REVIEW: UNIDEN BCD436HP
New handheld scanner is top-of-the-line receiver | Page 10
Who Says You Can’t Teach an Old Dog New Tricks?

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I’ve seen a lot of changes in hobby radio over the years.

I can say I technically got into CB way back when I was a kid in the early 1960s when my sister and I received two heterodyne receiver Ross CB walkie-talkies crystals on Channel 11. Back in that day, Channel 11 was the calling channel. You made your call for another station on Channel 11 and then moved to another frequency. I remember hearing CBers saying “breaker” on my new radio and thought they were saying it because my sister and I were interfering with them—or “breaking” into their conversation.

Low-power CB then moved to the 49-MHz band for a while, sharing spectrum with cordless phones and baby monitors. And today’s inexpensive consumer walkie-talkies are on FRS/GMRS on UHF. MURS also is a similar service that really never has taken off, but has proven popular nonetheless with radio hobbyists.

Scanners have moved from crystal-control to synthesized programmable units. I remember my first programmable scanners, the Electra Bearcat 101 (which was a failure after going through a few units and then getting a refund from Electra) and the Regency Touch T-16K. I still have a box of scanner crystals today though, however, I think I have finally unloaded all my crystal scanners. Today’s high-end scanners handle digital and trunking systems, something that didn’t even exist a few decades ago.

When I first got my original Class A Citizens Radio license in 1977, I was only able to transmit on one frequency, 462.625 MHz. Today’s GMRS license under the same call sign, KAB3210, allows me to transmit on any of the eight frequency pairs, plus up to 5 watts on the seven 462-MHz interstitial channels located between the eight GMRS base frequencies. There are a lot more users on GMRS these days than there were back in 1977, too. When I first got on CB with a base station back in the early 1970s, I was licensed as KFL9953 and later as KBZ1055. Today, there is no need for a CB license. That’s mainly because the FCC couldn’t keep up with the surge in CB license applications back in the mid to late 1970s.

Like the radio hobby, National Communications changes, too. If we don’t change, we’re not meeting the needs of our readers. Our interests change as technology changes. If we all sat around with our 23-channel CB rigs or crystal-control scanners, we’d be missing out on a lot of new things in our hobby. On the other hand, we like to look back at those days of old and reminisce. One of my aims as your new editor and publisher here at NatCom is to make this your magazine and your first choice for radio communications information. When NatCom first started publication back in 1988, it was called National Scanning Report, and you can guess what our focus was back then. Along the way, we’ve added some new interests to the magazine.

One of my goals is to refocus NatCom and hit hard on a couple of areas, mainly being scanning and CB radio. With those topics comes two-way radio, too, especially with all the interest in import two-way radios used in a variety of ways by hobbyists such as on amateur, MURS, GMRS and FRS channels. I welcome your thoughts and comments about YOUR magazine. If you see something you really like or really hate, let me know. If I don’t know how you feel, it’s hard for me to make this your magazine. My email box is always open. I invite your comments always.

73, Chuck (editor@NatComMag.com)
We bring you the radio news you need to know to stay up to date with the communications hobby. Here’s this issue’s report:

**Digital receiver will decode newer modes**

We don’t know when this new AOR receiver will – or even ever will – reach the United States, but there is some excitement brewing after it was introduced at the Tokyo Ham Fair in August. The AOR AR-DV1 receiver (unknown street price) will offer a wide 100 kHz to 1.3 GHz receive range – and if it hits the USA, the 800-MHz cellular band is expected to be removed from coverage.

However, the exciting part about this radio is that it looks like it will decode Motorola MOTOTRBO digital systems that are springing up in many areas of the nation, not only on commercial business frequencies, but even public safety channels, too.

The spec sheet for the AR-DV1 from AOR details the operating capabilities of the receiver, including the ability to decode digital MOTOTRBO, NXDN, P25 and D-STAR communications.

In addition to DMR systems like TRBO, the receiver will decode similar digital systems like NXDN and APCO P25, as well as amateur D-STAR communications. In addition, it will decode narrow and wide FM, FM stereo broadcast, AM, SSB and CW. The receiver also will decode CTCSS and DCS signals on two-way channels.
Radio news of note (continued)

The rear of the AOR AR-DV1 receiver is simplistic.

For such a hot receiver, the 2,000 channels (50 channels times 40 banks) seems inadequate. The receiver also has an SD card reader that will allow audio recording off air, firmware updates and memory data upload/download. Start saving your money, but don't hold your breath!

We'll let you know when this receiver hits the continent. If this AOR radio does get released here, it will be the first radio capable of decoding digital MOTOTRBO communications.

Want to see a video of the receiver? Visit here: http://youtu.be/Mge3_6wmAZo

New MURS device allows texting without cell coverage

Every time I log in to Facebook, I get promoted messages about the Gotenna. I finally had to check it out. It’s a low-power MURS device that operates on the no-license five Multi-Use Radio Service channels at 151 and 154 MHz.

In a nutshell, it’s a device you connect to your smartphone via Bluetooth connection. If you are in the wilderness – or in a disaster area! – without cellular service, you can text another user with a Gotenna device. The text message goes out over the MURS frequencies rather than over the cellular network. As long as the other user is within MURS radio range (typically a half-mile to a few miles), you’ll receive the text message.

While the device hasn’t been released to the public yet, early sales started in August. Early pricing was $149 per pair of devices (you need at least two to communicate between them), however, once the firm sells $50,000 of the devices, pricing was going to increase to $299 per pair.
Radio news of note (continued)

The device has a built-in antenna and because it uses MURS frequencies, there is no cost to use the device, except for the initial expense to purchase a pair of the units. The Gotenna works on Android and iPhones (no word on BlackBerry phones).

If you want to learn more about how the Gotenna works, go to this link: http://gotenna.com/pages/how-it-works.

Coast Guard seeks radio hoax caller

The U.S. Coast Guard is seeking help with identifying a hoax caller who made 11 false distress calls on June 21 and several more times in July.

All the false distress calls were determined to have originated from the Seneca Creek area in Maryland and involved the same male voice transmitting over VHF-FM marine radio Channel 16, 156.800 MHz. The Coast Guard’s cost for the searches is estimated to be about $15,000. In addition to the financial cost, there is significant operational impact caused by making false distress calls.

“Making false distress calls limits the Coast Guard and our rescue partners’ capabilities to assist those boaters who are in actual emergency situations,” Capt. Kevin Kiefer, commander of Coast Guard Sector Baltimore, said. “Hoax radio calls also place first responders in unnecessary danger as they work to assist the boating public.”

Making a false distress call is a felony, and the maximum penalty for making a false distress call is six years in prison, a $5,000 civil fine, a $250,000 criminal fine and reimbursement to the Coast Guard. The Coast Guard Investigative Service is offering a reward of $2,000 for information that leads to the positive identification of the person involved with the hoax call.

Anyone with information that can help identify the caller is asked to contact Coast Guard Investigative Service Baltimore at 410.576.2696.

Motorola’s wireless microphone makes it easier for two-way radio users to use the radio outside their vehicles.

Wireless microphones make two-way radio use easier

Agencies are starting to use wireless microphones for a variety of reasons. Without tangled cords, microphone usage is safer, especially while driving, and also allows the microphone to be taken out of the vehicle.

Motorola offers a wireless microphone for some of their radios, especially the MOTOTRBO digital mobile radios. The Motorola microphone reportedly works up to 300 feet away from the mobile radio. In addition, a company called Wireless Pacific also has served up its X10DR wireless mic for the mobile environment, too. Wireless Pacific says their wireless mic works up to 1,000 feet away from the vehicle.

Bluetooth usually is used for a connection from the mobile radio to the wireless mic and allows for transmitting and receiving, so the radio can be heard away from the vehicle, too. Wireless mics offer short-range coverage...
without the need for more costly mobile repeaters and handheld radios.

In Wisconsin, after a series of trials and evaluations, the state patrol there is using secure wireless microphones from Wireless Pacific to allow troopers to communicate seamlessly over Wisconsin’s P25 trunked statewide network while away from their vehicle.

**Florida CBer fined for refusing to allow FCC inspection**

A Jacksonville, Florida, CB operator faces a $14,000 fine after refusing to allow the Federal Communications Commission permission to inspect his station as the result of an interference complaint.

According to the FCC, Tommie Salter was issued a Notice of Apparent Liability for Forfeiture on Aug. 22. Agents from the FCC’s Tampa office were denied permission to inspect Salter’s CB station earlier this year after monitoring him transmitting on CB Channel 25 (27.245 MHz). The agents had responded after receiving a complaint from a neighbor alleging that Salter was interfering with home electronic equipment.

FCC rules allow a base forfeiture amount of $7,000 for failure to permit inspection by agents. According to the FCC, Salter previously received a Notice of Violation for refusing an inspection request in 2004 along with being fined for operating a non-certificated transmitter during restricted hours the FCC had imposed on him three times from 2004 to 2006 because of interference complaints.

Salter was given 30 days to pay the fine or to seek a reduction or cancellation of the proposed forfeiture.

**County not allowed to return to wideband**

A California county has been denied returning its public safety radio system to wideband on a permanent basis because narrowband channels were not working there.

The FCC has denied a 2013 waiver request by Del Norte County for permission to return from its 12.5-kHz narrowband channels to its former 25-kHz wideband frequencies. The county claimed its narrowband system reduced critical coverage by 40 percent and up to five new towers would be needed to make the narrowband system offer the same coverage the former wideband system allowed. Because the northern California county has only 30,000 people and no radio spectrum congestion in its 1,007 square miles, it had asked to return to wideband frequencies.

In denying the request, the FCC said the county eventually would experience a system that is less reliable and that wideband radio equipment would become obsolete.

**CBer avoids electrocution in lightning strike**

A United Kingdom CBer escaped electrocution when lightning struck his antenna and blew up his radio equipment.

Robin Tester had just called a friend on his CB rig to warn of the impending storm. He switched off his rig and lightning struck his antenna located 6 feet away from his house. The lightning strike destroyed his radio, microphone and antenna. Even a lightning arrester installed between the CB rig and antenna was destroyed.

Tester said that the lightning strike could have been worse, but because his coaxial cable was buried, the ground took out some of the lightning strike.

**FCC says no to petition for ham gear on GMRS**

A Florida ham’s request to the FCC asking that amateur radio operators be allowed to use their ham gear on General Mobile Radio Service channels has been rejected.

The FCC acted swiftly on the May 29 petition by Mark Friedlander, KV4I of New Smyrna Beach, Florida, who requested an amendment of GMRS’ Part 95 rules to allow a person holding a GMRS license and a technician or higher ham license to operate on the 462- and 467-MHz channels with a transmitter not type accepted...
Radio news of note (continued)

for GMRS use as long as it complied with the service’s technical rules.

The petition to the FCC stated that the amateur service and GMRS operate on similar frequencies and that hams are authorized to design, build and operate transmitters without equipment certification. The FCC’s June 20 ruling that GMRS transmitters with capability of operating on amateur frequencies will not be type accepted for GMRS use, adding that the FCC would not be able to monitor and enforce compliance if there became a proliferation of home-built and non-standard transmitters being used on GMRS channels.

Ohio city gets FCC waiver for 800-MHz mobile channels

The city of Cleveland Heights, Ohio, has been granted a waiver of FCC rules, allowing it to operate as many as 300 mobile transmitters on six 800-MHz frequencies.

The waiver allows the operation of the mobile radios in simplex mode without an associated base station. Cleveland Heights wanted to use the mobile radios in the 851-869 MHz band, whereas FCC rules generally require mobile radios to be operated with base stations, but on frequencies in the 806-824 MHz segment. The city said it planned to operate the mobile radios for low-power use at the scene of emergencies only. In addition, the frequencies being sought are primarily licensed in Canada. The frequencies that were sought were chosen to avoid interference from high-power operations on base station frequencies in the United States.

Los Angeles business fined for using two VHF frequencies

A Los Angeles business operating a trunked VHF radio system has been fined $10,000 for using two frequencies it wasn’t authorized to use.

Acumen Communications was cited for operating a base station on 152.405 MHz and mobile on 157.665 MHz without authorization under its license WQHT586. While Acumen acknowledged the unauthorized opera-

tion to the FCC, it hasn’t filed a response to the proposed $10,000 penalty assessed against the business.

In an unusual twist in the case, the FCC actually granted a license to Acumen on Jan. 14 of this year for the frequencies they were cited for using illegally, however, the FCC reversed the grant on Feb. 4 pending the resolution of the enforcement action against the business.

New Yorker cited for causing interference

A Bay Shore, New York, man faces a $25,000 penalty from the FCC for causing interference to the Melville Fire District’s UHF radio system in New York.

Drew Buckley of Bay Shore, New York, has a proposed $25,000 penalty being assessed against him by the FCC for what it calls malicious interference to the Melville Fire District’s radio system on 470 and 476 MHz.

The FCC cited Buckley for intentionally interfering with frequencies used by fire crews during emergencies and demonstrated a deliberate disregard for public safety, warranting a substantial penalty above normal sanctions for interference with licensed communications by an unlicensed operator.

The fire district filed a complaint with the FCC in October 2013 stating that a man made unauthorized transmissions on its radio system such as chanting and heavy breathing. Firefighters on emergency calls were forced to switch to alternate frequencies during periods of the interference.

Melville fire officials noted that the radio causing the interference to their system was being made with a unique identifying code assigned to fire rescue officers in the Suffolk County (New York) Fire Service. In November 2013, FCC agents traced the interference to Buckley’s home. Police officers interviewed Buckley while Melville’s fire chief confirmed that two of numerous portable radios found at his home could transmit on Melville’s repeater frequencies. Buckley was arrested Nov. 30, 2013, and his case is pending in Suffolk County District Court.
There is good news in the world of scanning receivers right now. We have at least two new scanners on the market with APCO Project 25 Phase II receive capability.

Kudos to Uniden Corp. for producing both the BCD536HP mobile and the BCD436HP handheld scanners. The scanning hobby community has waited patiently for nearly a year now for the return to market of receivers with APCO P-25 Phase-II TDMA capability.

You see, most of the federal government and perhaps roughly a third of all non-federal public safety agencies have moved to some form of digital-voice-technology dispatch and tactical communications systems. And happily, we scannists have had digital scanners available for many years already. Specifically, by design, all such federal and nearly all non-federal systems are APCO P-25 compliant for their digital audio standard. On the one hand, it is good to see that so many agencies’ mad rush to digital voice appears to be slowing considerably. On the other hand, what was not-so-great news is that a number of these systems already have switched over to Phase-II of the Project-25 standard.
Phase-II (that’s Phase “two”—not “eleven” or “aye-aye”) is a substantially different voice encoding mechanism. Here, in addition to digital vocoding on the RF channel, two different audio transmissions are literally time-shared onto a single channel. This multiplexing was apparently left out of the design factors of most P25-capable scanning receivers until very recently. There may have been a reason for this other than possibly saving on engineering and production costs.

Originally, by early design or at least as a consideration under discussion, this Time Division Multiple Access (TDMA) multiplexing was only to be used on the voice uplink (mobile-to-repeater/base) RF channels. Original (Phase-I) P-25 transmission would serve the downlink (repeater/base-to-mobile) channels. The reasoning here is that there are any number of mobile radios in use at any given moment, communicating with only a few base station consoles. Presumably, the bulk of the RF traffic would be on the uplink—the repeater input channels. How would that help me, the monitor, you may wonder? My scanner still wouldn’t hear three-fourths of the action! Well, not really. When monitoring any repeater-based radio system, trunked or not, we are always monitoring the repeater output channels. There is never any real need to listen to the weaker input channel (uplink) transmissions, you see. So, your original Phase I scanner for P-25 would have essentially still heard all system radio traffic, through the repeater base site. Based on this presumption, there would have been no real need for a Phase-II scanning receiver.

Unfortunately or not, this has become a moot point. APCO P-25 Phase-II mode is now being designed into public safety radio systems on both the uplink and the downlink channel frequencies. So for those systems whose administrators elect to upgrade to Phase-II P-25, we will need receivers specifically engineered for Phase-II reception in order to monitor those systems’ voice transmissions.

Up until about a year ago, there was only one hobbyist-grade scanner on the market that was widely known to have P-25 Phase-II reception capability. According to various reports, this was the GRE model PSR-800 receiver. This was excellent news at the time because Phase-II radio systems were just starting to be deployed in a few jurisdictions. However, that manufacturer ceased production of its various scanner products, evidently leaving a gaping hole in the market for this type of digital scanner.

**BCD436HP – The scanner**

Our Phase-II monitoring concerns are now over though, thanks to Uniden’s diligent research, engineering and marketing efforts. Let’s take a succinct look at the marvelous BCD436HP portable handheld digital scanner from Uniden Corp. We also should be aware of Uniden’s companion BCD536HP mobile scanner. The ’536HP is nearly identical in function to the ’436HP handheld (same user manual!), with the major difference being the ’536HP mobile’s Wi-Fi capability. An optional Wi-Fi dongle is used to link to smartphones running Uniden’s yet-to-be-released Siren application for remotely controlling the mobile scanner. Consequently, the ’536HP mobile lists at $100 more (plus $35.99 for the dongle) than the excellent ready-to-use BCD436HP handheld.

The BCD436HP has the appearance of an amateur radio or public safety handheld transceiver: Basic black case with a more-or-less telephone-style keypad, a large LCD display screen, and a front-firing speaker. The scanner is powered by three AA nickel-hydride (NiMH) cells recharged by means of the mini-USB port on its side panel. There is no expensive, specialized, commercial-style battery insert or case involved here. The display screen is simple: Monochrome—essentially black block lettering on a pale bluish white screen. The display lettering font size varies line by line in relation to the information given. There are many lines of text displayed simultaneously, and they are grouped by horizontal lines for ease of readability. Quite a bit of information is given during scanning and reception. There are no color variations and there are no fancy graphics in the display, however. The BCD436HP is for the serious monitor and experimenter.

Although the ’436HP is considered one of Uniden’s Home Patrol scanners (as indicated by the “HP” in the
model number), this scanner does not seem to attempt the same level of user-friendliness achieved by the earlier, popular Home Patrol scanner. The ’436HP does however share the Home Patrol’s same ease of operation coming right out-of-the-box, as relates to initial location-based scanning programming. But beyond that point, the BCD436HP is a serious instrument requiring computer software programming by the user to fully indulge oneself in all of its functions, options, and operator control—in my opinion as one still learning to fully utilize this excellent product.

But first, let’s have the basics. Getting started with the BCD436HP upon opening the box is truly simple. Insert the included batteries, slip the battery door back on, and press the power-on button (indicated by the universal 1/0 symbol). The ’436HP then demands that its clock be set, just this once, at initial turn-on. Clock setting is essentially intuitive, although a glance at the appropriate page in the user manual will help, if absolutely necessary. The ’436HP will read, “Nothing to scan” on its LCD screen. Then, simply enter the local ZIP code essentially following the on-screen prompts. And with that, we are listening to all receivable police, fire, and EMS dispatches within a predetermined “radius” (more like a polygon, but can be adjusted in firmware).

The marvelous BCD436HP scanner has just about all the “bells and whistles” that we could expect from any top-of-the-line scanning receiver. And this TrunkTracker V series scanner is clearly one of only a few at the very top of the value chain. Here are just a few of its most relevant features: It receives APCO P-25 Phase-I and Phase-II, including X2-TDMA, as well as wideband and newer narrowband FM, and AM transmission modes. It tracks Motorola, EDACS and LTR trunking protocols,
Cover feature (continued)

and covers the new 700 MHz public safety band. The '436HP is preloaded with the entire USA and Canada RadioReference database on a 4 GB micro SD card. Its enhanced dynamic memory facilitates recording, playback and instant replay of transmissions and monitoring sessions. And the '436 does location-based scanning by ZIP code, LAT/LON coordinates, or GPS data input through a dedicated NMEA port.

The '436HP also has Uniden’s Close Call RF capture, temporary “avoid” (lockout) of channels, systems, or departments (agencies). This scanner executes radio system analysis and discovery, system and channel number tagging, P-25 NAC and CTCSS/DCS decoding, and multi-site system support. It has fire tone-out alerting and NOAA Weather Radio SAME alert decoding.

Other features of the BCD436HP scanner include audio AGC (automatic gain control), and per-channel volume offset. It offers backlit keypad and LCD screen, which can be programmed for momentary illumination or for continuous lighting. Scanned channel priority and preemptive trunking priority are supported. The provided mini-USB port makes possible PC programming and control, and for updating the scanner’s frequency/system database and its firmware. Uniden tells us that the radio database is updated approximately weekly.

Frequency ranges covered include:
- 25-512 MHz
- 758-824 MHz
- 849-869 MHz
- 894-960 MHz
- 1240-1300 MHz

Let’s consider portability, too. Perhaps the biggest advantage of a handheld scanner is being able to use it either at home, at the office or in the car. In this case, you may wonder what to use as a stand or mount to hold the BCD436HP scanner in place on either a desktop or on the dashboard. Specialized hand-portable radio holders are typically quite pricey. Such holders and stands likely could be used with this scanner, if desired, for a nice solid mount. However, Uniden did us a huge favor by providing a standard mobile microphone-style button mount centered on the back of this radio. The button fits any standard mic mounting clip (not included). So for the price of two such clips, less than about $7, we have mounts on our radio desk shelf and on our vehicle dashboard. The scanner may occasionally pivot, but we find the mic clips to be perfectly adequate. Additionally, it appears that if a user really objects to the slightly protruding mic button on the back of the BCD436HP, that it may possibly be removed by means of a single accessible screw head. Nice!

PC software programming

The purchase of our BCD436HP scanner includes a free download of Uniden's Sentinel programming software. And it includes the appropriate USB cable right in the box. First we go to the designated website to find the Sentinel application and to download it to our PC. The app simply installs just like any such other new software. Click on the new icon to open Sentinel.

Following the extremely simple instructions, you will find it easy to connect your '436HP to your PC via the
supplied cable, and establish communications between radio and computer. The first thing you will want to do is to see if you have the latest firmware loaded. Ours already had it. Updating the firmware however, would require very few mouse clicks. Think of firmware here as the “operating system” software of the radio. If needed, new firmware is downloaded into our opened Sentinel application. Then it would go from Sentinel to radio by clicking on “Write to scanner.”

The second prudent thing to do with Sentinel and your new scanner right out of the box is to download the latest RadioReference database to your PC. Here again, just a few mouse clicks bring the latest frequency and system data into Sentinel, and a couple more clicks uploads it to the ’436HP scanner. Updating both operating firmware and radio database is as simple a process as can be! To be sure, we should know that the Sentinel PC app does far more than mere software updates. We can program nearly every aspect of the scanner’s operation from this app. Most importantly, experienced users tell us, is the ability to create user Favorite Lists. Although our scanner operation does not require it, we are urged in the instructions to create at least one such list that we can custom edit. Editable parameters include features such as channel avoid (lockout), channel name/alpha tag (such as, “Fire Tact 1” or “Narcotics Task Force”) as well as CTCSS or DCS codes. They also include channel service type (such as, “Law Dispatch” or “Public Works”), important since service types can be switched on or off in the scanner’s menu. Things like scan delay, priority and volume offset (higher or lower) are programmable on a per-channel basis. So are optional alert tones and alert light color and flash (or no flash) pattern.

NOAA Weather Radio FIPS and SAME (event type and locality) programming can be done either in the BCD436HP menu or in Sentinel. Fire alert tone-out is programmed in Sentinel, too. Frequencies can be added and talkgroups can be edited. We can set up Quick Keys to go directly to various Favorite Lists when powering on the radio. And naturally we will want to set up at least one radio Profile for our ’436HP. That will contain data such as service types to be scanned, location-based scanning parameters (LAT/LON, radius, GPS data rate, etc.), custom search ranges, and Close Call operation and bands—and a number of other variables.

BCD436HP – Scanning, upgraded

We now have positively the greatest portable scanner in hand. Even so, why settle for out-of-the-box stock performance? The decision was made to upgrade our Uniden BCD436HP to the max! The current, common “street” price for our ’436HP is $499.99. For a “mere” approximately $100 more, we now have the best of the best. Four particular upgrades were made. These were specific simple upgrades in the general areas of:

- Power supply
- RF interface
- Mass storage
- User interface

First, we noticed that the three included generic NiMH AA-size cells are labeled as being 2300 mAH capacity. According to Uniden, these will provide some 8 hours of scanner operation. While that seems quite adequate, there is room for some improvement. We found Duracell® NiMH AA cells at a local drug store rated at 2400 mAH. These will allow for longer run time. Just how...
Cover feature (continued)

much longer is as yet unknown. A consideration such as this is difficult to quantify since various factors will alter the result, such as volume level setting. Additionally, it was realized that there are Duracell AA cells with as much as 2650 mAH capacity, a substantial improvement over 2300 mAH. However, no 2650’s could be located in time for preliminary testing. Before you go spending the better part of $20 on “bigger” batteries though, you should be aware that the stock 2300 mAHs are not bad at all, as some AA NiMH cells are rated as low as 1600 mAH.

Additionally, regarding power supply considerations, we purchased a generic cell phone-style mini-USB charging cord/plug set. This item is available from both local drug stores and highway truck stops. The set we chose provided both a 110-volt wall-wart charger and a 12-volt vehicle cigar lighter plug charger with a very convenient retractile “coily” cord. Price ran just about $20.

Second, we replaced the included “rubber duck” antenna. Truthfully, we never tried the stock SMA-mount antenna. We wanted the quick-disconnect ability afforded by the standard BNC twist-lock connector, so that the radio could be quickly moved from desktop to mobile operation—from rooftop antenna to vehicle-mounted mobile antenna. Uniden thoughtfully included an SMA to BNC adaptor with the BCD436HP. This very nice adaptor precluded use of the original SMA duck whip however. In order to have a rubber duck available for actual portable operation, we needed a BNC-mount duck antenna. Various Internet user groups highly recommend RadioShack’s popular 800 MHz scanner rubber duck. RS model #20-283 lists at $24.99 online, plus applicable shipping. This antenna is said to provide greatly enhanced reception (compared to stock) on the 800 MHz band, good reception on high band VHF and on UHF, and adequate-to-marginal performance on VHF low band (-25 to ~75 MHz). At about 7 inches in length it is, as mounted on the included adaptor fitting, just slightly longer than the stock whip. It should work very well on 700 MHz as well.

If some of us feel the need for better performance on low band though, there is at least one user group-recommended alternative portable antenna. The Diamond Antenna RH-77CA is a BNC-mount rubber duck rated for transmitting on the amateur 2-meter and 70-cm bands, and for “receive up to 900 MHz.” Price at one national amateur radio dealer chain is only $22.95 plus applicable shipping. We would have selected this antenna for our upgrade, but there is one detractor. Greatly improved performance often comes at a price other than dollars. The RH-77CA is 15 inches in length. While this is hardly an inconvenience at all, we elected to use the more compact RadioShack option, instead. It’s simply a matter of preference.

Third, mass data storage in the BCD436HP is provided by an 8 GB MicroSD card located behind the batteries inside the battery compartment. It is not conveniently located and it is not easy to remove the MicroSD from its holder. Still, we don’t see a need to be removing or replacing this SD card from the radio with any regularity. The user manual tells us that the ’436HP supports up to 32 GB data storage on the MicroSD card. So, it’s to the max we go! We located a generic 32 GB MicroSD card at our local drug store on sale for about $29. However we also discovered a genuine SanDisk® Ultra Micro SDHC™ (high speed) card at a local RadioShack store on sale for only $29.99 (marked down from just under $60)! Why the maximum data storage capacity? The stock 8 GB card holds the complete frequency databases for both the United States and Canada. The remainder of the storage is for recording and playback of received transmissions. This capacity likely allows for hours and hours of voice and related data recording. Now, with four times the memory capacity, we should be able to record for days!

Yet, that’s not all. We elected to create a “README” folder within the SD directory. There we have also stored a copy of the PDF of the user manual, the BCD436HP spec sheet, the FCC certification document and related test report PDF. Additionally, we have stored there the ZIP file for installing the complete Sentinel PC application, and copies of the original firmware version and radio databases from the scanner. There is plenty of mass storage room to spare. While these backed-up files cannot be viewed or executed on the ’436HP scanner, when connected to a PC by means of the provided USB cable, the computer views the BCD436HP’s SD card as simply an additional disk drive which gets assigned a
“letter” designation by the PC. Files and data can then be routinely read, written, or overwritten just as in any system drive. Simple!

Fourth and finally, we upgraded the “user interface” experience. No, there is no change in firmware, no change in the BCD436HP’s GUI. Think simple. Think outside the box—the box that is the radio. We sought and found what I feel, in terms of simplicity and even durability, at least, to be an upgraded user manual. The 92-page manual provided by Uniden is well-written and appropriately detailed, covering both the BCD436HP & BCD536HP models. And you will need to refer to it for certain specific programming information. So be sure to keep it handy! Still, the provided manual can be overwhelming, particularly for those of us who perhaps are not fast learners. We found welcome relief in the BCD436HP & BCD536HP Scanner Guide from N6FN’s Nifty! Ham Accessories (at http://www.niftyaccessories.com). We paid $25.95 plus shipping directly from Nifty! for this extremely well-organized and well-written manual. And its 24 laminated, spiral-bound pages were worth every penny. This guide is set up in three distinct sections: [1] orientation, [2] manual (keypad) setup & control, and [3] software control & setup. While a few of the less-accessed (we feel) programming features do not appear to

Here are some accessories for the scanner: charger set, earphones and amplified speaker. 

Photo by Alan Dixon
Cover feature (continued)

be covered in this guide; unless you have a photographic memory, an IQ over about 140, and are adept at speed-reading, you need this book.

There is one more matter to consider: Accessories—Two in particular and one other possibility. We found a set of genuine Uniden stereo ear buds [1] at a local “dollar” store for about $5. However, they were only available in two different bright colors. So back we went to our local drug store chain and purchased generic, basic black ear buds for that same $5. Because Uniden thoughtfully used a stereo headphone jack in the BCD436HP, scan-nists are able to use either stereo of monaural ‘phones for listening to this receiver’s necessarily mono audio.

Another item of interest is a good external speaker [2]. The factory user manual tells us that the BCD436HP’s headphone jack provides a low-level output, obviously intended specifically for earphone use. And there is no dedicated speaker jack. An amplified speaker is thus required for any such external use. These are available from any number of sources, but if at least for convenience sake, our local RadioShack store was able to help us out. For decades, RadioShack offered their 7.5-watt amplified external communications speaker, the 21-541, which retailed at one point for $24.99. We could not locate this item, or any apparent later version of same, on RadioShack’s website. It appears to have been discontinued, most unfortunately. Still, we found two new-old-stock 21-541’s at our local store, for less than half of the latest retail price. What a find! You will want to check diligently for an appropriate source for your own amplified comm’s speaker.

Here is one other possible accessory to consider: Uniden offers their BC-GPSK Serial GPS Receiver for location-based scanner operation. Uniden lists this GPS for $99.99 plus applicable shipping. However, we located this item at the RadioShack website (not available in-store) for $82.99 plus appropriate shipping and tax. Plugging this item into your BCD436HP and making the appropriate front-panel or software settings will cause the scanner to automatically tune in whatever activity is going on in your immediate area (radius adjustable). Does it get any cooler than this? We elected not to bother with this accessory since using it would evidently involve having a dangling cable set and a disk-type/bottle-cap antenna dangling loose unless placed in a more or less “fixed” location – however temporarily. This outboard GPS receiver may be better suited to Uniden’s companion BCD536HP mobile scanner. You choose.

Scanning, uninterrupted

We really like Uniden’s BCD436HP handheld scanner. This receiver will receive most public safety (police, fire, and EMS) and government two-way radio communications, including the latest APCO-standards trunking and channelized/simplex systems, digital or analog modes. Just how future-proof might the ’436HP be, and what can it not hear right now?

Well, among other possible modes, the ’436HP does not receive MotoTRBO DMR, D-Star, TETRA, iDEN or Open Sky. Fortunately, these modes are not often used in the United States for public safety. They find use more often in public works (like water, sewer, electric service, transit systems, etc.), and in business. An exception is D-Star, which to date is used exclusively in the amateur radio Service. The ’436HP will not deliver intelligible audio for any encrypted mode. However, it is my understanding that P-25 encrypted channels still will display relevant data like department name (agency), site, talk group ID, unit ID, DCS/NAC, signal strength and service type. That’s a lot of intelligence to have about a transmission, even without the audio!

Still, there is no telling what features future firmware upgrades may bring. Whether the BCD436HP has any inherent ability to demodulate and decode other digital modes remains to be seen. Perhaps not, but nearly every communications receiver and transceiver designed in the last decade or so has some degree of software (or firmware)-defined operation. To what degree here, time may tell.

What we do know now is that the Uniden BCD436HP portable handheld scanner (along with the counterpart BCD536HP mobile scanner) is one state-of-the-art radio design that is at least as capable, if not outright more capable than anything else on the market. And we are pleased to have it in our “commo arsenal.”
Universal Radio — Quality equipment since 1942.

ICOM
AH8000

The Icom AH8000 is a multipurpose discone antenna that receives solid from 100 to 3300 MHz! It can also be used for transmit on 144, 430, 1200 and 2400 MHz ham bands (under 200W). This omnidirectional antenna is 3 feet high and attaches to any 1-2 inch standard mast with two supplied U-bolts (mast shown is not supplied). 2.1 lbs. Comes with a preassembled 49 foot coaxial cable with N connectors.

AH8000 Order #1945 $269.95

This adapter converts the N male to a BNC male.

UG-349/AU Order #4571 $4.95

This adapter converts the N male to a PL-259.

UG-83 Order #1384 $4.95

CommRadio CR-1a

The CommRadio CR-1a is a true SDR receiver, but does not require a computer. Enjoy the benefits and performance of state-of-the-art SDR, but in a conventional radio package. The CR-1a SDR is independent of a host PC, using embedded digital signal processing technology that provides a degree of portability and performance previously unavailable to the radio enthusiast. Covers: 500 kHz-30 MHz, 64-260 MHz and 437-468 MHz in AM, SSB, CW, WBFM, NBFM modes. I&Q output to PC’s and Android platforms. PC app 200 kHz spectrum analyzer. The incredible performance is combined with exceptional portability. Powered via USB or 6-18 VDC input. Enjoy top-shelf American technology in a compact, metal case 5.64 x 2.43 x 6.10” 1.8 lbs.

Order #2002 $599.95 (+$9.95 UPS)

The earlier model CommRadio CR-1 is shown right to illustrate scale.

Visit www.universal-radio.com for details!

ICOM
IC-R75

✓ FREE
Bonus Item

Enjoy exciting international radio reception with the Icom IC-R75 communications receiver. With 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 and 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! See web for bonus item.

Order #0012 Call for price.

ICOM
IC-R6

Sport covers 100 kHz to 1309.995 MHz (less cellular gaps) in: AM, FM Narrow and FM wide. Enjoy local VHF-UHF coverage plus international shortwave broadcast. 1300 memories store: frequency, mode, step size, duplex, CTCSS, 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. Put the world in your pocket for under $200.

Call or visit website for price.

ICOM
IC-R20

Sport 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 belt clip and strap. Requires 3 AA cells. Call or web for price.

The Icom R9500 raises the bar for professional receivers. Visit the Universal website for full details on this state-of-the-art instrument.

AH8000 Order #1945 $269.95

This adapter converts the N male to a BNC male.

UG-349/AU Order #4571 $4.95

This adapter converts the N male to a PL-259.

UG-83 Order #1384 $4.95

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Universal Radio is also pleased to carry the complete Icom amateur radio equipment line. The IC-7700 shown.

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Something’s going on in the upper reaches of the shortwave (HF) radio bands, and it sure makes for an intriguing situation.

Any radio hobbyist familiar at all with the HF radio spectrum knows about the unique properties of bands at and around 10 meters and 11 meters (12 meters, too). Signals here radiate and propagate in a fashion not quite matched by any of the other radio bands anywhere around the dial. And the radio sets for these bands are unlike those for any other two-way radio operating. These are the HF high bands: 10 meters, 11 meters (Citizens Band) and 12 meters.

And over the past 10 or so years—particularly the last five years—11-meter CB activity has been steadily on the rise. This is obvious to those deeply involved in it. The increased activity is both on-air and in particular, off-air as well. And it is the off-air activity that truly points to the genuine hobby characteristic of CB radio. This includes all of the tinkering with circuitry, the tuning, adjusting, fabricating (making) and yes, even hacking of radio equipment. And that is what makes 11-meter radio just so much fun to play around with. In fact, these off-air endeavors probably account for the recent increase in activity in the hobby.

This is exciting news! But there are many who believe or even insist that CB is a dying avocation. What’s going on here—and how did we get from there to here? Although we live in the Information Age, an abundance of misinformation remains running amok. Surprisingly, one of the most often misunderstood subjects is the present state of 11-meter CB popularity and usage. It’s surprising for folks like so many radio hobbyists who rightly pride themselves on being highly proficient in radio communications matters. Whether or not any of us are old enough to remember the glory days of CB during the 1970s, nearly everyone even remotely familiar with CB has some knowledge of that decade’s greatest fad. But fads, by definition, come and go.

When the CB craze (as such) of the ’70s faded just as rapidly as it arrived, many people both within and outside the CB world naturally concluded that CB radio was either dead or dying. Aside from the fad though, how has CB popularity fared over the last two-plus decades? The entire CB craze phenomenon of the 1970s notwithstanding, a large number of communications volunteers and hobbyists, as well as communications industry profes-
CB radio (continued)

sionals, feel that CB use has been on a steady decline over the past 35 years. Members of various Internet blogs and forums have long asserted that CB popularity is on the decline. Some of these commentators and their followers then use this assumption as justification for walking away from their CB sets and turning to other radio bands and modes. But, is this presumption valid?

For many of us who lived the CB fad in the 1970s, it’s an all-to-easy conclusion. In 1976, all 23 CB channels were loaded with traffic, in nearly every part of the country. The (then) three main trucking channels – 10, 15, and 21 – were busy around the clock in even the sparsest areas, if we were within listening range of any major highway. Today, truckers nearly everywhere in the US are on one channel: 19. The remainder of the 40 channels we have today are relatively somewhat quieter. That is, except for the faint daytime long distance (DX) operators on channels 35-40 on sideband and one or two lower channels with AM DXers, typically Channels 6 and 11. And what is the conclusion to which so many of us are quick to jump? Simple: CB radio popularity has been on the decline. Right?

Maybe not. Jumping to such a conclusion may cause us to leap right over some highly relevant realities. How can we see what’s really going on? In the course of my own research over the years, I have noticed a scarcity of statistics on CB use, sales, manufacturing and imports, or anything else telling. That’s officially speaking. The stats that I have had available have indeed indicated increasing sales of CB sets in the United States within the past 20 years (for those years in which any data was found). But, that’s admittedly spotty. My personal observations do agree with and in fact expound upon the optimistic industry data, though. And that is certainly exciting news!

So, what makes the HF high bands so special, anyway? Several things do, really. First and most importantly, CB operating is just plain fun. There are basically no rules about what we can say or talk about. Unlike the amateur radio universe, on 11 meters you can really let your hair down and even get silly if you want to (at least on the AM channels). The unwritten rule in ham radio that dictates never discussing politics, religion, or sex doesn’t apply here. To be sure, nobody wants to hear a bunch of pro-

fanity or bizarre religious or political doctrine. And the vast majority of CB ops honor that anyway. Some salty language persists, but that is the nature of the beast. That is to say, on CB radio we wanted no rules, so this is what we’ve got.

And look, the available radio equipment is just so—so—so cool! And it’s actually affordable, to boot! So many of the transceivers on the market are very deliberately of old-school design. We get chrome knobs and bezels, and sometimes chrome faceplates, too. We don’t have to put up with menu-driven front panel controls, and we certainly don’t have to deal with layers of hidden sub-menus. Every knob, switch and button has its own single purpose, and is labeled appropriately. Best of all, we get an honest real mechanical meter, like a genuine needle-swinging D’Arsonval meter movement typically with colorful numeric scales for S-units, RF power, and often modulation percentage. Operation is innately user-friendly. Even top-of-the-line CB transceivers with all of the control knobs and switches available are still amazingly simple, and therefore fun to operate.

Now if you prefer state-of-the-art technology in a CB radio, you will not be left disappointed either. It seems that for every old-school CB set on the market, there is a complementary high-tech model available. We have 11-meter radios with Bluetooth capabilities. We have CBs that interface with cell phones, so that we can take an incoming call on the CB and have the Caller ID appear on the set’s LCD screen. Another CB transceiver offers us a wireless Bluetooth headset for hands-free radio operation. Many have large, colorful LCD screens indicating various operating parameters, including frequency in megahertz, digital SWR and options activated (such as noise blanker, etc.).

But the big thing we have seen in more recent years is a convergence of sorts among 27 MHz CB radio sets and 10-meter amateur radio sets. We are seeing growing numbers of mobile and base station transceivers that bear great resemblance to CB Radios that are actually 10-meter ham transceivers or are dual-band 10- and 11-meter radios. Some are actually tri-band 10, 11 and 12-meter sets. Most of these units have both the standard 40-channel number display along with a five- or six-digit frequency display.
The 10-meter and 12-meter amateur radio sets should be entirely legal for licensed ham radio use, but the FCC has taken issue with some of these radios. The problem may be that many of these units are very easily adaptable to 11-meter CB use. Uncle Charlie isn’t too thrilled with this development, it seems. Regardless, these amateur radio transceivers remain on the market. The radios that cover both 10 and 11 meters (or 10, 11 and 12 meters) are specifically not authorized in the CB radio service. FCC rules prohibit a 27-MHz CB radio from having any frequencies of the amateur radio Service included (47 CFR §95.655(a), et al.). Therefore, such radios are commonly marketed as “export” CB radio sets. Sales of these within the US are not allowed, but to date these remain widely available from Internet online vendors.

In any case, this convergence of 11-meter and 12- and 10-meter radio equipment in play is driving a fundamental broadening of interest in the HF high bands as a whole among radio hobbyists.

Consider also that 10- and 11-meter radio equipment is so easy to work on. The old-school designs that persist nearly all share certain design considerations. For instance, a great number of different CB radio and 10-meter amateur set brands and models share a relatively small number...
CB radio (continued)

of printed circuit board (PCB) blanks. Apparently, most of these transceivers were designed on-par during the late 1970s or early 1980s. Historically, certain state-of-the-art developments in CB radio occurred early during that period. And technological development has stabilized since then, with few new improvements necessary in the basic underlying CB technology. Surely, much engineering has been shared or traded among manufacturers over the years. And this makes for simple repairs, upgrades and modifications (authorized or otherwise) among users.

Old-school transceivers use spacious well-laid-out conventional printed circuit boards. And they tend to have all components labeled so as to correspond to schematic diagrams and service manuals. No specialized tools are needed to replace most individual components. Adjustment potentiometers and tunable coil slugs are helpfully provided in various circuits. It's an electronic hobbyist's dream come true.

Even the newer state-of-the-art CB and 10-meter sets very often continue to utilize the old-school design main circuit boards. More recently devised functionalities (such as LCDs and Bluetooth) are built on small ancillary boards. While most of these ancillary boards contain complex IC chip sets and make use of surface mount technology (SMT), all customary adjustments and modifications are done on the main board. If any component on any ancillary board happens to malfunction, it is a simple matter to replace the small, usually cheap board in question. Any way we look at it, 11- and 10-meter radios are a breeze to work on.

And let's never forget the “When all else fails…” principle. These days, we don't have to be survivalists or anything like conspiracy theorists to appreciate the need for SHTF* disaster preparations. (*SHTF: I paraphrase loosely, “when the Stuff Hits The Fan.”) Experienced radio hobbyists know that it doesn't take much to overload the cellular systems. Any long-term disaster situation, natural or man-made, will cripple wireless telephone and Internet services, usually over an entire region. Most radio communications enthusiasts have long known that amateur radio is the way to go in disaster preparation. Sophisticated, high-powered, and technologically highly reliable ham radio gear can be had at reasonable prices. And a basic technician class ham license is simple to earn, and cheap in cost. So, as regards to emergency preparedness, why then should we consider anything like CB or consumer-grade two-way devices, or even business-class radio such as MURS or its licensed sister, itinerant business radio.

Ask any ham old-timer. During two World Wars of the 20th century, amateur radio and at least one other licensed radio service were ordered off the air by two presidents under their war powers authority. Hams remained on-air in subsequent wars simply by the good graces of the chief executive. Circa 1991 wording in the Code of Federal Regulations (Title 47 CFR §214) was changed, just in time for the Persian Gulf War. Henceforth, the default scenario in case of war has been that hams may remain active during the conflict in question, unless the president orders otherwise. Previously, the default was for hams to go off-air unless allowed to remain on by the Oval Office (formerly, per §214.4(b)(4)). Notice that in either case the continued operation of the licensed radio services in question have been entirely at the whim of the president, with no particular decision-making reasoning required. And this executive emergency authority to quash ham activity is not limited solely to military conflict. It also comes into play whenever a “state of public peril” exists.

What would any perceptive prepper (one who prepares for when SHTF) do here? Well, preppers think largely in independent terms and in tactical terms. And when all else fails—including the unavailability of amateur radio, for whatever reason—CB radio is the first resolution that should come to mind. It is inherently low power (with all the advantages that low-power ops offer), transmits no identifying information or location information, has diverse propagation characteristics, and relies on no network or infrastructure. And if it matters, note that CB has never been ordered off the air for any reason, and the government has never been able to regulate it or control it! CBers and preppers do seem to share one common characteristic: each is a bit of a rebel – again, if it matters.

Whether we think we like it or not, RF linear amplifiers are a major fact of life in 11-meter radio. My own observations—although admittedly anecdotal—show us that “linears” are everywhere. For our purposes here, we will define a “linear” as any RF output signal amplifier. Truth
is that few of these amps operate anywhere near Class A phase linear mode, or even Class AB. Most operate Class C (look for the telltale AM/SSB mode selector switch) or possibly a few in Class D. As we all know, these RF amplifiers—linear or otherwise—for 11-meter CB use, are illegal. This is one remaining rule that the FCC does occasionally enforce, often in cases of egregious and ongoing interference to other communications or electronics. Consequently, we aren't going to find linears on display for sale at our local CB shop or truck stop. Not surprisingly, they can be found on the Internet from a variety of sources. In advertising, linear amps often are deliberately mislabeled as “transmitters” or sometimes as “power boosters.”

So, why are we discussing CB linear amplifiers anyway? Because of the ubiquity of these devices, their presence is not to be ignored. Legalities aside, the 4-watt RF power output of CB radio (12 watts on SSB) is largely ineffective in many localities for a number of reasons. Suffice it to say here that in everyday practical terms, on average, our useful functional range of CB transmissions may be a mere two to five miles. And that is typical base-to-mobile communication. The wavelengths between about 24 to 56 MHz favor considerable groundwave transmission range, given adequate transmit power. RF power in the area of 100 to 300 watts will yield some 50 to 100 or more miles of ground wave, even in somewhat varied terrain. And this is regardless of solar propagation conditions or time-of-day or night. Local comms—within about 30 miles—become extremely dependable. Is it any wonder that so very many CB operators use linear amplifiers on a regular basis? Use—or not—at your own risk and peril.

We can’t have a discussion about CB radio and 12- and 10-meter amateur radio without considering the exceptional propagation characteristics of this portion of the spectrum, especially because we were having a discourse about transmission range. We need to be aware of the 11-year sunspot cycle that affects RF propagation, mostly below ~56 MHz. During the “high” end of the cycle, ionospheric skip propagation is most likely, and includes the lower frequencies, reaching well into the higher ones. During the “low” end, long distance (DX) skip transmission is less likely, occurring perhaps only a few days in a season, and for maybe only a few hours of such a day. Licensed 10-meter operators will pray for a plethora of dark sunspots that bring in skip signals from all over the globe. That’s what HF amateur radio is all about. On the other hand, 11-meter operators differ in their want (or not!) of skip conditions: Some crave the DX; typically sideband operators, while others disdain the cacophony of distant signals as an annoyance that blots out weaker local comms.

Whatever our opinion of ionospheric skip, we must bear in mind that thanks to the ever changing solar cycle, we will always have widely varying DX skip conditions. Not only that, but the 10-, 11- and 12-meter bands are also highly affected by time of day. The sunspots bringing in the skip will be out of our antenna’s sight in the hours after sunset, making late night local comms the norm. Soon after Old Sol rises in the AM, the skip may return, depending on whether a number of dark sunspots appear on the visible side of the sun. Some days will yield no skip at all. Nevertheless, the skip will refuse to let up on certain evenings, not at least until the wee hours. The propagation variety is unending. And that is precisely the sporting aspect of the HF high bands.

To be sure, the convergence of 10- and 11-meter, and even 12-meter radio equipment represents a major shift within the greater radio hobbyist community. The subculture that only 10 or 15 years ago characterized CB operators has now expanded horizontally to include many within the broadest class of licensed amateur operators, those authorized to work the 10-meter band. Both the legacy novice class hams and the new entry-level technician class licensees have operating privileges in the most popular portion of the 10-meter band. Never have radio hams and CB operators been so close, not only in occupied band space, but now in shared/mirror image transceivers for these bands also. No longer can we think of 11-meter radio enthusiasts as merely CBers. So many of us happen to be licensed hams who share a vested interest in the 11-meter band as well.

Please note: Any political or legal observations herein are merely the unqualified musings of the author. “I am not a lawyer, nor do I play one on TV. However, at times I have been accused of being a politician.”
Have you ever heard an ambulance siren nearby or a medical helicopter fly over and wonder what the emergency was and if you can listen in?

There is something special about the excitement of monitoring medical emergencies whether it be an ambulance, medic squad or life flight that gets the adrenaline pumping. A life-and-death drama could very well be unfolding and listening in on the scanner is a great way to find out what is happening in real time.

If you live in an area where there are no trunked systems, medical comms will be on conventional VHF and UHF frequencies. In many metro areas, medical comms are on trunked systems. EMS crews, ambulances and med flight copters will have dispatch and working talkgroups in addition to conventional medical frequencies. When ambulances come to a metro area from outlying areas, chances are good they will communicate with hospitals on conventional VHF and UHF frequencies so programming a mix of both trunked and conventional in your scanner is a good idea.

There are several good sources for frequencies and trunked radio systems for your area. NatCom's very own...
Scanning (continued)

VHF medical frequencies

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<th>Frequency</th>
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<th>Channel</th>
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<td>American Red Cross (nationwide)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150.775</td>
<td>EMS (simplex)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150.790</td>
<td>EMS (simplex)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>152.0075</td>
<td>EMS (medical paging)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155.160</td>
<td>EMS (also search and rescue)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155.175</td>
<td>EMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155.205</td>
<td>EMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155.220</td>
<td>EMS (also search and rescue)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155.235</td>
<td>EMS</td>
<td></td>
<td>Marine VHF Channel 16 calling</td>
</tr>
<tr>
<td>155.265</td>
<td>EMS</td>
<td></td>
<td></td>
</tr>
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</table>

Military bases: medevac, medical net, etc.: 148-150.7 MHz; 163-174 MHz.

UHF medical frequencies

Med UHF voice frequencies: (non-voice biomedical telemetry frequencies not included).

<table>
<thead>
<tr>
<th>Mobile receive</th>
<th>Mobile transmit</th>
<th>Channel</th>
<th>Use</th>
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<tbody>
<tr>
<td>462.95000</td>
<td>467.95000</td>
<td>Med 9</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.95625</td>
<td>467.95625</td>
<td>Med 91</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.96250</td>
<td>467.96250</td>
<td>Med 92</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.96875</td>
<td>467.96875</td>
<td>Med 93</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.97500</td>
<td>467.97500</td>
<td>Med 10</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.98125</td>
<td>467.98125</td>
<td>Med 101</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.98750</td>
<td>467.98750</td>
<td>Med 102</td>
<td>Dispatch/paging</td>
</tr>
<tr>
<td>462.99375</td>
<td>467.99375</td>
<td>Med 103</td>
<td>Dispatch/paging</td>
</tr>
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<td>463.00000</td>
<td>468.00000</td>
<td>Med 1</td>
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<td>Medical control (voice)</td>
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<td>468.05000</td>
<td>Med 3</td>
<td>Medical control (voice)</td>
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<td>Med 4</td>
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<td>Med 41</td>
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<td>Med 42</td>
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<td>Med 43</td>
<td>Medical control (voice)</td>
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<td>Med 5</td>
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<td>Med 51</td>
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<td>Med 52</td>
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<td>Medical control (voice)</td>
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<td>468.16250</td>
<td>Med 72</td>
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<tr>
<td>463.19375</td>
<td>468.19375</td>
<td>Med 83</td>
<td>Medical control (voice)</td>
</tr>
</tbody>
</table>
Scanning (continued)

http://www.Nat-Com.org has this information available for you. From time to time, I like to compare information from various sources. One of the more popular websites I check is http://www.radioreference.com which has database and forums for every state as well as Canada. In addition, many air medical and ambulance companies are licensed in the VHF and UHF business bands. NatCom and RadioReference have this information listed for your area.

Depending on the nature of the call, they also may use regional, countywide and statewide frequencies and talkgroups along with individual police and fire agency frequencies and talkgroups. When responding to state and national parks, medical crews usually will contact park dispatch. Some parks have their own medical facilities that may have their own frequencies. Yellowstone Park has a small hospital at Lake Village and a clinic at Mammoth HQ on 462.450 MHz, for example. Remember to use the fire or medical search button on your scanner, this function has turned up quite a few calls I would have otherwise missed. I also have heard medical calls on Forest Service and BLM frequencies so program those frequencies if you are within monitoring range.

What you can expect to hear: you will hear medical crews talking about patient condition, details of the accident or incident, traffic conditions, etc. One frequency every scanner should have programmed is 155.475, which is used as National Law Enforcement Mutual Aid. This frequency is used extensively nationwide.
Scanning (continued)

Many ambulances use various emergency medical frequencies for ambulance-to-hospital comms. These frequencies also should be programmed into every scanner as you will hear activity on these VHF frequencies. Med flights will be using the VHF air band to communicate with airport control towers and other aircraft. Check 123.025, 123.050 and 123.075 helo frequencies as well as the regular tower frequency for your local airport.

Once in the air, the on-board medical crew can be heard talking to the hospital about the patient's condition and relevant vitals including a brief description of the incident. The hospital will advise the medical crew what to do next or what precautions to take until the patient arrives at the hospital. You might be surprised at these aircrafts’ actual missions.

You also will hear air med flights for accident victims, moving patients to other medical facilities and any other number of situations where time is of the essence. Many times I have heard medical copters called to help in search and rescue (SAR) operations to help find lost or missing persons as well as for transporting them to safety once they are located.

A U.S. Coast Guard team transports a patient basket.
Scanning (continued)

Med Channels 4 to 8 and 41 to 83 is where you will hear medical crews talking to the emergency room. If you live in an area where trunking is used, you’ll need to find the talkgroups for fire, rescue and med flights. Our area uses trunked talkgroups for all ambulance, rescue and air med-to-hospital comms.

Don’t overlook fixed-wing medical aircraft. When a helicopter isn’t practical or longer range is needed, fixed-wing medical aircraft can be called into action. For example, a helo might make a rescue in a remote area where a fixed-wing aircraft could not possibly go. But the distance to the nearest medical facility is beyond the range of the helo, so the helo makes the rescue and takes the patient to a waiting fixed-wing aircraft at a regional airport. This airplane makes the several hundred-mile run to a larger city, where the required medical facility is located. Another medical copter is waiting that transports the patient the last few miles from the airport to the hospital.

You also can monitor medical emergencies on the VHF marine band. Where there is navigable water, there is potential for a medical emergency. Most scanners have a pre-programmed marine band search, but always monitor Channel 16 first. Other sources of medical emergency traffic are the Ski Patrol, amusement parks and backcountry outfitters. When you are in or near state and national parks, program dispatch frequencies for those areas (see my article on vacation scanning in the July-August issue for National Park Service frequencies).

In the event of a disaster, medical, police and fire communications may go down along with cell phones and landlines. In this scenario, amateur radio may be called on to provide radio systems until power is restored so you will want to find out what frequencies your local hams use. Most likely they will be in the 146-MHz and 440-MHz ham bands.

I enjoy hearing from our readers. My email is kf7yn@yahoo.com. Be sure to put NatCom in the subject line so you don’t end up in the spam folder.
This month, we’re going to take a look at a variety of scanning targets, from railroads, to a few oddball frequencies (depending on where you live), antennas and towing communications.

One of the favored scanning targets of many – especially railfans – are railroad frequencies. I’m not a railfan, but I monitor rail frequencies in my scanner usually wherever I am. While some of the smaller tourist rail lines just use business radio frequencies, most railroads use a set of frequencies specifically allocated for rail use.

First of all, railroads have both short-distance and long-distance communications. Railroads usually use remote transmitters along rail lines to keep in touch with trains while they are traveling in certain areas. These remote transmitters usually operate on designated road channels and can be activated by dispatchers either by microwave or telephone lines. This allows rail crews to have constant contact with their dispatchers no matter where they are.

Some railroad communications, such as those in a rail yard, are short distance by their very nature, and don’t need to transmit over a wide area. In many areas of the United States, railroads will operate private telephone systems on dedicated frequencies so rail crews can make telephone calls over their radios. They may refer to these channels as PBX channels.
Scanning (continued)

If you want to know where to look for railroad communications, all you have to do is search in 15-kHz steps in the following range: 160.215 to 161.565. There also are some 12.5-kHz channels on UHF from 452.3125 to 452.4875 and 452.7625 to 452.9625. Likewise, the accompanying “input” frequencies 5 MHz higher on UHF also may be used for inputs or mobile communications.

On UHF, you’ll probably find data tones as trains pass by. These tones are transmitted by radio boxes installed on the last car of a train to send signals to the crew in the locomotive. The rear-end detectors have replaced the caboose of the past. In the near future, railroad communications will gain additional channels, much like other radio services that have gone to narrowband communications. These channels will fall between the current rail frequencies.

Im-media-ate fire

If you’re on the East Coast, you may have noticed that the frequency of 170.150 may be used for fire calls in your area, but seems to be a broadcast media frequency in some other areas. There’s a good reason for that. The frequencies 166.250 and 170.150 may be assigned to fire departments within 150 miles of New York City only. The frequencies are in use primarily in the northern New Jersey, Connecticut and Philadelphia area.
Scanning (continued)

In the rest of the nation, radio and TV stations get to use 166.250 and 170.150 for remote broadcasts. In many areas, a station may use both of the frequencies in one way or another. The usage of those frequencies may be in conjunction with channels in the 161-MHz band (161.640, 161.670, 161.700, 161.730 and 161.760) that stations also may be licensed on. For instance, in one area where I used to live, a radio station uses 166.250 for the actual remote broadcasts, but uses 161-MHz channels for cuing on that system.

Picking up signals

I know many scanner listeners will use a handheld scanner at home, but also have a base scanner antenna on the roof of their home for extended range. Some listeners say that allows them to hear most stations in perhaps a 50-mile radius of their home, especially if the area is mostly flat. However, if you want to hear a station that’s farther away, how do you accomplish this?

First of all, there may be a reason you won’t hear a specific station you want to hear. The station’s power output may be too low for you to ever hear it, no matter what you do. If you can hear the signals while mobile a good distance from where the transmitter is located, then you might be able to tune it in from home with a few tricks. Also, consider that there may be a natural obstruction that keeps you from hearing the signal. Is there a mountain or elevated rise in the land that would effectively block the signal?

If you want to try to capture the signal, here are a few tips. First of all, omnidirectional antennas are out of the picture. You’ve got to aim a directional (yagi) antenna at the sought signal. The more elements you have on the yagi antenna, the greater your chances of snagging the station. Yagi antennas aren’t generally available from scanner shops. You’ll need to check with a local two-way dealer or amateur radio supplier for what you want. The yagi antenna generally will be operative on one band only, too, such as VHF high band or UHF, although there are some dual-band ham yagi antennas available. Ham yagi antennas generally are cheaper than yagi antennas made for two-way radio users and perform the same (and sometimes are the exact same antenna, but cut lower in frequency for the ham bands at 144-148 and 440-450 MHz).

In addition to a yagi, be sure to use a good coaxial cable. Forget the CB-type RG58U cable as you will lose too much signal before it gets from the antenna to the receiver. Spend a little more on a cable such as 9913, which has a lot less signal loss at VHF and UHF frequencies. Another idea would be to purchase a signal preamplifier designed for scanner users, or even better yet, one designed for the band you want to listen to. If you can’t find one of these from a radio supplier, you even can use a preamp designed for TV. Check to see what frequency range the preamp is designed for. Typically, you will find them for a range such as 50-900 MHz, which would cover all the TV channels, as well as all VHF high and UHF scanner bands, including the 800 and 900 MHz bands. I know of many scanner listeners who have gotten very satisfactory results from TV preamps on their scanners (between the antenna and receiver). I personally use TV preamps myself with very satisfactory results.

By improving the ears for your scanner, you greatly improve your chances of hearing a faraway signal. We’re
not guaranteeing that you will be able to hear the station you want to hear, but you will be much closer with each step you take along the way.

On your tows

A lot of listeners like to listen to tow trucks, especially when the weather gets bad. However, unless you are looking in all the right places, you may hear only half the tow trucks in your area, especially if all you monitor are the business frequencies formerly allocated to the automobile emergency radio service.

First, let’s take a look at the frequencies that used to be reserved for privately operated tow trucks: 150.815, 150.830, 150.845, 150.860, 150.875, 150.890, 157.470, 157.485, 157.500 and 157.515. In addition, the following frequencies used to be set aside for use by auto clubs providing emergency road service for members: 150.905, 150.920, 150.935, 150.950, 150.965, 452.525, 452.550, 452.575 and 452.600. The four UHF frequencies originally were set aside as simplex only – without repeaters – meaning the base stations and mobiles operate on the same frequency, which is unlike most wide-area UHF radio services. Since the former tow frequencies have been absorbed into the catch-all business radio service now, you still will find tow services and automobile clubs like the AAA running on these frequencies listed above, but don’t be surprised if you find other businesses using these frequencies today, too.

However, the place you’ll find most tow trucks aren’t generally these former VHF and UHF automobile emergency radio service frequencies. Most use the catch-all business band frequencies on VHF (151-, 154 and 451-453 and 461-465 MHz). In larger metro areas, you also will find tow trucks using the 470-512 MHz T band, the 851-856 band, or the 935-940 MHz trunked band.

Write in

Do you listen to railroad communications? Do you monitor tow-truck frequencies? Why? Have a question about scanning? Want to share a photo of your listening shack? Send it to chuck@NatComMag.com.
CB radio
Citizens band QSL cards were colorful in their day
By CHUCK GYSI, N2DUP

When I upgraded from my 100-milliwatt CB walkie-talkie to a full 5-watt tube-type, crystal controlled Lafayette Comstat 19 CB base station back in the 1970s, something unusual came with that first rig.

The teen who sold me his radio also gave me his coax and antenna. In addition, there were several dozen CB QSL cards in plastic sleeves for display on a wall. As a shortwave listener, I knew about QSL cards and had my own collection of SW QSL cards from international broadcast stations around the world. I was fascinated by these folksy, down-home CB QSLs, many done with simple artwork, probably designed by the CBers themselves.

At the first CB coffee break I attended, I witnessed CBers exchanging these QSL cards, which led me to learn that they were used not only for over-the-air conversations like ham operators, but also for “eyeball QSOs.”

The CB QSLs of the 1960s and 1970s are classic. They take us back to a simpler time. Some of these QSLs were done well before Channel 19 highway chatter and “smokey.” Take a look at some of the CB QSLs we’re displaying in this issue and join us in that visit back to CB’s heyday. If you had a QSL card as a CBer back in the day, we’d love to see it here at NatCom. Let us know what QSL card you like the most! Send your email to chuck@NatComMag.com.
CB radio (continued)
CB radio (continued)
Online
Social media: Follow NatCom on Facebook, Twitter

By CHUCK GYSI, N2DUP

Are you on Facebook or Twitter?

We’re trying to build our community on our social media platforms and we’d like you to participate!

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NatCom’s aim is to use Facebook to interact with you, our readers! We’ll tell you about articles that are in NatCom, tell you about some radio news you may be interested in and we’ll seek your input on articles that appear in each issue of the magazine. We invite your comments to questions we ask, too, on our Facebook page.

Likewise, we will be sending out information on Twitter to keep readers informed and to receive your tweets, too! You can “like” our Facebook page and “follow” our Twitter account if you are on either. You don’t need a Facebook or Twitter account, however, to read the information that we post -- you only need an account if you want to post on our Facebook page or send us a tweet on Twitter.

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