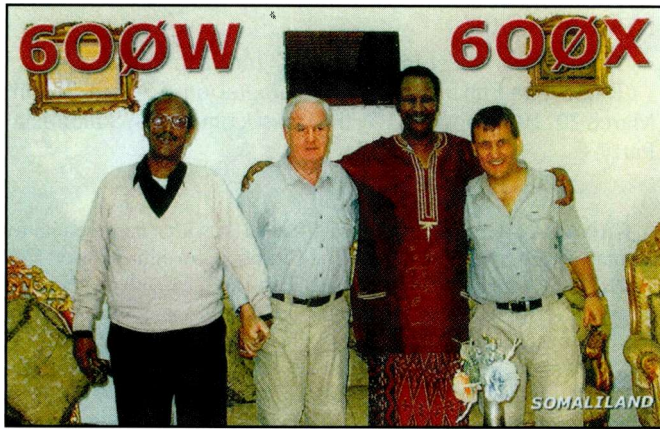
Radio Havana Cuba, 11740 in SS on American "terrorism." (Maxant, WV) 11880 with EE news at 2204. (Sellers, BC)

DJIBOUTI—Radio Djibouti, 4780 at 0322 with M in AA talk with a couple of music bridges and into M local vocals. (Coady, ON) 0417 with talks in (I) Afar. (Brossell, WI)

ECUADOR—Centro Radiofonico de Imbabura, Ibarra, (unid, but very likely) 3380, reactivated after years of silence, poorly heard at 1108-1118. I think this one has a nominal 1100 sign on. Again at 1056 with an OC and *1058 and open anmts at 1100. Very poor mike modulation. (Perry, IL)

Radio Oriental, Loja, 4781.7 with seeming later sign on lately, 1130 rather than 1100, M with echo SS anmts but the band has mostly gone for LA at that time, later days opens at 1130. Later, again noted at *1100. Heard almost daily. (Perry, IL)

Radio El Buen Pastor (t), Saraguro, 4815, noted 1104 with bassy-



Amateur's call letters also grace this Radio Hargeisa QSL received by D'Angelo.

voiced M ancr, muffled audio and into a string of Ecuadorian selections on guitar. (Perry, IL)

HCJB Global, 6050-Pichincha at 0500 in SS with ID, choir and Ecuadorian NA at 0503*. (Sellers, BC)

EGYPT—Radio Cairo, 11890 at 2130. Carrier only, no audio. (Maxant, WV) (How did you ID it then? - gld)

ENGLAND—BBC, 5905-Oman Relay at 2215 with *World Briefing*, //9915, 11895-Thailand Relay with *Newshour* at 1237. (Coady, ON) 5945-Oman Relay at 1853 with news at 1831 and a panel on international issues. //9410, 5980-Oman Relay with news to 2306 and an in depth look at rebel activity in Mali. Also, 9430 at 1831 with news, //9410. (Sellers, BC) 15400 with *Newsday* at 0530. (Miller, GA)

ETHIOPIA—Radio Fana, 6110 in Amharic at 0419 with M/W and excited talk with HOA vocals. (Coady, ON)

FRANCE—Radio France International, 9790 with FF pops at 2146 and 11995 in FF at 1952, //21690. (Sellers, BC) 2034 with talks and songs in FF. (Brossell, WI)

FRENCH GUIANA—Radio France International Relay, 21690 in FF with panel and news analysis at 1813. (Sellers, BC)

GERMANY—Deutsche Welle, 9655-Rwanda Relay with *Africa Link* at 2120, 11830-Rwanda Relay at 2123 on education problems in Africa, and 12070-Rwanda Relay at 1742 with talks in FF. (Brossell, WI) 11800-Rwanda at 0530 with *Inside Europe*. (Maxant, WV) 12070 in EE at 1948 on Morocco at 1948. (Sellers, BC) 9800-Rwanda Relay at 0416 with African news, M with ID at 0429, 12070 via Ascension at 0326-0400* with news, features, and frequent IDs, all in Swahili. (D'Angelo, PA)

Norddeutscher Rundfunk, 7355 via Wertachtal at 2217 with a special Christmas pgm from this German public broadcaster. Mainly GG talks and a few Christmas music selections, nice ID and (p) address at 2239. (D'Angelo, PA)

GREECE—Voice of Greece, 9420 at 1540 in GG and 15630 in GG at 1931. (Brossell, WI)

RS Makedonias, 9935 in Greek at 1553. (Brossell, WI)

GUAM—Adventist World Radio, 15230 with EE preacher and Voice of Hope ID at 2256 f/by closing anmts, and 15320 signing on at 1120 "This is Adventist World Radio — the Voice of Hope, KSDA, Agat, Guam" plus frequency and pgm lineup. (Sellers, BC)

GUATEMALA—Radio Verdad, Chiquimula, 4055 with EZL LA music. Excellent listening! (Rippel, VA) 1144 with preacher in JJ, then organ, several IDs and into SS anmts. (Sellers, BC)

INDIA—All India Radio, 4920-Chennai at 0014 sign on Tamil battling with co-channel Tibet. But very poor, 5010-Thiruvananthapuram with sub-continental music at 1245, 7550 at 1815 ending a commentary and into a pgm of Indian music, 9705-Panaji (Goa) 2244 sign on with ID and schedule. (Sellers, BC) 7550 with the General Overseas Service at 2125 and 11670 at 2200 on the India-China relationship. (Maxant, WV) 13710-Bangluru, //9690 at 1357 with W and wailing Hindi vocals. (Coady, ON) 9445-Bangaluru with domestic music to

ID at 2200 into EE news. ID and closedown at 2200. (D'Angelo, PA) 2120 with a guest poet reading. (Fraser, ME) 11620 at 2213 with a commentary. (Rasmussen, CA) 11670-Bangaluru with flute music and Hindi at 2120. (Brossell, WI) 2053 with Hindi vocals, EE ID and EE news. (D'Angelo, PA) 11740-Panaji (Goa), at 2135 with profile of the Andaman Islands. (Sellers, BC)

INDONESIA—Radio Republik Indonesia – RRI Palangaraya (Kalimantan), 3325 with W host in II at 1621 and telephone caller. (Sellers, BC)

IRAN—Islamic Republic of Iran Broadcasting, 5950-Sirjan at 2220-2332* with M in (I) Bosnian and light instls. Into Koran just prior to pgm termination, 6165 at 2044-2147* with W in (I) Albanian and into a new pgm segment at 2115. (D'Angelo, PA) 6145 at 2115 in (I) JJ and 9710 in (I) Bosnian at 2132. (Brossell, WI) 9710 at 0335 with pgm highlights and talk on drug laws in the US. (Miller, GA)

ISRAEL—Kol Israel, 15760 at 1515 with M in Farsi with many mentions of "Israel" and "Kol Israel." (Coady, ON)

JAPAN—Radio Japan, 11730 with *Japanese Pop Culture Magazine* and brief W pop vocals, M/W talk in JJ, 11740 via French Guiana at 0503 with W with news and EE ID, //15190-French Guiana with news and ID at 0506, 15190 at 1206 with M/W and news of Japan. 15720 via Madagascar at 1810 with M/W in EE opening JJ language pgm. (Sellers, BC)

Radio Nikkei, 3925 at 1030, with //6055 doing better. (Perry, IL) 1345 stronger than // outlets 6055, 9595. (Rasmussen, CA)

KUWAIT—Radio Kuwait, 5960 at 0815 with M/W talk and into AA music. (Maxant, WV) 11630 with Koran at 1305. (Rippel, VA)

LIBYA—Radio Libye, 11600 in AA at 1656 with IDs and anmts at 1658 and 1700. (Sellers, BC)

MALAYSIA—Traxx FM, 7295 at 1701 with M and EE news with music bridges in between items. Poor with co-channel QRM from Voice of Russia in FF. (Sellers, BC) 1850 with W vocal. Poor and just above the noise floor. (Maxant, WV)

Sarawak FM, 9835 at 1631 with Malay pops song by a Canadian at 1638. (Sellers, BC)

MALI—RTV Malienne, 5995 at 2207 in FF with apparent news, AA vocals at 2227 recheck. (Coady, ON)

MOLDOVA—Radio PMR, 7260 at 2230-2259 with music, time pips and opening of GG pgm. 7290 at *2200 with time pips opening EE pgm with domestic news. Closed around 2211, with GG service beginning at 2230. (D'Angelo, PA)

MOROCCO—RTV Marocaine, 15350 in AA monitored at 2017. (Brossell, WI)

Radio Medi Un, 9579 at 0503 with news in FF and ME vocals. (Coady, ON)

MYANMAR—Thazin Radio, 7110 (p) at 1202 in Burmese with pop vocals and W with talk. (Coady, ON)



An Indian temple is featured on this card from A.I.R. sent to John Miller in Georgia.



The Arc de Triomphe is the star of this Radio France International QSL sent to John Miller.

NETHERLANDS—Radio Nederland, 17605 via Vatican at 1934 with a report on military operations in Africa. (Brossell, WI)

The Mighty KBC, 9450 at 0045 with pops, IDs, and a mention that the transmitter was in Bulgaria (Kostinbrod – gld). (Coady, ON) 0107-0200* with mainly oldies, several IDs with M in EE mentioning that it was a repeat of the previous weeks digital broadcast. After the test they returned to their standard format. The signal deteriorated steadily until sign off. (D'Angelo, PA)

NEW ZEALAND—Radio New Zealand International, 9765 with *The Music Mix* pgm at 1027. (Coady, ON) 15720 on excess alcohol leading to violence. (Maxant, WV) 11725 at 0805 with news and U.S. vocals. 17670 with U.S. pop love songs. (Maxant, WV)

NICARAGUA—El Buen Pastor, 8989u at 2307 with an LA hymn and impassioned SS speaker. (Coady, ON)

NIGERIA—Voice of Nigeria, 7255 at 2131 with W doing a pops countdown and then 30 minutes of Nigerian music. (D'Angelo, PA) 2135 with W in EE playing soul, rap things and talk about the performers. ID at 2153. (Coady, ON)

NORTH KOREA—Voice of Korea, 3250 in KK at 1616. (Sellers, BC) 9335 in FF at 1146 with ID as “La Voix du Koreee” then traditional instls, 11710 at 1501 with NA and opening in EE with patriotic chatter. (Coady, ON) 11535 at 2301 with martial songs and KK talks. (Brossell, WI)

Pyongyang Broadcasting Station, 332 at 1620 in KK with female choir and 6400 at 1637 in KK with orchestra and choral things. (Sellers, BC)

OPPOSITION—Radio Free Kenyalang, 15650 (Bulgaria to Malaysia), in Iban at 1228 with 2 M talking, male vocals, and pop W vocals. A definite ID at 1248. (Coady, ON)

Voice of Iranian Kurdistan (p), 4860 (to Iran), at 0358 in (p) Kurdish with vocals and M with high-spirited talk. (Coady, ON)

Sound of Hope (Taiwan to China), 7280 in Mandarin at 1212. (Coady, ON) 9450 in (I) Mandarin at 1545. (Brossell, WI)

Echo of Hope (South Korea to North), 6348 in KK at 1639 with W in KK, very poor with //3985 also very poor. (Sellers, BC)

Voice of the People (South Korea to North), with W in KK at 1643, poor with a noise jammer. //3912, 4450 and 4557. (Sellers, BC)

Radio Dialogue FM (via Madagascar to Zimbabwe), 12105 at 1626 with talk and some singing. Carrier cut at 1700. (D'Angelo, PA)

Radio Dabanga, (via Madagascar to Sudan), 15535 in AA at 1535. (Brossell, WI)

Radio Tamazu (via Madagascar to Sudan), 15535 in AA at 1535. (Brossell, WI)

Voice of Tibet, (via Tajikistan to China) in (I) Tibetan at 1242. (Brossell, WI)

PAPUA NEW GUINEA—Radio East New Britain, Rabaul (New Britain), 3385 at 1015 with country things, fading in a bit better by

1030. Muffled modulation so couldn't tell if M or W speaker. (Perry, IL)

PERU—Radio Vision, Chiclayo, 4789.9 one of the strongest Andean signals this morning on 60. M with time check/ID at 1055, then a charming rendition of hymns by a local young men's choir. (Perry, IL)

Radio San Antonio, Ucayali, 4940 all but certain the LA stn heard here around sunset local with a variety of EZL music including LA romantic vocals and some tropical rhythms. Nice OA folkloric as part of 0000 ID, which I couldn't copy. (Perry, IL)

Radio Voz Cristiana, Chilca, 4985 with *1056 sign on joining pgm already in progress with end of “crazed preacher” pgm, then an a' cappella hymn and religious talks in SS. (Perry, IL)

Radio Ondas del Suroriente, Quallabamba, 5120, noted several times lately, even with noisy conditions. Variable sign on time between 1045-1100 with anmts starting around 1055. (Perry, IL)

Radio Tawantinsuyo, Cusco, 6173.9 noted around 1020, just barely clear of the big Asian signal on 6175, SS sports recap pgm. But it was difficult reception, even using ECSS. (Perry, IL)

PHILIPPINES—Far East Broadcasting Co., 9420 in (I) Mandarin at 1543. (Brossell, WI) 12095 at 2253 with IS under BBC-Ascension Is. Off just in time for clear EE ID and into Hmong language pgm. (Sellers, BC)

PIRATES—Captain Morgan Shortwave, 6950 at 0233 with Christmas tunes. Off by 0252 when I checked back. Emailed to <captainmorganshortwaved@gmail.com>. (Hassig, IL)

WFMT (?), Family Radio, 6924.7 at 2155 strong but with quick fades, “Sonja Norwood on Family Radio.” carillon bells playing various tunes. (Hassig, IL)

Undercover Radio, 6925 at 0041 with M rambling on about beginning programming and what conditions will be like. (Sellers, BC) Also 6940u at 0459 with Dr. Benway doing a radio drama and talk about big government. (Wood, TN) 0157 with Dr. Benway claiming to be broadcasting “from the middle of nowhere.” Things by Pink Floyd. Email as: <undercoverradio@gmail.com>. (Hassig, IL)

XFM, 6945 at 0150 with M saying “greetings people of Earth” and various comments on recent news items. <XFMSHortwave@gmail.com>. Long ID at 0205. (Rippel, VA)

Wolverine Radio, 6925 at 0100 with big band and blues music, also rock-a-billy and rock. QSO at 0151 with both Dr. Benway and Blue Ocean Radio. (Hassig, IL)

Radio True North, 6935 at 0032 with a song, ID at 0135, a mention of Free Radio Shortwave, back to more songs, and a switch to 6955, another ID at 0047. (Sellers, BC)

Blue Ocean Radio, 6925 with blues, 0036 ID, Email and QSL offer. (Sellers, BC)

Cupid Radio (Euro), 6300 at 2300-2319* with wide variety of pops. QSLs from <cupidradio@hotmail.com>. (Rippel, VA)

Reflections Europe (Euro), 6295 (t) at 2232 weak, under-modulated and fighting it out with a co-channel UTE. (Rippel, VA)

Black Arrow (Netherlands), 6924.9 at 2349 with various U.S. pops and numerous IDs. (Rippel, VA)

ROMANIA—Radio Romania International, 7220-Galbeni as listed in SS. Off without ID at 0056. (Wood, TN) 2335 with vocals and into giving their frequencies and times, 7340 at 0120 with a Romanian folk song. (Maxant, WV) 7300 at 1843 with an EU pgm looking at banking there. (Sellers, BC) 7310 at 0630 and *Song of the Day* at 0645. (Miller, GA) 11970 in (I) Romanian at 1924. (Brossell, WI) 17530 with *Folk Box* pgm at 1225. (Fraser, ME)

International Radio Relay Service, Saftica, 7290 with Brother Stair to pgm close at 2058 and choral singing to carrier termination at 2100. Also 15325-Tiganesti at 1356-1400* close in unid language with IRRS ID and mention of a special QSL at 1348. (D'Angelo, PA)

RUSSIA—Voice of Russia, 6090-Armavir at 2138-2159* with M and PP talk, some anmts and operatic vocals, ID, and frequency anmt at 2158 f/by IS, 7260 via Grigoripol (Moldova), at *2300 opening RR broadcast and M with news. (D'Angelo, PA) 7240-Petropavlovsk-Kamchatka (Asiatic Russia), at 1716 discussing the American fiscal crisis, 7305-Irkutsk in Mandarin at 1100 with Moscow bells IS and ID,



The crew of the "Happy Station program," formerly on Radio Nederland. (Courtesy of John Miller)

opening music and W with news. Also 9560-Novosibirsk at 1228 ending *Burning Point* pgm and into news break at 1230, 12075 via Tajikistan at 1220 with W doing an interview. (Coady, ON) 7295 at 2340 on new construction in Moscow. (Maxant, WV) 9395 (nf) via Armenia in EE at 2200. (Sellers, BC) 9735 with an interview at 1713, 9880-Petrozavovsk-Kamchatska on Russian economy at 1549, 11830-Petropavlovsk-Kamchatska at 2224 on Egyptian government, and 15510-Samara at 1245 in (I) Pashto-Dari. (Brossell, WI) 15630, //17665 and 17690 loud, but distorted at 0215-0245. (Rasmussen, CA) Radio Kyzl, 6100 with talks in RR at 1223. (Brossell, WI)

RWANDA—Radio Rwanda, 6055 at 0601 with M and news in FF. Poor with RHC providing co-channel QRM. (Coady, ON) 2055 with monotonous drum rhythms, M with partial FF ID and African vocals. (Perry, IL)

SAO TOME—VOA Relay, Pinheira, 4960//9885 with W on human rights in Swaziland. (Coady, ON) 11885 in (I) Hausa at 2031. (Brossell, WI)

SAUDI ARABIA—Broadcasting Service of the Kingdom, 9870 at 2014 with discussions on Yemen. (Sellers, BC) 15205 at 1607 with Koran recitations and some AA talk. (D'Angelo, PA)

SERBIA—International Radio of Serbia, 6100 via Bijeljing (Bosnia) opening at 2200 with EE pgm, ID, and news hosted by a M. EE closes at 2228, IS and Serbian begins at 2230. (D'Angelo, PA) 2110 with talks in GG. (Brossell, WI)

SEYCHELLES—BBC-Indian Ocean Relay Station, Mahe, 9410 at 2135 with *Revolutions per Minute* pgm. (Coady, ON)

SINGAPORE—BBC-Eastern Relay, 6195 with *World Business Report*. Poor at 2232, //9915 and 12095 both Ascension and both

This Month's Winner

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

Georgia's **John Miller** is this month's prize winner, namely a copy of the **2013 World Radio TV Handbook**, the essential "must have" guide to international broadcasting. If you don't have your copy yet you had better get with it. You can get the WRTH from any radio equipment supplier, online bookstore, nearby big box store, or your neighborhood bookstore can always get a copy for you quickly.

good, 9505 at 1719 with "football" news and an interview. QRM from Voice of Sudan. (Sellers, BC) 9740 with *Business Daily* at 2330. (D'Angelo, PA)

SOLOMON ISLANDS—Solomon Islands Broadcasting Corp., 5020 with a Christian devotion, 1200 with M/W speaking and into choir. Seemed to go off earlier than usual. (Sellers, BC) 1530 with HOA music, also 0400 with Somali talk. (Rasmussen, CA)

SOMALIA—Radio Hargeisa, 7120 in Somali at 0353 with live HOA music, then M with talk. (Coady, ON) *0330-0347 NA f/by M opening pgm and Koran recitations. (D'Angelo, PA) 1310 with back to back M talks and into HOA music. (Rippel, VA)

SOUTH AFRICA—Channel Africa, 7230 in EE at 0401 with M/W doing news, and at 1706 with W and news in EE. (Sellers, BC) 7230 at 0405 on Mandela's return home. (Maxant, WV) 15235 at 1700 with time pips, W with ID, frequency and pgm highlights and into news at 1701. (Coady, ON) 1615 with talks in FF. (Brossell, WI)

SOUTH KOREA—KBS World Radio, 3955 via Skelton at 2202-2229* with W and EE news and features, then quiz prior to closedown. (D'Angelo, PA)

SPAIN—Radio Exterior de Espana, 6055 at 0000 with news, week-end soccer scores, than a press review. Also 9605//9665 with *North by Southwest* pgm at 1945. (Coady, ON) 0039-0100* with mailbag pgm and M ancr with close of the reactivated EE pgm. Also 7265 at 1949 with continuous music to AA anmt at 1956 with Email addr, more music to AA talk, ID and news at 2000 after time pips. (D'Angelo, PA)

SRI LANKA—Radio Sri Lanka/SLBC, 11750-Ekala at 1730 with local pops, M ancr and then a phone caller. (Sellers, BC)

SUDAN—Radio Omdurman, 7200 at 0257 in AA with Koran, then O/C at 0303-05 before resuming Koran. (Coady, ON)

Radio Dabanga, 7315 via Vatican at 0441 in AA with M/W talk, news with music bumpers between items, 11940 in AA at 0448 with M talk, ID and possible news headlines with brief music bridges. (Coady, ON)

SWAZILAND—TWR, 6120 at 0535 on the Congolese war. (Maxant, WV) TWR, 6130 from 2000 tune in with African choral rhythms, chimes at 2004 and off at 2005. (Perry, IL) 9500 at 0509 with M preaching. (Coady, ON) 1808 with M greeting listeners and W discussing youth. (Sellers, BC)

SWEDEN—IBRA Radio, 12045 via Wertachtal with AA talks at 1749. (Brossell, WI)

SURINAME—Radio Apinte (p), 4990 at 0315 with light pops and M ancr, but very low modulation, making it impossible to determine the language. (D'Angelo, PA) Stunningly big signal at 2330 but deep fades as noted before on stns from NE South America. (Perry, IL)

TAIWAN—Radio Taiwan International, 6150 with M in CC at 2207. (D'Angelo, PA) 9735 in JJ at 1340. (Rasmussen, CA)

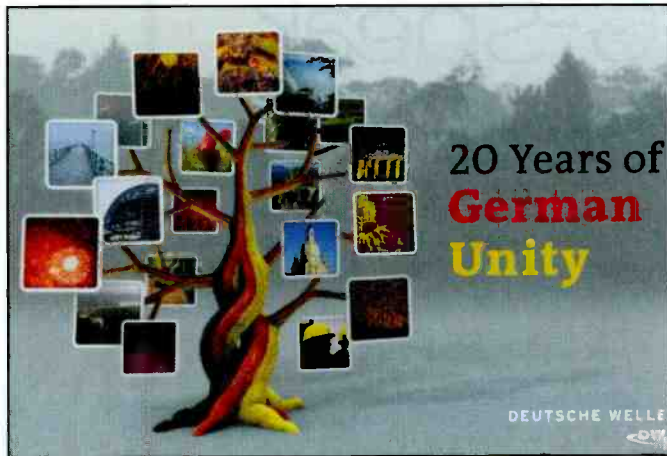
TANZANIA—Radio Tanzania Zanzibar, 11735 in Swahili at 1802 with M doing news, several mentions of "ZBC" and "ZBC Radio." They were off the air by 1832. (Sellers, BC) 1845 with sub-continental-sounding music. (Rasmussen, CA) Nice music to sudden loss of signal at 2115. (Maxant, WV) 2047-2108* with M hosting Swahili pgm of local vocals. Nice ID at 2058 and a few EE words at 2101. Also, 2210-2137* with very brief Swahili talks to an abrupt ending. (D'Angelo, PA)

THAILAND—Radio Thailand, 9535 at 2036 with M/W ancrs, EE news with ID and promo anmt at 2040. (D'Angelo, PA) 9720 with Thai news, 9950 on the Thai government. (Maxant, WV) 13745 at 0000 with time pips M with EE ID, march-like anthem and M/W with *Newshour*. (Coady, ON) 1130 with EE anmt introducing pgm in Lao. (Sellers, BC)

TURKEY—Voice of Turkey, 5960 with Turkish vocals at 2330, 9655 at 0410 on U.S. missiles being installed there and 12035 at 1355 on Syrian refugees in Turkey. (Maxant, WV) 9410-Emirler at *0155 with periodic SS IDs, 5+1 time pips at 0100 f/by W with opening ID for the SS pgm. (D'Angelo, PA)

UGANDA—UBC Radio (suspected), 4976 at 0358 but low audio levels and high QRN made an ID impossible. (Rippel, VA)

UNITED STATES—Voice of America, 6170-Kuwait Relay, with M ending news, W with ID and *Special English Education Report*. 9530-Philippines Relay at 1154 in Mandarin with M/W talk over piano.



John Miller also got this "anniversary" card marking 20 years of German Unity from Deutsche Welle.

(Coady, ON) 9320-Philippines Relay in (I) Burmese at 1331, 15115-Northern Marianas Relay in (I) Mandarin at 1235, and 15250-Philippines Relay in (I) Mandarin at 1237. (Brossell, WI) 11705-Thailand Relay at 0106 with top news stories of 2012. (Sellers, BC)

Radio Free Asia, 9875 via Lithuania in Tibetan at 2313. Oriental songs at 2316 and M/W talking over the top. (Coady, ON) 12140-Northern Marianas Relay in (I) Khmer at 1233. (Brossell, WI)

Radio Farda, 9395-Lampertheim Relay, on suddenly at 1730 with news in Farsi. (Sellers, BC) 11750 via Biblis at 0841 in Farsi with nice ID at 0850, Email address and a remote report. (D'Angelo, PA)

Armed Forces Network, Diego Garcia, 4319u with world news at 2201. (Brossell, WI)

Adventist World Radio, 9770-Austria Relay in (I) Dyula at 2015. And 15320 via Guam at 2225 in Indonesian. (Brossell, WI)

TWR, 15480 via Sri Lanka in Mandarin with W and religious talk. (Coady, ON)

WWCR, Tennessee, 5935 at 1850 with Gene Scott. (Maxant, WV)

WEWN, Alabama, 11520 at 1825. (Maxant, WV)

WRMI, Florida, with M preacher at 1430. (Maxant, WV)

WJHR, Florida, with a preacher at 2140. (Maxant, WV)

WTTW, Tennessee, 12105 with ID at 1902 before returning to regular religious pgmg. (D'Angelo, PA)

WRNO, Louisiana, 7506 at 0213. Very good signal, but with some distortion. (Sellers, BC)

KJES, New Mexico, 7555 at 0110 with a child reciting Hail Mary in SS. (Maxant, WV) 11715 in SS at 1644. Fair with low modulation. (Sellers, BC)

WWRB, Tennessee, 3185 monitored at 1840 with Brother Stair. (Maxant, WV)

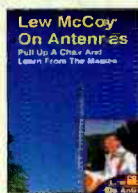
VATICAN—Radio Vaticana, 6075 at 0803-0805* in (I) AA f/by IS at 0804. the carrier was cut at 0805. (D'Angelo, PA) 11625 via Madagascar at 0200 to Africa. (Rasmussen, MD) 2001 with Catholic Liturgy, then IS and begin of EE pgm at 2010. (D'Angelo, PA) 13765 at 1732 with religious talk and Bible reading. (Sellers, BC)

ZAMBIA—Zambia National Broadcasting, 5915 at 0357 in vernacular with soft African vocals and brief talk at 0341. (Coady, ON)

That wraps things up for this month — except to extend our salutes and high fives to these folks for contributing their logs this time: Harold Sellers, Vernon, BC; Rich D'Angelo, Wyomissing, PA; Robert Wilkner, Pompano Beach, FL; Chuck Rippele, Chesapeake, VA; William Hassig, Mt. Pleasant, IL; Ralph Perry, Wheaton, IL; Charles Maxant, Hinton, WV; Joe Wood, Greenback, TN; Robert Fraser, Belfast, ME; Lloyd Rasmussen, Kensington, MD (reporting logs made in CA); John Miller, Ochlocknee, CA; and Robert Brossell, Pewaukee, WI. Thanks to each of you and until next month — good listening!

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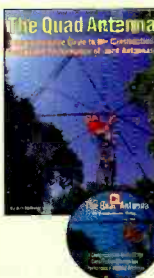
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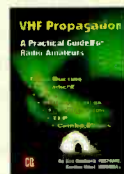


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A Guide to GIG-Speak (Revisited, Revised, Refreshed)

By Gerry Dexter, WPC9GLD

“It’s time for a refresher course, and perhaps to include some abbreviation explanations for those ‘abbr’ that may have snuck in under the fence.”

WWe shortwave listeners have a language all our own. It’s one that’s not necessarily interchangeable with those used by the hams, or UTE DXers.

SWBC (shortwave broadcast) listeners, finding themselves amongst a table full of BCB (broadcast band) enthusiasts, can be just as mystified as anyone dealing with talk of night patterns, TAs, CPs, U-1, D-2s, and so on. Five minutes’ worth of that stuff could set your eyebrows on fire!

Similar situations can be found elsewhere. Any profession would leave the neophyte or just someone who’s been out of touch for any length of time quite confused. Baseball players, dermatologists, plumbers — they all have their own slang and, in overhearing them, the uninitiated can be left in full head-scratching mode.

Some three years ago my *Global Information Guide* column occasionally featured a sidebar called *A Guide to GIG-Speak*, which was an attempt at making sense out of all the abbreviations used in the column.

So it might be time to present a refresher course — and perhaps include some abbreviation explanation for those “abbr” and such other shortcut talk that may have snuck in under the fence when I (or we) weren’t looking.

For Your Reference

Here’s a comprehensive list of abbreviations frequently found in Pop’Comm’s monthly Global Information Guide:

* – An asterisk placed just before or just after a UTC time indicates a sign on or sign off

l (after a frequency) - indicates a lower sideband operation

(nf) – A new frequency for that station

(p) – the station mentioned is a presumed reception. The reporter is quite sure — but he is not absolutely positive.

(u) – after a frequency the broadcast was using upper sideband (often true with pirates)

v or (v) – indicates the time or frequency varies, even if just by a few tenths of a kilohertz

// a parallel frequency carrying the same program or service at the same time

AA – Arabic language or speaker



Photo A. The Shepherd Gate clock at the Royal Observatory, Greenwich, UK shows Greenwich Mean Time, GMT, which is a 24-hour clock used as a standard around the world. When this photograph was taken, it was 14:05:42 GMT, or 2:05:42 p.m. in Greenwich. (**IN DEPTH:** Learn about GMT at <http://bit.ly/RUw0VJ>). – WPC9GLD (Courtesy of Alvesgaspar via Wikimedia Commons)

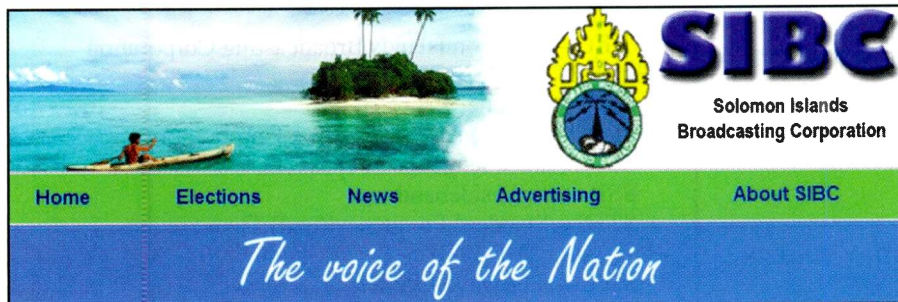


Photo B. SIBC, which stands for the Solomon Islands Broadcasting Corporation, is an abbreviation you often see in Gerry Dexter, WPC9GLD's, *Global Information Guide*. Visit: <<http://www.sibconline.com.sb/>> (*Internet screen grab*)

- ABC – Australian Broadcasting Commission
- ad – advertisement (a commercial)
- AFN – Armed Forces Network
- AFRTS – Armed Forces Radio TV Service
- AIR – All India Radio
- alt – alternate
- AM – Amplitude Modulation, the AM radio band
- annt(s) – announcement, or announcements
- AWR – Adventist World Radio
- BBC – British Broadcasting Corporation
- BBG – Board of Broadcasting Governors (US)
- BSKSA – Broadcasting Service of the Kingdom of Saudi Arabia
- BOH – Bottom Of (the) Hour
- CA – Central America
- CC – Chinese language or speaker
- Co-chan – co-channel, operating on the same frequency, not on the next.
- Comm – commercial
- CP – Bolivian music
- CRI – China Radio International
- CVC – Christian Vision International
- DD – Dutch language or speaker
- DJ – disc jockey
- DS – Domestic service
- DSWCI – Danish Shortwave Club International
- DW – Deutsche Welle (Voice of Germany)
- DXing or DXing – distant listening or a distant DX station
- EE – English language or speaker
- ECNA – East Coast of North America
- f/by – followed by
- FEBA – Far East Broadcasting Association
- FEBC – Far East Broadcasting Company
- FF – French language or speaker
- FM – Frequency modulation
- GG – German language or speaker
- GMT – Greenwich Mean Time (**Photo A**)
- HH – Hebrew, Hindi, Hungarian
- HF – high frequency
- HOA – Horn of Africa, usually music particular to that area
- ID – (station) identification
- II – Italian or Indonesian language or speaker
- intl – international
- instl(s) – instrumental or the plural form
- IBB – International Broadcasting Bureau
- IRIB – Islamic Republic of Iran Broadcasting
- Irr – Irregular, (time, day or frequency use)
- IRRS – Italian Radio Relay Service
- IS – interval signal
- JJ – Japanese language or speaker
- KCBS – Korean Central Broadcasting Station
- kHz – kilohertz

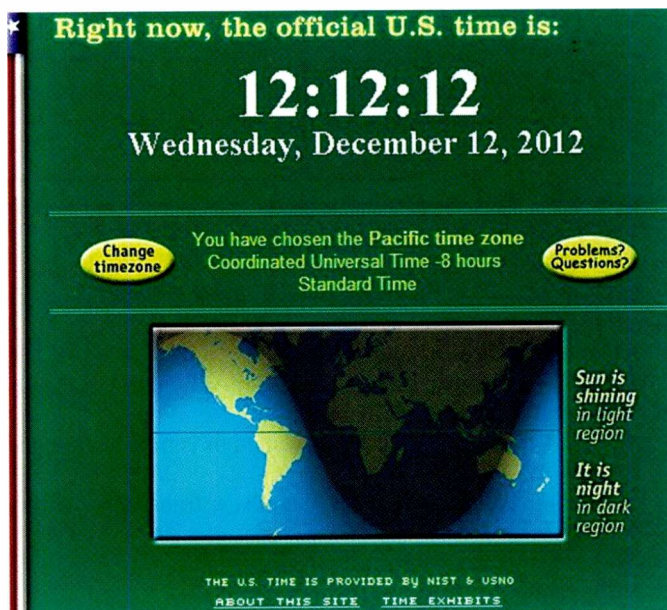
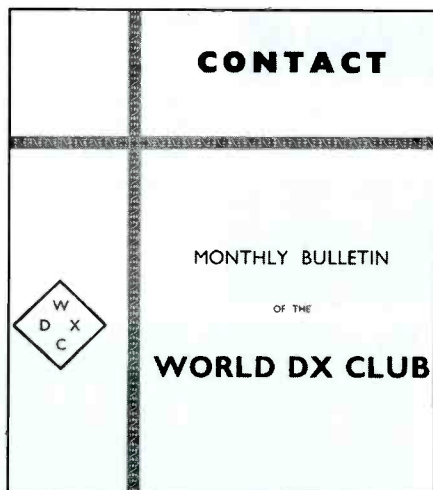


Photo C. This Internet screen grab captured the Coordinated Universal Time (UTC) in the U.S. Pacific time zone at 12 minutes, 12 seconds after noon on December 12, 2012, or 12-12-12-12-12-12. (**IN DEPTH:** For details on UTC, visit <<http://bit.ly/TIAjHK>>. – WPC9GLD) (Courtesy of KPC6PC)

- KK – Korean language or speaker
- KW or kw – kilowatts
- LSB – lower sideband
- LV – La Voz, La Voix (The Voice)
- M – man or male
- MHz – megahertz
- MW – medium wave (the AM/BCB band)
- NA – national anthem; North America
- NBC – National Broadcasting Corp. (Papua New Guinea)
- (nf) – A new frequency used by that broadcaster
- OA – Peruvian music
- OC or O/C – An open, (unmodulated) carrier wave
- orch – orchestral
- PBS – Peoples Broadcasting Station
- pgm(s) – program or plural
- PP – Portuguese language or speaker
- promo – a promotional announcement
- PSA – public service announcement
- QQ – Quechua language or speaker
- QRM – man-made interference
- QRN – atmospheric noise (static)
- QSL – verification from a radio station
- Rdf – Radiodiffusion, radiodifusora
- REE – Radio Exterior de Espana
- RFA – Radio Free Asia

Photo D. The first edition of *Contact*, the journal of the World DX Club (WDXC), was published in May 1968. After a long and distinguished run, it ceased print publication in November 2012. The club, however, goes boldly forward. Visit: <<http://www.worlddxclub.org.uk/>> (Internet screen grab)



RFE/RL – Radio Free Europe/Radio Liberty
 RNZI – Radio New Zealand International
 RR – Russian language or speaker
 RRI – Radio Republic Indonesia, Radio Romania International
 RTI – Radio Taiwan International
 Relay – A transmitter owned or operated by that broadcaster or privately operated on its behalf
 relay – A transmitter site that is rented or is time exchanged
 SA – South America
 SCI – Song of the Coconut Islands, a transition melody sometimes
 SEA – Southeast Asia
 s/off – sign off

s/on – sign on
 SIBC – Solomon Islands Broadcasting Corporation
(Photo B)
 sked – schedule
 SLBC – Sri Lanka Broadcasting Corporation
 SS – Spanish language or speaker
 SSB – single sideband
 STFS – Standard Frequency (and) Time Station
 <<http://bit.ly/VDdYBU>>
 SWL – shortwave listener
 T/C – time check
 t/in – tune in
 TOH – top of (the) hour
 t/out – tune out
 TT – Turkish language or speaker
 TWR – Trans World Radio
 Unid or unid – unidentified
 USB – upper sideband
 UTC – Coordinated Universal Time,
 <<http://bit.ly/TIAjHK>>, **(Photo C)**
 UTE or ute – utility station
 Vern or vern – vernacular (any local) language
 via – same usage as *Relay* (lower case)
 VOA – Voice of America
 VOR – Voice of Russia
 VOIRI – Voce of the Islamic Republic of Iran
 W – woman or female
 WCNA – West Coast of North America
 WDXC – World DX Club **(Photo D)**
 WRTH – World Radio TV Handbook
 ZBC – Zimbabwe Broadcasting Corporation

DX World Guide
 By Franz Langner, DJ9ZB

Known throughout the DX and DXpedition world as a meticulous and tireless operator, Franz Langner, DJ9ZB, is also noted as one of the most knowledgeable individuals in Amateur Radio in terms of documenting DXCC entities. This is the third edition in his series of books bearing the title *DX World Guide*, first published in Germany in 1988, and then in a second edition, also in Germany in 1997. This edition is the first to use color throughout, and includes information on well over 300 DX entities. Whether used as a desk reference for the DXer of any level of proficiency or as a “wish book” for DXers just starting his or her DXCC journey, the new *DX World Guide* is a worthy and pleasant companion.

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AM Gone But Not Completely Forgotten

by Shannon Huniwell,
WPC2HUN
<melodyfn@yahoo.com>

“Though the words convey certainty that the famed band member was high on the power of AM and FM, neither Jan Lowry nor I are sure of all the intricate connections between Perry and the iconic-looking but sadly now silent Hanford station”

Who can be absolutely certain of the identity of the boy pictured in the falling tower photo printed in the *St. Petersburg Times*? A musty clipping showing the 1965 event was sent my way by a *Pop'Comm* subscriber wondering if I could verify the kid as his former fourth grade chum. The mother of shortwave listener/scanner enthusiast, Jayson Tucci recently found the picture — ripped from all but a few words of its related caption — while unpacking some old Christmas decorations.

It was part of a larger piece of shredded newsprint protecting a delicate Rudolph reindeer ornament. Because Tucci's mom noticed that one of the newspaper's articles was radio-related, she set it aside. It became a topic of conversation during his December 2012 holiday visit to the old Florida homestead. Jayson believes the press photo shows his friend Wyley, and vaguely remembers him talking about its content in one of their class' current events sessions.

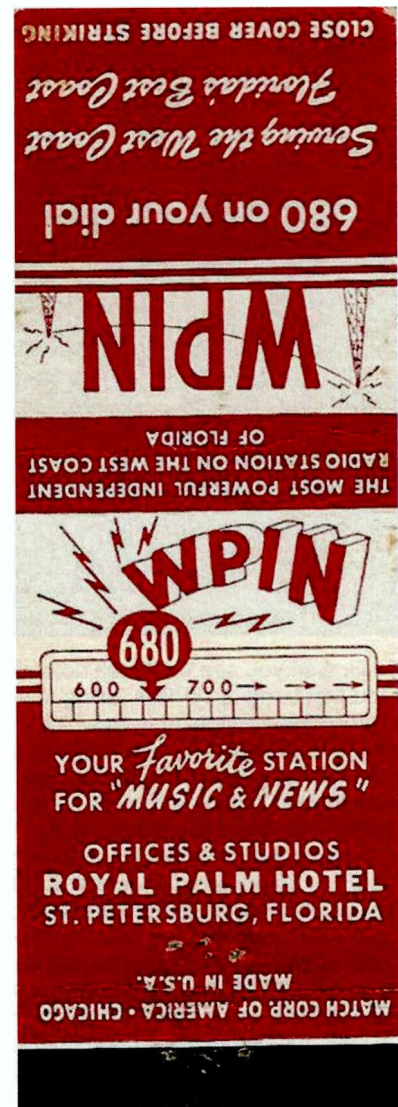
“Sadly,” Jayson recounted, “Wyley can't be of any help solving this mystery. He was a great daredevil and, besides repeatedly getting as close as possible to that crashing tower . . . a couple of years later, he borrowed someone's *Sunfish* sailboat in an apparent attempt to navigate solo across the Gulf of Mexico.”

Classmates recalled him predicting he'd make such a voyage. “He fancifully presented an oral book report on ‘The Old Man and the Sea,’” Jayson reflects, “and spellbound us with a soliloquy on the proposed adventure, as if it had already been accomplished. After his performance, there were several pregnant moments of quiet before some kids started muttering *what a stupid story* he'd told. Even the teacher said

something like, ‘Yeah, right . . . You even had me believing your plan for a minute there.’”

The Coast Guard recovered the little red and white capsized boat — its sheet rope tied fast to a cleat only meant to reduce the line's friction — about 55 miles due west from the mouth of Tampa Bay. Thirteen-year-old Wyley was never found. For years thereafter, the legend grew to the point where several of Wyley's former classmates on vacation with their parents in Mexico reported seeing him with long dyed-jet black hair and Castro beard somewhere in the rustic seaside

Photo A. An early 1950s matchbook cover heralding WPIN. This probably dates prior to the station's 1953 official city-of-license change from Clearwater to St. Petersburg. Because most of Tampa Bay area's stations were affiliated with networks at the time, WPIN management could identify the 1,000-watt facility as “the most powerful independent radio station on the Sunshine State's left coast.” Note the interesting slide rule dial that only indicates 600 to 700 kilocycles . . . and a trio of arrows pointing towards the seemingly irrelevant remainder of the broadcast band. And the two self-supporting towers with a wire strung between them are curious for a non-directional outlet. That wire antenna would be a temporary reality, however, while crews installed a new stick in 1965.



markets of Ciudad Madero. There was also a supposed sighting in a shack near Cancun. Arguably, much of this related to Wyley's favorite conspiracy theory about how easy it would be for a boy to learn a foreign language, change his identity, and then vanish in plain sight.

Was Wyley the kid closest to the crumbled AM tower in that newspaper picture? In the logical parlance of *Star Trek's* Mr. Spock, "Unknown."

I was, however, able to uncover the call letters of the radio station connected to the photographed antenna. Knowing the name of the paper and the piece's date, it was relatively easy to locate a digital file revealing the lost wording. "First it sagged, then it fell and snapped," the caption writer began, "... and thus

ended 17 years of service for the tower at radio station WPIN on 62nd Avenue North, in St. Petersburg, yesterday [March 20, 1965]. It wasn't an accident or an act of nature. WPIN felled the 300-foot tower to make way for a new one."

The paper then reported that, until the nearly 400-foot replacement stick could be commissioned several days later, WPIN listeners would be hearing a signal emanating from a "temporary antennae [sic] strung between pine trees." Also chronicled was WPIN management's concern that tower riggers might miscalculate their demolition and inadvertently cause the structure — or pieces of it — to rain down on some "nearby houses."

Jayson Campbell says that his friend Wyley lived in one of those homes close enough to get the station on their plumbing.

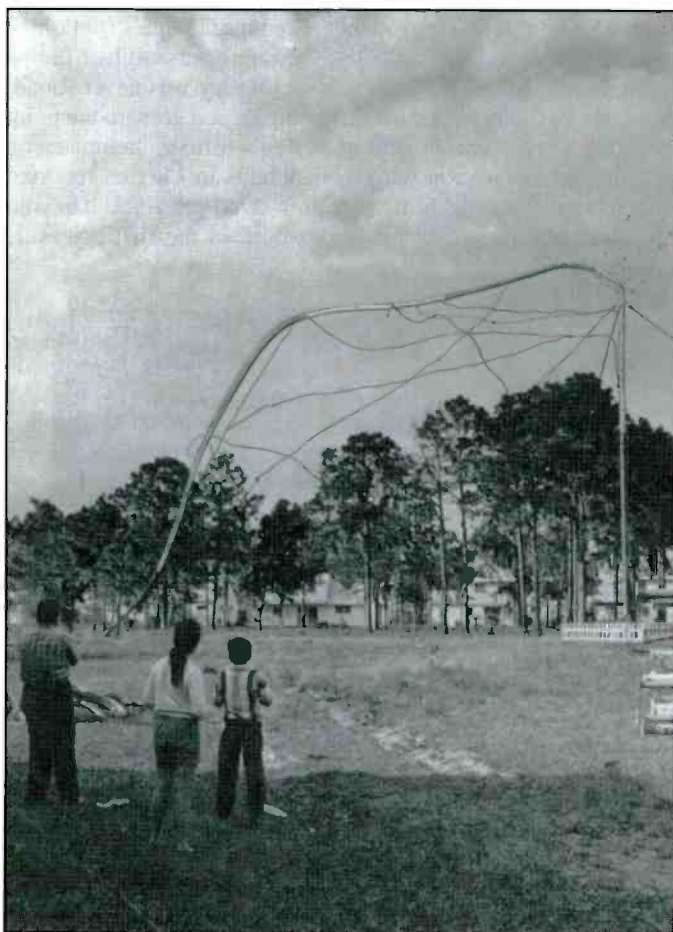


Photo B. Can you see the black dots exploding in mid air near the first bend in WPIN's falling tower? The *St. Petersburg Times* clipping from which this photo was found reports that those specks are "chips of [red] paint flying away from the tumbling tower as it breaks up." Felling of the 300-foot tubular stick — arguably a Lingo-brand Tubular Pole antenna — was intentional and required to make way for a taller, three-faced tower designed to augment WPIN's signal and hold the antenna bays for new WPIN-FM. A guy working for the tower company told a *Times* reporter that his demolition plan was to loosen guy wires anchored into the ground near the houses (in background) and tighten ones towards the open field where he predicted the structure to fall. Wind kept things from going smoothly during the first few attempts. By the way, the boy in the striped shirt is reportedly the friend of *PopComm* subscriber, Jayson Tucci, who contributed this story suggestion.



Photo C. Broadcast station buffs will no doubt agree that the *St. Petersburg Times* photographer who spotted this scene had a great eye for radio. "Happiness is _____," was a trendy mid 1960s way to confer *positive vibes* about a particular noun, no matter how otherwise mundane. WPIN's marquee visually broadcast the thing for which station management and staff could be most proud. Surprisingly seldom employed as a promotional device today, such signage — especially with a programming prompt (NEWS IS ON) designed to motivate the curious — was a real asset to smaller stations located within sight of a well-traveled roadway.



Photo D. While story contributor, Jayson Tucci was a bit hazy about the TR-6P model number, he could vouch for the fact that the six-transistor Lloyd's radio shown here is identical to the shirt pocket portable that lived its life receiving WWBA 680 in his mom's kitchen. "Once, while pulling dishwashing duty during my junior high years," he laughs, "I sort of accidentally bumped it into the warm sudsy water. I guess I was sick of the 'old peoples' music it played and the fact that my mother had one kitchen rule; Don't fool with that delicate dial! Even after its trip to our sink's version of Davy Jones' locker," Jayson remembered, "the darn thing still worked." He yelled for his sister to come see the curious sight as it dried off; Little bubbles forming on the speaker grill.

Jayson mentioned playing in Wyley's room and, whenever the conversation stopped, hearing high-pitched strains of music in the background. His buddy pointed to a hefty pair of crystal headphones hanging on the bedpost and plugged into what was described as a germanium diode radio and then bragged that "it runs all day for free." Presumably, it was playing WPIN, a St. Pete AM that, like the Wyley of legend, decided to assume a different name and language. In fact, the Florida broadcast property born on 680 kilohertz has had at least eight identities.

Shining An Historical Ray On One Tampa Bay Station

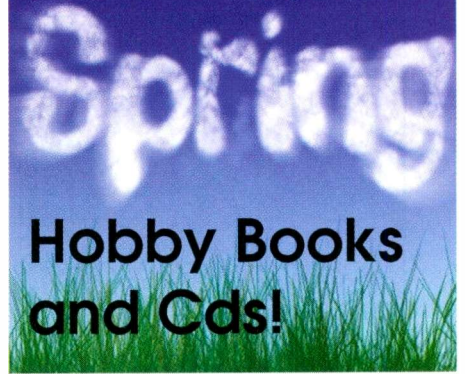
WPIN, the lively St. Petersburg Top-40 outlet in our 1965 newspaper photos, began life in 1947 as a sleepy Clearwater daytimer named WCLE, in honor of its hometown. This 1,000-watt facility remained in founder Clearwater Broadcasting Company's hands until the 1950 sale to Florida West Coast Broadcasters, a company with identity reinvention on the agenda. The buyer quickly positioned its purchase as a county-wide electronic media service and de-emphasized Clearwater coverage while focusing on potential listeners throughout Pinellas County. Consequently, WCLE became WPIN with auxiliary studios and an office opened in the St. Petersburg-based Royal Palm Hotel.

Prior to deregulation of the 1980s and '90s, one could not simply abandon his or her broadcast facility's city-of-license in order to tryout a more populous locale without FCC approval. Government permission to officially identify with St. Pete arrived from Washington during 1953. Five years later, WPIN hit the road again. This time studios and offices were fitted into its revamped St. Petersburg transmitter building overlooking the backyard where the 1965 falling tower picture was snapped.

The demolition allowed for the construction of a taller, stronger stick on which the antenna for a new FM could be mounted. At 107.3 megahertz with about 30 kilowatts, WPIN-FM debuted with programming distinct from its AM sister and became the more attractive of the two signals, leading to the combo's 1968 sale.

The Buyer, WWBA, Inc., had already decided on a set of anticipated available call letters, WWBA and WWBA-FM, first adopting them in its corporate name and then successfully seeking them for the WPIN twins. The pair flipped to a beautiful music format, the favorite audio fare of a growing number of the upwardly-mobile adult demographic calling the Tampa/St. Pete area their home for at least part of the year. An interesting website covering Central Florida Radio's past, [Radioyears.com](http://www.radioyears.com)<<http://www.radioyears.com>>, says this switch was cleverly handled.

"Before converting WPIN to WWBA,



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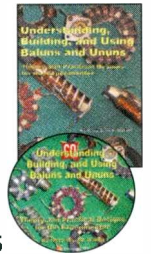
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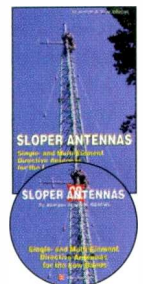
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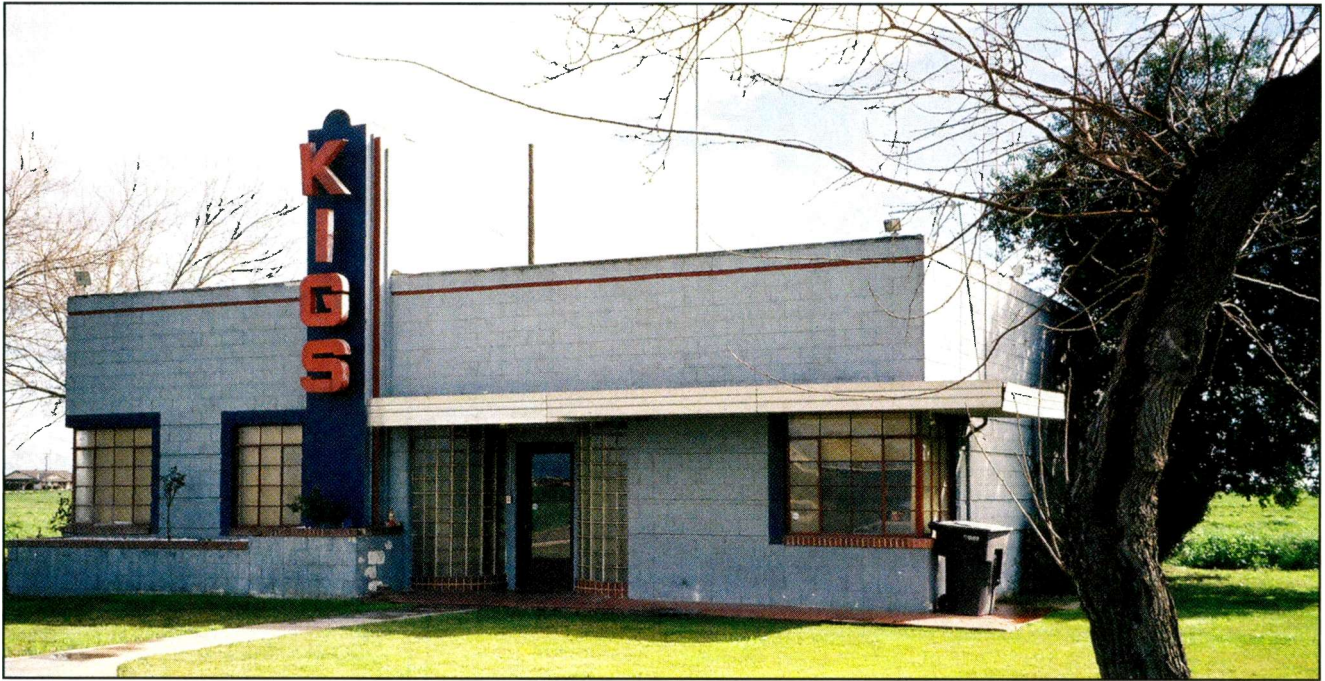


Photo E. As Jan Lowry focused his lens for snapping this shot of the KIGS pylon-mounted sign, he couldn't help but notice that the "I" had suffered some sheet metal modifications. "That's right!" He realized, "in a previous life, the 'I' had been an 'N' suitable for identifying the Hanford AM by its original name, K-N-G-S. Imagine approaching those glass brick accent windows as you entered the station in order to audition for an announcer position . . . That Art Deco architectural feature and the sight of two stately towers would be sufficient to produce butterflies in the stomach of any applicant! Check out the cardboard against the inside of the other windows. Apparently, nosey kids from the nearby neighborhood were not encouraged to peek.

[the stations' new ownership] engaged in a massive advertising campaign which was extremely successful in generating public curiosity. [They] had billboards and bus stop benches throughout Tampa, St. Pete, and Clearwater painted to read *A New Bay is Coming to Tampa!*, *A New Bay is Coming to St. Petersburg!* The signs said nothing else and gave no hint as to what type of service or product they referred to. After several months, the public breathlessly awaited to see what the *New Bay* would be. It turned out to be Bay Radio WWBA, a new radio station with a new type of format" — instrumentally-based beautiful music, or in the period vernacular, doctor's office/waiting room music.

The Sunshine State radio resource reports that in the late 1970s the old 62nd Avenue studio/transmitter building, dubbed "Broadcast House," was re-purposed for RF generation only. That's when the "offices and studios moved to 9721 Executive Center Drive in the Koger Complex, and the towers relocated to a single stick behind Derby Lane on Gandy Boulevard. The AM was a 1-kilowatt daytimer, while the FM broadcasted full time with 64,000 watts in stereo. The FM's power would be upgraded to 100,000 watts in 1975."

Someone associated with the website has a good memory of the Executive Center Drive setup, circa 1980 and describes it this way: "A narrow hallway housed the automation system — six Scully reel-to-reel tape decks for the FM and four for the 1-kilowatt AM. Below were two time-announce cart machines. One played the odd minute time checks and the other played the even. A series of standard cart machines were located on top of the racks, each loaded hourly with spots scheduled to run as per the program log. Although both stations shared a single

production room, the AM had a full control room with an adjoining news booth while the FM had only a very small announcer's booth. FM programming was a 50 percent duplication of the AM" with FM exclusive origination after the AM signed off at sunset.

With the possible exception of youthful fare inexpensively generated by some late 1960s/early '70s FMs running reels of Top-40 hits largely unattended or virtually without any live voices, the traditional beautiful music format was one of the few brands of radio programming that became incredibly successful without much human presence or personality.

Radioyears.com proudly points out that "in the ratings, WWBA was a solid number one 12+." That's a real testament to the station's older listenership that was so big that the under 35 demographic were likely those in households where a pre-Baby Boomer controlled the dial.

Baking Pan Quality Audio

Jayson Tucci's mother was part of that big audience. Not long before the Apollo 11 moon landing, she'd won some "guess how many paper stars there are in the jar" contest at a local shopping center and received a Lloyd's transistor radio as her prize.

Jayson clearly remembers that shirt-pocket portable for two reasons; his late dad's name was Lloyd and "it was always on the kitchen counter next to the sink playing schmaltzy music all day." He laughs that the tiny radio's 3-inch speaker's attempt to reproduce orchestral cover versions of pop standards sounded like violins made from copper wires and tin pie plates! Apparently, this condition was made worse by the transistor's

several accidental swims in dish water over years. Still, his mom loved that plastic AM radio. Even after Jayson and his sister gave their mother a nice Panasonic AM/FM table radio and demonstrating how much better WWBA's product sounded in frequency modulation mode with a modest amount of stereo separation from two speakers, she insisted on hearing it the old fashioned way — in rather flat and tinny monophonic AM. Their mom kept the Panasonic at the ready, though, on a guest bedroom dresser "in case company couldn't sleep and wanted to hear the news or weather."

Jayson admits never paying much attention to WWBA-AM or FM, as it wasn't a particularly cool station among kids. But he did notice another set of calls and more vocals emanating from his mom's faithful Lloyd during the early eighties. We figure that was WWLF or Life 680, the Music of Your Life standards-type incarnation of WWBA begun in 1981 when *The Bay's* owner sold WWBA-FM to Metromedia, Inc., but kept the little AM in order to remain active in the business. The following year, WWLF morphed into WLFW. When the 680 daytimer did get sold in 1985, buyers gave it yet another closely related identity, WLFF. Six years down the road, both its name and language were changed when this WLFF version of nostalgia/Music of Your Life 680 started speaking Spanish as WRMD, Rumba 680.

While that foreign tongue was maintained after a 2006 sale, the original WCLE which had long since changed to WPIN, next WWBA, then through the confusingly similar "life series:" WWLF, WLFW, and WLFF, before assuming Spanish dressed as Radio Mundo WRMD, finally (as of early 2013, anyway) took the ID as WGES transmitting a religious format with Spanish language play-by-play of the Tampa Bay Rays.

The latter signal is a full-time upgrade over the St. Pete frequency's long-held 1,000-watt, daytime-only status, and runs 6.9-kilowatt days and 12.5 kilowatts at night. Jayson Tucci guesses that much of this higher power footprint gets directed over the ocean waves that claimed his grade school friend, Wyley Duncan, who once lived near the old WCLE/WPIN tower.

On The Cover Of The Roll-A-Way Record

Something only tangentially related to any Florida radio activity presents me an



Photo F. The KIGS site on New Year's Day 2013. Arguably, it's no *Times Square* on the big day after and — other than fallen leaves instead of ticker tape — offers little indication of celebration. Jan admitted being sad as he clicked the shutter on the remaining vestiges of this now silent AM station. He walked away from the moribund scene hoping that someone might take an interest in the old 620-kilohertz outlet and implement a plan to return it to the Hanford, California area airwaves.

opportunity to answer a reader's question and consider my number one *Pop'Comm* broadcast history source, Jan Lowry, as clairvoyant.

Jayson Tucci's 2012 Christmas celebration visit to his Mom's Sunshine State house had an additional purpose. He and his sister helped their mother in the final phase of downsizing before moving her into a "bright, carefree condo close enough to Tampa Bay to benefit from some very pleasant sea breezes."

One box of stuff that he was assigned to go through contained his long-lost 1986 Journey album, "Raised On Radio." (*LISTEN: To Journey's "Raised on Radio"* <<http://bit.ly/T5J3CX>>.) When he enthusiastically grabbed the musty thing, its LP jumped free of the jacket, rolled across the length of the kitchen, continue onto a screened porch, and then fatally crash into the sharp metal leg of the patio table.

Perhaps in the clean-up/throw-out spirit of his assignment, Jayson cut away the front cover and then chucked the back part along with the chipped record into a 30-gallon plastic trash barrel awaiting such decisions in the middle of his mother's kitchen. He has since framed the intriguing image and gladly gave it wall space next to a *Pop'Comm Monitoring*

Station certificate in his Indiana listening post.

Jayson tells me that the album cover art has "captivated" him and was obviously inspired by someone associated with the group Journey who absolutely loves the sights and sounds of music radio's local heyday. The *Pop'Comm* reader added a request to his initial query about the WPIN tower photo; "Is that artist's rendering of the broadcast facility on Journey's album cover focused upon an authentic station or might the picture simply be a fanciful composite of any number of such powerful-looking AM outlets that dotted the American landscape?"

I recalled hearing a bit of radio trivia noting that the parents of Journey's lead singer, Steve Perry, had been broadcast owners. This scintilla led me to an Internet research resulting in specific call letters and a city-of-license — KIGS at Hanford, California. With that accomplished, I cashed this informational check at the metaphorical Broadcast Commerce Bank of Jan Lowry and walked away from my email inbox with a station profile and pictures showing the reality of the transmitter site Journey immortalized in album art.

Like our aforementioned Florida 680



Photo G. Don't you love those War-Of-The-Worlds Martian monster-style towers! This Jan Lowry image captured the KIGS sticks (and yellow flora) in all of their glory on an overcast afternoon during the station's Portuguese language format days. It also provides a reality check for the artistically-licensed version of the scene on the rock band Journey's "Raised On Radio" album cover.

kilohertz subject in its WWLF, WLFW, and WLFF life-forms, KIGS had been known by another and strikingly similar handle, KNKS. Both monikers were provinces of the Kings County, California coverage area held by the 1-kilowatt, full-time station on 620 kilohertz. The original owners took about seven months to build KNKS, which debuted on February 1, 1948. The noted sign-on was facilitated technically from the Art Deco-style, two tower transmitter site "four miles east of Hanford on Highway 198" and depicted on the Journey cover.

Sometime in 1950, KNKS' downtown studios/offices headquarters were abandoned in favor of its neat building on the tower property. Jan notes that the station was an early adopter of the 24-hour schedule, having done so by the middle of 1952.

This seemingly gave the licensee Hanford Broadcasting all the time in the world to reorganize with various founding family members, partners, and subsequent interests, something that occurred often until Hanford Broadcasting's 1958 (\$260,000) sale to Vallejo Broadcasting Company. Accepting \$50,000 in profit, Vallejo sold KNKS in the summer of 1960 to the Kings Broadcasting Company, a tenure which fast melded into the principal buyer's Central California Communications Corporation.

ABC Radio Network news and features were offered along with the station's home-grown programming starting in 1963. Jan's check of KNKS's musical offerings — other than middle-of-the-road selections — circa Kennedy era included 8 hours weekly of Spanish, 2 hours of country tunes, and 180 minutes of Portuguese. By then the station had long since throttled back on its 24/7 experiment, running instead from about 5 a.m. to midnight.

The dawning of 1968 saw KNKS affiliating with ABC's new

American Entertainment Radio Network, do a little more country music, and bump-up the foreign language output a bit. The country and western became the thousand-watter's main format following KNKS' 1972 (\$250,000) sale to Kings Broadcasters Limited Partnership.

During 1977, round-the-clock operation resumed, although later reduced again when lean ad sales lent logic to nixing the wee hours on the air. A 1984 offer for KNKS and sister KLTK (FM) was anything but Spartan at \$1.75 million. The buyers, Sunrise Media/Lartec Investment Company, ran the pair for only two years, before their cashing-in with a \$2.8 million sale to Liggett Broadcast, Inc. Fast on the transaction's heels, KNKS studios/offices were moved to nearby Fresno, California along with an identity shift from KNKS to KCLQ. In 1989, the still-licensed to Hanford AM was shopped around for a buyer. Liggett wanted to concentrate on its big FM, so it let KCLQ go for \$300,000 to Joaquin Correia and Maria O. Pereira.

This duo quickly dumped KCLQ's country format to make room for Spanish language programming with a dozen hours of Portuguese thrown in for good measure. It appears that KCLQ ownership wanted to get back the station's original callsign, but KNKS had been snapped-up in the interim. Resultantly, they settled on similar-sounding KIGS.

Maria O. Pereira took full control of the Hanford AM in 1990, by which time the station had quit ABC news and relocated in its predecessors' iconic transmitter site represented on the Journey album. The facility's next significant change was the 1992 switch to an all-Portuguese language output. First this fare was dubbed as the product of "Radio Horizon," and then from "620 AM, The Giant."

On the last day of July 2012, KIGS "control passed from

Maria O. Pereira — deceased — to John Pereira, special administrator. Also soon passing into history was KIGS itself. The station went dark on August 1, 2012. Jan indicates that this drastic action was not only due to a station principal's death, but can also be attributed to an incredibly rare factor; staff members' "inability to reach the station property due to a major highway reconstruction taking place in 2011 and 2012 in which the [KIGS driveway] entrance was passed by higher road surfaces and no westbound access at all. Wanting to see this fatal flaw with his own eyes, Jan grabbed a camera and drove to Hanford on January 1, 2013. That visit and nothing but static and a bit of distant sky-wave on 620 kilohertz, he reports, instantly "disclosed the abandoned nature of the station."

A Long Day's Journey Into Dead Air

If one consults *Wikipedia* or several other websites devoted to chronicling information about rock group Journey's lead singer, Steve Perry, references aplenty can be found immortalizing the story of Perry's creative role in the "Raised On Radio" album cover. Those stating that his parents Ray and Mary Perry owned KNGS jointly, or that his father was a vocalist on the station and was an investor in the broadcast property, however, are apparently highly apocryphal, *a.k.a. untrue.*



Photo H. There's little doubt that KNGS/KIGS is the muse for the cover of this LP. Though it appears that the towers have just been hit by lightning and the signage call letters (denoting Journey's name) are more akin to Japanese station identification than American broadcast media IDs, the image is a dead ringer for its three-dimensional Hanford, California counterpart. In real life, the extreme light pouring from the studio/transmitter site windows might indicate an incredibly overactive modulation transformer or an overnight DJ who is very afraid of the dark. Nonetheless, the brightness conveys the vibrant life that such a local station provided to its faithful listeners. See the ample highway leading to the station? Ironically, a loss of such access caused the picture's actual likeness' owners to turn off the studio lights and take the transmitter dark.

Jan and I combed more official sources than the Internet's usual suspects and found no reference to a Ray Perry in the Hanford AM's past. Because Perry's folks were of Portuguese descent, though, it could have been that he did sing on one of KNGS' foreign language shows. Complicating matters was an indication that Ray Perry divorced Steve's mother while Steve was a teen. For a while, we did think that one of the station's late 1980s owners, Maria O. Pereira was, in Anglicized nomenclature, Mary Perry. But, it is apparent that Perry's mom died in late 1985 and during his recording of the "Raised On Radio" LP.

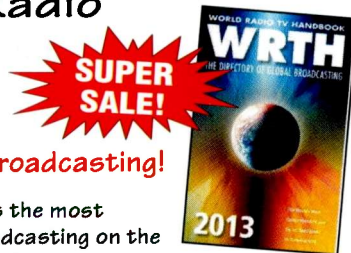
In fact, Steve Perry was born in KNGS/KIGS' hometown of Hanford (in 1949), so he was likely familiar with the KNGS building and towers that simply scream "You are now in the presence of an actual radio facility!" And chronicles regarding Perry's original fascination with pop music state that it can be traced back to he and his mom enjoying hit pop songs coming through the radio while she drove him here and there in her 1957 Thunderbird.

The hook on "Raised On Radio's" title tune never identifies the Hanford station. Rather, it expresses the experience of countless Baby-Boomers who discovered a world larger than their own through the aural medium. "Radio, radio. We're all raised on radio, radio," Perry's lyrics emphasize. "I love my radio radio, radio, radio, radio." Though the words convey certainty that the famed band member was high on the power of AM and FM, neither Jan Lowry nor I are sure of all the intricate connections between Perry and the iconic-looking but sadly now silent Hanford station.

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A New Lease on Life for a Vintage Heathkit SB-220 Amplifier for the Radio Amateur

By Peter Bertini, K1ZJH

“One fateful day I reached to tune the amplifier and managed to turn the band-switch knob instead of the plate tuning — instantly destroying the switch . . .”

Despite being a relic of another time in amateur radio, many Heathkit SB-220 amplifiers are still operating reliably in daily use in ham stations around the world.

My SB-220 came to me back in the early 1980s. It was “used” when I purchased it, and it has since suffered through three decades of heavy use in my shack. I’ll confess to being lazy, and the amplifier was pretty much neglected for those years.

One fateful day I reached to tune the amplifier, and while running full power I managed to turn the band-switch knob instead of the plate tuning — instantly destroying the switch and causing other damage. The designers had the same size knobs for the plate-loading and band-switch, all placed in line. Alas, this was a recipe for disaster if one lapsed into a moment of carelessness, as I found out!

Junk, Part Out, Or Repair?

New band-switch wafers are available, but replacing the damaged wafer involves a lot of work and time. Inspecting the amplifier revealed several other deficiencies.

The old filter capacitors were nearing the end of their usefulness and needed to be replaced. The

meter board had damaged resistors and age-related damage.

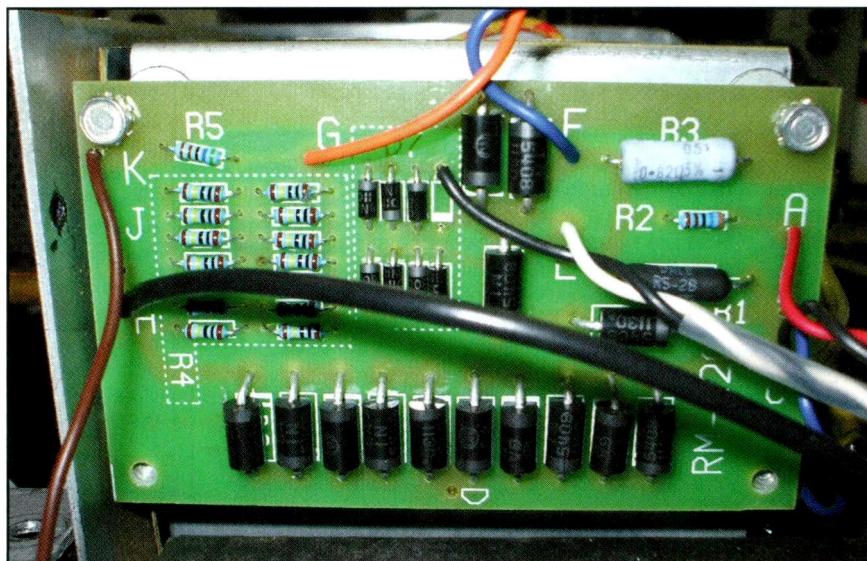
The estimated repair bill was exceeding \$200 at this point. The 3-500Z PA tubes were replaced in the early 1980s, and if they were near the end of their life, replacements would be another \$300 tab.

While the SB-220 is a workhouse, and a darn good amplifier, it lacks several amenities that limit its usefulness in a modern shack. The amplifier keying isn’t compatible with modern transceivers — although the Soft Key module from Harbach Electronics could correct this for a modest cost.

The total estimate to bring my amp back to life was growing at a steady pace.

The biggest problem was the lack of 160 meters and proper WARC band coverage. The SB-220 dates to the pre-WARC band days, although many hams have found the amplifier will perform passably on those bands. Adding WARC band coverage and 160-meter band coverage basically meant the amplifier would have to be stripped down and redesigned from the ground up. Fortunately, a 1989 *QST* article headlined *Adding 160-Meter Coverage to HF Amplifiers*, written by Rich Measures, AG6K,

Photo A. Here’s the Harbach RM-220 rectifier and meter board replacement for the Heathkit SB-220 and SB-221 amplifiers.



provided the needed impetus and convinced me it was viable to do so.

I also enjoy CW operation, and both my Ten-Tec Paragon II and Omni VI are classic QSK dream machines, while the SB-220 wasn't QSK compatible. Expense, design, and time considerations had just about cancelled out my grandiose schemes at this point, as you might imagine.

Bitting The Bullet

Realistically, getting a new Ameriton AL-80 would have been the approach taken by a saner individual.

But I decided to rise to the challenge.

The first steps were to install the Harbach replacement meter board and Harbach replacement filter capacitor kit for the SB-220. These can be seen in **Photo A** (Harbach model RM-220 rectifier and meter board) and **Photo B** (Harbach FB-220 filter block) <<http://www.harbachelectronics.com>>.

The next steps involved a complete rebuild of the chassis, top and bottom. Let's take a peek at **Photo C**. This shows the renovated under-chassis view of the modified and upgraded SB-220 linear amplifier. There's quite a bit going on here. So, let's look at the various changes that were implemented.

Under Chassis Changes

Photo D shows the large amount of work that was done below chassis. Since I wanted to modify the amplifier for the new WARC bands and to include 160 meters, the original 3-500Z cathode-matching networks were removed and replaced with the new six-band relay switched cathode-matching network.

The TU-6B board is offered as a partial kit by WD7S, and provides for up to nine-band coverage. (**NOTE:** Visit <<http://home.earthlink.net/~wd7s/TU-6B.htm>> for details and pricing. - K1ZJH.)

A close-up view of the TU-6B board is shown in **Photo E**. The L match was designed with Qs between 1 and 2, with the lower Q values selected for those bands that would also be used for WARC coverage.

For example, the 10-meter band network covers both 28 and 24 MHz, the 15-meter band covers 21 and 18 MHz, and finally the 14-meter band network will allow operation on 10 MHz to take advantage of the U.S. 200-watt band limit — a 3-dB improvement for those of us with 100-watt transceivers. The new board also has a dedicated tuned matching network for 160 meters. I needed to add a 5-VDC power supply to operate the

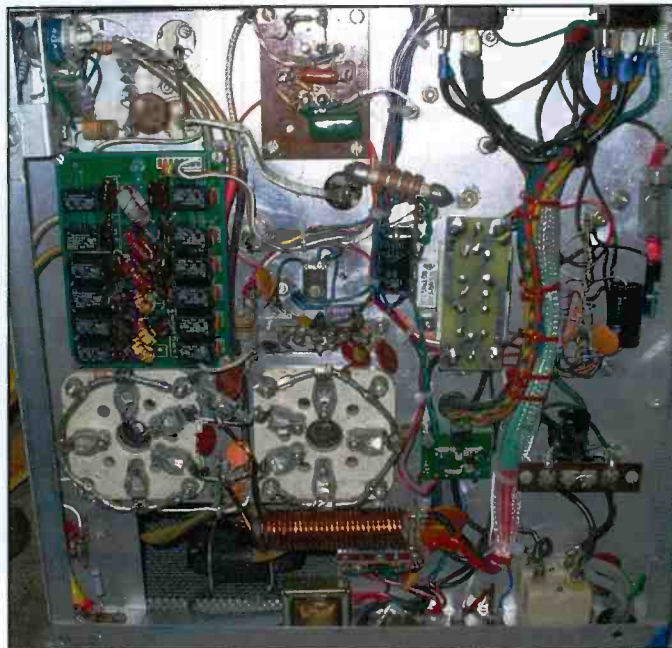


Photo C. Here's a view of the under-chassis view of the completely redesigned SB-220. The amplifier now features full nine-band coverage between 1.8 and 30 MHz and full QSK CW operation.

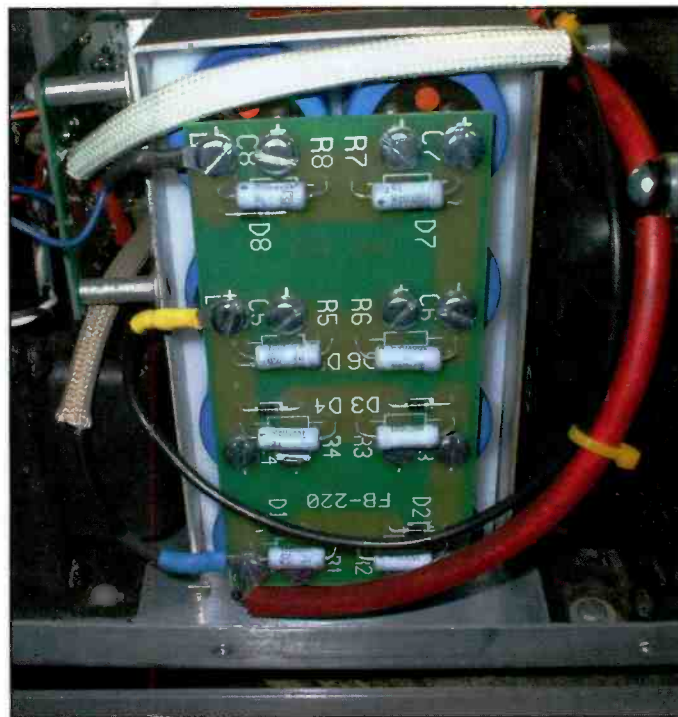


Photo B. This is the Harbach FB-220 replacement filter capacitor block for the SB-220 and SB-221 amplifiers.



Photo D. These are the RF antenna changeover relays. The high-power RF switching uses a very fast vacuum relay for true QSK CW.

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relays in the TU-6B. The small filament transformer needed for this task is mounted on the rear apron, directly behind the relocated filament choke.

The 3-500Z grids were directly grounded using short leads. The 130-VDC cutoff bias switching was changed to prevent damage to the expensive bias

and filament transformer in case of a PA tube failure.

Details can be found on the <<http://www.somis.org>> website. While I was at it — *hey, its only money!* — I also splurged on the Harbach SK-220 Soft Key module. This made the amplifier compatible with the modified FET QSK

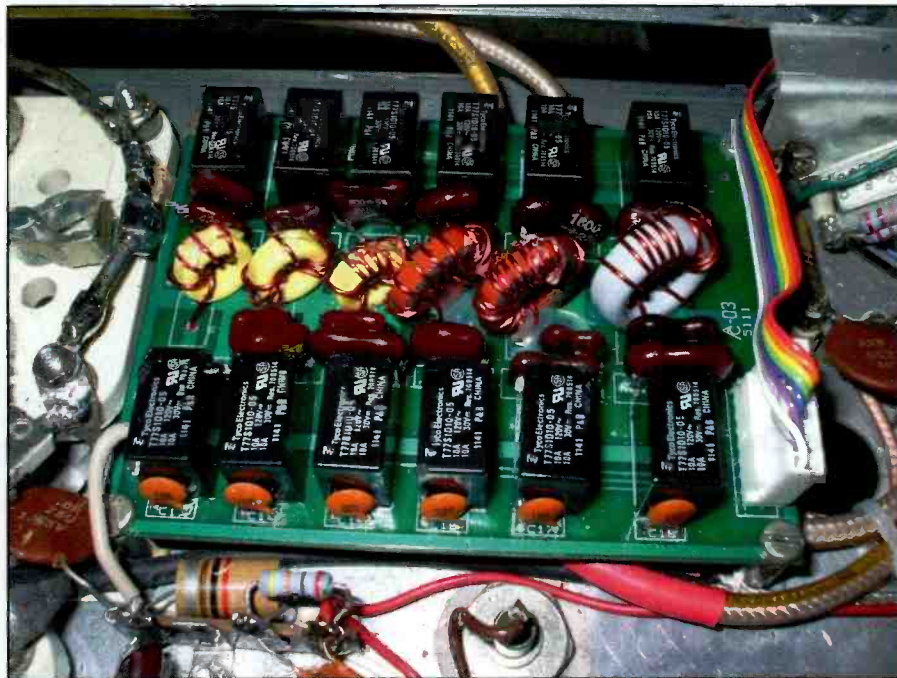


Photo E. Nine-band coverage required replacing the original Heathkit input matching network with the WD7S TU-6B input matching board.



Photo F. Take a look at the new RF deck. Adding 160 meters and the WARC bands required an extensive redesign of the entire PA network!



Photo G. A Jackson Brothers vernier reduction drive was added to the plate tuning capacitor for easier plate tuning on the higher HF bands.

amplifier keying outputs that I installed in my Ten-Tec transceivers.

I also installed the Harbach SB-221 Soft Start module. This device steps the power to limit the turn-on current inrush. ABS is another touted feature found in many newer amplifier designs. Automatic Bias Switching is used to place the final tubes in cut-off between word syllables; this supposedly saves power and improves the overall efficiency of the amplifier.

Part of the ABS circuitry is contained on the small Phenolic board that can be seen in the bottom center of **Photo C**, just to the left of the vacuum relay assembly. Point-to-point construction techniques were used.

Top Chassis Changes

Take a look at **Photo F**, which shows the extensive amount of electronic and mechanical work that was required to add full nine-band coverage to the SB-220.

An MFJ plate choke replaced the original SB-220 Heathkit choke. My choke was discolored from years of use, and there was less risk of in-band series resonances on the WARC bands with the MFJ part.

The SB-220 plate tank required several changes. The additional plate inductance to permit covering the 160-meter band



Photo H. A new front panel with newer styled knobs replaced the worn and damaged original.



Photo I. Keep those old tubes glowing! The 3-500Z final tubes are getting a work out on 160 meters. That red plate glow is a good thing. It helps keep the tubes gettered and degassed.

was achieved by adding a toroidal-wound coil. It is visible to the left of the original Heathkit plate tank assemblies.

For increased load control range, additional RF ceramic doorknob caps for the 160- and 80-meter bands are mounted on the left wall, adjacent to the plate tuning capacitor. The tuning capacitor required additional RF ceramic caps to cover the 160-meter band. Those were mounted on the rear of the loading capacitor body.

The hardest, and potentially most costly, aspect of the RF deck rework was the redesign of the RF band switch assembly. The switch now uses four wafers — three of which are expensive ceramic parts.

- The front wafer selects the relay switched band selection for the TU-6B board.
- The next wafer switches in fixed loading capacitors for the 160- and 80-meter bands.
- The third wafer section switches in fixed padder caps for the tuning capacitor on the 160-meter band.
- The last wafer selects the band taps on the plate tuning coils.

Two of the ceramic switch sections were reclaimed and repaired SB-220 band switches. This reduced the cost of the project by almost \$80.

The safety high-voltage interlock was relocated to the rear apron. Never take short cuts with deadly high voltages! I also added glitch resistor protection, which limits the maximum current in case the 3-500Z PA tubes should ever arc over internally.

A Final Improvement and Finishing Touches

I've always found the SB-220 plate tuning to be especially touchy on the higher frequency bands. I was determined to resolve this problem. A Jackson Brothers vernier reduction drive was mounted on the plate tuning capacitor. I wish I had done this years ago. See **Photo G**. Now, the plate tuning is smooth and easy to adjust.

The last step was to replace the front panel. Mine was permanently stained and discolored, and the lettering was worn. I was able to locate a fellow who was doing one last production run of replica Heathkit SB-220 faceplates. While he did reproduce the panels that followed the Heathkit green motif, I chose a more modern looking black panel, which was a better complement to the equipment in my shack, **Photo H**.

The original green Heathkit knobs were replaced with more modern knobs — similar to those used on Drake and Henry amplifiers. This time, I made sure to use different style band switch knob to make sure I never hot switched the band switch again!

One other small item that always bothered me was the lack of a standby switch. The amp had to be turned off to take it offline. A small toggle switch was added between the two small control knobs below the meters. It breaks the key line for standby.

Wrapping It Up

The project was a success! So far the original 3-500Z tubes are still delivering full power, and the amplifier is working better than I had hoped. The QSK, 160-meter, and WARC modifications have met all of my expectations. It would be impossible to cover all of the technical details that went into this project in one short column. Perhaps at a future date a more complete treatise of what took place on the workbench might be in order.

It's been my pleasure to be your host for the past few decades, and I hope we will meet again. Until then, keep those soldering irons warm, and those old tubes glowing. I sure am, see **Photo I**. *Adios!*

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'He's a WHAT?'

by Bill Price, N3AVY
<chrodoc@gmail.com>

"Yes, a registered S.O.B. Yet another case of shortness of breath, caused by pneumonia — or 'ammonia,' as I called it as a lad"

It's official. I am now registered at several hospitals as S.O.B. That should be nothing new, I guess — I think there are similar notations next to my name at several stores, at least one dry cleaner, and the DMV.

But seriously, folks, it's yet another case of shortness of breath, caused by pneumonia (or ammonia, as I called it when I was a wee lad). They say that once you get it, you just keep getting it over and over until it gets bored with you and goes after someone else.

The last two times I went to the doctor with it (or in this case, a friendly ER in Pennsylvania) I offered my own diagnosis to save them time, money, and x-ray film, but they have all insisted on doing it their way and diagnosing me themselves. Even when I said, "See, I told you so," they still charged me the same amount and left me sitting ignored for just as long as all the other people waiting to be treated.

So I came back from Pennsylvania with not only a lovely case of pneumonia, but two cases of clay pigeons, about seven enormous chokes (the kind made of copper wire from a TV station) and my very own three-phase variac — with each phase section able to handle quite a few amps.

In layman's terms, that adds up to several hundred pounds of copper, none of it useful except for the variac, but all of it increasing in value as I write. I've taken the copper to my bank and asked to put it into a safe deposit box, but the rental on a box that large is prohibitive, though copper is now considered a precious metal. I'm thinking of having three-phase wiring put in the house so I can dim the whole house at once, but the power company said it was not a wise investment.

And now that the heating season is almost over — at least for us here in Cowfield County — we begin to put away the space heaters with only one incident to report. It seems that the long-suffering Mrs. N3AVY had gotten comfortable and didn't realize just how close her right foot was to the nice, cozy radiant heater. Since neighbors sometimes burn some odoriferous items in their wood stove, I ignored the telltale aroma of a sneaker-sole when I should have been alerted.

The sole was thick enough that the heat did not warn my significant other's toes until the smell caught her nose, and by then it was too late. I might be able to remold the sole using our waffle-iron, but she's so sensitive about appearances, and is likely to know I've attempted a repair. We'll just have to buy a new one — and not just the right one either. She wants a whole new pair!

Norm, the inverse snowbird, will soon be on his way to sunny Florida, and will probably be stopping by as he passes through. He tries to schedule his trips to coincide with as many hamfests as he can hit in one trip, so I expect he'll be bringing some treasures for me to use, and perhaps to store for a season or so, depending on what goodies he finds.

It's reasonable to expect that we'll be launching some sort of antenna while he's here. Beezer is busily preparing for an impending disaster while Norm and I are pretty much preparing our next meals. I think I still have some emergency relay traffic pending in my tickler file, but I have long since lost the tickler file.

My newest email friends from the *Pop'Comm* readership now include another Dave — Dave B, who is in western Massachusetts, and he brings with him a handful of co-correspondents (or co-conspirators) to join the fray.

It's a pleasure to have readers and friends-of-readers join in the fun. Dave and I seem to have worked in parallel universes, sometimes at the same company, sometimes competitors, sometimes with the same people at different times, and even in adjacent towns along the way.

I hope you'll drop a line if you haven't already. Maybe by the next issue (or the one after that) this pneumonia business will be history and I'll actually be on the air.

Of course, that'll force me to get new QSL cards — something special for all my *Pop'Comm* ham and SWL friends. But it'll be a worthwhile investment. *Oh, and stay healthy out there.*

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