Monitoring Times

Winter Propagation:
Hot frequencies in the cold months

Also in this issue:
Monitoring the Army National Guard
First Look at the Radio Shack PRO-96
A Useful, Easy-to-Make Antenna
AOR SDU5600 Spectrum Display Unit

Spectrum Display Just Got More Interesting!

With sampling at up to six times per second, you're quickly aware of new active frequencies. The "waterfall display" function is a new convenience, along with a host of menu driven selections and features.

The AOR SDU5600 is the “next generation” in spectrum display units. Using a five-inch TFT color display, DSP and FFT (Fast Fourier Transform), faster sampling rates and color imaging, the SDU5600 opens the door to new possibilities and applications.

Enjoy full control of compatible AOR receivers. The 10.7 MHz input may be compatible with receivers from other manufacturers as well. PC control is also present, as is highly accurate frequency management.

AOR SDU5600
- High resolution 5 inch color TFT display
- Built-in “waterfall” display function
- Now features FFT signal analysis
- DSP
- Uses 10.7 MHz IF input frequency
- Wide input level range: 0 - -90 dBm
- High dynamic range, 60 dB
- Fully interactive with AOR AR5000 models, AR8600, AR-ONE
- 10 MHz bandwidth (± 5 MHz from center frequency)
- Samples up to 6x per second
- Four frequency resolutions: 4, 32, 64, 128 KHz
- Image output to your PC
- Bus signal can be saved to memory
- Graphic display and statistical (text) data
- Menu driven operation
- Two RS-232C ports for receiver and computer control
- Easy to operate

Authority On Radio Communications
AOR U.S.A., Inc.
20655 S. Western Ave., Suite 112, Torrance, CA 90501, USA
Tel: 310-787-8615 Fax: 310-787-8619
info@aorusa.com http://www.aorusa.com

Specifications subject to change without notice or obligation.

The Serious Choice in Advanced Technology Receivers™
WiNRADiO G303i
Shortwave receiver for the 21st century

In today's dangerous world, attention is turning again to shortwaves; the only information medium which can quickly reach around the globe even if major infrastructure failures occur.

The innovative WiNRADiO G303i software-defined shortwave receiver has the performance and capability to bring shortwave monitoring to the higher level demanded by today's standards and to take advantage of new digital broadcasting technologies. A range of new options is now available to bring the most out of this exciting receiver, and to provide an integrated solution whose performance equals or surpasses that of conventional receivers costing many thousands of dollars more.

The G303i PCI-card receiver is designed with maximum reliability and performance in mind. Not a single tunable part has been used in its design. There are two high-performance DDS units, and thousands of ultra-miniature surface-mount components delivering a truly stunning performance.

The G303i control panel features no less than seven different methods to tune the receiver. There are additional features such as a real-time spectrum analyzer, three scanning options, a highly accurate S-meter displaying signal strength in absolutely calibrated user-selectable units, sweeping wide-band spectrum scope, powerful memory facilities, and many others.

Professional Demodulator Option
The Professional Demodulator introduces user-adjustable filter bandwidth and selectivity, additional demodulation modes, interactive demodulator structures, SINAD and distortion meters, bandwidth presets, user-definable audio AGC, and many other features.

Advanced AM Demodulator Option
The Advanced AM Demodulator offers passband tuning, notch filter, noise blanker, RIT and recording facilities. The ability to record at the IF level, and so "re-receive" a signal with different filter and demodulation parameters, is the world's first in a receiver of this class.

DRM Decoder Option
The DRM Decoder introduces one of the most exciting innovations in radio of our times: Digital broadcast on MW and SW radio. Hear FM-quality broadcasts on shortwaves, thousands of miles away!

Long-wire Antenna Kit Option
The WiNRADiO AX-05E Long Wire HF Antenna is a low-cost kit containing all the necessary components for a simple but effective shortwave antenna suitable for short wave, medium wave and long wave listening applications. An excellent accessory for the G303i receiver or any other shortwave receiver.

Long-Wire Antenna Adapter Option
The WiNRADiO LWA-0130 Long Wire Adapter employs a dual transformer design, making it more efficient than most conventional "longwire baluns". It is especially suitable for the AX-05E Antenna and the G303i receiver, but can be used with any third party HF radio to improve performance. A typical signal improvement using WiNRADiO Long Wire Adapter is 5dB, and in some cases up to 17dB.

Advanced Digital Suite Option
The WiNRADiO Advanced Digital Suite expands the power of the WiNRADiO G303i receiver with HF fax and NAVTEX decoders, a signal conditioner with numerous user-defined filters, audio spectrum analyzer and oscilloscope, audio recorder with pitch shift, and numerous others digital processing facilities.

Reviews
The G303i receiver has attracted numerous reviews worldwide.

On spurious signal rejection: "As far as I can remember I have never found any receiver, analogue or digital, which had such cleanliness, and the WR-G303i has set a new standard for others to emulate." [Short Wave Magazine, SWMJ]

On sensitivity: "... higher than necessary in a receiver of its type..." [SWM] "Much of this sensitivity is contributed by the low phase noise of the oscillator, typically -148dBc/Hz at 1kHz. Clearly this radio makes or exceeds the competition head on..." In short, the performance is superb. The sensitivity and selectivity surpassed my expectations, and there was no sight of intermod even in the presence of strong stations at night: time..." [Radio & Communications, R&C]

On bandwidth: "... a very useful feature and allows you to exactly match the filter bandwidth to the incoming signal... once experienced never to be forgotten." [SWM] "The experience of being able to finely tune selectivity to suit a particular signal you are listening to is truly incredible, especially if you have been used to having just a few fixed bandwidths on your old radio." [R&C]

On noise immunity: "Just in case you're curious, no, the location of the G303i inside the computer doesn't seem to result in a noise problem. I don't know how WiNRADiO did it..." [Monitoring Times]

On noise immunity: "... higher than necessary in a receiver of its type..." [SWMJ]

On variable IF bandwidth: "... a very useful feature and allows you to exactly match the filter bandwidth to the incoming signal... once experienced never to be forgotten." [SWM] "The experience of being able to finely tune selectivity to suit a particular signal you are listening to is truly incredible, especially if you have been used to having just a few fixed bandwidths on your old radio." [R&C]

The verdict: "If I had to choose between a Collins 95S-1 and the WR-G303i (ignoring the obvious fact that the 95S-1 tunes to 2 GHz), I would take the WR-G303i." [SWMJ] "This receiver is a gadget-owner's dream! But it isn't fantasy; for the first time in consumer technology, the shortwave listener can tailor his receiver to his own requirements, independent of factory-set parameters." [MTJ] "The WiNRADiO WR-G303i receiver, in addition to being an excellent receiver on its own right, has a certain exciting feeling about it. Perhaps this is because of the promise of a change of an entire paradigm which makes a difference between just another run-of-the-mill product and a truly Innovative cult product, sparking an entirely new following." [R&C]
Winter Propagation: A Welcome Relief
By Tomas Hood NW7US

Why is there only a hiss where a strong signal came in just a few days ago? Why was HF reception so poor last August and September? Is there better "weather" to come?

This article looks at radio wave propagation, how it relates to sun cycles, what that means in the current solar cycle, and what we can anticipate over the coming winter months.

On our cover: Instability in the Sun impacts radio propagation on Earth. This June 9, 2002, "prominence" was caused by explosive instabilities in the Sun's magnetic field. Courtesy jpl.nasa.gov

CONTENTS

Monitoring the Army National Guard .....................16
By Larry Van Horn

The Army National Guard - Civilian in Peace, Soldier in War - predates American independence by almost 150 years and has participated in every US conflict! Though National Guard units report to the federal government in a national crisis, they are responsible to their state governor on all other occasions, and therefore every state has a National Guard presence. What that means for radio hobbyists is a significant opportunity for military monitoring, across the bands.

This article is a major summation of frequencies known to the monitoring hobby, but there's a lot more remaining to discovered!

Life as a News Junkie ..............................................22
By Brian Rogers

Ever since he heard a radio message from General Eisenhower coming all the way across the Atlantic, this author has been hooked on listening to the news from the countries in the news. He shares some of his favorite listening targets from his location in eastern Michigan.

Army National Guard AH-64 Apache
Reviews:

We have quite a selection of radios and accessories to suggest to you this month. After all, Christmas is around the corner! You’ll find some suggestions for Christmas gifts on pages 27 (Bright Ideas) and 72 (On the Ham Bands).

Of course, a lot of scanner hobbyists have been waiting for the Radio Shack PRO96 to be released, and it’s now here! MT takes a quick peek before the full review next month (p.88). If you’re looking for an inexpensive but reputable receiver for a shortwave fan, you might want to consider the Sangean Travel Pro, also reviewed on page 88.

Even non-hobbyists will appreciate the features available in the Cobra PR4000WX FRS/GMRS handi-talkies, which come as a pair and include weather radio and a compass (p.86).

A good frequency counter is a flexible tool with myriad applications for hobbyists and hams. MT reviews the Aceco FC2002 – a fairly sophisticated counter at a reasonable price (p.78).

If you’re traveling to Grandma’s house this Thanksgiving, don’t ruin the trip by acquiring a speeding ticket on the way. Recent changes have rendered many radar detectors illegal or ineffective, but the K40 RD850 Radar Detector appears to be just as good as it claims... Bob Grove checks it out on page 82!

Table of Contents

Departments:
Monitoring and the Law .................................................. 4
Monitoring Michigan
Letters ........................................................................... 6
Communications ............................................................... 8
Stock Exchange ................................................................ 90
Adverisers Index ............................................................... 90
Closing Comments ........................................................... 92
interoperability: The Holy Grail

First Departments
Getting Started
Beginners Corner .............................................................. 24
Counteracting the Beginners Lament
Ask Bob ........................................................................... 26
Bright Ideas ...................................................................... 27

Scanning Report ............................................................... 28
The NFI, Football Report
Scanning Canada .............................................................. 30
Emergency Management Radio Service

Utility World ..................................................................... 32
Long Distance Operational Control
Utility Logs ...................................................................... 33
Digital Digest ................................................................. 35
Listening to Low Frequency Uses

Global Forum .................................................................. 36
Radio Free Cascadia International
Broadcast Logs ............................................................... 39
The QSL Report .............................................................. 40
Is it Time for a Follow-up?
Programming Spotlight ................................................ 41
DX Programs: the VOA and You

Listening Guide
English Language SW Guide ............................................ 42
Program Listings by Station
MT Satellite Services Guide ......................................... 70
Amtecom-3, Galaxy 11, 3C, Telstar 6

Second Departments
Milcom ............................................................................. 62
Monitoring the Test Pilots
Tracking the Trunks ........................................................ 64
The Digital Diversity of APCO-25
Fed File ............................................................................. 66
NASA Call signs
American Bandscan ........................................................ 68
IBOC and LPFM Status
Outer Limits .................................................................. 69
FM Pirate R Free Cascadia
Below 500 kHz .............................................................. 71
Beaconfinder FAQs
On the Ham Bands .......................................................... 72
Uncle Skip’s Holiday List
Antenna Topics ................................................................ 74
Useful, Easy-to-Make Antenna
Radio Restorations .......................................................... 76
Demodifying the S-40A

MT Reviews
Scanner Equipment ......................................................... 78
Aceco FC2002 Frequency Counter
Computers & Radio ......................................................... 80
DRM: Who and What is it?
MT Review ........................................................................ 82
K40 RD850 Radar Detector
On the Bench ................................................................. 84
How a Geet Sets His Watch
The Gadget Guy .............................................................. 86
Cobra’s PR4000WX
View from Above ............................................................ 87
I RIT Testing, Testing...
What’s New ....................................................................... 88
Monitoring and the Law

Monitoring Michigan

Michigan is a state of many lures, from Detroit, the motor city, to the upper peninsula's natural outdoor beauty the state has something to offer everyone. When radio hobbyists visit they often travel with scanning radios, which may not be legal in a vehicle without a permit.

Since 1929, Michigan has had one law or another regulating the use of radios in vehicles which can tune in police communications. Although still carrying an antiquated title, Michigan's Penal Code, Act 328 of 1931 is the latest incarnation of that law as of March 2003. Section 750.508 states:

(1) Any person who shall equip a vehicle with a radio receiving set that will receive signals sent on frequencies assigned by the federal communications commission of the United States of America for police purposes, or use the same in this state unless the vehicle is used or owned by a peace officer, or a bona fide amateur radio operator holding a technician class, general, advanced, or extra class amateur license issued by the federal communications commission, without first securing a permit so to do from the director of the department of state police upon application as he or she may prescribe, is guilty of a misdemeanor punishable by imprisonment for not more than 1 year or a fine of not more than $1,000.00, or both.

While the law is silent on the definition of what it means “to equip,” some Michigan counties have been known to confiscate and charge anyone who has a scanner anywhere in their vehicle. This means tourists visiting the state to see the fall colors or attend a sporting event or auto race risk being charged for having the radio in a car without a permit.

Although the law in its recent form has made exception for licensed Amateur Radio operators, some police departments are unaware of that provision and a few licensed ham radio operators have had their radios taken by uniformed officers. Usually after many weeks or months of letter writing to the responsible prosecuting attorney these cases have been dropped and any responsible prosecuting attorney these cases have been dropped and any confiscated equipment returned.

The Michigan law in its present form seems to track language originally sponsored by State Representative Mike Kowall of White Lake, Michigan, who sits on the Energy and Technology Committee. Several years ago Representative Kowall proposed a change to Michigan's scanner law in response to requests from the Oakland County Sheriff's Office which believed scanners were being used by burglars in their community to avoid being caught.

Groundswells mostly in the Amateur Radio community convinced Representative Kowall to withdraw the bill at the time. Michigan ARRL Section Manager Dick Mondro, W8FQT, writing to Strong Signals (http://www.StrongSignals.com) quoted Representative Kowall as saying “Rest assured that I have driven a stake through the heart of this bill, and it will never see the light of day and will die before it reaches the committee process.”

Kowall went on to praise Amateur Radio operators who he said “play an integral role in emergency management agencies, and whose freedoms are guaranteed under the first amendment of the US Constitution and should never be challenged.”

♦ Getting a Permit

Permits for mobile monitoring in Michigan can be obtained from the Michigan State Police by calling 517-336-6613 and are available to both residents and out-of-state non-residents. The application can also be found online at http://www.mpscs.com/com-022.pdf. The two-page application entitled “Application for Short Wave Permit in a Vehicle to Monitor Police Frequencies” collects certain information such as name, address, type of installation - permanent or portable, and then requires the applicant to promise that the monitoring is not for the purpose of committing any crime or helping others do so.

Specifically, applicants agree “... not to use the vehicle equipped with a short wave radio receiving set in the commission of a crime or to assist anyone in doing so. [They] further agree not to answer police calls or pursue police vehicles answering radio dispatched if a permit is approved for any police frequency.”

Lastly, applicants promise they have read and understand section 605 of the Federal Communications Act of 1934 concerning unauthorized publication of communications. Copies of the Michigan State law MCL 750.508 and Federal section 605 are provided on page two of the application for convenience.

Perhaps the sentiments of many Michigan Police at the thought of being listened to can be summed up in the words of the Holland Police Department which gives this answer on its Internet web site’s frequently asked questions section. In response to a frequent request for their frequency (I have a scanner and wanted to enter your frequency. Can you give that to me?) they responded: “Although the great majority of people who monitor police and fire radio traffic are law-abiding citizens, some are not. Many techno-savvy criminal persons would use such information for illegal purposes. It is legal for a person with a Michigan State Police issued permit to monitor police frequencies in a vehicle. Please refer to the State statute MCL 750.508. We are not too anxious to give out our radio frequencies, as you can understand. Public listings or Directories do exist, but you will have to find them yourself. Sorry, hope you understand.”

♦ Free Subscription to MT

In addition to an honorable mention by name for those readers who submit stories to Monitoring and Law, beginning in 2004 if we use your story in the column, I will award the contributor with six months of Monitoring Times or a six month extension of your subscription.
THE VERY BEST IN SHORTWAVE RADIOS

YB 400PE AM/FM/Shortwave Radio
This high-performance PLL synthesized, dual-conversion YB 400PE receiver pulls in AM, FM-Stereo, Shortwave, and Longwave, including continuous coverage from 520-30,000 KHz. Even ham radio two-way communications can be heard using the SSB circuitry. Its highly sensitive auto-tuning system stops even on weak stations within the international Shortwave broadcast bands. Its 40 programmable memory presets allow quick, easy access to your favorite stations. Key features include:
- Easy tuning with direct frequency entry, up/down buttons, and auto-scan
- Multifunction LCD displays time, frequency, band, alarm wake time, and sleep timer
- Sleep timer, dual clocks, and dual alarm modes wake you with beeper or radio play
- Built-in antennas for complete portability and socket for supplementary Shortwave antennas
- Includes AC adaptor, earphones, carrying pouch, supplementary Shortwave wire antenna, and batteries
$149.95

YB 550PE AM/FM/Shortwave Radio
Unique features define the model YB 550PE, such as 200 randomly programmable memory presets with user-defined memory page customizing, digital fine-tuning control, and favorite station wake-up memory. Through its PLL synthesized digital tuner, receive AM, FM-Stereo, and Shortwave with excellent sensitivity and selectivity. Enjoy the entire Shortwave spectrum that includes all 14 international broadcast bands and continuous Shortwave coverage of 520-29,999 KHz. Its auto-tuning system stops even on weak stations within the international Shortwave spectrum, or with the direct frequency entry system, go instantly to any frequency in its tuning range. Key features include:
- Signal strength and battery power level indicators
- Digital clock with selectable 12/24 hour clock display format
- LCD with display light that shows simultaneous display of frequency and clock
- Alarm with snooze feature and 10-90 minute sleep timer
- Includes built-in antennas, sockets for supplementary Shortwave and FM antennas, earphones, and optional AC adaptor
$99.95

S350 AM/FM/Shortwave Radio
Incorporating a sensitive, high-performance analog tuner with digital frequency readout, the S350 receives AM, FM-Stereo, and continuous Shortwave coverage of 3,000 to 28,000 KHz, including all 14 international broadcast bands. Its classic analog tuning knob with superimposed fine-tuning control makes it a pleasure to operate, and the variable RF gain control, wide/narrow bandwidth selector and low pass filter give you complete control over incoming signals. Operates on 4 'D' batteries for long battery life. Key features include:
- Multifunction LCD shows digital frequency, clock, and more
- Alarm and 1-90 minute sleep timer
- Variable, independent bass and treble controls
- Left/right line-level outputs (stereo in FM)
- Includes built-in antennas, sockets for supplementary Shortwave and FM antennas, convertible nylon handle/carrying strap, earphones, and optional AC adaptor
$99.95

FR200 AM/FM/Shortwave Emergency Radio
Requiring no external power source, the FR200 is a versatile multi-purpose tool for keeping informed, entertained, and safe. Combining AM/FM/Shortwave radio and flashlight in one, the FR200 operates without batteries — powered by its built-in hand-crank generator — allowing you to listen to news, music, and international programming from anywhere, including places where power is a problem. Key features include:
- AM/FM/Shortwave Tuning (SW1, 3.2-7.6MHz; SW2, 9.2-22MHz)
- Hand-crank power generator recharges internal Ni-MH battery
- Built-in flashlight perfect for emergencies or camping
- Splash-proof ABS cabinet withstands your adventures and abuse
- Can also operate on 3 AA batteries or optional AC adaptor
$39.95

The Most Powerful Compact Shortwave Radios in The World.

1015 Corporation Way, Palo Alto, CA 94303 | Tel: (650)903-3866 | Fax: (650) 903-3867 | www.etoncorp.com
On Scene at the “Big E”

Ken Windyka, author of September’s article on monitoring the Eastern States Exposition, reported on the activity at this year’s event. But first, he has a story to tell on himself:

“I again went ‘On Scene’ at the Big E 9/13/03. Had programmed all the frequencies into the Icom R2 along with the stubby SMA 501 antenna and earphone. I went over half the day not hearing any transmission on the Big E internal security repeater (152.90) (and was saying to myself, wow there’s going to be some terrible letters to the editor on this!). Well, when I checked the programming, I had entered 152.92 in error…ALWAYS best to recheck what is programmed into the scanner. I might add, the frequency was quite active!”

Here was some other activity at the “Big E”:

“1. The Big E has an outdoor stage where various musical/vocal groups perform. Just before the 1 p.m. show is about to start I hear the on stage coordinator/announcer calling the control center on 462.70 and advising them that the drummer had cut his finger so the show would be delayed a bit. Sure enough, [there was] a short announcement that the show would be starting a little late and when the band came out the lead singer specifically mentioned about the drummer injuring himself…Now that’s information!”

“2. Later in the day a C5 aircraft was landing at Westover JARB, runway #05, and the approach path takes the aircraft right over the middle of the Big E grounds. Because of a light cloud cover you could not see the plane but could hear the whine of the engines. A significant number of people stopped in their tracks and stared up at the sky (not sure if it was curiosity or terror!); of course I had heard the aircraft talking with Westover Tower on 134.85 so knew there was an aircraft on approach.

“I didn’t see anyone else with a scanner but FRS radios were being utilized. Interestingly, most FRS radios actually had CTCSS enabled (getting multiple hits with different tones).”

— Ken Windyka

To his credit, Ken says he’s been invited to tour the local NBC TV affiliate station since he’s one of the top news tippers in the area — about 60% of his tips become a major story. Way to go, Ken!

Nevada Test Site

“Just got the Sept MT after returning from vacation in Las Vegas (and some Flag monitoring). Interesting story on Area 51. I made the same trip out to Rachel two years ago. What an ‘odd’ place, but also great for watching Red Flag action. Didn’t get the chance this time out.

“While playing radio at the hotel I found the new (or not so new) DOENTS 400 MHz Astro system was alive and well. Could hear at least four control channels at any one time from the room with a stub antenna. (16th floor at Bally’s facing west) Had to use a ‘racing’ stub antenna due to overload from the Ballys UHF LTR system.

“But, I could not get the system to track. Do you know if it happens to be a 9600 baud system? It would lock up on the control channel(s), but no talk group IDs. I had every voice freq I found active entered and would change out the control channel and also tried several base/offset combinations with no luck.

“I could hear ASTE traffic fine on individual freqs, lots of encryption also. Just could not get it to track.

“And nice job on the Kennedy Space Center trunked article. The 407.7625 is confirmed at CCAFS. 410.7625 is confirmed at Patrick. All the others are 100%.

— Mike Comer, Tinsville, Florida

Can any readers or columnists comment on Mike’s query? - ed.

Support Needed for SpaceCam

The MAREX-MG team is pleased to announce a new educational Amateur Radio project scheduled to be used on board the International Space Station (ISS) in the year 2004. The new imaging project is called SpaceCam!. The SpaceCam! Slow Scan Television (SSTV) project is a joint project between MAREX-MG and ARISS (Amateur Radio International Space Station). This system is an entry-level PC based SSTV imaging system which was designed to be used on board the International Space Station.

The SpaceCam! system will support multiple common SSTV transmission modes. SpaceCam! has been specifically designed to be accessible to as many Amateur Radio stations and shortwave listeners as possible, around the world. There are currently over a dozen software applications currently on the market which will decode the SSTV images coming down from the ISS.

This project is designed to allow school systems, satellite enthusiasts, shortwave listeners and Amateur Radio operators easy access to a new JPEG imaging project on board the International Space Station. The new SpaceCam! Slow Scan TV imaging system will be using a common Amateur Radio channel to send and receive images from the International Space Station to and from Earth. Anyone with a simple UHF receiver and antenna system will be able to decode and display live JPEG images coming from the International Space Station.

As an added bonus, if you are a licensed Amateur Radio station, you will also be allowed to transmit images from Earth to the SpaceCam! system on board the ISS, and to use the image repeater, which will retransmit your picture over a 1500 mile radius.

We believe this project will help stimulate students’ interest in the space program by putting part of the ISS project within reach of the common student or school system. And it will also increase the public’s awareness of the things that can be done with Amateur Radio and Amateur Radio Satellite projects.

The MAREXMG club began in 1991 as a small club with the goal of educating people on how to use the Amateur Radio projects on board the Russian Space Station Mir. As the club grew, we then began building new educational projects, which were successfully flown and used on board Mir.

We have come a long way since those days and we are now a 501(c)3 not-for-profit corporation, MAREXMG is looking to raise $50,000.00 USD this year to help pay for SpaceCam!.

The SpaceCam! software project is 100% complete. Our final task is in finishing the approval process for Space Flight Certification. We even have a tentative Rocket Launch schedule for early 2004 on board a Russian Progress Cargo rocket.

We now need your support to help pay for the development of the Educational SpaceCam SSTV project. Your donations are needed to help us to continue bringing the world affordable and educational Amateur Radio experiments from ISS.


Gregory Miles Mann, CEO MAREX MG
Manned Amateur Radio Experiment MG Inc.
3 Moccasin Lane
Chelmsford Massachusetts 01824 USA
marexmg@comcast.net

Print Screen

“We while I found the short article interesting (Volume 22, No 8, Computers & Radio - A Potpourri of Useful Programs…Reviving the “Print Screen” Key), I was wondering why you would go through all that trouble when all you have to do is hit Print Screen and then Ctrl and C at the same time. Go to your favorite application (Word, or some Graphic program) and then hit Ctrl and V at the same time. Then print it. Does the same thing and you can resize it to suit your needs.

“Just a Thought…(saves money too).

— James Wells, Raytown, Missouri

Not everyone knows of that tip, James. I discovered it, too, by accident. However, I hadn’t been using Control C: Shift plus Print Screen also copies it into memory for pasting into another application - ed.

Hooked on Radio

“The first magazine I ever read was Playboy. The second was Monitoring Times. I am now so old that I have given up on Playboy, but I still read Monitoring Times. (sigh)"

— John Jones, Ohio

We welcome your ideas, opinions, corrections, and additions in this column. Please mail to Letters for the Editor, 7540 Highway 64 West, Brasstown, NC 28902, or email editor@monitoringtimes.com. Letters may be edited for length and clarity. Happy monitoring!

-Rachel Baughn, KE4OPD, editor
Here's what you'll get with a subscription to MT, every month:

- International broadcasting program schedules
- Shortwave and longwave DXing
- Satellite broadcasting
- Pirate and clandestine stations
- Two-way communications monitoring
- Listening tips and insights from the experts
- Frequency lists
- News-breaking articles
- Exclusive interviews
- New product tests and book reviews
- Feature articles, and much, much more

Do you own a radio, a shortwave receiver, a scanning receiver, or a ham radio? Then Monitoring Times® is your magazine! Open a copy of MT, and you will find 92 pages of news, information, and tips on getting more out of your radio listening. In fact, it's the most comprehensive radio hobby magazine in the U.S.

Packed with up-to-date information concisely written by the top writers in the field, Monitoring Times® is considered indispensable reading by top government and newsgathering agencies.

From longwave to microwave, if you are interested in communications, Monitoring Times® is your foremost guide to profiles of broadcasting and communications installations; home projects; and tips on monitoring everything from air, sea, and space to distant ports of call.

For a mere $19.95, MT EXPRESS gives you Monitoring Times magazine
- in PDF format viewable with free software
- delivered by FTP (10 MB file)
- viewable in brilliant color on your computer screen
- easily navigated by clicking on the Table of Contents
- printable using your own computer printer
- searchable to find every mention of a topic or station schedule
- importable into your frequency databases
- compatible with software to convert text to audio for sight impaired listeners

To find out if this new subscription is the delivery solution for you, you may download a sample issue for free! Just go to http://www.grove-ent.com to find out how.

One year subscription to MT EXPRESS—only $19.95, or for even greater savings, $11 in addition to your printed subscription.

Subscribe to MT for as little as $14.50 (U.S. Second Class Mail)

<table>
<thead>
<tr>
<th></th>
<th>6 months</th>
<th>One Year</th>
<th>Two Years</th>
<th>Three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US 1st Class</td>
<td>$14.50</td>
<td>$26.95</td>
<td>$51.95</td>
<td>$76.95</td>
</tr>
<tr>
<td>Canada Surface*</td>
<td>$21.50*</td>
<td>$39.50*</td>
<td>$75.95*</td>
<td>$111.95*</td>
</tr>
<tr>
<td>Foreign International*</td>
<td>$30.50*</td>
<td>$58.50*</td>
<td>$114.95*</td>
<td>$171.50*</td>
</tr>
<tr>
<td>Electronic Subscription</td>
<td>$19.95</td>
<td>$38.90</td>
<td>$57.95</td>
<td></td>
</tr>
</tbody>
</table>

*All payments must be in U.S. Funds drawn on a U.S. Bank!
What Goes Around, Comes Around

With his bid to ease media ownership rules under assault from members of Congress and the courts, Michael K. Powell, chairman of the Federal Communications Commission, said he would create a task force to study the "localism" of radio and television stations.

Mr. Powell said that the panel would seek to answer such questions as how many hours stations already devote to local issues and "what was the nature and the quality of that local news," with a goal of increasing such coverage. Powell said that he remained skeptical of the notion that "the only way such coverage. Powell said that he remained skeptical of the notion that the only way you can serve a local community is by having a small station in a local community owned by a local owner."

The day before they were to take effect, a federal appeals court issued a surprise order to block the FCC from imposing new rules that would make it easier for the nation's largest media conglomerates to add new markets and areas of business.

Here's the first irony: Mr. Powell has emphasized that it was a string of federal court decisions that compelled the Commission to rewrite the old regulations in the first place.

Powell also said the FCC would expedite the approval of hundreds of applications for low power FM stations from churches, community groups, schools and other non-profit organizations. The Commission said it had already granted construction permits to 530 additional low-power stations, which is the first step in the licensing. It has yet to take action on the applications of more than 1,200 others.

"We have low-power FM's that have been waiting three years to hear from the FCC, without so much as a postcard," said Pete Tridish, technical director for the Prometheus Radio Project, a Philadelphia group that builds such stations and advocates on their behalf. "This is a very small step in the right direction."

Here's irony number two: Pete Tridish was co-founder of pirate station Radio Mutiny in West Philadelphia, shut down by the FCC five years ago. Subsequently he helped found Prometheus, a nonprofit group which helps set up legal low-power FM stations in "radio barn raisings" around the country. It was Prometheus that successfully petitioned a federal court and got the order to block the new FCC regulations the day before they were to go into effect. Prometheus is to present arguments in November to show that the new regulations decrease the public's ability to get on the air. The FCC bid to move the case to more sympathetic Washington courts from Philadelphia was unsuccessful.

Irony number three: Prometheus is bringing its suit in part because there are no public access radio or television stations in Philadelphia. The irony is that most urban areas do not qualify for the new low-power FM stations because of limitations imposed on the FCC by Congress after intense lobbying by the National Association of Broadcasters. The difference is that this time the NAB and community groups are on the same side; and both houses of Congress are listening.

Neighborhood Interference

Public safety agencies are still wrestling with problems caused by the explosive growth of the mobile phone industry. A common problem arises when a police officer, for example, is close to a wireless phone company transmitter but far from a tower that carries the signals for emergency radios. In that situation, the wireless phone tower overpowers the officer's radio.

Emergency departments in at least 27 states have reported unsettling stories of officers who can't call for backup, dispatchers who can't relay suspect descriptions and firefighters who can't request ambulances because of radio "dead spots" believed to be caused by wireless phone interference.

The Federal Communications Commission has vowed to find a solution, even if it has to reshuffle channels in the 800 megahertz band to separate the wireless companies from the public safety departments, so they inhabit different ends of the band. It would be a massive and controversial task, potentially costing hundreds of millions of dollars and taking years to complete, industry officials said.

FCC Chairman Michael K. Powell warned that solving the problem "may be one of the most challenging spectrum policy proceedings" to come before the agency. However, many communication experts have said that a complete reorganization of the spectrum is unnecessary, too expensive and too time-consuming.

Meanwhile, many officers have concluded "if you can't beat 'em, join 'em": They carry cell phones in case their radios go dead.

In Miami Beach, dead zones are a problem, but a bigger concern for police officers are dead batteries. Their Motorola XTS-3000 two-way radios won't hold a charge for a full 10-hour shift, so most carry a second battery with them. Motorola claims that until recently, there wasn't a battery made that could hold a 10-hour charge.

Jamming with a Cuban Twist

When the Voice of America launched a daily, 30-minute, Persian-language television news program, American officials were convinced Cuba interfered with it and with several other Iran-bound broadcasts, using an old Soviet listening post "in the vicinity of Havana."

The jamming related to Telstar-12, a commercial communications satellite orbiting at 15 degrees west, which carries programs by the American government as well as by commercial Iranian radio and television stations based in the US aimed at mainland Iran. Though the regime has banned satellite dishes, it is estimated that more than 2 million households, using small and easily concealed equipment, receive more than a dozen such programs.

At first, it was believed that the Cuban government, acting on demands from Iran's ayatollahs, was jamming the US government and private Persian-language radio and TV broadcasts into Iran. However, in late August, a spokeswoman for the US State Department said that Havana had informed them that the jamming was made by the Iranians in Cuba, using a compound in a suburb of the capital belonging to the Iranian embassy, and that they had taken steps to stop it.

Marti by Satellite

TV Marti and Radio Marti will begin satellite transmissions to Cuba in an effort to break through the government jamming that has left the $11 million-a-year station largely unable to get its pro-democracy message to its intended audience, U.S. officials announced. The satellite TV broadcasts will begin with a three-month trial period and, if deemed successful, will be extended on an annual basis for up to seven years. The signal for Radio Marti, now broadcast on shortwave and AM frequencies, will also be broadcast on satellite. TV Marti also will nearly double its airtime to eight hours, from 6 p.m. to 2 a.m. daily, to include more news programs as well as Major League baseball games -- Cuba's national sport. Its top programs will be copied on VHS tapes and given to travelers to the island for distribution to friends and relatives.

TV Marti currently relies primarily on a regular TV signal, broadcast from a balloon tethered 10,000 feet above Cudjoe Key in the Florida Keys. Those transmissions have been easily blocked by the Cuban government, and few Cubans have ever seen its programs.

With the experience of Cuba-based jamming of satellite signals to Iran (see above), it remains to be seen if Cuba will block the TV Marti signal. It will be broadcast from the Hispasat satellite, which orbits above the Atlantic and close to the Brazilian coast. It will allow Cubans with any satellite dish and receiver, such as those used by Direct TV subscribers, to obtain the free-of-charge transmissions.

Radio Drop Blocked

South Korean police thwarted a group of activists trying to launch balloons carrying transistor radios into North Korea in a bid to undermine the communist government. The group of mainly South Korean activists had gathered 48 miles northeast of the South Korean capital, to try to fly more than 20 balloons, each 18 ft tall and carrying about 30 small radios, into North Korea.
The “Give the Ear to a North Korean” campaign was aimed at overcoming North Korea’s strict ban on its people receiving outside broadcasts. North Korean radios and televisions are built so they can only tune in to government channels, which run mostly martial music or praise of reclusive leader Kim Jong-il.

The Voice of America and South Korea’s KBS air programs aimed at North Korea, but they are frequently jammed.

Steve Anderson Sentenced
Steve Anderson, a former militia member who shot a deputy sheriff’s cruiser and eluded capture for more than a year, was sentenced to 15 years in prison. Anderson operated Patriot Radio, an unlicensed short-wave station in Kentucky promoting white supremacist views (see April 2002 M/7).

Anderson was apprehended in Cherokee County, NC, in November 2002 following a tip called in to the television show “America’s Most Wanted.”

David Tapp, Anderson’s attorney, said that Anderson was remorseful. “He is sorry for the things he said on his shortwave radio program, which caused a great deal of alarm, and he is very sorry for his actions in Bell County which led to his imprisonment.”

NHP System to be Scrapped
In July we covered the story of the Nevada Highway Patrol which operated its $16 million radio communications system for three years without having obtained Federal Communications Commission approval to use the frequencies.

Col. David S. Hosmer, commander of the state highway patrol, said “We’ve used 10 consultants, our frequency vendors, NDOT, our own communications staff and three outside attorneys that specialize in the FCC, and no one has been able to provide us with a viable frequency plan that is legal.” The FCC refused to grant retroactive approval to operate on the existing 150 MHz frequencies. Therefore, to avoid nearly $1 billion in possible fines, the NHP will move its radio communications to the system now operated by the Nevada Department of Transportation.

To transition to NDOT’s 800 MHz system, the state will have to build 11 mountain-top transmitters to get statewide coverage, and buy equipment for dispatchers and patrol troopers. The highway patrol will be able to use some radios and dispatch equipment. What it can’t use, it hopes to sell at heavily discounted prices. Hosmer said.

Ghosts No Competition
Tony Cornell, a British expert who has spent years researching the occult, told the Sunday Express newspaper that reports of ghost sightings started to decline when mobile phones were introduced 15 years ago.

“Ghost sightings have remained consistent for centuries. Until three years ago we’d receive reports of two new ghosts every week,” said Cornell, of Cambridge in Eastern England. “But with the introduction of mobile phones 15 years ago, ghost sightings began to decline to the point where now we are receiving none.”

Apparent paranormal events, which some scientists put down to unusual electrical activity, could be drowned out by the electronic noise produced by phone calls and text messages.
Winter Propagation: A Welcome Relief
By Tomas Hood, NW7US

There it is: a signal in the hiss can be heard. A whisper of a signal captures your attention, and then it fades, only to tease you with its elusive presence on the shortwave radio. Only last week, this same shortwave station came in loud and clear. It seems that the vast majority of days through the summer and early fall of 2003 was filled with poor propagation on the High Frequencies (HF). Wouldn’t the signals on HF be reliably strong and readily present? Why were conditions so poor?

To better understand what’s been happening in 2003 and where we stand in the current cycle, consult the sidebar story (on page 12) on Solar Cycle 23—a story which could start out, “It was a rough and stormy night...” However, a welcome change takes place as the winter season arrives in the Northern Hemisphere. A change in propagation conditions can be observed as we move away from the long sunlit days of summer into the longer hours of winter’s darkness.

But the change in the length of daily darkness is not the only influence on the propagation of radio waves through the atmosphere. The amount and strength of radiation arriving and passing through our atmosphere varies from season to season, as well as from the solar cycle minimum to the solar cycle maximum.

During the Northern Hemisphere’s winter months, the Earth is closer to the sun than during any other time of its travel around the sun. This makes the daytime ionization more intense than that of summer days. To understand the significance of this, think of a wood stove. When you open the front door to add more fuel to the fire, and get very close to the fire, you feel intense heat. When you close the door and back away from the fire, the heat decreases.

This is much like the position of the Earth in the winter—closer to the sun than during the summer. But the “door” is only open during the short period of daylight. With the more intense ionization during winter’s daylight hours the radio waves refracted off of the ionosphere are relatively higher in frequency than those of summer. During the longer winter hours of darkness, the ionosphere has more time to lose its electrical charge. These conditions cause a wide daily variation in the maximum frequency that can be refracted by the wintertime ionosphere.

At any given time during the day, a fairly wide range of frequencies will be refracted from the ionosphere. The ionosphere is made up of ionized particles and electrons in the uppermost portion of the earth’s atmosphere that is formed by the interaction of the solar wind and solar radiation with the very thin air particles that have escaped the earth’s gravity. These ions are responsible for the reflection or bending of radio waves occurring between certain critical frequencies. The highest frequency that will still be refracted by the ionosphere is called the critical frequency, or Maximum Usable Frequency (MUF). This critical frequency varies depending on the amount of ionization at the point where it enters the ionosphere and the angle by which it arrives.

In winter months, the noticeable rise in this critical frequency brings a steady parade of DX signals through the higher shortwave bands during the day. But the winter openings are short. Summer openings last much longer, since the ionization continues as long as the daylight lasts.

When ultraviolet radiation from the sun penetrates through the outer atmosphere, it ionizes the various gases found there. Ionization causes electrons of neutral gas atoms to become detached, leaving the originally neutral gas atoms unbalanced, with an excess of positive charge. Such unbalanced atoms are referred to as positive ions. Since it takes the radiation of the sun to charge up the ionosphere, a lack of radiation that occurs during hours of darkness causes the ionized gases to lose their charge. This allows the detached electrons to recombine with the positive ions, forming balanced, neutral gas atoms. This process, the opposite of ionization, is called

Image courtesy NASA and Elbate Engineering LTD
In the summer, the long hours of sunlight keeps the ionosphere from recombining, but because the heating of the gases causes the layers to expand and thin out, the daytime critical frequency is generally lower than during the winter. But, the nighttime critical frequencies of summer are typically higher than nighttime critical frequencies during the winter. This gives us better nighttime DX in the summer, but better daytime DX in the winter over paths that propagate through sunlight regions. In addition, winter nights are far more quiet on lower shortwave bands due to the seasonal low in tropical storms, and because the lower critical frequencies won’t propagate as much of the atmospheric and man-made noises.

It is the combination of these conditions that cause many radio enthusiasts to celebrate the arrival of the winter shortwave season. The winter of 2003 and early 2004 is promising, in part because of the seasonal relief we are having from the high geomagnetic storminess we’ve had this year, and because this geomagnetic peak is slowly declining now, as we move ever closer to the solar cycle minimum. With these improvements, we also experience a relief from electrical storm and atmospheric noise of summer. This makes it much easier to DX those tropical band broadcasts, medium wave AM broadcast stations, and HF International broadcasters.

How to Read the Numbers

Take a look at the Solar Cycle Progression charts from the NOAA Space Environment Center site at http://www.sec.noaa.gov/SolarCycle/ What do all the solar index numbers mean? What is the Ap index? What’s the 10.7-cm Solar Flux? How do these numbers tell us what is going on with propagation?

The Ap index, or Planetary A index, is a twenty-four hour averaging of the Planetary K index (Kp). The Planetary K index is an averaging of worldwide readings of Earth’s geomagnetic field. High indices (Kp over 4, or Ap over 20) means that the geomagnetic field is very active and that stormy conditions exist in the geomagnetic field.

The more active the geomagnetic field, the more unstable propagation is, with possible periods of total propagation fade-out. This is especially true at higher latitudes and especially at the Polar Regions, where the geomagnetic field is weak. At these high latitudes, propagation may disappear completely long before total degradation of signals over low- and mid-latitude paths. Extremely high indices may result in aurora propagation, with strongly degraded long-distance propagation at all latitudes.

Low indices result in relatively good propagation, especially noticeable around the higher latitudes, when transpolar paths may open up.

The maximum Kp index is 9. The Ap index can exceed well over 100 during very severe storm conditions. The classification of A-indices is as follows:

- A0 - A7 = quiet
- A6 - A15 = unsettled
- A16 - A29 = active
- A30 - A49 = minor storm
- A50 - A99 = major storm
- A100 - A400 = severe storm

The 10.7-cm Solar Flux index (SFI) is a number obtained from the amount of radiation on the 10.7-cm band (2800 MHz). It is closely related to the amount of ultraviolet radiation, which is needed to create an ionosphere. Solar Flux readings are more descriptive of daily conditions than the Sunspot Number. The higher the Solar Flux, the stronger the ionosphere becomes, supporting refraction of higher frequencies.

The Sunspot Number (SSN) is a number related to the observable sunspots on the solar face. Sunspots are magnetic regions on the Sun with magnetic field strengths thou-
The current solar cycle, numbered 23, began statistically during May 1996, when the smoothed Royal Observatory of Brussels, Belgium, (RWC Belgium) Solar Influences Data analysis Center (SIDC) International Sunspot Number (ISN) was 8.0. The cycle has had two peaks; the first and strongest peak was during April 2000, with a smoothed ISN of 120.8, and the second and weaker peak was during November 2001, with a smoothed ISN of 115.5. Clearly, we are now in the decline of Solar Cycle 23. The cycle is expected to end sometime in 2007.

What is not easily seen by just looking at the monthly smoothed average sunspot numbers is what is happening with the geomagnetic field, as well as the general condition of propagation. Starting with Solar Cycle 11, scientists have seen that the Earth’s geomagnetic activity has a cycle, too. Just as the solar cycle lasts for about eleven years, so, too, does the geomagnetic activity cycle.

Interestingly, there are typically two peaks in the geomagnetic activity cycle, just as there are two in the sunspot activity cycle. However, the geomagnetic activity cycle peaks at different times than the solar cycle smoothed sunspot peaks. The first geomagnetic activity peak usually occurs slightly before the solar maximum, while the second and more intense peak occurs in the declining phase of the cycle.

The first peak in the current cycle was during September and October of 1999, with another spike and peak during August of 2000. Then, in May of 2003, we had the highest peak so far recorded during this cycle. Take a look at the ISSE Solar Cycle Planetary A index (Ap) Progression chart at http://www.sec.noaa.gov/SolarCycle/, which clearly shows the several peaks of the current cycle. What is most clear is how the geomagnetic activity (Ap index) greatly increased after the sunspot cycle peak years.

The second and more intense peak is caused by an increase of coronal holes that produce an unrestricted outward flow of solar plasma into interplanetary space. A coronal hole is a breakdown in the magnetic fields in the solar corona. When one of these coronal hole mass ejections (CME) impacts the Earth’s Magnetosphere, or when the Earth passes through one of the solar streamers with a high solar wind speed caused by a coronal hole, a disturbance in the Earth’s magnetic field results.

Coronal holes occur more often during the decline of a solar cycle because the sun starts to lose some energy and cannot continue to contain the solar plasma bubbles and complex magnetic structures. These breakdowns of the magnetic fields cause the plasma bubbles to burst, and are therefore a primary source of geomagnetic storms during the years of solar activity minimum. This increase in geomagnetic activity and storminess causes ionospheric recombination and degradation, which can wipe out most shortwave signals. At the same time, propagation on VHF and higher may and often are enhanced during these days of high geomagnetic storminess and ionospheric activity.

Stormy Weather

The summer and early fall shortwave season was very rough because of the great number, strength, and duration of geomagnetic storms. Mixed in with these periods of storminess were a fair number of moderate and strong solar flares. Solar flares can instantaneously shut down the High Frequencies, because the X-ray energy from these flares will ionize the D layer of the ionosphere, causing radio signals to be absorbed. Solar flare disturbances, called, “radio blackouts,” last anywhere from a few minutes to several hours, because they are directly caused by the X-ray radiation from a flare. When the flare subsides, the ionosphere recovers.

Flares will not directly degrade propagation on the dark side of the Earth. On the other hand, geomagnetic storms can cause severe degradation of propagation worldwide, for many days.

Geomagnetic storms do not directly disrupt HF propagation, however. Geomagnetic field disturbances during a storm cause the chemistry of the atmosphere to change, especially in the high-latitude regions. This change is a recombination of ions with the gas atoms of the ionosphere, much like the recombination that occurs at night after the influence of sunlight ends. The higher in latitude that this disturbance occurs, the more recombination that results. This is called an “ionospheric storm” or “radio storm” and is the real cause of degraded HF propagation during the day. It is possible, however, to have a geomagnetic storm without experiencing an ionospheric storm. But, you will always have a geomagnetic storm associated with an ionospheric storm.

Ionospheric storms produce many effects, all of which degrade HF propagation. During an ionospheric storm, the Maximum Usable Frequency (MUF - see text) may drop as much as fifty percent below normal. Severe storms may even cause the same behavior in the E layer. The obvious effect is the loss of signals that are too high in frequency. Rapid fading and echoes might be observed. Under extreme conditions the combination of a weaker ionosphere and increased absorption results in a radio blackout, especially on signal paths that cross through the high latitudes of the polar regions, where the concentration of charged particles is greatest.

This past summer and early fall was a period of high geomagnetic storminess and activity, along with the moderate number of solar flares. Conditions were pretty rough, even though the sunspot activity was generally good. Solar activity was high enough in fact to support great DX on most active shortwave bands, if only the signals could get through. Typically, summer propagation supports higher frequencies than winter propagation. But, with the degradation of the ionosphere and the lowering of the effective Maximum Usable Frequencies, these bands were shut down.
The number of sunspots visible on the sun waxes and wanes with an approximate 11-year cycle.

We look at the Planetary A (Ap) index to get a picture of how conditions have been and to discover a trend. The Planetary K (Kp) index, on the other hand, indicates the overall current state of the geomagnetic field. When the Ap has been rising, or has been high over several days, we expect that ionospheric propagation will be degraded. If we see the Ap falling, or remaining low for a number of days, we can expect shortwave propagation on high frequencies to be good to excellent, even possibly over the high latitude and transpolar paths. If we see a quick rise in the Kp index, we might be alert for sudden fading and loss of signals, and even possible Aurora. If the Kp index rises above 5, it is quite possible to have visual sighting of Aurora in mid- and even low-latitude locations. Recent aurora events in the last several years have been viewable as far south as Mexico. Propagation was shut down on the high frequencies during these periods, but aurora-mode propagation on VHF and above was quite active. When we see the Kp index rapidly falling, or staying low for a period of time, we expect great conditions on the high frequencies.

We look at the sunspot and ionospheric activity because these numbers have a direct correlation to the level of ionization during the period in question. Over many years of careful observation and exploration, scientists have been able to model the way the ionosphere works, and how it is influenced by the solar activity. Using software tools, even radio hobbyists may now take the sunspot and flux numbers and make an analysis of propagation over various paths through the ionosphere.

The general rule of thumb is that the higher the solar activity, as shown by higher sunspot numbers and higher solar flux numbers, the higher the frequencies that will propagate via the ionosphere. So, when we see a trend of rising flux levels over several days, we can expect openings on higher frequencies, while a dive in flux levels warns of the closing of higher frequencies.

Since the sun rotates once every approximately 27 days, we can also watch all of these numbers, and discover what might occur 27 days from now. If the sunspot activity is currently high, and the Ap is low (say, a sunspot number of 95, and an Ap index of 12), we can reasonably expect the same overall condition 27 days from today. If, on the other hand, the Ap index is 30, and the sunspots are 60, we can expect poor conditions again in 27 days. Keeping a record of daily index readings will clearly give you a way to estimate the best shortwave bands.

Shortwave Bands Quick Reference

Courtesy Larry Van Horn

SHORTWAVE BROADCAST BANDS (AM)

2300-2495 kHz 120 Meters
3200-3400 kHz 90 Meters
3900-4000 kHz 75 Meters
4750-5060 kHz 60 Meters
5850-6200 kHz 49 Meters
7100-7350 kHz 41 Meters
9400-9900 kHz 31 Meters
11600-12050 kHz 25 Meters
13570-13800 kHz 22 Meters
15100-15800 kHz 19 Meters
17480-17900 kHz 16 Meters
18900-19020 kHz 15 Meters
21450-21850 kHz 13 Meters
25600-26100 kHz 11 Meters

AMATEUR CW BANDS

1800-2000 kHz 160 Meters
3500-3750 kHz 80 Meters
7000-7150 kHz 40 Meters
10100-10150 kHz 30 Meters
14000-14150 kHz 20 Meters
18068-18110 kHz 17 Meters
21000-21200 kHz 15 Meters
24890-24930 kHz 12 Meters
28000-28300 kHz 10 Meters

AMATEUR PHONE BANDS

1800-2000 kHz 160 Meters (LSB)
3750-4000 kHz 75 Meters (LSB)
7150-7300 kHz 40 Meters (USB)
14150-14350 kHz 20 Meters (USB)
18110-18168 kHz 17 Meters (USB)
21200-21450 kHz 15 Meters (USB)
24930-24990 kHz 12 Meters (USB)
28300-29700 kHz 10 Meters (USB)
Observing the sunspot cycles can help you schedule your radio listening (Credit Stanford University archives)

days to schedule your radio listening or amateur radio activities.

Good resources on the Internet where these records are kept include:
http://www.sec.noaa.gov/ftpdir/weekly/RecentIndices.txt
http://www.sec.noaa.gov/ftpdir/weekly/Predict.txt
http://www.sec.noaa.gov/ftpdir/latest/45DF.txt
http://www.sec.noaa.gov/ftpdir/indices/DSD.txt

I have also created a comprehensive radio propagation resource center at http://prop.hfradio.org

A Look at the Winter DX Season

With short daylight days, the openings on many paths are short, though possibly strong, on the higher HF frequencies. In general, paths on 31 through 19 meters (see chart for frequency equivalents) are now in their seasonal peak, especially between North America and Europe in the morning, and between North America and Asia during the late afternoon hours. Nineteen and 22 meters are probably the best daytime DX band, opening for DX just before sunrise and remaining open from all directions throughout the day, with a peak in the afternoon. Nighttime conditions will be short and weak, and mostly north/south in orientation since the Southern Hemisphere has long daylight hours.

The best bands for around the clock DX will be 31 and 25 meters. Twenty-five meters continues to be an excellent band for medium distance (500 to 1500 miles) reception during the daylight hours, with longer distance reception (up to 2000 to 3000 miles) possible for an hour or two after local sunrise, and again during the late afternoon and early evening. Thirty-one and 41 meters provides medium distance daytime reception ranging between 400 and 1200 miles, and beyond 3000 miles during the hours of darkness until two to three hours after local sunrise.

Seventy-five through 120 meters are stable now, so you can expect great nighttime DX conditions, especially with the decrease in seasonal noise, and the longer hours. Look for Europe and Africa around sunset until the middle of the night, and then Asia, the Pacific, and the South Pacific as morning approaches.

Signals below 120 meters are also greatly improved. Tropical and regional stations are easier to hear, with stronger openings late into night and through early morning hours. Seasonal static, which makes it difficult to hear weak DX signals, is still decreasing as we move into the depth of winter.

Conditions on medium wave (MW) are generally excellent, now. Normally, most MW signals never make it past 800 to 1000 miles, first because of ground wave signal loss, and second because of the D-layer absorption. Occasionally, however, exciting but often short-lived openings of over 3000 miles occur. During the late fall, winter, and early spring months these openings increase. Shorter paths also become more stable and last longer.

Overall, Solar Cycle 23 continues to have enough activity to support daytime propagation on higher shortwave frequencies. At the same time, the winter season is more geomagnetically quiet than this last summer. This is the recipe for some exciting DX opportunities for all radio hobbyists.

Write Me

I'd like to hear from you about this article. Please write me an e-mail message or a letter. Is the information I am presenting helpful? I look forward to hearing from you. Don't forget to check out my propagation resource center on the Internet at http://prop.hfradio.org. If you have a cellphone or other handheld device capable of reading WML, I have a WAP version of this resource center at http://wap.hfradio.org. You can even sign up for my propagation eAlert service for free. These propagation eAlerts keep you informed of the various index numbers, in real-time. Happy hunting those signals!

73 de NW7US, Tomas Hood (AAMOEWA), prop-man@hfradio.org (P.O. Box 213, Brinnon, WA 98320-0213)
Your Source for Radio Scanners, Receivers, Accessories, and Publications

Established in 1979 by well-known communications expert Bob Grove, Grove Enterprises has become a world leader in radio monitoring equipment, accessories, and publications.

If you decide you don't like a product, Grove Enterprises doesn't penalize you for it. There is NO restocking fee so long as you call our toll free number for a return authorization within fifteen days of shipment and the item is returned in new condition. Once the item is received we will give you credit toward another item or issue a full refund (less shipping charges). Software cannot be returned if opened.

That's it! No hassle! No negotiations! Just call 1-800-438-8155 and our friendly staff will assist you with a return authorization number.

Grove means service and quality. You won't find better customer service anywhere.

THE Source for ALL of your receiver and accessory needs!
Hop on our website for up-to-the-minute prices and products!

www.grove-ent.com

Shipping/ Handling Charges

<table>
<thead>
<tr>
<th>Order</th>
<th>Shipping Charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1-$29.99</td>
<td>$3.00</td>
</tr>
<tr>
<td>$30-$49.99</td>
<td>$6.95</td>
</tr>
<tr>
<td>$50-$59.99</td>
<td>$8.95</td>
</tr>
<tr>
<td>$100-$399.99</td>
<td>$12.95</td>
</tr>
<tr>
<td>$400-$899.99</td>
<td>$16.95</td>
</tr>
<tr>
<td>$900-$1499.99</td>
<td>$20.95</td>
</tr>
<tr>
<td>$1500-$1999.99</td>
<td>$24.95</td>
</tr>
<tr>
<td>$2000-$2499.99</td>
<td>$28.95</td>
</tr>
<tr>
<td>$2500+</td>
<td>$32.95</td>
</tr>
</tbody>
</table>

** Call for special promotional pricing
Civilian in Peace, Soldier in War
Monitoring the Army National Guard
By Larry Van Horn, N5FPW

Rooted in the English tradition of militia service and firmly established by the U.S. Constitution, the composition and service of the Army National Guard – the Citizen Soldiers – has evolved from early beginnings. Today the Army National Guard (ARNG) is one of the seven reserve components of the United States armed forces that augments the active components in the performance of their missions.

Administered by the National Guard Bureau (a joint bureau of the departments of the Army and Air Force), the ARNG has both a federal and state mission. The dual mission, a provision of the U.S. Constitution and the U.S. Code of laws, results in each soldier holding membership in the National Guard of his/her state and in the National Guard of the United States.

History and Constitutional Basis

The Army National Guard predates the founding of the nation and a standing national military by almost 150 years. America's first permanent militia regiments, among the oldest continuing units in history, were organized by the Massachusetts Bay Colony in 1636. Since that time, the Guard has participated in every U.S. conflict from the Pequot War of 1637 to Operation Iraqi Freedom in 2003.

A subject of extensive debate and compromise during the Constitutional Convention of 1787, the National Guard finds its formal origins in provisions of the United States Constitution. This language reads, in part, "to provide trained units and qualified persons available for active duty in the armed forces, in time of war or national emergency and at such other times as the national security requires, to fill the needs of the armed forces whenever, during, and after the period needed to procure and train additional units and qualified persons to achieve the planned mobilization, more units and persons are needed than are in the regular components."

In addition to the constitutional charter, a variety of statutes have been enacted over the years to better define the Guard's role in the affairs of our nation. Detailed federal guidelines, both statutory and regulatory, govern the organization and operation of the National Guard. While federal regulations dictate much of the Guard's organization and function, control of Guard personnel and units is divided between state and national levels.

For example, the federal government determines the number of authorized National Guard personnel and the unit mix available across the country. However, the states reserve the authority to locate units and their headquarters and federal officials may not change any branch, organization, or allotment located entirely within a state without the approval of the governor. This state-federal relationship in Guard management and control continues to evolve today.

Where the colonial period saw Guard activities largely confined within the nation's borders, later 19th century conflicts found the Guard contributing to the nation's defense both at home and abroad. The first half of this century witnessed the foundation of the modern Army National Guard, as Guard soldiers contributed greatly to U.S. participation in both World Wars. The Guard's evolution continued in the years following the Second World War with participation in Korea and in several Cold War mobilizations. Finally, the Guard has found a dramatically increasing role at home and throughout the world during the 1990s.

The Army National Guard of today fulfills a national defense role. Strategic planning integrates Guard units into crucial combat, combat support, and combat service support elements of our nation's military forces. These elements provide a trained, capable, and cost-effective military force, able to provide rapid augmentation, reinforcement, and expansion in time of call-up or mobilization such as we have now during Operation Iraqi Freedom.

Federal Mission

The Guard's Federal mission is to maintain well-trained, well-equipped units available for prompt mobilization during war and provide assistance during national emergencies (such as natural disasters or civil disturbances). Guard units (or any Reserve component forces) may be activated in a number of ways as prescribed by public law. Most of the laws are found in Title 10 of the U.S. Code.
In addition to the categories listed above, Guard units may be mobilized to perform missions that include promoting democratic ideals. These are performed through programs such as Partnership for Peace; humanitarian missions such as Operation Provide Comfort (Kurdish refugees in Iraq/Turkey); counterdrug operations, and peacekeeping/peace enforcement missions such as Operation Joint Force (formerly known as Joint Endeavor and Joint Guard) in Bosnia-Herzegovina.

The National Guard Bureau (NGB), located in Crystal Springs, Virginia, is both a staff and operating agency that administers the federal functions of the Army and the Air National Guard (ANG). As a staff agency, the NGB participates with the Army and Air staffs in developing and coordinating programs that directly affect the National Guard. As an operating agency, the NGB formulates and administers the programs for training, development and maintenance of the ARNG and acts as the channel of communication between the Army, Air Force and the ANG and reports to the governor of their respective state, territory (Puerto Rico, Guam, Virgin Islands), or the Commanding General of the District of Columbia National Guard. Each of the 54 National Guard organizations is supervised by the Adjutant General of the state or territory.

Under state law, the ARNG provides protection of life, property, and preserves peace, order, and public safety. These missions are accomplished through emergency relief support during natural disasters such as floods, earthquakes and forest fires; search and rescue operations; support to civil defense.

### Table One: Army National Guard Callsigns and ALE Addresses

<table>
<thead>
<tr>
<th>Callsign</th>
<th>ALE Address</th>
<th>NGB ##</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAB1NGB</td>
<td>HQ1NGB</td>
<td>NGB01</td>
<td>Arlington, VA</td>
</tr>
<tr>
<td>AAB2NGB</td>
<td>HQ2NGB</td>
<td>NGB02</td>
<td>Andrews AFB, MD ANG Readiness Center</td>
</tr>
<tr>
<td>AAB3NGB</td>
<td>HQ3NGB</td>
<td>NGB03</td>
<td>Crystal City, VA ANG Readiness Center</td>
</tr>
<tr>
<td>AAB1AL</td>
<td>MMANGN</td>
<td>NGB10</td>
<td>Montgomery, AL</td>
</tr>
<tr>
<td>AAB1JK</td>
<td>Anchorage</td>
<td>NGB11</td>
<td>Anchorage (Fort Richardson), AK</td>
</tr>
<tr>
<td>AAB2AZ</td>
<td>Phoenix, AZ</td>
<td>NGB12</td>
<td>Phoenix, AZ</td>
</tr>
<tr>
<td>AAB5AR</td>
<td>LITNGB</td>
<td>NGB13</td>
<td>North Little Rock, AR</td>
</tr>
<tr>
<td>AAB5CA</td>
<td>MHRNGB</td>
<td>NGB14</td>
<td>Little Rock, AR WMD-CST 61 Weapons of Mass Destruction - Civil Support Team</td>
</tr>
<tr>
<td>AAB6CO</td>
<td>ECONGB</td>
<td>NGB15</td>
<td>Sacramento, CA STARC HQ California National Guard [Warner Airport]</td>
</tr>
<tr>
<td>AAB1CT</td>
<td>HARNGB</td>
<td>NGB16</td>
<td>Englewood Goldens (CO)</td>
</tr>
<tr>
<td>AAB1DE</td>
<td>WDENG9B</td>
<td>NGB17</td>
<td>Buckley AFB, CO WMD-CST 08 Weapons of Mass Destruction - Civil Support Team</td>
</tr>
<tr>
<td>AAB2DC</td>
<td>WDCNG9B</td>
<td>NGB18</td>
<td>Bethany Beach, DE 193RTI</td>
</tr>
<tr>
<td>AAB2FL</td>
<td>STANGB</td>
<td>NGB19</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>AAB2GA</td>
<td></td>
<td>NGB20</td>
<td>St. Augustine, FL</td>
</tr>
<tr>
<td>AAB5IJ</td>
<td>BOINGB</td>
<td>NGB21</td>
<td>Atlanta, GA</td>
</tr>
<tr>
<td>AAB5IL</td>
<td>SPRINGB</td>
<td>NGB22</td>
<td>Tamuning, Guam</td>
</tr>
<tr>
<td>AAB5IN</td>
<td>INDNGB</td>
<td>NGB23</td>
<td>Honolulu, HI</td>
</tr>
<tr>
<td>AAB5IS</td>
<td>GUSNGB</td>
<td>NGB24</td>
<td>Boise, ID</td>
</tr>
<tr>
<td>AAB5JA</td>
<td>JOINGB</td>
<td>NGB25</td>
<td>Springfield, IL</td>
</tr>
<tr>
<td>AAB5JN</td>
<td>LINNGB</td>
<td>NGB26</td>
<td>Indianapolis, IN</td>
</tr>
</tbody>
</table>
| AAB5KJ   | FATPNGB/FOENGB | NGB27 | Grissom AFB, IN (
| AAB5KY   | KYESAF     | NGB28  | Frankfort, KY               |
| AAB5LA   |            | NGB29  | Frankfort, KY Office Support Facility (AASF) |
| AAB5MA   | MFDRNGB    | NGB30  | New Orleans, LA           |
| AAB5MB   |             | NGB31  | Arlington, VA             |
| AAB5ME   | LITNGB     | NGB32  | Baltimore, MD             |
| AAB5MI   | LITNMB     | NGB33  | Baltimore-Washington Intl, MD |
| AAB5MN   | LITNMB     | NGB34  | Augusta, ME               |
| AAB5MO   | LINNGB     | NGB35  | Lansing, MI               |
| AAB5MS   | JMSNGB     | NGB36  | St. Paul (Holman Field), MN |
| AAB5MT   | JMSNGB     | NGB37  | Jackson, MS               |
| AAB5MS   | JMSNGB     | NGB38  | Jefferson City, MO        |
| AAB5MX   | LINNGB     | NGB39  | Helena, MT                |
| AAB5NE   | LINNGB     | NGB40  | Lincoln, NE               |
| AAB5NY   | LINNGB     | NGB41  | Carson City, NV           |
| AAB5NH   | LINNGB     | NGB42  | Concord, NH               |
| AAB5NJ   | LINNGB     | NGB43  | Trenton, NJ               |
| AAB5NM   | LINNGB     | NGB44  | Latham, NY                |
| AAB5NY   | LINNGB     | NGB45  | Albany, NY                |
| AAB5NY   | LINNGB     | NGB46  | Binghamton, NY            |
| AAB5NY   | LINNGB     | NGB47  | Buffalo, NY               |
| AAB5NY   | LINNGB     | NGB48  | Jamestown, NY             |
| AAB5NY   | LINNGB     | NGB49  | Rochester, NY             |
| AAB5NY   | LINNGB     | NGB50  | Ronkonkoma, NY & AASF     |
| AAB5NY   | LINNGB     | NGB51  | Riverhead, NY             |
| AAB5NY   | LINNGB     | NGB52  | Saranac Lake, NY          |
| AAB5NY   | LINNGB     | NGB53  | Staten Island, NY         |
| AAB5NY   | LINNGB     | NGB54  | Syracuse, NY              |
| AAB5NY   | LINNGB     | NGB55  | Troy, NY                  |
| AAB5NY   | LINNGB     | NGB56  | Valhalla, NY              |
| AAB5NY   | LINNGB     | NGB57  | Raleigh, NC               |
| AAB5NY   | LINNGB     | NGB58  | Bismarck, ND              |
| AAB5NY   | LINNGB     | NGB59  | Port Columbus, OH         |
| AAB5NY   | LINNGB     | NGB60  | Springfield, OH           |
| AAB5NY   | LINNGB     | NGB61  | Springfield, OH           |
| AAB5NY   | LINNGB     | NGB62  | Beightler Armory, OH State ANG HQ |
| AAB5NY   | LINNGB     | NGB63  | Oklahoma City, OK         |
| AAB5NY   | LINNGB     | NGB64  | Salem, OR                 |
| AAB5NY   | LINNGB     | NGB65  | Ansville, PA              |
| AAB5NY   | LINNGB     | NGB66  | San Juan (Luis Munoz Martin ANGB), PR |
| AAB5NY   | LINNGB     | NGB67  | Cranston, RI              |
| AAB5NY   | LINNGB     | NGB68  | Quanset State Airport, RI |
| AAB5NY   | LINNGB     | NGB69  | Columbus, SC              |
| AAB5NY   | LINNGB     | NGB70  | McEntire ANGB, SC         |
| AAB5NY   | LINNGB     | NGB71  | Rapid City, SD            |
| AAB5NY   | LINNGB     | NGB72  | Nashville, TN             |
| AAB5NY   | LINNGB     | NGB73  | Austin, TX                |
| AAB5NY   | LINNGB     | NGB74  | Draper, UT                |
| AAB5NY   | LINNGB     | NGB75  | Salt Lake City, UT        |
| AAB5NY   | LINNGB     | NGB76  | Camp W.G. Williams, UT    |
| AAB5NY   | LINNGB     | NGB77  | Winooski (Colchester), VT |
| AAB5NY   | LINNGB     | NGB78  | Richmond, VA              |
| AAB5NY   | LINNGB     | NGB79  | St. Croix, VI             |
| AAB5NY   | LINNGB     | NGB80  | Tacoma, WA                |
| AAB5NY   | LINNGB     | NGB81  | Charleston (Yeager Airport), WV |
| AAB5NY   | LINNGB     | NGB82  | Madison, WI               |
| AAB5NY   | LINNGB     | NGB83  | Cheyenne, WY              |

Unknown and Tentative ALE Idents

<table>
<thead>
<tr>
<th>Callsign</th>
<th>ALE Address</th>
<th>NGB ##</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRNGB</td>
<td>Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JIOGNGB</td>
<td>Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PKBNGB</td>
<td>Unknown (California?)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
fense authorities; maintenance of vital public services, and counter-drug operations.

Domestic Mission Support

In addition to Guard deployments in support of federal missions, here and overseas, the Guard plays an extensive and highly visible role in domestic missions. As part of its "dual-mission" responsibilities, the Guard routinely responds to domestic requirements within each state. As an example, local governments in 48 states requested emergency support through their state Governments 267 times in fiscal year 1999 alone. The Army National Guard provided 261,276 soldier man-days in response to these requirements in reducing suffering and meeting critical support needs in local communities.

Services provided by the Guard in support of state requirements included security, electrical power, heat, water, transportation services, food, and shelter. In addition, the Guard provided emergency engineering support to victims of numerous natural disasters, including floods, drought, ice storms, and tornadoes.

Another important Guard program in support of domestic needs involves counter-drug activities. In a program dubbed "the war on drugs," Guard soldiers provided in excess of 411,336 soldier man-days in support of local law enforcement and the Drug Enforcement Agency (DEA). Through these efforts, the Guard plays a significant supporting role in the battle to stem the flow of illegal narcotics into and across the United States.

Radio Communications

The Army National Guard makes extensive use of the HF and VHF/UHF spectrums. While our records are nowhere complete in this regard, we will present some of the information we have on these communications systems. Additional coverage on National Guard frequencies can be found in two of our Grove CD-ROM publications. The HF spectrum is covered in our new 9th edition of the Grove Shortwave Frequency Directory on CD-ROM. You can find more information on the VHF/UHF spectrum in the 1st edition of the Grove Military Frequency Directory on CD-ROM. Both products are available from Grove Enterprises.

The HF Radio Spectrum

Over the last few years the Guard has increased its presence in the HF radio spectrum. With the advent of ALE (Automatic Link Establishment), the Guard's use of the HF spectrum has become better understood. Table One presents a current list of known ALE addresses and callsigns for the Guard nationwide.

HF Radio Nets

Over the last several years we have seen the National Guard become a major player in the HF radio spectrum. We have also seen the Guard incorporate some of the newer communications technologies such as ALE. This
Newsbyte: Telstar 4 Failure

At 8:56am Eastern Time on September 19, 2003, Loral Skynet's Telstar 4 suffered a short circuit of its primary power bus, cutting off communications to and from the satellite. Loral Skynet spent the day trying to regain communication and restore service on Telstar 4 before eventually declaring the satellite a total loss. All Telstar 4 services have been relocated to other satellites.

Telstar 4, a hybrid C- and Ku-band satellite that was insured for $141 million, was launched in September 1995. It served the continental United States, Alaska, Hawaii, Canada, and Puerto Rico.

Users with capacity on Telstar 4 were the following: ABC television network, CBS television network, The Erotic Networks/New Frontier Media, Public Broadcasting Service (PBS), Georgia Public Television, The Florida Channel, South Carolina Educational Television, Montana PBS, DMX for Business, private business network users, Muslim TV Ahmadiyya, and U.S. Government training services. Check page 70 for some reassigned channels.

Telstar 4 is scheduled to be launched in 2004 to replace Telstar 4 at the orbital location of 89 degrees West longitude.

- Robert Smathers

MORE BOOM FOR YOUR BUCK!

Antenna Crossarm Boom (Design 1)

With 4-ft. or 2M (78-3/4") lengths, and designed for mast or tower, static or marine mountings, this boom fits the bill! Unique structural platform mounts four magnetic-base mount antennas OUT AND AWAY from mast or tower.

Four Foot Steel with four different antennas pictured above. Other uses include a versatile Meteorological sensor platform, surveillance cameras and supports for Photographic and studio lighting. Stacked arrays have multiple Military applications: amphibious operation voice and code communications plus RDF.

1. Four Foot Steel/Gold Zinc (small 4" pads) 9.4# $129.00
2. Four Foot Steel/Gold Zinc (large 5" pads) 9.6# $149.00
3. Four Foot Aluminum/Grey (large thin 5" pads) 4.7# $199.00
4. Two Meter Al (78-3/4") Grey (large thin 5" pads) 7.5# $349.00
5. Two Meter Al (78-3/4") Grey (large thick 5" pads) 9.8# $369.00
6. Two Meter Stainless Steel (small thick 4" pads) 20.3# $599.00

The advantage of flush pads is they can accommodate larger base amounts without blocking ground plane mounting holes. Flush bases are more desirable when two extra pounds are not critical. 12- and 24-foot designs available direct from factory. Special Stainless or Rubber coated U-bolts available at additional charge.

Shipping and handling in the USA is a flat $15.00 for the first unit and $10.00 for each additional unit. Payment may be made by check or money order to Talon Creative Inc. at the address below.

P.O. Box 1111 - Chino Valley, AZ 86323
Phone/Fax (928) 777-8839
www.antennacrossarmmount.com

U.S. Patent # 6,348,899 B1
Talon Creative Inc.
Patented Technological Inventions

SCANNER USERS • COMMUNICATIONS PROFESSIONALS

Buy Police Call 2004 and get a CD at no extra cost!

POLICE CALL

2004 EDITION

COMPLETELY REVISED THROUGH JULY, 2003

• With Fully Searchable Nationwide CD.
• 20,000 Codes and Signals.
• Trunking Talkgroup IDs.
• Includes U.S. Government, Rail & Air.
• Illustrated 10-Page Listener’s Guide.

GOT A SCANNER? GET POLICE CALL

At your scanner dealer and all Radio Shack stores. Visit our web site at www.policecall.com

More People Buy POLICE CALL Than All Other Frequency Guides (VHF/UHF) Combined.
increase in activity has also resulted in an increase number of frequencies being utilized by the Guard in the HF spectrum. Table Two is our exclusive state by state breakdown of the known HF frequencies used by the Guard. A variety of sideband based modes will be monitored on Guard HF frequencies. Be sure to check both upper and lower sideband for activity.

<table>
<thead>
<tr>
<th>State</th>
<th>Frequency Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>38.200-38.700</td>
</tr>
<tr>
<td>Arizona</td>
<td>244.300-261.600</td>
</tr>
<tr>
<td>Arkansas</td>
<td>41.500-39.150</td>
</tr>
<tr>
<td>California</td>
<td>34.100-40.950</td>
</tr>
<tr>
<td>Colorado</td>
<td>41.750-39.625</td>
</tr>
<tr>
<td>Connecticut</td>
<td>40.900-41.900</td>
</tr>
<tr>
<td>Delaware</td>
<td>46.900</td>
</tr>
<tr>
<td>Florida</td>
<td>40.050-40.100</td>
</tr>
<tr>
<td>Georgia</td>
<td>44.000-47.000</td>
</tr>
<tr>
<td>Hawaii</td>
<td>141.1500-121.650</td>
</tr>
<tr>
<td>Idaho</td>
<td>41.500-39.000</td>
</tr>
<tr>
<td>Illinois</td>
<td>32.300-47.000</td>
</tr>
<tr>
<td>Indiana</td>
<td>41.500-39.000</td>
</tr>
<tr>
<td>Iowa</td>
<td>36.100-36.700</td>
</tr>
<tr>
<td>Kansas</td>
<td>41.700-49.950</td>
</tr>
<tr>
<td>Kentucky</td>
<td>41.150-39.350</td>
</tr>
<tr>
<td>Louisiana</td>
<td>40.900-141.300</td>
</tr>
<tr>
<td>Maine</td>
<td>139.050-139.100</td>
</tr>
<tr>
<td>Maryland</td>
<td>226.600-232.600</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>38.700-46.690</td>
</tr>
<tr>
<td>Michigan</td>
<td>41.850-39.125</td>
</tr>
<tr>
<td>Minnesota</td>
<td>41.400-49.650</td>
</tr>
<tr>
<td>Missouri</td>
<td>41.850-41.000</td>
</tr>
</tbody>
</table>

**Table Three VHF/UHF National Guard Frequencies**

All frequencies in MHz. Land Mobile modes are wideband and narrowband FM, Aero frequency mode is AM. National Guard Common.

<table>
<thead>
<tr>
<th>State</th>
<th>Frequency Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationwide</td>
<td>38.400</td>
</tr>
<tr>
<td>Alabama</td>
<td>38.200-38.700</td>
</tr>
<tr>
<td>Arizona</td>
<td>244.300-261.600</td>
</tr>
<tr>
<td>Arkansas</td>
<td>41.500-39.150</td>
</tr>
<tr>
<td>California</td>
<td>34.100-40.950</td>
</tr>
<tr>
<td>Colorado</td>
<td>41.750-39.625</td>
</tr>
<tr>
<td>Connecticut</td>
<td>40.900-41.900</td>
</tr>
<tr>
<td>Delaware</td>
<td>46.900</td>
</tr>
<tr>
<td>Florida</td>
<td>40.050-40.100</td>
</tr>
<tr>
<td>Georgia</td>
<td>44.000-47.000</td>
</tr>
<tr>
<td>Hawaii</td>
<td>141.1500-121.650</td>
</tr>
<tr>
<td>Idaho</td>
<td>41.500-39.000</td>
</tr>
<tr>
<td>Illinois</td>
<td>32.300-47.000</td>
</tr>
<tr>
<td>Indiana</td>
<td>41.500-39.000</td>
</tr>
<tr>
<td>Iowa</td>
<td>36.100-36.700</td>
</tr>
<tr>
<td>Kansas</td>
<td>41.700-49.950</td>
</tr>
<tr>
<td>Kentucky</td>
<td>41.150-39.350</td>
</tr>
<tr>
<td>Louisiana</td>
<td>40.900-141.300</td>
</tr>
<tr>
<td>Maine</td>
<td>139.050-139.100</td>
</tr>
<tr>
<td>Maryland</td>
<td>226.600-232.600</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>38.700-46.690</td>
</tr>
<tr>
<td>Michigan</td>
<td>41.850-39.125</td>
</tr>
<tr>
<td>Minnesota</td>
<td>41.400-49.650</td>
</tr>
<tr>
<td>Missouri</td>
<td>41.850-41.000</td>
</tr>
</tbody>
</table>

**National High Frequency (HF) Communications Exercise (COMEX)**

The objective of this biannual exercise is for state units to communicate with the National Guard Bureau (NGB) in Arlington, Virginia, via the National Guard High Frequency Operating Net (NGHFON). This exercise allows NGB to assess the operation of their HF Email program now being integrated into their HF radio network. During these 28 hour operations all Regional Net Control Stations (RNCS) and Alternate RNCS make contact with NGB via the NGHFON. This exercise also provides command with information regarding address problems, issues within each region, and planning for any necessary corrective measures.

I want to remind our readers that additional information on National Guard HF aviation communications was published in my Milcom column in the April 2003 issue of Monitoring Times.

**VHF/UHF Spectrum**

Not only will you hear the National Guard in the HF spectrum, but they are also heavy users of the VHF and UHF (primarily the military aircraft band). Unfortunately, our list is nowhere near complete. So if you want to discover some new frequencies being used by the National Guard in your area, here are some places in the radio spectrum to start your search.

<table>
<thead>
<tr>
<th>Frequency Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.00-30.55</td>
</tr>
<tr>
<td>32.00-33.00</td>
</tr>
<tr>
<td>34.00-34.99</td>
</tr>
<tr>
<td>36.00-36.99</td>
</tr>
<tr>
<td>38.00-38.99</td>
</tr>
<tr>
<td>40.00-41.99</td>
</tr>
<tr>
<td>46.58-47.00</td>
</tr>
<tr>
<td>49.61-49.99</td>
</tr>
<tr>
<td>138.0-144.0</td>
</tr>
<tr>
<td>148.0-150.8 MHz</td>
</tr>
</tbody>
</table>

You will find a wide variety of transmission modes in used by the Guard in the spec-
trum above, so expect the unexpected.

Table Three is our list of known state VHF/UHF National Guard frequencies. A couple of caveats need to be made at this point. Not all frequencies listed there are used statewide in the respective states. Some of these frequencies can be very rewarding during times of crisis and could provide you with the inside track to the events of the day. The next time a crisis and could provide you with the inside track to the events of the day. The next time

**Source:** Universal Radio

---

**Race Scanning**

**Chapters:**
- History of race commns.
- What you can hear
- Racing terms
- Racing flags
- Choosing a scanner
- Tips and tricks
- Racing frequencies

**By Richard Haas, Jr.**

Listening to a scanner radio at the track adds a dramatic new element to the race fan's experience. This book will help you be properly equipped and informed to enjoy the race from a new perspective. Listen to, and understand exciting real-time transmissions from the driver's seat and support communications from behind the scene. Printed September 2003 with up-to-date frequencies. [Only $4.95 (+$2.00 ship)]

---

**Universal Radio**

6830 Americana Pkwy.

Reynoldsburg, OH 43068

Info: 614-666-4267

www.universal-radio.com

---

**Keep Your C-Band System Running Strong!**

**Free Buyer's Guide**

**Best Values On...**
- Receivers, including 4DTV
- Dish Movers & LNbs, all kinds
- Tuner-up Kits, Tools & Parts
- Skypac Programming
- Toll Free Technical Help

**Sources:**
- 9010 Frontier Dr.
  Ferguson Falls, MN 56637
- Fax: 218-739-4879
- web: 218-739-5231
- 800-543-3025
  www.skyvision.com

---

**November 2003**

**Monitoring Times**

21
My name is Brian, and I'm a news junkie.

It all started when I was seven years old and my mother sent me down the street to retrieve my five-year-old sister from a birthday party.

The birthday girl's father was crouched on the floor in front of an enormous radio-phonograph console that took up most of one wall of their living room.

"Do you want to hear General Ike on the shortwave?" the dad asked. "Our army landed in France today."

If you're a history buff and you guessed that "General Ike" was General Dwight Eisenhower and that the date was June 6, 1944, go to the head of the class! You're right!

"He's talking on the BBC from London, England," said my sister's friend's father. I knew London was across the ocean; and the thought of a radio wave traveling from there all the way to Detroit, USA, gave me a thrill I still experience daily.

I was surprised the man was nice enough to ask me if I wanted to listen to his radio, because he frequently yelled at me for riding my bike across his lawn.

I only vaguely remember running home with my sister, because I was so eager to find out if we could listen to London, too. That evening my father helped me make an antenna for our living room Sears Silvertone console, which had a seldom used shortwave band, by attaching a length of doorbell wire and running it under the rug so it wouldn't show.

The wire was insulated with red and white waxed fabric and reminded me of a long skinny candy cane.

It seemed such fun, even at age seven or eight, to listen to news stories on the radio coming directly from the countries I was learning about in school.

Growing Up with Shortwave

During the Cold War in the 1950s, I took money I earned at a part time grocery store job and bought my first real shortwave receiver, a Hallicrafters S-38C, whose story appeared in these pages in September 1999.

I remember how angry I became listening to Radio Moscow's portrayal of life in the United States during that time. Sometimes they devoted over half a newscast to a story about a race riot and described with infinite detail dogs snapping at rioters and authorities swinging nightsticks and spraying people with fire hoses. Ignored were the "good news" stories from the US, such as Jonas Salk's development of a vaccine for
polio and the thriving US auto industry.

But despite Cold War Radio Moscow’s programs, I continue to believe, after more than a half century of listening to reports of the world’s current events on shortwave radio, there’s no better way of knowing what’s happening on our planet.

Tuning In

With most good shortwave radios today displaying the frequency to which they are tuned and using tools such as this magazine’s monthly “Shortwave Guide,” and annual publications like Passport to World Band Radio, and the World Radio-TV Handbook, finding news programs on shortwave is easier than ever.

I’ll share with you a few of my favorite shortwave news sources that are easily heard at my listening post in eastern Michigan. But remember, what you hear and what I hear can vary because of where you live, the time of day, and the time of year. And, of course, stations often change frequencies. That’s why an aid such as the “Shortwave Guide” is so valuable.

I begin my shortwave day about 1200 UTC (7 am EST). Even though the BBC World Service has abandoned its shortwave service directed specifically to North America, its English language service to the Caribbean is heard then at usually good strength on 6,195 kHz and 15,190 kHz.

Another strong station at 1200 UTC is Radio Australia on 9,580 kHz. Besides a thorough report of world news, there is a concentration on Pacific Rim events.

An hour later, at 1300 UTC, Radio Canada International has a transmission on 9,515 kHz. This station is a major player in the shortwave news game, and opens each transmission with a comprehensive report. The program begins an hour later on weekends.

If you’re an old retired guy like me and can listen to shortwave during the day, you can hear Radio Nederland’s transmission on 15,220 kHz at 1430 UTC. A nearly 30-minute sequence of news and in-depth reports called Newsline, from the station’s studios in Hilversum, Holland, is as informative as anything on the air. The transmission is relayed over Radio Canada International’s facilities at Sackville, New Brunswick, and aimed at the West Coast of the USA; but I hear it well.

On Saturdays, a feature called Wide Angle starts at 1435 UTC. A recent Wide Angle segment that really taught me something I didn’t know discussed the Russian enclave of Kaliningrad.

In the afternoon, at 1830 UTC, RTE in Dublin, Ireland, relays a half-hour domestic program through Sackville on 13,640 kHz. Where else can you hear weather and traffic reports from the Emerald Isle as well as international news?

Later in the day, at 2000 UTC, Radio Canada’s transmission to Europe is heard well here most days. Try 15,325 kHz or 17,870 kHz.

In the evening, after about 0000 UTC, (7 pm EST) you can take your pick of several stations. Your problem may not be whether you can hear anything, but which one to choose. There’s the BBC World Service on 5,975 kHz, and Radio Canada International has a transmission to the Americas on 9,590 kHz or 13,670 kHz. Right after the news at 2300 UTC, RCI has a great newsmaker telephone-interview program called As it Happens.

Radio Nederland has a transmission at 2330 UTC on 6,165 kHz and 9,845 kHz similar to the one at 1430 UTC. At 0000 UTC, you can listen for Radio Japan on 6,145 kHz and Radio Exterior Espana from Madrid on 15,385 kHz, although this frequency will probably change in the winter. An hour later, at 0100 UTC, Radio Canada International has another transmission to the Americas. Tune to 9,755 kHz.

Don’t forget, when standard time is in effect, most shortwave programs show up an hour earlier local time wherever you live. Frequencies, programming, and times can all change with the new broadcast season. Some of the higher summertime frequencies listed here will be changed for lower ones during the winter season.

This is, of course, only a partial listing of what’s out there. I’ve chosen stations that are "armchair copy," at my location and whose news programming I’ve found to be comprehensive and thorough. You’ll probably find the same qualities in other stations easily heard where you live.

But, if you become a news junkie, beware. After nearly 60 years, I haven’t found a cure. I must confess, however, I haven’t tried very hard.

Additional Frequencies

MT frequency manager Gayle Van Horn suggests some additional frequencies for the referenced broadcasters, always bearing in mind that winter schedules had not been released at presstime.

RTE 1800-1830 5585
1830-1900 13640, 21630
RCI 0100 9755
0000-0100 9640, 15205
RN 1430 9860, 11835, 12075, 15220
Countering the Beginner's Lament

I'm always amazed at how easily people can become discouraged in the radio monitoring hobby. Here are the top three lamentations I've heard recently: "Everything's going digital or encrypted or both!" or "They've priced the ordinary person right out of the hobby!" And, finally, "You've got to have an engineering degree to do anything in this hobby nowadays."

Let's just take a look at how unfounded these excuses really are.

**The Digital Divide**

Anyone who believes technology won't change is living on another planet. We're right in the middle of a transition period between analog and digital modes of transmission on all segments of the frequency spectrum, a period which will likely take a decade to complete. But, that's not a bad place to be. Despite the wailing and gnashing of teeth we can still enjoy shortwave listening on radios costing less than $50. We can even build simple crystal radio sets which still work the same way they did 80 years ago. We can listen in on police and fire action on scanners which have more features and cost less than they did 10 years ago.

And then there's the Internet. With newer, more powerful computers, laborious research on hundreds of radio related topics is just a click away. Anyone who doesn't think they're getting their money's worth from their ISP just isn't spending enough time online. Thanks to the Net we can tune into hundreds of signals we'd never dream of hearing any other way.

While technology will surely change, it won't happen overnight. Don't let the digital future scare you into inactivity. Remember that most of the hype about digital TV and radio is coming from various industry trade groups and representatives of companies who are eager to sell a new generation of equipment to help offset the enormous losses they more than likely incurred with the collapse of the hi-tech sector. The company PR teams are always years ahead of reality.

The fact is that a very small percentage of people in this country have digital TV set top tuners and there's a good reason: prices are still too high and standards still aren't set. But, even if they were there's little point to it if you don't have a high-definition TV set which are still so expensive and the technology so poorly developed that most viewers are still left watching decades old designed analog TV sets.

The Yaesu FT1000D: More radio and price tag than beginners need.

**The Price Is Right**

It's easy to become hysterical at the prices of new amateur radio gear. Sure, a brand new Yaesu FT1000D will set you back $4,000, but what's a beginner doing with this kind of radio anyway? Start out with something cheaper, such as any of the 10 year old solid state, digital read-out, HF rigs typically priced at one-tenth the FT1000D, and which, by the way, make dandy SWL radios into the bargain! With this radio and a Grove Tunerless All-band antenna (which you can make yourself for less than $60), you can work the world.

Now check out the scanners. For $250 you can get a brand new trunk tracking, triple conversion, 500 channel memory, cloneable, text message reading scanner. What more do you want, a toaster/blender option?! Most people will spend that much at the video rental store this year on bad movies alone. But, before you plunk down the cash, ask yourself if you need a hand-held scanner or a base model. Do you do most of your listening on the go or at home? Keep in mind that handhelds have limited reception compared to base models using roof-mounted beam antennas on rotators. Then again, if you're in the city, you won't be able to use an external antenna because it will likely overload your scanner's front end.

Twenty years ago when C-band satellite TV first became available, folks spent thousands of dollars just to watch cable TV for free. Now, thanks to the DBS revolution, everything you need to watch DISH or DirecTV is free; all you pay for is the annual subscription or as little as $34/month (still cheaper than most cable-TV systems).

But, whatever happened to C-band satellite TV? It's still there. And, again thanks to the DBS revolution, those systems can be had for free. With many still-in-the-clear channels, hundreds of free-to-air MPEGII channels and many more satellites than ever before, there are great video and audio monitoring opportunities. People are waiting to give you satellite systems to play with. Tens of thousands of dishes, receivers and related gear are waiting to be carted off to your house or the landfill. Which will it be? Information on broadcast satellite transmissions, thanks again to the Web, is plentiful. You can find out what's on nearly every transponder of every satellite around the world and it's free (see chart). A better chart for MPEGII viewing...
and listening is Global Communications (see chart).

Don’t be afraid to buy refurbished electronics. Here’s a great way to get far more for your buck than you’d imagined. Check out what’s available from Big Blue. I recently needed a new computer and found a reconditioned IBM NetVista with a 1.8 GHz processor, more memory than I’ll use in a lifetime, tons of extras, Microsoft XP, a set of Infinity speakers, a second set of speakers just in case and free shipping for $500. You have to check in regularly for the latest deals as they change constantly.

I also saved hundreds of dollars on my Motorola 4DTV digital C/Ku-band satellite receiver buying a refurbished unit. These receivers are hard to find (see chart) and not always available. As you might imagine, they’re sold quickly. Unlike used equipment, refurbished gear has been thoroughly checked out by the manufacturer and everything has been brought up to spec. These products usually have a very limited warranty. The point here is that you shouldn’t have to pay full price for anything unless you want to. Do some research and save a bundle.

Educate Yourself

When was the last time you curled up in your armchair and read every line of a gripping owner’s manual? (Me neither.) The reason that most people’s VCRs are continuously flashing 12:00 is that few of us bother to read even the most basic owner’s manual. I know this is true because most home electronics products now include a one sheet “quick start” owner’s manual which attempts to get the basics of operation onto one page.

If you can just overcome your aversion to reading the manual you may be surprised at what you can learn.

Lost your owner’s manual? There are several web sites which can supply either a text or PDF format copy of your owner’s manual. Radio Shack is particularly good about that. You can find manuals for nearly everything they make, and if you’re the type that likes to experiment you’ll find the Shack has made in the last several decades (see chart).

It’s never been easier to study for your amateur radio license. Practice exams and code practice software are widely available on the web. There’s simply no excuse for not getting an amateur radio license. But, it’s the result of your radio hobby which will benefit from your study. Everything you need to know about the technical side of SWL and scanning you’ll learn about while studying for your ham ticket. What’s more, you’ll find more and more opportunities to expand your interests in radio when you’re a ham. Remember, getting your ticket doesn’t mean you know everything; it means you know enough to really start learning. Now you can spend the rest of your life in serious hands-on study of the radio arts.

Just when you think everything’s already been invented something happens to prove you’re wrong. Here’s an example. This past summer the FCC saw fit to give hams the 60 meter band. The restrictions for operating on this band are numerous (see chart) and present hams with some interesting opportunities. It’s made to order for experimenting and radio design. I foresee a company coming out with a stand-alone 60 meter transceiver. Since there are only 5 “channelized” frequencies, USB only, and limited to 50 watts PEP, a designer could have a lot of fun making such a 60 meter transceiver. Thousands of hams whose rigs can’t be configured to work 60 meters would snap them up.

On top of that, 60 meter antennas are critical. The FCC mandates that only transmitting antennas equal to the design of a half-wave dipole can be used. High gain antennas for transmitting aren’t allowed. But, it says nothing about receive antennas. Hams using a combination receive and transmit antennas a la 160 meters will clearly have the upper hand in pursuing Worked All States or DX on the one DX frequency available.

There are dozens of similar opportunities in the radio hobby for you to learn more and exploit what you know. Look at all the add-on devices which are the result of people studying the issues and applying what they know: Digital Signal Processing on receivers; all the new digital modes of transmitting, including packet, APRS, etc.; audio processing on microphones used in transmitting for higher fidelity on the ham bands and DX pile-up breakthroughs; software for modeling antenna design; and amateur radio over Internet are just a few examples of some of the hot things happening on the bands right now.

None of these things require a degree in electrical engineering. What they do require is for you to spend more time studying and digging a little deeper into everything you already know something about. It also requires getting out your tools and doing some hands-on experimenting.

Don’t forget that the history of science is peppered with the work of dedicated amateurs, and that goes for today as well. Many comets and other celestial discoveries are made by amateur astronomers toiling in their backyards, using their own funds, studying on their own and at their own pace. Professional astronomers rely on them. Some aspects of today’s hot technology; micro-satellites, packet e-mail, and other digital discoveries have their roots in amateur radio. So, go ahead, crack the books, venture out of your familiar surroundings. You’ll amaze yourself!
Q. We have just installed mercury-vapor lighting at our clubhouse for better visibility, but the bug attraction is awful. What lighting would be better to reduce the flying insect pests? (Mark Burns, Terre Haute, IN)

A. Yellow is the least attractive wavelength for bugs; fortunately, it is also the most brilliant part of the visual spectrum to humans, so that choice is win-win! The lower wattages, of course, will work best, and are inexpensive. Such incandescent bulbs are available everywhere. For greater visibility, yellow sodium lights should work, but they may have more bug attraction due to their overall higher light output.

Stay away from mercury-vapor bulbs – they are the most attractive to bugs since they generate a great deal of ultraviolet light.

For disposal, there are insect vacuum systems that work better than bug zappers, and you can also try burning citronella candles and applying bug sprays as well if it is still an annoyance, but the choice of yellow incandescent bulbs is still your best bet.

Q. Most of my mobile scanner listening is in the 856-861 MHz trunking band. I've tried several 1/2 wave whips that I've cut to about 6-1/2" inches. My reception is poor, even within the city limits. What could be the problem? (Steve Palmer, email)

A. The proper length of a simple mobile whip on a car roof is 1/4 wavelength, not 1/2 wavelength; this might be one of your problems since a 1/2 wave antenna under these conditions is likely to be a very poor impedance match. If I were you, I'd suggest trying to find a gain-type cellular mobile antenna (the kind with the squiggly coil); these work well throughout the 800-900 MHz range, and because it's extra long, it works well for your occasional listening on lower bands as well.

The proper place for a mobile antenna is in the center of the roof, although at these UHF wavelengths it will work just fine a foot or so from an edge if you can't put it in the center.

Just to be sure the antenna is the problem and not the scanner, substitute another scanner to see if you have the same problem before you switch antennas.

Q. Since a cell phone is essentially a transceiver, does every cell phone really transmit and receive with the same efficiency as every other? (Truman Harris, email)

A. There are just a few a leading chip makers, so cell phones are peas in a pod with a few variances such as accessory ports (data, antenna, etc.) and functions. Choose one based upon cost, functional requirements, and ease of operation. A pull-out whip adds a minor improvement in reliable range versus an internal antenna.

Q. Do I have to install a grounded pipe to get an electrical ground for my radio? (Numerous inquiries)

A. No. Generally speaking, signals are not made stronger by a ground. In the case of scanners, they definitely are not, and in the case of shortwave receivers and even medium-wave AM radios, the only effects of a good earth ground are reduction of the likelihood of electrical shock when touching grounded objects and the radio, and reduction of background electrical interference in some cases.

There are some alternatives if you want the electrical ground, including a cold-water pipe if you have metal plumbing, and the third (ground) wire of an electrical outlet (the round pin and the mounting screw).

Reader John Norberg, a retired telephone-company veteran, suggests another possibility. He says that in a properly-installed phone system, the yellow wire is a ground wire. But it’s best to test it first before relying on it.

Using a conventional multimeter, first make sure there is no AC or DC voltage measured between the yellow wire and a known ground. If there is not, then test for resistance (which should be only a few ohms at most) between the yellow wire and the known ground. If both tests pass, you have a ground.

Q. Does the disruption of the northern lights and radio communications by solar activity also affect the accuracy of magnetic compasses? (Mark Burns, Terre Haute, IN)

A. Yes, indeed – a solar eruption with the equivalent energy of 40 billion atomic bombs can have quite an effect! Immense plasma clouds of protons and electrons are blasted outwards as a “solar wind,” traveling at some 1000 miles per second. Five days later the electrically charged field strikes earth’s upper atmosphere, the magnetosphere; the earth’s magnetic field repels most of it, but some lingers to produce the spectacular aurora borealis in the northern hemisphere and the aurora australis in the southern latitudes.

High altitude power surges on the order of 1 trillion watts at 100,000 volts can produce quite a jolt, inducing lower-level currents into telephone and electrical power lines and pipelines, affecting earth satellites, disorienting birds’ navigational systems, and deflecting compass bearings.

Q. As more and more communications on shortwave are being digitized and sent as text, does that mean that eventually we aren’t going to be able to monitor any messages? (Martin Franko, Yorkton, Saskatchewan)

A. Just as a voice message may be sent in plain analog for anyone’s reception, or scrambled for privacy, there is a difference between digitizing and encrypting (scrambling) text messages. So long as the voice or digital message is not encrypted there will be demodulators and software programs available to read them. This has been true for decades since Morse code, amplitude modulation and the earliest teletype machines.

Q. Is there a book club that specializes in the shortwave industry? (Terryne Ondola, Norwood, OH)

A. There are publishers who specialize in books about the radio industry, books about shortwave listening, radio retailers who sell books about shortwave radio, and shortwave listening clubs that have their own publications occasionally including books, but there are no book clubs that specialize in the shortwave radio industry.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bobgrove@monitoringtimes.com. (Please include your name and address.) The current Ask Bob is now online at our website: http://www.monitoringtimes.com

26 Monitoring Times November 2003
Last month, I listed several “must have” items from the office supply house. To thoroughly enjoy the radio hobby, you need to have information at your finger tips. I find the only way to accomplish this is to be organized with the necessary lists and reference materials.

If you followed last month’s bright ideas, you went to the office supply store and stocked up. The use for most of these items is obvious, but I thought I would remind you of the best ideas. I use the plastic sheet protectors for lists of what frequencies are in which bank of which radio. I also have lists of police number codes, and penal code numbers used by the various agencies. I tear out or make photocopies of interesting maps and other information, such as the city maps in the front of the phone directory. From the local fire department website, I printed out the map of station locations and copied the apparatus at each station.

I have made a cheat-sheet on how to operate every radio, so I don’t always need to pull out the Owner’s Manual. (Remember I have about 50 different radios.) All these references in sheet protectors are inserted into three-ring binders.

I also custom cut a plastic sheet protector to be used as the cover protector for all soft cover books, such as Police Call. In a pinch, these plastic sheets also serve as emergency beverage coasters or meal tablemats to protect the desktop/tabletop. (My rule about no food or beverage in the radio room was overruled long ago.) I replace the sheet protectors every year as they tend to get dirty and stained. Hey, they’re cheap, keep ’em looking new.

The Post-It flags are used as book marks in my reference materials to find things quickly. I also use the colored highlight pens for important instructions such as how to program the radios. I also mark on the edge of the page for special groups of pages.

The new 2004 Police Call frequency books should be out by the time you read this. I need both the Volume 9 (CA, OR, and WA) plus the combined Volume 5 and 8 for the western mountain region. I end up with two identical CD-ROMS. The second CD will make great Christmas gift for a friend, especially with a customized dust cover. (Keep reading.)

Anyone with a mailbox has probably received CDs for beginning service with an internet provider. I used to throw these away, but now I just discard the CD. The plastic dust covers are great for protecting CDs that don’t arrive in their own protective shell. I remove the paper advertising insert to get an empty, generic CD holder. I can protect any CD that came without a case (i.e., the Police Call Frequency Database) or use it to mail or transport the disk to another party. If you have trouble removing the original mailing label, use a "goo" remover.

I even made my own custom cover inserts. It is easy. In your word processor, set your document for landscape rather than portrait orientation. Use pictures, large graphics, or colorful fonts, whatever you wish. Print it out, and compare it to the plastic CD holder. From a standard 8x11 inch sheet, you need to cut about 1/4 inch off the width, and about 1/2 inch off the bottom or top, depending on your design.

Hint: if you really get interested in this project, ask your friends and neighbors to contribute. These CD cases propagate quickly if you have information at your finger tips.

Ah, it’s time for you to make up your Christmas wish list. You know the routine: Tear out the pages with the items you need, and leaving them laying around the house. A yellow highlighter will prioritize the list.

Coffee mugs. No radio shack is complete without a couple of these. I use one for the pens and markers, another for the rubber duck antennas. Really cool ones are available from Sovietski Collections at http://www.sovietski.com. A matched set of CIA and KGB mugs are only $16.90 plus S&H. Ask for #200491 -Set, or call 1-800-442-0002 and ask for their “best price.”

I often visit truck stops along the interstate. Recently, I found two useful items. First was a mini power supply by “Road Pro.” This gel cell can be recharged from AC or DC plugs (furnished). The battery is encased in a very nice custom cloth bag, and comes with a fused, 12 volt female cigarette lighter plug for whatever you need to power.

I also bought a “T” cigarette lighter receptacle which has two female outlets. The key feature? It also has a voltage readout. The display is a little hard to read in the daylight, but excellent under low light conditions. Warning: it does draw a continuous load, so don’t leave it plugged in for long periods of use; it will drain your battery.

The Ultimate Christmas Gift might be that new scanner or ham transceiver, but consider a frequency counter, specially the Opto Scout™. It has four memory banks that will log up to 400 different frequencies and record the number of hits on each one. Hooked to a rooftop or gain antenna, this will really suck ‘em in. I love to drive through a new city area and see what I can catch. I also use the available filters to eliminate unwanted signals such as FM radio stations and powerful paging transmitters.

I do not recommend any other frequency counters as they only record one frequency at a time. The 400 memories makes the Scout the best counter available for the intended use of snagging new radio signals. Look them up at http://www.optoelectronics.com/ or 1-800-327-5912. About $349, but worth every penny.

Next month we will feature more bright ideas that make good holiday gifts. Whether it is from this column, or a large ad from a magazine, you can tear the page out, highlight the item you want and leave it laying around. Hopefully, Santa will spot it, and you will be rewarded on December 25th.
The NFL Football Report

Our unofficial Field Correspondent, Chris Parris, continues to supply us with a wealth of information from his travels around the country. Thanks, Chris, for always finding time to send in these frequency updates.

**Kansas City**

"Robert, I can confirm activity...at the San Diego / Kansas City NFL game...[CBS Sports] Game Day frequency coordination at NFL games is on 467.8375." Chris reports this frequency is used nationwide at CBS-covered NFL games.

Other frequencies used for CBS-television games include:

- 450.0125 Data 1
- 450.9000 Data 2
- 450.9125 Data 3
- 450.9875 Data 4
- 455.9000 Data 5
- 451.8000 Data 6
- 451.8125 Data 7
- 456.8000 Data 8
- 464.5000 Talk 1
- 464.5500 Talk 2
- 465.5250 Talk 3
- 467.5750 Talk 4

According to Chris, "The data frequencies are used for remote control of the RF hand-held cameras. The talk channels are used for the comms to the RF camera. Also, I can pass along 464.775 as the game security operations repeater frequency. The talk channels are used for the RF hand-held cameras. The Simplex channels are used for remote control of the RF hand-held cameras."

**Philadelphia**

And even some more: "Hey, Robert...Time for Chris’ weekly report from the CBS NFL tour. This past weekend we were in Philadelphia. They have a new stadium, so operating frequencies were unknown. I started searching and found..."

- 451.8000 Security repeater - During the game it was Command Post, very busy
- 460.4250 Repeater, unknown location but seemed to be close to stadium
- 461.0750 Repeater, stadium operations of some sort, mostly in Spanish
- 461.4875 Repeater, Coach-to-Quarterback comms - scrambled
- 461.9875 Repeater, Coach-to-Quarterback comms - scrambled
- 463.8000 Repeater, stadium game operations.
- 464.7625 Simplex at stadium.

"Some of these frequencies were found to be licensed to Eagles Stadium Operator LLC."

**Miami**

Jan Fine, moderator of the SEFLORIDA Yahoo! Group, sends these along for Miami Dolphins games at Pro Player Stadium:

**Identified Channels in use at stadium:**

- 151.6250 Goodyear Blimp air/ground
- 161.7300 WIOD-Miami
- 450.4875 ESPN
- 450.8750 ESPN
- 453.1500 Miami-Dade Fire Rescue units working stadium detail
- 461.1375 Stadium CP
- 461.2000 Stadium Security F2
- 461.4375 Stadium CP
- 462.5500 Referee Coordination
- 462.6000 Referee Coordination
- 462.8375 Coaches Suite
- 462.8625 Concessions
- 463.2000 Stadium Security F1
- 464.0000 Referee Coordination
- 464.0625 Facilities
- 464.3250 Possible concessions use
- 464.5000 Concessions
- 464.5250 Concessions
- 467.0125 Coaches Suite
- 467.0375 Coaches Suite
- 467.1125 Parking
- 468.1125 Coaches Suite
- 468.3125 Coaches Suite
- 469.0750 Maintenance
- 469.1750 Parking
- 469.3750 Catering F1
- 469.5250 Catering F2

**Unidentified Channels in use at stadium:**

- 151.2350 152.8500
- 154.6000 461.0375
- 461.3125 461.3250
- 461.3625 461.4625
- 461.7125 462.0125
- 462.1250 462.5625
- 462.6125 462.8125
- 463.2500 463.5875
- 463.6250 463.9625
- 464.0375 464.3875
- 464.4250 464.6125
- 464.9000 464.9375

**Special Event Update: Arena and Concert Events**

And for something different...an anonymous reader found these at September’s Latin Grammy Awards at American Airlines Arena in Miami, Florida. Although the individual frequencies are not identified, our contributor reports that radios were used for media coordination, VIP transportation, and facility operations. Miami Police provided traffic control and security using their trunked radio system.

- 72.025 Assisted Listening System
- 184.2700 / 206.0250 RF intercom
- 185.7750 / 206.7750 RF intercom
- 204.0050 / 207.7750 RF intercom
- 205.2000 / 208.2000 RF intercom
- 420.0000 - 450.0000 RF cameras (various channels)
- 452.1375 - 465.8625 Local site radios (various channels)
- 465.0000 - 480.0000 RF cameras (various channels)
- 656.0250 / 207.4000 RF intercom
- 656.7500 / 207.4000 RF intercom
- 657.8500 / 207.4000 RF intercom
- 661.2500 / 207.4000 RF intercom
- 788.5000
- 790.8750
- 793.0000
- 2.4 GHz Lighting Control System

As seen in these lists, business-band channels are extremely active during special events. Don’t forget to search the business frequencies when monitoring an event... there’s much more “behind the scenes” communications to be heard other than local police and fire agencies.

**Scanning Equipment Update: Icom PCR-1000**

Regarding MT’s recent review of the...
Icom PCR-1000 receiver, Chris Parris sends in this usability report and request:

"I have one and have been very happy with the sensitivity and quality of the unit, but the Icom software was awful. It would only scan 50 channels at a time and was very s-l-o-w. At last, the fine folks at DataFile, who write the PROBE software package for the Opto receivers, have come out with a version of PROBE that speaks Icom. I ordered it this past week and just installed it today, and it's outstanding! The operation is almost identical to the PROBE for Opto radios and I'm scanning at 45 channels per second! The existing PROBE files I have are all compatible with the PROBE1K program, so importing stuff has been a snap. It's certainly made the PCR box much more useful as a scanner to me!" (See MT's review of PROBE 1K in the September Computers & Radio column.)

Chris also added the following request: "I'm going to ask DataFile if they plan on coming up with anything that will speak Uniden next!" Keep us posted on DataFile's response, and...if the DataFile team is reading this column...please consider Chris to be a Beta Tester for all new products!

**Homeland Security Update: Patient Tracking Systems**

Emergency planning for mass casualty incidents has been the subject of many government and private forums. A component topic within the realm of emergency planning is "patient tracking," the ability to identify and locate victims of incidents using high-technology devices.

As envisioned by planners, first-response personnel should have the ability to immediately "tag" all victims and prioritize ("triage") their medical condition. While paper tags, color-coded ribbons, hospital-style ID bracelets and other methods have been used for many years, current planning discussions include the adaptation of barcode IDs, portable transponders or RFID tags to not only identify victims and categorize their condition, but also track them as they move around the incident scene or are transported to local hospitals.

An ideal scenario is one in which a first responder can rapidly deploy a small, lightweight tag on each victim encountered at a catastrophic scene. Once the patient is evaluated and perhaps stabilized, a PDA or similar device is used to record the tag's electronic address and present a brief electronic form so that vital signs and symptoms can be documented.

Each time the patient is treated or moved, the tag is scanned or otherwise recorded and the patient's record is updated. The individual PDA units, carried by each healthcare worker on-site, are subsequently uploaded to a main computer system where all entries concerning a patient are consolidated and stored. If an RFID tag system is used in coordination with a local (on-scene) wireless network, patient IDs can be remotely logged.

The addition of GPS or RDF equipment can add geographic information and tracking to the remote ID screen, and wireless physiological sensors can even add a patient's vital signs to the data stream.

With such a program in place, emergency medical personnel can monitor all incident victims within an entire scene, whether through handheld terminals or a van-mounted remote display. Triage information, current vitals, on-site location and disposition (patient released at scene or transported elsewhere) can all be viewed in real-time and permanently recorded. If a patient's medical condition deteriorates, an immediate response can be sent no matter how many other victims are located nearby.

![Credit: Ideo RFID](image)

This highly informative data stream, essential to wireless technologies, is also the main point of concern from privacy advocates and "watchdog" groups. There is no question as to the need for a more efficient on-scene medical evaluation system; these groups just worry about how secure such data will be from prying eyes and nearby computers. Specifically, the ability to identify an individual patient and tap into the patient's "syndromic surveillance" data stream is something that must be blocked from unauthorized people.

In light of the extremely popular WiFi system and its well-publicized security issues, some type of encryption will surely be required.

In next month's column, we'll look at voice and data radio equipment that's been tested so far and discuss the portions of a mass casualty incident that may be monitored by radio hobbyists.

**Wireless Data Update: The Connected Courtroom**

Pretend it's 2004 or 2005 and you're in a legal proceeding. Perhaps it's a personal injury or product liability case, or maybe some other civil or criminal matter. You're "lucky" enough to have the case heard in a brand new courtroom...beautiful in its architectural design but also functional in its technology...because hidden behind the ornate desks and wall coverings is a spiderweb of wires, antennas, infrared transceivers, Bluetooth hubs, WiFi "hotspots" and universal battery chargers/AC adapters for computers and other devices.

An attorney stroll's in with a small folder of papers instead of huge file baskets and boxes. A courtroom worker is handed a memory card, then the attorney proceeds to "beam" something from a PDA.

In addition to workspaces and seating areas provided for the Judge, Clerk, Bailiff, Witnesses, Jury, Attorneys and spectators, there is another desk and console installed...for the Litigation Communications Specialist. Welcome to the connected courtroom, where wired and wireless technologies merge into a digital suite of voice and data communications.

Armed with only a PDA and small notebook computer, attorneys will soon be able to conduct trials with a minimum amount of paper files. New courtrooms are being designed with technology in mind, and old courtrooms are being refurbished in those jurisdictions that have embraced such technological advances.

With WiFi, Bluetooth, Infrared and proprietary RF systems in place, combined with flat-panel monitors and projection systems, a courtroom can support all types of document, video, and physical evidence presentations. Digital audio and video recordings of the trial will occur, and juries may be able to replay key testimony and evidence files during their deliberations.

For an attorney or expert witness, a memory card containing documents, photos, videos, and other materials may be all that is needed to illustrate a point or assist in testimony. The Litigation Communications Specialist, sitting behind a console of audio, video, and data connectivity controls, acts like a television director by calling up the required documents and photos at the proper time, and remotely connecting the various input and output devices needed for trial presentation.

For a glimpse of this emerging technology, check out [http://www.courtroomconnect.com](http://www.courtroomconnect.com) to see how one company is wiring courtrooms for secure Internet access. It may take a decade or more to wire all courtrooms, but we're "witnessing" the start right now.

**SPEAKER LEVEL MIXER**

<table>
<thead>
<tr>
<th>Model: BX2</th>
<th>5&quot; x 4&quot; x 1.5&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four speaker level outputs, transformer coupled</td>
<td>7 watts audio output</td>
</tr>
<tr>
<td>Convenient front mute switches</td>
<td></td>
</tr>
<tr>
<td>Order toll free (888) 280-8287</td>
<td></td>
</tr>
<tr>
<td>$139 plus $5 shipping</td>
<td></td>
</tr>
</tbody>
</table>

B&D Enterprises
PO. Box 28362, San Jose, CA 95159
[www.bdenterprises.com](http://www.bdenterprises.com)

November 2003

**MONITORING TIMES**
September 11 is a date that marks a historic milestone in the development of Canada’s emergency preparedness. On this day, while the ravages of war were tearing the world apart, our country took a major step forward in putting together the pieces of a giant communications puzzle that is still being assembled today. I am not referring to the events of September 11, 2001, in New York City and Washington DC. I am referring to an event that took place on September 11, 1944, in Ottawa, Canada.

While the second world war was raging in Europe, Canada’s Minister of Industry, C.D. Howe, was presented with a proposal to create a body that would act as an advisor to the federal government in matters concerning radio technology. The sponsors of the idea proposed that the war-driven development of radio technology in Canada would result in the country having a significant influence in the fields of broadcasting and the design and production of radio equipment after the war.

On September 11 of that year, with the blessing of minister Howe, a meeting of several interested parties was convened. As a result of that meeting an “association of associations” called the “Canadian Radio Technical Planning Board” was born. Government was not allowed to be directly represented on the board, but would instead accept advice from the board in matters related to radio technology.

The eight founding members of the board included the Canadian section of the ARRL (American Radio Relay League) as well the railways, manufacturers and broadcasters. Within a year the Canadian Army, Royal Canadian Navy and the Royal Canadian Air Force were also participating in the board’s activities. As the war ended, Canada had a body in place that would develop into what is now known as the Radio Advisory Board of Canada (RABC).

Today, RABC has a broad-based membership (including Radio Amateurs of Canada) and has many functions, including broadcasting issues and frequency allocations. It is also a key player in the formulation of public safety issues through the participation of the military, police and members such as APCO Canada (Association of Public Safety Communications Officials). RABC is also a stakeholder in the Canadian Public Safety Radiocommunications Project, whose mandate is to resolve communications interoperability issues between public service agencies in Canada. That mandate also includes coordination with the United States.

On that other September 11 the world will never forget, Canada and the United States were pulled together in an act of cooperation that involved multiple public service agencies on both sides of the border. In an amazingly well-coordinated act of unplanned international cooperation, the skies over the entire continent of North America were cleared of civilian air traffic within a couple of hours of the first attack on New York. Inbound planes to the United States were diverted to airports in Canada, and in the aftermath of the attack, Canadian firefighters joined their American colleagues in memorials to those who lost their lives in the attack.

The big blackout affecting 50 million people in the USA and Canada in August this year was another call to action.

Emergency services stand by for action.

Close Cooperation

While Canada and the United States live as friendly, but separate neighbors, we are often called upon to cooperate in the handling of emergency events and in preparation for future emergencies. With this mind, the Government of Canada sponsored a National Public Safety Conference in Ottawa in March last year to come up with a set of solutions. Following the conference, an RABC paper was published calling for cooperation between Canada and the United States to create common radio channels to aid in coordinating multiple public service agencies in both countries. I am very grateful to MT reader Jerry None for bringing this publication to Scanning Canada’s attention.

The paper discusses channel allocations and the need for radio equipment that integrates access to specific frequencies for interoperability during emergencies.

Five VHF high band frequencies were suggested: 151.1375/154.4525 155.7525 158.7375 159.4725
In addition, the following frequency pairs from the VHF marine band were selected:
Four channel pairs in the UHF-Low band were designated:
453.2125/458.2125 453.4625/458.4625 453.7125/458.7125 453.8625/458.8625
The following frequencies are identified for inter-agency law enforcement:
Mobile Transmit (VHF) 167.0875 (Simplex) 167.2250 167.5000 168.1125 168.4625
Mobile Receive (VHF) 167.0875 167.2500 167.7500 168.1125 168.4625
Mobile Transmit (UHF) 414.0375 (Simplex) 418.9875 419.1875 (Simplex) 419.3375 (Simplex) 419.4375 (Simplex)
Mobile Receive (UHF) 414.0375 409.9875 410.1875 410.6125 410.6125
It is interesting to note that these are analog FM channels. Don’t throw those old scanners out yet!

Another set of frequencies is reserved for incident response:
Mobile Transmit (VHF) 164.7125 165.2500 165.9625 166.5750 167.3250 169.5375 170.0125 (Simplex) 170.4125
Mobile Receive (VHF) 164.7125 165.2500 165.9625 166.5750 167.3250 169.5375 170.0125 (Simplex)
Mobile Transmit (UHF) 419.2375 419.4375 419.6375 419.8375 413.1875 (Simplex) 413.2125 (Simplex)
Mobile Receive (UHF) 419.2375 419.4375 419.6375 419.8375 413.1875 (Simplex)
Note that these frequencies are recommendations for discussion purposes. Interference to existing bandplan users may arise, so a migration strategy is also discussed. Don’t expect inter-agency traffic on these frequencies right away, but they do hold out hope for scanner owners to participate in, or at least monitor, inter-agency and cross-border emergency management — despite the intrusion of new digital technology.

Calgary Completes Move to Digital

ScannCan thanks another reader for a contribution sent in to the column. Brian Jagger, VE6TAJ of Calgary, Alberta, wrote that his city’s police have been using digital radios for some time. However, he notes that EMS and Fire Services have only just recently made the move. Brian reports that his BC995XLT can no longer find the control channel and only 13 out of a previous 29 frequencies are still in use. A thank you card has gone out in the mail to Brian for his contribution.

Scanning Canada
John David Corby, VA3KOT
johncorby@monitoringtimes.com
Bearcat® 895XLT Trunk Tracker

Manufacturer suggested list price $499.95
Less -$320 Instant Rebate / Special $179.95

The BC895XLT comes with AC power cord for temporary operation from your vehicle's cigarette lighter (Continuous Tone Control Squelch System) allows channel activity from the scanner onto a tape recorder. CTCSS trunking activity for an entire trunking system. Other features include:

- Frequency Coverage: 29.000-54.000 MHz.
- 108.000-174.000 MHz.
- 216.000-512.000 MHz.
- 300 Channels
- 10 banks
- Built-in CTCSS
- S Meter

Less -$320 Instant Rebate / Special $179.95

When you buy your Bearcat 785D state-of-the-art Digital Capable TrunkTracker III package deal from Communications Electonics, you get more. The GV means "Great Value." With your BC785D scanner purchase, you also get a free digital scanner headphone designed for home or race track use. The Bearcat 785D has 1,000 channels and the widest frequency coverage of any DCS cordless scanner when you order the optional BC25D, APDC Project 25 Digital Card for $299.95, when installed, you can monitor Public Safety Organizations who currently use cordless digital radios. Trunk 3.149, 99 and standard mode APCO Project 25 systems. APDC project 25 is a modulation process where voice communications are converted into digital communications similar to digital mobile phones. You can also monitor Motorola, EDACS, EDACS CAT, and EF Johnson systems. Many more features such as S.A.M.E. weather alert, full-frequency display, and backlit controls, built in TCXO/CDCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control with RS232 port, Back Light - An LCD light remains on for 15 seconds when the back light key is pressed. Autolight - Automatically turns the backlight on when your scanner stops on a transmission. Battery Save - In a standard mode, the BC895XLT automatically reduces its power requirements to extend the battery's charge. Alarm bou - Designed for high sensitivity, eliminates false alarms. Preprogrammed Service, Emergency, and commercial squelch. The BC245XLT comes with AC adapter, one rechargeable battery save feature with battery low legend. Separately controls for volume and squelch, arrow four four channel controls. Separate controls for volume and squelch, arrow four.

Bearcat® 245XLT Trunk Tracker II

Mfg. suggested list price $429.95 CEI price $189.95

300 Channels
- 10 banks
- Trunk Scan and Scan Lists
- Trunk Lockout
- Trunk Delay
- Eliminates false alarms. Preprogrammed Service, Emergency, and commercial squelch. The BC245XLT comes with AC adapter, one rechargeable battery save feature with battery low legend. Separately controls for volume and squelch, arrow four four channel controls. Separate controls for volume and squelch, arrow four.

Frequency Coverage:
29.000-174.000 MHz. 406.512 MHz. 823.895 MHz. 809.125 MHz. 868.995 MHz. 940.125 MHz. 956.000 MHz.

Our Bearcat TrunkTracker BC245XLT is the world's first scanner designed to track Motorola Type I, II, III, Hybrid, Standard and Advanced, APCO Project 25 digital trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if you were listening to the vehicles in real time.熊 Offer's many new benefits such as Multi-Track - Track more than one trunking system at a time and scan conventional and trunked systems at the same time. 300 Channels - Program one frequency into each channel. 12 Bands, 10 Banks - Includes 12 bands, with aircraft and 800 MHz. 10 bands with 30 channels. 50 Channels - For the truly serious operator, you can even set the BC245XLT to generate the second version of all the frequencies programmed in your scanner are retained in memory. Manual Channel Access - Go directly to any channel in your scanner. LCG Back Light - An LCD light remains on for 15 seconds when the back light key is pressed. Autolight - Automatically turns the backlight on when your scanner stops on a transmission. Battery Save - In a standard mode, the BC895XLT automatically reduces its power requirements to extend the battery's charge. Alarm bou - Designed for high sensitivity, eliminates false alarms. Preprogrammed Service, Emergency, and commercial squelch. The BC245XLT comes with AC adapter, one rechargeable battery save feature with battery low legend. Separately controls for volume and squelch, arrow four four channel controls. Separate controls for volume and squelch, arrow four.

More Radio Products

Save even more on radio scanners when purchased directly from CEI. CEI's price for your recent sale is listed below. Bearcat® 245XLT Trunk Tracker II Base Model $399.95
Bearcat® 245XLT Trunk Tracker II Special $299.95
Bearcat® 245XLT Trunk Tracker II Deluxe $299.95
Bearcat® 245XLT Trunk Tracker II Deluxe with RS232 port $299.95

For credit card orders call 1-800-USA-SCAN
e-mail: cei@usascan.com
website: www.usascan.com

Long Distance Operational Control

As October comes to an end, so does the Concorde, doomed by a variety of business factors. Air France stopped flights of this supersonic airliner in May, and British Airways is about to follow suit.

One place listeners used to hear the Concorde was on the British Airways LDOC radio system. LDOC stands for Long Distance Operational Control. The defined purpose of this international aero mobile service is "to provide communications between aeronautical enroute stations and aircraft stations anywhere in the world for control of the regularity and efficiency of flight and safety of aircraft."

LDOC can be extremely interesting listening, with phone patches to company dispatchers or medical services. On international oceanic flights beyond the range of very-high-frequency (VHF) aeronautical radios, high-frequency (HF) takes over. To keep down the chatter, HF ground stations use a two-tone selcal (selective calling) system to call specific aircraft.

British Airways is heard daily from its London base, also known as "Speedbird Radio." It uses these HF frequencies, all in kilohertz (kHz) and upper sideband (USB): 3497.0, 5535.0, 8921, 10072.0, 11333.0, 13333.0, 17922.0, and 21946.0. Files also show a frequency for 4770 kHz.

However, this company is in a dwindling minority of those investing in their own radios and staff. In keeping with the modern corporate trend to "outsource" everything, most airlines contract for radio service. The giant here, of course, is the American ARINC, Aeronautical Radio, Incorporated. It's a huge corporation with global reach, offering integrated voice and data services on all bands. We've written previously of ARINC's global networks. Remotes are in Texas and southern California.


Cedar Rapids Radio has four LDOC consoles, which are capable of injecting traffic into ARINC's global networks. Remotes are in Texas and southern California. This Texas operation was started in 1978, using ARINC frequencies, and operated by Universal Weather and Aviation, Incorporated. Universal offers a wide range of other services such as weather and propagation forecasting, data networking, and refueling.

Finally, there's the Miami contract station, known as "Sylvair," but just as likely to be heard identifying as "Connie Ops." "Connie" is thought to refer to Kalitta Air, a freight carrier started by champion drag racer Connie Kalitta. Other calls have been heard, such as "Big A." These are apparently for Kalitta planes on US Government charters.

Other Major LDOCs

In Canada, Tors Cove still operates "Rainbow Radio" out of Newfoundland on frequencies 3458, 5604 8819 13285 17910 kHz USB, aimed at Europe. The "Atlantic Sector" uses the same frequencies plus 13420 kHz USB. In Toronto, Ontario's "Elite Ops" is on 5475 and 8900 kHz.

In Sweden, Stockholm Radio ("STORadio") operates high-power transmitters, and at least that many receivers. It's on 3494, 5541, 8930, 11345, 13342, 17916, and 23210 kHz. "Berna," Berne Radio in Switzerland, guards 5395, 6643, 8936, 10069, 13205, 15048, 18023, 21988, and 22385. In Russia, Aviakompaniya Vostok is on 4770 kHz.

Echo Charlie?

The nature of civil aero HF frequency selection deliberately minimizes multiple-hop skip to keep interference down. As a result, these bands often sound unused, making them tempting places to start up other, far less authorized, activities.

"Echo Charlie" is one of these. It's phonetic for "EC," but no two people will agree on the name's origin. It refers to a very old, unlicensed, hobby radio scene that started around World War II in Europe, on and around 6670 kHz in the aero mobile band. Early operation used amplitude modulation (AM) on surplus military radios. Today, it's usually lower sideband (LSB) on out-of-band ham transceivers.

Echo Charlie has added calling frequencies of 3475, 13970, 18030, and 20930 kHz LSB to the original 6670. In each case, there's a band going up or down around 25 kHz from these. New modes are being explored, sometimes with noisy results. Growing in popularity around 6650 kHz LSB is slow-scan TV, really more like a form of color facsimile. Some pictures are reputed to be rather on the "adults only" side.

There's a lot of this kind of thing happening on our planet. Australian utilities face a severe problem with interference from the nightly Pacific activity. Much of it is from high-powered equipment on Indonesian islands barely reached by the government, let alone international radio enforcement. Even in the US, it can be quite remarkable in winter to hear propagation reveal a layer of chatter all the way from 6520 to maybe 6800 kHz.

It appears as if most of the world remains unconvinced that HF is dead.

<table>
<thead>
<tr>
<th>Table One</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARINC US LDOC Watch Frequencies</td>
</tr>
<tr>
<td>New York</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>San Francisco</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Cedar Rapids</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Houston Universal</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Sylvair, Miami</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
ABBREVIATIONS USED IN THIS COLUMN

AFB  Air Force Base
ALE  Automatic Link Establishment
AM  Amplitude Modulation
ARQ  Automatic Repeat Request teleprinting system
ARQ-E3 French ARQ teleprinting system
AWACS  Airborne Warning and Control System
CAMSANT  Communication Area Master Station, Atlantic
CAMSPAC  Communication Area Master Station, Pacific
Cq-8  Coquelet; French/Algerian 8-tone printing mode
CW  Morse code telegraphy ("Continuous Wave")
DEA  Drug Enforcement Administration
E2  Russian intelligence numbers, English, ends "000000"
E7  Russian intelligence numbers, English, ends "000000"
El0a  Israeli phonetic numbers, callup-only or abnormal
EAM  Emergency Action Message
EOC  Emergency Operations Center
FAX  Facsimile
FBI  Federal Bureau of Investigation
FEA  Federal Emergency Management Agency
HF-GCS  High-Frequency Global Communications System
JSTARS  Joint Surveillance Target Attack Radar System
LDOC  Long Distance Operation Control
LSB  Lower Sideband
M22  Ministry of Foreign Affairs
MARS  Military Affiliate Radio System
Meteo  Meteorological
MFA  Ministry of Foreign Affairs
NIPRNET  Non-Secret Internet Protocol Routing Network
PACTOR  Packet Teleprinting Over Radio
PR  Puerto Rico
RSA  Republic of South Africa
RTY  Radio Teletype
Selcal  Selective Calling
SHARES  Shared Resources, US interagency net
SITOR-A  Simplex Teleprinting Over Radio, ARQ mode
SITOR-B  Simplex Teleprinting Over Radio, FEC mode
UK  United Kingdom
Unid  Unidentified
US  United States
VOLUMET  Aviation weather broadcasts ("Flying Weather")

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in ( ) with their ENIGMA station designators, as issued by the European Intelligence Gathering and Monitoring Association.

3155.0 ERCC-Unknown agency, possibly US government, sounding in ALE at 0236. [Ron Perron-MD]
4028.0 Cuban AM "Atencion" station (V2), 5-number groups in progress at 0310. [Burry Williams-AL]
4127.0 Unid-Fishing boats, with the usual chatter at 0355. [Williams-AL]
4146.0 Unid-Jacksonville, FL, station taking reports from boats at 0512. [Williams-AL]
4241.0 4XZ-Israeli Navy (M22), with CW marker and coded messages, simultaneously on 4331, 5159, 6379, 8103, 10046, 12984, and 13966, at 2130. [Bory Boender-Netherlands]
4271.0 CFH-Canadian Forces, Halifax, NS, RTTY weather forecasts at 2350. [Bob Hall-RSA]
4372.0 "Y-1-P"-US Navy, Link-11 coordination with "R-4-V" "D-6-T," and "W-9-D," at 0024. [Cleary-SC]
4490.0 AATBMURS-US Army MARS SHARES, DE, sounding in ALE at 2130. (Perron-MD) [SHARES was at Level 2 for the power outage. -Hugh]
4521.7 L2C-Prefectura Naval Argentina (Argentine Navy), Buenos Aires, with SITOR-B marine bulletins at 0117. (Hall-RSA)

4924.5 HQ1INGB2-National Guard Bureau, Arlington, VA, calling LANNGB (Lansing, MI), in ALE at 2322. [Perron-MD]
5327.5 LRD1-US Army Corps of Engineers, Great Lakes, sounding in ALE at 0918. [Perron-MD]
5711.0 AFA1PUMARS-US Air Force MARS, MD, sounding in ALE at 1333. KGD34NCC-SHARES Master Station, VA, calling KNYB3 in ALE, also heard on 1127 and 17487, at 1733. [Perron-MD]
5732.0 25C-US Coast Guard helicopter on possible drug interdiction, reporting position to CAMSPAC, CA, at 0030. [Cleary-SC]
6491.5 LOR-Argentine Navy, RTTY 5-letter code groups and very strong signal, at 0514. (Hall-RSA)
6501.0 Honolulu-US Coast Guard, HI, broadcasting marine weather using the "Perfect Paul" synthesized voice, at 0615. [Williams-AL] [Received on an HP 35868 selective level meter! -Hugh]
6535.0 Dakar-South Atlantic oceanic route control, Senegal, working aircraft, heavy interference from scrambled voice [probably Mexican Navy -Hugh], at 0145 and 0350. [Williams-AL]
6586.0 New York-Caribbean oceanic route control, NY, working aircraft at 0355. [Williams-AL]
6604.0 New York Radio-VO.MET, possibly on backup during the power blackout, transmitter in New Jersey, at 0147. [Williams-AL]
6628.0 New York-North Atlantic oceanic route control, NY, working aircraft at 0358. [Williams-AL]
6697.0 Unwanted-US military, with EAM simulcast on 8992 and 11244, sounding in ALE at 1357. [Perron-AL]
6754.0 Trenton Military-Canadian Forces, male reading VOLMET very fast as if to finish on time, at 0120. [Williams-AL]
6912.0 SYN2-Israeli intelligence, repeated AM callup (E10a at 0350. SYN2, AM callup (E10a) at 0445, gone at 0450. [Williams-AL]
6930.0 MiW2-Israeli intelligence, AM callup only (E10a), at 0115. [Williams-AL]
7300.0 ERCC-Unknown agency, possibly US government, sounding in ALE at 0227. (Perron-MD)
7527.0 Panther-US DEA, Bahamas, position check with Juliet 13, at 1635. (Cleary-SC)
7777.0 RAYO-Mexican Army "Animals" net, in ALE link analysis with LEON at 0146. Unid-ALE initiated voice contact (missed data exchange) at 0200, went scrambled at 0202. COCA, LOQ analysis with ALFIL, at 0340. (Hugh Stegman-CA)
7778.6 WF1-FBI, Washington, DC Field Office, sounding in ALE at 0144. [Perron-MD]
7810.0 CI02-Israeli intellectual audit callup (E10a), same time SYN2 was on 6912, at 0350. [Williams-AL]
7903.5 QT2-FBI, Quantico, VA, calling ALI (Atlanta), in ALE at 0126. ME1, Memphis, TN, calling QT2 in ALE at 0743. BS1, Boston, calling QT2 in ALE at 1357. [Perron-MD]
8012.0 062NHQCAP-Civil Air Patrol headquarters, Washington, DC, sounding in ALE at 0714 and 0859. [Perron-MD]
8047.0 F2Z224-Virginia Air National Guard, sounding in ALE at 2257. [Perron-MD]
8050.0 FR5FEM-FEMA Region 5, sounding in ALE hourly, at 0133, 0233, 0333, and 0433. (Stegman-CA)
8141.0 The English Man-Russian intelligence (E6), with weird English synthesized AM voice, began with "527," ended "00000," at 2100. (Patrice Privat-France)
8161.5 R26601-Georgia Air National Guard, calling OPS171, GA, in ALE at 2309. [Perron-MD]
8181.5 ASP1IL-Aviation Support Facility 1, Illinois National Guard, sounding in ALE at 0237. (Perron-MD)
8337.6 Shark 10-US joint task force, directing Dolphin 45 in a surveillance near "Sat Cave," at 2133. Stingray 02, working aboard Shark 10 at 2323. (Cleary-SC)
8418.2 L2C-Argentine Navy, Buenos Aires, with SITOR-B navigation at 1555, simultaneously on 12580.7, at 2118. (Day Watson-UK)
8422.0 Unid-Unknown CW station, sending dit and long dah, then "DESUO," at 0336. [Williams-AL] [Same as 12601, 16828, and 22387. OK - I'm going to take a stab, and guess this is sending "DESUO," at 0336. (Williams-AL) [Same as 12601, 16828, and 22387. OK - I'm going to take a stab, and guess this is sending "DESUO," at 0336. (Williams-AL)]
8764.0 CAMSLANT-US Coast Guard, VA, setting radio guard with Cutter Cypress, at 2019. (Cleary-SC)
8912.0 Service Center-US Customs Service, working helicopter 33C, probably US Coast Guard, and Predator, unknown, at 2231. (Cleary-SC)
8921.0 London-British Airways DOC, UK, working a company aircraft, presumably a Concorde-Hugh, reducing speed to subsonic due to engine problems, at 2200. (Williams-AL)
8971.0 Trident 43-US Navy, with Spare Group 8 report for Goldenhawk, Brunswick, ME, at 1818. Red Talon 711, passing Spare Group 6 report to Fiddle, Jacksonville, FL, at 2207. (Cleary-SC)
8983.0 J-3-F-US Coast Guard, declaring inflight emergency to CAMSLANT for #1 engine shutdown, and returning to Clearwater, at 2222. (Cleary-SC) "F-2-C-US Coast Guard, reporting departure to CAMSLANT Chesapeake, at 1802. (Stern-FL)
9007.0 Confluence 4447-Canadian Forces, patch via Trenton to Operations at 0044. Confluence 4443, arrival weather for European locations from Trenton at 2221. (Cleary-SC)
9016.0 Ruby Red-US military, working Barn Roof at 2230. (Cleary-SC)
9025.0 Reach 9060-US Air Force, in an ALE-initiated patch to Hilda Global, at 0020. Falcon 33-AL-E, ALE-Coast Guard Station Cape Cod, enroute to plane crash aid, at 1954. (Cleary-SC)
10046.0 4XZ-Israeli Navy (M22), with CW marker and coded messages, at 1721. (Hall-RSA)
10051.0 New York-New York VOLMET, aviation weather at 1230. (Jeff-CA)
10135.0 123-Mexican Army base station, possibly a headquarters, in ALE link analysis with Puma, at 0404. (Stegman-CA)
10780.0 Cape Radio-US Air Force, Eastern Test Range, FL, working King 123 -Mexican Army base station, possibly a headquarters, in ALE at 1450. Cape Radio, patching Razor 35 (E-BC JSTARS) aircraft to Peetchke Ops (Warner-Robins AFB, GA), at 1715. (Stern-FL)
11181.0 Strikestar-US military, probably a JSTARS, working Stargate at 2146. (Cleary-SC)
11205.0 Smasher-US Joint Task Force, FL, working "H-1-X," at 1830. (Stern-FL)
11217.0 NNNOELA-US Navy/Marine Corps MARS, calling KNR33, SHARES Coordination Station, VA, in ALE at 1435. (Perron-MD)
11232.0 Rescue 305-Canadian Forces aircraft on a search, patch to Rescue Coordination Center via Trenton Military, at 0019. Sentry 62-US Air Force AWACS, patch via Trenton to "Tape Library," at 2324. (Cleary-SC)
11244.0 Blackout-US military, no connection to power outage, called Mainsail (general call) with no joy, at 1820. (Haverlah-TX)
11396.0 Qantas F3-B Australian flight working Uijung Pandang (South-east Asia air route control), at 1710. (Patrice-Privat-France)
11486.0 ERMBEL-Brazilian Navy, Belem, calling NEBRSL (Sailing training ship Brasil), in ALE at 0218. (Perron-MD)
11494.0 Service Center-US Customs, relaying position of "33" to Predator via 2124. CAPMASC working Juliet 33, at 2346. (Cleary-SC)
12562.5 UHEL-Russian vessel Kazan, calling UIW, Kaliningrad, in RTTY, at 1630. (Privat-France)
12579.0 NRV-US Coast Guard, Guam, SITOR-B warnings for the Great Australian Bight, at 1601. (Hall-RSA)
12580.7 L2C-Buenos Aires, Argentina, with SITOR-B navigation warnings, simulkeyed on 8418.2, at 2118. (Watson-UK)
12666.3 FUG-French Navy, La Regine, running an RTTY test loop at 1728. (Hall-RSA)
12790.2 NMG-US Coast Guard, New Orleans, LA, with FAX tropical weather charts at 1225. (Hall-RSA)
13155.0 Unknown-US military, too weak to copy call, with a 28-character EAM simulcast on 8992 and 11244, at 1837. (Haverlah-TX)
13242.0 ADWNP-US Air Force NIPRNET gateway, Andrews AFB, MD, sounding in ALE at 1748. (Perron-MD)
13257.0 Titan 20-US Marine Corps tanker, patch via Trenton to Chery Point, NC, came from 11232, at 1851. (Cleary-SC)
13444.0 RFMGXX-unknown routing indicator and station, and a long ARQ-E3 message for several warships at 1725. RHVAKS-unknown US military, 5-letter-group ARQ-E3 message to Bahrain and several ships, at 1739. RFFLADL-French Navy vessel Duplex, very long 5-letter-group ARQ-E3 message to many ships, at 1830. (Hall-RSA)
13500.0 PNME1-Venezuelan military, calling COFFRI1 in LSB ALE at 0227. (Perron-MD)
13530.0 1901-Colombian phone patch net, calling PRF321, in LSB ALE, at 2137. (Perron-MD)
13927.0 Razor 35-US Air Force E-BC JSTARS, getting status of Razor 66 in a patch via MARS AFA2HF to Peachtree, Robins AFB, GA, at 1628. (Cleary-SC)
14408.0 AFA2CJ-US Air Force MARS, handling morale patches from Reach 329Y, at 2045. (Stern-FL)
14569.0 PCRC5-Venezuelan Army, calling CLC51, in ALE at 1947. (Perron-MD)
14686.0 Flint 453-US DEA, working Atlas (Rockwell/Collins contract facility, IA) while enroute to Panther (DEA, Bahamas), at 1804. (Cleary-SC)
14731.7 RFFTD-French Air Force, Villacoublay, with ARQ-E3 traffic to RFVITT, Mayotte, at 1516. (Hall-RSA)
14757.0 AMTIF1-US Army, calling LBA291, in ALE at 1520. (Perron-MD)
14776.0 FC6-FEMA Region 6, TX, calling MO7, Missouri state emergency center, in ALE at 1530. (Perron-MD)
14867.0 Idokkr-Egyptian MFA, Cairo, ARQ messages in Arabic to six embassies, at 1610. (Hall-RSA)
14937.0 The English Lady-Russian AM "female" synthesized voice in English (E7), brief callup and then "000," at 0620. (Privat-France)
16321.0 CENTR8-Romanian military, working OCP in ALE, at 0859. (Privat-France)
16798.0 UCTK-Russian vessel Ordynskiy, calling Murmansk in RTTY, at 1650. (Privat-France)
16801.0 1UVD-Russian vessel More Sodroujestwa, RTTY traffic for URL, Sevastopol, at 1610. (Privat-France)
16802.0 AUAD-US Russian vessel Marshal Krylov, calling UIW, Kaliningrad, in RTTY at 1520. (Privat-France)
17147.0 URL-Sevastopol Radio, Russia, relaying RTTY traffic to vessel Safni Panovarov, at 1709. (Hall-RSA)
17487.0 KSZ78-Unknown station on SHARES ALE net, calling NNNOELA at 1817. (Perron-MD)
17519.0 FCBFM-FEMA Region 8, CO, sounding in ALE at 0248. (Per-ron-MD)
18529.5 Unid-Algerian embassy, Abidjan, Ivory Coast, with a Coq-E message to Algiers, in French, at 1610. (Hall-RSA)
19048.7 RFFKC-French Navy, Brest, 5-letter ARQ-E3 code groups to RFT1CF, vessel Cap Vert, at 1621. (Hall-RSA)
19145.7 RFVIC-French Navy, La Reunion, with ARQ-E3 weather at 1533. (Hall-RSA)
20633.6 RFVI-French Navy, Le Port, with offline encrypted traffic, then weather in English and French, in ARQ-E3 at 1550. (Watson-UK)
20992.5 AFA2CJ-US Air Force MARS, FL, patch with Reach 6145, at 1737. (Stern-FL)
Listening to Low Frequency Utilities

This month we take a look at some of the utility stations that live below 100 kHz, in the Very Low Frequency (VLF) region of the radio spectrum. Interesting stations have lived here for years and often remain undiscovered by many listeners.

One of the principal reasons for not frequenting this part of the spectrum is that many receivers only begin their coverage at 100 kHz, neglecting a very interesting part of the utility world. If you find yourself with just such a receiver, there are various solutions available, including the venerable frequency converter.

These simple devices generally connect between the antenna input of your receiver and a suitable antenna for the VLF range. The frequency converter mixes the incoming signal with a suitable antenna for the VLF range. The frequency converter mixes the incoming signal with a fixed signal at a higher frequency - one that is in the normal tuning range of the receiver. For example, I used to own a converter which covered 10-100 kHz and placed this range at 5010 kHz.

In reality, this band plan turns into a lot of interesting signals that can be heard over long distances.

**Time Signals**

Germany, Great Britain, Russia, and Japan, in addition to the US all still operate super-accurate time signal stations on VLF. These are the stations that control the "radio watches" and "atomic clocks" you see advertised as never needing to be set. Many electricity and home automation controls also use these signals for timing purposes.

Besides a highly accurate carrier frequency that can be used for all sorts of timing and calibration purposes, one can recognize these signals by a regular tick each second, often with a voice announcement of the time at certain minute or hour intervals. Many also send a burst of data that carries the time information in some standard format. The Hoka decoder software, for example, is able to decode the data stream from the German station DCF77 on 77.5 kHz and use it to set the computer’s real-time clock very precisely.

**Fixed and Maritime Mobile**

As one might expect, very long transmission distances and penetration of water are just two features that have made VLF a popular choice for military communications, and especially with navies. In practice, the majority of these military signals are encrypted streams of low-speed data, usually shifts of 75 or 100Hz. Traditional FSK (Frequency Shift Keying) is sometimes used, but most signals now tend to be MSK (Minimum Shift Keying) which spectrally looks (and sounds) very much like FSK-type RTTY, but, in fact, is a special form of PSK that is very efficient in its use of bandwidth.

Making the most of bandwidth is of course very important at VLF. With only 100 kHz in this whole allocation, using say a MIL-188-110A high-speed modem that occupies 2.4 kHz (or nearly 3% of the whole band to carry one signal) would cause quite a stir!

Although the end of the Cold War reduced transmissions markedly, the US Navy TACAMO ("Take Charge And Move Out") airborne system for nuclear submarine communications also uses VLF. TACAMO transmissions come in various flavors of FSK and MSK.

**Radio Navigation**

Probably the most common VLF navigation systems is the venerable LORAN which occupies most of the space between roughly 90 and 110 kHz. LORAN is a worldwide system and can provide navigation accuracies of up to 50m or better. The LORAN-C chain or 24 US-based transmitters provides complete coverage of continental US and Alaska and cooperating Russian stations cover the Bering Sea. The strong pulses of the LORAN system in most parts of the world are easy to hear.

**A typical LORAN transmitter**

Here at Digital Towers we often find that early morning is a great time to listen, especially shortly after sunrise when the higher HF bands have yet to open for business during the day. Here are the results of a typical morning's VLF listening over the past couple of years:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Station</th>
<th>Country</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 kHz</td>
<td>NSY</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>40 kHz</td>
<td>NPM</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>30 kHz</td>
<td>NAA</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>25 kHz</td>
<td>NLK</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>21 kHz</td>
<td>NML4</td>
<td>US</td>
<td>200bd  MSK</td>
</tr>
<tr>
<td>37.5 kHz</td>
<td>NRR</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>40.75 kHz</td>
<td>NAU</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>45.9 kHz</td>
<td>NPS</td>
<td>US</td>
<td>200bps MSK</td>
</tr>
<tr>
<td>50 kHz</td>
<td>Unidentified</td>
<td></td>
<td>Time signal</td>
</tr>
<tr>
<td>60.05 kHz</td>
<td>WWVB</td>
<td>US</td>
<td>Time signal</td>
</tr>
</tbody>
</table>

**Until next time, enjoy your digital listening.**

**Resources**

Ramsey Electronics VLF Converter - [http://www.ramseyelectronics.com](http://www.ramseyelectronics.com)

ITU - [http://www.itu.int](http://www.itu.int)

International LORAN Association - [http://www.loran.org](http://www.loran.org)

US Coast Guard LORAN-C Site - [http://www.navcen.uscg.gov/loran/default.htm](http://www.navcen.uscg.gov/loran/default.htm)
Radio Free Cascadia International

RFCI notified us in advance that they would broadcast Sept. 10-14 in opposition to globalization as exemplified by the World Trade Organization meeting in Cancún. World Of Radio listeners and DX Listening Digest readers were ready and waiting to hear it. Schedule was approximately 1700-0500 on 15045; signal here was typically 20 over 9, peaking in the afternoon but fading out before 0500; it had lots of anti-establishment coverage in English and accented Spanish, claiming power of 8 kW, from an organic farm “in northern America,” powered by organic diesel. It had reports from as far away as China and Argentina, acknowledged on a mailbag the final day. One listener, David Hodgson in TN, also heard it with a spur on 14600 at 2300, reported to the harmonics yahoogroup.

From their website http://www.efn.org/~radio985/rfc1/index.htm: “We broadcast in solidarity with the thousands of people who are protesting the World Trade Organization in Cancún, México, and around the world... RFCI will relay streaming audio sources from Cancún, and will originate programming in Spanish and English directed at Mexico and may also be heard in other nations of Latin America, and in the U.S.

“Radio Free Cascadia International is a direct action of resistance and solidarity. We modulate the air as freely as we breathe it, as a challenge to those who would claim ownership and control of the natural elements, peoples, and creatures of the Earth.” Address: RFCI, P O Box 703, Eugene OR 97440, rfc@riseup.net

“Solid signal. 100% copy with very good audio, anti-establishment song, talk on situations in Central/South America. Great programming!” says Joe Talbot, Alberta. “Very good signal with deep fades. Hopefully this isn’t the last we’ve heard from them on SW” – Mark Mohrmann, VT.

We heard them say they do have plans for future transmissions, but can’t divulge them yet. For a couple of hours on their final day, they dropped carrier because an aerial vehicle was checking them out. After that, big news was that the “Cancún talks collapsed,” causing great celebration.

Robert Ross, Ontario DX Association, noted angry punk rock protest music, anti-government slogans like “Go to Hell, you Materialist Oppressors” and “Protest to the United Nations.” Are we calling this clandestine?

Rich D’Angelo, PA, in the NASWA Flashsheet: Seems very political in nature and presumably illegal so is “clandestine” the appropriate home or is “pirate” the correct classification? GH noted that they referred to themselves on air as “clandestine.” But Clandestine Radio Watch decided RFCI was merely an “interesting political pirate” and did not qualify for coverage there.

RFCI wondered if being non-violent kept them from being called clandestine as they preferred. Anyhow, a group of people evidently had a great time pulling this off, and gave us, however briefly, a much-needed alternative to corporate media.
DENMARK The World Music Radio tests planned for August were never reported heard.

GOA All India Radio, Panaji, English news at 1530-1545 on 11740 often starts some

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,

GHANA GBC is on 4915 only, following breakdown of the Radio 1 transmitter (on 4915)

KOREA NORTH Lost patience since South Korea did not stop their propaganda

HONDURAS R. Misiones Internacional, Comayagüela, reactivated on 3340, ID at

HONDURAS DRM SW frequency. Reports welcome to WMR, PO Box 112, DK-8900 Randers,
on a radio station, I think I ask for just such a certificate. The wording could hardly be improved upon (Glenn Hauser, DX Listening Digest) I think that these "certificados de visita" that TIN collects are more than souvenirs. They well could be useful as a sort of safe-conduct in case of eventual trouble ... That kind of researches on guerrillas and spies, or at least, may awake some kind of suspicion: a stranger so interested in radio technical issues, collecting and annotating addresses, transmitter and even cassette recorders and deck data (Horacio A. Nigro, Uruguay)

PORTUGAL RDP transmitter on 15525 put out very strong spurss on approx. 15356.5 and 15691.5 at 1600-2000 (Wolfgang Büscher) And 1950-2005, (Wyly spurn on 13554.1 (Mark Hattam, England) Same transmitter I guess, spurs 166 kHz away from both sides of fundamental 13720, also on 13886. Furthermore, 13640, Sat and Sun only at 0700-1345, puts spurrs on 14373.5 and 13806.5 (Wolfgang Büscher, Germany, DX Listening Digest)

ROMANIA Of RRI’s 12 SW transmitters, only 5 are functioning, according to their international transmissions, where CBS services ore on top of established which is the reason for the activation of the schedules at unusual times during the coordination in advance with those in use by the majority of other broadcasters, and the authorities in Taipei decline to recognize Beijing as the parent regulatory and international transmissions, where CBS services are on top of established broadcasters (Bob Paulia, World Broadcast Magazine http://www.epog.org)

TIBET 9490, China Tibet PBS, English talk at 1104-1114, then Chinese (George Moroti, NY, Cumbre DX) Another date, English until 1130, inviting letters (Scott R Barbour Jr, NH, World Of Radio)

UGANDA [non] A revised T-Systems = DTK schedule of relays from Germany showed some problems with starting the transmissions. A revision, 7, 2250-0000 UTC, 11050-1530, Sat & Sun 1500-1559, 145". This is kind of inter-cultural organization in Colagne, http://www.allerweltshauste.de/ (gh) Among the groups involved are Ethiopian, Ugandan and Kenyan, fitting the CIRAF zone 48 target area (Kai Ludwig, Germany, DX Listening Digest) It is R. Rhino International Africa, opposition- ing satellite in the service of Uganda (M. Schudy, Netherlands, ibid.) Times of operation are available on website http://www.rhinoradio.org/material/about_rhia.htm are confirmed; UT may stay same for B-03. Only trace of signal here; must be in a null. Former Pres. Milton Obate said to be involved (gh, OK)

Trial broadcasts at first, fair here (Alan Pennington, UK, DX Listening Digest) good sentiment signals from RRI’s 15305, 17400-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)

SLOVENIA Aug 21 was a great night for MW harmonics! Such as on 1854 kHz, R. AI-Islah (presumed), 15705, 1800-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)

SA’UDI ARABIA [non] R. Al-Islah (presumed), 15705, 1800-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)

ROMANIA Of RRI’s 12 SW transmitters, only 5 are functioning, according to their international transmissions, where CBS services ore on top of established which is the reason for the activation of the schedules at unusual times during the coordination in advance with those in use by the majority of other broadcasters, and the authorities in Taipei decline to recognize Beijing as the parent regulatory and international transmissions, where CBS services are on top of established broadcasters (Bob Paulia, World Broadcast Magazine http://www.epog.org)

TIBET 9490, China Tibet PBS, English talk at 1104-1114, then Chinese (George Moroti, NY, Cumbre DX) Another date, English until 1130, inviting letters (Scott R Barbour Jr, NH, World Of Radio)

UGANDA [non] A revised T-Systems = DTK schedule of relays from Germany showed some problems with starting the transmissions. A revision, 7, 2250-0000 UTC, 11050-1530, Sat & Sun 1500-1559, 145". This is kind of inter-cultural organization in Colagne, http://www.allerweltshauste.de/ (gh) Among the groups involved are Ethiopian, Ugandan and Kenyan, fitting the CIRAF zone 48 target area (Kai Ludwig, Germany, DX Listening Digest) It is R. Rhino International Africa, opposition- ing satellite in the service of Uganda (M. Schudy, Netherlands, ibid.) Times of operation are available on website http://www.rhinoradio.org/material/about_rhia.htm are confirmed; UT may stay same for B-03. Only trace of signal here; must be in a null. Former Pres. Milton Obate said to be involved (gh, OK)

Trial broadcasts at first, fair here (Alan Pennington, UK, DX Listening Digest) good sentiment signals from RRI’s 15305, 17400-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)

SLOVENIA Aug 21 was a great night for MW harmonics! Such as on 1854 kHz, R. AI-Islah (presumed), 15705, 1800-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)

SA’UDI ARABIA [non] R. AI-Islah (presumed), 15705, 1800-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)

ROMANIA Of RRI’s 12 SW transmitters, only 5 are functioning, according to their international transmissions, where CBS services ore on top of established which is the reason for the activation of the schedules at unusual times during the coordination in advance with those in use by the majority of other broadcasters, and the authorities in Taipei decline to recognize Beijing as the parent regulatory and international transmissions, where CBS services are on top of established broadcasters (Bob Paulia, World Broadcast Magazine http://www.epog.org)

TIBET 9490, China Tibet PBS, English talk at 1104-1114, then Chinese (George Moroti, NY, Cumbre DX) Another date, English until 1130, inviting letters (Scott R Barbour Jr, NH, World Of Radio)

UGANDA [non] A revised T-Systems = DTK schedule of relays from Germany showed some problems with starting the transmissions. A revision, 7, 2250-0000 UTC, 11050-1530, Sat & Sun 1500-1559, 145". This is kind of inter-cultural organization in Colagne, http://www.allerweltshauste.de/ (gh) Among the groups involved are Ethiopian, Ugandan and Kenyan, fitting the CIRAF zone 48 target area (Kai Ludwig, Germany, DX Listening Digest) It is R. Rhino International Africa, opposition- ing satellite in the service of Uganda (M. Schudy, Netherlands, ibid.) Times of operation are available on website http://www.rhinoradio.org/material/about_rhia.htm are confirmed; UT may stay same for B-03. Only trace of signal here; must be in a null. Former Pres. Milton Obate said to be involved (gh, OK)

Trial broadcasts at first, fair here (Alan Pennington, UK, DX Listening Digest) good sentiment signals from RRI’s 15305, 17400-2000*, weak with quick QSB. Heavily jammed but some audio still getting through (Dave Valko, Dunlo PA, Cumbre DX)
0102 UTC on 6134.81
Bolivian style music mixing with Brazilian Radio Aparecida. (GVH, Brasstown, NC) Bolivia's Em Pio XII 5092.89 with discussion on democracy to mentions of Radio Fides twice to "Em Pio XII" identification. Radio Dif Tropico 6037.5, 2230-2255 (Robert Wilkner, FL/HCDX) Radio Santa Ana 4650.35, 2242-2246; Radio Yura 4716.79, 0106-0130 Radio San Gabriel 6080.06, 0858-0906. (Nicholas Eramo, Buenos Aires, ARG/HCDX) Radio Paititi 4681.08, 2356-0037. Bolivian's audible between 0105-0120; Radio Perla del Acre 4600.32; Radio Nor Andina 4460.84; Radio Bambamarca 4426.79. (Dave Valko, PA/Cumbre DX).

0240 UTC on 3335
COSTA RICA: Radio Exterior Espana relay. Latin vocals to four stations. (D'Angelo, PA/NASWA) 4426.79. Radio Yura 4716.79, 0106-0130. Radio Dif Tropico 6037.5, 2230-2255; Radio Santa Ana 4650.35, 2242-2246; Radio Yura 4716.79, 0106-0130 Radio San Gabriel 6080.06, 0858-0906. (Nicholas Eramo, Buenos Aires, ARG/HCDX) Radio Paititi 4681.08, 2356-0037. Bolivian's audible between 0105-0120; Radio Perla del Acre 4600.32; Radio Nor Andina 4460.84; Radio Bambamarca 4426.79. (Dave Valko, PA/Cumbre DX).

0505 UTC on 11820
NEW ZEALAND: Radio NZ Intl. Local news and weather to item on gun control in Marshall Islands. Rugby commentary at 0523 and 0528. (MacKenzie, CA) Station 13615, 2150-2200 ID as, "WEWN Global Catholic Radio" into rosary. (Wood, TN) 9830, 0845 UTC on 3335. (Dave Valko, PA/Cumbre DX)

0645 UTC on 3291
GUAYANA: Voice of. Hindu/subcontinental music at tune-in. Pop and hip hop vocals to "good morning from Georgetown." Station ID and morning time check. Greetings and personal messages of birthdays and anniversaries. (Sam Wright, Biloxi, MS)

1051 UTC on 6105
BOLIVIA: Radio Panamericana. Spanish national news to regional time check. Interview to beautiful station jingle and more news as "Panamericana presenta...las noticias junto con CNN." SINPO 43443 Radio Fides 9625, 1110-1125. (Slaen, ARG)

1526 UTC on 3335
PAPUA NEW GUINEA: Radio East Sepik. Possible religious service at tune-in. English news at 1100. (Banks, TX) Voice of Indonesia 9525, 1016-1037; 15150, 2028-2106. (D'Angelo, PA/NASWA)

Thanks to our contributors - Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times (or e-mail gaylevanhorn@monitoringtimes.com)  Please note: paper strips and cassette recordings will no longer be accepted. English broadcast unless otherwise noted.

Broadcast Logs
Gayle Van Horn
gaylevanhorn@monitoringtimes.com

Global Forum

November 2003 MONITORING TIMES 39
Is it time for a follow-up?

Last evening while checking my QSL records, I found a few stations that have yet to answer my reception reports. Like many collectors, I, too, have stations that no matter my plea (or ploy) have ignored me! In fact, my local postal clerk continues to ask, “heard from Zanzibar yet?” National Radio of Cambodia never picked up my registered letter at the Phnom Penh post office, so it was returned...and yet I’ve attempted twice since then!

When the waiting game has extended over three to six months, a follow-up report should be considered. A follow-up report consists of the original report with a new cover letter. The new letter should point out politely that no reply was received to your first communication. Mention the dates of the original letter(s) if you like, and a paragraph or two requesting an answer to verify your monitoring.

I always send my letters to the attention of a QSL Manager, Chief Engineer, or the language service department for the program language I monitored. Many DXers send their reports to a Veri Signer, the person reported as verifying reports in the hobby press. While that method is successful much of the time, remember that staff personnel can change. A envelope addressed to Mr. Wylie Coyote may be disregarded if Mr. Coyote has left the station. You should not have a problem sending letters to those signers who have been reported regularly.

Once that sought-after QSL arrives, a thank you postcard to the station is a great idea, and could persuade the staff to rethink their return rate to listeners. Keep your letter upbeat...and be patient! Is it time for a follow-up?

AMATEUR RADIO
Belgium-OQ5SCD, 10 meters. Full data commemorative celebration card of Princess Elizabeth’s birth. Received in nine months via ARRL QSL Bureau. (Larry VH, NC)

Burkini Faso-XT2T1, 10 meters. Full data photo card via EA4YK. Received in 46 days for a Euro self-addressed-envelope and two US dollars. QSL address: (Larry VH, NC) DXCC Country # 163.

CUBA
China Radio Intl relay 5990 kHz. Full data Jinggang Mountains scenery card, signed by “Yingljan,” noted as Cuban site. Station souvenirs including handmade Chinese art papercuts. Received in twelve days for an English report, souvenir postcard and personal business card. Station address: 16A Shijingshan Street, Beijing 100040, China. Station website: http://www.cri.com.cn. (Gayle VH, NC)

EL SALVADOR
Radio Imperial, 17833.5 kHz. No data verification on station letterhead signed by Pedro Mendoza-Postor. Received in 26 days for a Spanish/English report and mint stamps. Station address: Apartado 56, San Salvador. (Brian Bagwell, St. Louis, MO)

GERMANY

Swiss Radio Intl via Juelich, Germany relay, 13795 kHz. Full date color photo monogram card unsigned, noted as “Juelich” site. Received in 20 days for an English report, souvenir postcard and personal business card. Station address: Giacomettistrasse 1, CH-3000 Berne 15, Switzerland. Email: englishts@sr.ch. Station website: http://www.swissinfo.org. (Gayle VH, NC)

LIBYA
Radio Jamahiriya, 17880 kHz. Full data colored rainbow/logo card unsigned. Received in 65 days for an English report and souvenir postcards. Report sent to P.O. Box 333, Tripoli, Libya, postmarked from P.O. Box 17, Hamrun, Malta. (Masato Ishii, Japan/DSCW1 DX Window/DXLD) 15220 kHz verified with full data card unsigned in 130 days. Sent to Malta address. (Patrick Martin, Seaside, OR) letters to Malta address recommended over Libyan address. -ed.

MEDIUM WAVE
KDZR, 1640 kHz AM. Personal note on Disney letterhead from Tom White-Chief Engineer. Received in 13 days for an AM report. Station address: 3030 SW Moody Avenue, Portland, OR 97201 USA. (Martin, OR)

KUTI, 1460 kHz AM. Verification form letter signed by Operations Manager (name illegible). Received in 20 days for an AM report. Station address: 4010 Summitview Ave., Yakima, WA 98908. (Martin, OR)

WDSR, Fernandina Beach, FL, 1570 kHz AM. Full data QSL letter signed by Ron Gitschier-Tech Asst. Received in 54 days for DX Test. Not a new station, but always log their DX tests. Station address: c/o Ron Gitschier, 68 Roxboro Drive, Palm Coast, FL 32164. (Martin, OR)

PARAGUAY
Radio America, 7370 kHz. Full data QSL folder card signed by Adan Mun-Assesor Tecnico. Received in four days for Spanish reception report via email to: radioamerica@lycos.com. Station address: Casilla No. 2220 Asuncion, Paraguay. (Slean, ARG)

PIRATE
Radio Alfa Lima Intl, 15070 kHz. Full data card signed by “Alfred” plus station sticker. Veri signer states the station currently having legal problems and is off the air, with plans to return shortly. Received in one year. QSL maildrop: P.O. Box 663, 7900 AR, Hoogeveen, Netherlands. (Cesar Perez Dioses, Chimbote, Peru)

Voodoo Radio, 6925 USB kHz. Full data card signed by “Rev.VB.”, plus inspirational literature. Received in 20 days for three mint stamps and an applause card. QSL maildrop: P.O. Box 69, Elkhorn, NE 68022 USA. (Joe Wood, Gray, TN)

ROMANIA
Radio Romania Intl. 11775, 11940 kHz. Full data cards The Village Museum Peasant House, unsigned. Received in 37/57 days. Loyalty Diploma enclosed for two years of station monitoring, plus program/frequency schedules and station sticker. Reports sent via email to: englorri.ro. (Kraig Krist, Annandale, VA) Station address: 60-62 Berthelot St., RO-70747 Bucharest, Romania (or) P.O. Box 111, RO-70756 Bucharest, Romania.

UNITED ARAB EMIRATES
Gospel for Asia via Al Dhabayyo. Full data GFA Radio card signed by Rhonda Penland-Co-ordinator, confirming Hindu and Malayam services. Business card, schedule and apology note for six months delay in reply. My report was forwarded to India after receiving initial reply from Stony Creek, Ontario. QSL address: GFA Radio, West Coast Office, P.O. Box 1210 Somis, CA 93066 USA. Email: gfaradio@mygfa.org. (Edward Kusak V66EFK, Canada/ Cumbre DX)

ZAMBIA
Radio Zambia 6265 kHz. Full data card unsigned. Received in 79 days for an English report and Zambian mint stamps. Station address: Mass Media Complex, Alick Nkhata Road, P.O. Box 50015, Lusaka, 10101, Zambia. (Ross Comeau, Andover, MA) Station website: http://www.znbc.co.zm.
Global Forum

DX PROGRAMS; The VOA and YOU

◆ Semi-Annual SWL/DX Program List

The listing this time has been tightened: strictly programs on shortwave about shortwave and DXing. Get frequency information and abbreviations from MT's SWG. Times approximate; everything subject to change; corrections welcomed.

- WWCR - WWCR (fortnightly) - W 1815 (15825); F 1045, 2130 (9475); A 0945 (5070); S 0045 (9475), 1115 (15825), 1830 (12160).
- CIDX Report - R. Canada Int. - S 2107; M 0130, 1130, 1330, 2030; T 2330.
- DX Corner - All India Radio, fortnightly - Viva Miami - WRMI Florida - S 0330 (7385), 1030 (9955), 1330 (15725).
- DXers Unlimited - DXers' Corner - All India Radio, fortnightly - WHRI Indiana - A 0600 (7580), 1000 (9955), 1330 (15725).
- Viva Miami - WRMI Florida - S 0300 (7385), 1030 (9955), 1330 (15725).
- VOA to be journalistically sound and others who want it to reflect official thinking above all else. In his book, Heil chronicles these battles that seem to flare up in times of crisis and threaten to strip the VOA at the blink of an eye of its painstakingly hardwon reputation for trust and accuracy. Not that there aren't also valid arguments for the VOA to reflect a national consensus of sorts overseas.

◆ The VOA, Public Diplomacy & SWLs

Alan Heil, author of Voice of America, A History (see October's column and September's What's New section), wrote in to clarify some information presented here last month. He writes that although Radio Sawa and Radio Farda were initially billed as being part of VOA, they really aren't. Neither uses the VOA name or VOA central news, instead principally rely on formats of local and Western pop music, interrupted by brief headline-style news summaries. Both have little foreign content.


This circumstance illustrates a most disconcerting feature of US international broadcasting. It's confusing, both organizationally and in its public presentation. Why so many, often competing services? In a word: politics. Many decision makers assume that the VOA is a broadcast service and not a public information service.

Available resources - quite thin already - inevitably get used inefficiently. U.S. international broadcasting also takes place almost entirely out of view of the people footing the bill - you and me. This is largely due to the Smith-Mundt Act, an almost paranoic legacy from the '40s which - in essence - forbids the VOA and its siblings from communicating with us. It's confusing, both organizationally and in its public presentation. Why so many, often competing services? In a word: politics.

Ongoing conflicts over fundamental matters also transpire in near secrecy, such as that between those who emphasize the need for the VOA to be journalistically sound and others who want it to reflect official thinking above all else. In his book, Heil chronicles these battles that seem to flare up in times of crisis and threaten to strip the VOA at the blink of an eye of its painstakingly hardwon reputation for trust and accuracy. Not that there aren't also valid arguments for the VOA to reflect a national consensus of sorts overseas.

My preference is for one, journalistically sound Voice of America that eschews the shading of information or (worse yet) blatant propaganda, in favor of reflecting the true diversity of this society on all its levels. Others may have an alternate view. The essential point, though, is that this is far too important a discussion to be had without informed public participation.

Until December, good listening!

Programming Spotlight

John Figliozzi
johnfigliozzi@monitoringtimes.com

Longwave Resources

◆ Sounds of Longwave 60-minute Audio Cassette featuring WWV, Omega, Whistlers, Beacons, European Broadcasters, and more! $13.95 postpaid

◆ The BeaconFinder A 55-page guide listing Frequency, ID and Location for hundreds of LF beacons and utility stations. Covers 0-530 kHz. $13.95 postpaid

Kevin Carey
P.O. Box 56, W. Bloomfield, NY 14585

Available resources - quite thin already - inevitably get used inefficiently. U.S. international broadcasting also takes place almost entirely out of view of the people footing the bill - you and me. This is largely due to the Smith-Mundt Act, an almost paranoic legacy from the '40s which - in essence - forbids the VOA and its siblings from communicating with us. It's confusing, both organizationally and in its public presentation. Why so many, often competing services? In a word: politics.

Ongoing conflicts over fundamental matters also transpire in near secrecy, such as that between those who emphasize the need for the VOA to be journalistically sound and others who want it to reflect official thinking above all else. In his book, Heil chronicles these battles that seem to flare up in times of crisis and threaten to strip the VOA at the blink of an eye of its painstakingly hardwon reputation for trust and accuracy. Not that there aren't also valid arguments for the VOA to reflect a national consensus of sorts overseas.

My preference is for one, journalistically sound Voice of America that eschews the shading of information or (worse yet) blatant propaganda, in favor of reflecting the true diversity of this society on all its levels. Others may have an alternate view. The essential point, though, is that this is far too important a discussion to be had without informed public participation. We - SWLs, that is - need to get ourselves into that conversation. More ideas on this to come.

November 2003 MONITORING TIMES 41
HOW TO USE THE SHORTWAVE GUIDE

Convert your time to UTC.

Broadcast time on ☀️ and time off ☐️ are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Time) 4, 5, 6 or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on ☀️, then alphabetically by country ☐️ followed by the station name ☐️. (If the station name is the same as the country, we don’t repeat it, e.g., “Vanuatu, Radio” [Vanuatu].)

If a broadcast is not daily, the days of broadcast ☐️ will appear in the column following the time of broadcast, using the following codes:

<table>
<thead>
<tr>
<th>Day Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>s/S</td>
<td>Sunday</td>
</tr>
<tr>
<td>m/M</td>
<td>Monday</td>
</tr>
<tr>
<td>t/T</td>
<td>Tuesday</td>
</tr>
<tr>
<td>w/W</td>
<td>Wednesday</td>
</tr>
<tr>
<td>h/H</td>
<td>Thursday</td>
</tr>
<tr>
<td>f/F</td>
<td>Friday</td>
</tr>
<tr>
<td>a/A</td>
<td>Saturday</td>
</tr>
<tr>
<td>D/</td>
<td>Daily</td>
</tr>
<tr>
<td>mon/MON</td>
<td>Monthly</td>
</tr>
<tr>
<td>occ</td>
<td>Occasional</td>
</tr>
<tr>
<td>DRM</td>
<td>Digital Radio Mondiale</td>
</tr>
</tbody>
</table>

Choose a program or station you want to hear.

Selected programs for prime listening hours appear following the frequencies – space does not permit 24 hour listings nor can every station be listed. However, listings for the most popular stations and selected lesser-known stations illustrate the variety available on shortwave. The format of the listings alternates among three different styles – by station, by genre and by day – month by month. Times listed are approximate and programs are subject to change.

The program listings emphasize broadcasts targeted to North America. In most cases, the stations and programs listed should be readily receivable in North America using a portable radio. Most broadcasters produce one broadcast in English per day that is repeated over a 24 hour period to all areas. If you are able to listen to transmissions to other areas of the world during “non-prime” times, referring to the prime time listings for those stations will likely be helpful in determining what programs will be broadcast.

Occasionally, a program or station listing may be followed by a reference to another listing for the same program or station at a different time. This is done to conserve space and make it possible to provide more listings.

But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring team and MT readers to make the Shortwave Guide up-to-date as of one week before print deadline.

MT MONITORING TEAM

Gayle Van Horn  John Figliozzi
Frequency Manager  Program Manager
gaylevanhorn@monitoringtimes.com  johnfigliozzi@monitoringtimes.com
Mark Fine, VA

Program Highlights

John Figliozzi

Changes at R. Netherlands

Despite its consistently excellent programming, even R. Netherlands is not immune to budget cutting. Consequently, there are some changes and reductions taking place to the station’s schedule effective October 26, though RN has done a commendable job minimizing the effects on its listening audience.

All transmissions now start on the hour, instead of the half-hour. Other than this time shift, the two hour transmission to eastern and central North America (now at 0000-0200 UT) and hour to western North America (now 0400-0500 UT) remain intact. However, the four-hour morning transmissions (two to the east and two to the west) instituted after the BBC reductions in July 2001 have themselves been reduced to a single one hour transmission to eastern North America at 1200 UT. On the plus side, a two-hour afternoon transmission to North America (1900-2100 UT) has been added to the schedule on weekends.

There are programming changes as well. A new arts series called Vox Humana premieres. The program is a merging of Aural Tapestry and The Sound Fountain, both of which will no longer air. Music 52-15 and Sincerely Yours, the listener feedback program, have both been cancelled.

...And At R. Australia

RA also took a budget hit recently and this has resulted in some schedule changes there, as well. Programs dropped include Blacktrackr, The Australian Music Show, Fine Music Australia. Oz Sounds, Australian Express and Go Zone. Replacement titles include Hit Mix (hosted by RA’s Brendan Telfer), The Lounge (with RA’s Heather Jarvis) and Keys to Music (a two hour music appreciation program originating from ABC Classic FM). The series Australia Now is also being repeated and now has its own web site http://www.abc.net.au/ra/australia, which is entitled Understanding Australia. It stores the audio and transcripts of the series, available on-demand, but has much more information as well.

Revised schedules for these and many others are in this month’s Guide.
### Shortwave Guide

#### Frequencies

<table>
<thead>
<tr>
<th>Time</th>
<th>Country/Region</th>
<th>Station/Network</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700 UTC</td>
<td>Australia, NT</td>
<td>Katherine</td>
<td>20755 am</td>
</tr>
<tr>
<td>0715 UTC</td>
<td>Lithuania, Radio</td>
<td>Vilnius</td>
<td>9470 am</td>
</tr>
<tr>
<td>0730 UTC</td>
<td>Finland, Scandinavian</td>
<td>9500 am</td>
<td></td>
</tr>
<tr>
<td>0745 UTC</td>
<td>Finland, Scandinavian</td>
<td>9500 am</td>
<td></td>
</tr>
<tr>
<td>0800 UTC</td>
<td>Indonesia, Voice of</td>
<td>9500 am</td>
<td></td>
</tr>
<tr>
<td>0815 UTC</td>
<td>Iran, Voice of the</td>
<td>Islamic Rep</td>
<td>9500 am</td>
</tr>
<tr>
<td>0830 UTC</td>
<td>Japan, Radio</td>
<td>9500 am</td>
<td></td>
</tr>
<tr>
<td>0845 UTC</td>
<td>New Zealand, Radio</td>
<td>NZ Intl</td>
<td>9500 am</td>
</tr>
<tr>
<td>0900 UTC</td>
<td>Bangladesh, Radio</td>
<td>9500 am</td>
<td></td>
</tr>
<tr>
<td>0915 UTC</td>
<td>Sri Lanka, Radio</td>
<td>UNAMSIL</td>
<td>9500 am</td>
</tr>
<tr>
<td>0930 UTC</td>
<td>United States, Voice</td>
<td>of America</td>
<td>13760 am</td>
</tr>
<tr>
<td>0945 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1000 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1015 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1030 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1045 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1100 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1115 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1130 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1145 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1200 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1215 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1230 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1245 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1300 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1315 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1330 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1345 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1400 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1415 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1430 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1445 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1500 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1515 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1530 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1545 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1600 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1615 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1630 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1645 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1700 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1715 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1730 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1745 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1800 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1815 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1830 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1845 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1900 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1915 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1930 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>1945 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2000 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2015 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2030 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2045 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2100 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2115 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2130 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2145 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2200 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2215 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2230 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2245 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
<tr>
<td>2300 UTC</td>
<td>USA, Armed Forces</td>
<td>Radio</td>
<td>13760 am</td>
</tr>
</tbody>
</table>

---

**SELECTED PROGRAMMING BEGINS ON PAGE 55**

November 2003  MONITORING TIMES  43
### 0400 UTC - 11PM EST / 10PM CST / 8PM PST

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Frequency</th>
<th>Language</th>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>0400</td>
<td>Malaysia, Radio Malaysia Kota Kinabalu</td>
<td>5979do</td>
<td>Malay</td>
<td>Malaysia</td>
<td>Kota Kinabalu</td>
</tr>
<tr>
<td>0400</td>
<td>UAE, WAFV Alexandria VA</td>
<td>5160as</td>
<td>Arabic</td>
<td>UAE</td>
<td>Alexandria VA</td>
</tr>
<tr>
<td>0400</td>
<td>UK, BBC World Service</td>
<td>1542oof</td>
<td>English</td>
<td>UK</td>
<td></td>
</tr>
<tr>
<td>0400</td>
<td>USA, Voice of America 6800af</td>
<td>7290of</td>
<td>English</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>0400</td>
<td>9585as</td>
<td>English</td>
<td>USA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0400</td>
<td>Tajikistan, Tajik Radio</td>
<td>7245as</td>
<td>Tajik</td>
<td>Tajikistan</td>
<td></td>
</tr>
</tbody>
</table>

### 0500 UTC - 12AM EST / 11PM CST / 9PM PST

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Frequency</th>
<th>Language</th>
<th>Country</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>0500</td>
<td>Venezuela, Caracas</td>
<td>7570af</td>
<td>Spanish</td>
<td>Venezuela</td>
<td>Caracas</td>
</tr>
<tr>
<td>0500</td>
<td>El Salvador, Radio</td>
<td>7570af</td>
<td>Spanish</td>
<td>El Salvador</td>
<td></td>
</tr>
<tr>
<td>0500</td>
<td>Mexico, Radio Mexico</td>
<td>7570af</td>
<td>Spanish</td>
<td>Mexico</td>
<td></td>
</tr>
<tr>
<td>0500</td>
<td>USA, Voice of America 8200af</td>
<td>7570af</td>
<td>English</td>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>0500</td>
<td>9590af</td>
<td>English</td>
<td>USA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**November 2003**, **MONITORING TIMES**, **45**
<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Country</th>
<th>Language</th>
<th>Station Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0630</td>
<td>6620 kHz</td>
<td>Switzerland</td>
<td>German</td>
<td>SWF Radio</td>
</tr>
<tr>
<td>0630</td>
<td>6800 kHz</td>
<td>Slovakia</td>
<td>Italian</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>6120 kHz</td>
<td>Belgium</td>
<td>Dutch</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>6760 kHz</td>
<td>Switzerland</td>
<td>German</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>6450 kHz</td>
<td>Germany</td>
<td>German</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>6045 kHz</td>
<td>Germany</td>
<td>German</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>9870 kHz</td>
<td>Monaco</td>
<td>French</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>9870 kHz</td>
<td>Monaco</td>
<td>French</td>
<td>Voice of America</td>
</tr>
<tr>
<td>0700</td>
<td>11675 kHz</td>
<td>New Zealand</td>
<td>English</td>
<td>Voice of America</td>
</tr>
</tbody>
</table>
0700 UTC - 4AM EST / 3AM CST / 1AM PST

0700 0927 Czech Rep, Radio Prague Intl 21745va
0730 0928 Australia, Radio 17750as
0730 0930 Austria, AWR Europe 17780as
0730 0930 Guernsey, GWR Radio 15330as
0730 0935 China, China Radio Intl 17690as 15210pa
0730 1000 Angola, Caribbean Beacon 6090m
0730 1010 Australia, AFRU Alice Springs 23100as 4835rr
0730 1020 Australia, ABC Katherine 2485as
0730 1030 Australia, ABC NT Tennant Creek 2325as
0730 1040 Australia, ABC Katherine 11740as
0730 1040 Argentina, Radio 9580va 11880as 15240as
0730 1045 Australia, Voice Radio 17750as 21820as
0730 1050 Australia, Voice Radio 13658as
0730 1050 Botswana, Radio 33550as 8725as
0730 1050 Canada, CFRX Toronto ON 6070as
0730 1050 Greece, ERT Col. 6030as
0730 1050 Canada, CKZN St. John's NF 6160as
0730 1050 Canada, CKUZ Vancouver BC 6160as
0730 1050 Costa Rica, Radio Peace for Intl 7445as 15038as
0730 1050 Costa Rica, University Network 5030as 6150as
0730 1050 Eritrea, Voice Radio Africa 519as
0730 1050 Finland, Scandinavian Weekend Radio 6170as
0730 1050 Germany, Deutsche Welle 15440as
0730 1050 Germany, Deutsche Welle 6140va 15440as
0730 1050 Guyana, Voice of 32910as 5950as
0730 1050 Holy, IRS 13840as 3850as
0730 1050 Solomon Islands, SIBC 5020as 9545as
0730 1050 UAE, Radio UWEVE 2179as
0730 1050 UK, BBC World Service 7305as
0730 1050 UK, BBC World Service 6190as 6195as
0730 1050 USA, WSHB Cypress Creek SC 8660as 945nas
0730 1050 USA, WSHB Cypress Creek SC 9370as
0730 1050 USA, WWCW Nashville TN 5070as 593nas
0730 1100 Australia, Radio 3945as 496as
0730 1100 USA, KDYX Seattle WA 385as 1332nas
0730 1100 Greece, Voice of 12105as 15630as
0730 1100 Netherlands, Radio 9785as 1206nas 1370as
0730 1100 Netherlands, Radio 9590as

1000 UTC - 5AM EST / 4AM CST / 3AM PST

1000 1027 Vietnam, Voice of 9840as 12020as
1000 1030 Germany, Deutsche Welle 17615as 17715as
1000 1030 Guernsey, GWR Radio 15650as 11930as
1000 1030 Mongolia, Voice of 12085as
1000 1030 Netherlands, Radio 9750as 1206nas 1370as
1000 1030 UK, BBC World Service 9650as 15360as
1000 1030 UK, RTE Radio 15280as
1000 1045 China, China Radio Intl 9330as 11565as
1000 1050 South Korea, Voice of 3560as 1175as 1770as
1000 1050 North Korea, Voice of 3560as 9335as 11701as
1000 1050 Australia, ABC NT Alice Springs 23100as 4835rr
1000 1050 Australia, ABC Katherine 2485as
1000 1050 Australia, ABC Tennant Creek 2325as
1000 1050 Australia, ARWR教育部 21830as
1000 1050 Georgia, Radio Georgia 1197as
1000 1050 Lithuania, Radio Vilnius 97710as
1000 1050 Switzerland, Swiss Radio Intl 21770as
1000 1050 Croatia, Voice of 13820as
1000 1050 Turkmenistan, Turkmen Radio 493as

November 2003
<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Call Sign</th>
<th>Country</th>
<th>Language</th>
<th>Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>2200</td>
<td>9870kHz</td>
<td>AYCC</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11020kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11040kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11060kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11080kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11100kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11120kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11140kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11160kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11180kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11200kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11220kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11240kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11260kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11280kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11300kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11320kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11340kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11360kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11380kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11400kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11420kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11440kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11460kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11480kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11500kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11520kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11540kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11560kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11580kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11600kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11620kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11640kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11660kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11680kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11700kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11720kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11740kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11760kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
<tr>
<td>2200</td>
<td>11780kHz</td>
<td>CBN</td>
<td>Nigeria</td>
<td>Igbo</td>
<td>News, Sports</td>
</tr>
</tbody>
</table>

*Note: The frequencies listed above are approximate and may vary depending on the broadcasting day or time.*
**Shortwave Guide**

**Headnotes:**
1. Deutsche Welle program listings for transmissions to other regions of the world have provided credible reception in at least parts of North America are included herein. These are, in order of reliability, 2100, 0400, and 2000. Consult the frequency section of the SWG for more information.
2. Listings for the US-based independent shortwave broadcasters are limited to general interest programming that departs from their primary formats of religious and political fare.
3. BBCWS stream abbreviations: (am) = Americas; (eas) = East Asia. These are the streams recommended by Bush House for North American listeners. Please note that, in recent years, the BBC has made significant seasonal changes to its program schedules that have not necessarily been consistent season to season. Because details of any changes planned for this season were unavailable from the BBC at press time, the schedules this month represent our best guess as to the changes that will be implemented. Any required corrections will have been made by December.

**Finally, we've also scambled the order in which various formats appear during the winter listening season. For this, the list full month of that season, we are starting with the "station by hour" format because it provides the most complete snapshot of the new and revised seasonal schedules.**

---

### 0000 UTC / 7pm E / 4pm P - Page 43 Freqs

<table>
<thead>
<tr>
<th>PROGRAMMING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BBC WORLD SERVICE (am)</strong></td>
</tr>
<tr>
<td>0000 D News; 0005 S Pick of the World (BBC's best), M One Planet (ecology), T/A Outlook (magazine), 0032 M I'm Sorry I Haven't a Clue (panel game), 0045 S Write On (letters), T/A Off the Shelf (book readings)</td>
</tr>
<tr>
<td><strong>RADIO AUSTRALIA</strong></td>
</tr>
<tr>
<td>0000 D News, 0005 S Keys to Music (enjoying the classics), A Business Report, 0100 D/A MAILBOX (Australia), T Science Show, W National Interest (Australian politics), H Background Briefing (documentary), F Sightings (Australian history), 0030 A Ochikarto's Razor (science opinion), 0045 A Linguagro (about language)</td>
</tr>
<tr>
<td><strong>RADIO CANADA INTERNATIONAL</strong></td>
</tr>
<tr>
<td>0000 D CBC News, 0005 S Quirks &amp; Quarks (science), M Global Village (world music), T/A It Happens (world news)</td>
</tr>
<tr>
<td><strong>RADIO EXTERIOR ESPANA</strong></td>
</tr>
<tr>
<td>0000 D Visita Book (travelers to Spain), M Window on Spain (culture), T News International (Spain, Latin America), 0015 S/M Spanish history or culture series, 0025 S/M Rebroadcast of 0035 weekday programs, F/A Spanish pop music, 0030 T/A Press Review, 0035 S/T Radio Waves, W Chronicles (Spain &amp; the US), H Entremeses (food &amp; travel), F Africa Today, A Radio Club (letters), 0045 T/A Language Without Bounds (Spanish lesson)</td>
</tr>
<tr>
<td><strong>RADIO JAPAN - NHK WORLD</strong></td>
</tr>
<tr>
<td>0000 D News, 0010 S Hello from Tokyo (listener contact), M Weekend Japanandoo, T/A Songs for Everyone, 0015 T/A 44 Minutes (magazine), 0054 M Sights &amp; Sounds of Japan</td>
</tr>
<tr>
<td><strong>RADIO NETHERLANDS</strong></td>
</tr>
<tr>
<td>0000 S/M News; T/A Newsline, 0005 S Wide Angle (in-depth), M Europe Unrapped, 0025 S/T The Week Ahead (on R4), M Insight and Opinion, 0030 S/T Amsterdam Forum (conversations), M Vox Humana (culture), T Research File (science), W EuroQuest (Europe in context), H Documentary, F Dutch Horizons, A Good Life (development)</td>
</tr>
<tr>
<td><strong>RADIO NEW ZEALAND INTERNATIONAL</strong></td>
</tr>
<tr>
<td>0000 S/A RNZ News, M Pacific Regional News, 0006 S At the Movies, M Fad Caderno (light classics), A Digital Life, 0030 S Mailbag, M Saturday Comedy Zone</td>
</tr>
<tr>
<td><strong>RADIO FOR PEACE INTERNATIONAL, Costa Rica</strong></td>
</tr>
<tr>
<td>0000 S/M Mailbag, M Spiritual Awakening, T Middle East Project, M CounterSpin (media analysis), A Making Contact, F Peace Watch (cont'd.), A WINGGS, 0030 S Making Contact, M World of Radio, T/A Highpower Radio (commentary), 0035 S/T Earthwatch (ecology), 0040 S Earth &amp; Sky (astronomy), 0040 S/T Neumayer Report, W/A UVP programs</td>
</tr>
<tr>
<td><strong>VOICE OF AMERICA (News Now)</strong></td>
</tr>
<tr>
<td>0000 T/A News and Reports, 0015 T/A Focus (topic in-depth), 0023 S/T Sports, 0030 T/A News Headlines, 0033 T/A Coast to Coast (American life), 0055 Government Editorial</td>
</tr>
<tr>
<td><strong>WBCQ, Maine</strong></td>
</tr>
<tr>
<td>7415 kHz.: 0000 S The Real Amateur Radio Show, M Le Show (human/entertainment), H Off The Hook (public telecommunications issues), F Uncle Ed's Musical Memories (cont'd from 2130), A The Last Days Music Show, 0030 S Fred Flintstone Music Show, 9330 kHz.: 0000 S Split Secs (free form)</td>
</tr>
</tbody>
</table>

---

**MONITORING TIMES**

November 2003
Performing Arts, W Youth Club, H Partners in a Changing World, A Cultural Survey, 0440 S Bucharest Along the Centuries, T Pages of Romanian Literature, W/F Skylark (folk music), H Stage and Screen, A Spectator (voice of the people), 0445 S DX Mailbag, T Romanian Hits, H Romanian Musicians, A Romanian Folk Music At its Best, 0450 M Romanian Folk Music At its Best, T Sports Roundup, W Athlete of the Week, H Sports Club, F Football Flash, A Sports Weekend.

RADIO UKRAINE INTERNATIONAL
0400 D News; 0410 S Ukrainian Diary (weekly review), M News from Ukraine, T/A Ukraine Today (magazine), 0415 S The Whole World on the Radio Dial (DX program); 0430 S Hello From Kiev (listener letters/music), M Roots (culture & education), 0445 T Closeup (current issues).

RVI, Belgium
0400 S Music from Flanders, M Radio World, T/A News, 0404 T A Flanders Today (incl. press review, reports & CD of the Week); 0408 M Tourism in Flanders; 0414 M Brussels 1043 (letters).

VOICE OF AMERICA, Africa Service
0400 D News; 0410 D Reports & Reviews, M 0415 F/M Focus (a topic in-depth), 0420 D Sports, 0430 S/A New Headlines, M/F Daybreak Africa (morning newspaper); 0433 S Main Street (about America, incl. Kim Elliott media report); a Press Conference USA.

VOICE OF RUSSIA

VOICE OF TURKEY
0400 D News; 0410 D Press Review; 0415 S Outlook, M/F Tours Spanning Centuries, T Last Week, W Live From Turkey, H Review of the Foreign Media, A Big Powers & The Armenian Problem, A Archaeological Settlements in Turkey, 0420 S The Stream of Love or DX Corner, T/Hues & Colors of Anatolia, H Letters; 0425 M/A Music From Turkey, F In the Wake of a Contest; 0430 S/T Music, 0435 S Turkish Arts, M Turks in the Mirror of Centuries, T From Past to Present, H Turkey’s OR the Beaten Track Sites, F The Culture Parade, A The Travel Itinerary of Anatolia.

KHWIR, Hawaii
17700 kHz.; 0430 S DXing with Cumbre.

WBCQ, Maine
7415 kHz.; 0405 S You Are What You Think (satire), M Radio New York International (cont’d).

WHR, Maine
7580 kHz.; 0430 S DXing with Cumbre.

WHBI, Indiana
7315 kHz.; 0430 S DXing with Cumbre.

WRML, Florida
3750 kHz. 0400 S IBC Radio Network, M Old Time Radio.

WWCR, Tennessee
5070 kHz.; 0400 S Spectrum (communications discussion).

0500 UTC / 12am E / 9pm P - Page 45 Freqs

BBC WORLD SERVICE (am)

CHANNEL AFRICA, South Africa
0500 S Network Africa (week in review), M/F Dateline Africa (news magazine), A Channel Africa Sport.

CHINA RADIO INTERNATIONAL
0500 D News & Reports; 0510 S Report on Developing Countries; 0515 S A Cutting Edge (sci/tech); 0520 S In the Spotlight (cultural magazine); 0530 M People in the Know (China’s leading personalities), T/Bi China, W China Horizons (China outside Beijing), H Voices from Other Lands, F Life in China, A Listeners’ Garden; 0545 S Health Briefs.

RADIO AUSTRALIA
0500 D News; 0505 S The Europeans, A The Music Show (cont’d); 0510 M/F Pacific Beat (Pacific islands magazine with regional sports report @ 0530), 0530 S The Ark (religious history); 0545 S The Pulse (music magazine).

RADIO HABANA CUBA

RADIO JAPAN - NHK WORLD
0500 D News; 0510 S Pop Joins the World, A Hello from Tokyo (listener contact); 0515 M/F 44 Minutes (magazine).

RADIO NEW ZEALAND INTERNATIONAL
0500 D RNZ News, 0507 S Whenua Moana (magazine), M/F What’s Going On? (arts & entertainment), A The Mix (‘live music’ acts), 0530 M/F Worldwatch (international news), 0545 M/F Storytime.

RADIO FOR PEACE INTERNATIONAL, Costa Rica
0500 S/F TUC Radio, M Living Enrichment Center, T Making Contact, W/T/A Peace Watch; 0530 S World of Radio, T Steppin’ Out of Babylon, F Peace Watch.

VOICE OF AMERICA, Africa Service
0500 S News, A/M A News & Reports; 0506 S Best of Talk to America; 0523 M/A Sports; 0530 D News Headlines; 0533 S Best of Talk to America, M/F Business Report, A VOA News Review; 0545 M/F DateLINE (documentary); 0555 M/F Government Editorial.

VOICE OF NIGERIA
0500 S/A News Summaries, M/F VON Scope (news magazine); 0505 S This Week on VON, A VON Link-up (music requests), 0530 D Moving On (variety magazine).

VOICE OF RUSSIA
0500 D News; 0511 S/M Musical Portraits, T/F Moscow Mailbag, W/A Science and Engineering, H Newmarket (business); 0530 D News in Brief, 0532 S Kolesnikov, M Jazz at Night, W/M Moscow Yesterday & Today, H Folk Box, F Audio Book Club (Russian lit.); A Timelines; 0547 T Music At Your Request.

WBCQ, Maine
7415 kHz.; 0500 S Tom & Darryl (electronic media), M/A Ama ‘N Andy, 0515 T/F Planet Word News Tonight; 0545 M World of Radio.

WRMI, Florida
3750 kHz.; 0500 S Twilight Zone (science fiction), M Old Time Radio (cont’d).

WVCR, Tennessee
5070 kHz.; 0500 S Cyber Line (digital communications).

0600 UTC / 1am E / 10pm P - Page 46 Freqs

CHANNEL AFRICA, South Africa
0600 S Network Africa (week in review), M/F Dateline Africa (news magazine), A Channel Africa Sport.

RADIO AUSTRALIA
0600 D News; 0605 S The Arts on RA, A Feedback (letters/stories on communications), 0610 M/F Regional Sports Report, 0620 M/Ockham’s Razor (science opinion), T In Conversation, W Lingua Franca (about

November 2003
VOICE OF NIGERIA  
VOICE OF AMERICA, Africa Service  
587415 kHz.: 0600 S Juliet's Wild Kingdom.  
0600 D Nigeria/Africa/World News (magazine); 0630 S In the News, A Network, D/Radio Minutes; 0645 A Window on Abuja.

RADIO HABANA CUBA  
0600 D International News; 0610 M From Habana (Cuban musicians), T/S National News; 0615 T S Reports and music; 0630 M The Jazz Place or Top Tens, T/S News Bulletin; 0635 S World of Stamps, T/A Reports and music; 0650 S Cuban music.

RADIO JAPAN - NHK WORLD  

RADIO NEW ZEALAND INTERNATIONAL  
0600 S/A NZN News, M-F Checkpoint (repeat of 0400); 0604 S One in Five (disability issues), A Saturday Night with Peter Fy (variety); 0635 S This Week in Parliament.

RADIO FOR PEACE INTERNATIONAL, Costa Rica  
0600 S Mailbag, M Spiritual Awakening, T Middle East Project, W CounterSpin (media analysis), H-Making Contact, F Peace Watch (cont'd.), A WINGS, 0630 S Making Contact, M World of Radio, T/A Hightower Radio (commentary), 0635 S/A Earthwatch (ecology); 0640 T/A Earth & Sky (astronomy); 0645 S T Neumaier Report, W/A UN programs.

RADIO ROMANIA INTERNATIONAL  

VOICE OF AMERICA, Africa Service  
0600 S/A News & Reports, M-F Daybreak Africa (morning newsmagazine); 0623 S/A Sports, 0630 S/A News Headlines; 0633 S Main Street (about America, incl. Kim Elliott media report), A The On The Line (US foreign policy).

VOICE OF NIGERIA  
0600 D Nigeria/Africa/World News (magazine); 0630 S In the News, A News Maker, 0645 A Window on Abuja.

KWHR, Hawaii  
11565 kHz.: 1000 A DXing with Cumbre.

1100 UTC / 6am E / 3am P - Page 48 Freqs

BBC WORLD SERVICE (am)(eas)  

RADIO JAPAN - NHK WORLD  

RADIO NEW ZEALAND INTERNATIONAL  
1100 D News; 1105 S Mediawatch, M-F Late Edition (the day's news), A Deep Purple (relaxing music/mosta-gio); 1035 S Sunday Supplement.

RADIO FOR PEACE INTERNATIONAL, Costa Rica  
1100 S Country Life Today, M-F Seoul Calling (international music), M Research File (science), T Mailbox (letters & DX news) or W/Talk (station info), W Tradewinds (Pacific commerce), H The World in Sport, F Pacific Correspondent.

RADIO FOR PEACE INTERNATIONAL, Costa Rica  
1100 S/T UXC Radio, M Living Enrichment Center, T Making Contact, W/H/A Peace Watch; 1130 S World of Radio, T Steppin' Out of Babylon, F Peace Watch.

WWCR, Tennessee  
5070 kHz.: 1130 A World of Radio.

1200 UTC / 7am E / 4am P - Page 48 Freqs

BBC WORLD SERVICE (am)(eas)  
1200 D News, F News Commentary, A Worldwide Friendship (letters, cards on the table or The Studio, M Sunday Society Today, F Cards on the Table (debate) or The World of Culture, M Romanian by Radio, T/H/A Honoring Mother Earth: Indigenous Voices, T/A Democracy Now!; 1030 S Freespeech Radio News (repeat of Fri. newscast).

VOCAL WORLD OF NEWS (News Now)  
1000 D News and Reports; 1023 D Sports; 1030 D News Headlines; 1033 S Main Street Life in the US); F/A On the Line (US foreign policy); 1055 A Government Editorial.

KWHR, Hawaii  
11565 kHz.: 1000 A DXing with Cumbre.

1100 UTC / 6am E / 3am P - Page 48 Freqs

BBC WORLD SERVICE (am)  

RADIO JAPAN - NHK WORLD  

RADIO NEW ZEALAND INTERNATIONAL  
1100 D News; 1105 S Mediwatch, M-F Late Edition (the day's news), A Deep Purple (relaxing music/mosta-gio); 1035 S Sunday Supplement.

RADIO FOR PEACE INTERNATIONAL, Costa Rica  
1100 S Country Life Today, M-F Seoul Calling (international music), M Research File (science), T Mailbox (letters & DX news) or W/Talk (station info), W Tradewinds (Pacific commerce), H The World in Sport, F Pacific Correspondent.

RADIO FOR PEACE INTERNATIONAL, Costa Rica  
1100 S/T UXC Radio, M Living Enrichment Center, T Making Contact, W/H/A Peace Watch; 1130 S World of Radio, T Steppin' Out of Babylon, F Peace Watch.

WWCR, Tennessee  
5070 kHz.: 1130 A World of Radio.

1200 UTC / 7am E / 4am P - Page 48 Freqs

BBC WORLD SERVICE (am)(eas)  
1200 D News, F News Commentary, A Worldwide Friendship (letters, cards on the table or The Studio, M Sunday Society Today, F Cards on the Table (debate) or The World of Culture, M Romanian by Radio, T/H/A Honoring Mother Earth: Indigenous Voices, T/A Democracy Now!; 1030 S Freespeech Radio News (repeat of Fri. newscast).

VOCAL WORLD OF NEWS (News Now)  
1000 D News and Reports; 1023 D Sports; 1030 D News Headlines; 1033 S Main Street Life in the US); F/A On the Line (US foreign policy); 1055 A Government Editorial.

KWHR, Hawaii  
11565 kHz.: 1000 A DXing with Cumbre.

1100 UTC / 6am E / 3am P - Page 48 Freqs

BBC WORLD SERVICE (am)  

RADIO JAPAN - NHK WORLD  

RADIO NEW ZEALAND INTERNATIONAL  
1100 D News; 1105 S Mediwatch, M-F Late Edition (the day's news), A Deep Purple (relaxing music/mosta-gio); 1035 S Sunday Supplement.

RADIO FOR PEACE INTERNATIONAL, Costa Rica  
1100 S/T UXC Radio, M Living Enrichment Center, T Making Contact, W/H/A Peace Watch; 1130 S World of Radio, T Steppin' Out of Babylon, F Peace Watch.

WWCR, Tennessee  
5070 kHz.: 1130 A World of Radio.
<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALL INDIA RADIO</strong></td>
<td>1800 UTC / 12pm E / 9am P</td>
<td>Page 51 Freqs</td>
</tr>
<tr>
<td><strong>CHANNEL AFRICA, South Africa</strong></td>
<td>1700 S Network Africa (week in review), M-F Dateline Africa (news magazine), A Channel Africa Sport.</td>
<td></td>
</tr>
<tr>
<td><strong>CHANNEL AFRICA, South Africa</strong></td>
<td>1700 S Network Africa (week in review), M-F Dateline Africa (news magazine), A Channel Africa Sport.</td>
<td></td>
</tr>
<tr>
<td><strong>RADIO AUSTRALIA</strong></td>
<td>1700 D News; 1705 S Sound Quality (innovative music), M-F Australia Talk Back (phone-in), A The Spirit of Things (spiritual matters); 1755 M-F Perspective (commentary), A The Pulse (Aussie new music).</td>
<td></td>
</tr>
<tr>
<td><strong>RADIO JAPAN, NHK WORLD</strong></td>
<td>1700 M News; 1710 S Pop Joins the World, M-F Songs for Everyone, A Hello from Tokyo (listener contact); 1715 M-F 44 Minutes (feature magazine).</td>
<td></td>
</tr>
<tr>
<td><strong>RADIO FOR PEACE INTERNATIONAL, Costa Rica</strong></td>
<td>1800 S/A Shortwave Radio Network (cont'd).</td>
<td></td>
</tr>
<tr>
<td><strong>SWISS RADIO INTERNATIONAL</strong></td>
<td>1700 UTC / 12pm E / 9am P</td>
<td>Page 51 Freqs</td>
</tr>
<tr>
<td><strong>ALL INDIA RADIO</strong></td>
<td>1900 UTC / 2pm E / 11am P</td>
<td>Page 52 Freqs</td>
</tr>
<tr>
<td><strong>VOICE OF NIGERIA</strong></td>
<td>1900 UTC / 2pm E / 11am P</td>
<td>Page 52 Freqs</td>
</tr>
</tbody>
</table>

---

**Shortwave Guide**

- **WHRL, Indiana**: 13760 kHz.: 1600 A DXing with Cumbre.
- **WRMI, Florida**: 15725 kHz.: 1600 S/A Shortwave Radio Network (cont'd).

**Voice of America, Africa Service**

- **VOICE OF AMERICA, Africa Service**

**Voice of America, Costa Rica**

- **RTE, Ireland**: 1830 S Saturday View, M This Week with Gerald Barry, T A S Live (top news of the day).

**Voice of America, Hawaii**

- **SWISS RADIO INTERNATIONAL**
  - 1900 S/A Presidential Radio Address/Democratic Response.

**Radio Australia**

- **2000 UTC / 3pm E / 12pm P**
  - **DEUTSCHE WELLE** 2000 D News; 2005 S Mailbag, M-F Newlink Africa, A Inside Europe; 2030 M Insight (international affairs), T World in Progress (development), A Money Talks, H Man & Environment, F Spectrum (sci-tech); 2045 M Business German.

**Radio Australia**

- **2000 UTC / 3pm E / 12pm P**
  - **DEUTSCHE WELLE** 2000 D News; 2005 S Mailbag, M-F Newlink Africa, A Inside Europe; 2030 M Insight (international affairs), T World in Progress (development), A Money Talks, H Man & Environment, F Spectrum (sci-tech); 2045 M Business German.

**Radio Australia**

- **2000 UTC / 3pm E / 12pm P**
  - **DEUTSCHE WELLE** 2000 D News; 2005 S Mailbag, M-F Newlink Africa, A Inside Europe; 2030 M Insight (international affairs), T World in Progress (development), A Money Talks, H Man & Environment, F Spectrum (sci-tech); 2045 M Business German.

**Radio Australia**

- **2000 UTC / 3pm E / 12pm P**
  - **DEUTSCHE WELLE** 2000 D News; 2005 S Mailbag, M-F Newlink Africa, A Inside Europe; 2030 M Insight (international affairs), T World in Progress (development), A Money Talks, H Man & Environment, F Spectrum (sci-tech); 2045 M Business German.
<table>
<thead>
<tr>
<th>Country</th>
<th>Frequency</th>
<th>Broadcasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>2234 kHz</td>
<td>M-F Flinders Tones (community)</td>
</tr>
<tr>
<td>Austria</td>
<td>2235 kHz</td>
<td>M-F Flappers Tones (music)</td>
</tr>
<tr>
<td>Turkey</td>
<td>2237 kHz</td>
<td>M-F Flinders (partner)</td>
</tr>
<tr>
<td>Japan</td>
<td>2244 kHz</td>
<td>M-F Flinders (partner)</td>
</tr>
<tr>
<td>Ireland</td>
<td>2254 kHz</td>
<td>M-F Flippers Tones (economics)</td>
</tr>
</tbody>
</table>

**SWISS RADIO INTERNATIONAL**

2230 S/A Swiss Scene, M-F Newsletter; 2335 A Tock: 1740 S Culture Zone (the arts: 1st/3rd wk) or Out and About (Swiss places:2nd/4th wk), A Sounds Good [Swiss music:3rd/5th wk], 2345 F Business Spotlight.

**VOICE OF TURKEY**


**RADIO PRAGUE**


**RADIO CANADA INTERNATIONAL**


**WBCQ, Maine**

5105 kHz: 2300 M-F Radio Caroline (the original European pirate radio station).

7415 kHz: 2300 W World of Radio, F Pab Sungenis Project (cont’d), A Radio Timon Worldwide, 2330 W Think Tank North America (the bizarre), H Uncle Ed’s Musical Memories, F Wanton Display of Control & Disruption.

**WWZ, Maine**

17650 kHz: 2300 DXing with Cumbr, 2330 A DXing with Cumbr, 2345 M-F Business Spotlight.

**WBBQ, Missouri**

14950 kHz: 2300 DXing with Cumbr, 2330 A DXing with Cumbr, 2345 M-F Business Spotlight.

**WBBQ, South Dakota**

12160 kHz: 2300 S Travel Channel Radio.

**WBBQ, Tennessee**

9395 kHz: 2300 DXing with Cumbr, 2330 A DXing with Cumbr, 2345 M-F Business Spotlight.

**WBBQ, Wisconsin**

17650 kHz: 2300 DXing with Cumbr, 2330 A DXing with Cumbr, 2345 M-F Business Spotlight.

**Thank You ...**

Additional Contributors to This Month’s Shortwave Guide:

Mike Bannaclough, UK; Wolfgang Bueschel, Germany; Rich D’Angelo, NASWA Flash Sheet; Glenn Hauser, Enid, OK, DX Listening Digest, World of Radio; Jose Jacobo VU2JOS, India; Evelyn Marcy/WYFR; Anker Petersen, DX Window; Harold Sellers, Canada, OD/XDX/Ontario, Larry Van Horn, MT Asst. Editor, Alexander Yeyorov, Ukraine; BBC On Air; BCL News; BCDXC: CIXD: Cumbre DX: DXA: DX News; Firemaw: Hard Core DX; NASWA Journal; Observer: Worldwide DX Club.
Monitoring the Test Pilots

The Air Force Flight Test Center (AFFTC) at Edwards Air Force Base, California, is the Air Force Materiel Command (AFMC) center of excellence for research, development and test and evaluation of aerospace systems for the United States and its allies. It operates the U.S. Air Force Test Pilot School and is home to NASA’s Dryden Research Center and to considerable test activity conducted by America’s commercial aerospace industry.

From the development of the country’s first jet aircraft to the Air Force’s newest fighter, the F-22 Raptor, the test forces at Edwards have played a role in virtually every aircraft to enter the Air Force inventory since World War II.

The two major organizations coming out of the Center’s mission are the 412th Test Wing and the 95th Air Base Wing, with their nearly 6,000 service members and government employees.

The 412th Test Wing manages the Center’s flight operations programs and functions. In doing so, it manages all engineering support for manned and unmanned aerospace vehicle test programs. With many different types of planes operated by the 412th, the Edwards flight line takes on an almost expeditionary aerospace force look. The aircraft flown here include the B-1B, B-2, B-52H, C-12, C-17A, NC-135B/D, KC-135R, C-135C/E, CV-22B, F-15A/B/C/D/E/N/F, F-16A/B/C/D, F-22A, YF-12/D, A/T-38, F-15/A/B/C/D/E, Nike-Ajax, B-2, B-52H, C-12C, C-17A, C-130, PMD, C-141, C-130.

Additionally the Global Hawk unmanned aerial vehicle and L-29 glider are tested at Edwards. The Airborne Laser 747 test platform arrived in late 2002 for testing and in 2005 the X-35 Joint Strike Fighter aircraft will be tested here.

The 412th Test Wing programs, develops, operates and maintains engineering technical services and facilities to support testing, as well as operates and manages logistic support.

The Test Wing’s support-side counterpart, the 95th Air Base Wing, runs Edwards like a small town, delivering a quality of life that makes the base a great place to live and work. The Air Base Wing maintains the security, roads, buildings, transportation and community support services that make the flight-test mission possible. It provides the housing, childcare, recreational activities and medical care that affect every person on base.

Table One is a listing of the pre-set VHF/UHF frequencies for the AFFTC Support Fleet and Test Pilot School aircraft. Table Two is a complete list of squadron and other Edwards base unit frequencies. Finally, Table Three is a list of ground and airborne callsigns for Edwards base units.

### Table One: AFFTC Support Fleet/USAF Test Pilot School Frequency Presets

<table>
<thead>
<tr>
<th>Ch.</th>
<th>VHF</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>269.90</td>
<td>ATIS</td>
</tr>
<tr>
<td>02</td>
<td>304.00</td>
<td>CONFORM</td>
</tr>
<tr>
<td>03</td>
<td>390.10</td>
<td>Edwards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Control</td>
</tr>
<tr>
<td>04</td>
<td>318.10</td>
<td>Edwards Tower Primary</td>
</tr>
<tr>
<td>05</td>
<td>272.00</td>
<td>SPORT</td>
</tr>
<tr>
<td>06</td>
<td>335.60</td>
<td>JOSHUA (Isabella)</td>
</tr>
<tr>
<td>07</td>
<td>322.30</td>
<td>JOSHUA (Owens)</td>
</tr>
<tr>
<td>08</td>
<td>256.80</td>
<td>JOSHUA (Saline)</td>
</tr>
<tr>
<td>09</td>
<td>291.60</td>
<td>JOSHUA (Panamint)</td>
</tr>
<tr>
<td>10</td>
<td>354.40</td>
<td>Air Refuel</td>
</tr>
<tr>
<td>11</td>
<td>315.90</td>
<td>Low Level</td>
</tr>
<tr>
<td>12</td>
<td>340.20</td>
<td>China Lake Naval Air Weapons Station (NID) Tower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JOSHUA (PMD-Palmdale)</td>
</tr>
<tr>
<td>13</td>
<td>290.30</td>
<td>126.10</td>
</tr>
<tr>
<td>14</td>
<td>317.60</td>
<td>123.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Palmdale Production Flight Test Installation AF Plant 42 (PMD)</td>
</tr>
<tr>
<td>15</td>
<td>286.40</td>
<td>Tower Mission</td>
</tr>
<tr>
<td>16</td>
<td>294.60</td>
<td>MISSION</td>
</tr>
<tr>
<td>17</td>
<td>297.40</td>
<td>MISSION (Test Pilots School)</td>
</tr>
<tr>
<td>18</td>
<td>262.50</td>
<td>MISSION (Test Pilots School)</td>
</tr>
<tr>
<td>19</td>
<td>236.60</td>
<td>Edwards Tower Secondary</td>
</tr>
<tr>
<td>20</td>
<td>308.70</td>
<td>Supervisor of Flight/ Tech Assistance</td>
</tr>
</tbody>
</table>

### Table Two: Squadron/Organization Frequencies

<table>
<thead>
<tr>
<th>Flight Test Squadron</th>
<th>Callsign</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>410 FLTS</td>
<td>Dagger Ops</td>
<td>322.700</td>
<td>226.600</td>
<td></td>
</tr>
<tr>
<td>411 FLTS</td>
<td>Raptor Ops</td>
<td>373.500</td>
<td>139.775</td>
<td></td>
</tr>
<tr>
<td>416 FLTS</td>
<td>Zoom Ops</td>
<td>311.200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>418 FLTS</td>
<td>Tiger Ops</td>
<td>379.700</td>
<td>288.700</td>
<td>123.150</td>
</tr>
<tr>
<td>419 FLTS</td>
<td>Torch Ops</td>
<td>276.650</td>
<td>279.900</td>
<td></td>
</tr>
<tr>
<td>B-1B</td>
<td></td>
<td>266.300</td>
<td>383.200</td>
<td></td>
</tr>
<tr>
<td>B-2</td>
<td></td>
<td>324.700</td>
<td>287.200</td>
<td></td>
</tr>
<tr>
<td>Voron Ops</td>
<td></td>
<td>315.200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>445 FLTS</td>
<td>Eagle Ops</td>
<td>351.400</td>
<td>300.800</td>
<td>385.900</td>
</tr>
<tr>
<td>452 FLTS</td>
<td>Aria Ops</td>
<td>267.800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TPS</td>
<td>Cobra Ops</td>
<td>297.400</td>
<td>262.500</td>
<td></td>
</tr>
<tr>
<td>NASA</td>
<td>NASA 4</td>
<td>371.100</td>
<td>135.825</td>
<td></td>
</tr>
<tr>
<td>OL-HM</td>
<td>X-ray Control</td>
<td>290.700</td>
<td>138.000</td>
<td></td>
</tr>
</tbody>
</table>

### Table Three: Edwards Callsigns

<table>
<thead>
<tr>
<th>Ground Callsigns</th>
<th>AFMC Support Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>COBRA - Normal Operations</td>
<td></td>
</tr>
<tr>
<td>EAGLE/RICK</td>
<td></td>
</tr>
<tr>
<td>LIT/DACO/POGO</td>
<td></td>
</tr>
<tr>
<td>PONDEROSA</td>
<td></td>
</tr>
<tr>
<td>R-2515SPORT</td>
<td></td>
</tr>
<tr>
<td>SPARE</td>
<td></td>
</tr>
<tr>
<td>ASPEN</td>
<td></td>
</tr>
</tbody>
</table>

I would like to thank Robert Wyman for his assistance in preparing this Edwards AFB profile.

**Robins AFB, Georgia, Airshow Report**

Some of our regular Milcom southeast military monitors attended the Robins Airshow in September and one of them, Mike Riffle, put together an excellent after show report which he shares with Milcom readers below. My additional comments will be offset in brackets.

**Show Frequencies**

123.150 Lima Lima flight team
126.200 Show Boss victor (Robins tower frequency)
133.225 Red Talon/Eagles flight team
143.850 Thunderbird four ship
239.350 Thunderbird solos
320.100 Show Boss uniform (Robins tower freq)
376.025 F-15 west coast demonstration team
413.250 Thunderbird ground (referred to as comm 1)
Aerial Demonstration Aircraft/Callsigns

**ROGUE 01**
C-130H 84-0205 700AS dropping the US Air Force Academy (USAF) Wings of Blue parachute team (Sunday only)

**EAGLE 01**
F-15 west coast demo team aircraft

**N908SP**
Bell OH-58A Georgia State Patrol helicopter flying traffic control

**RAZOR 22**
E-8C 116ACW

**ROGUE 01**
C-5B 86-0202 339FLTS flew by himself on Saturday then a formation flyby on Sunday with a C-130 (88-4402) and C-141 (66-0132) along with two F-15 aircraft in trail. One of the F-15s was 90-0240 and the other may have been the F-15 aircraft listed below. All were from Robins Air Logistics Command (ALC).

**ROGUE ##**
F-15E 86-0184 445FLTS Robbins ALC demonstration aircraft

**STEALTH 81**
F-117 49FWF

**TOIL 35**
C-130H 357AS dropping the USAF Wings of Blue and the 421st Quartermaster jump teams (Saturday only)

Static Displays

**A-10A**
79-0105 47FS had two frequency cards (below) onboard, both the same. First one was down by the radio, second one was on the left canopy pillar and was labeled Barksdale. Callsign SWINE 63

<table>
<thead>
<tr>
<th>Ch</th>
<th>Frequency</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>383.300</td>
<td>[197 Wing AFRES Tactical Communications, Barksdale AFB, LA]</td>
</tr>
<tr>
<td>02</td>
<td>275.800</td>
<td>[Barksdale AFB Ground Control]</td>
</tr>
<tr>
<td>03</td>
<td>295.700</td>
<td>[Barksdale AFB Tower]</td>
</tr>
<tr>
<td>04</td>
<td>350.200</td>
<td>[Shreveport Approach/Departure Control]</td>
</tr>
<tr>
<td>05</td>
<td>376.800</td>
<td>[Unknown user/usage]</td>
</tr>
<tr>
<td>06</td>
<td>346.250</td>
<td>[Fort Worth ARTCC-Shreveport, LA, RCAG, Approach/Departure Control Services]</td>
</tr>
<tr>
<td>07</td>
<td>236.500</td>
<td>[Fort Worth ARTCC-Shreveport, RCAG Special Use Discrete Air Force Training]</td>
</tr>
<tr>
<td>08</td>
<td>298.600</td>
<td>[Caddo Range R-3801 Range Control/Operations]</td>
</tr>
<tr>
<td>09</td>
<td>399.800</td>
<td>[Caddo Range R-2402 Range Control/Operations]</td>
</tr>
<tr>
<td>10</td>
<td>259.150</td>
<td>[Fort Polk Joint Readiness Center/Polk AAF, LACCSS Training Net]</td>
</tr>
<tr>
<td>11</td>
<td>226.500</td>
<td>[Fort Polk Approach/Departure Control]</td>
</tr>
<tr>
<td>12</td>
<td>255.400</td>
<td>[AAA Flight Service Stations – Nationwide]</td>
</tr>
<tr>
<td>13</td>
<td>288.100</td>
<td>[Houston ARTCC Alexandria, LA, RCAG Low/High Altitude Sector]</td>
</tr>
<tr>
<td>14</td>
<td>278.800</td>
<td>[Fort Worth ARTCC MOA Anise Discrete]</td>
</tr>
<tr>
<td>15</td>
<td>327.000</td>
<td>[Shreveport Approach/Departure Control]</td>
</tr>
<tr>
<td>16</td>
<td>261.300</td>
<td>[Fort Polk Approach/Departure Control]</td>
</tr>
</tbody>
</table>

**C-141C**
65-0225 729AS

**C-23B**
94-0312 171 AVN

<table>
<thead>
<tr>
<th>Ch</th>
<th>Frequency</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>271.600</td>
<td>Dobbins ARB, GA ATIS</td>
</tr>
<tr>
<td>02</td>
<td>275.800</td>
<td>Dobbins ARB Ground</td>
</tr>
<tr>
<td>03</td>
<td>397.200</td>
<td>Dobbins ARB Tower</td>
</tr>
<tr>
<td>04</td>
<td>126.975</td>
<td>Atlanta Approach/Departure Control</td>
</tr>
<tr>
<td>05</td>
<td>119.300</td>
<td>Atlanta Approach/Departure Control</td>
</tr>
<tr>
<td>06</td>
<td>121.000</td>
<td>Dobbins ARB Ground Control</td>
</tr>
<tr>
<td>07</td>
<td>134.125</td>
<td>Controlled Approach (GCA)</td>
</tr>
<tr>
<td>08</td>
<td>372.200</td>
<td>Dobbins ARB Pilot-to-Dot- Dosser (PTD)</td>
</tr>
<tr>
<td>09</td>
<td>47.000</td>
<td>[Probably AASF Operations for the 1-171 AVN Company C]</td>
</tr>
<tr>
<td>10</td>
<td>274.750</td>
<td>Dobbins ARB Pilot-to-Metro Service (PMVS)</td>
</tr>
<tr>
<td>11</td>
<td>122.800</td>
<td>Common Traffic Advisory Frequency (CTAF)</td>
</tr>
</tbody>
</table>

**ROGUE 01**
C-5B 86-0019 436AW this was an ALC aircraft on display

**TOIL 35**
C-130 95-0107 tail sticking out from hanger

**C-5B**
86-0019 436AW this was an ALC aircraft on display

**E-8C**
93-0597 116ACW

**EA-6B**
160436 VMAQ-1

**F-15E**
88-1677 333FS

**F-16A**
75-0745 part of the Cross Into The Blue exhibit

**C-135V**
64-14842 38RS

**T-37B**
64-13443 14FTW Callsign: CULASS 11 Note: the frequency card info was very difficult to see as it was sticking out perpendicular from the instrument panel, also the canopy was not open.

**C-5B**
86-0019 436AW this was an ALC aircraft on display

**C-5B**
86-0023 stripped of point

**C-5B**
70-0452 no engines

**C-17A**
95-0107 tail sticking out from hanger

Inside the cockpit of a C-5B on display (photo by Mike Riffle)

There was a C-141 parked in a roped off area by the static C-5 with tail 60143. According to Scramble that tail crosses to a "scrapyard on D" aircraft listing. However, this looked very much like an active aircraft from the 452AMW, including engine covers with the March AFB star on them. Could this have been the Thunderbirds support aircraft?

Robins ALC Aircraft

**C-5A**
69-0023 stripped of point

**C-5A**
70-0452 no engines

**C-5B**
86-0025 missing nose cone and engines

**C-17A**
95-0107 tail sticking out from hanger

And finally, Mike passed along this fabulous bit of communications humor heard during the airshow that weekend. He wrote, "As COBB 05 was taxiing back in on Sunday, NASA driver Ricky Rudd's #21 race car was giving rides down one of the taxiways. COBB 05 was instructed to 'hold short then taxi without delay, traffic is a, uh, Pontiac at your 10 o'clock.' Of course, Rudd drives a Ford, so that controller should be getting some remedial training for misidentifying a Ford as a Pontiac!"

Thanks to Mike for that great report. And until next month, 73 and good hunting.

Ricky Rudd's Ford "Pontiac"! (Mike Riffle)
Despite all the silence you hear while listening to police and fire department radio systems, the public safety spectrum in many locations is quite full. While efforts are underway to allocate new frequency bands, the Federal Communications Commission (FCC) has also been pushing to fit more users in the same amount of space. Their basic plan is to slice up the existing channels into smaller pieces and require users to operate within those pieces. This is a difficult requirement for the older analog radios, but the new digital systems—including APCO Project 25—are prepared for this eventually.

**APCO-25 Modulation**

The original APCO (Association of Public-Safety Communications Officials) Project 25 specifications, now a decade old, spelled out two phases for radio operation. Phase I operates in channels that are 12.5 kHz wide, which is the current FCC requirement. However, because the FCC wants to pack more users into the limited spectrum available, they’d like to eventually have everyone using radio channels that are 6.25 kHz wide, or half as much as before. To meet this requirement, Project 25 defined Phase II to operate within 6.25 kHz wide channels.

APCO-25 uses a modulation process called QPSK-c, which stands for Quadrature Phase Shift Keying, continuous. Modulation is just a fancy word for the process of carrying information content over some kind of carrier signal. The transmitter superimposes the information onto the carrier, and the receiver removes the information. Everyday AM (Amplitude Modulation) and FM (Frequency Modulation) radios tune to a carrier signal and retrieve the audio information sent by the radio station.

For Phase I systems, the version of QPSK—APCO-25 Modulation—used is called Compatible 4-Level Frequency Modulation (C4FM). When the basic Project 25 specifications were being worked out a decade ago, C4FM was chosen primarily because it provides relatively good efficiency without requiring equipment manufacturers to produce complex and expensive radios. C4FM is designed to operate within a radio channel that is 12.5 kHz wide.

Under the Phase II plan of Project 25, another type of QPSK-c modulation called CQPSK (Compatible Quadrature Phase Shift Keying) is used. It’s not all that different from C4FM, but requires a different transmitter and a little more work on the receive side to make things function correctly. The advantage is that it takes up less bandwidth than C4FM, allowing two users to fit where only one did before.

Because C4FM and CQPSK are so similar, the intent was that same basic receiver hardware could properly handle both Phase I (12.5 kHz) and Phase II (6.25 kHz) channels. This means that with modern digital signal processing (DSP) technology, the same scanner hardware should be able to handle both types of modulation.

**Digital Simulcasting**

As the new APCO-25 scanners make their way into hobbyist’s hands, there are reports that they don’t work correctly while monitoring some simulcast systems. (Simulcast just means that the same information is transmitted from more than one repeater at the same time, allowing users across a wide geographic area to all hear the same messages.) The symptoms are mainly the inability to hear an entire transmission. The first second or two of voice is heard, which then trails off to silence.

To add to your list of acronyms, there is another type of modulation scheme that’s used with some multi-site Project 25 systems. Linear Simulcast Modulation (LSM) is a trademarked term for a form of CQPSK that provides a way for receivers to properly handle multiple identical transmissions. It’s just different enough that the regular C4FM processing doesn’t work correctly.

Because no Phase II systems are currently in operation, the developers at Uniden and GRE didn’t expect an immediate need to handle this type of modulation. However, several municipalities are using LSM/CQPSK modulation for simulcast, including Phoenix and Mesa in Arizona; the greater Twin Cities area of Minnesota; Hamilton County in southwest Ohio; and Austin and Travis County in Texas.

If you live near any of these areas, or monitor systems that are “pure” APCO-25 with simulcasting, you may want to wait until Radio Shack has an upgrade for the PRO-96.

As described in the August Tracking the Trunks column, the Radio Shack PRO-96 (built by GRE) was designed to accept updates to the “DSP Application” portion of the scanner through the use of flash upgrades. This kind of flexibility allows production problems and bugs to be corrected without the need to buy a new scanner or replace circuit boards. In this case, an upgrade can also add new features and capabilities.

Radio Shack is expected to provide a firmware update that will give the scanner the ability to process LSM transmissions. As of this writing there’s no release date for such an update, nor indication whether there will be a cost involved. There may be a way to have the upgrade done at your local Radio Shack store, or to download the upgrade from Radio Shack’s web site. We’ll keep you posted as we get more details.

No word yet from Uniden on a fix for their scanners, although they have a new pair of scanners in the works to compete with the PRO-96.

**New Uniden Scanner**

There’s a rule of thumb in the software business: “Never buy revision 1.0,” meaning don’t buy a product when it’s first produced, since it’s likely to have bugs. It takes time to iron out bugs and integrate new features. This happened to the Pontiac Fiero in the 1980s, which was famous for production problems early in its life. On the other hand, if no one ever bought revision 1.0 there would never be revision 1.1.

In any case, Uniden is circulating pre-release information about a pair of enhanced scanners to correct some of the shortcomings of the current 250D and 785D digital scanners. The new 296D (handheld) and 796D (base/mobile) scanners are very similar to the 250D and 785D, but will have the ability to track digital trunked systems that use a 9000-baud control channel. Also, a digital decoder card will be included—current scanners require the purchase of a separate card (the BCi25D) in order to handle APCO-25 systems.

So far there is no exact release date, although it’s expected to be available in early 2004. Price is rumored to be around a thousand dollars, although no official list price has been forthcoming.

** Rapids Parish, Louisiana**

Dear Dan,

In the July 2003 Tracking the Trunks column you requested Talk Group IDs for Rapids Parish, Louisiana. This is a Motorola Type II
There is a private TRS in the area using frequencies 853.3375; 856.1125; 856.5375; 857.1125; 857.5375; 858.5375; and 859.5375. Thanks to guidance from Larry Van Horn, and the FCC web site, I have discovered that this system is licensed to Tower Communications of Alexandria, Louisiana. They, in turn, contract out the system to area businesses. The following is nearly all of the active talkgroups, with some confirmations:

<table>
<thead>
<tr>
<th>Code</th>
<th>Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1648</td>
<td>Kay Radio and Electronics</td>
</tr>
<tr>
<td>144</td>
<td></td>
</tr>
<tr>
<td>272</td>
<td></td>
</tr>
<tr>
<td>464</td>
<td></td>
</tr>
<tr>
<td>720</td>
<td></td>
</tr>
<tr>
<td>1104</td>
<td></td>
</tr>
<tr>
<td>1232</td>
<td></td>
</tr>
<tr>
<td>1344</td>
<td></td>
</tr>
<tr>
<td>1560</td>
<td>Hixon Autoplex</td>
</tr>
<tr>
<td>2128</td>
<td></td>
</tr>
<tr>
<td>2384</td>
<td></td>
</tr>
<tr>
<td>2448</td>
<td>Newschannel 5</td>
</tr>
<tr>
<td>3280</td>
<td></td>
</tr>
<tr>
<td>4240</td>
<td></td>
</tr>
<tr>
<td>4368</td>
<td></td>
</tr>
<tr>
<td>8736</td>
<td></td>
</tr>
<tr>
<td>40976</td>
<td></td>
</tr>
<tr>
<td>41024</td>
<td></td>
</tr>
<tr>
<td>41040</td>
<td></td>
</tr>
<tr>
<td>41104</td>
<td></td>
</tr>
<tr>
<td>41136</td>
<td></td>
</tr>
<tr>
<td>41216</td>
<td>Cabrini Outpatient Services (most active channel)</td>
</tr>
<tr>
<td>41248</td>
<td></td>
</tr>
<tr>
<td>41296</td>
<td></td>
</tr>
<tr>
<td>41376</td>
<td></td>
</tr>
<tr>
<td>41408</td>
<td></td>
</tr>
</tbody>
</table>

I will continue to monitor this system to obtain a more complete list of users.

One tip for the scanner enthusiast: A city map and a telephone book are great tools to make your Talkgroup ID confirmations.

I hope that this information will be of use to you.

– Bill in Pineville, Louisiana

Cleveland, Ohio

I was curious as to whether the Pro-96 will be able to receive the city of Cleveland digital radio system, which is not APCO-25 compliant. Any information would be appreciated. Thank You.

– Larry in Ohio

Like Memphis, Tennessee, the city of Cleveland uses Motorola digital radios – but they do not follow the APCO Project 25 standard. The digital voice is done through an older vocoder (voice encoder/decoder) called VSELP (Vector Sum Excited Linear Prediction) instead of the IMBE (Improved Multi-Band Excitation) vocoder specified in the APCO-25 standard. Since there is currently no consumer scanner that can process VSELP, you won’t be able to hear digital transmissions on the PRO-96.

Cleveland’s system uses the following frequencies: 851.0125, 851.1375, 851.1875, 851.2375, 851.2875, 851.3375, 852.0125, 852.1375, 852.1875, 852.2375, 852.2875, 852.3375, 852.3875, 853.0125, 853.1375, 853.1875, 853.2375, 853.2875, 854.0125, 854.1375, 854.1875, 854.2375, 854.2875, 854.3375, 855.0125, 855.1375, 855.1875, 855.2375, 855.2875 and 855.3375 MHz.
NASA Callsigns

WPBA230 - WPBA244
Goddard Space Flight Center
WPBA245 - WPBA259
Jet Propulsion Laboratory
WPBA260 - WPBA274
Johnson Space Center
WPBA275 - WPBA289
Kennedy Space Center
WPBA290 - WPBA304
Langley Research Center
WPBA305 - WPBA319
Glen Research Center
WPBA320 - WPBA335
Marshall Space Flight Center
WPBA336 - WPBA350
Stennis Space Center
WPBA351 - WPBA365
Wallops Flight Facility
WPBA366 - WPBA380
Applicable only to fixed operations.

Washington-based). The callsigns are assigned, as required, to all frequency users at the Center or JPL, including commercial contractors. For special requirements or when there's a shortage of basic callsigns, any assigned basic callsign may be expanded by suffixing any letter (A-Z) or any number (including zero), and may consist of more than one digit.

The callsigns allocated to each NASA Center and JPL are shown below.

**Experimental Callsigns**
- Glenn Research Center NA2XAA - NA2XGZ
- Dryden Flight Research Center NA2XHA - NA2XOZ
- Langley Research Center NA2XPA - NA2XZZ
- Ames Research Center NA3XAA - NA3XGZ
- **Goddard Space Flight Center**
  - NA3XHA - NA3XOZ
- NASA Headquarters NA3XPA - NA3XZZ
- Jet Propulsion Laboratory NA3XSA - NA3XZZ
- Marshall Space Flight Center NA4XAA - NA4Xez
- **Stennis Space Center**
  - NA4XHA - NA4XOZ
- Wallops Flight Facility NA4XHA - NA4XOZ
- Kennedy Space Center NA4XHA - NA4XOZ
- Johnson Space Center NA5XAA - NA5XGZ

**HF Callsigns**
- NASA Headquarters KHA900 - KHA904
- Ames Research Center KHA905 - KHA909
- **Dryden Flight Research Center**
  - KHA910 - KHA919
- **Goddard Space Flight Center**
  - KHA915 - KHA919
- **Jet Propulsion Laboratory**
  - KHA920 - KHA924
- Johnson Space Center KHA925 - KHA929
- **Kennedy Space Center**
  - KHA930 - KHA934
- Langley Research Center KHA935 - KHA939
- **Glenn Research Center**
  - KHA940 - KHA944
- **Marshall Space Flight Center**
  - KHA945 - KHA949
- Stennis Space Center KHA950 - KHA954
- Wallops Flight Facility KHA955 - KHA959
- **Spare Call Signs**
  - KHA960 - KHA969
- Applicable only to fixed operations.

**VHF/UHF Callsigns**
- NASA Headquarters WPBA200 - WPBA214
- Ames Research Center WPBA215 - WPBA229
- Dryden Flight Research Center WPBA230 - WPBA244

Monitoring the NICD
Some of the more exciting communications in the VHF/UHF spectrum involve the government agencies who fight wildfires and forest fires. The National Interagency Incident Communications (NAIIC) acts as a clearing house for these activities. Here is a list of the NICD frequencies used by air assets.

**NICD National Air Frequencies**
- 122.850 National Civil Air (AM) frequencies (Air-to-air, air-to-ground, fixed and rotor wing)
- 122.975 National Civil Air (AM) frequencies (Air-to-air, air-to-ground, fixed and rotor wing)
- 123.025 National Civil Air (AM) frequencies (Air-to-air, air-to-ground, fixed and rotor wing)
- 123.050 National Civil Air (AM) frequencies (Air-to-ground, fixed and rotor wing)
- 123.075 National Civil Air (AM) frequencies (Air-to-air, air-to-ground, fixed and rotor wing)
- 166.675 Air Tactics (FM) <Group 2, Channel 1> Air-to-air and air-to-ground
- 166.750 Air Tactics (FM) <Group 2, Channel 2> Air-to-air and air-to-ground
- 166.825 Air Guard Frequency (Air-to-air initial contact; emergency ground-to-air communications; and initial call, recall and redial.)
- 166.650 National Flight Following (Flight following, dispatch, and/or redirection of aircraft; air-to-ground and ground-to-air administrative traffic.) This frequency is not authorized for ground-to-ground traffic.
- 169.150 Air Tactics (FM) <Group 2, Channel 1> <Group 2, Channel 2> Air-to-air and air-to-ground
- 169.200 Air Tactics (FM) <Group 2, Channel 3> Air-to-air and air-to-ground
- 170.000 Air Tactics (FM) <Group 2, Channel 4> Air-to-air and air-to-ground

And while we are on the subject of the NICD, according to their official website, this agency will change all the national cache radios to narrowband analog for the 2004 fire season. Radios will remain wideband analog in 2003. And some good news for owners of the new digital scanners. The NICD will only purchase P25 digital radios in the future. Analog radios will be replaced during normal replacement cycles.

One additional note for federal monitors: The departments of Agriculture and Interior have prohibited the use of Family Radio Service (FRS) radios. FRS radios cannot be used by anyone associated with federal wildland fire/incidents. This includes agency, military, and contractor personnel.

**US Government Comms in France**
We have a new reporter this month from France who identifies himself as "Pizza Waves." He passes along the following report on US government frequencies in Paris, France.

- **444.4875 FM simplex (no encryption), security service embassy US (marines guard or diplomatic SS) Callsigns: Charlie and Delta**
- **464.4875 FM simplex (no encryption) American security service (not US embassy) Callsigns: Tango and Delta**

Thanks, PW, and we look forward to future reports.

**More APCO Project-25 Comms**
We continue to receive increasingly more mail regarding the federal government’s use of the APCO Project 25 standards. Fed Files regular reporter Chris Parris passes along the following observations.

- **165.950 MHz P-25**
  - "I just heard an extensive conversation on this frequency using P25 digital, but not encrypted between a mobile unit and ‘Saem洙 Base.’ Both were hitting the Portland repeater very nicely and were commenting on how good the new radio system seems to be working and complimenting the radio techs. Also mentioned a repeater in Eugene, but didn’t mention if it was on the same frequency pair. (What is the input to this repeater anyway?)"

- **417.200 MHz Analog**
  - "I just heard the local (Portland, OR) Federal Protection Sector dispatcher telling someone that ‘We don’t have digital at our end...’ but I did not hear any mobile unit trying to call in digital. They may have been trying from another region and the dispatcher was just keying up everyone in response, but the fact that they were talking about digital modes may mean they are moving that direction. Also heard today several units check-
San Diego Area Fed Communications

Also, Chris had a chance to spend some time down in the San Diego area and report on some of the interesting communications being monitored by area members via the Fedcom newsgroup. Here are some of Chris’ observations.

“First off, I do not believe that this system is running any kind of exotic digital mode other than Motorola ASTRO IMBE, APCO Project 25 compliant digital. I monitored these frequencies with the BC-250D scanner with the APCO-25 digital back, and heard both clear P25 and encrypted P25 digital on all these listed frequencies. I have looked into the ‘Seneca’ encryption that has been mentioned by some of the San Diego reporters, but the Motorola and Harris press information seems to describe ‘Seneca’ as the model name of the new line of radios, not a digital encryption standard, (There is a European project involving Motorola called SENECA, but it involves voice recognition in automobiles).

“Second, I can’t be sure this is a trunked system. I searched from one end of the VHF spectrum to the other and was never able to hear anything that even remotely sounded like trunking control data, or any other kind of data (other than DES on known Customs frequencies or paging control data, or any other kind of data (other than encryption standard, (There is a European project involving Motorola called SENECA, but it involves voice recognition in automobiles).

“I searched the bands using several radios, including the BC250D, the Optoelectronics Optocomm radio and an Alinco DJX-10. I also sat a various locations around the San Diego County area, including Point Loma, Cabrillo National Monument area, Mission Valley, El Cajon and the Alpine area. Again, no sign of any trunking data was heard.

“Another interesting question is the sheer number of frequencies that seem to be used. In preparation for this trip, I started a spreadsheet of the frequencies that had been posted to Fedcom. Although I’m sure I only caught some of the posts, there were close to 200 unique frequencies listed. The major technical benefit of using a trunk radio system is the efficient use of radio spectrum. You are supposed to be able to fit maximum users in minimum radio frequencies. If the system reported in the San Diego is trunked, it would appear to be going the wrong way – a maximum number of frequencies with an apparently small number of agencies!

“I will freely admit that I have no idea of how this system is set up as far as inputs, outputs, transmitter locations, and channels. There are many active frequencies that seem to be involved in this, but since they are mostly encrypted and the users or purposes can’t really be discerned, it’s still a guessing game.

“I can confirm that some of the unencrypted communications that were monitored sounded like Immigration Service operations. But since I heard only ASTRO IMBE digital communications, I honestly don’t think that the digital part of the system is somehow unique in requiring multiple repeaters inputs or outputs for its operation. Public safety radio systems around the country are using the same digital modes without any unusual requirements for multiple simultaneous repeaters. However those of us who are old enough to remember the older INS radio system, which did have repeaters feeding into other repeaters, one could often hear an INS patrol unit talking into four or five repeaters at the same time for wide-area coverage.

“Even with the previously mentioned Fedcom frequency posts, I can only confirm about 40 or so active frequencies that I believe are part of this San Diego area system. I could not find that many different frequencies were all activated with one input. I was searching through the listed frequencies and when one came up active, I did not hear others come up at the same time. Also, when one frequency did become active, that frequency seemed to stay active with that particular conversation until it was through and not hop over to another frequency as you might expect on a trunked system. When I was able to catch an unencrypted radio talking with an encrypted radio, the back-and-forth communications would stay on that frequency for the duration.

“So, here are the frequencies that I found active with digital communications during my searches, along with any notes on what was heard. P25 means unencrypted APCO Project 25 compliant digital communications; ENC means encrypted P25 digital communications.” (My comments will be in brackets as noted-LVH.)

Chris is planning on making further trips to the area to see what else he can find. I have a nice shopping list I am preparing for him and if anyone else in the San Diego area has some info they want to share we will be happy to present it here.

Finally, I would like to thank all of our reporters this month for their contributions to the column. Until next time – 73 and good hunting.

San Diego Area Frequencies

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Mode</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>143.2750</td>
<td>P25</td>
<td>Military, probably not part of “Justice System”</td>
</tr>
<tr>
<td>162.7000</td>
<td>ENC</td>
<td>Nothing in my files nationwide, new narrowband frequency allocation</td>
</tr>
<tr>
<td>162.8500</td>
<td>ENC</td>
<td>[INS paired with 165.825]</td>
</tr>
<tr>
<td>163.6500</td>
<td>ENC</td>
<td>[INS]</td>
</tr>
<tr>
<td>165.0625</td>
<td>ENC</td>
<td>[U.S. Army allocation, probably the California National Guard, see</td>
</tr>
<tr>
<td></td>
<td></td>
<td>173.4625]</td>
</tr>
<tr>
<td>165.8250</td>
<td>ENC</td>
<td>[INS paired with 162.975]</td>
</tr>
<tr>
<td>165.8750</td>
<td>ENC</td>
<td>[INS sometimes paired with 168.975]</td>
</tr>
<tr>
<td>165.8875</td>
<td>ENC</td>
<td>Busy [New splitter frequency, nothing in my files nationwide]</td>
</tr>
<tr>
<td>165.9125</td>
<td>ENC</td>
<td>Busy [ATF simplex]</td>
</tr>
<tr>
<td>166.8750</td>
<td>ENC</td>
<td>[National Park Service in California]</td>
</tr>
<tr>
<td>166.9000</td>
<td>ENC</td>
<td>[US Fish and Wildlife Service Nationwide]</td>
</tr>
<tr>
<td>166.9125</td>
<td>ENC</td>
<td>Strong at Mission Valley [Bureau of Reclamation reportedly in Califor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>nia and Interior/NPS in other parts of the US]</td>
</tr>
<tr>
<td>167.2250</td>
<td>ENC</td>
<td>[FBI]</td>
</tr>
<tr>
<td>167.2375</td>
<td>ENC</td>
<td>Strong at Mission Valley [FBI reportedly used in San Francisco and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sacramento]</td>
</tr>
<tr>
<td>167.3625</td>
<td>ENC</td>
<td>Busy [FBI reportedly used in Los Angeles and Sacramento]</td>
</tr>
<tr>
<td>167.3750</td>
<td>ENC</td>
<td>Busy [FBI]</td>
</tr>
<tr>
<td>167.5250</td>
<td>ENC</td>
<td>P25 Unencrypted digital heard [FBI]</td>
</tr>
<tr>
<td>167.6000</td>
<td>ENC</td>
<td>F11</td>
</tr>
<tr>
<td>167.7250</td>
<td>ENC</td>
<td>[FBI reportedly used in Los Angeles and Sacramento]</td>
</tr>
<tr>
<td>168.5000</td>
<td>P25/ENC</td>
<td>Suspected Border Patrol P25 [US Coast Guard Law Enforcement repea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ter system with inputs at 165.3215 and 164.300]</td>
</tr>
<tr>
<td>168.8250</td>
<td>P25</td>
<td>Unencrypted digital heard [INS paired with 162.875]</td>
</tr>
<tr>
<td>169.3000</td>
<td>P25</td>
<td>Transportation Security Administration repeater input at Lindbergh F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>eld</td>
</tr>
<tr>
<td>169.6375</td>
<td>ENC</td>
<td>[New splitter frequencies, nothing in my files nationwide]</td>
</tr>
<tr>
<td>170.0625</td>
<td>P25/ENC</td>
<td>Unencrypted digital heard [New splitter frequency, nothing in my fil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>es nationwide]</td>
</tr>
<tr>
<td>170.6750</td>
<td>ENC</td>
<td>Busy [INS]</td>
</tr>
<tr>
<td>170.7500</td>
<td>P25</td>
<td>Unencrypted digital heard [US Marshal Service]</td>
</tr>
<tr>
<td>170.9125</td>
<td>ENC</td>
<td>[New splitter frequencies, nothing in my files nationwide]</td>
</tr>
<tr>
<td>171.1750</td>
<td>ENC</td>
<td>[FBI reported in San Diego]</td>
</tr>
<tr>
<td>171.2625</td>
<td>ENC</td>
<td>Busy [FBI in San Diego]</td>
</tr>
<tr>
<td>171.3375</td>
<td>ENC</td>
<td>[Transportation Department - Federal Highway Administration in Cali</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fornia and US Coast Guard District 11]</td>
</tr>
<tr>
<td>171.4375</td>
<td>ENC</td>
<td>[New splitter frequencies, nothing in my files nationwide]</td>
</tr>
<tr>
<td>171.5125</td>
<td>ENC</td>
<td>Busy [NASA nationwide]</td>
</tr>
<tr>
<td>171.6375</td>
<td>ENC</td>
<td>[NASA nationwide]</td>
</tr>
<tr>
<td>172.0250</td>
<td>ENC</td>
<td>[National Park Service]</td>
</tr>
<tr>
<td>172.2875</td>
<td>ENC</td>
<td>[US Forest Service outside California]</td>
</tr>
<tr>
<td>172.4000</td>
<td>ENC</td>
<td>Busy [US Forest Service, Region 5]</td>
</tr>
<tr>
<td>172.5125</td>
<td>P25</td>
<td>[US Department of Agriculture nationwide]</td>
</tr>
<tr>
<td>172.9000</td>
<td>P25</td>
<td>Transportation Security Administration repeater output at Lindbergh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Field</td>
</tr>
<tr>
<td>173.3500</td>
<td>P25</td>
<td>Unencrypted digital heard [Nothing in my files nationwide]</td>
</tr>
<tr>
<td>173.4500</td>
<td>P25/ENC</td>
<td>Confirmed Border Patrol in P25</td>
</tr>
<tr>
<td>173.4625</td>
<td>ENC</td>
<td>[U.S. Army allocation, probably the California National Guard, see</td>
</tr>
<tr>
<td></td>
<td></td>
<td>165.0625]</td>
</tr>
<tr>
<td>173.6625</td>
<td>ENC</td>
<td>[Variety of users nationwide: NASA, VA, Air Force and Army]</td>
</tr>
<tr>
<td>173.9750</td>
<td>ENC</td>
<td>[The only user I have for this one is the National Weather Service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in Texas]</td>
</tr>
</tbody>
</table>
IBOC and LPFM Status

Back in July I wrote a few notes about IBOC (In Band On Channel) digital radio. At the time, the original “PAC” compression scheme faced serious problems. Critical listeners heard serious compression artifacts in IBOC-FM, and even many non-critical listeners thought IBOC-AM sounded worse than analog. The whole transition went on hold.

(Data compression is necessary to make digital radio possible within the bandwidth available. To oversimplify, compression works by calculating what parts of the audio your hearing isn’t sensitive to, and removing them from the bitstream.)

In mid-August, Ibiquity Digital Radio announced a new compression scheme or “codec”. Engineers who’ve heard the new scheme say HDC works much better than the original PAC system. Radio World magazine reports all the IBOC receivers makers have been using programmable integrated circuit chips in their receivers, so IBOC receivers can be reprogrammed to handle the improved codec.

Radio World suggests there are still problems with IBOC-AM, though. As I’m sure most readers know, the FCC is not authorizing nighttime IBOC-AM, due to adjacent-channel interference issues. The magazine suggests the interference complaints received from adjacent-channel stations once IBOC begins deployment will put another brake on digital AM. I suppose that wouldn’t surprise most DXers, either! The magazine makes mention of the European DRM shortwave digital system — though also noting that it doesn’t allow simultaneous analog and digital broadcasts on the same frequency. That would be a deal-killer in the U.S.

On a vaguely related note, Ibiquity has announced KFUO-AM (850) in St. Louis has begun IBOC operation. KFUO belongs to the Lutheran Church and carries religious programs. It’s one of a small number of “limited time” stations, operating from St. Louis sunrise until sunset at the Class A station on the frequency (KOA Denver). No mention is made of IBOC on KFUO-FM, a classical-music station that could probably make better use of digital!

BMI Power FM Settlement

National Public Radio reports FCC Chairman Michael Powell is planning on stepping up the issuance of LPFM permits. The Commission has taken some heat over excessive consolidation of media ownership, and apparently Powell feels loosening up on LPFM will allay some of these concerns.

The primary means for speeding up the process appears to involve the opening of a settlement period for mutually-exclusive groups of LPFM applications. “Mutually-exclusive” applications are groups of applications of which any one can be granted without causing interference to existing stations, but if more than one is granted they will interfere with each other. For example, group #89 includes three applications for 97.1 MHz:

- Polk Appreciation Society, Dane, Wisconsin
- Lake City Church, Inc., Madison, Wisconsin
- Sun Prairie Educational Association, Sun Prairie, Wisconsin

There are a total of 95 such groups involving 285 applications. These applicants had until the end of October to amend their applications to eliminate the exclusivity – to make all applications in a group grantable without interference. This can be done by moving transmitters further apart – by changing frequency – or by time-sharing agreements. The FCC statement said: “This settlement opportunity could rapidly push the total number of outstanding LPFM authorizations to over one thousand by year end.”

- Bits and Pieces

  - Monte Carroll WC4MBC here in Nashville has had interesting results with a long-wire antenna. For years, he used a 300-foot long-wire pointed northwest. It worked great, but was ugly and inconvenient. So he reorienting it, going 150 feet north from his 3rd-floor window to an 8-foot pole; then another 150 feet north to a 30-ft-high tree limb, then straight down to a terminating resistor and ground rod in a creek bed. It was a failure — “Lots of noise.” When the antenna broke in a storm, Monte reposisioned the north end over a lower limb, only about 10 feet high. It works perfectly.

  - Most radio stations operate only one transmitter on a frequency at a time. KKOB-770 Albuquerque is an exception. They’re required to protect WABC New York with a deep null in their directional antenna pattern. Unfortunately, the city of Santa Fe lies within that null; KKOB’s main transmitter cannot be heard in Santa Fe at night. (See the map. Santa Fe is the city at the upper right.)

- Write me at 7540 Highway 64 West, Brasstown NC 28902-0098, or by email to dougs@monitoringtimes.com. Good DX!
FM Pirate Radio Free Cascadia

During the late 1990s Radio Free Cascadia operated from time to time as an FM pirate on 98.5 MHz in the Eugene, Oregon area. In March 2001 the station suffered a bust by the Federal Communications Commission. But, in September, during the conference of the World Trade Organization in Cancun, Mexico, DXers were startled to hear Radio Free Cascadia return to the air. This time the station was widely heard all over North America, 15,045 kHz shortwave.

Pirate and clandestine radio stations are commonly operated by political protesters at various World Trade Organization meetings. Although operations of Radio Free Cascadia ceased when the WTO meeting in Cancun ended, this piece of information is worth remembering when the next WTO conference is organized.

In the meantime, if you would like to see more about Cascadia, their mission statement remains up on the internet at the http://www.efn.org/~radio985/statement.html URL. Both the shortwave clandestine and FM pirate versions of this station have been opposed to capitalist corporate domination of the world’s financial structure. During the special clandestine broadcast, Cascadia also mentioned other web sites, such as that of the Radio Project “Making Contact” program at http://www.radioproject.org/ on the internet.

There was immediate speculation that the embattled Radio for Peace International in Costa Rica might have something to do with the Cascadia broadcast. But, despite some announcements during the transmission that they were in solidarity with RFPI, there has been no definitive proof of this. Nevertheless, given the frequency and propagation conditions, it is possible that RFPI and Cascadia had some relationship for the duration of these special clandestine broadcasts. The definitive transmitter site had not been pinned down by the deadline for this case with ambiguous clandestine transmitter operations. But, it remains to be seen if this was a one-shot effort. (unknown)

Radio Chiguiro- Chiguiro’s South American pirate radio operations, commonly on 11430 kHz. (Santiago)

Partial India Radio- Parody of All India Radio programming and has created a new ID from the announcer omits the “radio” part of the ID. (unknown)

Captain Morgan- Typical rock music and pirate advocacy format. (None, asks for reports on the Free Radio Network)

Grasscutter Radio- Rock music pirate. At times the announcer omits the “radio” part of the ID. (Uses grasscutterradio@yahoo.com e-mail)

Foolin Slob Net- Well, some pirate finally bowed to a pejorative term from various stations’ programming and has created a new ID from it. Little is known about this one yet. (None, but may be related to WTHY)

Ironman Radio- Rock music. (Belfast)

KPSA- New one during the late summer. Their slogan is “all PSA’s, all the time,” sometimes even in Morse code, but it remains to be seen if this was a one-shot effort. (unknown)

KROW- poetry and other material from the movie “Crow,” apparently accounting for its call letters. (Elkhorn)

Lubavitcher Radio- This odd fundamentalist Jewish station continues to be heard from time to time by listeners on the east coast, using a medium wave frequency of 1710 kHz. (None)

Oxycontin Radio- Recreational drug advocacy. Recent shows mixed ragtime piano music in with the drug commercials. (unknown)

Polka Radio- Several MT contributors logged an unidentified station playing polka music during the late summer. Polka Radio may have made a reappearance, but no one had a clear and definite ID. (Unclear)

Radio Cochin- Cochin’s South American pirate radio operations, commonly on 11430 kHz. (Santiago)

Sunshine Radio- Rock oldies format overshadowed by the odd accent in which the announcer gives station IDs, sometimes making it difficult to understand the “Sunshine” name. (None, but some replies have resulted via the grasscutterradio@yahoo.com e-mail address)

Sycko Radio- Not as active as earlier in 2003; eclectic formats and their own professionally produced jingles. (Still none)

What We Are Hearing

At least half of the pirates that our readers reported this month have moved down to what is starting to become a new “standard frequency” for North American pirate broadcasts. Many pirates have given up on 6955 kHz as a result of interference from Peruvian broadcast stations and utility transmissions. So, if you sit down at your receiver in an attempt to find pirates, 6925 kHz is now the place to start.

If you sent in material to us, but do not see your name acknowledged here, you were a victim of last summer’s “Worm” incident.

Our readers heard all of these North American pirate broadcasters this month, despite thunderstorms and the big summer power failure. All pirates operate on a sporadic schedule, but shortwave pirate broadcasting increases noticeably on weekends and during major holiday periods.

Arthur J. Green Found

Back in the 1920s many of the shortwave broadcasting stations in the world were, technically, pirates by modern definitions, given the fact that many nations had not yet established regulatory mechanisms for broadcasting. But, back in those chaotic pioneer days of radio, DXers were already searching for information on the stations that could be heard on the shortwave bands.

The first shortwave broadcast club in the world for DXers was the International Short Wave Club. It was founded in the Klondyke neighborhood of East Liverpool, OH, by Arthur J. Green. Green’s qualifications were that he had heard 65 foreign shortwave stations. He had QSL verifications from 44 of them. Obviously there are hundreds of MT readers who have now exceeded Green’s DXing totals of 1930.

Better yet, the issue discovered by Jerry Berg’s includes a photo of Arthur J. Green. After 75 years, we need to memorialize both the pioneering work of Green’s International Short Wave Club, and the pioneering journalism of Radio Design magazine. Without the long-forgotten work of Green and the ISWC, we would probably not be reading Monitoring Times magazine today.

More information on the history of the International Short Wave Club in Klondyke and East Liverpool, OH, is available on the shortwave section of your editor’s web site, found at http://www.nacs.net/~george.
C - Band - 91 degrees West longitude

1(V) 11720 Data Transmissions
2(V) 11740 Data Transmissions
3(H) 11760 Occasional video
4(V) 11780 Data Transmissions
5(H) 11800 Data Transmissions
6(V) 11820 Occasional video
7(H) 11840 Data Transmissions
8(V) 11860 Occasional video
9(H) 11880 Occasional video
10(V) 11900 Muslim TV Ahmadiyya - MTA International (digital)
11(H) 11920 Data Transmissions
12(V) 11940 Occasional video
13(H) 11960 CNN NewsSource (digital)
14(V) 11980 Occasional video
15(H) 12000 Occasional video
16(V) 12020 Occasional video
17(H) 12040 Occasional video
18(V) 12060 The Florida Channel, Florida Knowledge Network (digital)
19(H) 12080 Louisiana Public Broadcasting (digital) / Montana PBS (digital)
20(V) 12100 Public Broadcasting Service (digital)
21(H) 12120 Public Broadcasting Service (digital)
22(V) 12140 Indiana Higher Educational Telecommunications Service (digital)
23(H) 12160 Public Broadcasting Service (digital) / Amnberg-CPS Channel (digital)
24(V) 12180 Public Broadcasting Service (digital)

Panamsat Galaxy 11

C - Band - 91 degrees West longitude

1(V) 11720 Data Transmissions
2(V) 11740 Data Transmissions
3(H) 11760 Data Transmissions
4(V) 11780 Data Transmissions
5(H) 11800 Data Transmissions
6(V) 11820 Occasional video
7(H) 11840 Data Transmissions
8(V) 11860 Occasional video
9(H) 11880 Occasional video
10(V) 11900 Data Transmissions
11(H) 11920 Data Transmissions
12(V) 11940 Occasional video
13(H) 11960 ABC Satellite Newsgathering (digital) / Occasional video
14(V) 11980 ABC Satellite Newsgathering (digital) / Occasional video
15(H) 12000 Data Transmissions
16(V) 12020 Occasional video
17(H) 12040 Data Transmissions
18(V) 12060 Primedia Workplace Learning (digital)
19(H) 12080 Data Transmissions
20(V) 12100 Occasional video
21(H) 12120 Data Transmissions
22(V) 12140 Occasional video
23(H) 12160 Data Transmissions
24(V) 12180 Data Transmissions
1-EX(V) 10964 (Brazil beamed)
2-EX(V) 10976 (Brazil beamed)
3-EX(V) 10994 (Brazil beamed)
4-EX(H) 11006 (Brazil beamed)
5-EX(V) 11024 (Brazil beamed)
6-EX(H) 11036 (Brazil beamed)
7-EX(V) 11054 (Brazil beamed)
8-EX(V) 11066 (Brazil beamed)
9-EX(V) 11084 (Brazil beamed)
10-EX(H) 11096 (Brazil beamed)
11-EX(V) 11114 (Brazil beamed)
12-EX(H) 11156 (Brazil beamed)
13-EX(V) 11144 (Brazil beamed)
14-EX(H) 11166 (Brazil beamed)
15-EX(V) 11174 (Brazil beamed)
16-EX(H) 11186 (Brazil beamed)

Panamsat Galaxy 3C

C - Band - 95 degrees West longitude

1(V) 11640 Satellite News (digital)
2(V) 11660 Satellite News (digital)
3(H) 11680 Data Transmissions
4(V) 11700 Data Transmissions
5(H) 11720 Data Transmissions
6(V) 11740 Data Transmissions
7(H) 11760 Data Transmissions
8(V) 11780 Data Transmissions
9(H) 11800 Data Transmissions
10(V) 11820 ABC Satellite Newsgathering (digital) / Occasional video
11(H) 11840 Data Transmissions
12(V) 11860 Occasional video
13(H) 11880 Occasional video
14(V) 11900 Data Transmissions
15(H) 11920 Data Transmissions
16(V) 11940 Occasional video
17(H) 11960 Data Transmissions
18(V) 11980 Occasional video / CBS network (digital)
19(H) 12000 Data Transmissions
20(V) 12020 Occasional video / CBS network (digital)
21(H) 12040 Data Transmissions
22(V) 12060 Occasional video / CBS network (digital)
23(H) 12080 Data Transmissions
24(V) 12100 Occasional video / CBS network (digital)
T he first edition of the BeaconFinder was prepared in October 1998. Since then, several hundred copies have been shipped to DXers for use in identifying the stations they hear. My intent for the Finder was not to replace the Aero/Marine Beacon Guide, (now defunct), but rather to offer an inexpensive alternative for those needing a guide focused squarely on North America and commonly logged foreign stations.

A second edition of the guide is now in print, entitled BeaconFinder II. (See advertisement elsewhere in this issue.) The book has been extensively revised, with a special emphasis on Canadian entries and commonly-logged Central and South American stations. Jacques d’Avignon, VE3VIA (ON) was instrumental in supplying the Canadian updates, and DX loggings/updates came from such longwave notables as Perry Crabill (VA), Dick Pearce (VT) and Al Hemmalin (RI).

Over the years, I’ve received several comments and questions about the guide. Experience tells me that if four people have a question, 40 more probably are wondering the same thing. The questions that follow, then, are representative samples of those I’ve received over the past few years. I’ve tried to answer each one completely, but I remain open to additional comments and will consider them for use in future editions.

Q. In the “Location” column, why are the names of U.S. states spelled out instead of abbreviated? Isn’t that a lot of extra work?

A. Entries for the guide come from many sources, including FAA lists in the public domain, aviation databases, and hobby/personal loggings. In the case of the U.S. Aeronautical beacons, my source material already contains spelled out state names for each entry. As such, it is much simpler to leave them as they are. Sure, I could have used my computer’s Search and Replace function to change them into abbreviations, but what would be the point? The process would need to be repeated 50 times – once for each state, and with the current mix of other abbreviations used in the same column (ITU Country Codes, Canadian Provinces, etc.) the state listings would not stand out as well as they currently do.

Q. Why is the frequency listed for each station, rather than a single entry at every increment thereafter?

A. Again, this is primarily due to how I receive the source material for the guide. The majority of the databases I use include individual frequency entries for each listing. It would be a very time-consuming process to pull through the nearly 1,000 listings and manually edit out this information. Since they do no harm, I’ve chosen to leave them in place. There are usually only a handful of stations assigned to the same frequency anyway, so it is a simple matter to scan through the IDs (which are presented alphabetically) to find the station you need.

Q. Why are Airport Designator Codes included in the guide? Of what use are they to a DXer?

A. Beacon DXing is sometimes like detective work. You need to use every bit of information at your disposal to come up with the complete picture of an intercept. True, the designators are not useful to everyone, but they can be very helpful to the serious DXer who needs to determine a QSLing address or wants to know the closest major city to the beacon. Consider the case of FS/245 kHz, in Sioux Falls, SD. Relatively few people would know the actual name of the airport this beacon is associated with. However, armed with the Airport Designator code “FSD” we can visit a website such as www.airnav.com/airports, and learn that the beacon is associated with “Joe Foss Field.” Using this technique, you will get more information than you ever thought you wanted to know about an airport, including photos, runway maps, other nearby beacons, VHF frequencies, etc.

Q. Why are some beacons listed which are not currently active?

A. This was a judgment call. I could easily remove these listings, but sometimes a beacon will re-appear after being shut down for an extended time. I feel that as long as there is still a transmitter out there set to that frequency, it is possible that it will return to the air. Rather than remove it entirely, I have left many of these stations listed until their long-term status can be determined. Only when a beacon is confirmed as being permanently shut down do I consider removing it from the list.

Q. Is price of the guide same for U.S., Canada, and Mexico? What about shipping costs?

A. The cost of the guide is $13.95 (U.S. funds) anywhere in North America, including shipping. Although my cost for mailing is somewhat higher to Canada and Mexico, the volume of orders to those countries is typically not as great as U.S. orders, and I have chosen to absorb the increase for these destinations. For the time being, there will be no increased charge to our neighbors North or South of the U.S. border.

♦ Beacon Loggings

Our loggings this month come from Dale Parfitt, W4OP (NC). Dale enjoys exploring the entire radio spectrum and is now active from longwave to 1296 MHz. At the upper end of this range, he has even bounced signals off the moon (EME)! Dale is founder and President of Par Electronics (www.parelectronics.com) where he designs many types of antennas and other interesting products for hams and monitors alike. Welcome aboard, Dale. We look forward to hearing from you often.

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dixon</td>
<td>NC</td>
<td>Dixie Drive</td>
</tr>
<tr>
<td>Galveston, TX</td>
<td>TX</td>
<td>Galveston</td>
</tr>
<tr>
<td>Wilmington, NC</td>
<td>NC</td>
<td>Wilmington</td>
</tr>
<tr>
<td>Mount Airy, NC</td>
<td>NC</td>
<td>Mount Airy</td>
</tr>
<tr>
<td>Spartanburg, SC</td>
<td>SC</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Clemson, SC</td>
<td>SC</td>
<td>Clemson</td>
</tr>
<tr>
<td>Jasper, TN</td>
<td>TN</td>
<td>Jasper</td>
</tr>
<tr>
<td>Union, SC</td>
<td>SC</td>
<td>Union</td>
</tr>
<tr>
<td>Elkin, NC</td>
<td>NC</td>
<td>Elkin</td>
</tr>
<tr>
<td>Marion, VA</td>
<td>VA</td>
<td>Marion</td>
</tr>
<tr>
<td>Greenville, NC</td>
<td>NC</td>
<td>Greenville</td>
</tr>
<tr>
<td>Albermarle, NC</td>
<td>NC</td>
<td>Albermarle</td>
</tr>
<tr>
<td>Raleigh, NC</td>
<td>NC</td>
<td>Raleigh</td>
</tr>
<tr>
<td>Brunswick, GA</td>
<td>GA</td>
<td>Brunswick</td>
</tr>
<tr>
<td>Madisonville, TN</td>
<td>TN</td>
<td>Madisonville</td>
</tr>
<tr>
<td>Asheville, NC</td>
<td>NC</td>
<td>Asheville</td>
</tr>
<tr>
<td>Tallahassee, FL</td>
<td>FL</td>
<td>Tallahassee</td>
</tr>
<tr>
<td>Jasper, TN</td>
<td>TN</td>
<td>Jasper</td>
</tr>
<tr>
<td>Emony, GA</td>
<td>GA</td>
<td>Emony</td>
</tr>
<tr>
<td>Marion, SC</td>
<td>SC</td>
<td>Marion</td>
</tr>
<tr>
<td>Morganton, NC</td>
<td>NC</td>
<td>Morganton</td>
</tr>
<tr>
<td>Dalton, GA</td>
<td>GA</td>
<td>Dalton</td>
</tr>
<tr>
<td>Omeido, TN</td>
<td>TN</td>
<td>Omeido</td>
</tr>
<tr>
<td>W. Jefferson, NC</td>
<td>NC</td>
<td>W. Jefferson</td>
</tr>
<tr>
<td>Shelby, NC</td>
<td>NC</td>
<td>Shelby</td>
</tr>
<tr>
<td>Ft. Payne, AL</td>
<td>AL</td>
<td>Ft. Payne</td>
</tr>
<tr>
<td>Springfield, KY</td>
<td>KY</td>
<td>Springfield</td>
</tr>
<tr>
<td>Lincolnton, NC</td>
<td>NC</td>
<td>Lincolnton</td>
</tr>
<tr>
<td>Washington, GA</td>
<td>GA</td>
<td>Washington</td>
</tr>
</tbody>
</table>

Have a great Thanksgiving, and best LW DX!
Uncle Skip’s Holiday List

You may have noticed that it seems like they start the holiday shopping season earlier and earlier. When I was a mere lad, the Christmas shopping crunch was signaled by Santa Claus climbing the steps at Macy’s on Thanksgiving Day at the close of the annual parade. Now it seems the holiday tinsel and trimmings encroach on the Halloween pumpkins and masks. I expect some day not too far in the future we’ll see Christmas ornaments sitting on the shelves next to the “Back to School” merchandise. So it goes.

Anyway, this being the November column and in a few short weeks Ole’ Saint Nick will in fact be heading into Macy’s, I thought it would be prudent to give you all a few thoughts about really nice gifts you may want to suggest to your significant other. After all, you’ve been exceptionally good this year, haven’t you? And if you have been really, really, really good, the first item on Ole’ Uncle Skip’s list to Ole’ Saint Nick will be right up your alley.

The Ten-Tec Orion
$3300 ($3599 w/ autotuner)
Ten-Tec
1185 Dolly Parton Parkway
Sevierville, TN 37862
1-800-833-7373
http://www.tentec.com

If you are an HF band ham and you aren’t licking your chops over this radio, there can only be two possibilities. 1) You already own one (you lucky devil) or 2) You have gone Silent Key! The Orion is correctly described in its sales brochure as an “Ultra High-End HF Transceiver.” This is a truly no-compromise rig utilizing the most up-to-date receiver technology available. Utilizing dual 32 bit DSP processors, low phase noise synthesizer as well as Ten-Tec’s trademark Crystal filtering, the dual receivers in this unit deliver noise reduction characteristics that put it at the top to the charts.

In addition to the incredible receiver dynamic range and brick wall filtering, the unit makes use of “Panoramic Stereo” that allows the user to pick out signals in a pile-up with ease.

The Orion is no skunk in the transmitting department, either, offering 18 transmitter bandwidths through to a maximum of 3.9 kHz. It also offers transmit audio equalization.

The back panel sounds like a scene from Noah’s Ark. Two of everything. Two antenna connections, two data connections, two amplifier keying lines all running out of a rig that has two receivers, two DSP units and two noise blankers.

On the front you get more buttons than your fingers can handle along with a large screen display that includes real time spectrum analysis in 5 bandwidths.

One of the two receivers is General Coverage, reminiscent of the Ten-Tec Paragon. The Orion is destined to be this latest generation’s equivalent of that fine old rig.

The unit is backed by Ten-Tec’s historic technical service and support including free Flash -ROM updates to bring your rig up to the latest operating version.

Like all of Ten-Tec’s transceivers, there is a complete line of accessories including the Heil/Ten-Tec Studio One Microphone that takes full advantage of this unit’s transmit audio controls.

Once you go over the specs you will be convinced that this radio could win a DX contest of that fine old rig.

The Yaesu VX-2R
$229.00
Vertex Standard
10900 Walker Street
Cypress, CA 90630
(714) 827-7600
http://www.vxstdusa.com

The VX-2R is billed as the “World’s Smallest Dual-Band 1IT with a Wide-Band Receiver” and at a mere 1.9“ x 3.2“ x 0.9” and weighing in at less than 0.3 pounds I would have to take their word for it. To get all the features of this little gem I currently have to carry three more or less standard-sized “talkies” with a total weight of over 2 pounds. They get the job done, but I really worry that one of these days my pants are going to fall down!

When powered by the unit’s internal 3.7 volt Lithium-ion battery pack, the rig puts out 1.5 watts on 2 meters and 1 watt on 70 centimeters. More than enough for most local repeater work. Need a little more oomph? Supply the unit with an external 6 volts and you’re up to 3 watts on 2 meters and 2 watts on 70 centimeters. Either power level is enough to drive most “brick” amplifiers designed for mobile or home use.

The feature that really gets me excited about this rig, given my weakness for DC to Daylight monitoring, is the Wide Band Receiver. Covering AM broadcast, HF Shortwave, FM Broadcast VHF/UHF up to 729 MHz (including Marine, Air & NOAA Weather) and 800 – 960 MHz (sadly cellular blocked). There is lots of good stuff to listen to when not talking on the other two bands.

The rig features the latest WIRES™ Internet Linking technology as well as a 9 memory DTMF autodialer. And, while we are talking about memories, the unit has the capacity to manage one thousand memory channels in 20 memory groups. More than enough to set the rig up for a variety of uses. The unit also has full CTSS/DCS encoding and decoding capability.

Even though it is diminutive in size, the VX-2R is built like a tank. The chassis is diecast metal.

I’ve been using the Yaesu R2 wide band receiver for a number of years now. It has more or less the same form factor as the VX-2R. I find that there is a small learning curve because of the multiple use controls, but once you get the hang of things the radio is a lot of fun to have in the shack. I expect the same will be said of the VX-2R. So if Santa were to see his way clear to leave a VX-2R in my stocking I’d be one happy radio puppy.

The Elecraft KX1 Ultra-Portable CW Transceiver Kit
Base Price $ 279.00
Elecraft
PO Box 69
Aptos, CA 95001
(831) 662-8345
http://www.elecraft.com

You folks have heard me rave about Elecraft rigs for a number of years now. I have built both the K2, which I use as my primary home station and the K1 which I use for portable use. Both rigs offer superior performance along with the fun of building professional quality gear with your own hands.

Well, for this holiday season the folks at Elecraft have produced a perfect stocking stuffer – the KX1 – A diminutive rig designed with the need of the backpacker in mind. It’s enough to get me to blow the dust off my “Alice” pack and head for the trails.

The KX1 is just 1.2“ x 3“ x 5.3“, but in that small package is packed a superhet receiver with variable passband crystal filtering, RTT, S-meter,
digital readout, memory keyer, voltage monitoring and 1 to 4 watt transmitter output. The unit’s DDS VFO has three tuning rates and covers the entire ham portion of both 20 and 40 meters with receive only coverage of nearby SWL segments. 30 Meters can be added as an option. If that’s not enough crammed into such a small space, you can even add automatic antenna tuning as an additional option.

The KX1 is designed to be extremely miterly in the power consumption department, drawing a nominal 34 mA on receive. Casual operation runs between 20 and 30 hours from the internal battery pack (yes, they cram the batteries in the case as well.)

The KX1 is designed around a single printed circuit board and all end-user-installed parts are traditional “through-hole” components. Alignment can be performed with just a digital multi-meter and off the air signals.

Another option is a custom designed paddle that attaches right to the KX1.

As with all Elecraft designs, you get a well illustrated assembly manual that allows the unit to be built and tested in discrete sections. The KX1 Manual (as well as all other Elecraft product manuals) can be viewed on the Elecraft web site. You also get Elecraft’s incredible customer support via telephone and Internet. And don’t forget the very active Elecraft on-line user group. When you build a “K” box, you become part of a family.

I must confess... I don’t need a KX1. But given the fun I had building my other Elecraft rigs, I expect if one doesn’t show up under my Christas tree I’ll be ordering one anyway before Groundhog’s Day!

The PowerPort GearHarness $36.95
Cutting Edge Enterprises
130 Anacapa Circle
San Luis Obispo, CA 93405
1-800-206-0115
http://www.powerportstore.com

Something I do need is a way to keep my radios sorted out when I am operating in a Tactical environment. I may not even wait for the holiday gift giving season to get my hands on this next item.

I’ve become a rather rabid bicyclist in recent years. I ride over 100 miles per week and I participate in long distance rallies and bike-a-thons. I also like to get out in the woods on my mountain bike as well. I also like to play radio while I do all this pedaling. I have been searching for a convenient way to carry a couple of handheld rigs and a few accessories. (Maybe even that KX1 if Santa is reading this article.) The PowerPort line of products are made for just such uses and the GearHarness is perfect for anyone who plays radio and need to have their hands free.

The harness has three pockets just right for many portable and handheld rigs. One is in the back and would be perfect for a radio with a speaker mic. The other two are in the front for quicker access. There are two additional vertical pockets that can hold spare antennas and glowsticks. One large zippered pocket runs the entire width of the front of the harness allowing stowage of maps, manuals, notepads, writing implements, etc.

The harness also has a good number of connecting points for microphones and other “clip-on” accessories.

All this carrying capability is made with a heavy duty nylon exterior with foam padding and a mesh back for improved ventilation. Perfect for the bike riding (or hiking, or ARES/RACES) ham.

The Code Mite $59.95
The Vibroplex Co., Inc.
11 E. Midtown Park, Mobile, AL 36606
1-800-840-8873
http://www.vibroplex.com

As most of you have probably figured out by now, I am a fairly dedicated CW operator. Part of the joy of being a code mode op is playing with various keys. Vibroplex is a time honored brand name in the telegraphy world. When they come out with a new product, CW oriented hams take notice. Just in time for the holiday season comes the Code Mite.

I must confess I’m a bit of a sucker for teensey weensy keys. When I use one to operate I get a Walter Mitty image of being a secret agent sending out with a new product, CW oriented keys take notice. Just in time for the holiday season comes the Code Mite.

Well, that’s about it for my “dream” shopping list this year. Maybe we can all ask Santa to send the three Christmas Ghosts to FCC Director Ponder so he will wake up on Christmas morning with no thoughts of BPL. Have fun. I’ll see you on the bottom end of 40 meters.

UNCLE SKIP’S CONTEST CORNER

ARRL Sweepstakes Contest (CW)
2100 UTC, Nov 1-0300 UTC, Nov 3
North American Collegiate ARC Championship (CW)
2100 UTC, Nov 1-0300 UTC, Nov 3
QRP ARCi Running of the QRP Bulls
2100 UTC, Nov 1-0300 UTC, Nov 3
Japan Int. DX Contest (Phone)
0700 UTC, Nov 8-1300 UTC, Nov 9
ARRL Sweepstakes Contest (Phone)
2100 UTC, Nov 15-0300 UTC, Nov 17
North American Collegiate ARC Championship (Phone)
2100 UTC, Nov 15-0300 UTC, Nov 17
RSGB 1.8 MHUTC Contest (CW)
2100 UTC, Nov 15-0100 UTC, Nov 16
CQ Worldwide DX Contest (CW)
0000 UTC, Nov 29-2400 UTC, Nov 30

Outer Limits continued from page 69

Undercover Radio- Dr. Benway’s pirate ad- vocacy and comedy format. (Merlin)

VU0DI- Sometimes IDs as Voodoo Radio; rock music format. (Elkhorn)

WHYP- Takeoff on genuine licensed WHYP in North East, PA. Mixes pirate humor with out- dated weather reports for the Cleveland, Erie, and Buffalo areas. Sometimes relays United Patriotic Militia Bingo, the KSMR parody of Steve Anderson. (Providence)

WMFQ- Using slogan of “Where’s my (censored) QSL” this rock music pirate promotes the verification process. Just like Arthur J. Green did many decades ago. (Providence)

WMPR- The “dance party” beat of “Micropower Radio” is fairly easy to recognize, even before the IDs. (Still none, but occasionally QSLs loggings in The ACE)

QLSling Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations. Addresses, identified above in parentheses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 69, Elkhorn, NE 68022; PO Box 293, Merlin, Ontario N0P 1W0; c/o AMPB, PMB22, 2018 Shadid Avenue, Berkley, CA 94704; and Box 159, Santiago 14, Chile.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. Try THE ACE ($2 US for sample copies via the Belfast address above) and the e- mailed Free Radio Weekly newsletter, still free to contributors via niel@ican.net. The Free Radio Network web site, another outstanding source of content about pirate radio, is found at http://www.frn.net on the internet.

Thanks

Your loggings and news about unlicensed broad- casting stations are always welcome via 7540 High- way 64 W, Brasstown, NC 28902, or via the e-mail address at the bottom. We thank this month’s valuable contributors: John T. Arthur, Belfast, NY; Dave Balint, Wooster, OH; Dick Baxter, North Canton, OH; Jerry Berg, Lexington, MA; Artie Bigley, Columbus, OH; Cachito, Santiago, Chile; John Calabro, Melfrose, MA; Ross Comeau, Andover, MA; Harold Cones, Newport News, VA; Rich D’Angelo, Wyomissing, PA; Brian Duddy, Nyack, NY; Bill Finn, Philadelphia, PA; Harold Ford, Ridge, Midland, MI; William Hassig, Mount Prospect, IL; Chris Lobell, Stoneham, MA; Greg Majewski, Oakdale, CT; Bill McClintock, Wellington, OH; Mark Mohrmann, Coventry, VT; Mike Prindle, New Suffolk, NY; Lee Reynolds, Lempton, NH; Robert Rees, London, Ontario, PA; Martin Schoch, Meisenburg, Germany; John Sedlack, Omaha, NE; Ed Walsh, AL; Brian Williams, Taos, NM; Niel Wolfish, Toronto, Ontario; and Joe Wood, Gray, TN.

Antenna Designer

New Version 2.1 for Microsoft Windows 95 and 98
Computer program helps you design and build 17 different antennas from common materials. Based on Antenna Handbook by W. Clem Small

Only $39.95
$5.50 on all orders to CA residents add 8.5%
Shipped on CD ROM

Send check or money order to:
Small Planet Systems
623 Mangels Avenue
San Francisco, CA 94127

http://www.smallplanetsystems.com
415-337-9894

November 2003
MONITORING TIMES 73
A Useful, Easy to Make, Inexpensive Antenna

The random-length antenna is one of the simplest to make, easiest to erect, and least expensive antennas around. It is also a good performer for general use in radio monitoring. It's a favorite of mine, and when space allows I always put a long one up each time I move to a new QTH. In use, it almost always compares favorably with other antennas I erect. If I had to choose just one inexpensive antenna for general, all-purpose monitoring, I think that a long, random-length antenna mounted high and in the clear would certainly be a strong contender for that choice.

Random-length antennas are most often found on the HF band and lower frequencies. However, they are also useful on VHF and higher frequencies. At the higher frequencies open-wire feed line radiation, losses due to poor-quality coax, and balun bandwidth limitations can be problems. If the feed line is good quality then random-length antennas cut for resonance at particular frequencies and random-length antennas can be any length. At some locations a length of five or six feet may work reasonably well for general monitoring on HF, and even on lower frequencies. On the other hand, when received-noise levels are low, a longer antenna may well give better weak-signal results. As a general rule a random-length antenna for HF or lower frequency should be made as long as is convenient.

As explained above, random-length antennas are usually cut to fit available space, not to a resonant length for a particular frequency. However, it's useful to understand that practical random-length antennas a half wavelength or less in length at the frequency being received are relatively non-directional with shallow nulls off the ends.

As an antenna's length increases beyond a half wavelength, then more pronounced lobes (directions of maximum response) and more nulls (directions of minimum response) are formed in the antenna's radiation and reception (R&R) pattern. The more half wavelengths the antenna's length includes, the more lobes and nulls it will have. As its length increases progressively beyond one wavelength, the antenna progressively becomes a bi-directional beam with maximum response moving toward both ends. This also gives lower vertical angles in the R&R pattern. Both these directional characteristics are good for DX work.

The equations below yield approximations of the physical length of a wire antenna needed for an antenna of a specific number of wavelengths when operating at a specific frequency.

\[ L_{\text{on}} = \frac{984(N - 0.025)}{F} \]
\[ L_{\text{lim}} = \frac{300(N - 0.025)}{F} \]

Here \( L \) is the length of the antenna in feet or meters, \( N \) is the number of wavelengths desired, and \( F \) is the specific frequency (in MHz) utilized. For instance, at 10 MHz an antenna one wavelength long would be: \( L = 984 \times (1 - 0.025)/10 \), or about 96 ft in length.

**A Bonus: Free Diversity Reception!**

The longer any antenna is, the more it is likely to show "space diversity" performance. The area covered by a ray of incoming signals can wander around somewhat over time. This can cause signal fading. The more space an antenna covers, the more likely it is that some portion of the antenna will remain in the path of a wandering signal.

**Let's Make One**

Fig. 1 shows some random-length antennas. Any wire that will take the strain is okay to use. Stranded or copperweld antenna wire is designed to stand up to strains and hard use. Solid copper house-wiring wire will work, but tends to break more easily than antenna wire.

At least two insulators are needed as shown. For longer antennas extra insulators may be tied from supports along the antenna's length to keep the antenna from sagging excessively. I have had good results with random-length antennas a couple of hundred feet long made by draping insulated wire across tree tops. In these, the only insulation, except at the ends, was the insulation covering the wire.

Make your antenna as long, high, and in the clear as is practical. Never run it over or under a power line. Don't forget lightning-induced damage protection; the minimum is to disconnect and ground the antenna when it is not in use, and never use it when weather is likely to produce lightning.

**Feed Lines and Matching**

The relatively high received-noise level generally determines quality of reception on HF and on lower frequencies. Thus it may not matter whether you attempt to match antenna's feed point impedance to the impedance of your receiver's antenna input circuit at these frequencies. At VHF and higher frequencies received-noise levels are generally relatively low, and at these frequencies matching becomes more im-

---

**Fig. 1.** Random-length antennas connected to their receivers with no matching (A), with a balun up at the antenna; coax feed line (B), with a balun near the receiver (C), with an antenna tuner near the receiver (D).
Tuning; however, antenna tuners must be retuned to the noisy area often reduces this noise. Received electrical noise from household appliances can be minimized by using a balun. A balun is an impedance transformer that allows a coaxial cable to be connected to a high-impedance feed line. Baluns should have at least a 4:1 impedance ratio, or preferably higher. Baluns need no tuning; however, antenna tuners must be retuned when sizable frequency changes are made. An antenna tuner can yield a more precise match, but for reception at HF and lower frequencies such precision is usually unnecessary.

For Transmitting

If a random length antenna is used for transmitting, it is most likely that matching between line and transmitter will be needed. And, unless high-impedance feed line (twin lead, ladder line, open-wire line) is used, matching between antenna and feed line is likely to improve antenna-system efficiency. If coax is used make sure it's good quality.

RADIO RIDDLES

Last Month:

I said: "Okay, so a mismatched antenna on a feed line causes some portion of the RF energy arriving from the transmitter to reflect back down the line. And a matched antenna accepts all the energy from the line. What would happen if the end of the feed line were connected to nothing? Would the RF energy coming down the line just fly out the open end, and launch itself as a radio wave?"

Well, actually very little RF would escape from the open end of an ordinary feed line. The impedance of the space at the end of the line is not a good match for the line's impedance, and so there would be a mismatch at that junction. The RF energy coming down the line would be reflected back from the mismatch. On the other hand, if the end of the line was shaped like a funnel with the large part at the line's open end, and if the funnel's dimensions were a significant part of a wavelength in size then there would be more radiation. Such funnel-shaped cone construction is sometimes used to launch RF from coax onto a single wire. The single wire then makes an inexpensive, relatively low-loss transmission line for long runs. And opening a waveguide into a funnel-shaped cone of appropriate dimensions is one way of making UHF and microwave beam antennas.

Now consider open-wire or twinlead feed line. Let's progressively separate and spread the last quarter wavelength of the two wires that comprise the line to form a "Y" shape. This improves the match between line and space at the 'Y's "mouth." More RF is radiated now than when the line was intact. As these quarter-wavelength wires are opened out even more, then even more of the RF energy coming down the line is radiated. When the wires are opened so far that they are perpendicular to the feed line, then radiation is maximum (if the line is 72-ohm impedance). And now those two quarter wavelength portions of the line have evolved into our old friend, the halfwave dipole!

This Month:

What is the "HCL" antenna? Want a not very-helpful hint? OK, it's also called the "hydrochloric acid antenna."

You'll find another riddle, another antenna-related web site or so, and much more, in next month's issue of Monitoring Times. 'Til then Peace, DX, and 73.

Pre-Publication Sale!

2004 EDITION

WORLD RADIO TV HANDBOOK

This information-packed reference for professional monitoring stations and serious shortwave listeners bulges with station information, staff listings, contact information, worldwide mediumwave and shortwave frequencies, and schedules for programs in all languages. A special English language program section makes station selection a breeze. Includes non-U.S. TV and FM broadcasters as well!

Order before December 31, 2003 to take advantage of this special discount offer! Available January 2004.

www.grove-ent.com

828-837-9200; FAX 828-837-2216 7540 Highway 64 West, Brasstown, NC 28902 email: order@grove-ent.com

November 2003

MONITORING TIMES 75
Recapping and De-Modifying the S-40A

Last month I wasn’t able to spend a lot of time on our ongoing S-40A restoration, but did manage to complete the physical and mechanical work and reassemble the set. Now it was time to turn the chassis upside down and begin work on the wiring.

Normally this consists mainly of changing out all of the radio’s paper and electrolytic capacitors — replacing each with a new one of the proper electrical specifications. However, this receiver presented a slightly more difficult problem. (Incidentally, I won’t dwell here on the issues associated with choosing replacement caps because I’ve gone into them, in some detail, during two or three of the projects already chronicled in this column. The last one being the Zenith “black dial” radio completed just prior to this restoration.)

A Twice-Traumatized Radio

I had already noted during an earlier inspection that the S-40A’s power transformer had been replaced. At the time it looked as if the new unit was operating properly and conformed to original specifications, so I decided to leave it alone. Since all sections of the original filter capacitor were still wired into the circuit, it had apparently not been responsible for the short that carried off the transformer. There had most assuredly been a short, though, as was evidenced by the obvious discoloration of a couple of the power resistors in the receiver’s filter circuitry.

Depending on what component had shorted out (probably a bypass capacitor), there might well be other, hidden damage that would turn up later. As evidence, I remembered that I had earlier found two weak tubes (a rarer occurrence than you might think in radios of this era) as well as a couple more that were okay but definitely not original with the set.

Besides the severe short-circuit damage suffered by the radio, it also showed signs of another type of trauma: modifications and “re-pairs” by a person with a limited technical background and/or very little respect for the set. Crudely-wired circuit changes were visible in several places. Though some of the paper capacitors had been neatly replaced with high-quality Sprague “Orange Drops,” several others had been partially disconnected for testing but never hooked up again. I’d guess that the Sprague guy was not the person who left the other caps disconnected, and that the latter had obviously tried to trouble-shoot the radio and given up in disgust.

I decided to go through the S-40A methodically, starting with the r.f. stage at the front end and progressing through to the audio output tube. Each stage would be checked against the schematic as I replaced its paper and/or electrolytic capacitors. That way I would be able to catch and reverse any modifications made by the previous “technician” and make sure that the new caps replacing the half-disconnected ones were connected to the proper circuit points.

Butchered “S”-Meter socket

The first anomaly I ran into was in the wiring of the socket for the accessory “S” meter. This 5-pin socket is supposed to have connections to ground, filament voltage (for “s”-meter illumination), B-plus, and the receiver’s a.v.c. line. The ground had been cut, as had the lead to the a.v.c. line. In fact, the socket lug to which the a.v.c. lead should have been connected was missing entirely.

A new lead, connected to an unused lug on the socket, had been tack-soldered, via a resistor, to a location somewhere in the first audio stage. As it snaked its way under the chassis between the two points, it looped into and out of the bottom of one of the i.f. cans — as if to pick up some r.f. energy there. The purpose of this wire is known only to the previous owner. But since there had been an extra lug for it available on the “s”-meter socket, one has to wonder why the lead from the a.v.c. line had to be disconnected. (Some of you may remember a similarly crazy wire, removed earlier in the project, that had been coiled inside the b.f.o. transformer).

I wanted to restore the “s”-meter socket wiring to its stock configuration, and when I located and untaped the end of the disconnected a.v.c.-line wire, I found out why its connection was missing. Some of it was still soldered to the wire, apparently having been cut off as a convenient way of removing it from the socket! I share this with you so that you will not be surprised, or feel compelled to understand, any madness you may uncover in your own restoration projects.

I disconnected the mutilated socket, drilled out its mounting rivets, and replaced it with a new 5-pin socket. Then I was able to restore the wiring as indicated on the schematic. It gave me great pleasure to accomplish this and, especially, to remove the crazy jury-rigged extra connection.

Other Parts Substitutions

As I went through the stages of the radio, I spot-checked the values of the various resistors. These were generally okay, except for three of the four power resistors mentioned earlier, whose discolored appearance suggested that they had been overloaded. The resistances of two of them had dwindled to one-third and one-half of their specified values, respectively. The third was completely open. I had suitable replacements for these on hand and wired them in. I’m thinking that these seriously out-of-spec resistors could have been responsible for significantly increased plate currents that might well account for the weak and replaced tubes found in the set.

I almost missed a broken quarter-watt 15 megohm resistor in the first audio stage. Only half of it was still there. Luckily I had a replacement for this odd value in my resistor drawer. Its leads were less than a half-inch long (I save everything!) but I was still able to install it.

I disconnected the leads to the 3-section can-type electrolytic capacitor, leaving it in place to preserve the radio’s original appearance above the chassis. A long terminal strip was installed under the chassis by soldering its
mounting lug to one of the disconnected capacitor’s mounting “feet.” That lug also served as a convenient ground point for the three individual electrolytics that were installed on the strip to replace the units in the can. Some of the leads that had been connected to the original electrolytic wouldn’t reach their new locations on the terminal strip and I had to original locations. I didn’t want any unpleasant surprises this time!

Even though the chassis opening had been made wider to accept the slightly larger replacement transformer, the original-design transformer still fit pretty well. It almost covered the enlarged opening so that it was hardly noticeable from above the chassis. I was also able to use the original mounting bolts by utilizing flat washers to help them get a grip on what was left of their matching holes.

That accomplished, I wired up the transformer and the “standby-receive” switch, and also re-installed the headphone jack (which would have blocked access to the switch had I replaced it earlier). Finally, I needed a new line cord. Like most early zip cord, the original had badly deteriorated. But amusingly, the parallel line cord from the parts set - itself a rusted hulk - was perfect and supple. I quickly removed it and hooked it up in my project set.

At last, the receiver was ready to try out. I have to admit that I felt a certain sense of satisfaction as I looked over my work. The job had been a little grueling at times, and the very convoluted Hallicrafters schematic hadn’t made it much easier. But, through my efforts, the electronics were now in essentially stock condition, with all of the nutty modifications removed.

**Transformer Surprise**

The last haywire item in the radio was the “standby-receive” switch. The switch, definitively not an original one, was not connected to the set’s wiring. Instead, a length of zip cord had been attached to it. The free end was cut off and I have no idea how it was originally hooked up.

I removed a proper switch from my S-40 parts set and checked the schematic to see how it should be wired. No problem: it was to be connected in between the center tap of the transformer’s high-voltage winding and ground. I assumed that, for some inscrutable reason, the previous owner had bypassed the switch by connecting the center tap directly to ground.

I attached a couple of long leads to the switch, installed it on the panel, and went looking for that center tap. Guess what - it wasn’t there! I had checked the transformer voltages before beginning the restoration project, and am sure I found the expected voltage across the high-voltage winding and fifty percent of it between each end of the winding and ground.

Perhaps there was, somehow, an internal connection from the transformer’s center tap to ground. If so, the “standby-receive” switch could not be hooked up in the normal manner. And that certainly explains why it had been disconnected.

Continuing to test the transformer in place, I found that there was continuity between the high-voltage winding and the 6.3-volt filament winding. A short circuit? Or was one of that winding internally connected to the center tap? Both points are usually grounded, so this might have been some kind of manufacturing shortcut.

In any case, the setup was a little too peculiar for my taste. I decided to remove the replacement transformer and put in an original one from that indispensable parts set of mine. Of course I checked it out thoroughly in advance. I didn’t want any unpleasant surprises this time!

I had indeed. A tiny capacitor intended to Couple the output of the beat frequency oscillator to the detector plates of the 6SQ7 first audio amplifier was missing. This was identified on the parts list as a “gimmick” capacitor - just a couple of pieces of hookup wire twisted together. I finally found the lead coming from the oscillator. It was cut off near the 6SQ7 socket - but the “gimmick” was nowhere to be seen.

We’ll attend to that next time.
The Aceco FC2002 is a handheld, wide range frequency counter which is useful both for finding nearby transmitters and as a general purpose counter on the test equipment bench.

Aceco Electronics Corporation (http://www.aceco.com.tw) builds the FC2002 in Taiwan. The company specializes in manufacturing handheld frequency counters that wear other brand names around the world, e.g., MFJ, Elenco, and GW. For instance, Aceco makes the MFJ-886 frequency counter, a less sophisticated version of the FC2002. Today, Hamtronics manufactures the MFJ-866 to serve as a general purpose counter on the test equipment bench.

Hamtronics, Inc. of Hilton, NY, was kind enough to lend me this FC2002 for review. The Hamtronics name is familiar to scannists who have been in the hobby for many years. In the 1980s, Hamtronics manufactured a series of military air and 800 MHz band frequency converters for scanners. Today, Hamtronics manufactures several kits, including receivers, transmitters, and other accessories.

**Features**

The FC2002 is capable of counting audio and radio frequency signals between 10 Hz and 3000 MHz. That's a wider frequency range than the MFJ-886, which has a lower limit of 1 MHz.

A top mounted BNC jack conducts RF signals to the counting circuitry. An internal prescaler circuit serves as a frequency range "extender" and a 2-position slide switch sets the frequency range. The lower frequency range is applied directly to the low frequency counting circuitry and the higher frequency range applies the RF signal to the prescaler, which divides the frequency by a fixed amount for measurement by the low frequency circuitry.

The Range switch is marked 300 MHz and 3 GHz. The 3 GHz position is for use between 10 MHz and 3 GHz and scannists should use the 3 GHz position when sniffing for transmitters.

A Gate key lets you choose among four gate times: 0.0625, 0.25, 1, and 4 seconds. The longer the gate time, the longer you must wait before the 10 digit LCD display is updated with the current frequency. A red LED located near the upper right corner of the display blinks each time the gate closes. Longer gate times permit the frequency to be displayed with higher resolution, i.e., more digits (see specifications table).

You don't need much precision, perhaps 1 kHz, for transmitter hunting. The higher precision capability is suitable for other applications, such as radio alignment.

In addition to frequency, the FC2002 can measure period, which is useful primarily for measuring very low frequency signals. Period is the reciprocal of frequency. For example, a 1200 Hz signal has a period of approximately 0.0008333 seconds (1/1200), which is 833.3 microseconds.

One advantage to measuring period instead of frequency is better resolution. For example, the highest resolution displayed for a 1200 Hz signal in frequency mode is 0.0012000 MHz. You must use a gate time setting of 4 seconds to obtain that resolution so the display is only updated every 4 seconds. By contrast, the period mode display shows 833.3333333 microseconds regardless of gate time.

The FC2002 provides selection of two different input impedances, 50 ohm and 1 megohm. Scannists would usually choose the 50 ohm input, which is restricted for use above 1 MHz.

The 1 megohm position should be employed when connecting the FC2002 to the circuit being measured. In this case, you would use a cable or probe instead of the telescoping antenna. The high impedance helps prevent the counter from "loading down" or drawing current from the circuit under test, which would interfere with the circuit's operation. The high impedance position is restricted to measurements below 50 MHz.

The FC2002 provides a "capture" feature to freeze the display when a signal is detected. This works for measuring either frequency or period. When armed in capture mode, the counter emits a beep and the display is updated each time a new signal is detected. The capture facility, a signal activated latch, frees you from having to keep your gaze on the display and watch for a signal. This is a major advantage of the FC2002 over the MFJ-886.

In addition to the capture mode, the FC2002 also provides a Hold key which freezes the frequency display reading when pressed.

**What You Get**

The FC2002 counter is powered by an internal 600 mAh NiCd battery pack. The included 9 VDC 300 mA wall wart power supply plugs into a jack atop the counter and can recharge the batteries in 12 to 16 hours.

The LCD display shows the frequency using digits 5/16-inch tall. It is easy to read in daylight and illuminated for night viewing. A bar graph portrays relative signal strength.

We are impressed with the 24-inch black telescoping antenna included with the counter. The same antenna is furnished with the MFJ-886. A rubber ring around the BNC plug makes it easy to grip. The collapsed antenna fits handily in a shirt pocket, and incorporates a pocket clip similar to a ballpoint pen.

The FC2002 construction feels hefty. The cabinet is a 2-piece anodized aluminum affair thick enough to resist flexing when pressed. A rubber pad along the bottom prevents the counter from scratching a table when sitting upright.

The instruction sheet contains basic guidelines, cautions, and limited specifications but provides no schematic.

The display has indicators for frequency, period, hold, signal detected, filter, and low battery. There are also indicators for MHz, milliseconds, microseconds, nanoseconds, the last three being used for period measurements.

A selectable backlight uses a pair of green LEDs to illuminate the display for night viewing.

**Performance**

The FC2002 (s/n 0318-5-7623) performed well in both quantitative lab tests and during field testing. However, our FC2002 was not as sensitive on VHF as the MFJ-866 (s/n 0126-2-
We measured the FC2002's sensitivity from 30 MHz to 1300 MHz using a signal generator and the results appear in the accompanying graphs.

The FC2002 displayed the frequency of a 146 MHz walkie-talkie up to 185 feet away when testing in a flat, open field. It captured a 446 MHz walkie-talkie up to 161 feet under the same conditions. Adjusting the telescoping antenna to the proper length made a significant difference in whether the counter could lock on a distant signal.

We took the FC2002 mobile. It snagged several VHF-high band signals while connected to a 19 inch magnetic mount whip antenna atop the truck, including a 151.415 MHz base station used at the local golf course, a 158.1 MHz paging transmitter, a 151.385 MHz fire repeater, and a 95.9 MHz commercial FM broadcaster.

We used a Yaesu VR-500 receiver to verify most signals, though the FC2002 detected a signal on 164.975 MHz, a US government frequency, before we were able to turn on the scanner to identify the user.

The counter displayed the frequency of a 171.055 MHz wireless microphone 7 feet away, but was able to detect two 49 MHz baby monitors only when brought within a couple of feet.

The FC2002's display is easy to read and the backlight is very effective. A front panel hole provides easy access to the timebase alignment adjustment.

The FC2002 has a switchable filter which blanks the displays until a signal is detected. When the filter is off, the counter displays random readings until it detects a signal.

We took the FC2002 mobile. It snagged several VHF-high band signals while connected to a 19 inch magnetic mount whip antenna atop the truck, including a 151.415 MHz base station used at the local golf course, a 158.1 MHz paging transmitter, a 151.385 MHz fire repeater, and a 95.9 MHz commercial FM broadcaster.

We used a Yaesu VR-500 receiver to verify most signals, though the FC2002 detected a signal on 164.975 MHz, a US government frequency, before we were able to turn on the scanner to identify the user.

The counter displayed the frequency of a 171.055 MHz wireless microphone 7 feet away, but was able to detect two 49 MHz baby monitors only when brought within a couple of feet.

The FC2002's display is easy to read and the backlight is very effective. A front panel hole provides easy access to the timebase alignment adjustment.

The FC2002 has a switchable filter which blanks the displays until a signal is detected. When the filter is off, the counter displays random readings until it detects a signal.

**Manufacturer Specifications**

**Aceco FC2002 Frequency Counter**

Price range: $219

Dealer:
Hamtronics, Inc.
65 Moul Rd., Hilton, NY 14468-9535.
Tel. (585)-392-9430
http://www.hamtronics.com

Frequency coverage (MHz):
10 Hz - 3 GHz

Specifications

Weight: 250 g.
Size: 100 mm high x 68 m wide x 31 mm deep
Impedance: One dual purpose BNC socket,
50 ohms input (1 MHz - 3 GHz)
1 Megohm input (10 Hz - 50 MHz)
Max. input: 100 Vrms for the 1 Megohm input
and 15 dBm for the 50 Ohm input
Case: Stamped aluminum with black anodized finish
Battery: Internal 4 x AA 600 mAH NiCd pack
External power: 9 VDC 300 mA
Timebase: less than 1 PPM at room temperature

---

**Conclusions**

The Aceco FC2002 performed flawlessly during testing. It is well built and extremely sensitive. The capture and filter features make the FC2002 more useful than simpler counters for transmitter hunting.

The 600 mAH rechargeable battery pack is low capacity by today's standards. We would prefer the ability to use individual AA cells instead of a monolithic battery pack.


---

**QuickCharger**

Sets A New Standard In Battery Chargers!

"... this is hands-down the best consumer battery charger that I've seen. ... A Gotta-Have"
– Jock Elliott, Easy Access Radio

FREE CATALOG
800-522-8863 · ccrane.com

Quickly Charges Up To 4 'AAA', 'AA', 'C' Or 'D' Size NiCad or NiMH Batteries
The Only Charger To Fully Charge All Sizes Of New High Capacity NiMH & NiCd Batteries
Intelligent Discharge Revitalizes NiCads

**LOOP ANTENNA**

The best tabletop AM broadcast antenna. Loops for 50 KHz to 6-MHz plug into amplifier. Free Catalog.

Model LA-1 Loop Amplifier .... $135
530-1700 KHz Loop .... $135
+ $6 SS&H Tax, in Calif.

**GLENN HAUSER'S WORLD OF RADIO**

http://www.worldofradio.com

For the latest DX and programming news, amateur nets, DX program schedules, audio archives and much more!
Digital Radio Mondiale Overview - Part 1
Who and What is it?

We have heard all the fuss about DRM, Digital Radio Mondiale, being the radio mode of the future. But we have heard this claim a number of times before from radio modes that have almost been forgotten. Remember AM Stereo?

Over the next few columns we'll look at DRM in a very objective manner. We'll try to sort marketing hype, if any, from actual use and throw in a bit of science. This series on DRM will follow the Computers & Radio approach of striving to inform, entertain and perhaps stimulate further investigation.

Before we get any technology tutorial emails, let me clearly state something. In order to entertain and reach the widest audience, without putting them to sleep, I will be taking great liberties with technical details.

♦ Go To The Source

The source of much of the DRM information will be listed at the end of each column. As was once told by my world-renowned professor of relativity who had worked with Einstein, "If you want to learn what Einstein knew, read Einstein, not someone writing about Einstein!"

In other words, if this column stimulates your interest in any subject I suggest that you then go right to the source.

It is said, "The longest journey starts with the first step." So let's begin our DRM journey.

♦ Why Digital Anyway?

A number of years ago, in the Computers & Radio column, we explored the technical and functional differences between analog and digital signal technologies. Then we compared the benefits and deficits.

In summary, in order to listen to analog signals we must detect and separate many small differences in signal shift levels. In contrast, decoding digital signals is all about detecting just two levels, 1's and 0's. The big benefit is that 1's and 0's can be separated by relatively large signal level. This minimizes any ambiguity in the detecting method. In other words, once the 1's and 0's are sensed, and converted back to a listenable analog sound, noise is a thing of the past. And if the digital signal is sampled at a high enough rate we are rewarded with high fidelity sound with no noise.

♦ DRM's Benefits

According to their website, the benefits of the DRM digital mode to the listeners are:

- FM-like sound quality with the AM reach;
- Improved reception quality;
- Flexible use of radio, whenever and wherever you want it;
- No change to existing listening habits;
- Same frequencies;
- Same listening conditions (fixed, portable and mobile radio);
- Same listening environment (indoors, in cities, in dense forests...);
- Low cost receiver, low energy consumption;
- Easy tuning: with selection by frequency, station name or program type;
- More diverse program content, using the full capabilities of new digital features;
- Wide receiver range with more and better features;
- Radios that will give you programs with associated text information, station name, record title, singer’s name..."

That’s quite an ambitious list!

♦ Downside of Digital Communications

The downsides of digital communications can be summarized as:

- Increased circuit complexity;
- High speed computer processing required;

The digital world is a world of mathematical functions and transformations implemented in hardware. Also there is the conversion of analog audio into digital bits, requiring high speed and high accuracy in analog to digital conversion. Then the process needs to be reversed at the receiver end with a comparable digital to analog converter.

Finally, in order to maintain reasonable sound quality this signal processing has to be done at a relatively high clock rate. This all translates to a pretty powerful DRM decoding “computer” using power. These requirements seem to be in contradiction to the “Low cost receiver, low energy consumption” benefit listed above.

♦ Who Is Backing DRM?

According to a press release on their website, http://www.drm.org, the DRM system was developed in 1998 by a consortium of companies in China. Its purpose is to create a universal digital system for the AM broadcasting bands below 30 MHz—shortwave, medium wave and longwave. It is headquartered in Geneva, Switzerland, and now has 82 members in 29 countries including broadcasters, network operators, equipment manufacturers, broadcasting unions and regulatory bodies.

This august body includes many heavy hitters in the radio world including: Atmel ES2, British Broadcasting Corporation, Deutsche Welle, Hitachi Kokusai, Harris Broadcast, JVC Victor Company of Japan, Merlin Communications International Ltd, Nippon Hoso Kyokai (NHK), Radio(s) Canada, France, Netherlands, Sweden, Vatican, Sangean America, Sony, Telefunken and Thales (UK)—to name a few you might recognize.

♦ Having What It Takes!

The members are key to the ultimate success of DRM. Long gone are the days when superior technology won the day, becoming a standard and commercial success. One has to just read of Edwin Armstrong’s life and the origins of FM radio in early days of commercial radio. No, instead it takes lots of technical, political, marketing and economic might. Finally, this must be augmented with corporate resolve and determination to make any standard a commercial reality.

My initial observation was that although many of these DRM companies such as Sony have a semiconductor division, I did not see any major semiconductor company in the
DRM consortium. Atmel does produce excellent semiconductors; however, Philips and Intel are notable by their absence. For DRM to succeed, a major international semiconductor company with world-class analog, DSP and perhaps PC component experience will be required to reduce the DRM system to a very inexpensive integrated circuit and supply it to radio manufacturers. Okay, enough crystal ball gazing. Let’s look at the structure of a DRM system.

**DRM Channel Structure**

According to the DRM Standard paper files with ETSI (the European Telecommunications Standards Institute http://www.etsi.org), DRM system consists of three channels: the Main Service Channel (MSC), the Fast Access Channel (FAC), and the Service Description Channel (SDC). Each has a different function and character. For those who are interested, I have included a summary of the data format for each channel.

**It's Not Called Main For Nothing**

The MSC (Main Service Channel) is where the audio or data for transmission resides. It may contain up to four different "broadcasts" or services. Each broadcast may be either in the form of audio or digital data.

If you looked at the MSC on an oscilloscope you would find that it is composed of one stream of data for each “broadcast.” Each stream is sent in blocks, which are 400 ms long in duration.

The specific DRM channel bandwidth and the transmission mode determine the bit rate of the MSC. The transmission mode is a combination of signal bandwidth and efficiency related parameters such as the highest useful bit rate relative to resulting effects of noise and/or multi-path propagation.

The current channel widths for radio broadcasting below 30 MHz are 9 kHz and 10 kHz. DRM system also supports half channel modes with bandwidths of 4.5 kHz to 5 kHz allowing for simultaneous transmissions of analog AM and digital AM. Double channel modes with bandwidths of 18 kHz to 20 kHz are possible. Typical data rates on a 9 to 10 kHz channel are 20 to 24 kbps. In double channel mode, maximum data rates may reach as high as 72 kbps.

**MSC and Digital Data Transmissions**

A data service comprises one data stream or one data sub-stream. Digital data stream “...may be composed of up to four ‘sub-streams’ consisting of data packets. A sub-stream carries packets for one service.” Data services generally consist of streams of information, in either synchronous or asynchronous form, or files of information. The maximum length of a data unit is eight 215 bytes.

**Data Services Packet Format**

The packet is made up as follows:

- **Header 8 bits**
- **Data field n bytes**
- **CRC 16 bits**

The header contains information to describe the packet. The data field contains the data intended for a particular service. The CRC is the Cyclic Redundancy Check.

**Audio Broadcasts**

Audio transmissions are digitized and compressed using MPEG-4 type compression and Spectral Band Replication (SBR). Keeping it simple, let’s just say that these complex advanced techniques have the potential of producing near-FM broadcast audio quality.

In addition, audio streams can also carry simple text messages. The text message is a basic part of DRM and consumes only 80 bits.

**Still With Us?!**

Next time we’ll look at the other channels and see how it’s all put together in a DRM transmission. Then we’ll look at what hardware and software is needed for DRM monitoring.

Get ready for some alphabet soup discussions full of acronyms. If you’re not into the digital details don’t worry. Only the basics are needed to follow the rest of the DRM Digital Radio Mondiale story as it unfolds.

I’ll leave you with one question. What the heck is Mondiale?

---

**United States Postal Service**

**Statement of Ownership, Management, and Circulation**

- **Publication Title:** MONITORING TIMES
- **Publication Number:** 35
- **Filing Date:** August 2001
- **Publication Date:** November 2003

**Main Service Channel (MSC)**

- **UMTS:** Universal Mobile Telecommunications System
- **Lorax:** Long Term Evolution
- **LTE:** Long Term Evolution

**Fast Access Channel (FAC)**

- **FAC:** Fast Access Channel

**Service Description Channel (SDC)**

- **SDC:** Service Description Channel

**Instructions to Publishers**

- **Publication Name:** MONITORING TIMES
- **Filing Date:** November 2003
- **Publication Number:** 35

**Statement of Ownership, Management, and Circulation**

- **Publication Title:** MONITORING TIMES
- **Publication Number:** 35
- **Filing Date:** August 2001
- **Publication Date:** November 2003

**data field n bytes**

**CRC 16 bits**

**Header 8 bits**

**CRC is the Cyclic Redundancy Check.**

**Data Services Packet Format**

The packet is made up as follows:

- **Header 8 bits**
- **Data field n bytes**
- **CRC 16 bits**

The header contains information to describe the packet. The data field contains the data intended for a particular service. The CRC is the Cyclic Redundancy Check.
radar detectors have become rather commonplace along America’s highways and interstates. The temptation to push the pedal just a little over the posted limits is hard to resist, and any device that will let the driver know that his speed is being monitored is welcome.

Older radar detectors had their share of problems. Some had enough oscillator radiation to disrupt downlink satellite terminals (VSATs) in the 11.7-12.2 GHz range, such as those used at gas pumps for credit card transactions, Muzak in fast-food establishments, financial transactions and other business applications. As of 2002, these are now illegal to sell.

Except for commercial vehicles (truckers), radar detectors are legal to use in every state except Virginia and Washington DC. They are illegal to even own, much less operate, in much of Canada! To cope with illegal use of radar detectors, law enforcement agencies employ “radar detector detectors” like the VG-2 Interceptor. These units listen for the weak emanation of oscillator signals from the radar detectors.

To thwart such detection, some consumer radar detectors are now equipped to listen for the oscillators from the police radar detector detectors! When heard, the radar detector is shut down for a few seconds, allowing the vehicle to drive past the radar detector detector – without detection!

Another new technology designed to thwart consumer radar detectors is “instant-on” (“POP”) or pulsed radar, such as the MPH Industries BEE III. This presumes that a speed-measuring pulse can be so short that the detector, which requires at least 150 milliseconds of signal to respond, won’t flash an alert. However, the 67 millisecond pulse is too short for MPH’s own circuitry to stabilize fast enough for an accurate reading that will hold up in court. Therefore, the “POP” must be followed by a longer-duration beam which alerts the detector.

K40 Electronics

K40 rose to prominence in the CB arena some 25 years ago when antenna manufacturers were endlessly beating the drum for their particular products. I had the pleasure of publishing my findings following a field test of the K40 antenna. The bottom line was that it worked well, better than other antennas with which it was compared. It’s still on the market and selling well. Recently, I was given the opportunity to perform a similar test with their new, sophisticated radar detector.

The RD850

The RD850 comes with a distinguished pedigree, carefully developed to respond quickly and sensitively to all three traffic radar bands: X, K and superwide Ka (33.8, 34.7, 35.5, 24.15, and 10.525 GHz). In addition, the RD850 responds to laser, “POP” (instant-on pulse radar) and VG-2 (11.4-11.6 GHz) radar detector detectors.

Power is derived from a convenient source of 12 VDC; both a cigarette-lighter cord and direct-connect cable are provided. Audible alert volume is continuously adjustable. The compact, lightweight unit can be mounted with the included sun-visor clip, window suction cup, or dashboard Velcro strips.

When a target signal is detected, the unit flashes its LEDs and emits a tell-tale tone as well to inform the user of the identification of the signal: Chirp (K), tweet (X), buzz (Ka), high-pitched beep (laser), or warble (VG-2).

False Alerts

Occasionally a radar detector will go off for no apparent reason; this is caused by extraneous signals which share the same frequency bands. Such signals include oscillator radiation from neighboring vehicles with radar detectors (the most common), high-power radio transmissions, some cell phones, and other incidental radiators.Parking at or driving alongside shopping centers and industrial complexes affords an excellent opportunity to activate your radar detector! A special filter mode may be selected to reduce, but not totally eliminate, such interference.

Our older model detector did this frequently as we drove down the interstate and as we stopped at busy complexes. The RD850, however, remained quiet until activated by more legitimate radiators like the occasional stray radiation from other radar detectors employed by passing motorists.

The Lab Tests

At the request of K40 Electronics, on April 17, 2003, Speed Measurement Laboratories of Ft. Worth, TX (http://www.speedlabs.com) conducted an independent, objective evaluation of the RD850 as compared with two other contenders in the field, the Passport 8500 and the Bel 985. Nine of the newest radar and laser guns were operated by a certified traffic officer to eliminate any doubts concerning authenticity of the tests. The 10-year veteran officer was instructed to use the radar guns just as he would in his daily traffic routine.

The results? To quote SML’s own release, “In our test of the industry’s top rated radar detectors, no other detector outperformed K40’s new portable RD850...” Apparently K40 feels pretty confident in their new product as well; they will pay any speeding fines incurred during the first year of the owner’s operation of the device!

On the Road Again

A 1200 mile trip along I-75 afforded an excellent opportunity to test the new RD850; we decided to try a side-by-side comparison with an older Radio Shack model, each facing out through the windshield of my wife’s new 2003 Jeep Liberty. It didn’t take long for both units to start sounding their alarms. As a matter of fact, all day long they sat there chirping away happily while I visually scanned the horizon unsuccessfully trying to locate the sources of these alerts. False alarms, but from where?

Finally I had an epiphany: Could the two units be interfering with each other? (Duh...) I switched off the older unit and the falses stopped immediately! This close to each other, the units were hearing each other’s oscillators, just like the radar detector detectors!

Now quiet, and my wife finally talking to me again, actual radar beams were signaled for great distances. In one case, a low-powered radar speed sign, normally
set to alert drivers of their measured speed at a maximum range of 250 feet, triggered the RD850 alarm at 0.8 miles!

In SML's tests, the RD850 consistently reported radar in excess of 2 miles from the target - seven times the normal targeting distance of police radar. At this distance, a vehicle traveling at 60MPH would have approximately two minutes to casually slow down before the typical radar gun could get an accurate reading.*

The ability to fine-control the audible volume, or instantly mute it, or even replace the various tones with a pleasant Geiger-counter "tick" sound that increases in rate as a radar speed trap is approached, is a welcome touch. I was very impressed with the overall performance of the RD850 and feel that it offers a reliable warning well in advance of an activated speed trap is approached, is a welcome touch. I was very impressed with the overall performance of the RD850 and feel that it offers a reliable warning well in advance of an activated speed-measurement device.

The RD850 carries a manufacturer's suggested retail price of $299.95. For ordering information, visit the K40 web site at http://www.k40.com, or call (800) 323-6768.

*At 60 MPH (1 mile per minute) it would take 1.75 minutes to get within 0.25 miles; but since the vehicle is gradually slowing down, it allows even more time.

PAR Antenna Follow-up

Hank Lane, KB1JLA, of Groton, Massachusetts, had purchased the PAR EndFed antenna prior to its review by Larry Van Horn in the September edition of MT. He wrote, "Everything you say in your review is right-on for build quality, performance, appearance, etc." However, he had run into a problem when a crimp joint gave way. "All the stress on the unit is carried by the single crimp joint where the wire end connector attaches to stud #3 on the matchbox. Strung between two trees and end-weighted normally for a N-S horizontal configuration, there is no strain relief mechanism to back up or offset all the stress hitting that one single crimp."

While neither Grove Enterprises nor Par reported any other returns for this reason (and the crimp is the same also used on Par's amateur line), Dale Parfitt said there had been a design change in the past few months. "We changed over to soldering the Flex Weave to the #10 lug and applying a short piece of heat shrink to the transition from lug to wire because we felt it gave the connection a better look." I have never been a big proponent of crimps and the resultant flatening.

He added, "On further reflection, we will be adding a section to the manual regarding strain relieving the antennas. As a teenager, I had a 40M dipole hung between the house and a stand of pines. Each week it was resonant lower in the band. Several times it broke. It finally occurred to me to put a pulley and window sash at the tree end. Guess I was lucky the strain on windy days did not pull down my folk's chimney! I don't know what Hank's installation was, but know from experience that the force from a moving tree driven by the wind is powerful."

Hank reported he would gladly accept the new radiator Dale offered as a replacement, and added, "It sounds as if the new, modified design should solve any 'crimp' problems that might have turned up (although I guess I was the only lucky one for that.) The reason I didn't return the unit to Grove was that I didn't want to part with it and as an alternative I made my own radiator with a solder connection. I am still using it as my main receiving antenna. Although, now, I'd much rather use the original radiator as supplied. (I couldn't find your original inedestructible wire anywhere, and had to use some inferior coated wire from Rat Shack.)" Overall, the antenna blows away most others I've tried for general SWL and Ute listening, including Grove's own Skywire of which I've owned two. Both Skywires have corroded away in New England weather because the twisted copper strands are not coated with any protective material. Eventually, one or more of the copper strands will break and then it's just a question of time.

"Thanks for the super technical support."

- Hank Lane, KB1JLA
there is only one thing a geek wants when he sets his or her wrist watch. The knowledge that when that watch chimes the top of the hour, the network news will start on the radio, or the TV program will start on the tube. People are amazed by the simplest things, and will usually ask me my favorite question: "How did you do that?". My usual reply to that question is, "We both set our watches to the same Atomic Clock."

First, you need something to set your watch to. Something accurate. The atomic clock of the National Institute of Standards and Technology (NIST) in Colorado is pretty accurate. So are the two at the US Naval Observatory in Washington DC. One is named "Tick" and the other is "Tock." A quick peek at http://www.time.gov/ (operated jointly by both agencies) will get you the time of day within a second or so, depending on your internet connection. In fact there are programs that utilize the internet's Network Time Protocol (NTP) that can set your system clock to within tenths of a second to the nation's great atomic clocks.

My favorite source for time, though, is radio station WWV on shortwave. The atmosphere plays funny tricks with radio waves, and at different times of the day the signal will be better on different frequencies. WWV transmits on 2.5, 5, 10, 15 and 20 MHz on shortwave from Ft Collins, CO, and WWVB is at 60 kHz in the low frequency bands. There is also a sister station WWVH in Hawaii on the same shortwave frequencies as WWV.

Many of the newer "Atomic Wall Clocks" set their time to WWVB. It's usually helpful if these clocks and watches are set near a window at night when the signals come in best. You can also dial up telephone numbers that will link you to the time signal for 3 minutes or so (see sidebar).

Next, don't worry about hitting "The Top of The Minute." You are going to set your watch a minute later. At the top of the minute, you just want to notice at which second on your watch that your time source gives the different "beep" for the "Zero Second" that starts the next minute. You can also look at your watch at the top of the hour, when radio networks send a time signal "beep" just before the news starts (the one we want to match, or be real close to). Notice which second the "beep" hits on. Now, put your watch in "Setting Mode." and when that second comes around again, hit the button to reset your watch to the top of the minute. That should put you right. Have a friend in the car when the network news comes on the radio, and wait for The Question: "How did you do that?"

About the Author
Ozzie N4SCY is a ham radio operator who lives on the Space Coast of Florida, just because he likes to watch things go "up." His job requires him to take his breaks on a highly regulated schedule, which he inputs to his computer and downloads to his watch—a Casio PC-Unite. He can be reached at N4SCY@amsat.org

Sources of accurate time:
5, 10, 15, 20 MHz on a shortwave radio
+1 303 499-7111, WWV, NIST, Ft Collins CO
+1 202 762-1401, US Naval Observatory Master Clock, Washington DC
NISTime.exe: a computer program to set the time on a PC.
International Date/Time format: YYYY-MM-DD hh:mm:ss - Not just an International Standard, it's computer sortable!

WWV, Ft Collins, Colorado (courtesy NIST)
Ready to upgrade your radio?

Your favorite communications company doesn’t just SELL radios, we BUY them as well!

Grove trade-ins are a win-win program! You receive an excellent allowance for your used receiver or scanner, and when you buy a trade-in from Grove, you’re assured of a fully-tested and guaranteed radio at a bargain-basement price!

Why go through the hassle and delay of trying to sell your radio and buy another all on your own when you can depend on Grove’s legendary customer service? We’ve bought and sold thousands of radios, making us the country’s number one choice for trade-ins! With such activity, our inventory changes daily, so stop by our web site right now at www.grove-ent.com/hmpgbbb.html, and visit us often!

www.grove-ent.com/hmpgbbb.html

All of our previously-owned equipment is tested and guaranteed against defects for 90 days. This list is updated frequently, visit often to catch outstanding bargains!

Listening is only half the fun...

POPULAR COMMUNICATIONS is the other half.

If you enjoy radio communications in all its variety, you’ll love Popular Communications

Since 1982 Pop’Comm has delivered thousands of pages of great reading for both the radio enthusiast and the professional communicator.

Name your favorite interest, Popular Communications is there for you. Whether you’re into Short-wave Listening, Scanner Monitoring, searching out Pirate Radio broadcasters, CB Radio, Satellite Broadcasting, ACARS, or Ham Radio, you name it, we cover it, every month.

Popular Communications

Subscribe today and save up to 58% off the newsstand price. Save even more with two or three year subs!

YES! Enter my Subscription to Popular Communications today!

Name ____________________________________________________________
Address __________________________________________________________
City ___________________________ State __________ Zip ________________

( ) Check ( ) MasterCard ( ) VISA ( ) AMEX ( ) Discover
Card No. ___________________________ Expires ____________________
Signature _________________________________________________________

Popular Communications 25 Newbridge Road, Hicksville, NY 11801 Telephone (516) 681-2922

USA  Canada/Mexico  Foreign Air Post
1 Year  $28.95  $38.95  $48.95
2 Years  $51.95  $71.95  $91.95
3 Years  $74.95  $104.95  $134.95

Allow 6 to 8 weeks for delivery

FOR FASTER SERVICE FAX 1-516-681-2926  MT 01
Cobra’s Sweet-Sounding PR4000WX

The old-timers have a saying about the weather in Maine: if you don’t like it, just wait a minute and it will change. So it is with the FRS/GMRS market. Just when you think you know what’s going on, things change.

A case in point: recently the nice folks at Cobra Electronics sent me a pair of PR4000WX handi-talkies. Among other things, what made these radios interesting is that Cobra is packing more features into these radios at a very modest price.

Check it out: for a paltry $119.95 (SRP), you get two 22-channel radios with 38 so-called “privacy” codes (really Continuous Tone-Coded Scanning System – CTCSS – codes), 10 channel NOAA All Hazards Alert Radio, voice-operated transmit (VOX) operation, enhanced water resistance, silent vibrating paging, 10-channel memory, battery saver circuit, selectable power with output key lock, 10 call tones, and roger beep. Pretty cool, huh?

As they say in the infomercials, “But wait, there’s more!” The PR4000WX, according to Cobra’s data sheet, also has the industry’s first half-watt transmitter power. GMRS stands for General Mobile Radio Service, a licensed radio service. To operate on GMRS frequencies, you must pay a fee to the Federal Communications Commission to get a license. The reason for getting a GMRS license is so you can use more power for more range. In the case of the PR4000WX, you can choose 3, 2 or .5 watts on the GMRS frequencies, but the handi-talkie locks the power to .5 watt on the FRS-only frequencies. There are GMRS repeaters across the country, but the PR4000WX is simplex only.

Features

Let’s take a tour of the PR4000WX. This is a large handi-talkie, measuring about 7-5/8 inches from the tip of the antenna to the bottom of the case, about 2-5/8 inches across the widest part, and about 1-5/8 inches deep from faceplate to the back of the belt clip. At the center of the upper front panel is a backlit liquid crystal display that serves as information central for the radio. Surrounding the LCD are a series of buttons: Call, Channel Up/Down, Hi-Med-Low Power, Lock and Compass. These are all pretty self-explanatory.

The Mode button covers all the other functions of the radio – some 16 of them – such as CTCSS codes, NOAA all hazards radio channel and alert, stopwatch, clock, alarm, VOX, memory channels, various scanning functions, roger beep on/off and so forth. In all, it is a pretty easy operating system: the frequently used functions each have a button, and the rest are accessible through the Mode button.

Below the display and surrounding buttons is a grill for the speaker and microphone. On top of the case is the antenna, a jack for an external speaker/microphone, and the On/Off/volume knob. On the left side of the case are the push-to-talk button and a button for activating the LCD backlighting and defeating the autosquelch for listening to faint transmissions. On the right side of the case is a jack for an optional charger for rechargeable batteries. On the back of the case are the strap connector, the rubberized battery compartment (for four AA alkalines), and the battery door latch. On the very bottom of the case (which can stand up on a flat surface) are a couple of metal contacts that could be used with a drop-in charger.

The performance of the PR4000WX was excellent. The NOAA radio received the local weather broadcasts very well; the compass, once calibrated (a necessary user operation), pointed in the appropriate direction. The range was as good as any FRS/GMRS radio that I have ever tested (the limitation here was not the radio, but the terrain – even the best can’t reach beyond certain physical obstacles on my standardized test course). All of this is top-rank performance. But what really set this radio apart was the almost-hi-fi-quality audio: it’s crisp, clear, and life-like without being harsh.

The bottom line is that the PR4000WX offers an outstanding combination of features and performance. Highly recommended. For additional information, visit http://www.cobra.com.

Frequenth	Service	Power (watts)
462.5625	FRS	.5
462.5675	FRS	.5
462.6125	FRS	.5
462.6375	FRS	.5
462.6625	FRS	.5
467.5625	FRS	.5
467.5825	FRS	.5
467.6125	FRS	.5
467.6375	FRS	.5
467.6625	FRS	.5
467.6875	FRS	.5
467.7125	FRS	.5
462.5500	GMRS	3, 2, .5 (selectable)
462.5750	GMRS	3, 2, .5 (selectable)
462.6000	GMRS	3, 2, .5 (selectable)
462.6250	GMRS	3, 2, .5 (selectable)
462.6500	GMRS	3, 2, .5 (selectable)
462.6750	GMRS	3, 2, .5 (selectable)
462.7000	GMRS	3, 2, .5 (selectable)
462.7250	GMRS	3, 2, .5 (selectable)

FRS is the Family Radio Service, an unlicensed radio service limited by FCC regulation to one-half watt transmitter power. GMRS stands for General Mobile Radio Service, a licensed radio service. The performance of the PR4000WX was excellent. The NOAA radio received the local weather broadcasts very well; the compass, once calibrated (a necessary user operation), pointed in the appropriate direction. The range was as good as any FRS/GMRS radio that I have ever tested (the limitation here was not the radio, but the terrain – even the best can’t reach beyond certain physical obstacles on my standardized test course). All of this is top-rank performance. But what really set this radio apart was the almost-hi-fi-quality audio: it’s crisp, clear, and life-like without being harsh.

The bottom line is that the PR4000WX offers an outstanding combination of features and performance. Highly recommended. For additional information, visit http://www.cobra.com.
World's #1 Selling Shortwave Guide!

PASSPORT TO WORLD BAND RADIO

20th Anniversary Edition

If you need it, PASSPORT TO WORLD BAND RADIO has it within its nearly 600 pages. PASSPORT’s frequency-by-frequency Blue Pages are nearly a book unto themselves, with thousands of station entries. Schedules, often confirmed by global monitoring, are for every transmitter on the air—times and days, transmitter locations and powers, target zones, networks, languages and whether there’s jamming.

TRUSTED BY OVER A MILLION READERS SINCE 1984
WWW.PASSBAND.COM

PASSPORT TO WORLD BAND RADIO is the world’s favorite guide to shortwave listening. Available from major dealers and bookstores, or by Priority Mail direct from the publisher:

PASSPORT TO WORLD BAND RADIO 2004 • Anniversary Edition

Box 300
Penn's Park, PA 18943
$22.95, ISBN 0-914941-84-4
24/7 automatic ordering (215) 598-9018
Fax (215) 598 3794
mktg@passband.com
www.passband.com

PASSPORT Reports tests, evaluates and scores dozens of the latest portable, portatop, PC controlled, professional and tabletop receivers... outdoor and active antennas, too. Outside magazine minces no words, “The best. They tell you what’s good about the good, bad about the bad, and advertisers be damned.”

PASSPORT’S “What’s On Tonight” provides hour-by-hour summaries of news, music, sports and entertainment shows in English. Station contacts and Webcasts? PASSPORT’S “Addresses PLUS” chapter is the industry bible, crammed with juicy tips. There’s also a separate section with on-the-spot reporting on broadcasting in Burma.

PASSPORT TO WORLD BAND RADIO
First Look at the PRO96  
By Bob Grove

With reception modes that include APCO-25 conventional and 3600/9600-baud digital trunking as well as analog Motorola and EDACS trunking, along with conventional AM and FM communications, Radio Shack’s new PRO96 hand-held scanner is a winner. We had the opportunity to preview one of these just before we sent it off to Bob Parnass for a full lab review which will appear shortly in MT.

Frequency range is 25-54, 108-184, 216-225, 406-512, 806-960 (less cellular) and 1240-1300 MHz.

The PRO96 is a triple-conversion superheterodyne, a scheme virtually mandated now by the FCC’s austere image-reduction requirements to minimize the likelihood of unauthorized cellular telephone reception. Image IF rejection is stated as 60 dB (380.8 MHz IF) and 100 dB (21.4 MHz IF) — very formidable. Spurious signal rejection is a healthy 40 dB.

Sensitivity on FM mode averages 0.5 microvolts. Selectivity bandwidths for -6 dB and -50 dB filter attenuation for AM are specified as +/-5 kHz and +/-9 kHz, and for FM +/-8 kHz and +/-14 kHz respectively.

Scan rate is up to 60 channels per second, with frequency searches at 75 steps per second. Scan delay is fixed at 2 seconds. Up to 500 memory channels (10 banks of 50 channels each) may be scanned, with virtual pages storing up to 5500 channels for call-up.

Audio is crisp, loud and clear on the internal speaker, with only slight distortion introduced at high volume levels. Additional functions include second-unit cloning, channel-selectable -20 dB attenuator, alphanumeric display labeling, battery saver, backlight, selectable key tone, digital AGC, updatable (downloadable) DSP firmware, custom-contrast display, SAME weather alert, “Zeromatic” exact frequency readout on search, and CTCSS/DCS decoder squelch.

The PRO96 can be powered by four AA alkaline or rechargeable cells, 9 VDC wall adapter, or 9VDC car cigarette lighter adapter; none of these are provided and must be purchased separately.

Grove Enterprises is carrying this unit at $499.95. See their web site at http://www.grove-ent.com or call 1-800-435-8155, and watch for a full review in MT.

Sangean Travel Pro  
By Bob Grove

For shortwave listeners seeking a low-cost, high-performance portable, the new Sangean Travel Pro is hard to beat. Offering worldwide shortwave frequency coverage along with conventional AM and FM broadcast reception, the pocketable Pro runs off three AA cells (not provided) or an optional 4.5 VDC power adaptor.

What we liked

The small size, ease of operation, clean audio, choice of frequency coverage and low-backlash tuning make this radio a good choice as a gift, or for backup listening on the road or during power outages.

While serious SWLs like external antenna attachments, inexpensive radios invariably suffer from strong-signal overload when operated with long antennas. The telescoping whip and internal ferrite-bar loop provide adequate reception when the radio is placed in most convenient, interference-free locations.

The new Sangean Travel Pro is available for only $59.95 plus shipping from Grove Enterprises (call 800-438-8155 or email order@grove-ent.com for details).

Uniden BCT8

The BCT8 covers 13 frequency bands: 25.0-28.0 MHz Petroleum Prod., CB Class D channels, Business and Forest Products, 28.0-29.7 MHz 10 Meter Amateur Band, 29.7-50.0 MHz VHF Low Band, 50.0-54.0 MHz 6 Meter Amateur Band, 108-137 MHz Aircraft Band, 137-144 MHz Military Land Mobile, 144-148 MHz 2 Meter Amateur Band, 148-174 MHz VHF High Band, 400-420 MHz Federal Government, 420-450 MHz 70 cm Amateur Band, 450-470 MHz UHF Standard Band, 470-512 MHz UHF T Band, 806-956 MHz 800 Band.

Though the BCT8 has been FCC type accepted, price was yet to be announced at pretime. Look for the BCT8 trunk tracking scanner from your local dealer or from Grove Enterprises (1-800-438-8155 or order@grove-ent.com).

Digital DRM Receiver

The new, second Generation Digital Radio Mondiale (DRM) receiver from MAYAH is now available from Germany with a target price of around 700 euro (around $768US depending on the exchange rate). It is the result of a joint development effort of MAYAH, Coding Technologies, Himalaya and AFG. The DRM2010 is based...
on standard components and is smaller and lower cost than the first generation receiver.

A DSP module performs all the DRM specific decoding functions. The software of the DSP module can be updated via the USB interface. The receiver can decode mono and stereo audio signals; full interface. The receiver also supports reception of analog AM programs in the domestic radio service. Within two years, the station now known as the British Broadcasting Company, boasted total service coverage estimated at about 65% of the population.

Over half of the book is devoted to the reminiscences of the people involved from the early years, to the BBC’s privatization in 1997 by Crown Castle International and Merlin Communications. These fascinating personal recollections reveal a staff devoted to advancing technological and organizational developments within a worldwide network. Go behind the scenes during the turbulent years prior to and during World War II. An exceptional chapter describes the troubled logistics of broadcasting from Ascension Islands during the Falkland Islands War... before the days of satellite technology. What tenacity!

Ever wondered about the BBC relay stations? Find out why only the committed would endure the early days on the volcanic terrain of Ascension Island in the South Atlantic Ocean. Find out why the Hong Kong relay site was demolished and what was HRH The Duke of Edinburgh doing in Thailand in October 1996?

On Air-BBC Transmission is an easy and quick read. As a devout listener of the BBC, I found it a fascinating “behind-the-scenes” look at a power house in broadcasting. This nostalgic book celebrates a lifetime involving thousands of people that maintained and operated the BBC facilities that millions depend on.

On Air History of BBC Transmission may be ordered from the publisher at http://www.newnespress.com. Email: directorders@elsevier.com. For US customers the price is $24.99.

In the UK it’s £16.99 from Elsevier Customer Services, Linacre House, Jordan Hill, Oxford, OX2 8DP, UK.

**Newnes Guide to Radio and Communications Technology**

By Ian Poole

Ian Poole, an occasional freelance writer for *Monitoring Times*, has written this guide to the technology and applications of modern radio communications equipment. While covering the technology and principles of radio, this book is written in an easy to understand style that provides a very useful foundation for anyone interested in understanding more about radio or wireless technology and its applications.

The key areas covered by this book are: radio principles; broadcasting, including digital radio; private mobile radio including trunking and TETRA; cellular telecommunications, including GSM and 3G; data communications, including Bluetooth and 802.11.


In the UK it’s £16.99 from Elsevier Customer Services, Linacre House, Jordan Hill, Oxford, OX2 8DP, UK.

**Library of Congress Cataloging**

Abridged Edition: 0-7506-3612-3

Full Edition: 0-7506-5612-3

**Order Information**

Send to: Wavechange Books, 94 Goddington Lane, Orpington, Kent BR6 9DY. Prices for hardback are £17.50; paperback £12.50 (plus £2 p&p in the UK). If you are ordering outside the UK, please send your email to editors@onairbook.co.uk and they will provide postage, handling and payment details.

My compliments to Norman Shacklady and Martin Ellen... we listeners applaud you. Or as my British colleagues would say, “Simply Brilliant”!

- Gayle Van Horn

**New for 2003-07**

**Learn from the “Master” – Gordon West, WB6NOA.**

Gordo has taught more people about ham radio than anyone! Get on the air and enjoy the fun hobby of ham radio. Book includes all possible test Q&A and much, much more. Start earning your Technician class license today!

**Get your license and be on the air quickly using our computer-aided course for the Technician class license.**

Includes Gordo’s book and W5YI software with all possible test questions, answers, and explanations. Study at your PC for the FCC exam!

**The W5YI Group**

POB 565101 – Dallas, TX 75356

Order today on the web or call: www.w5yi.org  800.669.9594

Want to know more about ham radio? Call us! Mention this ad to receive a free gift with your order!
LRIT Testing, Testing...

Another month of interesting developments in the weather satellite (WXSAT) field: NOAA conducted its first tests of the new digital format LRIT (Low Rate Information Transmission), and during late August, NOAA-14 imagery became synchronized once more.

◆ LRIT Gets Underway

The National Environmental Satellite, Data and Information Service (NESDIS) approved the Low Rate Information Transmission (LRIT) Global Specification as the new standard to replace current WEFAX data transmissions. This new digital format will therefore replace the existing analog design in due course.

Darrell Robertson of NOAA confirmed that the first ever GOES LRIT Test was successful. It was conducted as a live data transmission test during the second daily vacant time slot on August 21 in the GOES-East WEFAX schedule. NOAA's plan involves transmitting LRIT test data during two daily "vacant" time slots in the GOES-East WEFAX schedule.

The LRIT test data was transmitted Monday through Friday, excluding U.S. public holidays, during these two vacant slots throughout the months of August and September. The first daily test transmission period was from 16:50 to 17:06 UTC, with the second period from 17:50 to 17:58 UTC. A one minute buffer at the start and end times is used to avoid interference with WEFAX transmissions. Daily timeshare transmissions of WEFAX and LRIT were planned to start in October.

These irregular test transmissions of LRIT data from the GOES-East satellite will continue during 2003. A schedule of alternating analog WEFAX and digital LRIT products will begin in 2004, and by early 2005, NOAA expects to completely convert to full time LRIT service from both GOES-East and GOES-West.

Europe's LRIT

The European LRIT transmission tests have continued, together with concurrent HRIT (High Rate Information Transmission) tests. Europe's Meteosat Second Generation (MSG-1) satellite is currently located over longitude 10° west and has been providing test transmissions to approximately 100 users since late April. The transmission is actually made via a television DVB downlink from HotBird-6, due to a hardware failure on MSG-1.

This failure proved to be a welcome event (for amateur users!) because it led to the decision to not use the original downlink transmission from MSG-1. That downlink would have excluded the amateur community due to the near impossibility of operating giant reception dishes on domestic properties! Instead, we have only needed to set up conventional satellite television systems and then take the cable feed to a computer fitted with a DVB card to decode the telemetry. So far we have received virtually all the types of digital transmission - HRIT and LRIT. Picture quality has been excellent and WEFAX is rapidly becoming just a memory of the old analog system!

◆ NOAA-14 Bears Watching

The HRPT telemetry stream from NOAA-14 became degraded some months back. Degradation was due to the AVHRR (advanced very high resolution radiometer) providing a partially unsynchronized image. One consequence of this was that the APH transmission in the 137 MHz band was terminated to prevent periodic interference with other satellites using the same frequency.

The 1700 MHz (HRPT) telemetry downlink was left operational, so many of us have continued to monitor the transmissions. I made a habit of taking a pass, two or three times a week. Even so, it was Thomas Scheelen of Germany who advised me on August 23 that telemetry from NOAA-14 had apparently recovered synchronization for several days. Thomas commented: "In the last two weeks NOAA-14 works great without sync errors."

NOAA-14 provides a strong signal and is therefore well worth monitoring. Launched on December 12, 1994, it is currently the AM standby satellite, with several of its systems in condition green (operational, or capable of), some in yellow (operational with limitations), and only the AVHRR at red; and as of early September this was working..... but it failed again on the 6th!

◆ Next Launch

NOAA-N has an anticipated launch date of June 2004. Various tests are being carried out and preparation for the flight software load is underway.

Meanwhile, the other NOAA WXSATs continue with mostly unchanged status. NOAA-17 transmits just 2.5 watts power on its HRPT transponder – compared to its much larger output following launch in June 2002. This results in somewhat shorter effective passes where partial interference is experienced – such as through trees!

◆ Hurricane Fabian

Those using WEFAX systems to monitor either GOES-E or GOES-W, or possibly even both, are able to monitor the development and movements of every tropical storm and hurricane anywhere in the world. During early September, hurricane Fabian was being monitored. On September 1, David G. Brooks of Worthing, Christ Church, Barbados, West Indies, received figure 1, an image from NOAA-15 while Fabian was over the Atlantic Ocean. Fabian had been moving northward at 15 knots with maximum sustained winds estimated at 105 knots, gusts to 130 knots. It was reaching landfall over Bermuda as this article was being compiled, with winds having increased to 200km/hour. Visit David's highly weather-oriented site at http://www.brohavwx.com/

Fig 1: Hurricane Fabian - NOAA-15 image September 1, from David Brooks

<table>
<thead>
<tr>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAA-12 and -15 transmit APT on 137.50 MHz</td>
</tr>
<tr>
<td>NOAA-17 transmits APT on 137.62 MHz</td>
</tr>
<tr>
<td>NOAA-12 and NOAA-16 transmit HRPT on 1698.0 MHz</td>
</tr>
<tr>
<td>NOAA-14 and NOAA-17 transmit HRPT on 1707.0 MHz</td>
</tr>
<tr>
<td>NOAA-15 transmits HRPT on 1702.5 MHz</td>
</tr>
<tr>
<td>GOES-10 (west) and GOES-12 (east) use 1691 MHz for WEFAX (and LRIT tests on GOES-12)</td>
</tr>
</tbody>
</table>
Subscribe to MT for as little as $14.50 (U.S. Second Class Mail)

7540 Hwy. 64 W.; Brasstown, NC 28902
1-800-438-8155 US and Can.; 828-837-9200; Fax 828-837-2216
e-mail order@grove-ent.com

FOR YOUR FREE SAMPLE COPY.
Every issue features news and loggings that
Send 62 for a sample copy to:
AM/FM, shortwave
CANADIAN INTERNATIONAL DX CLUB
Visit us online at: www.cumbredx.org
ads, contact Beth Leinbach, 828-389-4007.
S50 per issue if camera-ready copy or, S85 if copy to be typeset. Photo
date. All ads must be paid in advance to Monitoring Times.
Ads for Stock Exchange must be received 45 days prior to publication
COMMERCIAL NON-SUBSCRIBER, AND MULTIPLE SALES RATES: SI .00
NON-COMMERCIAL SUBSCRIBER RATES: S.25 per word
LINE ADS

But the best part about Cumbre DX
is that it is absolutely
foreign International*

The Messenger features columns on
Foreign International
US 1st Class

Stock Exchange

Line Ads
Non-commercial subscriber rates: $2.50 per word — subscribers
only!
All merchandise must be personal and radio-related.
Commercial, non-subscriber, and multiple sales rates: $1.00
per word. Commercial line ads printed in bold type.

Ads for Stock Exchange must be received 45 days prior to publication
date. All ads must be paid in advance to Monitoring Times.
Ad copy must be typed for legibility.

1-3/4" SQUARE DISPLAY AD:
$50 per issue if camera-ready copy or, $85 if copy to be typeset. Photo
reduction $5 additional charge. For more information on commercial
ads, contact Beth Leinbach, 828-389-4007.

Join the Club!
Open to hobbyists worldwide, the
Canadian International DX Club
is Canada's national, general coverage
radio club serving members since 1962.
The Messenger features columns on
AM/FM, shortwave, utilities, scanning,
QSLing, pirates, ham radio and more.
Send $2 for a sample copy to:
CIDX
Box 87053-Lemoyne
St. Lambert, QC
Canada J4R 2T8
email: cidxclub@yahoo.com
Web: www.anarc.org/cidx/

Cumbre DX
is the world's best DX publication.
Every issue features news and loggings that
you just won't find elsewhere.
But the best part about Cumbre DX
is that it is absolutely
FREE!
FOR YOUR FREE SAMPLE COPY,
SEND AN EMAIL TO:
cumbredx@yahoo.com
Visit us online at: www.cumbredx.org

Listenin'
That's what we do and who we are.
Acclaimed worldwide as one of the top
publications for radio listeners, get a
sample of our 40-page monthly magazine
and see for yourself. Free if you mention
this ad!
Ontario DX Association
Box 151, Willowdale Station A
Toronto, Ontario M2N 5S8 Canada
E-mail: odxa@computerserve.com
www.odxa.on.ca

Huge 100 Page Catalog
Shortwave & Ham Gear
Scanners & RTTY/FAX
Antennas & Accessories
Radio Books & CDs.
Send $11 to Universal Radio
6830 Americana Pkwy.
Reynoldsburg, OH 43068
Tel. 800 431-3939
www.universal-radio.com

Satellite TV - Large selection of items at reasonable prices. We specialize
in Big Dish TVRO C & Ku Band equipment. Check us out at:
http://www.daveswebshop.com

Your personal photo on QSL card - $15.00.

For Sale: ICOM R71-A, AOR AR1000XLT, AOR AR1500, Bearcat 2500, Cherokee
AM/SSB AH-100, Sony IFCPRO80. Call 231-775-0842.
Attention Colorado SWL'S and Dxers come join COADX, Colorado Association
of Dxers. P. O. Box 100314, Denver, Colorado, 80250. Local radio meetings
and more! Website: http://www.qsl.net/n0nni/coadx.html

Think of what you could do with this space...
It's painless, we promise.
Contact our advertising manager, Beth
Leinbach, at 828-389-4007 today!

Index of Advertisers

Huge 100 Page Catalog
Shortwave & Ham Gear
Scanners & RTTY/FAX
Antennas & Accessories
Radio Books & CDs.
Send $11 to Universal Radio
6830 Americana Pkwy.
Reynoldsburg, OH 43068
Tel. 800 431-3939
www.universal-radio.com

Commercial Monitoring Antennas
HF/VHF/UHF Super Discone ...... S49.75
AntennaCraft Scantenna ......... S47.70
30-120MHz, 5-12 dB Log-periodic .... S68.50
800-902 MHz, 13 dB element yagi ........ S74.00
MURS/GMRS dual band base ... S45.95
All Prices INCLUDE Priority S&H
See these antennas plus many, many more
for Amateur, Business, CB, and Monitoring
radio, plus cellular phones on the web at:
www.antennawarehouse.com
MasterCard/Visa Order Line:
877-680-7818
To help maintain our pricing we do not print catalogs.

www.radios4you.com

KAITO KA008
AM FM Shortwave - Digital Readout
Solar - Dynamo/Hand Crank - AG/IC
$54.95 + S/H/I
(954) 925-8788

KAITO KA1101
PLL Digital - Dual Conversion
AM FM Shortwave Radio
$69.95 + S/H/I
(954) 925-8788

November 2003 MONITORING TIMES 91
Interoperability: Public Safety's Holy Grail

By Dan Veeneman

Nearly two decades before the terrorist attacks on the World Trade Center and the Pentagon, emergency personnel from Washington, D.C. learned an important lesson in how to work together. During the evening rush hour on January 13, 1982, in the middle of a snowstorm, an Air Florida 737 jet crashed on takeoff from National Airport. Half an hour later, across town a commuter train derailed. Numerous municipal and federal agencies responded to both of these incidents but were hampered when they discovered that they couldn't talk to each other—their radios were incompatible with each other. In addition, what few frequencies were available soon became overloaded.

The resulting confusion, delays and inefficiencies were the impetus to begin developing common standards for public safety operations. Committees, working groups, and consortiums generated hours of testimony and reams of paper to address these problems. But even with all of their efforts, how far have we really come?

Two decades later, despite good intentions and a lot of hard work, confusion, delays and inefficiencies plagued the investigation of sniper attacks in the Washington, D.C. area in 2002. More than 1,000 law enforcement officers and analysts were involved, coming from several cities, three states and the federal government. Because the department radios issued to these officers didn't work with other agencies (sound familiar?), hundreds of very expensive portable radios were handed out, programmed to work over a brand new digital system in Maryland. Many investigators simply used cellular telephones. Some senior officials made use of wireless personal digital assistants to send and receive electronic mail.

Although it's self-evident that the ability for public safety personnel to communicate with each other is critical during emergencies, what does it take for this to happen?

Technical Difficulties

The first step is getting equipment that can work together. Radio equipment for public safety agencies is currently available in several frequency bands, determined primarily by historical licensing decisions by the Federal Communications Commission (FCC). Other systems typically use VHF and UHF frequencies, while new systems commonly operate in the 800 MHz band.

However, one size does not fit all, even for frequencies. Generally speaking, systems operating in the 800 MHz band perform well in dense urban environments, while VHF and UHF systems are more appropriate in rural areas where they can provide greater coverage. There are patchwork solutions that can pass traffic between these frequency bands, but they're expensive and don't always work well.

Even if the radios can talk to each other, there often aren't any available channels to use. Trunking technology can help in using the existing channels more efficiently, but the next frontier is 700 MHz, which holds the promise of open, unencumbered bandwidth. It's currently allocated to UHF television channels 52 through 59, but is scheduled to become available in a few years. There are a number of proposals pending at the FCC as to how best use this space—some good, some not so good. As the final decision-maker, the FCC must establish rules about how the 700 MHz band is to be used. Poor decisions will simply duplicate the problems that currently exist in other bands and are especially acute in 800 MHz.

Standards

There are somewhere in the neighborhood of 30,000 emergency response agencies in the United States. Nearly all of these agencies use some type of Land Mobile Radio (LMR) technology. Much of this equipment is proprietary and will only work with radios built by the same manufacturer.

In 1989 the Association of Public Safety Communications Officials (APCO) began work on Project 25 to establish a set of open, publicly available standards for efficient narrow band digital communication. Instead of a proprietary system provided by a single equipment manufacturer, these open standards allow any number of manufacturers to produce compatible equipment. This allows some degree of healthy competition, potentially lowering prices for everyone.

Phase I of these standards is complete and quickly becoming commonplace, especially in large metropolitan areas. The federal government has specified Project 25 equipment for nearly all of their new systems, so future interoperability will require the use of these APCO standards.

Funding

Local jurisdictions typically cannot afford to build their own system. Even small systems run into the millions of dollars, where a single radio can cost several thousand dollars.

A potential solution is to follow the model used by such states as Colorado and Michigan, where the state government provides a basic network and invites local jurisdictions to join. In Minnesota, the Metro Public Safety Communication System covers nine counties, including the Twin Cities. It operates a common "backbone" of repeaters and related equipment, providing basic services to nearly 5,000 radios in Hennepin County alone; twice that are expected across the system when it reaches full deployment. The backbone cost $36 million to install, which was shared among the various participants.

If planned and equipped correctly, this type of cooperation can also solve much of the lack of capacity problems plaguing metropolitan radio networks.

Who is in charge here?

Although much progress has been made in addressing technology, interoperability is more than just getting radios to talk to each other. It requires procedures and processes to cure the jurisdictional conflicts and command struggles that occur when multiple agencies have to work together. This is perhaps the most difficult part of all, to create a true partnership focused on a common goal.

So, to summarize, several things need to happen:

- The FCC needs to establish clear, rational rules for public safety operation in the 700 MHz band;
- Additional funding needs to be made available for local police and fire departments to purchase, install, and be trained on new radio equipment that is Project 25 compatible; and
- Common operating procedures and clear lines of authority need to be established for agencies at every level of government, especially as public safety and national security continue to overlap.

Until these things can happen, the citizens of this country will continue to be at risk from a lack of interoperability.
Grove is always watching for new and powerful radio communications equipment. Here is some of the newest, cutting-edge products that are now in stock or soon to be released. Call Grove to be the FIRST to receive these products. As always, your card is never charged until we’re ready to SHIP your product!

**Uniden BCT-8**

The BCT8 is a state-of-the-art Trunk Tracking Scanner with BearTracker technology which will alert you when the highway patrol is within approximately a 3 mile radius. It can store 250 frequencies such as police, fire/emergency, marine, railroad, air, amateur, and other communications into 5 banks of 50 channels for a total of 250 channels. **Call for pricing and availability.**

- Highway Patrol
- Local Police and Country Sheriffs
- Trunking for: Motorola Type I Type II Type II: (Hybrid)EDACS Wide band Scat LTR Business/Industrial Radio
- Utilities
- Marine Band
- Aircraft Band
- And much more...

**Sangean PT-633**

For shortwave listeners seeking a low-cost, high-performance portable, the new Sangean Travel Pro is hard to beat. Offering worldwide shortwave frequency coverage along with conventional AM and FM broadcast reception, the pocketable Pro runs off three AA cells (not provided) or an optional 4.5 VDC power adaptor.

The internal speaker provides good, loud, crisp audio; while you can’t expect chest-pounding bass from its small internal speaker, you can expect clear, undistorted voice audio. A set of ear buds is provided for private listening and reception of stereo in the FM mode.

Nor is the radio continuous coverage; the shortwave broadcast bands are the target, not the utilities between them. The radio is designed for convenient shortwave listening in a highly-affordable package, and that’s what it does.

The radio weighs about one pound and measures 5-3/4” W x 3-1/4” H x 1-1/4” D. It is accompanied by a soft leatherette carrying pouch.

**Order RCV09 - $59**

**Radio Shack PRO-96**

APCO 25 digital trunking including the newer systems using a 9600bps control channel.

Follows analog Motorola I, II, I/II and GE/Ericsson (EDACS) trunked radio systems.

The first of an innovative and exciting new generation of RadioShack scanning receivers capable of receiving Phase 1 APCO-25 C4FM/IMBE digital voice modulation from the newest and most sophisticated conventional and trunked radio networks.

**Order SCN50 - $49**

(800) 438-8155

**Grove Enterprises, Inc.**

www.grove-ent.com

(828) 837-9200; fax: (828) 837-2216

7540 Hwy 64 W; Brasstown, NC 28902

Email: order@grove-ent.com

**www.grove-ent.com**
Tune in the world with Icom!

**New IC-R5**
Winning performance! Compact, and packed with features!
- 150 kHz - 1.3 GHz* AM, FM, WFM
- 1250 Alphanumeric Memories
- CTCSS/DCS Decode
- Weather Alert
- Dynamic Memory Scan (DMS)
- Preprogrammed TV & Shortwave
- Water Resistant
- 2 AA NiCds
- PC Programmable

**IC-R3**
See & Hear all the action!
- 500 kHz - 2.45 GHz* AM, FM, WFM, AM - TV
- 450 Alphanumeric Memories
- Tone Scan
- 4 Level Attenuator
- Telescoping Antenna with BNC Connector
- 2" Color TFT Display with Video/Audio Output
- Lithium Ion Power
- PC Programmable

**IC-R10**
Advanced performance!
- 500 kHz - 1.3 GHz* AM, FM, WFM, USB, CW
- 1000 Alphanumeric Memories
- Attenuator
- Backlit Display & Key Pad
- VSC (Voice Scan Control)
- 7 Different Scan Modes
- Beginner Mode
- Band Scope
- Includes AA NiCds & Charger
- PC Programmable

**New Software IC-PCR1000 Bon**
Turn your PC into a wide band receiver! Compatible with most PCs and laptops, the "PCR1000 connects externally in minutes! Now with Bonito" software! Updated ICOM software compatible with later versions of Windows OS is also now available!
- 100 kHz - 1.3 GHz* AM, FM, WFM, USB, CW
- Unlimited Memory Channels
- Real Time Band Scope
- IF Shift
- Noise Blanker
- Digital APC
- Voice Scan Control
- Attenuator
- Tunable Bandpass Filters
- AGC Function
- 5 Meter Squelch
- CTCSS Tone Squelch
- Computer Controlled DSP with optional UT-106

**Pull out the weak signals**
- 30 kHz - 60.0 MHz* AM, FM, S-AM, USB, CW, RTTY
- 101 Alphanumeric Memory Channels
- Twin Pulsed Turn (PTT)
- Commercial Grade
- Synchronous AM Detection (S-AM)
- Optional DSP with Noise Reduction Auto Notch Filter
- Triple Conversion
- Up to Two Optional Filters
- Front Mounted Speaker
- Large Display
- Well Spaced Keys and Dials
- PC Remote Control with ICOM Software for Windows® (RSR75)

**IC-R75**

**IC-R8500**
The experts choice
- 100 kHz - 2.0 GHz* AM, FM, WFM, USB, CW
- 1000 Alphanumeric Memories
- Commercial Grade
- IF Shift
- Noise Blanker
- Audio Peak Filter (APF)
- Selectable AGC Time Constant
- Digital Direct Synthesis (DDS)
- RS-232C Port for PC Remote Control with ICOM Software for Windows® (RSR8500)

Why not? You deserve it!

www.icomamerica.com