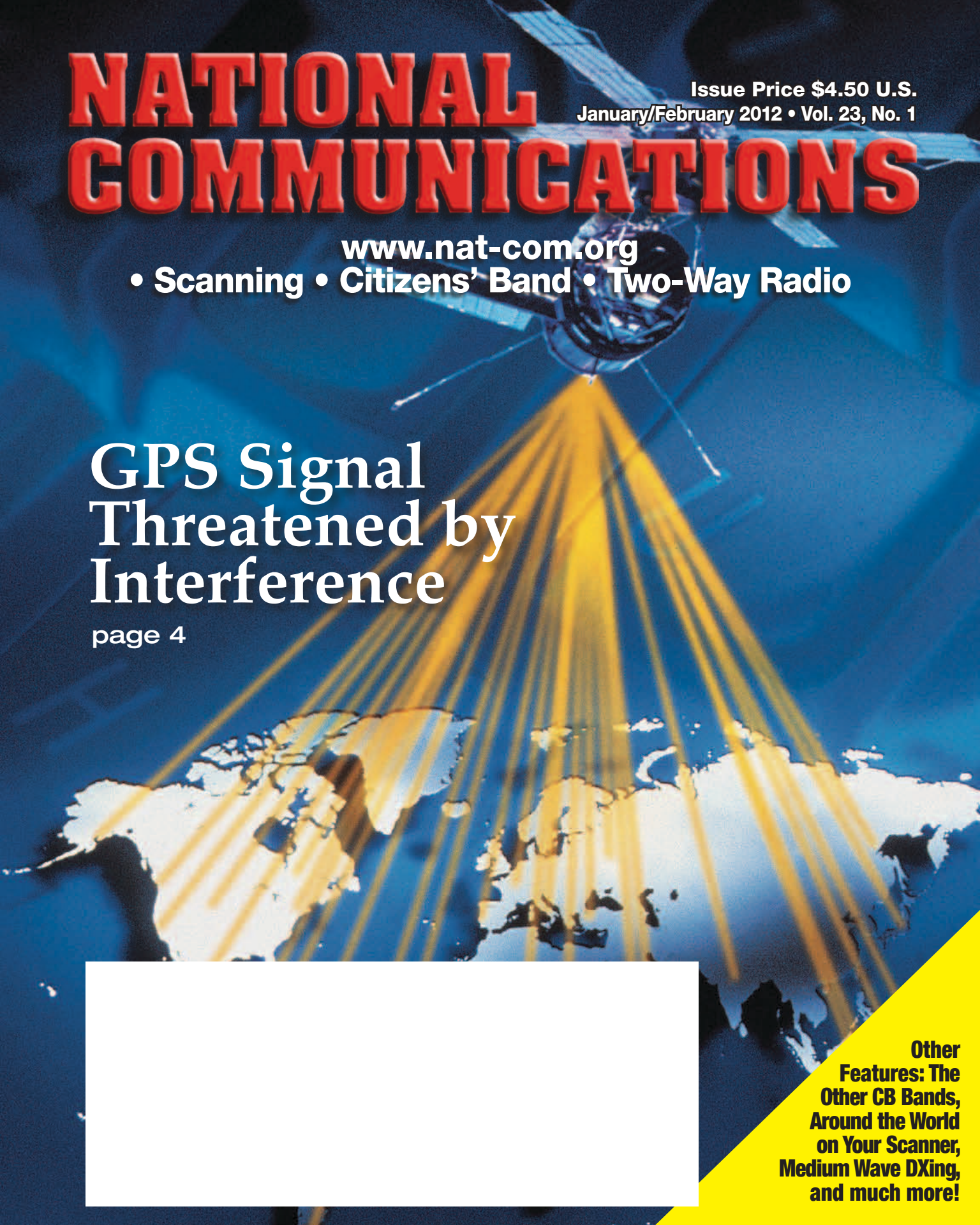
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GPS Signal Threatened by Interference

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GPS Signal Threatened by Interference

By Gordon West, WB6NOA

Our global positioning system (GPS) was originally called NAVSTAR, approved by the Department of Defense in 1973. Five years later, the first satellite went into orbit; and two years later, the constellation in six orbital planes, with a minimum of four satellites per plane, began sending signals down to Earth.

In 1983, civilian users were granted full use of the upper "L" band non-encrypted signals, and ten years later (1993) the GPS satellite constellation was complete with a few extra orbital spares.

In 2000, President Clinton ordered the civilian signals cleared of intentional DoD one hundred foot errors (selective availability, SA).

And while the rest is history on the absolute success of our GPS system, we also saw the turn-off of low frequency LORAN signals, leaving our space component of navigation as the sole source of precision timing and ranging of UHF signals.

The military component of the UHF signal is found on the lower L-band, L2, 1215 MHz to 1237 MHz. The Russian Glonass signals and the European Galileo signals are just above the encrypted military signals. The civilian signals that we use in portable and automotive GPS receivers are found on the upper L-band, 1559 MHz to 1587 MHz.

The spread spectrum emission of these civilian GPS signals (military, too) spreads out the incoming pseudo-random code pulses that are so faint that they blend in with the Earth's natural radio noise.

Your GPS receiver locks into the band limits, sampling the natural noise floor for recurring signatures within these random patterns. As your GPS receiver begins to lock in to Earth's recurring Earth's noise patterns, the count goes up on signal matches.

The military also uses this spread spectrum scheme with their "P code", with the civilian code called the "C/A code".

The civilian code for GPS satellite signal acquisition is almost jam proof – at least, that was the thinking before the "Morro Bay incident" on the west coast. Local residents of this small seaside community complained that GPS reception in their cars and handheld units became erratic down at the harbor. Local fishermen could not leave the harbor on a foggy morning because their GPS would not start working until well beyond the breakwater.

The accidental "jamming" came from runaway signal pre-amplifiers going into broadband oscillation, found in a new shipment of circularly polarized marine/RV over-the-air (OTA), television antennas. Remove power from the amplified white radome TV antenna amplifier and problem cured.

Until this year – a problem looming.

A frequency range just below our civilian GPS band, 1559 MHz-1610 MHz was allocated to space signals, much like our GPS signals from space. The Federal Communications Commission set to increase wireless broadband availability, granted access to 1525 MHz – 1559 MHz to LightSquared for development of 4G service, beaming down from satellites in space.

All seemed good on paper until the FCC granted to LightSquared a waiver for a 4G terrestrial (read "land") broadband service, ostensibly for covering tunnels and buildings where satellite signals could be blocked.

"The problem is that GNSS (GPS) satellite signals are extremely weak at the Earth's surface, and would be completely drowned out by LightSquared's powerful base station transmissions, perhaps a billion times more



Continued on page 6

GPS Signal Threatened by Interference

powerful than the GPS signals in the immediate vicinity of the base station," comments RTCM (Radio Technical Committee for Maritime Services) President, Bob Markle.

He points out that GPS signals have a strength of 50 watts ERP (Effective Radiated Power) at the satellite, a minimum of 10,000 miles away, yet local land base stations, on an adjacent frequency, could run up to 1,500 watts.

"Imagine standing on the Earth and trying to see a 50 watt light bulb on a satellite 12,000 miles above, and then a local street lamp comes on at nearly 1,500 watts, totally obscuring the 50 watt light up in space," adds Markle.

But there might be a cure – "simply" install band pass filters within each and every consumer GPS set, and maybe add a stop band filter somewhere else in the consumer's GPS receiver. That was the plan mentioned by the G4 gang, and it went over like a flaming MIR entering the Earth's atmosphere.

The FCC says they are studying the issue, along with their waiver to permit powerful land transmitters to operate where there may be nearby GPS receivers!

If a megabillion dollar shopping center installs GPS pseudo-satellite signals for customers to navigate to the "blue light special", those micro signals will most likely be clobbered by that same mall's G4 network on the next radio band down!

GPS manufacturers are ringing the war bell. Boating groups like Boat US hand delivered 15000 member comments, critical of the LightSquared plan to begin their base station transmissions on frequencies reserved for space to Earth emissions.

"LightSquared's power levels are predicted to be 96 dB higher than GPS – translating a LightSquared signal that is 4 billion times stronger than a GPS" comments attorney Ann Swanson, in a pleading to the FCC on Garmin's behalf.

The terrestrial G4 service is not on the air yet, so the GPS gear found in handhelds like Kenwood







Continued on page 8

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IC-RX7



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GPS Signal Threatened by Interference

and Yaesu should be doing just fine. Same applies to Garmin GPS communicators, as well as small handheld GPS navigation receivers – all unaffected at this time.

With the civilian astronomical numbers of GPS receivers in the field, the land component of this G4 rollout on the adjacent frequencies will be met by stiff opposition from equipment manufacturers. While I think we all agree there needs to be more bandwidth for broadband devices, the use of space to earth bands adjacent to our GPS frequencies, specifically for powerful land transmissions does not make sound sense to many GPS users.

For adding a filter INSIDE a GPS chip set imbedded in a wristwatch or smartphone – nope, I don't think we'll see that either.

Good news, on the horizon, an additional civilian GPS band is soon to be incorporated within our tiny GPS equipment and may take typical 20 foot accuracy down to 24 INCH accuracy.

As long as we don't get jammed! ●









Around the World on Your Scanner

By Jim Sutton N2OPS

SUNSPOT CYCLE 24

Fire calls from a county only 40 miles away on 33.70 do not come in at my home even with an outside antenna and a signal booster, yet they are heard in Germany, Northern Ireland, The UK and even New Zealand. Why? It is because of the F2 layer of the ionosphere and sunspot cycle 24.

Sunspot Cycle 24 is happening now and it's hot! Almost every day from around 10:00 am till sunset the signals from 2000 miles plus come in on the low band from 29.7-50 MHz. Starting at the lowest frequency the skip slowly climbs as the MUF or maximum usable frequency increases. In the links section you will find a real time MUF map that does a very good job of indicating where the skip is hot.

US listeners can hear calls from the opposite coast. Listeners on the east coast can hear California Highway Patrol. West coast listeners have a potpourri of public safety listening from all long the east coast.

WHAT IS F2?

F2 is the layer of the ionosphere that when ionized during the sunspot peak will reflect VHF low band signals over the horizon at distances of 2000-3000 miles. Multiple hops can take signals around the world.

Unlike Sporadic E, F2 is limited to daylight hours during 11-year sunspot peaks. F2 Usually begins in mid October and is over by the first week of April. Where Sporadic E dramatically climbs through the low band well into the FM broadcast band F2 is very slow to increase in frequency. Only during the best of times does reception climb above 34-35 MHz.

Cycle 24 has come on dramatically with the potential to be one of the best ever skip events ever!

WHAT IS THERE TO HEAR?

State police calls make the most interesting listening. Many east coast counties remain on 33 MHz frequencies providing great international listening. Lancaster County PA on 33.90 is a worldwide favorite. Live incident status allows listeners to confirm their reception on the spot.

US military communications from around the world can be heard with a common CTCSS of 150.0. Since scanners do not have this capability the communications will read 151.4 Hz. One popular station is Fort Hood, Texas Range Control on 30.450.

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Around the World on Your Scanner

continued

Signal quality can vary from remarkably clear to strained with a distinct grinding sound. Duration will range from a few minutes at a time to continuous hours.

CALIFORNIA HIGHWAY PATROL

Dense population has found frequencies at a premium in California forcing the CHP to remain on the low band resulting in great skip listening. CHP signals are heard around the world.

CTCSS tones indicate which part of the state the signal is coming from. Some CHP bases repeat the mobile units making for even more interesting listening.

CTCSS

Also known as PL is a sub audible tone designed to eliminate having to hear other users of the frequency. With 50 different CTCSS tones and 100 digital DCS tones nearly all of the interference is taken care of.

Reading the CTCSS or DCS tones with your scanner can help identify the skip reception.

IDENTIFYING YOUR CATCHES

There are several sources of information to determine what you have heard. These include the Yahoo skip group and the Radio Reference Skip Forum.

Spend some time researching on Google to see what has been posted. And be sure to share what you have discovered.

If you provide a local scanner information site why not have a special section for low band skip? If every local site had such a section identifying skip would be much easier. And programming scanners for specific areas of interest would be possible.

Low band frequency ranges vary in other countries, which can find just about anything coming in. And be ready to hear many different languages. Some listeners put their catches on You Tube to see if others can help identify their catches.



ANTENNAS

For the optimum reception of any scanner frequencies a good outside antenna is a must. The Scantenna does an OK job. Its elements are not the best for low band.

A professional antenna will bring in those weakest signals. For those

Around the World on Your Scanner

continued

CHP Base Frequencies

39.14
39.22
39.26
39.36
39.40
39.44
39.60
39.68
39.72
39.80
39.88
39.92
42.08
42.12
42.16
42.34
42.36
42.40
42.42
42.44
42.46
42.48
42.50
42.52
42.54
42.56
42.60
42.62
42.88
42.92
44.86
44.92
44.94
45.02
45.06
45.94

CHP CTCSS tones

107.2 Northern
118.8 Inland
131.8 Golden Gate
146.2 Central
162.2 Border
167.9 Coastal
179.9 Valley
192.8 Southern



US LOW BAND SEARCH RANGES

25.870-26.470 @.020	Studio Transmitter Links
30.000-30.550 @.025	Federal/Military
30.600-31.980 @.020	Land Mobile
32.000-32.975 @.025	Federal/Military
33.020-33.980 @.020	Public Safety
34.000-34.975 @.025	Federal/Military
35.020-35.980 @.020	Land Mobile
36.000-36.975 @.025	Federal/Military
37.020-37.260 @.020	Public Safety
37.280-37.880 @.020	Utility
37.900-37.980 @.020	Public Safety
38.000-38.975 @.025	Federal/Military
39.020-39.980 @.020	Public Safety
40.000-41.975 @.025	Federal/Military
42.000-42.940 @.020	State Police
42.960-44.600 @.020	Land Mobile
44.620.46.580 @.020	Public Safety
46.600-46.975 @.025	Federal/Military
47.020-47.400 @.020	State Highway
47.420	Red Cross
47.440-49.580 @.020	Land Mobile
49.600-49.975 @.025	Federal/Military

Continued on page 12

Around the World on Your Scanner

continued

limited to the antenna on the back of the scanner add a fine wire about 70 inches long extending from the base of the 18-inch whip at the back of the set. This will enhance both low band skip and local reception.

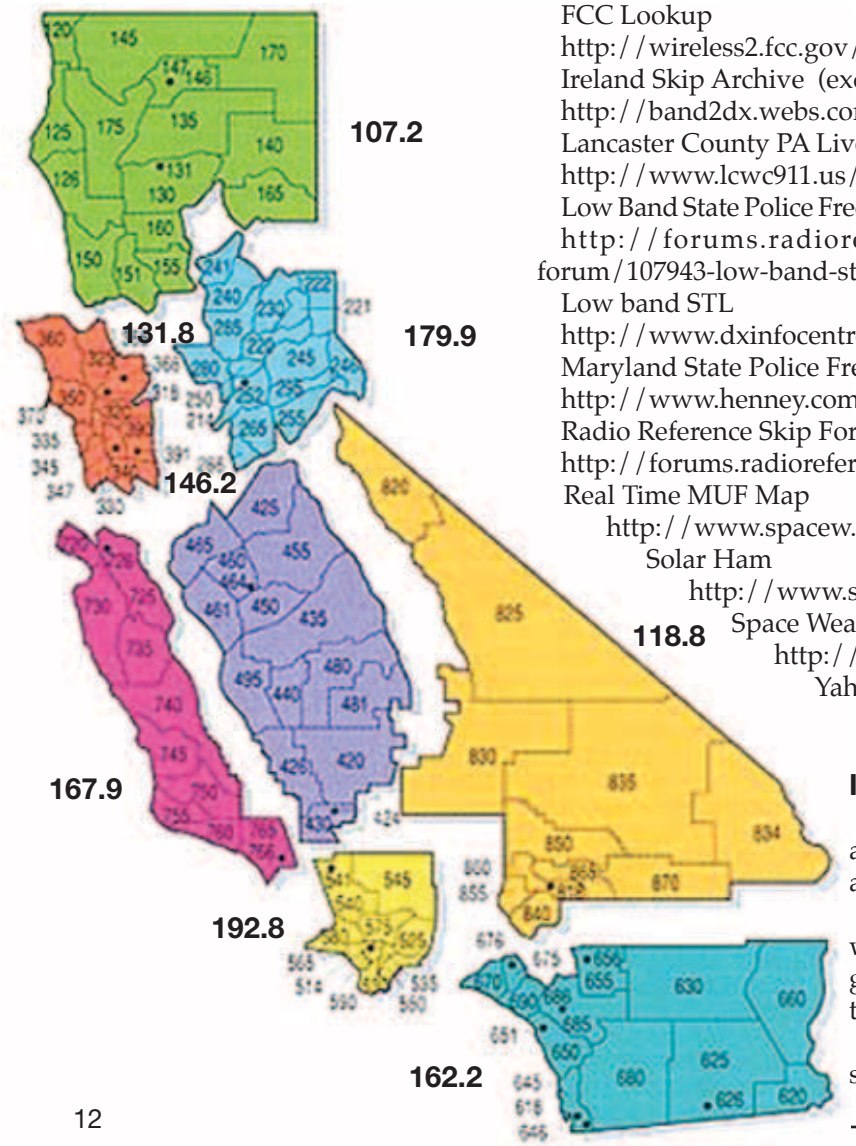
WHAT ELSE IS THERE TO HEAR?

Just about anything can be heard when the skip is coming in. Fishermen, taxis, farmers, military exercises, you name it.

LINKS

Canadian Frequency Lookup
http://sd.ic.gc.ca/pls/engdoc_anon/web_search.frequency_range_input
CHP Frequencies / CTCSS tones / Maps
http://www.freqofnature.com/frequencies/ca/chp.html
CHP Site Map
http://harrymarnell.net/CHPsiteMAP.pdf
FCC Lookup
http://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp
Ireland Skip Archive (excellent summary of skip received in Ireland)
http://band2dx.webs.com/lowvhfarchive.htm
Lancaster County PA Live Incident Status
http://www.lcwc911.us/lcwc/lcwc/publiccad.asp?lcwcNav=%7C
Low Band State Police Frequencies (cross reference frequencies and CTCSS)
http://forums.radioreference.com/skip-tropospheric-ducting-forum/107943-low-band-state-police-frequency.html
Low band STL
http://www.dxinfocentre.com/stl.htm
Maryland State Police Frequencies
http://www.henney.com/chm/msp.htm
Radio Reference Skip Forum
http://forums.radioreference.com/skip-tropospheric-ducting-forum/
Real Time MUF Map
http://www.spacew.com/www/realtime.php
Solar Ham
http://www.solarham.com/
Space Weather
http://spaceweather.com/
Yahoo VHF Skip Group
http://groups.yahoo.com/group/vhfskip/

California Highway Patrol CTCSS Map



IN CONCLUSION

With perseverance you can go from adding adjacent counties to your scanner listening to adding distant states, countries and continents.

In the next issue of National Communications we will learn how to take the same propagation and go beyond listening to actually talking to others in the distant states, countries and continents.

Until then may your signals be strong, your static be few.

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The Other CB Band





These Citizens Band Channels Offer No Talk – Just Noise

By Chuck Gysi, N2DUP

Did you know there is an additional CB band that you can't use for talking to other operators? The channels typically are used for radio-control use and they've been a part of the CB service for over a half-century.

What's now called the Radio Control Radio Service started way back in 1955 when the FCC created the Class C Citizens Radio Service on 27-MHz frequencies adjacent and between channels used by the then-Class D Citizens Radio Service, which is today's CB radio service. CB operators back in the day knew that these R/C channels were between some of their chatter channels.

The R/C Radio Service evolved with the addition of frequencies in the 72- and 75-MHz bands in 1966 and it was officially renamed from Class C CB to the Radio Control Radio Service in 1976, when the FCC restructured all the citizens radio services. At the same time, Class A CB was renamed the General Mobile Radio Service and rules were streamlined because of the burgeoning use of CB radios.

Class C CB users needed a license once upon a time, but when licensing was eliminated for Class D CB; the licensing requirement was eliminated for Class C CB, too. The radio services are considered to be "licensed by rule," which means you do not need an individual license to operate an R/C transmitter.

The six 27-MHz radio control channels are situated between and on top of regular CB voice channels. As you see what channels some of the frequencies lie in the middle of, you may start to see reasons for why channels are used as they are on CB. Here are the frequencies and the voice CB channels they fall in the middle of:



This 27-MHz-controlled car takes a jump on an R/C track.



- 26.995 – brown channel – between CB Channels 3 and 4
- 27.045 – red channel – between CB Channels 7 and 8
- 27.095 – orange channel – between CB Channels 11 and 12
- 27.145 – yellow channel – between CB Channels 15 and 16
- 27.195 – green channel – between CB Channels 19 and 20
- 27.255 – blue channel – shared with CB Channel 23



This early 1990s 27-MHz radio control Train Engineer transmitter and receiver were designed to control an entire garden railway system.



Hobbyists take flight with their planes at this R/C airfield. Aircraft transmitters typically have streamers on the ends of the transmitters' antennas indicating what frequency band is being used to avoid interference to others.





Let's take a look at how some CB channels are used. For instance, CB Channel 11 once upon a time was a calling channel. Back in the 1960s and 1970s, Channel 11 was a channel CBers monitored for others to call them and then they switched to another channel to talk. The fact that one of the radio control channels is located between CB Channels 11 and 12 gives it a little more space and avoids bleed over from Channel 12 because it's really two channels away when you factor in the R/C channel. It's a fact that the R/C channels are not busy at all and even R/C signals are going to be less noisy than an overpowered, over modulated CBer on an adjacent channel or frequency.

The 27.145 MHz R/C channel is located between CB Channels 15 and 16 and ever since sideband CB radios have been available, Channel 16 lower sideband has been the primary sideband CB channel. Again, that extra little space between voice channels helps keep the Donald Duck sounds away from normal AM CB channels.

And again, the R/C frequency sandwiched between CB Channels 19 and 20 gives the overused highway Channel 19 a little extra breathing room. When the highway channel was voluntarily moved from Channel 10 to Channel 19 in the mid-1970s, placing it on a channel adjacent to an R/C channel made a lot of sense and had a lot of foresight for what the channel has become today.

Continued on page 16

The Other CB Band

continued



This detailed remote control scale-model lobster boat can take to the water with its 27-MHz transmitter.

For some reason, CB Channel 23 shares a channel with the R/C service, but few radio control hobbyists use that channel knowing the signals of their devices can be overpowered by a voice CBer on the same channel.

Typically, radio control boats and cars use the 27-MHz channels while R/C aircraft avoid 27-MHz frequencies. That's primarily because if a model aircraft should lose the signal of its transmitter while in flight, a CBer on the ground either on the same channel or an adjacent frequency could wipe out the signal to the plane, sending it to an early demise in a trail straight to the ground or even worse – crashing into something while in the air. That's not as crucial for R/C cars and boats.

Typically the R/C aircraft use 50 frequencies in the 72-MHz band while surface models such as boats and cars use 30 channels in the 75-MHz Radio Control Service band. There also are 10 frequencies in the 50-MHz band that can be used by licensed amateur radio operators, as well as eight frequencies in the 53-MHz band for hams. There has been some increasing use of the 2.4 GHz band, which is used by unlicensed wireless devices such as wireless routers and cordless phones, for radio control purposes, too. For a thorough list of R/C frequencies, check http://www.modelaircraft.org/events/frequencies.aspx.

So, if you hear some odd noises next time while tuning through the CB channels on a receiver or perhaps even hear some noise coming from an adjacent channel while talking on your radio, it's very possible a nearby R/C device is in use. It could be a kid racing an R/C dune buggy in the back yard or perhaps even an R/C aircraft taking to the skies over your home. I've even seen an older computer wireless mouse that used 27 MHz.

The R/C and CB channels have coexisted for more than a half-century. Both share valuable spectrum. Now you can understand why there are spaces between CB channels for these devices and why certain CB channels are designated for specific usage. It's all because of our Radio Control Radio Service, the old Class C CB service. Be cognizant of the R/C channels adjacent to and on top of our CB channels and be careful while transmitting! You could be knocking out an R/C device.

Write in

Do you use R/C cars, boats or planes in the 27-MHz band? Did you hold a Class C or R/C Radio Service FCC license many years ago? What types of CB information would you like to see in Nat-Com? You can write to me at nat-com@citizensband.net (be sure to put "Nat-Com" in the subject line or your e-mail may wind up in my spam bin). This e-mail address is only for the author of this column.



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JULY 1973

UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D. C. 20554

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FEDERAL COMMUNICATIONS COMMISSION

This is the author's Class C CB license issued in 1976 with the FCC call sign of KVI2535 and allowed the use of five radio-control transmitters. The FCC did away with licensing Class C (radio control) and Class D (CB voice) stations shortly later.



This patch is worn with pride by members of the Radio Controlled Model Flying Club of Chesaning, Mich.

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A Practical Application for MURS

By Jon Van Allen, KF7YN



Fire Safety Officer Larry Hinman with his MURS handheld.



In the Jan/Feb 2011 issue, I reviewed the Dakota Alert M538-HT MURS handheld. I am still pleased with the quality and performance of my Dakota Alert radios. Shortly after that review went to press, I was asked to look into replacing an obsolete public address system at a Catholic school here in Salt Lake City. A professional quality wired PA system would cost at least $30,000 but the school's budget was under $10,000. Coming up with a workable system would be a tall order indeed!

Last spring I did an engineering study at the school and agreed that a wired system was out of the question because wiring up the main building and several detached buildings on the several-acre campus would be too costly. A radio-based system was the only answer but equipping nearly 30 rooms with a workable system within the available budget would be a real challenge! After a couple days of testing, I settled on a MURS based system consisting mainly of Dakota Alert M5387BS base stations and several M538HT handhelds. I also installed a Ritron LM-C150 VHF wireless "Loudmouth" PA receiver and horn for the gymnasium.

MURS is an acronym for Multi-Use Radio Service, a low power, short range VHF Citizens Band service in the 150 MHz band. Although there are limitations on transmitter power output and antenna height, the use of external antennas is allowed. You can use mobile or base station antennas up to 60 feet above ground or 20 feet above the highest point on the structure it is mounted on. MURS is a VHF Citizens Band service, and no FCC license is required to operate a MURS station. There are very few restrictions, you can use MURS for just about anything you want, personal or business, including schools!

At first everyone involved (myself included) had doubts whether this system would work satisfactorily. Among the available MURS base station choices, the Dakota Alert is the least expensive but the only one that would fit the school's budget for a large quantity order. There were other questions; would there be interference from other MURS radios? Intermod and adjacent channel "bleed-over" were also possibilities that needed to be addressed. Would the range good enough for reliable communications with the detached buildings across campus and on every level in the main



building? I was happy to confirm all radios including the handhelds were able to communicate reliably from any point on campus to the office.

The next issue would be whether all of the classrooms could hear pages from the office. Since the Dakota Alert base stations were not quite loud enough for noisy classrooms, I installed West Mountain Radio 'ComSpkr' communications amplified speakers in rooms where more volume was required. I chose West Mountain Radio speakers because they are RF shielded and plenty loud.

There were several engineering problems to overcome; making the sets work with external speakers required rewiring the speaker plugs and a circuit modification inside every base station to allow the internal microphone to work when an external speaker is plugged in. Dakota Alert units do not accommodate standard speaker/mic plug configuration so all speakers and base stations had be modified. Once that project was out of the way, we ran into a few spots where fluorescent lights caused 60 Hz hum in the speaker but this was solved by relocating those units. The school was built in 1957; the original wiring can be the cause of all sorts of problems.

I continuously monitored all five MURS frequencies for over a week and found that Channels 1, 2 and 3 were totally silent but I did hear a bit of use on channels 4 and 5. I decided to use Channel 3 (151.940 MHz) and PL Tone 8 (88.5 Hz). After the school tested the MURS system for a few days, everyone was pleased with the results. For the first time, classrooms could hear announcements from the office and having two-way capability means roving personnel (security, janitors, hall and playground monitors, etc) are no longer out of reach even at the edges of the campus. I was able to communicate with the office several city blocks beyond the campus. This particular MURS system was really the only answer to the school's requirements and budget.

Can MURS work for you? There are countless applications where these inexpensive radios can fill the need for reliable two-way communication or even one way paging or announcements. MURS systems are perfect for family outings; at the amusement park, at the mall, hiking, camping, neighborhood watch groups, small businesses, smaller schools, churches, farms, warehouses, volunteer organizations, the list goes on and on.

With no FCC license to purchase, MURS is ideal for anyone who wants better quality and range and less congestion than FRS. Keep in mind there are limitations, the maximum range is about 2 miles, real-world range is usually less. Comms between steel buildings does not work well without outside external antennas but MURS allows external antennas. Although there are antennas made specifically for MURS, most any 155 MHz VHF antenna will work fine.

Join the MURS revolution, you'll find it perfect for your application!

Resources:

http://www.dakotaalert.com/products.php?cdf=17

http://www.dakotaalert.com/products.php?cdf=19

http://www.ritron.com/pdf/loudmouth.pdf

http://www.westmountainradio.com/product_info.php?products_id=COM_spkr

I hope you find this information useful and welcome your questions and comments via email: kf7yn@yahoo.com. Until next time, happy communicating!

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Little Rock Air Force Base

By Mark Meece

When the movie Top Gun premiered in 1986 it show us the excitement and glamour of our nation's fighter pilots and their vehicles. Although it was only a movie, it left a lasting impression that the exciting aspect to mil-air monitoring was fighter exercises. While that is true to some extent, there are many flavors of great mil-air monitoring. One of those aspects are not to be ignored, when one looks to the skies and spies a giant behemoth hanging in the air. So this issue we take a trip to the heartland for a look at the largest C-130 base in the United States Air Force.

Back in the 18th and 19th centuries the main overland mode of transportation was the horse and wagon, most heading west across the unexplored expanse of our growing country. As they approached the south bank of the Arkansas River that was used by river traffic of the day there was a rocky outcropping that marked what became a well known river crossing. It was given the French name "la Petite Roche", meaning "little rock" in English.

That name was adopted by the locals for the nearby population center that has grown over the years to become the capital and largest city in the state of Arkansas, Little Rock. Seventeen miles north and east of Little Rock, up US Route 167 is the location of "The Rock" and "Home of The Herks", Little Rock Air Force Base.

In September of 1952 the United States Air Force announced plans to build a $31 million medium bomber base near the town of Jacksonville, Arkansas. A few months later, construction of the base began on December 8. 1953. By the following August the Strategic Air Command (SAC) assigned the 384th Bombardment Wing (BMW) and 70th Reconnaissance Wing to take up residence at the base. The base's first commander Colonel Joseph A. Thomas, while overseeing the construction of the base was tragically killed in the crash of the base's only aircraft, a C-54 being used for administrative duty. Finally, the base opened for air traffic on September 10, 1955. For fifteen more years

Continued on page 22



Little Rock AFB continued

Little Rock Air Force Base would fall under the auspices of SAC. The base was officially transferred to the command of the Tactical Air Command (TAC on April 1, 1970. Just over a year later Little Rock would begin its long affair with the C-130 Hercules aircraft. The first C-130 arrived at the base on March 4, 1970 and immediately began tactical airlift training operations. The 314th Tactical Airlift Wing (TAW) transferred to Little Rock on May 31, 1971 where it remains today now under the Air Education and Training Command.

The 314th AW is the largest and only training airlift wing for the C-130 in the Department of Defense. Four groups comprise the 314th, operations, logistics, support and medical. There is also a headquarters element. Two subordinate squadrons, the 48th AS and 62nd AS and the 314th Operations Support Squadron. These units along with a flight simulator contractor create the primary mission of training crews for the C-130. Each student is trained in all five crews' positions of the C-130 airframe, pilot, copilot, navigator, flight engineer, and load master.

All services in the Department of Defense, including the Coast Guard and 34 allied nations have their C-130 air crews trained by the 48th and 62nd squadrons using their fleet of 33 C-130s. The 48th AS provides training on the C-130J while the 62nd flies and trains on the C-103E. The 314th AW also hosts the 463rd Airlift Group which provides worldwide tactical airlift for the Air Mobility Command (AMC). The 314th has the added responsibility of training pilots for the C-21 with a fleet of three C-21 aircraft through the 45th Airlift Squadron at Keesler Air Force Base, Mississippi.

The host unit at Little Rock AFB today is the 19th Airlift Wing currently assigned to the Air Mobility Command (AMC), Eighteenth Air Force. The 19th AW contains the largest C-130 Hercules fleet in the world to the Department of Defense offering the ability to provide humanitarian airlift relief to victims of disasters, to airdropping supplies and personnel into hostile theaters of operations.

The 19th AW formerly a refueling wing based at Robbins AFB, in Georgia and was deactivated in June 2008 as part of the Base Realignment and Closure Act

TABLE 1

UNITS			
314th Airlift Wing (AETC)			
48th AS		C-130J	Gold/Black
62nd AS	BLUE BARONS	C-130E	Blue/White
463rd Airlift Group (AMC)			
41st AS	BLACK CATS	C-130J	Green/Black
50th AS	RED DEVILS	C-130H	Red/Black
53rd AS	BLACK BARONS	C-130J	Black/White
61st AS	GREEN HORNETS	C-130E	Green/Black
189th Airlift Wing (AR-ANG/AETC)			
154th TS	RAZORBACKS	C-130E	Red/White



Little Rock AFB continued

of 2005. It was reactivated as the 19th Airlift wing and assigned to Little Rock AFB in October 2008. The 19th are also the sponsors of the unit of Cadet Squadron 19 "Wolverines" at the United States Air Force Academy.

Also stationed at Little Rock Air Force Base is the Arkansas Air National Guard's 189th Airlift Wing. The primary mission of the 189th AW is to provide aircrew training for students from each branch of the military that flies the C-130 and from various allied nations. The C-130 Tactical Airlift Instructor School at Little Rock is operated by the 189th AW offering initial qualification and upgrade training for pilots, navigators, flight engineers and load masters. Here the 189th AW also operates the Air National Guard Enlisted Air crew Academic School, which provides entry-level training for C-130 load masters before they are sent on to the 314th Airlift Wing for mission qualification training. The 189th AW is currently converting to the C-130H aircraft.

Little Rock Air Force Base operates one runway (7/25) with an adjacent 3500 foot assault strip (70/250). Operational units can be found listed in TABLE 1 and all the operational frequencies in TABLE 2.



Little Rock Air Force Base utilizes a Motorola Type II Smartnet trunked radio system that uses a mix of analog and digital voice for some operations. This information is incomplete and no talkgroups have been reported yet, if any of readers have updates for this system, please send us a note. The system particulars can be found in TABLE 3.

Continued on page 24

TABLE 3

SYSTEM: Little Rock Air Force Base
TYPE: Motorola Type II Smartnet
SYSID: 4628
VOICE: Analog and APCO-25 Common Air Interface

CUSTOM TABLES:
BASE: 406.000
SPACING: 12.5 KHz
OFFSET: 380

FREQUENCIES:
406.96250c 407.16250 407.96250 409.76250

TABLE 2

LITTLE ROCK AFB, (KRLF)

AERONAUTICAL OPERATIONS	
119.175	ATIS
119.500	Approach/Departure
120.600	Tower
132.800	Ground
138.600	189th Command Post
143.800	154th TS Air Tactical
225.450	189th Command Post
239.800	METRO
251.100	ATIS
253.500	Clearance Delivery
257.100	154th TS Air Tactical
269.075	Tower
271.300	ATIS Arrival
275.800	Ground
306.200	Approach/Departure
341.650	Dispatcher
349.400	AMC Command Post
C-130 OPERATIONS	
125.350	Air Collision Avoidance
138.050	C-130 Inter-plane
138.125	C-130 Inter-plane
138.300	Aerial Refueling
138.475	C-130 Inter-plane
138.875	C-130 Inter-plane
138.950	C-130J Ops
139.600	Black Jack Drop Zone Ops
139.625	C130 Inter-plane
139.700	Air-to-Air Tactical
139.725	C-130 Inter-plane
139.925	C-130 Inter-plane
139.975	C-130 Inter-plane
141.800	All American Drop Zone
142.200	C-130 Inter-plane
142.235	Air Combat Maneuvers
143.920	Air-to-Air Training
148.200	Air to Air Tactical
232.150	C-130 Inter-plane
236.375	C-130 Inter-plane
246.050	Air-to-Air Tactical
267.250	C-130 Inter-plane
285.975	C-130 Inter-plane
293.400	C-130 Inter-plane
311.000	Airborne Command Post (Primary)
321.000	Airborne Command Post (Secondary)
342.300	All American Drop Zone
342.400	Black Jack Drop Zone
346.600	Weather
372.200	Dispatcher
381.150	Black Jack Ops

SUPPORT OPERATIONS		
148.0750	Command Post	AM
148.1000	Transient Services	AM
150.3150	Motor Pool	FM
165.1125	Command Net	FM
173.1000	Fire/Crash	FM
173.4400	Base Police	P25
173.5625	Medical Net	FM
173.5875	Fire/Crash	FM

Little Rock AFB continued



Just a few miles to the east of Little Rock AFB in North Little Rock is the 33,000 acre Camp Robinson, named for Arkansas statesman Joseph Taylor Robinson. It is also known as the Robinson Maneuver Training Center. The camp originally opened in 1937 under the name of Camp Pike. It was renamed to Camp Robinson during World War II when it was expanded for basic training and to house German Prisoners of War. After world War II it was declared military surplus and 32,884 acres were conveyed over to the State of Arkansas in August of 1950. Today it used as training area for the Arkansas National Guard. It contains one 5000 foot runway (4/22). Operational frequencies can be found in TABLE 4.

Also at Camp Robinson you can find the Arkansas National Guard Museum located in historic Lloyd England Hall. Take exit 150 off I-40 and follow the signs to Camp Robinson, then follow the orange Museum signs once on post. Admission is free, and an audio tour is available at no cost.

If you do not have a DOD ID card, you will need a driver's license, vehicle registration and proof of insurance to get a day pass. You can call the museum 501-212-5215 for more information.

Little Rock is located southeast of the Boston Mountains which is part of the Ozark Plateau. It offers some of the most spectacular scenery in the country. Plan yourself a trip to the area, remember to grab your scanner and see what you can hear.

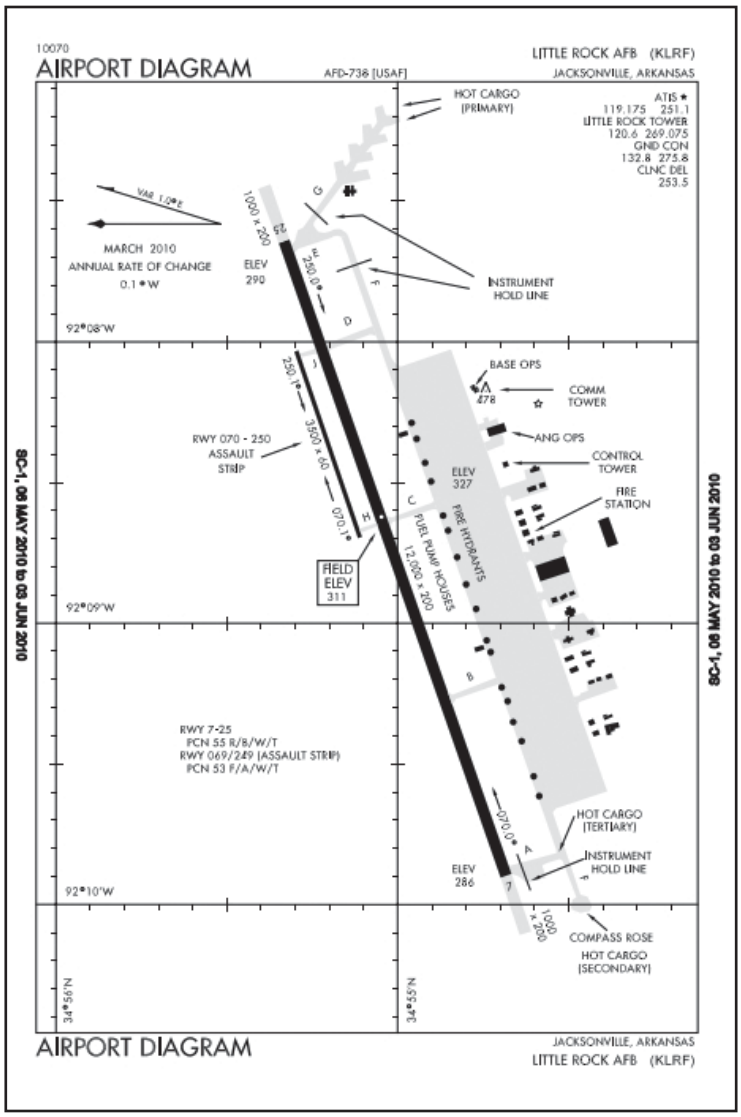


TABLE 4
CAMP ROBINSON (KRBM)

AERONAUTICAL OPERATIONS	
38.350	Air Tactical
41.500	Tower
126.200	Tower
139.200	NG Ops
139.200	NG Ops
241.000	Tower
242.400	Air Tactical

SUPPORT OPERATIONS	
38.450	Security/Fire F1
38.500	Range Control
38.600	Security/Fire F2
46.900	Range Control
46.900	Range Control



Have You Monitored These Busy Frequencies?

Some scanners, such as the RadioShack Pro-197 mobile unit, offer a preprogrammed search that includes all FRS, GMRS and MURS channels, as well as some itinerant business frequencies. (Photo by Lisa Stephens / scancomm.net)

By Chuck Gysi, N2DUP

Tune in the chatter of people in your own neighborhood and around you.

It's just after the winter holidays, and a lot of people either received or gave gifts of communications this time around. It seems that more and more holiday gifts are communications related as time goes on.

It doesn't matter whether the gifts are cellular, tablets, laptops, GPS units or handheld radios – they're all communications related in one way or another.

This also is a good time of year to monitor a bevy of frequencies that come alive during the holidays and for a while afterward – and then again during warmer months. I'm talking about frequencies used by civilians in their normal fun activities, but when these two-way radios are given as gifts during the holiday months, they become busy as new users test them to see how they work and how far they will transmit.

Typically these days, most new HTs, or handie-talkies, on the market are going to show up on Family Radio Service or General Mobile Radio Service channels. But that's not the only place to find activity. While FRS/GMRS handhelds are the most popular, we can't stop on just those frequencies. There also are MURS, CB and other unlicensed frequencies that we can tune in, as well as perhaps some commercial business frequencies.

First of all, I realize there are nay-sayers out there. I know some of you already monitor FRS and GMRS channels for whatever reasons and there are some who have monitored in the past only to be annoyed by periodic kiddie chatter. Stick with me here.

For the same reason most of us monitor public safety channels – to know what's going on in our communities – I also monitor FRS, GMRS, MURS, CB, 49 MHz and other bands just to know what's not

Continued on page 26

only going on in my neighborhood, but all around me when I am mobile.

One of the things I have noticed on Christmases past is that I can almost guaranteed hearing folks in the neighborhood testing FRS or GMRS radios right out of the box on Christmas Day and the days after Christmas. And where do people usually wind up when they test these gifted radios? FRS Channel 1, which is 462.5625 MHz. That's because most FRS handhelds default to Channel 1 when turned on for the first time. It's also pretty obvious that no one cares when they start chatting on the GMRS channels, even with the warning issued in the radios' packaging that an FCC license is needed to transmit on GMRS channels.

Here's a list of FRS and GMRS channels to monitor on your scanner during the holidays. We'll also tell you about other places and times to listen.

FRS: 462.5625 (Ch. 1), 462.5875 (Ch. 2), 462.6125 (Ch. 3), 462.6375 (Ch. 4), 462.6625 (Ch. 5), 462.6875 (Ch. 6), 462.7125 (Ch. 7), 467.5625 (Ch. 8), 467.5875 (Ch. 9), 467.6125 (Ch. 10), 467.6375 (Ch. 11), 467.6625 (Ch. 12), 467.6875 (Ch. 13), 467.7125 (Ch. 14).

GMRS: 462.550 (Ch. 15), 462.575 (Ch. 16), 462.600 (Ch. 17), 462.625 (Ch. 18), 462.650 (Ch. 19), 462.675 (Ch. 20), 462.700 (Ch. 21), 462.725 (Ch. 22).

So once you figure out who in your neighborhood got FRS/GMRS radios for Christmas (inevitably you'll hear names mentioned – more than just "Mommy" or "Daddy" – there are other good times and places to monitor these frequencies, too. I have them all programmed into my scanners because you never know who and where these frequencies will fall into use.



Here are some suggestions:

Summer months: When families hit the road for vacation, you can expect the FRS/GMRS radios to be packed for the trip, too. Monitor these channels near campgrounds, sporting events, shopping malls and factory outlet centers and even out on the highway as families use the radios in caravans. If you are taking a cruise, don't be surprised to find many FRS radios used during ports of call. Even though the FRS radios aren't legal for use in many ports of call because they are outside the United States, people still use them. You might hear much activity aboard cruise ships and while in port.

Industrial: You'd be surprised how many FRS radios are used in industrial and commercial applications. I've heard the radios used in warehouses (especially if the warehouse stocks FRS radios for distribution!), loading docks and on assembly lines.

Retail/business: Smaller retail stores such as my local Dollar General and hotel housekeeping staffs are just two examples of how I have seen FRS/GMRS radios used while out and about.

The point to be made is that you never know who or what will be using FRS/GMRS channels, so it can prove to be worthwhile monitoring not only at home in your neighborhood, but also while you are out and about on your handheld or mobile scanner. I always have all 22 FRS/GMRS channels programmed in my scanners. Some radios also offer the ability of searching all the FRS/GMRS channels so you don't miss any potential conversations.

MURS channels, while there are only five, are worth monitoring, too. There are few MURS radios on the market, so you may be more likely to hear grandfathered users from the days the two 154-MHz MURS channels were licensed to business users for low-power use.

MURS remains a newer radio service and has lacked serious radios made to support the service. There are only a handful of legal MURS radios out there, but others have adopted the channels using commercial radio equipment, sometimes at higher power than allowed for handheld use.

Continued on page 28

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Here are the five MURS channels and their bandwidths:

MURS: 151.820 (Ch. 1, narrowband), 151.880 (Ch. 2, narrowband), 151.940 (Ch. 3, narrowband), 154.570 (Ch. 4, wideband), and 154.600 (Ch. 5, wideband).

While I do hear some radio hobbyists using these MURS channels, I also have heard some families and other users. Primary users still seem to remain business users such as Walmart store operations, lumberyards, museum security, loading docks, scout camps and more. Again, for the same reasons listed as for monitoring FRS/GMRS channels, I recommend programming these five channels in your scanners, too. I've heard them used on Christmases when new MURS radios have been gifted and have heard them used by a wide variety of users, including hunters, circuses, political candidates and more.

When I was much younger (well before the days of FRS and MURS radios), monitoring the CB channels right around the holidays always proved entertaining as kids (myself included) received 27-MHz CB walkie-talkies for holiday gifts and got on the air immediately with siblings and parents. I was guilty of that myself way back when a few times. Still, today you may hear new users get on the air at the holidays. Some of the newer scanners allow the reception of CB channels in the AM mode. I personally monitor CB Channels 9 (27.065, emergencies) and 19 (27.185, highways) on my mobile and handheld scanners.

There are other bands that have been active in the past, but not so much these days. The 49-MHz band hosted five channels and became popular as a migration technique from crowded CB channels. These five channels were used for cordless phones, kiddie-talkies, baby monitors and other handheld and headset devices. To this day, I still use an old 49-MHz baby monitor in my home to remotely monitor a sump pump to ensure it is running during wet weather. You may be surprised to find some activity on these channels in your neighborhood. Listen here:

49 MHz original channels: 49.830, 49.845, 49.860, 49.875, 49.890. (Note: These channels were expanded to 25 channels for cordless phones at one point, with frequencies in the following segments: 43, 44, 46, 48 and 49 MHz. However, if you monitor the five original frequencies listed above, you will hear most 49-MHz devices). For a complete list, visit http://www.qsl.net/49mhz/reference/.

Lastly, you just might hear some new holiday radios pop up on itinerant business channels, and it's not all that unusual. I've heard neighborhood chatter after the holidays on frequencies normally reserved for itinerant business usage because someone spent a little more on radios for gifts. While not legal for individual use, they can be used if licensed as a business. Some of the frequencies I have heard in use are below.

Busiest itinerant business frequencies: 151.625, 151.505, 158.400, 451.800, 464.500 and 464.550.

Write in

Have you heard FRS/GMRS or MURS channels used in your neighborhood? What are the more unusual users you have encountered on these channels? You can write to me at natcom@scanning1.com (be sure to put "Nat-Com" in the subject line or your e-mail may wind up in my spam bin). This e-mail address is only for the author of this column.



The Garmin Rino series of handhelds offer GPS capabilities in an FRS/GMRS handheld. The radios can send GPS locations between radios, too. This is quite an unusual application for FRS/GMRS radios.



The Dakota Alert M538 handheld radio is one of the few MURS radios approved for use in that radio service by the FCC.



RadioShack once made and sold a low-power mobile radio that could be programmed on MURS channels. Many of those who adopted MURS when it was first introduced used these inexpensive radios in their homes and cars.



The Maxon 49FX belt-carried headset radio was designed to operate on the low-power license-free 49-MHz channel and actually was used in a lot of applications such as industrial use. Today, they're all just a relic if you can get your hands on one.

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Uniden HomePatrol Extreme

By: Tom Swisher WA8PYR

It still looks like a GPS unit for your car. It has a touch screen display like a GPS unit. It can even use GPS data to figure out where you are… but it's not a GPS unit. Introduced last year, the Uniden HomePatrol is a spiffy piece of work, and the latest upgrades have made it better. Could it be HomePatrol 2.0? Well, it's not really, but with one firmware update and another firmware upgrade, the HomePatrol is getting Extreme…

The first of these, a free update, adds several enhancements, and is almost in the nature of an upgrade itself. With this update, users will now be able to create new systems for the HomePatrol both in the radio and in software; this means that you are no longer dependent upon the Radio Reference database, and can create your own systems at will, including frequencies, talkgroups, alpha tags and so on. This is a major new feature which should go a long way toward silencing the complaints from the advanced scanner community in regard to limited customization capability in the HomePatrol.

I tried this feature out using the Columbia Gas conventional system. The Columbia Gas system is a multi-site P25 conventional system using talkgroups and radio IDs, with several talkgroups for voice and a few for data. Being a P25 conventional system with talkgroups, the only way to monitor it using talkgroups and radio IDs is to set it up as a P25 single-frequency trunked system, with each frequency set up as an individual site; even though it is not trunked, this method allows one to monitor talkgroups and radio IDs on a conventional P25 system by adding them to a scan list, just like any other frequency or talkgroup.

Setup was pretty easy, and by creating the system in software I was able to alter all aspects of the system settings before uploading it to the radio. Monitoring the Columbia Gas system worked just fine, with good clean audio, display of talkgroups and radio IDs, and the ability to lock out data-only IDs and talkgroups, which is a definite advantage.

At this point, thinking about P25 conventional talkgroups might cause one to ask what the point of P25 talkgroups might be when the same effect (separation of user groups and functions) can be accomplished by using separate Network Access Codes (NACs). As far as I can tell, there really isn't much difference from the scanning standpoint, but from the radio system administrator aspect there are certainly some advantages such as the ability to use multiple talkgroups and an all-call talkgroups on a single frequency, where the same setup using NACs would be a bit more complicated.

Another new feature from this update allows the user to set positive or negative scan delays on a per-channel basis. We're all familiar with positive scan delay, which allows you to set a delay on a channel or talkgroup which causes it to hold there and wait a predetermined time upon the end of a transmission. Negative scan delay is just the opposite, allowing you to set the radio to stay on an active channel for the selected length of time then move on. Negative scan delay can be useful with such things as automated dispatch channels which repeat messages several times; by setting a negative delay, you can monitor only the first one or two repetitions of a message then resume scanning.



Also included is the ability to set active channel alerts on a channel-by-channel basis. This allows you to set a particular channel or talkgroup to make a pleasant little noise when it becomes active, providing you the listener with additional notice that the channel is an important one. Be careful with this feature, though; overuse could cause your scanner to be like the Boy Who Cried Wolf!

Also in this update is a trunked ID search mode, which allows you to search all active talkgroups rather than simply scanning a pre-programmed list. In addition, you can also now export your favorites files for sharing with other users. This are features common to most scanners, and they're welcome additions to the HomePatrol.

The location-based scanning capability also received updates, in the form of the ability to define GPS rectangles (rather than radius circles as at present). This will allow much better control of the geographic area to be scanned; with radius based scanning, you're limited to a circle of so many miles radius, whether you want to hear something or not. No cities or counties are round, and rectangular GPS coordinates better enable you to select geographic limits for scanning, thus "weeding out" the stuff from County B when you're in City A and don't really want to hear County B.

Finally, one most excellent feature is the ability to activate more than one favorite file at a time. With this you can set up multiple favorites lists, for example one for fire/EMS, another for police, yet another for the highway departments (for those snowy days at home), and still another for ham radio; you can then monitor any or all of these favorites lists in any combination. This is a very slick feature!

Coming at the same time as the above updates is a paid upgrade with a large number of very interesting features which will satisfy many advanced hobbyists. Foremost among these are trunked system monitoring tools which mimic many of the features available in freeware monitoring programs such as Trunker, Unitrunker and Pro96Com. These trunked system monitoring tools will allow you to graphically view the loading and reception qualities of a trunked system; view activity levels on a channel-by-channel basis; and log system activity such as channel grants and other control channel information.

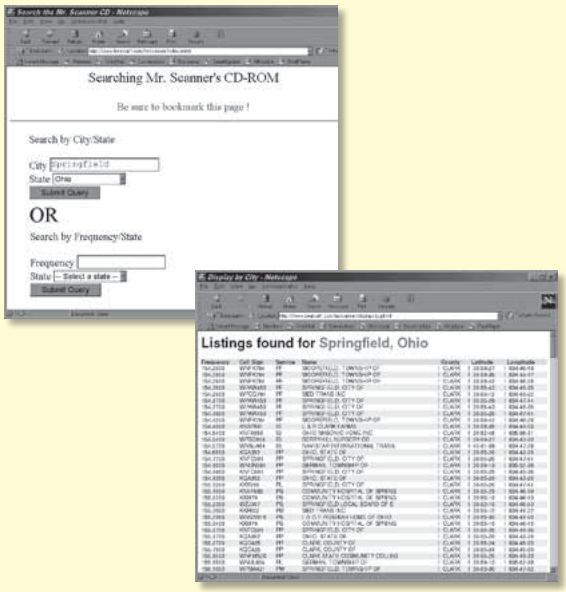
Another feature is an LCN Finder which can assist in finding the Logical Channel Number placement of unknown EDACS ad LTR trunked systems; this is a fairly useful feature when investigating a new EDACS or LTR system. It watches the control channel and helps you determine which frequency goes where in an LTR or EDACS system. I gave this a shot on my local EDACS system, and while it took a little doing to figure out, it was helpful in determining the LCN layout (which I already knew and was thus able to compare results).

While all of these features really work best when using a laptop with the appropriate software and two scanners (one for the control channel data and the other for the voice channels), the trunked system monitoring tools in the HomePatrol upgrade are all very useful, especially if you're in the field and don't have a laptop with you.

In addition to the trunked system monitoring tools, the Extreme upgrade includes a signal strength plot feature, which graphically displays the strength of a received signal over time, and a band scope. Similar in function to a spectrum analyzer, the band scope allows you to set a center frequency, span (from 200 kHz up to up to 200 MHz) and frequency step size, and "sweep" the band for active signals. The result is displayed on screen in the form of a frequency vs. time graph. While I really prefer the dedicated spectrum analyzer in my shop, not everyone has the need or money for a spectrum analyzer and band scopes such as this fit the bill nicely!

All in all, the firmware update alone is well worth the effort (little as it is) required to download and install it, even if you're not particularly computer-savvy. Uniden has made updating this radio so easy that nearly anyone should be able to do it, which of course is the whole idea behind the HomePatrol. And if you're a really advanced scannist, the paid upgrade should offer enough new features to keep you busy for awhile to come! ●

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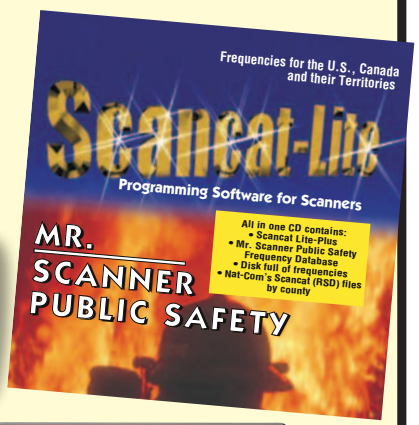
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Medium Wave DXing

By Ed Muro, K2EPM

Are you bored with the hobby? Maybe you haven't lost interest in radio but just need a change of pace. Maybe you want to explore a new nuance of the hobby but don't want to erect a tower or run 150-feet worth of wire. Then....try medium-wave DXing. Huh, what am I going to find on AM broadcast radio? These days, probably mostly talk radio or news, but that can add up to hours of enjoyment a number of different ways.

For me, medium wave listening goes back to my earliest involvement in the radio hobby. Back in 1972, when I was in the second grade, my parents took me to the newly opened Disney World in Orlando, Florida and they bought me a Donald Duck AM radio in the gift shop. I spent many hours listening to that radio as I did my homework or got ready for school. Being a resident of the Big Apple at the time, I listened to Top-40 music on 66 WNBC and 770 WABC with such legends as a young Don Imus and Howard Stern on WNBC to Ron Lundy, Harry Harrison, and George Michale on WABC (yes, the George Michael who did the SPORTS MACHINE TV show in the 80's.) I would listen to country music and METS' games on 1050 WHN. Over on 880 we had CBS News Radio and on 1010 there was News Radio WINS a Westinghouse station.

Yes, so far I am only talking about listening to local AM radio stations but this laid the ground work for a life time of enjoyment spinning the dial. Fast forward to the 7th grade; we still didn't have cable TV at the time but my career in scanning was well under way as I regularly monitored the FDNY and the Nassau





Continued on page 34

Medium Wave DXing cont.



County Police Department (then on 39 MHz) with my Regency ACT-16K. One evening it started to snow around dinner time on a school night. Later that evening, when I should have been sleeping, I turned on my Panasonic AM/FM clock radio....the kind that had the digits that flipped down every minute. I laid in bed tuning the AM dial looking for a news radio station to see if I could find out how long it would keep snowing and if I could make any determination if there would be school the next day. Then through the static I heard a station start to come in...it was a news radio station...I fiddled with the dial a little more and there I was listening to the news and weather reports it sounded a lot like WINS but something didn't sound quite right...I didn't recognize any of the locations they were reporting on. Then they went to a commercial and when they came back from the commercial the station IDed...it was WCAU out of Philadelphia. I was confused...how could this be?

Well, to simplify matters at night propagation changes and AM signals travel further thus affording you the opportunity to hear stations you might not normally hear. Wikipedia goes in to further detail with this explanation: During the daytime, medium and high powered medium-wave AM radio stations have a normal reception range of about 20 to 250 miles (32 to 400+ km), depending on the transmitter power, location, and the quality of the receiving equipment, including the amount of man-made and natural electromagnetic noise present. Long-distance reception is normally impeded by the D layer of the ionosphere, which during the daylight hours absorbs signals in the medium-wave range.

As the sun sets, the D layer weakens, allowing Medium Wave radio waves from such stations to bounce off the F layer of the ionosphere, producing reliable, long distance reception of (especially) high-powered stations up to about 1,200 miles (2,000 km) away on a nightly basis. Aside from the more or less regular reception of certain high powered transmitters, variable conditions allow reception of different stations at different times - for example, on one night a medium-powered broadcaster from Cleveland, Ohio may be audible in Duluth, Minnesota, but not on the following night. Much of the hobby consists in trying to receive and log as many of these stations as possible, identifying target stations and frequencies to listen to and log.





Medium Wave DXing cont.



As long as we are on the subject of logging there are still a couple of clubs out there that specifically cater to the AM DXer.

One such club is the National Radio Club, which is the world's oldest & largest Medium Wave DX Club. The National Radio Club was founded in 1933, and stands today as a respected group of radio listeners. Their newsletter, the DX News offers 30 bulletins per year, weekly in winter, monthly in summer, and contains over 750 pages a year of DX and radio information.

Another good source of information is the OXDA's Introduction to Medium wave and Shortwave DXing which can be found at: http://www.odxa.on.ca/beginnersguide/dxguide.html

In the United States and Canada, stations on the medium-wave dial are spaced at 10 kHz intervals from 520 to 1710 kHz. The tremendous number of radio stations in this region of the world and limited number of available frequencies means congestion is very common, and DXers may hear two, three, or more stations on the same frequency (especially on certain "graveyard" frequencies where many lower-powered stations operate). The most powerful stations in the two countries transmit with 50 kilowatts of power. Examples of stations in this category are WLS in Chicago on 890 kHz, KMOX in St. Louis on 1120 kHz, WTMJ in Milwaukee on 620 kHz, VOCM in St. John's on 590 kHz, WSB in Atlanta on 750 kHz, WCCO in Minneapolis on 830 kHz, CJBC from Toronto on 860 kHz, and WABC, 770 kHz, WCBS, 880 kHz in New York City, and WTAM in Cleveland on 1100 kHz, all of which can be heard over much of the United States and Canada east of the Rocky Mountains. In the southern half of the United States, Mexican stations, some of which operate with over 100 kW of power, may be heard on a similar night-to-night basis. Many of these stations are also clear-channel stations, ensuring that there will be no interference or limited interference on the same frequency.

So, now you know how I got started listening to local broadcast radio and AM DXing. Fast forward two decades and it's the early 1990's. I was just out of college but dating a local college coed who lived 44 miles away during the summer and her winter recess. At the time I was driving a 1990 Mercury Cougar and you could say I was burning the candle at both ends... up at 6AM for work, sometimes driving one to two hundred miles a day for work then driving an hour to see the honey and three or four hours later driving another hour to get home. Do this several times a week plus "live it up" on the weekends and it is a recipe for disaster. I often found myself drowsy on the ride home which would lead me to stop off and get a cup of coffee and a snack for a pick me up and then I would be back on my way. For the most part, I always brought my Regency HX-1500 scanner with me when I went to visit her but while driving in the car I mostly listened to music.

Then one night I started to get sleepy on the way home so I cracked open the window and then started to wonder if the music was adding to the problem and relaxing me in addition to just being plain tired. So, I decided to switch the radio over to the AM band and find some interesting talk show to listen to. As the radio scanned the band it stopped on 1100 and there was basketball game being broadcast. I had expected it to be the Knicks or the Nets but it wasn't, it was the Cleveland Cavaliers and some other out of town team. Sooner or later a commercial game on for a car dealership in Cleveland and my eyebrows raised...I wasn't tired anymore...I listened to the rest of the game on the way home and discovered that I was listening to WWWE or as it was known to the regulars as Three-W-E. Newsradio WTAM serving Greater Cleveland and much of surrounding Northeast Ohio now occupies that frequency. Owned by Clear Channel Communications, the station broadcasts primarily a news/talk format. The WTAM studios are located in the Cleveland suburb of Independence, and the station's transmitter resides in nearby Brecksville. When I got

Continued on page 36

Medium Wave DXing cont.

home in the late hours of the night I grabbed my copy of the World Radio TV Handbook and looked up the station, sending out a reception report the next day. About a month later the station sent back a nice letter confirming my report along with a couple of WWWE bumper stickers. From there on in I spent my late night commutes scanning the AM band.

One of the real neat things about medium wave DXing is that anyone can do it and you don't need any sophisticated or expensive equipment to play this game. As you see I have used a Donald Duck AM Radio, a Panasonic AM/FM clock radio, and a factory Ford AM/FM/Cassette radio with a basic steel whip in the fender.

Some folks, including our own Nat-Com columnist Mark Meece partake in a segment of the hobby called "Ultralight DXing." No, they are not scanning the airwaves looking for home-brew aircraft. They use the most basic SONY Walkman type of radios to do their AM DXing with and it becomes a challenge to snag the far away stations.

Then there are folks who take their DX serious and for a couple of decades GE (and then RCA) produced their Superadio line which retailed for about 50-bucks. The Superadio III™ was designed specifically for long range AM and FM reception. It features tuned RF on both AM and FM for excellent sensitivity. Optimum selectivity is provided by four IF tuned circuits on AM and three on FM. A wide/normal switch allows you to control selectivity. Excellent sound is achieved via a 6½" woofer and 2" tweeter. Other features include an FM-AFC, separate bass and treble controls, mono mini earphone jack and fold-down carrying handle. A built in 7 7/8 inch ferrite rod antenna brings in distant AM stations. Screw terminals are provided for external AM & FM antennas. Coverage: 530-1700 kHz and 88-108 MHz with analog tuning. This radio is a favorite among medium wave DX'ers, out performing multi-band radios costing many times more.

Getting a little more sophisticated is a radio I recently purchased from the C. Crane Company, the CCRadio2. The CCRadio 2 has earned an outstanding reputation as a quality radio specifically designed for talk radio, news, sports and weather. The CC Radio 2 is the worthy successor to the original CC Radio and CC Radio Plus. Audio has been specifically tailored for the human voice. The new clearer backlit LCD display has three levels of brightness plus an "off" setting. Separate Bass and Treble controls, combined with the 5 inch speaker, provide a full sound. A mini headphone jack (3.5 mm) is also provided. This digital radio tunes AM from 520 to 1710 kHz, FM from 87.5 to 108 MHz, NOAA weather from 162.400 to 162.550 MHz and even the 2 Meter Amateur Radio band (144-148 MHz)! The 2-Meter Ham band may make the CCRadio-2 a life saver during an emergency like hurricane Katrina. 2-Meter Ham operators are early on the scene and they donate their time while handling perhaps 90% of the emergency coordination efforts. The CCRadio-2 can act like a simple radio scanner and search the five memories for ham operator communications. Separate Bass and Treble combined with the 5 inch speaker provide excellent fidelity. Fine tuning on the AM band is to 1 kHz. Operation of the radio is as



simple as possible. Five stations can be stored into memory on each band. The CC Radio also has a clock alarm feature with sleep function. With the built-in weather band you can listen to the NOAA weather station for current local conditions. A special Weather Alert feature sounds an alarm to notify you of weather emergency updates. This feature even works while you are listening to AM or FM. This alarm will even sound at night and wake you up if there is an alert. In fact there are 3 weather alert functions that you can select (flashing light & no alarm, or NOAA audio or flashing light & siren). This radio operates with the supplied AC cord or may be operated for up to 250 hours on four D cells (not supplied). There is a carry handle lip built into the rear panel. All of the radios functions are available via logically positioned controls and buttons. The LCD is gently backlit at all times when the radio is plugged into AC. When on batteries you may momentarily illuminate the LCD with the touch of a button. The current model sells for about $150.

Whether you sit out in your car, pick up and old Walkman at a yard sale, use a clock radio you have on your end table, or pick up a modern radio designed for DX getting started couldn't be any easier and there's plenty to listen to on the band either locally or from distant exotic stations....so give it a try!

CLOSING COMMENTS

I want to thank all of you who took the time to answer my thoughts in the last two closing comments.

I am the type of person who hates to see prices rise. If it was up to me, I could still buy a bottle of Coke for five cents. However, as I have learned over the years is that it is not up to me. I have been pondering how to deliver National Communications magazine to our readers in the form and content that they have come to expect.

Over the past couple of issues I looked into ways of accomplishing that goal. One thought was to provide the magazine in an on-line version only. However, great numbers of you indicated that you really valued the magazine in the printed format. In the last issue I looked at the possibility of raising the subscription price slightly. Again many of you came to me and said that if we were able to keep the print format that you would not mind a rise in the subscription price.

After much pondering, including looking at the subscription prices of similar magazines, I have come to the conclusion that the way to provide the quality articles and appearance of this magazine is to create a slight increase in the subscription price.

Actually we have only raised the subscription price once and that was only $1.00. We originally started this magazine with the basic subscription price of $20.00. About ten years ago we raised the price to $21.00. Now we will be making a slight increase in our subscription price; something that we should have probably done a couple of times over the past years. However by so doing, we can keep the print version of the magazine and provide our subscribers the quality of article they have come to expect in National Communications.

Effective with new or renewal occurring in January, 2012 the new pricing will be as follows: Regular National Communications subscription which includes access to our on-line frequency database and access to magazine on-line as well (but you also get a magazine sent to you as well) will be $25.00. National Communications Plus which includes a mailed copy of the magazine, on-line access to magazines and frequencies and a hard copy of the Mr. Scanner Public Safety CD will remain unchanged at $31.90. Also, subscriptions coming through the National CB Center will remain unchanged at $25.90. The on-line only version of the magazine which also includes access to the on-line frequency database will now be $21.00.

I hate to raise prices, because I hate to pay higher prices myself. But after asking you and checking what similar magazines go for I cannot see any other choice. That being said, our subscription price is still lower than any other radio hobby magazine.

However, I am still looking for that five cent bottle of Coke.



By: Norm Schrein, KA8PGJ

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LAST PAGE OUT



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Photo by Norm Schrein

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