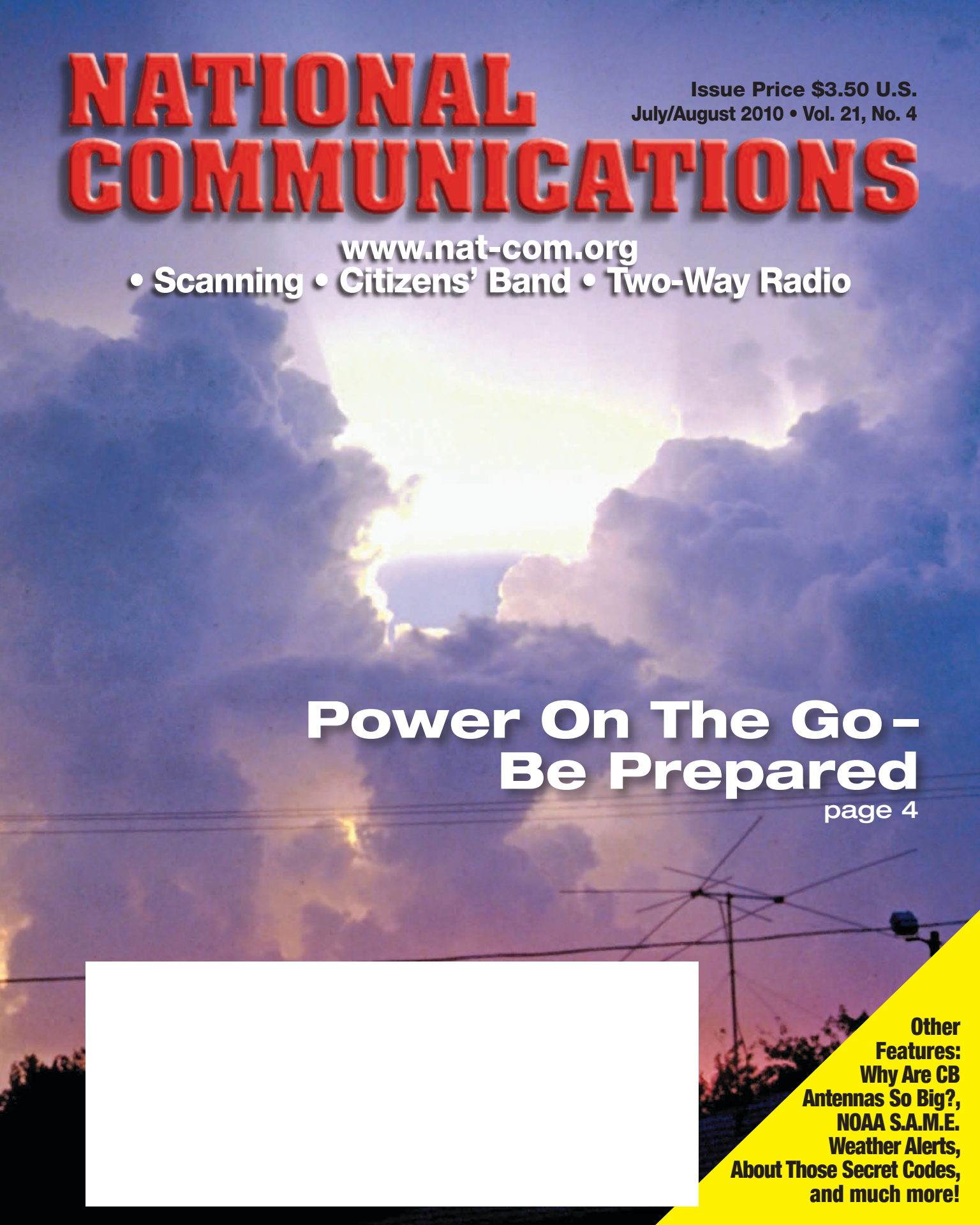
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• Scanning • Citizens' Band • Two-Way Radio



Power On The Go – Be Prepared

page 4

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NATIONAL COMMUNICATIONS

Scanning • Citizens' Band • Two-Way Radio

Table of Contents

Features & Columns

COVER STORY

Power On The Go – Be Prepared 4

Why Are CB Antennas So Big? 9

NOAA S.A.M.E. Weather Alerts Customized Weather Alerts 11

Radio's "Golden Age" Was "Entertainment Tonight" and More 17

Tampa's Vast Collection Of Military Frequencies 20

Local Weather Range Maker 26

About Those Secret Codes 29

INDUSTRY NEWS

Uniden to Unveil New Scanner 31

Understanding Trunking, A Basic Primer 32

Closing Comments 36

Last Page Out 38

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Advertisers

Cobra 2
Communication Electronics 13
Hobby Radio Stop 21
National Communications Frequencies 10
National Communications Subscription Form 16
Radio Shack 40
REACT 25
Scancat 37
St. Jude Children's Hospital 25
Uniden 39
Universal Radio 7

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POWER ON THE GO - BE PREPARED

By Ed Muro, K2EPM

It was just another average overcast Saturday morning in mid March that would make me soon realized that I was not at a level of preparedness to comfortably last a power outage of more than an hour. My wife and son had gone out to do some errands and I went my own way to get some errands done as the rain started. Then I noticed it was getting windy, I was happy the temperatures were up because had it been colder we could have been getting pounded with snow and I really needed a break from the snow and ice. I was actually happy that it was over 40-degrees out. Then as I drove around I started noticing the wind was whipping around and trash was blowing across the road, I thought.... this might be a good time to check out the weather forecast on one of the local AM all news stations. I tuned to WCBS, 880 AM, out of New York City knowing that every ten minutes they run a weather report. Sure enough, I was caught a little off guard when I heard there was going to be a Nor'easter arriving in a couple of hours. I called my wife on her cell and told her to keep an eye on the weather because the roads were starting to flood. With that, we spent the rest of the day and night hunkered down in the house. I got the shack cleaned up, played a little bit with some online radio tuning websites, and watched a movie. Our lights flickered on and off a few times as the winds were howling and I was afraid the siding on our the house might get some damage but I really didn't expect much else.....until the next morning when I got up and saw all of the debris scattered on the lawn.



I went outside, and three houses away was a huge tree, about 100 feet tall, that had crashed through a neighbor's fence and across the little league field. My mother was out of town for the week, but I decided to call her house. When her answering machine didn't pick up I knew something was amiss. So, when things settled down I told my wife I was headed over to Mom's house to check on things. Once I hit the road I was in utter disbelief as I saw the roads littered with downed wires and trees.... the whole area was a mess as you can see from the pictures of the downed trees in Brooklyn. Long Island, New York City, and most of New Jersey was a mess.

Here's how Julie O'Connor of the Star Ledger in New Jersey reported the damage:

"A deadly Nor'easter is causing widespread flooding and destruction as it continues to sock New Jersey with a two-punch combination of gusting winds and heavy downpours as the state's rivers rise in flood-prone areas.

Local and state officials said nearly every town in New Jersey has reported some flooding and wind damage last night, though it is unclear how extensive the damage



will be once the storm is over.

Winds and rain toppled a crane in Atlantic City, forced the closure of part of the New Jersey Turnpike, collapsed several houses and caused the complete shut-down of parts of the NJ Transit train system. More than 260,000 customers are without electricity as winds and fallen trees wreaked havoc on power lines.

At least two people were killed in Teaneck when gusting winds caused a tree to fall on them Saturday night on Garfield Street, police said.

The severity of the Nor-easter — which brought nearly 5 inches of rain and 70 mph wind gusts in parts of the state — surprised many meteorologists, said state climatologist David Robinson."

When I got to my Mom's what I found was a neighborhood littered with downed trees and power lines and not a sign of a cop or utility repair crew. At her house, I could not get her garage door open with my garage door opener so I suspected the power was out. There were a few missing roof tiles, a shutter torn off the front of her house, and a 10-foot limb of a tree hooked on her telephone line going from the pole to the house.

I made my entry in to the house through the front door, and became aware the burglar alarm was not working. Picked up the phone and it was out. Tried to turn on a light and there was no power. At that point, I assessed things in the house as best I could and then I went looking for a flash light. I couldn't find one. What I did find was a Coleman fluorescent lantern, so I turned it on and it was half dead. That was pretty much all I was able to find...but I wanted to go in her attic to inspect the roof and the half dead lantern wasn't going to cut it. It seemed there was enough light in the kitchen with just the light from the window to go about my business but when I decided to empty the freezer and bring the food over to my house I soon realized that without the light inside the refrigerator it was hard to see what I wanted to take.

Luckily, I knew I had an LED tactical flashlight out in the truck. After fetching the light, I went up and inspected the attic and then emptied the fridge as best I could and made my way back home. Luckily for us, as I said, my mother was out of town. But, her house was with out utility services for five days. Even with temperatures never going below 40, you would not believe how quickly that house became cold. I made daily and some times twice daily trips to the house and often found it warmer outside.

Keeping in mind that I lived in this house at the height of my ARES/Red Cross involvement until I got married in 2004, I was in utter disbelief at fact that I could not find a battery operated radio to entertain myself or keep abreast of the news nor could I find a decent flashlight.

Mom was away, there was no real harm done other than loosing the shutter and about fifty dollars worth of food but, I took it as a lesson to learn from. So, that very same week I set out to get some type of self sustainable radio for both my mom's house and my house. I do have a Baygen Freeplay at my house, but I thought something more up to date that I could also charge a cell phone with would not be a bad idea to have.

Continued on page 6

Power On The Go - Be Prepared continued

A couple of weeks earlier at the Winter SWL Fest in Kulpsville I had spotted an emergency radio being marketed by Eton, and I had become aware that Radio Shack was selling them. So, off to the shack I went and I came home with a couple of Eton FR-160s.

The Eton Microlink FR-160, sold under the American Red Cross banner, is a no frills crank up AM/FM radio. It is very simplistic to use, which in times of emergency can be good, yet it can be powered a number of ways. It is small enough that you can get several and keep one in your car's emergency tool bag as well as one in your house.

Features include:

- AM (520-1710 KHz) & FM (87-108MHz)
- NOAA weather-band – all 7 channels
- Built-in 3 white LED light source
- Powered by solar or dynamo both of which charge internal Ni-MH battery
- USB cell phone charger (USB cable not included)
- Earphone jack – 3.5 mm socket
- Etón Corporation will contribute $0.49 to $1.00 of the sales price of each Red Cross product to support the American Red Cross.

As you see by the feature list, it covers your basic AM/FM broadcast frequencies as well as the NOAA weather channels. It also has an LED flashlight on it and it incorporates a USB charging jack so that you can use it to charge your cell phone as long as you have a USB cable for your cell phone.



Eton Microlink FR-160

Those features are great, but what about the POWER? Well, it has internal Ni-MH batteries that can be charged by a solar panel or the crank.

It is a great little emergency gizmo that has serves several important functions in a simplistic manner. yet, I will point out that as a radio.... it is weak when it comes to tuning. The old fashioned analog slide rule frequency display reminds me of the Donald Duck portable radio I had when I was in the second grade. You are not going to go fishing for DX with this radio, but you will be able to pick up the local all news stations. That is about the only negative I found. On a positive note, when I tested mine out after cranking the thing for 90-seconds it played for 45 minutes and was still playing when I shut it off. At a price of $30-35 I was comfortable picking one up "just in case."

So, now knowing both my family and my mother would have at least a basic radio, a basic flashlight, and a way to charge our cell phones the next time the power went out I set my sights on solving a larger problem. Keeping reliable ham communications flowing if the power should go out.

Yes, I have numerous HT's with extra batteries but at what states of "charge" would they be at the next time the power fails? Also, how reliable would HT communications be in the event of an emergency? What would my local repeater act like if it were on generator power?

With that in mind, and an extra Yaesu FT-90 dual band radio sitting in a closet, I set out to find a way to keep my radio running short of buying a generator. I looked through a few magazines and kept going to the same advertisement from a company I am familiar with PowerPort / Cutting Edge Enterprises.

Continued on page 8

Universal Radio — Quality equipment since 1942.

ICOM

R75



The impressive **Icom R75-12** receiver offers full coverage from 30 kHz to 60 MHz; all longwave, medium wave and shortwave frequencies are supported plus extended coverage to include the 6 meter amateur band. Some innovative features of the R75 include: FM Mode Detection (but not the FM broadcast band), Twin Passband Tuning, Two Level Preamp, 99 Alphanumeric Memories, four Scan Modes, Noise Blanker, Selectable AGC (FAST/SLOW/OFF), Clock-Timer, Squelch, Attenuator and backlit LCD display. Tuning may be selected at 1 Hz or 10 Hz steps plus there is a 1 MHz quick tuning step plus tuning Lock. The front-firing speaker provides solid, clear audio. The back panel has a Record Output jack and Tape Recorder Activation jack. The supplied 2.1 kHz SSB filter is suitable for utility, amateur, or broadcast SSB. However, two optional CW/SSB filter positions are available (one per I.F.). The formerly optional **UT-106 DSP board** is now included and factory installed! Get a **free Icom ball cap** with your new R75 for a limited time! *Order #0012* **$599.95**

R5



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

R20



The **Icom R20** covers an incredible 150 kHz to 3304.999 MHz (less cellular) with 1250 alphanumeric memories, bandscope and SSB/CW. It has: two VFOs, dual watch, voice scan control, NB, large two line LCD and CTCSS/DTCS/DTMF. A built-in IC **audio recorder** can record up to 4 hours of reception! With charger, Li-ion battery, belt clip and strap. **Call for price.**

R8500



The Icom **R8500** is a full coverage wide band communications receiver that tunes from 100 kHz to 1999.99 MHz in AM, LSB, USB, CW, FM-N and FM-W modes. Available to government customers only. *#0663* **$1699.95**

ICOM

PCR1500
R1500



The **Icom PCR1500** wideband computer receiver connects externally to your PC via a USB cable. This provides compatibility with many computer models, even laptops. Incredible coverage is yours with reception from 10 kHz to 3300 MHz (less cellular gaps). Modes of reception include AM, FM-Wide, FM-Narrow, SSB and CW. (CW and SSB up to 1300 MHz only). The PCR1500 comes with an AC adapter, whip antenna, USB cable and Windows™ CD. *#1501* **$479.95**

The **Icom R1500** is similar to the above, but also includes a controller head for additional operation independent of a PC. *#1500* **$579.95**

ICOM

PCR2500
R2500



The **Icom PCR2500** wideband computer receiver uses a similar form-factor to the PCR1500, but has several enhancements, including two powerful features: ***dual watch*** (the radio can receive two signals simultaneously) and ***diversity reception*** (two antennas can be connected at the same time and employed to provide stable reception). The optional UT-118 Digital Unit provides D-STAR® digital voice reception and the optional UT-121 supports APCO25 digital voice decoding. The R2500 is shown above. *#2501* **$709.95**

The **Icom R2500** is similar to the PCR2500, but includes a controller head for additional operation independent of a PC. *#2500* **$879.95**

FREE ***ICOM Bonito CS 4.5 Software included!*** A $69.00 value included **FREE** with your R1500/R2500, PCR1500/2500 purchase for a limited time.

Special Note: Prices shown for the R1500/PCR1500 and R2500/PCR2500 reflect the $20 Icom limited time, mail-in rebate.



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Power On The Go - Be Prepared continued

Cutting Edge designs and manufactures pouches for Radios, Cell Phones, & Handheld Electronics as well as backpacks, chest harnesses, and cases for communication systems and their power supplies. They also offer a wide range of 12V rechargeable power supplies and accessories to enable you to run and charge your electronic equipment when you are far from conventional power sources.

I set my sights on their Power Port TransPorter HM-90F power supply which comes with a fast 2-stage AC charger that will recharge from a fully discharged state in 2.5 hours. What you get is a nylon carry case with enough room for the portable power source and your radio specifically designed to carry and operate your Yaesu FTM-10R, FT-90R or FT-1500 mini-mobile transceiver as a stand alone unit in the field.

The case is sturdy and weather-resistant made of laminated, heavy-duty black nylon with ¼" foam padding and a comfortable carrying strap. The radio fits neatly into the case next to the 8 AH rechargeable power cell that comes standard with the TransPorter™.You have a choice of overnight charger, automatic fast charger which gives worry-free recharging via AC, DC, or with the optional roll-up solar cell recharger. Removable accessory pockets on the sides of the case are great for holding your microphone, charger, and accessories.

I already have a solar charger panel with a cigarette lighter style connector, so I opted for the two-stage fast charger which will not over charge the battery.

To complete my set up, I plan on making a dual band roll up J-pole antenna and I also purchased an MFJ -1717PL, which is a dual-band, flexible, fold over antenna.

With this set up I will be ready to work the local repeater if the power goes out or maybe even from a picnic table down at the park on a sunny afternoon. I hope I have given you some information about a couple of useful products, but more than that I hope I have wet your appetite to explore your state of readiness should the power fail.



Yaesu FTM-10R



WHY ARE CB ANTENNAS SO BIG?

It all comes down to a simple math formula

By Chuck Gysi, N2DUP

Have you ever wondered why CB antennas are so big or long? There's a good reason and if you follow along with the math here, you'll see why.

My first mobile CB antenna was nine feet long. It was a steel rod screwed into a huge coil that was mounted on the rear fender of my 1962 Mercury Comet. While I had a clip on the driver's-side door that could hold the antenna down in an arching shape, that position wasn't optimal for making contacts on the air.

I had to be careful when I released the whip up in the air from inside the car. That piece of steel would whip straight back from the window clip, and if anyone was behind the vehicle, they'd surely be hit! Now imagine having an antenna that long while driving along the road. I hit my fair share of branches and left leaves flying in my rear-view mirror many times. The whip even hit a bird once or twice. Fast-food drive-throughs and bank drive-up lanes? The whip just scraped across the overhang … and it was the sound of pure steel scraping the top. And, of course, everyone would notice.

My first CB base station antenna was long, too. It was 18 feet high and waved highly in the air when I mounted it on the roof. It seemed so cumbersome, but I knew I needed that big of an antenna because of the math. While the base antenna for the scanner was a mere 18 inches, the CB antenna needed to be 18 feet. Seems to be disparate, right? Nope. Here's why.

Doing The Math

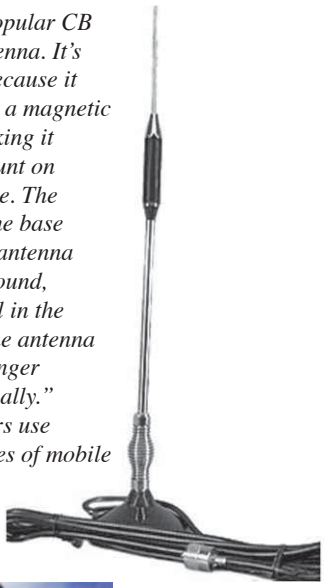
Radio waves are measured by the frequency they use. Antennas need to be electronically resonate with the wavelength to be effective in transmitting the signal. Could I transmit on CB with the scanner antenna? Perhaps, but it wouldn't transmit far because the antenna isn't a match electrically with the length of the radio wave being transmitted.

There's a general formula that can be used to calculate the length of antenna needed for specific radio frequencies. Using this formula, you can determine how long of an antenna you need. It also can help you trim antennas to the right frequency.

Here's how it works. Take the number 984 and divide it by the frequency in megahertz that you will be transmitting. So for instance, CB is basically 27 MHz. Take 984 and divide it by 27 (MHz) and you get an answer of 36.44. That's the wavelength in feet that your antenna needs to be at a full wavelength. In effect, an antenna for CB needs to be 36.44 feet long.

Wait … is that right? A 36-foot tall CB antenna? It doesn't sound like a good idea, does it? So the trick is to have an antenna in a fraction of that amount. CBers tend to use antennas that are a fraction of wavelength, such as 1/2, 5/8, 1/4 or 1/8. If you do the math again, take the 36-foot CB antenna and go with a half wavelength, you get 18.2 feet, which is what my first CB base antenna was. Electrically, it will work because it's a half wavelength.

Cont. on page 10

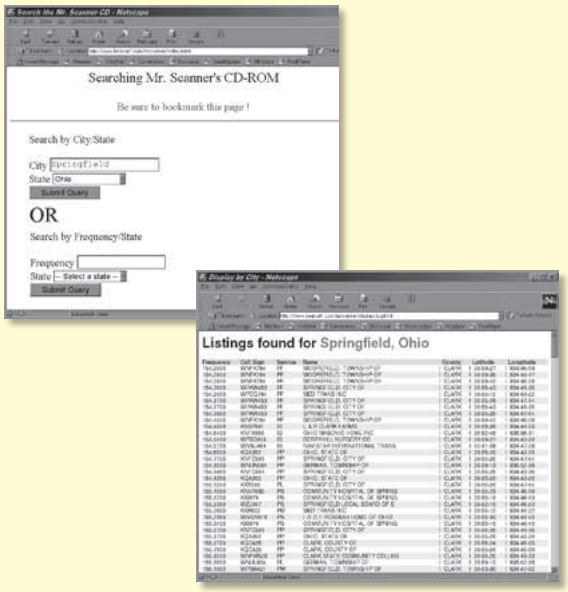


This is a popular CB mobile antenna. It's versatile because it comes with a magnetic mount, making it easy to mount on your vehicle. The spring at the base allows the antenna to move around, while a coil in the center of the antenna makes it longer "electronically." Many CBers use similar types of mobile antennas.



This has become a popular CB base antenna. It's only about three feet high and comes covered in plastic. Because it's not real tall like an 18-foot CB base antenna, it can be easily mounted in many situations, including on an RV.

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- When the form comes up fill it out with the exception of the credit card information. Be sure to include an e-mail address so we can send your user name and password back to you
- Pick Option #4 and insert your member number (which can be found on your mailing label) e.g. OH 8 AAA

Generally within the next 24 hours your user name and password will be e-mailed back to you and you will be ready to search for frequencies.

WHY ARE CB ANTENNAS SO BIG? continued



The Solarcon Antron A99 base station CB antenna is popular among CBers. The manufacturer describes it as a half wave over a quarter wave variable mutual transductance tuned antenna. It's 17.5 feet tall.

Likewise, my first CB mobile antenna was 9 feet tall, which is a quarter wavelength, or 36.4, divided by 4, which is 9.1 feet long. As long as it's a multiple, it will work.

This will work for any radio frequency, but now you can see why CB antennas have to be so long or tall to really get the signal out.

I currently have a compact CB base station antenna, but while it's short, it still electronically matches the wavelength of the radio signal. It won't get out as far as a half-wave 18-foot CB base antenna, but I don't need that capability these days. Don't let 18-foot-tall CB base station antennas scare you. There are others out there that will let you do the job. You may not talk as far, but again, you won't have that huge skyhook on the roof if you don't want it.

The same goes with mobile antennas. You may not want a huge antenna on your car like the first nine-foot whip I had. There are many equivalent smaller mobile antennas. Yes, the nine-foot whip might have an advantage over a much smaller mobile CB antenna, but a lot of people don't want to drill holes in their fender to support a huge loading coil for a nine-foot whip either! You'd be hard pressed to find anyone using an antenna like that these days.

Pick the best antenna for your application for base or mobile use and make that antenna work for you. You don't have to have a tall antenna to get on the air. It doesn't hurt, but other antennas will work fine, too.

Write in

What kind of experiences have you had with various CB base and mobile antennas? Feel free to drop me a line via e-mail to this address: cb-natcom@scanning1.com. Make sure you put Nat-Com in the subject line so if your message gets spiked to my spam bucket, I can easily spot the "Nat-Com" in the subject line and move your message right to the "in" basket. Tell me your handle, too. The e-mail address is used to reach the author of this column only.

In the meantime, keep the sunny side up and the dirty side down. 3s ●

NOAA S.A.M.E. Weather Alerts
Customized Weather Alerts

By Jim Sutton, N2OPS

Tornadoes, flash floods, severe thunderstorms, blizzards, and hurricanes are examples of severe weather that can impact our lives and our property. We now have the ultimate in advance alerting capability complements of weather radio.

Alerts are also issued for non-weather emergencies such as chemical or oil spills, 911 telephone outages, and Amber Alert or CAE Child Abduction Emergencies.

Personalized weather and non-weather warnings and watches are now available to citizens of the US, including adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories and Canada. Warning receivers can be tailored to the listener's area and needs.

One of the first continuous weather radio stations was KWO39 in Chicago. From stations in a few major metro areas there are now over 1000 NOAA Weather Radio transmitters in the US. From its beginning in 1977, 180 Environment Canada transmitters now provide continuous weather across Canada.

Today S.A.M.E., or Specific Area Message Encoding alerts are available across the US and Canada. Using seven VHF FM frequencies continuous weather broadcasts provide severe weather information.

Receivers can be set for an audible and/or visual alert. A display shows the nature of the alert.



NOAA Uniden PC78 Elite Radio

Earlier weather radios started with 162.550 and 162.400. As more stations came on the air 162.475 was added. These were channels 1, 2 and 3.

Some weather radios still use the original channel with the later frequencies of 162.425, 162.450, 162.500 and 162.525 as channels 4-7.

Ten channel weather radios have 2 or 3 Canadian Continuous Marine Frequencies and/or an older US weather frequency of 163.275 which was available for backup situations and is no longer used.

S.A.M.E alerts are not issued on the Canadian Continuous Marine Broadcast frequencies.

WEATHER RADIO FREQUENCIES

NOAA Channels original channel lineup	VHF FM Frequency	By Frequency Channels newer channel numbering	VHF FM Frequency
1	162.550	1	162.400
2	162.400	2	162.425
3	162.475	3	162.450
4	162.425	4	162.475
5	162.450	5	162.500
6	162.500	6	162.525
7	162.525	7	162.550

Canadian Continuous Marine Broadcasts	
21B	161.650
23B	161.750
83B	161.775

WHICH FREQUENCY?

It is essential that the listener do careful research as to the choice. Both NOAA Weather Radio and Environment Canada websites give details as to alerts issued by each station.

It is vital to note that the station with the strongest signal may not actually issue alerts for your location!

NOAA Weather Radio websites have excellent maps that show reception areas and shading to indicate which counties and/or areas receive alerts via that station.

Continued on page 12

NOAA S.A.M.E. Weather Alerts
Customized Weather Alerts continued

S.A.M.E. CODES

6 digit codes can be entered for one or as many as several counties or areas. Listings of S.A.M.E codes are available on NOAA Weather Radio and Environment Canada websites, usually alongside the frequency and station information.

Many, but not all weather radios have S.A.M.E. alert capability. Older weather alert radios worked with a 1050 Hz tone which was used for all alerts and all areas. S.A.M.E. alerts sound like a brief raspy burst of signal.

The table below lists the diverse events addressed by S.A.M.E. codes.

EAS Event (NWR-SAME) Codes		
Weather-Related Events	**NWR-SAME Code**	**Status**
Blizzard Warning	BZW	Operational
Coastal Flood Watch	CFA	Operational
Coastal Flood Warning	CFW	Operational
Dust Storm Warning	DSW	Operational
Flash Flood Watch	FFA	Operational
Flash Flood Warning	FFW	Operational
Flash Flood Statement	FFS	Operational
Flood Watch	FLA	Operational
Flood Warning	FLW	Operational
Flood Statement	FLS	Operational
High Wind Watch	HWA	Operational
High Wind Warning	HWW	Operational
Hurricane Watch	HUA	Operational
Hurricane Warning	HUW	Operational
Hurricane Statement	HLS	Operational
Severe Thunderstorm Watch	SVA	Operational
Severe Thunderstorm Warning	SVR	Operational
Severe Weather Statement	SVS	Operational
Special Marine Warning	SMW	Operational
Special Weather Statement	SPS	Operational
Tornado Watch	TOA	Operational
Tornado Warning	TOR	Operational
Tropical Storm Watch	TRA	Operational
Tropical Storm Warning	TRW	Operational
Tsunami Watch	TSA	Operational
Tsunami Warning	TSW	Operational
Winter Storm Watch	WSA	Operational
Winter Storm Warning	WSW	Operational

Naming Convention for EAS Event Codes

The FCC Report and Order which became effective May 16, 2002, established naming conventions for EAS event codes. In most cases, and for all future codes to be approved, the third letter of all hazardous state and local event codes is limited to one of four letters:

"W" for **WARNINGS**

"A" for **WATCHES**

"E" for **EMERGENCIES**

"S" for **STATEMENTS**

Note: The existing event codes for Tornado Warning (TOR), Severe Thunderstorm Warning (SVR) and Evacuation Immediate (EVI) will not be changed to conform to this naming convention.

- A **WARNING** is an event that alone poses a significant threat to public safety and/or property, probability of occurrence and location is high, and the onset time is relatively short.
- A **WATCH** meets the classification of a warning, but either the onset time, probability of occurrence or location is uncertain.
- An **EMERGENCY** is an event that, by itself, would not kill or injure or do property damage, but indirectly may cause other things to happen that result in a hazard. For example, a major power or telephone loss in a large city alone is not a direct hazard, but disruption to other critical services could create a variety of conditions that could directly threaten public safety.
- A **STATEMENT** is a message containing follow up information to a warning, watch, or emergency.

Continued on page 14

Big Savings on Radio Scanners

Uniden® SCANNERS



Bearcat® 796DGV Trunk Tracker IV with free scanner headset

Manufacturers suggested list price $799.95

CEI Special Price $519.95

1,000 Channels • 10 banks • CTCSS/DCS • S Meter

Size: 6 15/16" Wide x 6 9/16" Deep x 2 3/8" High

Frequency Coverage: 25.000-512.000 MHz., 806.000-956.000 MHz. (excluding the cellular & UHF TV band), 1,240.000-1,300.000 MHz.

When you buy your Bearcat 796DGV Trunktracker package deal from Communications Electronics, you get more. The GV means "Great Value." With your BC796DGV scanner purchase, you also get a **free deluxe scanner headphone** designed for home or race track use. Headset features independent volume controls and 3.5 mm gold right angle plug. The 1,000 channel Bearcat 796DGV is packed with features to track Motorola Type I/II/IIi Hybrid, EDACS, LTR Analog Trunk Systems and Motorola APCO 25 Phase I digital scanner including 9,600 Baud C4FM and CQPSK. Also features control channel only mode to allow you to automatically trunk many systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display and backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control and programming with RS232C 9 pin port (cable not supplied), Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for $29.95. For complete details, download the owners manual from the **www.usascan.com** web site. For fastest delivery, order on-line at www.usascan.com.

Bearcat® BCT8 Trunk Tracker III

Manufacturer suggested list price $299.95

CEI Special Price $169.95

250 Channels • 5 banks • PC Programmable

Size: 7.06" Wide x 6.10" Deep x 2.44" High

Frequency Coverage: 25.0000-54.0000 MHz., 108.0000-174..0000 MHz., 400.0000-512.000. MHz., 806.0000-823.9950 MHz., 849.0125-868.9950 MHz., 894.0125-956.0000 MHz.

The Bearcat BCT8 scanner, licensed by NASCAR, is a superb preprogrammed 800 MHz trunked highway patrol system scanner. Featuring TrunkTracker III, PC Programming, 250 Channels with unique BearTracker warning system to alert you to activity on highway patrol link frequencies. Preprogrammed service searches makes finding interesting active frequencies even easier and include preprogrammed police, fire and emergency medical, news agency, weather, CB band, air band, railroad, marine band and department of transportation service searches. The BCT8 also has preprogrammed highway patrol alert frequencies by state to help you quickly find frequencies likely to be active when you are driving. The BCT8 includes AC adapter, DC power cable, cigarette lighter adapter plug, telescopic antenna, window mount antenna, owner's manual, one year limited Uniden warranty, frequency guide and free mobile mounting bracket. For maximum scanning enjoyment, also order the following optional accessories: External speaker **ESP20** with mounting bracket & 10 feet of cable with plug attached $19.95. Magnetic Mount mobile antenna **ANTMMBNC** for $29.95.



Bearcat® BCD396T Trunk Tracker IV

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

APCO 25 9,600 baud compact digital ready handheld TrunkTracker IV scanner featuring Fire Tone Out Paging, Close Call and Dynamically Allocated Channel Memory (up to 6,000 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.40" Wide x 1.22" Deep x 5.35" High

Frequency Coverage:

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

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



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

More Radio Products

Save even more on radio scanners when purchased directly from CEI. Price includes delivery in the continental USA excluding Alaska.

Bearcat 898T 500 channel Trunktracker III base/mobile	$209.95
Bearcat 796DGV 1,000 channel Trunktracker III base/mobile	$519.95
Bearcat BCD396T APCO 25 Digital scanner with Fire Tone Out	$519.95
Bearcat 246T up to 2,500 ch. Trunktracker III handheld scanner	$214.95
Bearcat Sportcat 230 alpha display handheld sports scanner	$184.95
Bearcat 278CLT 100 channel AM/FM/SAME WX alert scanner	$129.95
Bearcat 248CLT 50 channel base AM/FM/weather alert scanner	$104.95
Bearcat 92XLT 200 channel handheld scanner	$109.95
Bearcat 72XLT 100 channel handheld scanner	$99.95
Bearcat BR330T up to 2,500 ch. Trunktracker III with Tone out	$274.95
Bearcat BCT8 250 channel information mobile scanner	$169.95
Bearcat 350C 50 channel desktop/mobile scanner	$104.95
AOR AR16BQ Wide Band scanner with quick charger	$199.95
AOR AR3000AB Wide Band base/mobile receiver	$1,079.95
AOR AR5000A+3B Wide Band 10 KHz to 3 GHz receiver	$2,599.95
AOR AR8200 Mark IIIB Wide Band handheld scanner	$594.95
AOR AR8600 Mark II Wide Band receiver	$899.95
AOR AR-ONE Goverment/Export sales only 10 KHz-3 GHz.	$4,489.95
Scancat Gold For Windows Software	$99.95
Scancat Gold for Windows Surveillance Edition	$159.95

Bearcat® BC246T Trunk Tracker III

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

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

Frequency Coverage:

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



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

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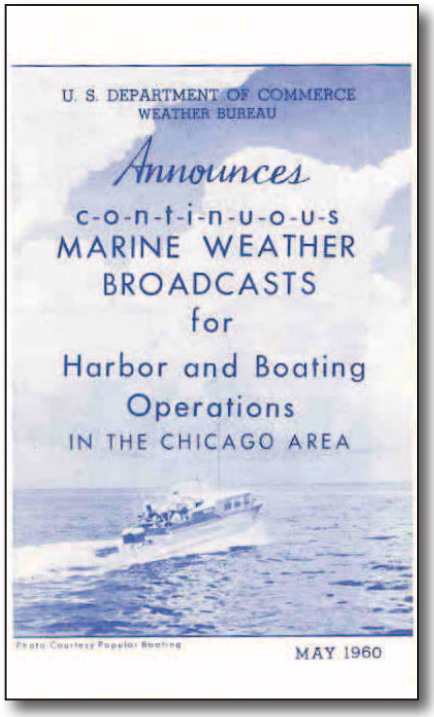
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NOAA S.A.M.E. Weather Alerts
Customized Weather Alerts continued

EAS Event (NWR-SAME) Codes *continued*		
Non-Weather-Related Events	**NWR-SAME Code**	**Status**
National Codes-Required		
Emergency Action Notification	EAN	Not currently implemented on NWR
Emergency Action Termination	EAT	Not currently implemented on NWR
National Information Center	NIC	Operational
State and Local Codes-Optional		
Avalanche Watch	AVA	Operational
Avalanche Warning	AVW	Operational
Child Abduction Emergency	CAE	Operational
Civil Danger Warning	CDW	Operational
Civil Emergency Message	CEM	Operational
Earthquake Warning	EQW	Operational
Evacuation Immediate	EVI	Operational
Fire Warning	FRW	Operational
Hazardous Materials Warning	HMW	Operational
Law Enforcement Warning	LEW	Operational
Local Area Emergency	LAE	Operational
911 Telephone Outage Emergency	TOE	Operational
Nuclear Power Plant Warning	NUW	Operational
Radiological Hazard Warning	RHW	Operational
Shelter in Place Warning	SPW	Operational
Volcano Warning	VOW	Operational
Administrative Events	**NWR-SAME Code**	**Status**
Administrative Message	ADR	Operational
National Periodic Test	NPT	Not currently implemented on NWR
Network Message Notification	NMN	Not currently implemented on NWR
Practice/Demo Warning	DMO	Operational
Required Monthly Test	RMT	Operational
Required Weekly Test	RWT	Operational



SELECTING A RECEIVER

Weather Radio receivers can be found in:

- Amateur radios
- CB radios
- Clock radios
- FRS/GMRS radios
- Home weather stations
- Marine radios
- Pocket radios
- Scanners
- Shortwave radios
- Wind up flashlights

Not all weather radios have S.A.M.E capability. Be sure to carefully read the description of the radio to be sure it fills your needs.

Be sure to check for the latest frequencies on the Nat-Com web page www.nat-com.org



Canada Weather Stations



NOAA Weather Radio, KPA504, Nenan, Alaska, 162,400 MHZ

WHAT TO LOOK FOR

Alarm Output for External Devices: These include visual and audible devices. Great for hearing impaired individuals.

Antenna jack: most weather radios have RCA jacks. Special external and outside antennas are available. This is a must in weak signal locations.

Backup power: Battery backup keeps the weather radio running during a power outage. Some weather radios have circuits that trickle charge rechargeable batteries. Be careful not to use alkaline batteries in these units.

Event lockout: This allows the user to choose events to be alerted to.

Reviews: Spend some careful time reading the reviews. Two excellent sources of reviews are Consumer Search dot Com and E ham dot Net

S.A.M.E.: Does the receiver allow for multiple area codes or only one. Some S.A.M.E radios can be programmed to respond to all alerts sent by that weather station.

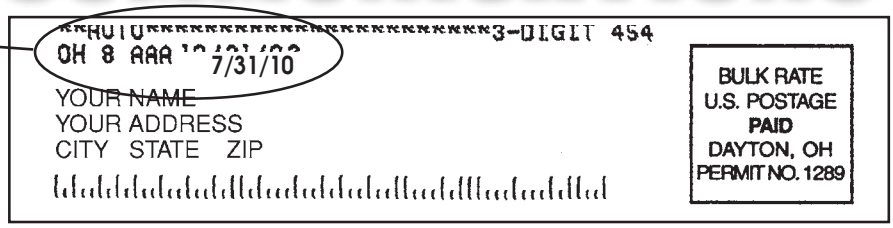
Continued on page 16

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NOAA S.A.M.E. Weather Alerts Customized Weather Alerts

continued

Sensitivity: Weather radios vary greatly in receive sensitivity. Good sensitivity is vital if you are in a weak signal area.

MISCELLANEOUS

Some scanners and ham radios have S.A.M.E. receive capability. These will usually receive weak weather signals long after consumer grade receivers have lost reception.

Be sure to determine whether the S.A.M.E. works while using the radio or only when the unit is off.

While researching for this story I discovered a really neat combo for the traveler. The Uniden PC-78ELITE is a weather alert and deluxe CB in one package. This unit utilizes the original 1050 Hz tone as S.A.M.E. encoding would be too restrictive to the traveler.

A combo CB/weather antenna will allow for the best weather reception.

LOCAL PROMOTIONS

KWCH Ch 12 of Wichita KS Weather Radio Program offers a deluxe S.A.M.E weather alert which will be custom programmed for the listeners location.

WWBT Ch 12 in Richmond VA has partnered with local Kroger grocery stores to make low cost S.A.M.E weather radios available

Tuscaloosa County, Alabama makes free S.A.M.E weather alert radios available to the senior citizens and the disabled of that county.



Midland S.A.M.E. Digital Weather/All Hazrds Alert Radio



Weather Radio Strope Light

LINKS

NOAA Weather Radio
http://www.nws.noaa.gov/nwr/
General information including weather radio stations, coverage maps and S.A.M.E. codes.

Environment Canada Weather Radio
http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=792F2D20-1

US SAME Codes
http://www.nws.noaa.gov/nwr/indexnw.htm#sametable

Canadian SAME Codes
http://ec.gc.ca/meteo-weather/default.asp?lang=En&n=1CD5BDF2-1

FINALLY

S.A.M.E. weather alert radios should be common place in homes, schools, workplaces, institutions, public safety agencies, parks, any place people gather.

Get yours today and remember weather radios make great gifts.

Until next time, may your signals be strong, your static be few.

Radio's "Golden Age" Was "Entertainment Tonight" and More

By Dorothy Rieke

The "Golden Age of Broadcasting" began in the mid 1920s and ended in the 1950s. The first radios marketed, powered by batteries or electricity and often equipped with trumpet-like speakers, brought the magic of a new world to everyone, especially to those living in remote regions.

By the 1940s radios were streamlined in design with adjustable volume, buttons for station selection, and better reception. In fact, free -standing cabinet models were wood-grained and designed to compliment any decor.

Because transportation had not reached the "modern" stage, families remained close to home relying on their radios for information as well as entertainment.

The radio was a "cure all" for those who lacked knowledge. Daytime radio brought weather reports, farm news, national events, discussions, soap operas, interviews, and talk. Evenings brought entertainment for all ages.

During the World War II years, radio conveyed news of enemy attacks and Allies' victories. Politicians used it to promote their ideas and plans. President Franklin Roosevelt, with his pleasing voice, broadcast "Fireside Chats" to gain support for his government policies.

The radio, at this time, was also used as a propaganda device against other countries. The "Voice of America," part of the Office of War Information, aimed broadcasts at Japan, south Pacific, and Europe under Nazi occupation. It advised foreigners about America's role in the war.

Evenings were filled with programs designed to delight and intrigue every family member. Comedies, mysteries, adventures, and dramas all arrived by way of air waves. Skilled actors and actresses presented programs that listeners enjoyed. Sound effects were part of the total result of programs. Often, unusual devices were used to produce sounds. For example, water sprayed into a metal bucket was used for the sound of rain.

Writers of the famed soap operas often employed dire circumstances to keep audiences interested. Young women and others were addicted to these dramas because the main characters encountered danger and romance. These listeners often lived vicariously through the adventures of soap opera casts.

"The Guiding Light," "One Man's Family," "Stella Dallas," "Our Gal Sunday," and others were ongoing dramas of beloved characters. It's interesting to note that these programs were named soap operas because most of them were sponsored by soap companies. *Continued on page 18*



These pictures are radio personalities from 1920 through 1939. Earl May is pictured in the top center.



"Hitting the airwaves in 1940-1969" reviews more KMA radio personalities such as Tom Beavers, Jim Ross Lightfoot, Jack Gowing and others.



"Hitting the airwaves in 1970-2000" displays news items and photos of more recent radio personalities. Evelyn Birkby, a popular homemaker, is in pictured on the center right.

Radio's "Golden Age" Was "Entertainment Tonight" and More continued

A program broadcast on October 30, 1938, rocked the world with its contents. Orson Welles" Mercury Theater presented H.G. Wells,' THE WAR OF THE WORLDS, using fictional news broadcasts describing the earth's invasion by aliens from Mars. Because some listeners did not hear the beginning of the program and misunderstood its fictional content, some believed an invasion was actually taking place in New Jersey. As a result, terrified people summoned the police, armed themselves with pistols and rifles, or fled from their homes in panic.

Music played a prominent role in the "Golden Age of Broadcasting." Some of the best bands ever, broadcast melodies over radio air waves. This music became the "medicine for the many ills of wartime." It soothed, refreshed, and renewed. It made the world seem brighter and burdens lighter. Glenn Miller, the Dorsey brothers, Guy Lombardo, Duke Ellington, Benny Goodman, and others lighted up the airwaves with "Sentimental Journey," "Tuxedo Junction," and more swing music.

Religion had its time on radio. Edythe Stirlen, the" Little Minister," presented Sunday School lessons early on Sunday mornings on a local radio station. Churches also broadcast sermons on Sunday mornings hoping to reach shut-ins and others.

Another type of broadcasting reached fame during this age. At this time, homemaking was considered a full- time job. Women stayed home to raise their children, clean house, wash clothes, and prepare meals. However, this kind of dedication often led to loneliness with the desire to hear another woman's voice.

Certain radio stations met this need by employing women, well-versed in cooking, baking, cleaning, and preparing food, to exchange favorite recipes, present interesting food preparation ideas, and reveal household hints over the air.

Midwestern radio stations such as KFNF, KOTD, KMA and others hired homemakers who offered friendship and company for stay-at-home women. These radio personalities advised, counseled, and sympathized. In doing so, a bond was created with each listener.

Such women as Florence Falk, Jessie Young, Edith Hansen, Brenda Kay McConahay, Colleen Ketcham, Martha Bohlsen, Evelyn Birkby, and others heated up the airwaves with delicious sounding recipes and household hints. Many of the household hints were from listeners.

One particular household hint that seemed rather ridiculous was "Scrub your floor with milk; it will give it a glossy appearance." That probably was poor advice knowing the stickiness of milk and its tendency to draw flies.



The photo on the upper right, taken during the 1930s, demonstrates the vast attendance at KMA's Harvest Jubilee. Other photos portray historical events related to the station.



Autographed photos of the Everly Brothers remind viewers that they began their careers on a KMA family music show.

One of the early KMA Homemakers to broadcast was Bernice Currier who successfully bridged the gap between being a "live" radio musician and a radio homemaker. Currier's unique recipes were organized in an easy-to-understand form using the alphabet. For example, the A group represented dry ingredients; B group, the liquids. Directions for preparation were easy using this type of arrangement.

Another lasting family of homemaker/broadcasters was Leanna Driftmier and her daughters, Lucille, Marjorie, and Dorothy. Like many others, this family recognized the value of radio advertising and used it daily during their shows. Their broadcasts reached listeners in at least five Midwestern states.

Family members and, at times, their companions and friends, regularly visited on the radio giving tested " tried and true" recipes. They published several cookbooks, a

Radio's "Golden Age" Was "Entertainment Tonight" and More continued

family history, a small inspirational magazine, KITCHEN CLATTER, and developed a company that produced soap, flavorings, salad dressings, and cleaners. Like other entrepreneurs, they used the radio to sell their company's products as well as their magazine and recipe books.

At times, tulips bulbs from Holland were sold on the Kitchen Klatter program. Radio listeners often visited Shenandoah, Iowa, hoping to catch a glimpse of the popular Driftmier women and see the advertised "Red Emperor Tulips" which they so adroitly advertised.

Perhaps one of the best loved radio homemakers was Billie Oakley. Her lively personality and excellent recipes won many listeners over the years. Preparing all kinds of food for her children as well as for social functions equipped her for being a competent radio homemaker. Her creative cooking was displayed in several recipe books and later in a small publication, HOMETALK.

One homemaker regularly presented both radio and TV homemaker shows. Martha Bohlsen broadcast for more than 32 years exchanging practically every type of recipe with Midwestern homemakers. Her favorite recipes were handed down from her grandmother and mother. Others were from radio listeners. She always vowed that her recipes were created to "suit your cooking moods." Bohlsen's recipes and others were simple to prepare using ingredients readily available.

As women radio listeners joined the workforce, fewer and fewer women listened to these shows. Today, KMA in Shenandoah, Iowa, airs one veteran homemaker, Evelyn Birkby, once a month. Kelly Young, a young homemaker with children, gives recipes each Thursday morning.

Radio has changed with the times . What worked years ago, in some cases, have been retained. Of course, the appearance of television altered radio offerings, but radio audiences continue to grow. Over five million radios are in use today. Portable radios also have played a role in retention of radio popularity.

Today's audiences enjoy current music, talk shows that enlist listeners' comments, and thorough coverage of news events. Not only do people carry radios with them, they tune in while driving as most cars are equipped with radios.

FM broadcasts and stereo broadcasting bring better sound quality, which generally surpasses AM broadcasts, emulating live performances. New ways and improved transmission have made radio what it is today-a very important communication tool.



This Shenandoah museum display includes a painting depicting the elaborate interior of the Mayfair Auditorium.



This display cabinet, filled with old radios and equipment, kept "millions advised." Several Eric Sevareid Awards for news stories are also on display.



Earl May, at the top left, along with his fellow radio expert Henry Field, founder of KFNF, bottom right, were true pioneers in the radio industry.

Tampa's Vast Collection of Military Frequencies

By Mark Meece

This month we head to the Gulf Coast side of Florida, in particular the Tampa area. This area has been inhabited by many various indigenous cultures. It was first spotted in the early 1500s by Spanish explorers, but remained free of western expansion until 1824 when the US Army established an outpost and named acovered by the Tampa Convention Center. Now heading just a few miles to the south, we find the focus for this issue; Mac Dill Air Force Base.

Situated on the south end of Interbay Peninsula as a staging area for Troops, Mac Dill originally known as Southeast Air Base, Tampa, traces its roots all the way back to 1898 and the Spanish-American War. In that era, Tampa was a strategic emplacement as a rendezvous location for troops on their way south to Cuba to aid that country in their fight for independence from Spain. During that time there were some 66,000 troops waiting to board ships heading to Cuba. 10,000 soldiers from those troops set up camp in what was called at that time Port Tampa City. The base was later renamed in honor of Colonel Leslie Mac Dill, a pioneer of the United States Army Air Corp who died in a plane crash in 1938. With the formation of the U.S. Air Force in 1947 the official name changed from Mac Dill Field to Mac Dill Air Force Base. The first mission assigned to the airfield was planning and execution of the continental United States' air defense, and it became the headquarters of the Air Defense Command's Third Air Force.



The actual age of the base is from the time of their official dedication, which took place on April 16, 1941, about one year after occupancy began. Flight operations began in 1941 following the Japanese attack on Pearl Harbor. The base became a major staging area for aircraft and crews of the Army Air Corp. The first units assigned to Mac Dill where charged with various responsibilities. The 29th Bombardment Group was charged with flying antisubmarine patrols over the Caribbean. The 29th served Mac Dill from May of 1940 until it transferred to Gowen Army Airfield in Idaho in June of 1942. At which time they became an Operational Training Unit (OTU) for the Consolidated B-24 Liberator. The 44th Bombardment Group, was a heavy squadron that also flew the B-24 on antisubmarine missions. They moved to Barksdale Army Air Field, Louisiana in 1942.

By the time the fall arrived in 1942, the antisubmarine patrols along with other naval operations were successful in bringing to an end the German U-boat operations in the western Atlantic that had been seriously disrupting the shipping lanes.

As the United States became fully involved in the second World War, antisubmarine operations were taken over by the U.S. Navy. Mac Dill then became a facility for training aircrews for deployment to overseas theaters. Training initially focused on heavy bomber groups flying the B-17 Flying Fortress.

As the summer of 1942 arrived,

Continued on page 22

Hobby Radio Stop

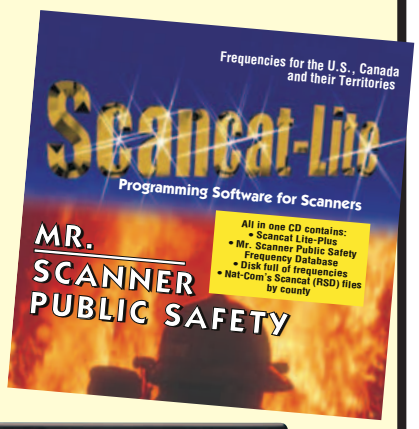


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Tampa's Vast Collection of Military Frequencies *continued*

Mac Dill became host to the newly activated 21st Bombardment Group. The 21st was the operational training unit for the Martin B-26 Marauder, that group also flew patrols watching for enemy submarines in the Gulf of Mexico. Training in the B-26 ended operations at Mac Dill in October 1943. The 21st disbanded and Mac Dill reverted back to a primary B-17 aircrew training base. You can find a list of those historic units in TABLE 1.

In November of 1943, the 488th Bombardment Group (Heavy) became the Operational Training Unit at Mac Dill. The 488th trained the 463rd Bombardment Group (Heavy) from November of 1943 to January 1944, and the 483rd Bombardment Group (Heavy) from November 1943 to March 1944. In May 1944 the 488th deactivated and aircrew training of the B-17 came to an end.

As World War II came to an end, the next fifty years saw many changes in operations at Mac Dill. In 1946 Mac Dill came under the directives of the Strategic Air Command (SAC). That year Mac Dill went from training aircrews in the B-17 to becoming the primary B-29 Superfortress training facility. The Strategic Air Command's first operational B-47 wing the 306th Bombardment Wing activated on September 1, 1950 at Mac Dill. Refueling operations began at Mac Dill in 1952 after the 306th Air



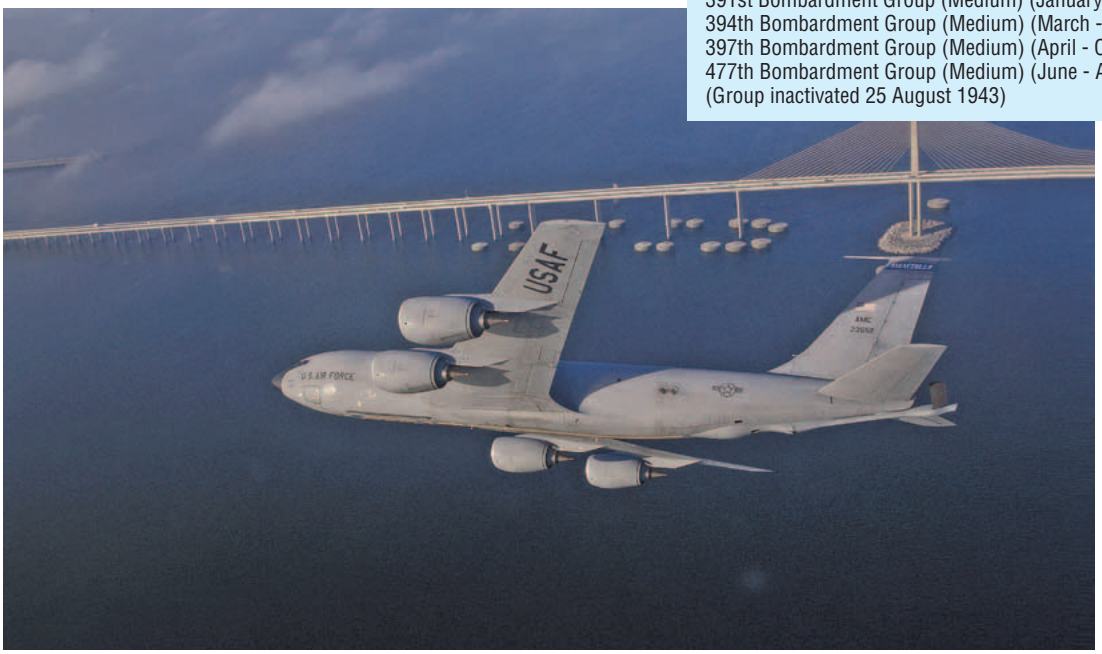
TABLE 1

HISTORIC B-17 FLYING FORTRESS SQUADRONS AT MACDILL

97th Bombardment Group (Heavy) (February - March 1942)
92nd Bombardment Group (Heavy) (March - May 1942)
91st Bombardment Group (Heavy) (May - June 1942)
99th Bombardment Group (Heavy) (June 1942)
94th Bombardment Group (Heavy) (June - July 1942)

HISTORIC B-26 MARAUDER SQUADRONS AT MACDILL

320th Bombardment Group (Medium) (June - August 1942)
336th Bombardment Group (Medium) (July - August 1942)
(Served as OTU at Lake Charles AAF, Louisiana after training at Mac Dill)
322nd Bombardment Group (Medium) (July - September 1942)
323rd Bombardment Group (Medium) (August - November 1942)
344th Bombardment Group (Medium) (September - December 1942)
386th Bombardment Group (Medium) (December 1942 - February 1943)
387th Bombardment Group (Medium) (December 1942 - April 1943)
391st Bombardment Group (Medium) (January - May 1943)
394th Bombardment Group (Medium) (March - July 1943)
397th Bombardment Group (Medium) (April - October 1943)
477th Bombardment Group (Medium) (June - August 1943)
(Group inactivated 25 August 1943)



Tampa's Vast Collection of Military Frequencies *continued*

Refueling Squadron accepted delivery of the first Boeing KC-97E assigned to SAC.

The first threatened closure of Mac Dill came in 1960, and the base was actually listed as "Government Surplus". A dramatic event changed that in 1962, when for thirteen days in October the world made its closest call with Nuclear War. The Cuban Missile Crisis pointed out the strategic value of the base's location. As a result of this Mac Dill became the home of the first unified command as a crisis response force was formed of the Unites States Strike Command. By 1962 Mac Dill was transferred from SAC to the Tactical Air Command (TAC), thus making the transition from a bomber base to a fighter base. On April 17, 1962 the 12th Tactical Fighter Wing was re-activated and placed under command of the Ninth Air Force at Mac Dill. By January 1964 the 12th TFW and its subordinate squadrons were flying the F-4 Phantom II made by McDonnell Douglas. The F-4 Phantom II is the only aircraft used by both the USAF Thunderbirds and the U.S. Navy's Blue Angels.

The 1st Tactical Fighter Wing was transferred to Mac Dill from Hamilton Air Force Base, California on January 10, 1970. The 1st TFW shared squadrons designations used by the host 15th Tactical Fighter Wing until 1971. By 1975, the 1st TFW and its operational squadrons had moved on to Langley Air Force Base, Virginia as they had arrived at Mac Dill, without personnel or equipment. The 56th became the new host unit at Mac Dill Air Force Base on June 30, 1975, its operational squadrons are listed in TABLE 2.

The transition from the F-4 to the F-16 Fighting Falcon took place in 1979. The US Readiness Command was replaced by the US Special Operations Command in 1987. By the early 1990s, airspace around Mac Dill had become very congested causing hazards for F-16 training. As a result, The 1991 Defense Base Closure and Realignment Commission ordered an end to all flight line activities at Mac Dill. This sent Mac Dill's F-16 mission to Luke Air Force Base and reassigned the 56th Fighter Wing to the Air Education and Training Command (AETC). However, the flight line closure was a short-lived thanks to efforts of local Congressman Bill Young (R-FLA), that order was rescinded in 1993.



TABLE 2

56th Tactical Fighter Wing

61st Tactical Fighter Squadron (yellow tail stripe)
62nd Tactical Fighter Squadron (blue tail stripe)
63d Tactical Fighter Squadron (red tail stripe)
13th Tactical Fighter Squadron (white tail stripe, deactivated at Mac Dill during conversion from F-4D to F-16A/B in 1981 and reactivated at Misawa AB, Japan as a F-16 squadron)
72nd Tactical Fighter Squadron (black tail stripe)
(F-16A/B/C/D Activated 1 July 1981, deactivated June 19, 1992)



One year after Hurricane Andrew ran a path of destruction across southern Florida, the National Oceanic and Atmospheric Administration (NOAA) moved their operations from Miami International Airport to the Aircraft Operations Center at Mac Dill. They now operate out of Hangar 5, flying both the Lockheed WP-3D Orion and Gulfstream IV SP aircraft heard as "Hurricane Hunters" on HF channels.

Continued on page 24

Tampa's Vast Collection of Military Frequencies *continued*



Since 1994, the 6th Air Mobility Wing has been the host wing at Mac Dill, under the watchful eye of the Air Mobility Command to provide support for the US Central Command (CENTCOM) and US Southern Command (USSOUTHCOM). The U.S. Special Operations Command (USSOCOM)which is a Unified Combatant Command charged with overseeing the various Special Operations Commands (SOC or SOCOM) of the Army, Air Force, Navy and Marine Corps of the United States Armed Forces is based at Mac Dill. The 6th Aerial Refueling Wing is the tenant flying unit stationed at Mac Dill. It squadron, the 91st Aerial Refueling Squadron fly twelve KC-135R Strato tanker aircraft, one EC-135 and one 1 CT-43 . The 6th AMW is heard as RAYMOND 19 on the HF-GCS of the US Military, aircraft and uses the call sign of BOLT. The 927th Air Refueling Wing of the US Air Force Reserves is an Associate Unit of the 6th AMW. This unit just recently transferred its personnel to Mac Dill from Selfridge Air Force Base in Michigan where they used the call signs AUTO and PISTON.

Mac Dill Air Force Base (KMCF) operates two runways 4/22 on 5,000 acres, supporting around 6,000 airmen and civilians. This also includes lesser known Mac Dill AFB Auxiliary Field (KAGR) in nearby Avon Park, Florida. Frequencies for these can be found in TABLE 3.

TABLE 3

MACDILL AIR FORCE BASE (KMCF)
AERONAUTICAL OPERATIONS

118.575	Mac Dill Ground
118.800	Tampa Departure Runway 22
119.650	Tampa Departure
119.900	Tampa Departure
123.700	Mac Dill Tower
124.950	Tampa Approach
132.775	91st ARS Command Post (LIGHTNING OPS)
133.825	ATIS
134.100	6th AMW Command Post
134.250	Tampa Departure Runway 4
139.875	Air Tactical
139.975	Air Tactical
141.800	Air Tactical
239.350	COM-1
266.500	Air Tactical
270.100	ATIS
275.800	Mac Dill Ground
290.300	Tampa Departure
294.700	Mac Dill Tower
311.000	COM-2
318.100	GCA
321.000	AMC Command Post Secondary
324.500	GCA
337.400	GCA
344.600	Metro
353.575	Tampa Departure
354.000	Tampa Approach
359.300	GCA
364.100	Air Tactical
372.200	Dispatcher
379.800	GCA



Tampa's Vast Collection of Military Frequencies *continued*



Mac Dill operates a Motorola Type II Smart Zone trunked radio system that uses digital voice modulation. Information on this system can found in TABLE 4.

TABLE 4

SYSTEM: Mac Dill Air Force Base
SYSTEM TYPE: Motorola Type II Smart Zone
SYSTEM VOICE: APCO-25 Common Air Interface Exclusive
SYSID: B112

CUSTOM TABLE:

LO CHANNEL: 380
HI CHANNEL: 759
OFFSET: 380
BASE FREQ: 406.5625
SPACING: 12.5 kHz

FREQUENCIES:

406.5625c 406.7625c 406.9625 407.7625c 408.1625

c - denotes Control Channel

TALKGROUPS

ID	USE
4800	Mac Dill Control
4848	Base Security
4864	Base Security
12800	Tampa Police F1 (453.550)
14400	Tampa Police F2 (154.430)
19600	ALPHA
24900	TIGER

Each year, Mac Dill AFB hosts Air fest, a two day air show of events. In 2010, the event took place over the weekend of March 20-21. The event is free and open to the public, keep an eye out for next year's event at http://www.macdill-airfest.com/default.aspx .

Mac Dill is always abuzz with activity, if you find yourself in the area you should find lots to listen to. ●

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Local Weather Range Maker

By Gordon West, WB6NOA

At 30 MHz and higher, summertime weather patterns may lead to VHF/UHF/microwave range enhancement. In fact, local weather conditions may trigger optical phenomena too!

This extraordinary radio and visual range enhancement regularly occurs in the months of "JulAugust", as some scanner enthusiasts proclaim, as the best 60 days of radio excitement.

Scanner and ham radio operators in the area of the Great Lakes may begin to hear Texas stations emerging out of the noise and remaining strong for 2 and 3 continuous days. TV DX watchers in Texas do a scan of all available digital channels, and smile when Tampa and Miami digital TV is received with few freeze-ups.

"The VHF and UHF path between New York and Florida stays in for days, with little signal fades," comments Ken Neubeck, WB2AMU, an avid long-haul VHF/UHF DXer. His buddy, Frank, AA2 "Dr. Radio" wants to be first to work the Azores on 2 meters SSB. In July and August, FM broadcast stations have been logged between Africa and South America, more than once!

Here on the west coast, every "JulAugust" treats us to VHF and UHF FM and SSB simplex contacts from Hawaii, 2500 miles away, for days on end.

Nope, not the more common sporadic E ionospheric thrill that we usually get in summer months on low band and high band scanner channels. Sporadic E is easily characterized by every-15-second momentary deep fades, as well as the event lasting no longer than an hour or so at most. Nope, not sporadic E.

THE WEATHER PHENOMENA

The weather condition that triggers extraordinary-range VHF, UHF, and microwave DX has several monikers:

Tropo
Tropospheric Ducting
Inversion Layer Ducting
Inversion Layer DX
Super Refraction

Good news for microwave DXers – we get a "heads-up" on pending long range reception from models like the most popular Hepburn Report at www.DXinfocentre.com.

The weather mechanics of radio VHF, UHF, and microwave range extension plus optical mirages are calm

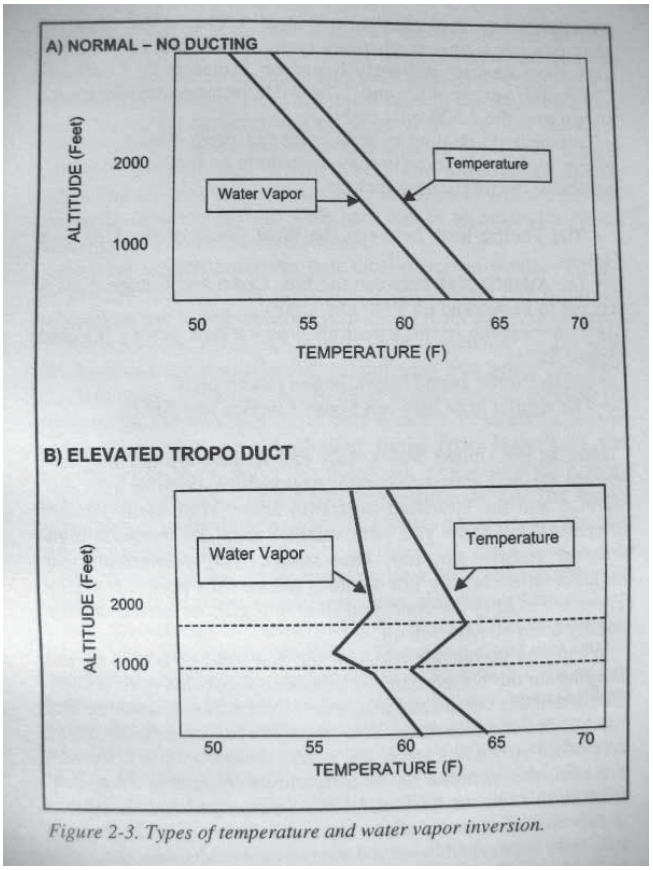


Figure 2-3. Types of temperature and water vapor inversion.

Figure of tropo, mechanics on how it happens.

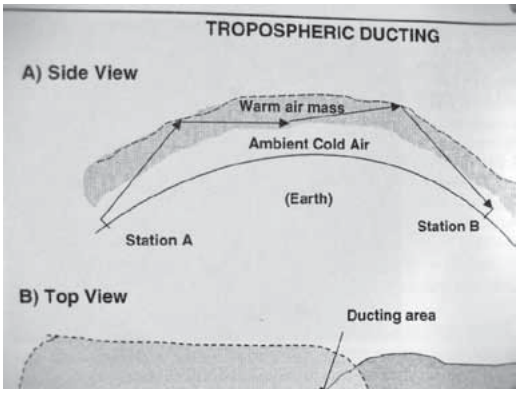


Figure of tropo, diagram

Local Weather Range Maker

continued

undisturbed windless high pressure weather systems, during the famous months "JulAugust". A well defined high pressure cell is the telltale sign of upcoming radio excitement. The high pressure cell usually spells hot weather and a sweltering windless several days down here "on the deck". As the concentrated air within the high pressure cell begins to drop, it compresses warm air below into a stratified band of hot air. You can sometimes see this on the horizon as trapped "smog" with a well defined band of yucky air seen from horizon to horizon. It usually stratifies about 1000 feet above the sea or land.

The subsided (compressed) air, which becomes stratified or layered, also loses moisture content. This loss of moisture now begins to form a waveguide effect on VHF and UHF scanner frequencies, the weather frequencies, police and fire radio, and most any signals above 30 MHz.

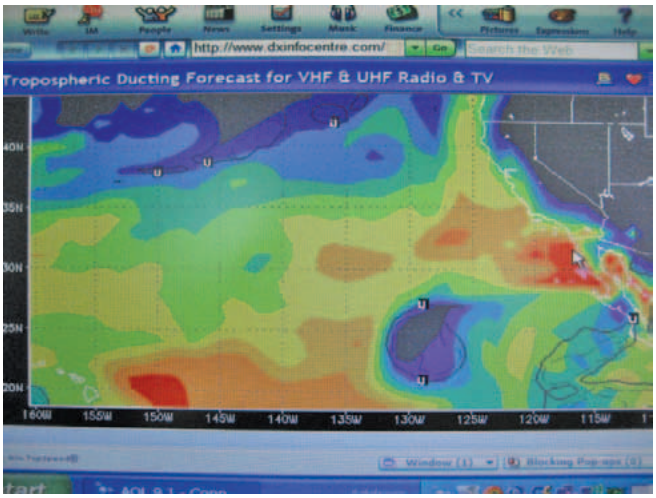
Any time there is a sharp change in temperature, water content and air pressure within this stratified band of hanging smoggy hot air, and radio ducting begins to take place. This is because the refractive index of air now becomes a distinct boundary to keep the microwave signals from "leaking" out.

When the inversion layer gains 10 degrees of temperature above the air above and below it, radio ducting begins at each end of the super refracted duct. If the stratified band of air pollutants remains unaffected by mid level winds VHF and UHF radio signals may travel for hundreds op miles, with not more than a half dB signal loss!

The longer the high pressure cell remains stalled over a region, extraordinary VHF, UHF and microwave ranges can be achieved. The greater the temperature elevation within the duct, the more compact the width of the duct, and higher and higher microwaves go into "super refraction".

Occasionally, tropospheric ducting becomes so pronounced that mysterious optical illusions form on the horizon. A local island off the Southern California coast developed what appeared to be land images that we KNEW just could not be! We also could peer well over the horizon and see a distant radio tower upside down, hundreds of miles away out in the ocean.

In the Midwest , rural farmers reported hearing VHF weather channel stations over a thousand miles away, and were quite surprised at midnight to see a 300 mile distant aero white/green searchlight illuminating their normally pitch dark bedroom.



The Hepburn report is best to spot good tropo conditions.



Gordo's stacked long-boomer beams for tropo work to Hawaii

In Hawaii, the locals tune in to Mexico FM stereo broadcasts, and a report from Paul, KH6HME, indicates the rare catch of a San Diego, California digital TV signal during the channel-scan update on the small converter box in Hilo!

August is the chosen month for a weekend ARRL microwave operating event, "limited" to signals 10,000 MHz and up. Guess what – during periods of tropospheric ducting within a stalled high pressure system, 10 watt X-band signals have traveled as far as 1000 miles down the coast in California!

To check FM high band tropospheric ducting conditions, turn down your squelch, and tune around vacant weather channels at 162 MHz. It takes only a few minutes of reception to determine "…Boston reporting 92 degrees Fahrenheit….." as you grab your log book from your desk in Orlando, Florida!

Continued on page 28

Local Weather Range Maker

continued

Ham radio operators turn to Single Sideband and CW modes to tune in constantly transmitting VHF and UHF propagation beacons:

50 MHz – 50.1 MHz
144.275 MHz - 144.300 MHz
222.050 MHz – 222.060 MHz
432.300 MHz – 432.400 MHz
10,368.3 MHz

These automatic beacons for narrow band ham radio gear make for interesting reception when the bands go long.

Ham operators employ digital signal processing add-on speakers to hush background noise without any squelch on at all. This allows for the faintest of CW notes to pass through the DSP circuit, and sound the "alarm" that a distant ham radio beacon is beginning to come through.

FM scanner enthusiasts all have their favorite long range constant transmitting beacon source, whether it's a 152 MHz pager 900 miles down range, or a weather channel that only becomes active when the distant 500 mile away weather station signal gets caught up in the tropospheric "wave guide" and lands – to your amazement – right into your antenna system on the roof.

Its JulAugust right now, so turn off the squelch, and start listening to white noise, and expect that tropospheric ducting associated with a stalled high pressure cell overhead, can bring in signals from up to 1000 miles away for days on end!

Good reading and listening:

The Gordon West, WB6NOA, 130 page VHF Propagation handbook, with included hour-long audio CD of the sounds behind VHF and UHF distant reception.

$20 plus $5 p&h, autographed, 2414 College Dr. / Costa Mesa, CA 92626.



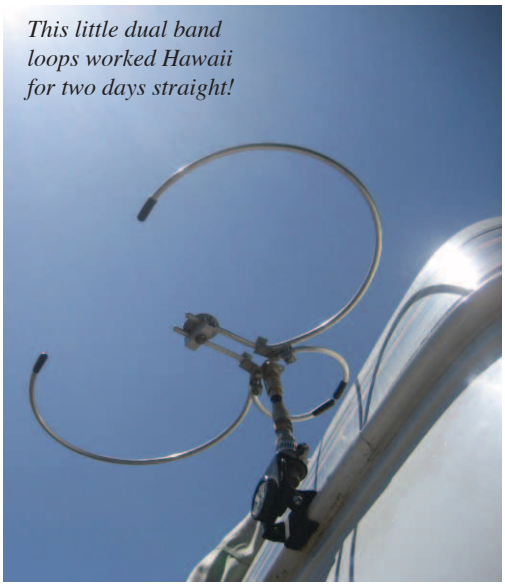
A hurricane to the south will spawn tropo ducting.



Weather radar bounces off a mirage, inversion layer offshore!



An add on DSP speaker keeps things silent until the band opens.



This little dual band loops worked Hawaii for two days straight!

ABOUT THOSE SECRET CODES

Screen out unwanted chatter if you have the right numbers

By Chuck Gysi, N2DUP

If you have one of the newer high-end scanner models such as the GRE PSR-500 or Uniden Bearcat 396XT, there is a feature on your scanner that allows you to screen out unwanted radio traffic – if you know how to use it.

Known by a variety of names, but generically as Continuous Tone-Coded Squelch System or CTCSS, Digital-Coded Squelch or DCS or Network Access Code or NAC, these codes when entered into your scanner allow you to decide what conversations you hear on a given channel if you don't wish to hear all the traffic on the same frequency.

These codes give you the ability to filter out unwanted communications. For instance, let's say your local fire department uses 154.130 for its communications. However, let's say there is a big-city fire department three counties away that uses the same channel. If your local fire department uses a CTCSS code of 103.5 and the big-city fire squad uses a DCS code of 023, you can easily screen out the big city department by entering 103.5 for the CTCSS code on that channel and eliminate hearing the big-city department. Your scanner will not stop on that channel unless it hears the code associated with that channel.

First, let's take a look at what these codes really are. CTCSS codes are literally subaudible tones that are transmitted by two-way radios. The receiver on the other end won't open up the speaker unless it hears the identified same CTCSS tone. Sometimes you can hear these tones over top the radio signals, especially during pauses in conversations. While the lowest tone is 67.0 hertz, higher tones, especially those from about 192.8 hertz and up, create a louder hum or tone on the channel and you can almost start to determine them if you have a good ear.



This was the first scanner to offer CTCSS tone scanning, the Uniden Bearcat BC590XLT and its sister, the BC600XLT. In order to monitor with the CTCSS feature, you had to remove a panel on the bottom of the radio and plug in a small circuit board. After that, you could monitor with CTCSS tones on any channel in the radio.

DCS is a digital version of code that isn't subaudible, but does the same thing in keeping channels quiet from other users. DCS offers additional codes, especially in urban areas where many CTCSS codes in use might find themselves being used over and over, causing channel congestion. NAC is a version of code that is used on digital P25 radio systems and has the same ability to keep digital frequencies quiet unless the right NAC code is transmitted.

The first scanner to offer CTCSS capability was the Uniden Bearcat 590XLT and the 600XLT (a version made exclusively for Scanner World USA and its dealers). The 590 and 600 models came out in the late 1980s and were popular with those who wanted to use the CTCSS feature to filter out conversations. Other models with CTCSS came along over the years and some versions offered the ability to scan a channel for tones that are being used, but proved to be slow in finding the tone, especially on little-used channels. Busy channels proved easy to snag tone information.

Today's scanners offer instant readout of tones without having to scan through all the possible combinations one at a time. If a tone is used on a channel, you'll have an instant readout of the tone whether it's CTCSS, DCS or NAC on digital

Continued on page 30

ABOUT THOSE SECRET CODES

continued

frequencies. Most scanners allow you to hit a button to automatically program that tone on the channel when it comes up on tone search, and then bingo – you have the right tone ready to go.

So what happens if there is more than one tone used on a channel that you want to monitor? Easy! A good example is the rural county where I live. All the fire departments throughout the county have their own repeaters on the same fire channel, but each one uses a different CTCSS tone. So for instance, the fire department in my town uses a 151.4 hertz CTCSS tone on their repeater. A town a few miles to the west uses 123.0 hertz and a town a few miles to the south uses 103.5. What I do is enter each as a separate channel. I enter the same fire frequency in the scanner each time for as many times as I need, but each time, I enter in a different CTCSS tone, as needed. I literally have the same fire frequency entered into my scanner 12 times, for each town's fire repeater, and each time, a different CTCSS tone is entered. This also gives me the capability of identifying each department when they are on their air with the alpha display because, for instance, I know that 151.4 is used in my town, so the town's name comes up on the display. There is no guessing whether it is another fire department in the county on the same channel. Cool, huh?

Often online directories such as RadioReference.com and some printed scanner directories offer these CTCSS codes. This makes it even easier for programming the right codes in your scanner.



This is an example of a radio frequency programmed into a RadioShack Pro-2096 scanner with a Digital Channel Squelch, or DCS, tone programmed. The receiver on this frequency will not open up for monitoring unless the 072 DCS code is transmitted by the ambulance service using the channel. Photo by Lisa Stephens/scancomm.net

How else can these codes help you? Well, suppose there is a frequency that you like to monitor and you don't have a digital scanner. However, suppose that there is another user on the same channel that uses digital radios. All that creates on your radio is a buzzing sound whenever they transmit in digital. By entering the CTCSS or DCS code, the digital buzz is gone! Very cool, huh?

Suppose vice versa and you want to monitor a digital system on your digital scanner and there are analog stations on the same channel that you don't want to hear. Enter the NAC for the digital channel and you've quieted the channel instantly. In fact, there are two NAC codes that you should be aware of for possible use to help you filter out channels. The first NAC code is 293, sometimes expressed as $293. This code is a default NAC code and I find it in use with several digital public safety radio systems in my area. Plug it in and you may find it in use! Also, F7E, or $F7E is a NAC code that will unsquelch a radio on any NAC code received. If you are in doubt as to the NAC code for a channel, plug this one in and any digital radio system with a NAC code will come through. That may help you filter out analog communications, and just let digital NAC-encoded conversations pass through on your scanner. That's again all pretty cool stuff that you can do with your higher-end scanner.

ABOUT THOSE SECRET CODES

continued

While it doesn't necessarily hold true all the time anymore, the CTCSS or DCS tone used on public safety radio channels usually stays the same throughout a county or city. For instance, if you found your police dispatch channel using 192.8, chances are the fire channel is 192.8 hertz, too. You also may find police using one CTCSS tone with the fire departments using another CTCSS tone. There just seems to be some similarity in tone usage in many areas of the country. In fact, I like to say that CTCSS, DCS and NAC codes almost are like fingerprints on frequencies. If your local law enforcement uses a tone of 100.0 hertz and all of a sudden you find surveillance communications on a new channel and the CTCSS is the same code, there's a good likelihood that it's the same agency. The same works for federal agencies. For instance, when the FBI used analog radio systems, the 167.9 hertz CTCSS tone was pretty much a dead giveaway that the channel likely was used by that agency. Today, they use 167 NAC code on digital channels.

So now you have a new tool in helping to identify local and other agencies, and perhaps businesses, too. Scan for the CTCSS, DCS or NAC code and you might be able to match up who you are monitoring.

Write in

Do you use CTCSS, DCS and NAC codes in your scanning? Do you collect these codes for programming into your radios? You can write to me at nat-com@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.

INDUSTRY NEWS

Uniden to Unveil New Scanner

On June 26th, Uniden America Corporation held an open house to show off their latest addition to their scanner technology. There will be more information in the September/October issue of National Communications on all the specifics, including cost and availability.



Nat-Com found Paul Opitz of Uniden carrying the yet to be announced scanner at their headquarters in early June. Since the scanner had not been announced officially, Paul has kept the radio "under wrap."

Understanding Trunking, A Basic Primer

By Jon Van Allen, KF7YN

I get a lot of email from readers asking for more information on Trunking and Trunked Systems. With more and more trunked systems coming on the scene, this is a good time to discuss how these systems work. We will also talk about the differences between Motorola, EDACS, LTR and how scanners decode them. Our goal is to make the basic theory of operation and technical jargon easy to understand.

The whole concept of trunking started as a way to improve frequency management when the available number of conventional frequencies began to max out. Although some agencies shared a frequency using different CTCSS (PL) access tones, congestion was still a problem. Even narrowing channel bandwidths down to 12.5, 7.5 and 6.25 KHz did not create enough capacity for the ever-increasing number of users. The solution was to create many more virtual channels than the available number of discrete frequencies. The only way to do this is "time share" the frequencies, in this case trunking, by means of virtual channels also known as talk-groups (we'll call these TGs). It is no longer necessary to have a separate frequency for each agency.

Before trunking, if you had 100 agencies, you would need more than 100 frequencies to accommodate all the agencies and their departments. Using the concept that any one agency uses a discrete frequency a small part of a given time period, why not pool the frequencies and share them between all agencies? With trunking, those 100 agencies can time share up to 30 frequencies on a priority basis. A 20 frequency trunked system is common, some have fewer frequencies, and a few larger systems have more.

Here's how it works: all trunked systems are computer controlled. Motorola and EDACS systems have 1 or more dedicated control channels (also called data channels) that transmit system data 24/7. This data tells all radios in any given TG what frequency to switch to. When a dispatcher keys up the radio, all radios in that group are instructed to tune to a specific frequency. When the dispatcher un-keys the radio, the controller releases that frequency. In short, each time a mike is keyed, a new frequency is assigned. Conversations jump from frequency to frequency.

LTR systems do not have a dedicated data channel; data is sent on the voice frequencies. Both LTR and EDACS frequencies must be in the proper Logical Channel Number (LCN) order to be heard on your scanner. Motorola uses a different system called a trunk table which is a frequency lookup table and frequencies are randomly assigned. Motorola and EDACS are by far the most common trunked systems.

Of course there are priority issues; the police dispatcher has priority over the Public Works Dept who has priority over trash pickup or animal control. Emergencies have priority over all others. At times, all frequencies can max out so the lower priority users get bumped until the system has a frequency available. In reality, the system seldom maxes out but it does happen.

The major advantage of TGs is the sheer number available in any system. Thousands of TGs can be created using a scenario of fleet, sub fleet, group and individual user. Detectives, Vice, Narc, etc. can now have their own TGs without having to share with busy channels such as patrol dispatch, for example. This reduces congestion and improves



efficiency. SWAT can now have their own TG with restricted access. This has an obvious advantage where safety of life is concerned.

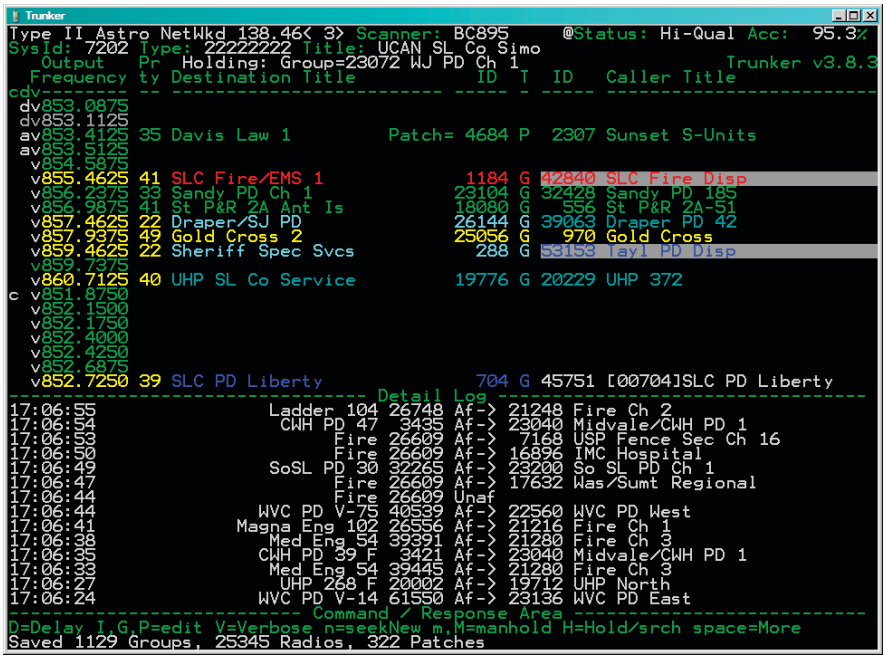
The real advantage for us hobby radio enthusiasts is that many agencies, once scattered around on various frequencies are now on one system. This makes listening easier especially for agencies that had been using low power simplex frequencies that were difficult to hear or couldn't be heard at all outside their local area.

Many trunked systems are networked, as with any other network, tied together by computers using fiber optic or microwave radio links. In my home state, it used to be impossible to hear agencies in other parts of the state beyond radio line-of-sight. In a state that stretches 400 miles north to south and 250 miles east to west; it is now possible to hear police, fire and medical in the far corners of

the state as clearly as those in my town. This is the allure to those of us who scan. Many systems around the US are now using networked trunked system so chances are you can hear more than ever before on your scanner and often without an antenna on your roof. This is good news for those who are not able to put up external antennas because of HOA or zoning restrictions, or other reasons.

Using the popular "Trunker" computer program, you can view the data channel info on a computer screen. You can see a conversation jump from frequency to frequency. You can see in the screen shot graphic all current conversations on the system simultaneously. Hearing them requires another scanner but being able to see what goes on is the best way to understand how the system works. Notice all the other information displayed on the Trunker screen such as user ID (individual radio IDs) network site number, etc. Hearing the action is great, seeing it all on your computer screen is awesome!

In a major emergency, the weakness of trunking becomes apparent when dozens or hundreds of agencies try to communicate on 30 or less frequencies (30 frequencies is the max per system) someone will get bumped. This is where networking helps; affiliated systems can accommodate a lot more traffic. In another emergency scenario such as wide-area power outages or controller software failure, the controller may crash and the system would go into site-mode trunking where each system communicates locally with limited number of TGs, usually dispatch and one or two alternates. Most people on the system become confused when the controller goes down. You may have heard people asking what the heck is going on when the system goes to site-mode, not everyone remembers, or has been instructed to go to that zone on their radios. Site-mode can be thought of as safe-mode, like when your Windows computer crashes and has to restart in safe-mode, it's the same principle.



Programming your scanner and scanning in the real world. In order to program a trunked scanner, you need to know three categories of information about the system before you start: 1. System Type (Motorola, EDACS, and LTR). 2. System Frequencies. 3. TG IDs you want to hear. All of this information is available from the database at RadioReference.com. For Motorola systems, you only need to note the control channel frequencies (these are shown in Blue and Red in the database). For EDACS and LTR systems, you need to make a note of all frequencies listed and their associated LCN which is denoted by the LCN number next to the frequencies.

In large trunked systems, there are so many TGs that listening to them all is not feasible or desirable. With conventional frequencies we can scan a few programmed frequencies or search all frequencies within a band. The same can be done with trunking; scan monitors only those TGs you have programmed, search monitors all. Some scanners call this open and closed mode. Open = search, closed = scan. I always use closed mode in a large busy system and open mode in small systems.

The easiest way to program your scanner is with software. Virtually all trunk tracking scanners can be computer programmed. Some software will allow programming directly from website database like radioReference.com. The most popular choices are: ScanCat Software www.scancat.com has a combo all-in-one package deal for their popular software ScanCat Lite-Plus, Mr. Scanner FCC Public Safety, Nat-Com's FCC Scancat Files and Bonus Disk of Frequencies, which separately sell for $84.95 all for only $49.95. ScanCat also has the excellent ScanCat Gold. Other popular choices are Win96 and Win500 from Starrsoft www.starrsoft.com and Butel ARC software www.butel.com.nl

Let's talk about conventional "fixed number" memory vs. dynamic memory. I think a lot of people are still uncomfortable with dynamic memory management because it is a totally different concept than conventional banks and channels which is what most of us learned. I have noticed younger people understand the concept better than us old timers. The real advantage of dynamic memory is being able to program a few TGs or frequencies into any trunked or conventional system. That means you don't have to program those TGs over and over. Let's say I want to listen to Search and Rescue on several

Continued on page 34

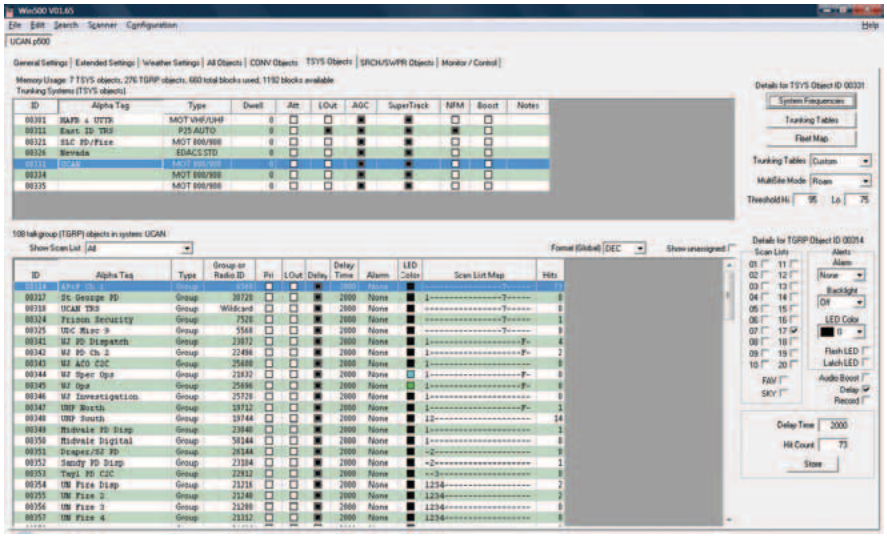
Understanding Trunking, A Basic Primer continued

different sites in a trunked system (or conventional groups) which are in different areas. All I have to do is program it once and tag it to each system I want to monitor. You can see that saves a lot of duplication and memory space. Each TG or conventional frequency in my Radio Shack Pro-197 can be tagged to 20 different scan lists; I can program SAR into any or all of those 20, for example. To do that with conventional memories, you have to duplicate the frequency or TG for each bank, thereby reducing the available memory. Not so with dynamic memory.

GRE and Radio Shack scanners with dynamic memory refer to trunked systems, frequencies and TGs as "objects". If that confuses you (it confused me at first!) just remember they are using one moniker (Objects) to describe systems, frequencies and TG channels. Now the rest comes easy.

Speaking of easy, the new Radio Shack iScan Pro-107 (reviewed by Tom Swisher in the Jan/Feb issue) is a dandy little scanner that is super easy to use. It comes pre-programmed with the entire US on a 2GB SD card. All you have to do is select your state, local city or county and what agency you want to scan from list. It is said to be as easy to use as an MP3 player and I can tell you it is super easy! After selecting and importing your scan lists, just press PLAY and you are scanning. It doesn't get any easier than this! The number of conventional channels, trunked systems and TGs is limited only by available file space on the SD Card.

I had not given the Pro-107 much thought until I read Tom's article. My first thought was "this thing doesn't have enough buttons, bells or whistles to be a real scanner". Talk about misguided first impressions! I decided to buy the Pro-107 because I travel a lot and the simplicity of programming is an idea whose time has come. It is amazing how much time and hassle it saves. Since I



spend a lot of time in Nevada, I wasn't about to individually program the 80+ Highway Patrol sites scattered all over the state or pick and choose from the list so I simply imported the entire system and Highway Patrol TGs. It took less than 2 minutes start to finish! I cannot emphasize how easy this gem is to use and how much time and grief it will save you.

It gets even easier by using the included software to import and edit your scan lists. You then export it back to the SD card and put it back in the scanner. This scanner is sure to be a hit with newbieís, experienced enthusiasts and news desks all across the country. If you are new and trying to make up your mind about scanning because of the complexities of modern trunked systems, try the Pro-107. You'll be up and scanning in minutes and you can always return it to Radio Shack within 90 days for a full, no questions asked refund if you decide this is not for you. My hat is off to GRE for this quantum leap in making scanning easy and painless.

Motorola control channel only scanning. Most new scanners can track Motorola systems by programming only the control channel. The trunk tables do the rest, tuning the scanner to the correct voice frequency. This saves a lot of time and effort; we no longer have to program all the frequencies in Motorola systems. Just remember Motorola systems can use more than 1 control channel so remember to program each one.

Digital or analog? If you can't monitor the action with your analog scanner you may need a digital model such as the GRE PSR-500/600, Radio Shack Pro-106/197 or Uniden BCD396/996T and XT variants. The older Radio Shack Pro-96/2096 and Uniden BC-796D also work well on digital. More and more Federal agencies are using P25 digital trunked and conventional systems including National Park Service, TSA, ICE, etc. The days of listening to Ranger Smith with an analog scanner are almost over. I have monitored P25 (and encryption) being used in Yellowstone National Park for the last 3 years. Other National Parks are also starting to use P25. All 9600 baud Motorola trunked systems are purely digital. 3600 baud Motorola systems can be analog or a mix of analog and digital. This is true whether the system uses VHF, UHF, 800 or 900 MHz. The Air Force Base in my area recently switched to a 400 MHz all digital Motorola Astro Networked system.

Re-banding for Motorola is more complex than for EDACS and LTR systems. With Motorola, a custom trunk table with new frequencies must be created. This is done with software and/or by a firmware update from GRE, Uniden or Radio Shack website. With EDACS and LTR, most often you only need to recreate the LCN frequencies exactly 15 MHz lower but this is not always true. For example if your system uses (or used) frequencies between 866-869 MHz, re-banding will move them to 851-854 MHz. 868.1125 now becomes 853.1125. See my "800 MHz Re-banding Made Easy" article in the March/April 2009 issue for more info.

Real world scenarios. More and more agencies are combining resources and this means you have to do a little digging to hear what may seem to be elusive. In many smaller suburban and rural areas, Highway Patrol and County Sheriff may be using a shared radio system. This is true for conventional VHF and UHF frequencies as well as trunked systems. For example, in my area there are TGs in several counties that are called "Law" TGs where Highway Patrol and County Sheriff share the same dispatch TG. In this example, Law-1 is combined Highway Patrol and Sheriff dispatch. Law-2 is dispatch for other local Police Departments within the county.

When Troopers or Deputies want to talk to each other, they switch to their individual car to car TGs. Most city PDs will have a car-to-car TG called "City". That really helps you identify who is talking and where to find them, especially if you have one of the new breed of scanners that show individual radio IDs. You can tag those radio IDs and when they turn up on a new TG, you know who it belongs to, no more guessing! Trunking is fun, easy and informative! Nothing beats having the satisfaction of figuring things out for yourself. With trunking, we have tools that were not available in the old days when we had no way to ID a radio or follow it to new channels.

Unfortunately, there are a few trunked systems that cannot be monitored on any scanner. EDACS Pro-Voice, MA/Com



Open Sky and encrypted Motorola systems are impossible to scan. Fortunately most of us are not 'locked out' by these systems. In my area, there are only 2 or 3 encrypted TGs on our Motorola trunked system. 99% of the comms are in the clear. Hopefully this is true in your area as well. If you see EDACS Wide, Narrow or Scat listed no worries. All of these (except Pro-Voice) can be monitored.

One trunked system that sees limited use in the US is MPT-1327 which is a European protocol. MPT-1327 is widely used in Europe and Down Under. The only way I know of to decode MPT-1327 is with WinRadio running their Trunking Suite software.

Resources: A hugely popular radio website is www.radioreference.com. This excellent resource was created by Lindsay Blanton. More and more scanner and software manufacturers use data on Radio Reference for download to your scanner, making programming as easy and painless as possible. Although legions of contributors nationwide do a superb job of keeping the Radio Reference database current, it is not 100% accurate so it pays to compare info with others in your area. If you are just starting out, I recommend downloading your area and then make corrections and additions after you become familiar. I also recommend this for travel; it is far easier to use the database for areas you will be visiting.

Join your local radio enthusiasts! Radio Reference.com offers forums for every US State, Eastern and Western Canada, Down Under and other areas. All you have to do is sign up but consider making a small donation or become a premium member to help Lindsay with the expenses required to keep the website up and running. Once you join, send a post introducing yourself with basic info such as where you live and what your scanning interests are. Members will give you a warm welcome and invite you to participate in the forum. Many folks have been Radio Reference members for years and know how to get you up and scanning so don't hesitate to ask questions and be sure to check out all the resources available, especially the database for your state, county, city, township, etc.

If you have questions or comments, my email is kf7yn@yahoo.com. Be sure to put Nat-Com in the subject line so you don't end up in the spam folder. Until next time, happy scanning!

CLOSING COMMENTS



By: Norm Schrein, KA8PGJ

I have seen the scanners evolve from simple receivers to the sophisticated radios of today. I have also seen how the data we compile to program into these radios evolve from typewriters and 3X5 cards to multi faceted computer programs.

My career in radio has given me the opportunity to meet many of the innovators in this business, be able to provide input into the manufacture of radios, and of course be able to travel not only across the country but around the world and all the time with radio and scanners in particular being the basis of my travel. Many times my experiences over the years in radio have turned up in the pages of National Communications which began publishing in 1991.

I have played with radio for the bigger part of my life. The first experience I can remember is when I was about 12 years ago and my future brother-in-law brought home a small AM radio transmitter that he had constructed in one of his electronics classes at the University of Dayton. The little box contained a small microphone and would transmit a few feet to an AM radio. It could be turned on by clipping two wires together. I soon found out that by adding more wire, the little transmitter would go further.

A couple of years later I and several of my friends made our own neighborhood radio station using a one tube Phillips phono oscillator. The transmitter was similar to what my brother-in-law constructed, but instead of operating on a battery, this one ran off 110 volts AC and we did not have to keep changing the battery. One of our neighbors was a television repairman and had been a ham radio operator some years before. He helped us modify the oscillator to get a bit more range. Soon we created our own antenna by using several hundred feet of wire. That was back in the 1960's and we were spinning our 45 rpm records and adding our own commentary for the kids in our neighborhood to hear. We never got into trouble with this station, even though we never held a license. It was all just fun and learning radio.

Then as we made our way into high school, we graduated into two way radio by using CB transceivers. I was too young to have a license (you had to be 18 years old as I remember), but my mother was more than willing to sign the license form and I soon became KHJ 5611. Soon we had our own network of high school buddies all communicating on CB. By the time graduation came around, we became involved with our local fire department. Although we were too young to be firefighters (then you had to be 21), we could be on the fire department's auxiliary unit.

We were able to attend all the training classes and even were certified, but we could not drive nor ride on the equipment. When there was a fire, we could drive to the fire scene and operate the fire trucks pumps and communicate on the radio, but could never actually fight a fire. We could learn about a fire in two ways. We could listen for the siren on top of the fire station or come up with a receiver that would get the fire calls directly. Of course at night, they did not blow the siren, so the receiver became a necessity. This was the time in my life when I became involved in listening to emergency communications radio.

I can't remember now where I got it, but I had a tunable receiver that would pick up the fire departmentís calls on 154.130 MHz Of course it would pick up all sorts of other things, from other fire departments to aircraft headed towards the Dayton airport. So, I would train myself to sleep with the radio on and only wake up when the tones for our fire department came across the radio. This was in the mid 1960's.

I finally became a member of the Harrison Township Fire Department when I reached my 21st birthday and I was home on leave from the Army. I carried my badge and the love of the work with me, even as I headed off to Vietnam. By then I had acquired a Bearcat Little Tiger which was a small device that would pick up the fire calls on 154.130 MHz when it was put close to an AM radio. I even took my Little Tiger to Vietnam with me, but never heard a thing. So instead I listened to The Voice of America, Armed Forces Radio and all sorts of other broadcasts including Hanoi Hanna.

After my time in the Army, I returned home and worked a job in a camera store and also worked as a volunteer with the Harrison Township Fire Department. I was also engaged to be married. Once married, I moved across town to a bedroom community known as Kettering. Interestingly enough they had a volunteer fire department as well, and I signed on even before we moved into our apartment. Once we did move in, I was issued my official "monitor" and was a volunteer fireman once again. However, my new bride was not exactly thrilled when the "moni-

CLOSING COMMENTS continued

tor" would go off several times during the night. You see, this was not a tone activated unit, so we got all the calls and I guess that she was just not able to train herself to sleep through the calls that did not involve my station. So, after some discussion, we decided to put the volunteer firefighting career on hold for a while. That was back in the early 70's.

From there, many things happened. I worked for a while for a public safety agency, went back to school and eventually graduated with my college degree. I went back to get a master's degree and sometime during that process my first son was born. Also sometime in this period, I became a general class amateur radio operator. I changed jobs again. This time I worked for a company called Panacom as a salesman for nurse call stations and related equipment for hospitals. On the side, I started publishing a frequency directory for my area. By now I owned a scanner and it required crystals in order to tune in the various agencies. I did not know what frequencies to listen to, but after talking to others with scanners, I was able to compile a list of frequencies which I eventually began to share by means of the booklets which I called "Scanner Radio Listings".

While I was working at Panacom and publishing my frequency booklets I found my directories now covering areas other than Dayton. I had one for Columbus, Toledo, Fort Wayne & Lima and somehow managed to put one together for the Tampa, Florida area as well. Another local company known as Fox Marketing had just introduced a programmable scanner and recruited me to start publishing frequency directories to go with their scanners. These books were known as the "Fox Scanner Radio Listings" and the areas covered expanded to include Los Angeles, San Diego, the entire state of Arizona, Buffalo, Rochester, Washington DC, Orlando, Toronto, Indianapolis, Minneapolis, Dallas/Fort Worth and many other places. I also earned the title of "Mr. Scanner" which was given to me by the company's personnel director.

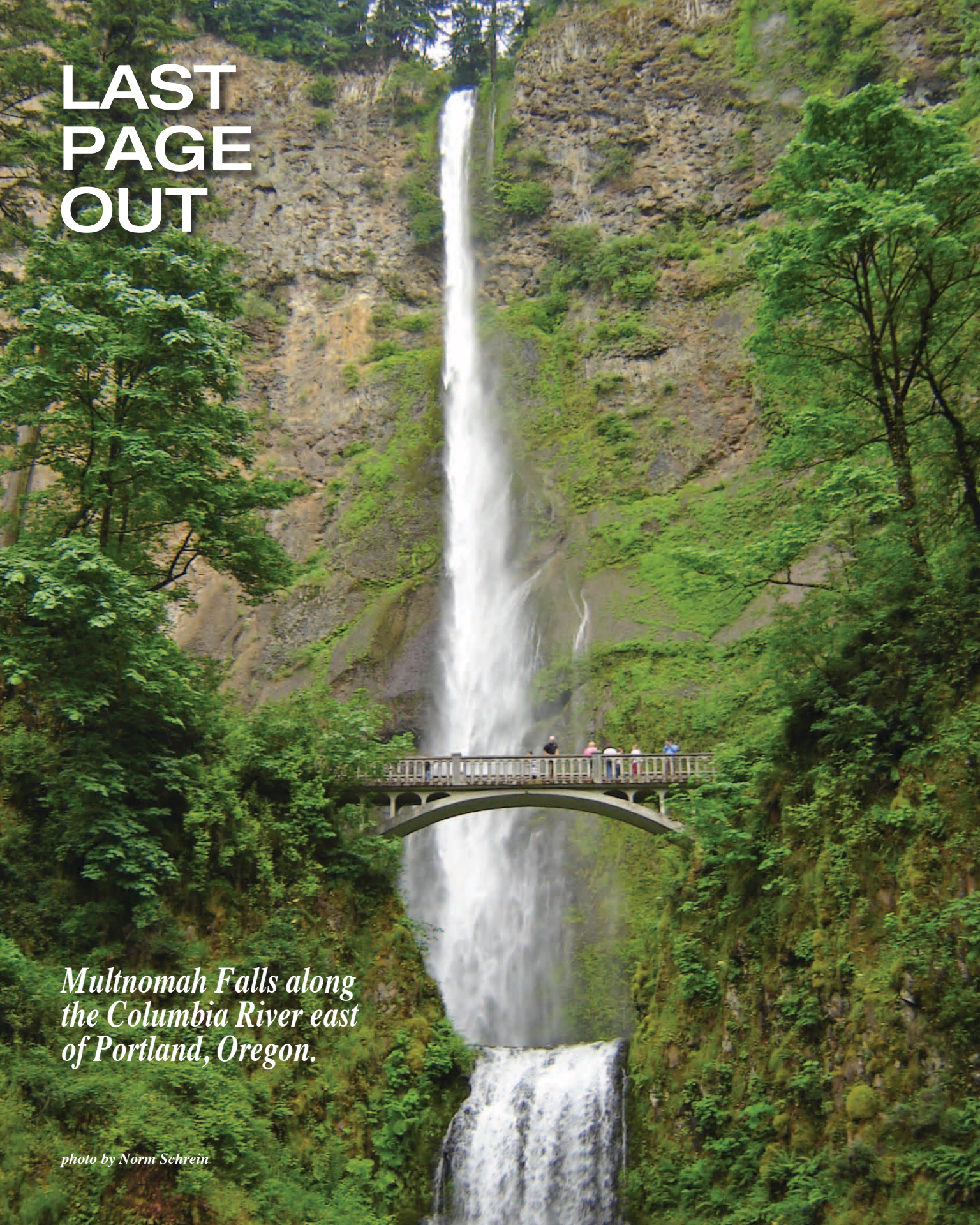
I then came up with an idea to compress the data and publish the books on a more regionalized basis, and the Fox Regional Frequency Directories were born. However, before all the books were to be completed, Fox went through some tough times and the project would be cancelled along with my job. Fortunately, however, I was being recruited by another company that liked the idea of the regional directories. That company was Uniden. The year was 1987.

I began working with Uniden and that job lasted for 18 years! I mainly was involved with creating the Betty Bearcat frequency directories, which were actually re-works of the Fox regional directories. Then the regional directories evolved into a new product -- the Betty Bearcat National Police Directory. By now, though, the books got to be pretty large and eventually with the help of some of my local computer buddies, I was able to put all the data into a program which became the Betty Bearcat CD frequency directory. That CD is still around today. It is now known as the 'Mr. Scanner Public Safety CD or the Mr. Scanner FCC CD.

Once again, my career in the radio world would change, but this time there would be two changes. Change number one was that my stay at Uniden had ended and I began a new relationship with RadioShack and change number two was that somehow I got back into radio broadcasting. I have become involved as a volunteer with a local public service radio station which involves setting up remote broadcasts to recording PSA's and any odd jobs. Of course somehow I am still publishing frequency lists with the Mr. Scanner CDs and of course publishing National Communications. In a way it feels that my time in radio has run full circle and so here I am back at Uniden once again with the opportunity to meet friends in the business both old and new. It has been a great trip and my ride is not over yet. I am just awaiting the next change. ●

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Multnomah Falls along the Columbia River east of Portland, Oregon.

photo by Norm Schrein

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