Romancing the River

Also in this issue:

- Annual MT Baseball Line-up Card
- Propagation Outlook
- User-Controlled On-Line Tuners
- Aero Monitoring and more...
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 AR500C 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

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Is this the most advanced shortwave receiver in the world?

You be the judge.

Extraordinary sensitivity, built-in spectrum analyzer with 16 Hz resolution, DSP with numerous signal processing features, built-in recorder (audio as well as intermediate frequency), and much more. See our Web site to find out what will impress you most: the technical details or the low price?

Specifications

Receiver type: Software-Defined DSP-based DDS receiver
PC-based (PCI card) with on-board DSP
Frequency range: 9 kHz to 30 MHz (1 Hz resolution)
Modes: AM, LSB, USB, ISB, DSB, CW, FM
Bandwidth: 1 Hz to 15 kHz
continuously variable in 1 Hz increments
Sensitivity: 0.25 µV (AM, 10dB S/N)
S-meter sensitivity: 0.1 µV

Specifications are subject to change without notice. © 2004 WinRadio

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CONTENTS

The Potomac TRACON ................................. 17
By Jean Baker Hubbard
Less than two years ago, the Federal Aviation Administration made a major change to the way air traffic control was handled around our Nation's Capital — it consolidated traffic control from five major airports under one umbrella — the Potomac TRACON. Here is how it works.

User-Controlled On-Line Tuner FAQs.................... 18
By Jim Southwick
Using the internet, it is now possible to control and listen to a receiver located a world away from you, in someone else's shack. Some people called such set-ups "remote-controlled" receivers, but the author simply calls them UCOTs. Here he answers "frequently asked questions" about the pros and cons of various software, where to find receivers to tune in, and what's involved in setting up your own UCOT.

The Annual MT Baseball Line-Up Card ................. 22
By Ken Reitz
It looks to be another good year for listening to baseball over the radio — whether it's a crystal set or a satellite radio.

Propagation Outlook for July-Sep ....................... 24
By Tomas Hood
In this installment, Tomas explains the chemistry of propagation, reviews the SnapMAX forecasting software, and gives his own forecast for the next three-month period.

Cover Story
Romancing the River
By Gayle Van Horn
MT's Frequency Manager, Gayle Van Horn, evokes the magic and mystery of the mighty Mississippi from a recent radio road trip to New Orleans. She covers general background to marine monitoring and channel usage as well as specific VHF-FM traffic in the New Orleans area — including the new 12.5 kHz spacing. Story starts on page 12.

On Our Cover: Ships doing the dipsy-doodle around one of the river's most dangerous curves, right in the heart of the city. (Photo by Gayle Van Horn)
You could save over $381.00 by only spending $28.95!

Are you one of the thousands of Monitoring Times readers that pick up your issue at a newsstand or bookstore? We know you value the information and the articles that MT offers, but that’s not where the value ends. By subscribing to MT today, you’ll get the following bonuses:

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You say you don’t want to have to choose? Why not get BOTH? That’s right, if you subscribe now to both MT print edition as well as MT Express, you can have them BOTH for only $39.95 per year! It just doesn’t get any better than that!

Order TODAY and use code MTSPECIAL to get all the great offers!

Call TODAY and tell the operator your want your MTSPECIAL!

Or just go to www.grove-ent.com to order NOW!
Reviews:

With summer storms you never know when the power might be out. Jock Elliott says an emergency "gottahave" is the C Crane Freeplay Plus. An AM/FM/SW radio with decent sound, it's also a flashlight. Best of all, it's rechargeable by any one of three methods so it's always ready to use (see page 86).

One tool that can be really handy for scanner hobbyists is a decoder that will display CTCSS, DCS, LTR and DTMF codes. The CSI Flex Series Multiprotocol Decoder will do just that. Help the monitor determine talk groups and trunked systems, among other uses. Even better, the decoder can be "flash" programmed to configure its brain to a different purpose; making the multiprotocol decoder also multipurpose (see page 78).

Ignore the butterfly logo and the name, and MixW is a sophisticated program for hams and SWLs alike. The program can encode or decode many different amateur modes, can tune your receiver by clicking on a spectrum display, and can even log your reception or amateur contact. This one is well worth checking out (page 81).

Hobbyists who are limited in their ability to put up an outside antenna are almost forced to resort to an active antenna if they want more than basic reception. The AOR WL-500 Antenna goes a long way towards reducing some of the noise issues seen with other active antennas, and it's great for anyone needing a portable shortwave antenna for camping or travel (see page 82).

TABLE OF CONTENTS

Departments:
Letters .................................. 6
Monitoring and the Law ...................... 8
New Florida Law ............................. 2
Communications ............................. 10
Stock Exchange ............................. 90
Advertisers Index ........................... 90
Closing Comments ......................... 92
Sharing is Good - Yes? .......................... 92

First Departments
Getting Started
Beginners Corner .............................. 26
Keeping a Log ............................... 26
Ask Bob ..................................... 28
Bright Ideas .................................. 29

Scanning Report
New York, New York .......................... 30
Scanning Canada ............................. 33
Frequency Hopping at Toronto Airport ...

Utility World .................................. 34
Morse Code Enters the 1970s ................. 34
Utility Logs .................................. 35
Digital Digest .................................. 37
Globe Wireless Isle Signals Revealed ....... 37

Global Forum .................................. 38
Information Radio is Back .................... 38
Broadcast Logs ............................... 41
The QSL Report ............................. 42
Hot July QSLing .............................. 42
Programming Spotlight ........................ 43
Keep Relaxing! It's Still Summer! ............ 43

Listening Guide
English Language SW Guide ................... 44
Programming Listings by Station ............. 44
MT Satellite Services Guide ................... 70
Americanas, S-9, S-5 ........................ 70
Panamssat SBS-6, Galaxy 11 ........................ 70

Second Departments
Milcom ....................................... 64
Airshow Frequency Update ..................... 64
Boats, Planes, and Trains ...................... 66
Exploring Your Aero World .................... 68
American Bandscan ........................... 68
IBOC: The Next Step .......................... 69
Outer Limits ................................. 69
Summer: Static and Daylight ................... 71
Below 500 kHz ................................ 71
Summer: Strategy ............................. 72
On the Ham Bands ............................ 72
Remembering OSCAR ....................... 72
Antenna Topics ............................... 74
Some Rules Made to be Broken ............... 74
Radio Restorations ........................... 76
Calling in a Substitute ........................ 76

MT Reviews
Scanner Equipment ............................ 76
CSI Flex Series Decoder ....................... 80
Computers & Radio ........................... 80
Can Radio Monitors Love a Butterfly? ......... 82
MT Review ................................. 82
AOR WL-500 Antenna ......................... 82
On the Bench .................................. 84
Audio Amplifiers You Can Build .............. 84
The Gadget Guy .............................. 86
C Crane Freeplay Plus ......................... 86
What's New ................................... 88
View from Above ............................. 88
HRPT Hardware Failing ...................... 90
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 FM radio two-way communications can be heard using the SSB circuitry. Its highly sensitive automatic 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, and sleep timer
- Sleep timer, dual clocks, and dual alarm modes wake you with beep 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
- Multifunction LCD displays digital frequency, clock, and more
- Alarm and 1-90 minute sleep timer
- Built-in antennas for complete portability and socket for supplementary Shortwave antennas
- Includes AC adaptor, earphones, carrying pouch, supplementary Shortwave wire antenna, and batteries

$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
 Anything for a Sale?

George Zeller forwarded a recent cover of the Japanese Amateur Radio magazine, sent to him by Lee Reynolds, the lobbies' editor of ACE (Association of Clandestine Enthusiasts). I asked the rather rhetorical question of what was the radio connection on the cover? George later replied:

“Paul Lunnier, formerly of Gilfer Shortwave, has come to our rescue about the Japanese Ham Radio magazine with the creative cover layout. He understands a fair amount of Japanese and actually subscribes to the magazine that I sent you. He says that the content of that month’s magazine was an antenna issue, just in case you are interested. It is hard to say the money to do it. Perhaps you could send them ham radio publicity material."

- Stan Blumenthal, Oak Ridge, Oregon

Pet Peeves

Sterling Marcher writes about another kind of pet – pet peeves. He asks why not have a column for them? I say we do – The “Letters” column. Or even “Closing Comments” if your comment is too long for use in this column.

Here’s one of Sterling’s pet peeves:

“I have a large box full of AC/DC transformers (aka wallwatts) and there is no ID on them except their manufacturing names. Can’t the manufacturers put a tiny tag on their wall warts showing what the transformer is for?”

Bring Back Radio Dramas

“Bravo to Greg Petro, on his excellent article Sunday and the Philcos, March 2004.

“I too was fascinated by the theater of the air, and believe my early introduction to the likes of Gainsmoke, Amos and Andy, X minus one, Fibber McGee and Molly, right on to Yours Truly, Johnny Dollar, prepared me for television (my folks bought our first television in 1954).

“I got briefly nostalgic when these very same shows were broadcast on AFRTS, while serving in Germany from 1965 to 1967. So Greg hit it on the nail, when he mentioned his visits to his grandparents and the thrill of listening to the菲les on the Philcos.

“I inherited the old Zenith table model I listened to in the early 1950s, which is now occupying a shelf in my garage. I look up on that shelf and smile. Thank goodness for Costco; in recent years I have collected the sets of tapes they offered for sale – the CBS collection – the Western radio series – and several I taped off the radio from PBS.

“At 58, I now long to see a revival of original radio drama programming. It is sort of hit or miss now; and some stations like KNX 1070 AM out of Los Angeles, which I can pick up here at night, run old-time radio shows. Even NPR and PBS have gotten away from original radio drama.

“I was asked not long ago, by my now-deceased father, what I would like to do if I had the money to do it. I answered without hesitation.. . .to run and program my own radio station. If that ever happens (and I if I had the money, for it would take a lot of it to do it) I would bring back radio drama original programming.

“Thanks again to Mr. Petro for bringing back memories of radio, and no matter what anyone says – back then, radio was king, and it gave us kids in the early fifties something that Game Boy or video games don’t give – it spurred our imaginations.”

- Ian Abel G3ZHI

Old Time Radio is still to be found with a little looking. In addition to the hundreds, if not thousands of recordings and scripts available for purchase or for download off the internet, some shows are being rebroadcast. For AM/PM, SW or satellite broadcasts of old-time shows, try the list at http://www.old-time.com/files/stations.ost.

To find on-line broadcasts, try http://www.yesterdaysusa.com/.


I noted in this month’s edition of Global Forum (page 41) that Steve Cole’s Different Kind of Oldies Show on WBCQ is being discontinued for lack of support. Still, WBCQ owns a substantial archive of Jean Shepherd’s memorable radio broadcasts. Look around – you’ll find you aren’t alone in this particular area of nostalgia!

Still Going Strong

Martin Franko of Yorkton, Saskatchewan, sent a photocopy of the listing of shows, try the list at http://www.old-time.com/files/stations.ost.

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Aid for Iraqi Amateurs

“The hams in Iraq need help in establishing ham radio in their country and for ham radio to survive after June 30th 2004 when the CPA hands over to the local authorities. It would be helpful if people could do what they can to support the Iraqi Association for Radio Amateurs at this sensitive time.

“This could be in the form of a letter of support for the future of the hobby in Iraq from your national radio society or educational material to help run ham radio classes or perhaps you could send them ham radio publicity material.”

“Thank you for your co-operation in this matter.”

- Ian Abel G3ZHI

“Thanks again to Mr. Petro for bringing back memories of radio, and no matter what anyone says – back then, radio was king, and it gave us kids in the early fifties something that Game Boy or video games don’t give – it spurred our imaginations.”

- Stan Blumenthal, Oak Ridge, Oregon

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My Start in Radio
By Peter Lautzenheiser

My interest in radio started as a child. Radio always fascinated me. My family didn’t have a TV when I was growing up. Mom had a portable shortwave receiver when I was very young. I have only vague memories of this. She told me about hearing a party on a boat once. This was in AM band back then.

I listened to the broadcast band late at night. When I started elementary school in Akron, Ohio, the bus driver was a registered nurse who was married to a truck driver. There was a CB radio on the bus. Sometimes, she would let us talk on the CB to her husband. My handle was “Peter Rabbit.” Once she talked to the Goodyear Blimp on the CB.

When I was little, one of the first things I thought I wanted to be when I grew up was a disc jockey on broadcast radio; now there’s too much politics involved.

My first shortwave was a Christmas gift in 1985. It was a Radio Shack SW-60 portable and it had Shortwave, AM, VHF and UHF. I listened to medical stuff like emergency squad calls, and all kinds of businesses like construction companies, school bus communications, etc.

During my high school years I started listening to shortwave radio. I heard the upheaval when communism fell. It was some of the most exhilarating radio I’ve heard in all my time in the hobby. My early years in shortwave listening were totally enthralling. There was Mikhail Gorbachev shaking up the Soviet Union with glasnost and perestroika; it was interesting to see Russia transformed from a communist government to an elected one.

The inspiration for getting into shortwave radio was the fact that I read a lot of history. I’m a lifelong user of the local library. World War II history is what really got me into shortwave radio. When the 1981 baseball strike occurred, I started studying aviation to fill the time, and this led to the interest in military history in general, not just the Second World War. I wanted to listen to places I was reading about. My early years in shortwave listening were totally enthralling. There was Mikhail Gorbachev shaking up the Soviet Union with glasnost and perestroika; it was interesting to see Russia transformed from a communist government to an elected one.

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Amateur radio operators as well as outlaw pirate radio broadcasters could face a third degree felony and a $5,000 fine in Florida under a new law which takes effect this month. Senate Bill 2714 relating to an unauthorized transmission to, or interference with, a public or commercial radio station, creates Florida Statute 877.27, which prohibits a person from making a radio transmission in Florida unless the person first obtains a license or an exemption from licensure from the Federal Communications Commission. The new law also prohibits an unlicensed radio or pirate radio transmission that interferes with a licensed public or commercial radio station.

Specifically, a person may not make, or cause to be made, a radio transmission in Florida unless the person obtains a license or an exemption from licensure from the Federal Communications Commission under 47 U.S.C. s. 301, or other applicable federal law or regulations. A person also may not perform an act, whether directly or indirectly, to cause an unlicensed radio transmission to interfere with a public or commercial radio station licensed by the Federal Communications Commission or to even enable the radio transmission or interference to occur.

In the wake of the new law, amateur radio operators in the state are concerned SB 2714 could be misconstrued to apply to anyone transmitting a signal, even an accidental interference, that affects public or commercially licensed broadcasters. This could include not only amateur radio operators, but anyone using the radio frequency spectrum.

The hope of some is that the FCC may intervene and issue a declaratory ruling noting that there is federal preemption in this area and that control of the airwaves is their exclusive domain.

**Scanners in Virginia and West Virginia**

In our continuing coverage of states that have specific statutes on the use and possession of scanners, this month we present the Virginia and West Virginia Statutes relating to such use and possession. West Virginia’s brief law prohibits the use of what you hear over a police radio to further the commission of a crime. Virginia similarly prohibits the use of what you hear over a police radio if used to help commit a felony.

**West Virginia Statutes §15-3-5**

"Use of information obtained by interceptions of transmissions on department of public safety communications system forbidden; penalties.

"No person shall intercept any message or transmission made on or over any communications system established by the department of public safety and use the information obtained thereby to aid, abet or assist in committing a crime, or in violating any law of this state, or use the same in a manner which will interfere with the discharge of the department’s operations.

"Any person who violates any provision of this section or of section two of this article shall be guilty of a misdemeanor, and, upon conviction thereof, shall be sentenced to confinement in the county jail for a period not to exceed one year or by a fine of an amount not to exceed five hundred dollars or by both such confinement and fine in the discretion of the court."

**Code of Virginia § 18.2-462.1.**

"Use of police radio during commission of crime.

"Any person who has in his possession or who uses a device capable of receiving a police radio signal, message, or transmission, while in the commission of a felony, is guilty of a Class 1 misdemeanor. A prosecution for or conviction of the crime of use or possession of a police radio is not a bar to conviction for any other crime committed while possessing or using the police radio."

**Radar Detectors in Virginia**

While the days of the Virginia State Police sniffing out your FuzzBuster (tm) radar detector and seizing it are gone, it is still illegal to use radar detection devices in Virginia. Contrary to the state statute, some local government web sites such as the City of Fairfax advise that drivers may possess a detector even in a vehicle if the device has no power source and no one in the vehicle can access it. The actual statute, however, still prohibits possession in a motor vehicle, even if disconnected and not in actual operation.

**§ 46.2-1079. Radar detectors**

"A. It shall be unlawful for any person to operate a motor vehicle on the highways of the Commonwealth when such vehicle is equipped with any device or mechanism, passive or active, to detect or purposefully interfere with or diminish the measurement capabilities of any radar, laser, or other device or mechanism employed by law-enforcement personnel to measure the speed of motor vehicles on the highways of the Commonwealth for law-enforcement purposes. It shall be unlawful to use any such device or mechanism on any such motor vehicle on the highways. It shall be unlawful to sell any such device or mechanism in the Commonwealth. However, provisions of this section shall not apply to any receiver of radio waves utilized for lawful purposes to receive any signal from a frequency lawfully licensed by any state or federal agency.

"This section shall not be construed to authorize the forfeiture to the Commonwealth of any such device or mechanism. Any such device or mechanism may be taken by the arresting officer if needed as evidence, and, when no longer needed, shall be returned to the person charged with a violation of this section, or at the person's request, and his expense, mailed to an address specified by him. Any unclaimed devices may be destroyed on court order after six months have elapsed from the final date for filing an appeal.

"Except as provided in subsection B of this section, the possession of any such prohibited device or mechanism in or on a motor vehicle on the highways of the Commonwealth shall constitute prima facie evidence of the violation of this section. The Commonwealth need not prove that the device or mechanism in question was in an operative condition or being operated."

**Police Radio Jammer Gets 8 Years**

Twenty-six year old Rajib Mitra of Brookfield, Wisconsin, has been sentenced to eight years under new guidelines that provide for harsher penalties under the Federal Sentencing Guidelines that took effect in November 2003. In March, a jury convicted Mitra, in the case of the "magic radio," of repeatedly interfering with the emergency communications radio system of the Madison Police department last year.

Federal District Judge John Shabaz could have added more time to the sentence for each of the times that Mitra interfered with the Madison police radio system, but he decided not to do so. The case is unique, since the United States charged Mitra’s interference with the police communications system as interference with a critical infrastructure under the new post 9/11 guidelines and not under any of the traditional federal radio laws.

During the sentencing last May, Judge Shabaz noted the government’s evidence showed Mitra also caused 36 other instances of interference over a dozen times starting in January of 2003.

Monitoring and the Law will have full coverage of how Mitra got himself into trouble with his scanners and radios in next month’s issue.
Bearcat® 245XL Trunk Tracker II

Mfg. suggested list price $429.95/CEI price $189.95

300 Channels • 10 banks • Trunk Scan and Scan Lists

True Tonal Lockout • Trunk Delay • Cloning Capability

10 Priority Channels • Programmed Service Search

Size: 2½"W x 6"D • Weight: 1.5 lbs

Frequency Coverage:
25 MHz: 25.000-54.000 MHz
50 MHz: 41.675-85.000 MHz
80 MHz: 144.000-148.000 MHz
110 MHz: 222.000-226.000 MHz
220 MHz: 435.000-440.000 MHz
440 MHz: 446.000-450.000 MHz
445 MHz: 450.000-452.000 MHz
896 MHz: 896.000-900.000 MHz
1080 MHz: 1080.000-1085.000 MHz
3400 MHz: 3400.000-3450.000 MHz

Bearcat® TrunkTracker BC245XL is the world’s first scanner designed to track Motorola Type I, Type II, Hybrid, SmartCTT® and SmartCTT®+ digital radio trunking systems on any band. Now, follow UHF High Band. UHF 800/900 MHz trunked public safety and public service systems just as if it were conventional two-way communications. Your Bearcat® offers 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 all 800 MHz and 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. Smart Scanner - Automatically program your 245XL into the channels and trunking talk groups for your local area by accessing the Bearcat® national database with your PC. If you do not have a PC you may use the optional TurboScan™ key to increase the speed search to 300 steps per second when monitoring frequency bands with 5 kHz steps. 10 Priority Channels - You may select from 10 trunked channels. Assigning a priority channel allows you to keep track of activity on your most important channels. Digital pre-programmed Software Card (SPC) Search - Allows you to take advantage of the multi-channel and multi-band features of your Bearcat®. The Digital Preprogrammed Servicenames on the SPC searches for the required servicenames in the database. Bearcat® also includes an enhanced battery save feature with battery low legend, separate controls for volume and squelch, four way side rocker with separate main tuning dial, user selectable keypad backlighting and LCD contrast, alphanumeric address labels for unconditional broadcast, and dual talk-and-listen switches. 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The military is normally very specific on what type of equipment can be used; frequencies must be coordinated with local usage, and most of the radios used by soldiers in combat are secure so the enemy can't intercept messages.

"I'm not sure whether the Army will let civilian type radios in the country," said Bobby Kreps, commander of the local AMVETS chapter. MT remembers when military units have gotten into hot water in the past by using Family Service Radios for squadron communications.

So far Rorrer has sent eight radios, he thinks, "Well, I might need it for something."
New York Statewide System

New York governor Pataki has been defending the ambitious statewide wireless emergency communications system contract recently awarded to M/A-Com after eight years of development. Contrary to early fears, the administration assures the system will not include any construction in the protected wilderness areas of the Adirondacks and Catskills, but will plan for a handful of towers to be erected in populated areas, and for repeaters mounted on emergency vehicles to be used as needed in outlying areas.

It could be two years before the pilot program is completed and three years after that before any kind of system is put into place, according to the administration. The M/ACom bid for the 20-year contract was $1 billion, as opposed to Motorola's $3 billion. Critics point to Pennsylvania, where a similar system is already three years late and double what the company bid.

Meanwhile, the network has no place to operate at this time, said the FCC. The additional channels the state counted on are television channels being used by mostly religious and ethnic television stations nationwide. California, Florida, Kentucky, New Jersey and Washington have also passed legislation to create wireless networks on the new television channels when available, according to the National Conference of State Legislatures.

"There are no channels left," said John McFadden, a vice president for Motorola, which has won contracts to build 22 of 25 states' emergency radio systems. "They asked the broadcasters to get off the channels, but they don't have to ... they are on the air now and they aren't going to just want to give up the channels." See Scanning Report for more in-depth report on these developments.

Nextel Swap

By the time you read this, the FCC may finally have made a decision about the long-debated swap of Nextel's 800-MHz frequencies for spectrum out of the public safety allocations. FCC Chairman Powell was pushing for a decision by the end of May, but he has backed off his support for Nextel's plan.

Nextel's proposed solution is one that actually came out of Oregon. During the 2001 Oregon Legislature, a bill drafted by Sen. Rick Metzen brought together metro-area public safety officials and representatives of the wireless communications industry. That plan formed the basis for the proposal known as the "Consensus Plan," in which the Federal Communications Commission would reassign radio frequencies to eliminate interference.

According to the Washington Post, Nextel competitor Verizon Wireless has won support from several dozen members of Congress and New York state Attorney General Eliot L. Spitzer. Nextel has the support of the Association of Public Safety Communications Officials and hundreds of local fire and police departments around the country.

Each side has threatened to sue if the FCC does not act in its favor.

Jammer Sentenced

Rajib Mitra, the University of Wisconsin student convicted in federal court of intentionally jamming the Madison emergency radio system 37 times last year, was sentenced in federal court as a domestic terrorist Wednesday to eight years in prison, placed on three years' probation and ordered to make restitution of $6,005 to the Madison Police Department.

Although the government considered Mitra the equivalent of a domestic terrorist, based on an application of the Patriot Act that punishes the substantial disruption of a critical public infrastructure, Assistant U.S. Attorney Tim O'Shea said Mitra's crime stemmed more from "immaturity than ideology."

Australia debates media access

Australia's Premier Peter Beattie asked for a public inquiry before deciding whether the media would be granted access to police radio broadcasts once the network turns digital. Judges, civil libertarians, and academics will be weighing in against the Queensland Police Service which currently plans to deny access to the system.

EMERGING TECHNOLOGY

Robots

Robots have been big in the news lately. Robots are center-stage in NASA's exploration of the Mars landscape (see last month's feature story). Robots go where it's too dangerous or difficult for mankind to go - from performing surveillance or delivering supplies within a war zone to performing microscopic surgery.

A couple of ambitious applications for robots have surfaced in the news lately. Japan is working on developing robots for the care and even companionship of the elderly and disabled, in anticipation of a manpower shortage to take care of an aging generation.

Back in space, NASA has agreed to consider the feasibility of repairing the Hubble Telescope using a robot. Without the required maintenance, Hubble will inevitably fail around 2007 and reenter the atmosphere, but NASA administration has determined that manned trips to the Hubble involve too many risks to human life.

MISCELLANY

Tauzin Still Truckin'

Contrary to expectations, Senator Billy Tauzin did not retire from Congress for either of the lucrative jobs rumored to have been offered him. And the bleeding ulcer which hospitalized him revealed a rare intestinal cancer. Tauzin underwent surgery in April and plans to return to finish his term in Congress after recovery, according to his website.

Surround Sound

Whales are having a hard time being heard these days. Researchers say that "calls" made by killer whales in the Pacific Northwest are about 15 percent longer than they were in 1990, when whale watching began to take off.

The scientists say that, like humans, the whales are trying to adjust to the noise around them. "Sound is everything to these animals. They live in a world of sound the way we live in a world of sight," said Iain Kerr, a whale researcher at Oceans Alliance, a nonprofit research organization.

Killer Radio

William Joseph Wolfe of Henderson, Texas, was charged in May with attempted murder after he allegedly prepared his wife a bubble bath, complete with candles and music, then tried to electrocute her by pushing a radio into the tub. Apparently such actions were unusual enough to alert his wife, Teresa Wolfe, who told the police she caught the radio before it hit the water and threw it out of the way.
Folklorists tell us there is magic in its brown waters and nowhere is this more true than in the city of New Orleans. They say, a visitor who drinks from it will surely return to that city; or if he washes his face in it, his luck is bound to change from bad to good. So goes the mystique of this mighty waterway...one that has traditionally been the great provider and the great destroyer.

What body of water are we talking about?
- The Father of all Waters - the Mississippi River.

Live around “Old Man River” long enough and it will become a part of your life; it certainly did mine. And I admit it: I still miss monitoring the tugs, cruise ships, container ships and tankers that plod up and down the great river. I miss hearing the calliope play on the Natchez steamboat as she works the river giving tourists a river eye view of the surroundings.

Recently, I was able to return to New Orleans (pronounced “Nawlins” by the locals). It was a chance to once again experience the ambiance of the city, catch up on some southern culture and food, and do some monitoring of the VHF marine bands.

Pull up a Park Bench and a Whip Antenna
One of the best places to conduct a maritime monitoring session is on the east bank of the river, on the levee in front of Jackson Square. Find yourself an empty park bench, pull up your whip antenna on the scanner and experience first hand the pulse of the river unfolding before you.

From this vantage point you have the best location to see and monitor the traffic from barges, massive tankers, cruise ships and even the occasional naval vessel from any one of a number of countries.

Armed with Table One in this article, you can experience the lure of the river and its radio traffic, not unlike the experience of radio hobbyists that specialize in aircraft or railroad monitoring.

Port of New Orleans
Annually, over 6,000 vessels move through the Port of New Orleans on the Mississippi River. Ships are guided through New Orleans by light operators, watching from an office with a river view, high above the Nicholls Street wharf. The job demands good judgment, the ability to endure an eight hour-shift, and, above all, a knowledge of ships and the river. All operators must hold an accredited license. Armed with a phone, radio, log book, a hotline to the lighthouse upriver at Gretna, and a small radar screen, the operator’s word is law as they are the eyes and ears to all river traffic in the port.

At Algiers Point, just down river, operators guide ships around what may be the most dangerous bend along the Mississippi River’s 2,350 miles. Speedy currents sweep across the channel, dragging ships along for the ride. The force of the water coming around the bend creates swirling eddies strong enough to suck a tugboat upstream. Giant container ships down river can careen wildly, skidding around the corner like a car on ice. Tugboats caught in the onshore currents may find themselves pulled into the direction of onrushing freighters. Reflecting on the day, light operator Chris Johnson commented, “It goes by faster when it’s busy,” he said, “but it’s real nerve-racking.”

Algiers is home to the most active of the area’s ferryboats. Ferries remain an integral part of river traffic and an alternate route into and out of New Orleans. Other ferry crossings include Gretna, Harvey, and the Chalmette Ferry in nearby St. Bernard Parish.

The Algiers Ferry carries passengers from downtown New Orleans to Algiers across the crescent path of the Mississippi. This is a great opportunity to listen to communications while getting a close-up view of cruise and container ships, tugs, NOAA vessels, and tankers, as well as the remarkable skyline of New Orleans. You might also be able to hear some distinctive music coming from the nearby French Quarter and Jackson Square during a ferry crossing.

River Pilots on the Mississippi
Decades before Mark Twain wrote a word about the Mississippi River, pilots were plying their trade along the waterways. In Louisiana, piloting dates back to the 1700s, during a time of brawling over the best river assignments, among many who lacked the skill and knowledge to handle the job.

Today, before becoming an accredited river pilot, a candidate must work as an apprentice, which means riding along with other pilots and learning the ropes. After completing the apprenticeship, candidates take a written examination...
administered and graded by a panel of pilots. Once that exam is passed, the oversight board recommends their appointment to the governor, who officially commissions all river pilots.

At that point, pilots legally can go into business for themselves. Pilots, also called “Masters of the River,” earn more than airline or cruise-ship captains in a pressure-filled job. They indeed, command the river, though at great risk. One mistake could send a 100,000-ton tanker filled with explosive jet fuel into a paddle-wheel ship filled with tourists.

Monitoring river traffic in and around New Orleans is not restricted to the Mississippi River. Pleasure boats can be heard on Lake Ponchatrain, and barge and tug traffic is active on the Harvey and Intracoastal Canals.

Yamna n’dem

Who doesn’t enjoy a get-together with friends and family? But at a draw bridge? That’s right, the drawbridge entering Plaquemines Parish over the Intracoastal Canal, just south of New Orleans on the west bank, remains a popular place to catch-up on gossip or socialize. Once the draw bridge has been drawn up for passing marine vessels, truck and car doors have been known to fly open and the zydeco music begins. Soon the socializing begins with, “Hey dawlin’, how’s yamamana’n dem” – a collective term spoken as one word to inquire about your immediate family. If the bridge is up long enough, due to an especially slow boat, you may hear the pop of a beverage can or two. Once the bridge returns to its normal position, so does the respective traffic until the next stopover.

This particular drawbridge over the Intracoastal has gained some notoriety in local circles. It is the only link from New Orleans into the town of Belle Chasse, home of Naval Air Station New Orleans and the rest of Plaquemines Parish down to Grand Isle, Louisiana. Consequently, it has earned a reputation as “one way in and one way out” – not exactly an encouraging thought during hurricane season. It does, however, stop many a law breaker, while the sheriff waits for them at the raised drawbridge!

Marine Communications Background

The Maritime, or Marine Services have evolved from the earliest practical uses of radio. In 1900, just six years after Marconi demonstrated his “wireless” radio, devices were being installed aboard ships to enable them to receive storm warnings transmitted from stations on shore. Today, the same principle applies in using both shipboard and land stations in the marine services to safeguard life and property at sea. Both types of stations are also used to aid marine navigation, commerce, and personal business, but such uses are secondary to safety, which has international priority.

The Marine Radio Services include the Maritime Mobile Service, the Maritime Mobile-Satellite Service, the Port Operations Service, the Ship Movement Service, the Maritime Fixed Service, and the Maritime Radio Determination Service. While these services classify the different types of marine radio communications we as monitors basically look at the marine band from two aspects – stations on land and stations aboard ships. The Federal Communications Commission (FCC) regulates this service both for ships of U.S. registry that sail in international and foreign waters, and for all marine activities in U.S. territory.

For this and other reasons, the rules from the FCC make a distinction between compulsory users of marine radio for safety at sea, and noncompulsory uses for purposes other than safety. In addition, rules concerning domestic marine communications are matched to requirements of the U.S. Coast Guard, which monitors marine distress frequencies continuously to protect life and property in U.S. waters.

Coast Stations and Their Frequencies

Land stations in the marine services are the links between vessels at sea and activities ashore. They are spread throughout the coastal and inland areas of the United States to carry radio signals and messages to and from ships on the water. These stations are generally characterized by the services they provide:

Public coast stations connect marine radios with the public switched telephone network. These stations are commonly known as “marine operators.” VHF-FM band (156-162 MHz) public coast stations provide short-range communications for vessels not more than 30 nautical miles from shore. High seas bands (2-27.5 MHz) public coast stations serve vessels far from shore. Some high seas stations can even serve vessels thousands of miles from land. Public coast stations are common carriers, and thus charge a fee for providing voice, telex, fax, or data transmission services. Nevertheless, public coast stations provide a vital public service, as they are reach well beyond the limits of terrestrial radio systems and are required by statute to relay distress messages free of charge.

Automated Maritime Telecommunications System (AMTS) stations are a special type of public coast station operating in the 216-220 MHz band. AMTS stations are licensed to provide coverage over an entire inland waterway or a substantial portion of an ocean coastline.

Private coast stations are not common carriers and they cannot charge for communications services. Instead, they provide information to associated vessels. Only those entities that provide some sort of service to vessels or control a bridge or waterway may become a private coast station licensee. Some common uses of private coast stations include: marinas, radio repair shops, bridges, locks and yacht clubs.

See Tables Two and Three for detailed VHF-FM marine band channel/frequency assignments.

Vessel Traffic Services (VTS)

The purpose of a Vessel Traffic Service (VTS) is to provide active monitoring and navigational advice for vessels in particularly confined and busy waterways. There are two main types of VTS, surveilled and non-surveilled.

A surveilled system consists of one or more land-based sensors (i.e. radar, AIS see below and closed circuit television sites) which output their signals to a central location where operators monitor and manage vessel traffic movement.

Non-surveilled systems consist of one or more reporting points at which ships are required to report their identity, course, speed and other data to the monitoring authority. They encompass a wide range of techniques and capabilities aimed at preventing vessel collisions, rammings and groundings in the harbor, harbor approach and inland waterway phase of navigation. They are also designed to expedite ship movements, increase transportation system efficiency, and improve all-weather operating capability.

VHF-FM communications networks form the basis of most major services. Transiting vessels make position reports to a vessel traffic center by radiotelephone and are in turn provided with accurate, complete, and timely navigational safety information. The addition of a network of radars and closed circuit television cameras for surveillance and computer-assisted tracking, similar to that used in air traffic control, allows the VTS to play a more significant role in marine traffic management. This helps reduce vessel congestion, critical encounter situations, and the probability of a marine casualty resulting in environmental damage.

The United States Coast Guard (USCG) maintains nine Vessel Traffic Centers (VTC) and is in the process of developing another. Valdez, Seattle, San Francisco, Los Angeles, Houston, Morgan City, Louisville, Sault Ste. Marie, and New York currently have VTCs. A VTC in New Orleans and the lower Mississippi River is being developed. See table two for more specific information on VTS frequencies.

Monitoring Marine Communications

Almost every scanner sold since the advent of programmable scanners is capable of monitoring the VHF-FM Marine Band. Some even have specialized search routines preprogrammed to find activity in the listener’s local area.

As far as reception range is concerned, the listener must remember that this is the VHF radio spectrum which is a line of sight band; range here is a function of antenna
Table 1: New Orleans Area VHF-FM Marine Band Station Sampler

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</table>

July 2004
height. The higher the antenna the more you are going to hear.

**Frequency Refarming the Marine Band**

Like many other areas of the radio spectrum, the VHF-FM marine band is very crowded. The FCC has now refarmed the marine radio spectrum from 25 kHz spacing to 12.5 kHz spacing. The new channels/frequencies are shown in Table Four.

**River Magic**

Whether you enjoy monitoring the big ships of the mighty river, ferryboats, or even communications from the area’s many bridges, it is a fascinating pastime to listen to a scanner programmed for maritime monitoring in the Big Easy. While listening along New Orleans riverfront, it’s not hard to imagine days of stately paddle wheels or flatboats. The magic and romance of the river is very much alive and well in the Crescent City of New Orleans.

### Table 2: U.S. VHF-FM Marine Radio Channels and Frequencies

<table>
<thead>
<tr>
<th>Chnl</th>
<th>Transmit</th>
<th>Receive</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>01A</td>
<td>156.050</td>
<td>156.050</td>
<td>Port operations and commercial. Vessel Traffic System (VTS) available soon in the lower Mississippi River (New Orleans) area.</td>
</tr>
<tr>
<td>05A</td>
<td>156.250</td>
<td>156.250</td>
<td>Port operations. VTS available soon in the lower Mississippi River (New Orleans) area and now in Puget Sound (Seattle), WA.</td>
</tr>
<tr>
<td>07A</td>
<td>156.350</td>
<td>156.350</td>
<td>Commercial</td>
</tr>
<tr>
<td>08A</td>
<td>156.400</td>
<td>156.400</td>
<td>Commercial (Intership only)</td>
</tr>
<tr>
<td>09A</td>
<td>156.450</td>
<td>156.450</td>
<td>Boater calling. Commercial and non-commercial.</td>
</tr>
<tr>
<td>10A</td>
<td>156.500</td>
<td>156.500</td>
<td>Commercial. VTS in Berwick Bay (Morgan City), LA; Houston/Galveston, TX; New York, NY; Puget Sound (Seattle) Vancouver area; and St. Mary River (Sault Ste Marie), MI.</td>
</tr>
<tr>
<td>11A</td>
<td>156.550</td>
<td>156.550</td>
<td>Port operations. VTS in Houston/Galveston, TX; New York, NY; St. Mary River (Sault Ste Marie), MI; and San Francisco, CA.</td>
</tr>
<tr>
<td>12A</td>
<td>156.600</td>
<td>156.600</td>
<td>Port operations. VTS in New York, NY; Puget Sound (Seattle), WA and San Francisco, CA.</td>
</tr>
<tr>
<td>13A</td>
<td>156.650</td>
<td>156.650</td>
<td>Intership navigation safety (bridge-to-bridge). Ships greater than 20 meters length maintain a listening watch on this channel in United States waters. All VTS areas alternate channel, and VTS channel in Louisville, KY and Prince William Sound (Valdez), AK.</td>
</tr>
<tr>
<td>14A</td>
<td>156.700</td>
<td>156.700</td>
<td>Port operations. VTS in New York, NY; Puget Sound (Seattle), WA and San Francisco, CA.</td>
</tr>
<tr>
<td>15A</td>
<td>156.750</td>
<td>156.750</td>
<td>Environmental (receive only). Used by Class C EPIRBs.</td>
</tr>
<tr>
<td>16A</td>
<td>156.800</td>
<td>156.800</td>
<td>International Distress, Safety and Calling. Ships required to carry radio, US Coast Guard and most coast stations maintain a listening watch on this channel.</td>
</tr>
<tr>
<td>17A</td>
<td>156.850</td>
<td>156.850</td>
<td>State/Maritime control</td>
</tr>
<tr>
<td>18A</td>
<td>156.900</td>
<td>156.900</td>
<td>Commercial</td>
</tr>
<tr>
<td>19A</td>
<td>156.950</td>
<td>156.950</td>
<td>Commercial</td>
</tr>
<tr>
<td>20A</td>
<td>157.000</td>
<td>157.000</td>
<td>Port operations (duplex)</td>
</tr>
<tr>
<td>21A</td>
<td>157.050</td>
<td>157.050</td>
<td>U.S. Coast Guard only</td>
</tr>
<tr>
<td>22A</td>
<td>157.100</td>
<td>157.100</td>
<td>Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.</td>
</tr>
<tr>
<td>23A</td>
<td>157.150</td>
<td>157.150</td>
<td>U.S. Coast Guard only</td>
</tr>
<tr>
<td>24A</td>
<td>157.200</td>
<td>157.200</td>
<td>Public correspondence (Marine operator)</td>
</tr>
</tbody>
</table>

Note that the letter "A" indicates simplex use of the ship station transmit side of an international duplex channel, and that operations are different from international operations on that channel. Some VHF transceivers are equipped with an "International – United States" switch for that purpose. "A" channels are generally only used in the United States and use is normally not recognized or allowed outside the U.S. The letter "B" indicates simplex use of the coast station transmit side of an international duplex channel. The U.S. does not currently use "B" channels for simplex communications in this band.

### Table 3: VHF-FM Marine Channels List by Usage

The chart below summarizes a portion of the FCC rules - 47 CFR 80.371(c) and 80.373(f)

#### Automatic Identification System (AIS)

**AIS1** (161.975) and **AIS2** (162.025)

The AIS is a shipboard broadcast system that acts like a transponder, operating in the VHF maritime band, that is capable of handling well over 4,500 reports per minute and updates as often as every two seconds. It uses Self-Organizing Time Division Multiple Access (SOTDMA) technology to meet this high broadcast rate and ensure reliable ship-to-ship operation.

Picture a shipboard radar display, with overlaid electronic chart data, that includes a mark for every significant ship within radio range, each as desired with a velocity vector (indicating speed and heading). Each ship "mark" could reflect the actual size of the ship, with position to GPS or differential GPS accuracy. And if your shack were AIS equipped, by "clicking" on a ship mark you could learn the ship name, course and speed, classification, call sign, registration number, MMSI and other information.

#### Coast Guard Liaison – Channel 22

This channel is used by boaters to talk to the U.S. Coast Guard after contact is first made on channel 16.

#### Commercial – Channels 15, 16, 17, 18, 19, 20, 21, 22, 23, 24

Working channels for working ships only. Traffic on these chan-
channels are about business or the needs of the ship. Channels 8, 67, 72 and 88 are assigned only for ship-to-ship messages.

**Digital Selective Calling – Channel 70**

This channel is reserved for distress and safety calling and for general purpose calling using only digital selective calling techniques (non-voice channel).

**Global Maritime Distress and Safety System – Channel 70**

VHF maritime channel 70 (156.525 MHz) is authorized exclusively for distress, safety and calling purposes using digital selective calling (DSC) techniques under the new Global Maritime Distress and Safety System (GMDFSS). Some vessels are now equipped with DSC capability and will be using channel 70 for this purpose. It is essential that this channel be protected and no other uses are permitted.

**International Distress, Safety and Calling – Channel 6**

This channel is used to get the attention of another station (calling) or in emergencies (distress and safety).

**Intership Safety – Channel 6**

This channel is reserved for ship-to-ship messages, for search and rescue messages, and ships and aircraft of the U.S. Coast Guard.

**Navigational – Channels 13 (Nation-wide) and 67 (on the lower Mississippi River only).**

These frequencies are also known as the bridge-to-bridge channels. These two channels are available to all ships (channel 67 is used on the lower Mississippi River only). Traffic consists of messages on ship navigation, for example, passing or meeting other ships. Traffic here is kept short and transmitter output powers cannot exceed more than one watt.

This is also the main working channel at most locks and drawbridges. All ships of a length 20 meters or greater are required to guard VHF channel 13, in addition to VHF channel 16, when operating within U.S. territorial waters. Users may be fined by the FCC for improper use of these channels.

**Non-commercial – Channels 9, 67, 68, 69, 71, 72, 78, 79 and 80**

These are working channels for pleasure boats (non-commercial). Traffic must be about the needs of the ship. Typical uses include fishing reports, rendezvous, scheduling repairs, and berthing information. Channels 67 and 72 only are reserved for ship-to-ship messages.

The Federal Communications Commission established VHF-FM channel 9 as a supplementary calling channel for non-commercial vessels (recreational boaters) at the request of the Coast Guard. A ship or shore unit wishing to call a boater would do so on channel 9, and anyone (boaters included) wishing to call a commercial ship or shore activity would continue to do so on channel 16. Recreational boaters would continue to call the Coast Guard and any commercial facility on channel 16.

The purpose of the FCC regulation was to relieve congestion on VHF channel 16, the distress, safety and calling frequency. FCC regulations require boaters having VHF radios to maintain a watch on either VHF channel 9 or channel 16, whenever the radio is turned on and not communicating with another station.

Since the Coast Guard does not have the capability of announcing an urgent marine information broadcast or weather warning on channel 9, its use is optional. The FCC recommends that boaters normally keep tuned to and use channel 16 in those waters unless otherwise notified by the Coast Guard.

**Public Correspondence (Marine Operator) – Channels 24, 25, 26, 27, 28, 84, 85, 86, 87 and 88**

Use these channels to call the marine operator at a public coast station. By contacting a public coast station, you can make and receive calls from telephones on shore. Except for distress calls, public coast stations usually charge for this service.

**Port Operations – Channels 13, 51, 12, 14, 20, 63, 65, 66, 73, 74 and 77**

These channels are used in directing the movement of ships in or near ports, locks or waterways. Messages must be about the operational handling movement and safety of ships. In certain major ports, Channels 11,12 and are not available for general port operations messages. Use channel 20 only for ship-to-coast messages. Channel 77 is limited to intership communications to and from pilots.

**State/Maritime Control – Channel 17**

This channel is used to talk to ships and coast stations operated by state or local governments. Traffic pertains to regulation and control, boating activities, or assistance to ships.

**Weather (NOAA) Frequencies**

On these channels you will receive weather broadcasts of the National Oceanic and Atmospheric Administration. These channels are only for receiving and mariners are not permitted to transmit on them.

| WX1 | 162.550 |
| WX2 | 162.400 |
| WX3 | 162.475 |
| WX4 | 162.425 |
| WX5 | 162.450 |
| WX6 | 162.500 |
| WX7 | 162.525 |

**Channel Superscript Translation**

1. Not available in the Great Lakes, St. Lawrence Seaway, or the Puget Sound and the Strait of Juan de Fuca or its approaches.

2. Only for use in the Great Lakes, St. Lawrence Seaway, and Puget Sound and the Strait of Juan de Fuca and its approaches.

3. Available only in the Houston and New Orleans areas.

4. Available only in the Great Lakes.

5. Available only in the New Orleans area.

6. Available for Intership, ship, and coast general purpose calling by non-commercial ships.

7. Available only in the Puget Sound and the Strait of Juan de Fuca.

**Table 4: New VHF-FM Marine 12.5 kHz Narrowband Spaced Channels/Frequencies**

<table>
<thead>
<tr>
<th>Chn</th>
<th>Ship</th>
<th>Ship &amp; Coast</th>
<th>Coast</th>
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<td>263</td>
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<td>314</td>
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MONITORING TIMES July 2004
Behind the Scenes

Three hundred controllers, engineers, and related personnel staff this facility, which is at work 24 hours a day, 365 days a year. The latest advances in technology include large, high-resolution monitors and touch screen displays to improve safety and efficiency in handling an air traffic volume of more than 5,000 flights per day within 23,000 square miles of airspace. The displays use flashing colors and vastly improve the ability of controllers to see aircraft previously obscured by weather fronts.

In the operations center, rear-projection displays show current aircraft positions, nationwide, regionally, or locally, overlaid on maps of geographical boundaries. These allow the controllers to predict congestion at any airport up to four hours in advance, establish appropriate delays for aircraft on the ground, and reroute aircraft to determine the most efficient route around severe weather. These displays provide critical SXGA resolution needed for very highly detailed flight information.

Within the TRACON, radar equipment allows the controllers to watch aircraft at distances from between 5 and 100+ miles of the facility. The controllers ensure that all aircraft departing or entering the airspace are kept separated at safe distances, and when necessary, the aircraft are rerouted to avoid dangerous weather patterns.

A TRACON’s total airspace is divided into areas called sectors, and each of these sectors is assigned to a controller. That controller directs the movement of traffic in and out of his airspace on a radar screen and maintains voice contact with the pilots. Although the controller’s individual responsibility is only for his or her own sector, all controllers within a consolidated TRACON such as Potomac have full radar information on all the aircraft that are under the control of the entire TRACON facility. And because they are co-located, these controllers are able to communicate with one another instantaneously — something which contributes significantly to assuring the safety of aircraft passengers.

By contrast, in the former individual TRACON environment, controllers in one TRACON had limited ability to communicate and coordinate with controllers in adjacent facilities, even though aircraft passed from the airspace of one TRACON into that of another.

Today, to assure the safety of hand-offs from one airspace to another, aircraft often must use longer routes than would be necessary in a single TRACON environment; however, some efficiency is sacrificed to safety concerns, as it should be in a system which puts safety first.

**Consolidated Potomac TRACON**

**Dulles International Airport:**
- Potomac Approach – 120.450 (241-330), 124.650 (091-240), 126.100 (331-090)
- Potomac Departure – 125.050 (300-120), 126.650 (121-299)
- Potomac Approach – 126.400 (031-170), 126.800 (321-030), 134.700 (171-320)
- Potomac Departure – 128.700 (181-019), 124.550 (101-130), 133.750

**Baltimore-Washington International Airport:**
- Potomac Approach – 119.000 (020-100), 119.700 (131-190), 124.550 (101-130), 126.700 (181-019), 282.275 (020-100), 125.300, 290.475 (131-180), 307.900 (181-019), 317.425 (101-130), 291.625
- Potomac Departure – 124.650 (091-240), 126.800 (321-030), 134.700 (171-320), 118.850, 124.200, 118.200
- Potomac Departure – 119.850 (West), 128.800 (East), 128.350 (19,000 ft down to 3000 ft, 126.800 (West), 128.800 (East), 128.350 (19,000 ft down to 3000 ft Southeast)
- Potomac Departure – 118.950 (West), 9500 ft and below, 121.050 (West 10,000 ft up to FL 230), 125.650 (East 10,000 ft up to FL 190)
- Potomac Departure – 126.400 (031-170), 126.800 (321-030), 134.700 (171-320), 118.800
- Potomac Departure – 118.850 (West), 9500 ft and below, 121.050 (West 10,000 ft up to FL 230), 125.650 (East 10,000 ft up to FL 190)

**Richmond International Airport:**
- Potomac Approach – 126.400 (031-170), 126.800 (321-030), 134.700 (171-320), 118.200
- Potomac Departure – 126.400 (031-170), 126.800 (321-030), 134.700 (171-320)

**Andrews Air Force Base:**
- Potomac Approach/Departure – 119.300, 335.500, 124.200, 118.950, 124.650
Have you thought about getting a shortwave radio to listen to distant stations – whether it be broadcast, pirate radio, or ham radio? Maybe you are wanting a scanner to cover a broad range of frequencies and modes.

In theory, it sounds quite easy to purchase a radio and start listening. The problem is, though we all know the radio is only as good as the antenna system to which it is connected, we tend to forget this additional cost and hassle, yet we still hope for better than average reception. In many cases, antenna requirements can even be prohibitive depending on one's location and limitations.

If you are wanting to listen to a broad range of frequencies in various modes (AM, SSB, FM, CW, etc.), this can be a further complication – the cost can be fairly steep for sophisticated communications receivers.

The “UCOT”

Fortunately, these days, you can try out a variety of high-end systems without having to worry about buying the radio or the antenna system – if you have a computer connected to the internet. Even a dial-up line will work fine. Welcome to the world of the user-controlled on-line tuner – which, for easier reference in this article, we will refer to as “UCOT.”

Essentially, with a UCOT someone has already gone through the trouble and expense of buying the receiver and antenna system along with the software to serve it up through the internet. This allows you to tune the radio in real time, as if you were sitting right in front of it.

Of course, the down side is you may have to share this radio with other users, but you will find you can often have a radio to yourself at various times throughout the day and night. The benefits are great. (In fact, check out this month’s Utility World column for one example of how remote monitoring can be used – ed.)

Borrowing an internet term, we’ll provide some background on the subject as a series of FAQs (frequently asked questions).

Are there many UCOTs around?

Although these public on-line systems have been around for some time in various formats, they have never really become abundant due to the fact they are expensive to set up, run and maintain. So although there are sites coming on-line now and then, many other existing sites are shutting down or have gone private. Also many of the remaining sites have gone to a pay status in order to try to recoup some of the costs of running the system.

So are there any free sites?

The good news is, there are still some long time sites offering full access to the public and, yes, they are completely free. Many of these free sites are actually superior to the paid sites as they are offered up by ham radio operators who enjoy sharing their radios and antenna systems and get a kick out of providing the service. My own site at jimandleah.com was started on just that premise. I will list where you can go to find other various sites later in this article.

What types of UCOTs are there?

There are various software “styles” of on-line radio systems. Some of the oldest programs have been written privately and have a more “manual” feel to the software. That is, they do not provide real time feedback such as the signal strength of the received signal or graphing and chat capabilities. You basically enter the frequency and mode and then listen. However, the station quality is very good at the sites I have seen using their own written software. The others, as explained below, will provide a host of supporting information to the user in real time.

What are the most popular UCOTs?

Two of the most popular public versions that provide real time feedback and are very easy to use are called Javoradio – not to be confused with the trademark Java – (http://www.javoradio.com) and Visualradio (http://www.visualradio.de). With few exceptions neither version requires you to download anything and will usually work as soon as you access the page. The Javoradio network consists of many radios worldwide (mainly throughout Europe) and has a very user friendly format rich with features. Javoradio has done a nice job of making this system easy to use for the on-line listener. You are able to tune many parameters of the radio, get signal strength, access a directory of stations, and chat. The sites on Javoradio feature the Icom PCR100/1000 receivers exclusively. Until about a year ago, the sites were actually free but have now unfortunately gone to a paid status. However, the cost to use the receivers is quite minimal and they also will feature a couple of free sites of their choosing that you can tune into without paying. There are a couple of sites that feature very elaborate antenna systems that alone can make the cost of admission worth it – especially if you are into TV and FM radio DXing.

The Visualradio public network is smaller in scope, featuring only a handful of receivers, but they are completely free (we love free!), and can accommodate any type of computer controlled radio on the serving end. This can allow for some very high quality radios, as the PCRs do have their limitations.

Visualradios offer two different formats: Java (although they are not Javoradios) and Active/x. The VisualRadio Java format basically...
gives you tuning capability, S Meter, and a chat.

More antennas used located on a tower on the
hillside behind my home. The current elevation
is 5090 feet.

What frequencies can I tune?

Since the majority of UCOTs are Icom
PCR1000s, you will be able to tune from .100-
1300 MHz (cellular excluded) and use all modes
(CW, FM, USB, LSB and AM). This is a lot of
frequency spectrum. The type of antenna the
owner has installed will be pretty obvious, de-
pending on where you tune. Many owners have
chosen to use a discone antenna which gives
decent coverage of the VHF/UHF spectrum (30-
1200 MHz) but really falls short on the HF
spectrum (0-30 MHz).

Because I am a ham radio operator, I al-
ready had the antennas in place for the receiver.
For my on-line tuner I currently use a tower
mounted inverted V with a 45 foot apex the
majority of time. This gives fairly broad cov-
erage across the HF spectrum. For the higher fre-
cuencies I also feed the receiver simultaneously
with a UHF/VHF yagi. This would be a disas-
ter on transmit, but fortunately in receiving we
don't have to worry about that when combin-
ing antennas.

For even better performance from this
combination, you can purchase a splitter which
minimizes the effects on one antenna detuning
the other.

Who uses the UCOTs?
The UCOT's lend themselves to a host of
purposes. Ham radio operators often use the
receivers to check to see if they are being "heard"
where the host site is located, and if so, test
their signal strength. This is very useful for get-
ing real time feedback of the band conditions,
and for determining one's audio quality.

Another group of users listens to the air
traffic control broadcasts. Many of these broad-
casts are carried on shortwave radio, so a good
UCOT can pick up these signals for hundreds
or thousands of miles. When combined with
various sites that allow a listener to watch
the progress of a plane in real time, you basi-
cally can follow a specific plane from origin to
destination, all in real time. This aspect of the
hobby really grew after 9/11, with people want-
ing to track a loved one who was traveling.

Still others like the public service broad-
casts on the VHF/UHF spectrum. Unfortu-
nately, many of these communications have
gone to a trunking or digital system that is not
available on the UCOTs. Yet another group of
individuals enjoy late night AM broadcast ra-
dio DX. If a site has a decent antenna for the
low part of the HF band, it will generally work
quite well for AM DX.

A few Javoradio sites actually feature large
antenna arrays allowing users to listen to
tropospheric skip, meteor scatter, and other
interesting conditions that mainly affect the VHF
portions of the bands. This last group are usu-
ally people who just enjoy general listening
across the bands, whether it be checking out
the local FM radio stations, trying to tune into
some cordless phone or baby monitors in the area
(shame on you!) or just armchair short-
wave listening.

My particular site has attracted a group of
people who like to gather each night to tune in
to the 80 meter band. Some enjoy listening to
Art Bell and a group of other ham radio opera-
tors that get together on this band each nite.
Since Ar: has retired from his late night radio
show of many years during the weekdays, this
allows the people who enjoyed his show to
listen to him and others in a whole new context
that is very relaxed and often humorous.

How can I set up my own public UCOT?

First of all, setting up a public UCOT is
an expensive endeavor. Believe it or not, there
are a couple of individuals who have set up
tuning and transmitting capability UCOTs, but
these systems are beyond the scope of this ar-
ticle. Even if it is just a receiver, it won't be
much of a service if you start out with one that
doesn't have decent reception or is very lim-
ited such as AM mode only. Word spreads fast
and you will soon find your site is only good as
a chat room for you and your friends. You also
need decent uploading bandwidth, or your site
will not be very enjoyable to listen to if it is
constantly buffering on the audio.

Javoradio has the advantage of the soft-
ware being free. Everybody loves free! The
downside to this is that it requires a Linux OS
based system. Which most computer users are
not set up for or familiar with. If you are —
you're in luck! Remember, you are limited to
an Icom PCR100/1000 receiver only with this
software so you will need that before you even
get started. You can go to http://

The most popular user controlled online tuner
is the Icom PCR-1000 shown pictured here with
a couple of antenna switches - one manufact-
tured and one home built. Don't forget to
ground the system (white wire in left of photo)
If you have modern ham equipment and antennas, you may be close to setting up your own online tuner with just some additional software. Pictured here with the Kenwood TS-2000 which will work out of the box with VisualRadio. Many other modern transceivers will work as well.

www.javoradio.com for more details about what is involved and how you can get started.

Visualradio has the advantage of working with the Windows OS format and practically any type of ham radio/receiver that can be controlled by computer. Many people (especially hams) already have radios that can connect to their computer. The downside is, the company no longer currently sells the software for the basic amateur. Instead the software is marketed for commercial users, so although the sophistication of the commercial release is well beyond what most basic users would ever need, so is the price. However, as I write this article, I am told they are considering offering it again to the “amateur” user at a substantially reduced price.

I have been a VisualRadio UCOT for over two years now and have found the software very flexible and feature rich. The java format is very straightforward and easy to use for anyone. However, by connecting to the active/x format, one discovers a whole new world in online radio features. You can go to http://www.visualradio.de for more information on this format. One can also view this format on my site at http://www.jimandleah.com

A third format that is being used is the RATS format by Kingsmith Software (http://www.kingsmith-software.com) This is an other feature rich format that can be served up utilizing Windows Net Meeting. The software is inexpensive. The downside is that accessing the remote radio is not as easy and straightforward as the other two formats and only one person can use it at a time. Advantages are you can use various radios in the Windows format and set up is quite inexpensive. In addition, there is hardly any delay on the audio. An exclusive site located in Hong Kong has set one up under this format at http://www.smeter.net

Just recently, an independent site has sprung up for the general public. This is apparently utilizing sophisticated software (including a band scope) and the software is offered for free if you host your site with them. The site is located in Salt Lake City, Utah. The software is currently written to run on Kenwood computer capable radios, but the developer has plans to expand to other manufacturers. It also is built on the Windows OS interface. You can access this site at http://www.smeter.net

Last but not least, some who are into writing their own software have chosen to do just that. One of the oldest sites that is self-written is still available at http://www.chilton.com and has been operating since 1995.

There is a fairly complete list of most of the UCOTS in existence at the DX Zone site (http://www.dxzone.com/catalog/Internet_and_Radio/Online_Repeaters)

Setting up the audio.

The other aspect of UCOTS is, of course, providing the audio. This is actually a big consideration, because it can require large upload bandwidth if you are going to be able to serve up decent sounding audio to the most people possible at the same time. There are various encoding styles one can choose from, but suffice it to say, a full time high speed connection is practically mandatory.

Javoradio mainly use Real Audio as their encoder and Visualradios mainly use Windows Media Encoder. Both formats are available for free from the web. I am currently able to stream simultaneously to about 25 people using Windows Media Encoder, but because I sometimes exceed this number, I also stream the audio through live365.com. This can allow practically unlimited simultaneous listenerhip at a very high bit rate, but also requires a monthly fee from the UCOT owner, depending on how many streams one wants to provide, whether for free or for a membership fee.

If your site gets to this point, you are definitely doing this as a labor of love and you may want to at least ask for donations to try to offset the costs a little. However, realize that your outgo is going to far outweigh any money coming in. You will find if you do set up your site and you work to maintain a free, quality service, the rewards will be meeting a lot of great people who take almost as much pride in your UCOT as you do. You may even find someone will set up a forum if you attract a group of loyal listeners who
enjoy your system. Midnightliams.com was a forum that was started by a group of dedicated individuals who frequented my site and continue to do so.

Last but not least, you can even go the extra mile and provide other useful services that practically guarantee people will enjoy visiting your site. One of the neatest aspects of remote monitoring I have witnessed is listeners using the online radio in conjunction with software to view slow scan TV (SSTV) pictures. These are pictures transmitted by hams that can be viewed with the proper software on your computer.

A UCOT lends itself to this perfectly, so I feature an automatic picture viewing system on my site that doesn’t require any software on the listener end. The listener only needs to tune the radio to the SSTV signal itself (usually 14,235 kHz), and the software on my end will automatically capture the image and upload it to my site. The auto tip upload software is generously made available free from John Benedict (KE5RS) at http://www.ke5rs.com. This has been a popular aspect of my site that surprisingly other online tuners have not incorporated to date.

Providing a chat area is also beneficial. Because your listeners have a lot of common interests, you will come up with all kinds of ideas. Feedback is guaranteed if you choose to chat with them.

In closing.

So whether you are interested in using a UCOT or in setting one up, you will find this is almost a hobby in itself – one that is currently a fairly well hidden secret to the general public. Their numbers are relatively few, but many UCOTs lie dormant waiting for someone to log on. It is my hope that the word will get out about how useful and fun these are, both to listen to and to operate if you so choose.

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July 2004

21
Baseball is the very definition of tradition. Since the first broadcast of Major League Baseball from KDKA in Pittsburgh in 1921, all MLB flagship stations have been found on the AM band. A glance at the station line-up below shows the tradition is alive and well. This may seem odd at a time when FM radio would appear to be a better choice, but the tradition of baseball on the radio is to provide coverage for the widely dispersed fan base in a team’s region. It would take dozens of FM stations to provide the same coverage of one big AM station.

Receiver Options

The fact that AM still rules in baseball actually widens your receiver options, because it’s possible to listen to baseball on everything from an old-fashioned oat box crystal set to a toptof-the-line stereo receiver. In fact, throughout the season I like to listen to baseball on as many types of radios as I can: (1) use a home-brew crystal set; a 1936 RCA table radio; a Kloss Model One; a car radio (preferably while parked on a hill or mountain top); and, of course, my old trusty Kenwood HF transceiver.

Each has its advantages and disadvantages, and none is really capable of overcoming the main problems of listening to the AM band in the summer. Because, unless you’re living in a Major League city, you’ll still have to contend with intense static crashes, fading, and adjacent channel interference.

For a real recreation of the early days of broadcast baseball, build your own crystal set and tune in KDKA, or any of the original baseball stations. These sets are cheap, easy to build, and it’s something you can do with a kid which just might get them interested in radio. Over 100 plans for building crystal sets can be found at http://www.crystalradio.net/crystalplans/index.shtml.

Antenna Options

The main thing about listening to the AM band is to be able to increase the signal strength and decrease the amount of interference from stations operating on or near the flagship station’s frequency. There are basically two ways to do this: Use of a highly directional small, tunable loop antenna, or (2) the use of a highly directional, high gain long wire or Beverage antenna.

The big advantage of the AM loop is that it’s small and easily moved from room to room. The disadvantage is that it isn’t a high gain antenna. The advantages of the Beverage antenna is that it is high gain and highly directional. On the downside, Beverage antennas are extremely long (700 to 2,000 ft) and can’t be easily moved. To have directional flexibility you would need a very large piece of property or a block’s worth of very cooperative neighbors. After using both for several years I’ve come to favor the loop for sheer convenience alone.

If you do opt for the Beverage, here are a couple of quick pointers. If the antenna is terminated at one end by a 400-600 Ohm resistor attached to the end of the antenna and a good ground, it receives best in the direction in which it’s laid out. By leaving off the resistor it becomes bi-directional. If you’re using a 50 Ohm coax cable to feed the antenna into your house, use a 9:1 balun to balance the feed line. You can buy one from Array Solutions at: http://www.arraysolutions.com/Products/icereconly.html#Beverage%20Matching. Or you can “roll your own” balun from plans found at this web site: http://www.hard-core-dx.com/nordicdx/antenna/feed/9_1balun.html.

By doing a little Internet reading you’ll find that there are a large number of sites devoted to Beverage and loop antennas. One of the best sources I’ve found for both is: http://www.hard-
Satellite Radio Options

It would seem obvious that ESPN Radio and Fox Sports Radio would broadcast live baseball action throughout the week during the season. And, as they did last year, ESPN Radio will broadcast all of the post season action in the League Championship Series and the World Series.

A major drawback to the Internet and Satellite option is that you can’t watch the game on TV and listen to the satellite or Internet audio. This is because the technology of satellite uplinking and downlinking and Internet interconnectivity and buffering causes delays in the audio from the live action on TV. The out-of-sync audio will drive you mad.

Passing the Time

Baseball personifies the slow pace of creeping through the long hot days of summer. And nothing suits the game as much as listening to the routine descriptions of play as it happens or the unending recitation of the all important statistics as provided by play-by-play announcers. Listening to baseball on the radio naturally lends itself to multi-tasking.

So, this summer as you listen, I invite you to visit a new web site developed by the Smithsonian Institution entitled Historic Baseball Guides 1889-1939. (http://www.memory.loc.gov/ammem/spaldinghtml)

Part of the American Memory web site, Historic Baseball Guides provides a collection of 35 of “Spalding’s Official Base Ball Guide” and the “Official Indoor Base Ball Guide” (you probably didn’t know about the promising Indoor Base Ball League) as originally published around the turn of the last century. Aside from the official rules, there’s advice, for example, on how to teach baseball to girls. Here’s an excerpt from a description of a ‘round-the-world tour on which Mr. Spalding took his team in 1889:

“After leaving Australia the tourists called at Colombo, Ceylon, and from thence went to Cairo, and while in that city visited the Pyramids, and they managed to get off a game on the sands in front of the Pyramid Cheops on Feb. 9...”

It’s all legendary stuff and should be required reading for youngsters who may think the only legends in the game are A Rod and Bonds.

MLB Radio On-line

Listen to every MLB game live on-line by signing up for MLB Game Day Audio http://www.mlb.com click on “Audio” and then on “Game Day Audio.” Season subscription is $14.95.

Minor League Baseball Radio

Minor League teams at the AAA level play a full 144 game schedule and most teams broadcast their games via local radio stations or the Internet. To find the frequency of your local team do a Google search for that team’s name. The home page usually has information on their flagship station or a link to the live broadcast. For a complete list of Minor League daily action check out http://www.sportsjuice.com. There is no charge for listening to Minor League games.

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July 2004 MONITORING TIMES 23
Solar Cycle 23 is in its final years, moving ever steadily toward the years of minimum activity. We expect the cycle to bottom out between the end of 2006 and the beginning of 2007. With the solar activity half of what it was just a year ago, is there hope for much life on the shortwave spectrum this summer? What can we expect on VHF?”

As we move into the summer season, changes in the chemistry of the ionosphere cause changes in how radio signals are propagated from one region of the Earth to another. Propagation is significantly different during the summer than during the winter. This is why most International Shortwave Broadcasters have frequency and schedule changes between their winter and summer seasons. This is also why DXers consider the winter season, the DX season.

One would think that in the Northern Hemisphere the Maximum Usable Frequency on a given radio signal path would be higher during the summer than during the winter. With more hours of daylight, wouldn’t the increased exposure to solar radiation cause greater ionization? Yet, a look at many signal paths reveals that there are higher peaks during the winter daytime than during the summer daytime. However, during the summer night, those same paths have higher MUFs than during the winter nights. This is known as “the Summer Anomaly.”

A Matter of Chemistry

As scientists continue to explore, our understanding of how the ionosphere works becomes ever more accurate and clear. Research has revealed that the reason summer MUFs are lower during the day is due only in part to temperature differences. The rest of the story lies in ion chemistry.

In the lower part of our atmosphere below 100 km, atoms and molecules are well mixed by wind and temperature. Above 100 km, atoms and molecules are distributed vertically by gravity according to their atomic weights. The heaviest atoms, argon, settle toward the bottom of the ionosphere, while the lightest atoms, hydrogen, extend to the greatest heights.

The exact composition depends on temperature. In the winter, when atoms and molecules are colder, they move lower, in part causing the ionosphere to contain a greater density of oxygen atoms. During the summer, they move to greater heights as they warm up, and the ionosphere becomes dominated by a more even mixture of nitrogen and oxygen molecules. In this upper atmosphere, ionization is more affected by the geomagnetic field than by atmospheric turbulence.

Ionization is the creation of ions by atoms losing their electrons. This is caused by the energy of photons from sunlight breaking the electron away from the atom. In the absence of sunlight, these free electrons recombine with whatever nearby molecule or atom happens to be available.

Electrons do not always recombine with the relatively small number of positive ions available, but they may also become attached to some of the far more numerous neutral molecules, forming negative ions. This is a great thing for those who DX the lower part of the HF spectrum, as these electrons are not disassociated from the negative ions very quickly during the morning sunlight. Since these negative ions are more massive than electrons and positive ions, they do not absorb radio energy. This makes a morning window for low-band DXing.

During the summer, then, the ratio of atoms to molecules is less than the ratio during the winter. The make-up of the ionosphere during the winter favors the production of electrons from oxygen atoms over the losses of electrons by recombination in molecular interactions. Since the summer ionosphere has a mixture of nitrogen and oxygen molecules, more recombination takes place, and the ionosphere loses some of its ionization. If one looks at a given summertime signal path and compares it with the same path during the winter, it is clear that the Maximum Usable Frequency (MUF) will generally peak higher in the winter. However, the nighttime critical frequencies will generally be higher than in summer nighttime.

Making the Most of It

Taking this into consideration, as well as the fact that we’re experiencing much less solar activity as we move toward the cycle minimum, is there much hope for hearing rare and weak shortwave stations during this summer season on the high frequencies? Most of the big-gun International Shortwave Broadcasters take the summer anomaly into consideration and adjust power, beam headings, and times, to overcome conditions. But, what about the lower-powered rare DX broadcaster?

Knowing the best times to catch a station can make your DX chasing more successful. You need to know when propagation will be best, as well as when a station is transmitting. Using the listings included in this magazine, as well as other resources such as the various lists on the Internet, (see, for instance, my listings at http://swlhradio.org/), you can determine the windows of time that you might hunt for a station.

Armed with the times and frequencies, the next step is to do some propagation forecasting. The idea is to look for times when propagation is predicted to be good enough for a station’s signal to propagate between its transmitter and your listening location.

SnapMAX Forecasting

One software tool that might come in handy for this planning is SnapMAX, by Crawford Mackeand, a Chartered Electrical Engineer in the United Kingdom. I evaluated version 5.01, which is a DOS executable application with supporting files. It ran fine for me under a DOS window in Windows98. It might not run on newer operating systems that don’t support TRUE DOS.

A useful feature of SNAPmax is the ability to select the Bandwidth and Modulation. From the main menu, selecting ‘B’ will bring up a new menu that allows you to select your operating mode. I selected ‘BC’ (using the ‘B’ item) as my Bandwidth and Modulation setting, because I wished to analyze shortwave radio broadcast signals. I set my latitude and longitude, and then selected Saudi Arabia (prefix of ‘HZ’) as the remote transmitting site, with a power level of 50 kW. I chose the “Signal-noise ratio (S units) shown vs. Frequency and Time” mode (‘M’ on the main menu, ‘SN’ on the submenu).

I set the Solar Flux to ‘89’, the A-index to ‘15’, and the K-index to ‘3’. I chose a local noise level of “Suburban.” I selected the frequency of 9530, the frequency listed for the Voice of the Iraqi People. Although the transmission is targeting the Near Middle East, what would the likelihood be for me to hear such a broadcast? I hit the space bar. The first of two pages of resulting calculations are shown in Figure 1.

A blank space says that there is not likely to be enough signal level for a useful QSO. A dot (.) says that signal/noise ratio is up to 1 S-Unit below noise. A number in any space, and its associated display color in that space, will show by how many S-Units (arbitrarily set at 6 dB each) your desired received signal will exceed your local noise level. A plus sign (+) indicates that predicted signal level is more than 9 S-Units over noise. A star (*) shows that this signal (the level being indicated only by the color) is above the Maximum Usable Frequency or MUF and is pro-
HF Propagation July-September

July is a month of typical summer-time radio propagation on the high frequency bands. Solar absorption is expected to increase, as we move into a period of seasonally high absorption levels. This causes generally weaker signals during the hours of daylight when compared to reception during the winter and spring months. Nighttime usable frequencies to most parts of the world are higher than at any other time of the year, while the daytime usable frequencies are generally lower than those during winter.

Propagation on the higher frequencies will fluctuate less drastically during September, as the hours of sunlight are quite long and the ionosphere has very little time to recombine during the hours of darkness. Higher HF frequencies are going to be unusable over most paths, but when sporadic-E (Es) openings occur, expect good domestic signals. These Es openings will be strong at times, and fairly common, but might be short-lived.

Solar activity is half of what it was last year. This results in lower maximum usable frequencies for the same period than last year. At the highest end of the HF spectrum, propagation from DX locations east and west are a rare event. North and South paths may still be hot, especially around sunrise and sunset. Nineteen and 16 meters will be the most reliable daytime DX band, while 19 and 22 may offer some...
Keeping a Log: Options for SWLs & Hams

It always starts out innocently enough. You’re tuning through your favorite band, let’s say Medium Wave, and you come across a station from far away you’ve never heard before. You reach for a pad and pencil and make a note: WXYZ at 1520 playing “oldies” with ABC Network news. It’s not long before scraps of paper give way to legal pads with some sort of informal organization. But, you find that you haven’t left enough room for additional stations at a particular frequency or you’d like to know how many different states you’ve heard. Now you have to look through all the pages and add them up or, worse yet, start a new list.

◆ The Ham Advantage
Hams are usually meticulous log keepers because the FCC used to require a complete log of all on-air activities. That requirement no longer applies, but most hams still keep a log anyway. The reason is the same for all monitors: we simply can’t remember the thousands of contacts or stations heard and have to jot them down in some sort of log.

Because of the earlier FCC requirement there are many pre-printed log books for hams and they are cheap. The ARRL makes a spiral bound, 50-page log with entries for 25 contacts per page, which sells for $5. In separate pages it also has a complete frequency listing for all ham bands; a list of international Q signals; the ITU phonetic alphabet; the Readability Strength Tone (RST) system of reporting received signals; a time conversion chart; a list of call sign prefixes and the countries to which they’re assigned; a Grid Locator Map of North America; and a map of the U.S. and Canadian states and provinces broken into call districts.

The pages of the ARRL log are divided into convenient columns such as Date, Frequency, Time, Station Worked, Report and Comments. These are all quite useful to hams and this log can be easily adapted to be used by SWL, AM or Long Wave monitors. But, the problem with a paper log is that it’s impossible to “mine” in the sense we’ve become accustomed with computer based data bases.

◆ The Software Advantage
A computer based log is the perfect solution to the needs of radio monitors. Some monitors use existing word processing software found on most computers and make up their own templates for their particular logging needs. These tend to fall short in the versatility department. However, if written correctly, a good logging program allows the user to mine the log for information pertinent to the needs of the individual.

There are several logging programs designed specifically for hams which are widely available via the Internet and which typically have free trial periods. Cost is usually between $20 and $40, but can be as high as $90 to be a registered user. Being a registered user allows you download updates and patches for various glitches which are bound to show up in the software.

Check out the chart below for a sampling of logging programs available to Hams and SWLers alike. For a more thorough list go to the DX Zone web site listed below and read details about each.

◆ Logger32
Most logging programs are similar and they all try to do what you really need such a program to do: log in the contacts (complete with special notes), bring up a list of other contacts with this particular person, note whether or not QSL cards have been exchanged, whether or not you need the country for DXCC (worked 100 countries) or need the state for WAS (Worked All States) awards. Most have provisions for special logging techniques when logging in a contest or special event such as Field Day.

MT Assistant Editor Larry Van Horn tipped me off to a versatile logging program called Logger32 which was written by Bob Furzer, K4CY, and is copyrighted by Zakanka, Inc. (see chart below). Logger32 is free and may be used by anyone agreeing to abide by the rules laid out by the author.

Logger32 was designed primarily for amateurs and it is not set up for the needs of SWLers. For that (and general ham use, too) Larry recommends W3KM’s GenLog. There are many other SWL programs to choose from as well which are in the list below.

Your experiences may be different, but using a slow speed dial-up connection, I found that I had to download the program several times before finally getting it right. Once downloaded it proved to be a very practical and versatile program. The toolbar at the top of the Logger32 page lets you do all sorts of minor miracles. It even has a small, real-time greyline tracking map which shows the location of the sun, which areas of the globe are in dark, and which are in sunlight.

Logger32 organizes your contacts to keep track of the various awards you might be working toward; it affixes serial numbers to each contact for contest purposes; it will do a call sign lookup on QRZ.com (when connected to the Internet); or a CD ROM based lookup if you have a popular version such as Buckmaster or Call Book in your CD ROM reader; you can import or export log files to other programs, or do database maintenance. It can even rotate your antenna!

When you download Logger32 you’ll be getting the very latest information available, such as a complete list of “entities” or countries as used to track DXCC. For instance, by clicking on the “Countries Database Maintenance” icon you’ll bring up the entities list. By further clicking on a particular country prefix on the list, such as YS for El Salvador, you’ll bring up a screen which shows the various prefixes and call districts allotted to that country by the ITU (International Telecommunications Union). This window allows you to add, delete or modify that particular call prefix to your database. This way you can keep track of states, provinces or call districts in any number of different countries, a task nearly im-
If you’re a new ham, consider starting out right away with an e-log program. It will make keeping track of your activities a real breeze. Hams who are used to the old paper method of logging will take a while getting up to speed. You may have to spend hours doing data entry to transcribe hundreds of pages of earlier paper logs to be current. Remember that the biggest problem with data entry is trying to reduce the number of errors which in ham logs could make the difference between saving and throwing away a valuable DX contact.

✦ Logging Last Word
Your on-air activities will determine whether or not you really need a logging program. Many hams only operate on their 80, 40 or 20 meter groups whose members don’t change throughout the years. There’s little need for any log with them. However, if you’re just catching the DX bug you’ll be glad you started your ham career with a good logging program. It won’t be long before you’ll want to start adding up your life-long countries list or trying to find out just how many of the 3000 + counties in the U.S. you’ve worked. Doing this by hand, sorting through hundreds of pages of contacts, turns this task into a chore.

As with all computer programs there’s a learning curve which will feel awkward at first. But, you’ll find that the more you use any particular software the more at home you’ll feel, and, the more you’ll find features you hadn’t known about before. It won’t be long before you’ll wonder how you ever did without logging software.

And, finally, before you choose which logging software to purchase, you’ll want take advantage of the trial period most offer. Compare the features of each and find out how they apply to your own monitoring needs. Read the forums and other reports from users who’ve already shelled out the money to use them. If you can, ask some of your friends which programs they use and what their experiences have been.

✦ Chart
Here’s an abbreviated list of logging software. A few are free, some require a minimum registration fee, all are copyrighted and have conditions against reproduction. Read all the fine print. Downloading extensive programs such as these may not be easy if you have a slow dial-up connection. Errors which may cause the program not to operate correctly may happen. Be aware that it’s possible to download unwanted programs such as viruses whenever you download material from the Web. It’s good practice to have an anti-virus program active on your computer.

DX 4 WIN - http://www.dx4win.com
DXbase logging program - http://www.dxbcese.com
DXtreme Ham, SWL, BCB, LW & TV - http://www.dxtreme.com
GenLog, Ham & SWL - http://www.qsl.net/w3km/gen_log.htm

Password: 37330796

N3FJP’s Amateur Contact software shows stations worked and those needed (Courtesy n3fjp.com)

✦ A Word of Caution
As great as any logging program is in keeping track of your listening or on-air activities you should always save your data to a back up zip drive, CD ROM, or even a slowly printout against the day when your computer gets fried or has an unforeseen melt-down. I’ve talked to more than a few hams whose entire electronic logs disappeared in such a catastrophic event. One ham, an avid DX contest, told me he lost a quarter of a million contacts in one such crash.

If you’re a new ham, consider starting out right away with an e-log program. It will make keeping track of your activities a real breeze. Hams who are used to the old paper method of logging will take a while getting up to speed. You may have to spend hours doing data entry to transcribe hundreds of pages of earlier paper logs to be current. Remember that the biggest problem with data entry is trying to reduce the number of errors which in ham logs could make the difference between saving and throwing away a valuable DX contact.
Q. I hear a distinct hum from my old Bearcat scanner; what can be done to repair it? (Paul Kamalsky, email)

A. AC hum is common in all radio receivers as the filter capacitors begin to dry out over time; in fact, it is routine to replace them in old vacuum-tube radios during restoration. But it happens in solid-state radios as well. You can confirm that this is the problem if the hum is still heard when the volume control is turned fully down. If this is the case, the filter capacitors in the power supply section need to be replaced.

Q. I see references on the Grove antenna web page to a "dipole cluster;" just what does that mean? (Andy Entrekin, email)

A. A dipole is the simplest antenna, a long conductor, cut at its center and attached to a transmission line. In order to keep the standing wave ratio (SWR) low to avoid losses in the system, different lengths are used for different frequency ranges. For example, a five-foot dipole would be best for 90 MHz FM broadcasts, but for TV channel 2 (56 MHz), eight feet would be better. What if we simply take both dipoles, cross them at their centers like an "X" and connect their cut centers mutually to a transmission line? They can actually drop quite a number of dB before you have a loss of signal above the noise, even though the S meter will read lower each time you do it. That's because the limiting noise in a shortwave receiver is atmospheric static, not the receiver sensitivity. All you are doing when you reduce the incoming signal level is reduce the signal and the noise proportionately, so if the signal was readable above the noise before the split, it will be after as well.

So far as the type of splitter, try a conventional TV splitter. Even though they are typically rated for 54-890 MHz or so, this is to reassure the user that it works throughout the TV range; it actually works much lower than that as well; I've used them down in the medium-wave broadcast band.

Q. What's inside the cylindrical "thingamajig" on some whip antennas, and what does it do? (Andy Entrekin, email)

A. It's not a "thingamajig," it's a "whatchamacallit," although engineers who want to impress their friends call it a "decoupling coil" or "loading coil."

It's simply a coil of wire inside a weatherproof jacket, and if it's all the way at the bottom of the element, it may be either an impedance-matching transformer (mostly found on transmitting antennas) or an "inductive reactance" to neutralize the "capacitive reactance" (radio-frequency resistance) that a too-short element has at a specific frequency range. You see the same thing, without its housing, on mobile cell-phone antennas.

If it's between element segments, it's more likely a decoupling coil, used to isolate one section from another so they can function independently rather than as one long element. This allows the sections to cover more than one band, or to add their mutual signal-gathering and signal-radiating patterns to provide gain.

Q. How many shortwave receivers can you run off one antenna, and what kind of splitter would you use? (Tom Claude, email)

A. If you have a passive splitter with no loss, you drop the signal 3 dB for each split; that's equivalent to half an S unit. You can actually drop quite a number of dB before you have a loss of signal above the noise, even though the S meter will read lower each time you do it. That's because the limiting noise in a shortwave receiver is atmospheric static, not the receiver sensitivity. All you are doing when you reduce the incoming signal level is reduce the signal and the noise proportionately, so if the signal was readable above the noise before the split, it will be after as well.

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Q. What HF SSB frequencies would a commercial aircraft pilot use in an emergency when he is out of VHF range? (Dale Unger, Baltimore, MD)

A. Over land in the U.S., only VHF channels are used. But over the vast ocean waters, depending upon the nature of the emergency, he might first elect to contact a long-distance operational control (LDOC) station monitoring aircraft in that particular air route.

If urgent, he may wish to try a "May-day" and "Pan" distress call on one of the internationally-delegated marine channels like 2182 kHz (within 300 miles or so), 4125, 6215, 8291, 12290 or 16420 kHz to communicate with ships and coastal stations.

He may be asked to switch to a Coast Guard emergency frequency like 5696 or 8984 kHz for rescue coordination. Upon impact, an automatic distress beacon buoy is deployed on 121.5 MHz with a swept tone for radio direction finding (RDF).
I hate to state the obvious, but the busiest time of the year for monitoring is the July 4th weekend. Looks like another busy season. If you are camping out, you certainly want to hear the local park rangers, and emergency services including fire, life flight helicopters, search, and rescue. If you are stuck in the big city, your local parks will also be busy. The highway patrol will be active with holiday travelers in traffic accidents, where alcohol is usually a factor.

If you are a shortwave listener, perhaps this is the time to try scanning the higher bands. You can buy a scanner and if you don’t like it, you can return it within 30 days if you buy from a reputable dealer such as Grove Enterprises or Radio Shack. If you are still in the big city, your local parks will also be busy. The highway patrol will be active with holiday travelers in traffic accidents, where alcohol is usually a factor.

Away from the big metro areas, you will find most public safety agencies are still on ordinary VHF, and UHF. No special scanner needed here, no trunking information to digest or pronary VHF, and UHF. No special scanner needed.

Radio Shack.

A reputable dealer such as Grove Enterprises or you can return it within 30 days if you buy from this store. This is the time to try scanning the higher bands.

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For National Parks try http://maxpages.com/frequencies/National_Parks_Freqs

For National Forests try the back of the Police Call book, or search the web with the specific name of the forest you will be visiting. Example: http://los_alamos.home.att.net/moh.htm

For BLM sites: http://www.geocities.com/CapeCanaveral/9952/gjac.htm

For state parks try the 151.145-151.490, and 159.225-159.465 ranges of nationally dedicated forestry conservation frequencies.

For local parks, try the public frequency on your scanner. You can always use the search mode on your scanner. A quick look at the antenna on the park ranger’s truck will give you hint as to the specific range to search. It is usually in the 150-160 MHz range. Of course, the feds are in the 163-174 range.

I must admit, I usually carry my faithful Scout™ Frequency finder in my back pocket while walking the campground or talking to the ranger. I might get lucky if he transmits. I usually ask to look at his radio. The frequencies are often listed on the back. Think quick!

Last month I highlighted some ideas about monitoring wildland fires. I need to clarify some information about the new narrow band 7.5 kHz frequencies. I forgot to mention that you can often program the new splits into your current radio. Your radio was manufactured to a specification using 15 kHz wide spacing. Thus, you will hear the new frequencies as well as the old standard 15 kHz spacing.

You might need to reprogram your radio in 5 kHz steps to see if that improves your listening experience. Use your programming software to see if that allows the new frequencies. Try the 6.5 or even 12.5 kHz steps to see if you can line up the correct frequency. New ham radios transmit using narrow deviation setting which will work.

Early reports from government users indicate that their new narrow band radios are not working up to expectation, nor to standards. They are hearing many adjacent radio signals. As usual, the government didn’t get it right. Look for the next generation of scanning receivers to have the 7.5 kHz step and meet the narrow band specification. Hello, manufacturers, are you listening?

Want to watch the action? DVDs of last year’s fires in southern California can be found at http://www.firestormvideos.com, or 1-800 549-3457.

I play an active role in major local fires. Part of our local Red Cross response plan requires listing to the scanner and contacting the Emergency Services Director of our local Red Cross Chapter. Our director, John, and several other key responders recently earned their ham ticket. There is much over-the-air coordinating of what is needed, who is going, what vehicles are responding, etc. This has really sped up our response time. What group are you volunteering with?

I had a visitor to radio ranch last week. This dedicated radio enthusiast wanted me to repair his radio and solder some Anderson connectors on his power cord. His radio was all but dead. I barely brought it back to life. What this person needed was new radio. Clearly, he could not afford one, so I grabbed an old scanner that had lain dormant in the shack for a long time. I slid in some new batteries and gave him the radio. He was overjoyed.

I also printed out a few pages of frequencies for our area. I also passed along some back issues of MT.

We need to do all we can to keep our hobby thriving. I’ll bet you have an old radio or two, that you could pass on to a friend. Christmas is not the only time for giving.

Monies from the federal government, via the Department of Homeland Security, is beginning to reach local and state agencies. Listen for new radio signal levels as new repeaters and frequencies are put into service. There is also much money for the new Community Emergency Response Teams (CERT). If you are part of such a grass roots effort or would like to start one, check the FEMA webpage for free on-line training. Try http://training.fema.gov/emiweb/IS/crslist.asp

A Note to Our Readers

The internet is a constantly changing and evolving database. URLs that exist one month may not be there three months later. Since my column is written a couple of months before you read it, the site address may have changed or disappeared altogether. Please do your own search for the new site. My email box is full and I just don’t have the time to respond to the dozens of emails I receive every month concerning URLs I mentioned.

If you wish to suggest a new idea, I will contact you only if I can use it. Ironically, most of the suggestions I receive are ones I have already listed in previous columns. You should buy the annual MT Anthology CD so you can research and use all those good bright ideas. The column started in January 2000.

I try hard not to repeat my own bright ideas or those that appear in any scanner hobby personal pages or other sources. It is also possible that your email was filtered out by the spam catcher. Please indicate "Bright Ideas" on the subject line of your email if you want a reply. I can not assist, nor respond to requests concerning frequencies, repairs, old manuals, etc. Thanks for understanding. Keep cool in the hammock, and I will see you next month.
Radio frequencies are the lifeblood of every public safety radio system. As communities grow and safety responsibilities increase, congestion on these frequencies increases. This leads to a demand for more frequencies—a demand that is leading the Federal Communications Commission (FCC) to find new frequencies in unexpected places.

**New York City Channel 16**

Earlier this year the FCC announced that television channel 16 in the New York Metropolitan Area would be permanently reallocated for use by public safety agencies. Channel 16 is a UHF (Ultra High Frequency) allocation between 482 and 488 MHz, which is typically used for broadcast television service.

Back in 1995 the FCC first allowed the temporary use of the 482-488 MHz band for public safety agencies, citing “an urgent and immediate need for additional spectrum capacity for public safety communications.” In December of 2002 the New York Police Department submitted a report to the FCC suggesting the temporary assignments be made permanent, pointing to the $50 million investment that had been made in transmitters, repeater sites, and about 25,000 portable and mobile radios. Numerous city agencies all use these frequencies, including the New York Fire Department, Corrections, Health and Hospitals, Parks and Recreation, Sanitation, and the Transit Authority.

The report triggered a Notice of Proposed Rule Making (NPRM), which is the FCC’s normal process for handling these types of changes. Part of the NPRM included a study from a communications consulting company that concluded there were no additional frequencies in any of the official public safety allocations that could be used in the New York metropolitan area. Every available channel was already in use within or near the city.

Several organizations responded to the NPRM, most of them asking for additional technical information about the city’s use of the Channel 16 band. Interestingly, the city responded that the requested information was sensitive and should not be revealed to the public. The requesting organizations were eventually given access under a secrecy order, so the public still does not have official access to that information.

**Channel 16 Layout**

The frequencies are 483.4625, 483.5375, 484.4625, 484.5375, 484.7875, 486.4625, 486.5375, 486.7875, 487.4625, 487.5375 and 487.7875 MHz.

Nearby counties and municipalities also use frequencies in the Channel 16 band. The County of Nassau has six repeaters located in East Meadow, Elmont, Matinecock, Massapequa Park, Syosset and Thomaston, operating on 483.8625, 484.1125, 484.3625, 484.6125 and 484.8625 MHz. Here are some others:

- **East Rockaway Fire Department**: 460.2625
- **Elmont Fire District**: 484.9625 and 487.9625
- **Hagerman**: 460.5250
- **Islip Fire District**: 460.275
- **Jamesport Fire Department**: 460.1875
- **Kings Point Police Department**: 465.3875
- **Lindenhurst**: 476.3500
- **Malverne**: 470.825
- **New Rochelle**: 484.9875 and 487.9875
- **Uniondale**: 478.6125
- **Volley Stream**: 472.9625
- **Yonkers Fire Department**: 484.7125

Frequencies in the Channel 16 band are also in use in other states, including California, Massachusetts and Texas. So, when you’re looking for new areas to scan, sometimes it can pay off to check bands that you might otherwise skip over.

**New York State System**

In April of this year the State of New York announced that they had chosen M/A-Com to create a statewide radio network that is expected to cost at least $1 billion. This would be the largest technology contract in the history of the state and is expected to be funded, in part, through a surcharge on cellular telephone service.

Although details of M/A-Com’s proposal have not yet been made public, when finalized the contract will be good for 20 years and include radios, infrastructure equipment, maintenance and service. The system is expected to be operational within five years and cover 95 percent of the state. It will replace a series of older radio systems (some of which have parts that date back to the 1960s) and allow agencies from across the state to talk to each other more easily. Some state
officials have indicated that the project might be rolled out in stages, to test the system in one part of the state before committing to the entire project.

One sticking point for implementing a statewide radio network is how many towers will be needed in the Adirondacks and Catskills, two rural mountainous areas sensitive to environmental concerns. Cutting trees and putting power generators and fuel in a protected wilderness doesn’t sit well with many nature conservancy groups, especially when some of those areas are protected by the state constitution.

The towers themselves will be required to withstand such heavy weather as ice storms and high winds, creating a challenge to camouflage or other ways of making them inconspicuous. A few days after the contract announcement, a proposal was floated to build repeaters only on land that was already developed and to use vehicle-mounted repeaters when in the mountains. How well this might actually work in practice was not detailed.

A serious concern for operating the new network is where to find available frequencies. Just as there is a shortage in New York City, the rest of the state comes up short when looking for enough unused frequencies. Several years ago the FCC began a process to move television stations out of the 700 MHz band, currently occupied by channels 52-69, whenever at least 85 percent of their customers are able to receive digital television signals. Part of the vacated band would then be made available for public safety agencies.

The original plan called for TV stations to be moved out by 2006 as digital television replaced today's analog signals, but a slower than expected roll-out of digital technology has pushed that date out by probably three more years. However, New York is still expecting them to be available in 2006. Until then, the state claims they will be able to find enough channels to make the system work.

Another point of contention is the difference between M/A-Com's bid and the only other bid, submitted by Motorola. M/A-Com's bid of about $1 billion is so much less than Motorola's $3 billion proposal that many observers are wondering if the state's requirements were correctly understood. New York's request for proposal (RFP) runs more than 300 pages and details how the system is to be built and what must be done to make it work as intended. Motorola believes the M/A-Com bid cannot meet all of the requirements, but until the details of the winning proposal are made public it's difficult to prove.

M/A-Com is a subsidiary of Tyco International, which has been in the news recently for the excesses of former Chief Executive Officer Dennis Kozlowski. M/A-Com offers a number of radio products for public safety agencies, including EDACS (Enhanced Digital Access Communications System), ProVoice, and APCO Project 25 equipment. They also market a system known as OpenSky, which is a fully digital radio system based on the Internet Protocol (IP). If you might expect OpenSky is not directly compatible with Project 25. The digital messages carried on an OpenSky are proprietary to M/A-Com and do not conform to any public standard. In addition, the vocoder (voice encoder/decoder) is AMBE (Advanced Multi-Band Excitation), a slightly different design than the IMBE (Improved Multi-Band Excitation) vocoder used by Project 25 radios. To address these problems, M/A-Com is pushing an additional product that will allow OpenSky to interconnect with Project 25 systems.

**OpenSky in Pennsylvania**

Some critics of the New York proposal point to the State of Pennsylvania, which has been working with M/A-Com for five years to install a statewide OpenSky system. Pennsylvania contracted with four vendors in 1999, with M/A-Com taking the largest financial slice to install OpenSky technology.

The Pennsylvania statewide system is now three years behind their original build-out schedule, which called for the network to be up and running by April 2001. The project cost has more than doubled, rising from $179 million to more than $400 million. Two state Representatives recently called for an audit of the project and public hearings to determine why the radio network is late and over budget.

Early in the Pennsylvania project the State indicated that receivers capable of monitoring OpenSky transmissions might be made available to media organizations, although they likely would be rather expensive. Regardless of price, as of this writing there are no commercially available scanners for OpenSky.

In addition to the state, the Counties of Cumberland and Lancaster have switched to OpenSky. Oakland County in eastern Michigan is currently in the process of migrating from a Motorola analog system to a 36-site OpenSky network for police, fire and emergency medical services.

**Maine Updates**

Dear Dan,

Thank you very much for including my scanner loggings of Belfast, Maine, in your "Scanning Report" in the May 2004 issue of Monitoring Times.

My source is the book "Official Maine

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**Full 800 MHz Scanners**

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<th>Model</th>
<th>Description</th>
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<tr>
<td>AR-8200MKII</td>
<td>Wideband portable receiver</td>
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<td>$499*</td>
<td>- 0.5 to 2040 MHz continuous</td>
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<td>- Alphanumeric memory identification</td>
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**NOTICE:** It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.
A couple more to add. 156.400 is the Belfast Harbor Master. She (the master is a woman) is beginning to get busy with the rumors of spring. The other is 154.490, the only ham repeater I have heard so far. It is quite loud, but Coburn lists it to an Ed Roth in the town of Washington some 20 miles to the southwest of here. Hope to be able to add more later on.

73, Bob

My copy of The ARRL Repeater Directory shows 145.490 as a repeater in Washington operated by Ed Roth, who also operates amateur radio repeaters on 53.550 and 224.280 MHz. The Pen Bay Amateur Radio Club also operates a repeater on 147.060 MHz. All of these appear to be located on Lenfest Mountain in Washington, halfway between Augusta and Belfast.

More Maine Updates

Greetings from Maine, Dan:

154.905 is the Maine State Police Zone #3 repeater system, with the Regional Communications Center located in Orono, Maine. 154.650 is Zone #2. Maine State Police, with four linked microwave repeaters to headquarters in Augusta. There is a fifth repeater located right at the Regional Communications Center (RCC) that can handle local, central Maine "trooper traffic."

155.055 MHz is the Region #4 Law Enforcement Repeater, part of eight separate regional repeater sites across the state (all VHF). It is located in the Ellsworth/Bar Harbor area on the peak of Cadillac Mountain on the mid-coast of Maine, and services Waldo and Hancock counties. All law enforcement agencies have privileges on this system across the state.

Hancock County has a new repeater going up; the frequency is 156.240. This is also a repeater in the little town of Sidney, off I-95 between Augusta and Waterville.

Waldo County has several repeaters, as follows:

- Waldo Emergency Management Agency: 155.760, PL = 123.0
- Waldo Sheriff's Office Belfast area law enforcement "chat": 155.130, PL = 127.3
- Waldo Sheriff's Office Fire: 159.135, PL = 123.0 (Located on Mt. Waldo)
- Waldo Sheriff's Office Fire north: 155.385R
- Waldo Sheriff's Office Prime: 156.030R PL = 127.3
- The Belfast Fire Department is 155.805 with no "official" tone. Belfast Police Department is 155.130 with a transmit PL tone of 127.3. The official "Maine State Fire" is 154.310. Three "TAC" (tactical) channels are utilized both officially and unofficially throughout the state; they are 154.265, 154.280 and 154.295 MHz. Every fire chief should have these handy.

Public safety/EMS low-band VHF exists in theory only, with the exception being several fire departments located mid-coast and southern coastal Maine. 33.700 is an active EMS paging frequency in the mid-coast region. No police agency currently uses low-band, yet the Maine State Police have several licensed from the "good ol' days" back in the 1970s and before.

However, the Maine Department of Transportation has an extensive (and well-laid-out) VHF low-band system, augmented by an ever-increasing VHF-hi network with UHF control links. 47.320 is the MDOT frequency for Division #5 and the secondary is 47.34.

This should clarify some things. All interested Maine scanners are encouraged to go to Yahoo! Groups and join the Scan-ME list/group that is on there. The URL is http://groups.yahoo.com/group/Scan-ME/ All the best.

Loren Fields, N1UMF

(Yes, folks, "The Book" is in the works!)

Deliberate Interference?

In Page and York Counties in southwest Maine there have been several incidents of what local officials there believe is deliberate interference. The Sheriff’s Department is certain that the incidents of poor or no communication are not related to cell phone towers or blockage from geographic features. Public safety radio communications have been jammed, mostly on weekends and weekdays after 5:00 pm, including during a mobile home fire handled by the Waterboro Fire Department. The FCC is investigating.

Waterboro uses 460.550 MHz, as do a number of other fire departments. York County Emergency Communications is licensed for a number of frequencies, including 33.86, 154.190, 154.310, 460.625 and 460.550, operating from repeater towers in the towns of Action, Alfred, Cornish and Shapleigh.

If the perpetrator is ever found, he or she may face the same punishment given to a 25-year-old University of Wisconsin graduate student in May after being found guilty of interfering with the Madison radio system on three occasions in 2003. He was charged as a terrorist under the PATRIOT Act for substantially disrupting a critical public infrastructure and sentenced to eight years in federal prison, three years of probation and ordered to pay $6,000 in restitution.

That’s all for this month. You can check my website at http://www.signalharbor.com for more detailed information on scanners, frequencies and other radio-related material. I also welcome electronic mail at danveeneman@monitoringtimes.com. Until next month, happy scanning!
A Scanning Canada thank you card recently went out to MT reader Kenneth Pearson of Freehold, New Jersey, for prompting a further ScanCan investigation into the new radio system at Toronto airport’s new giant terminal building. Kenneth wrote MT after seeing the picture of a Toronto airport radio in the April Scanning Canada column.

Kenneth wrote:
“I read your column every month in Monitoring Times. I saw in your Avril article a picture of a digital radio from Toronto’s new airport terminal. The radio looks a lot like a Motorola r750 plus that was marketed by Nextel in the US. However, the Nextel radio was not used in the 900 MHz range and is currently not sold in the US. My questions for you are:

What frequencies in the 900 MHz band does the product use?
Is it a Nextel type system?”

First, let me thank Kenneth and other readers in the United States for their interest in Canada. Of all the mail received by Scanning Canada, about half comes from the fruitful plain below the 49th parallel.

In response to Kenneth’s questions; first of all, his identification of the radio in the picture is absolutely correct. The unit is indeed a Motorola r750 plus. ScanCan’s mole inside the airport campus. This month’s frequencies used by the Motorola r750 plus radios in the new Terminal One. It is possible that the federal government’s database is not up-to-date, or perhaps that the investigation should proceed in another direction.

The online database had to be interrogated from a number of different angles to produce further clues. Different queries produced varying results, but, finally, a small group of frequencies emerged that seemed to match the search requirements.

The Greater Toronto Airport’s Authority is licensed to operate on a group of frequencies in the 800 MHz band that exactly match the specifications of Motorola’s r750 plus. The frequency group is identified in this month’s frequency table. Air Canada also uses frequencies that match the radio’s specifications, but the radio in the picture belonged to Terminal 1 security and was most probably owned by the GTA.

However, this doesn’t answer the question of “What frequencies in the 900 MHz band does the product use?” The radio in April’s picture is clearly labelled “900MHz”, but no frequency allocations in that range are currently documented as being licensed for use at Terminal One.

Scanning Canada’s opinion, based on the evidence available, is that 900 MHz band operation may be a future option and that the GTA has purchased radios with sufficient flexibility to allow other services to be added later. Of course, the real story may be different. If readers have better information on this subject, your comments and corrections will be welcome.

Digital Frequency Hunting at Toronto Airport

Close-up shot of control tower at the center of the airport property.

Motorola r750 plus Specifications:
Digital iDEN set with combined radio and cellular capability.
800 MHz band:
Transmit range 806-825 MHz, Receive range 851-870 MHz
900 MHz band:
Transmit range 896-901 MHz, Receive range 935-940 MHz

A search of Industry Canada’s online database produced a list of licensees of frequencies in the specified range. One of the licensees turns out to be “Tele-Mobile Company” aka Telus Mobility, operator of a commercial digital phone/ radio service called “Mike”. Telus does not publish specifications for the radios used in their commercial Mike service, but it does reveal that Motorola is its radio equipment partner and that digital iDEN radios are used.

Unfortunately, at the time of writing this column, Telus was not licensed to operate on the Motorola r750 plus radio in the new Terminal One. It is possible that the federal government’s database is not up-to-date, or perhaps that the investigation should proceed in another direction.

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Lester B Pearson International Airport, Toronto

<table>
<thead>
<tr>
<th>Air Canada trunking repeater</th>
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<tr>
<td>851.0250/806.0250 851.1250/806.1250</td>
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<td>851.2750/806.2750 851.3250/806.3250</td>
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<th>Air Canada (simplex)</th>
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<td>851.9250/851.9250 852.4250/852.4250</td>
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Greater Toronto Airports Authority

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<th>Greater Toronto Airports Authority (unassigned location)</th>
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<tbody>
<tr>
<td>806.5000/851.5000 807.0000/852.0000</td>
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<td>807.4750/852.4750</td>
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Telus Mobility (analog)

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<tr>
<th>Telus Mobility (digital, IDEN) Terminal 3</th>
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<tr>
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<td>807.4250/852.4250</td>
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<td>807.9750/852.9750</td>
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<td>852.0000/807.0000 852.4000/807.4000</td>
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<td>852.4750/852.4750</td>
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Telus Mobility (digital, IDEN) Terminal 3 (believed to be a similar service to Nextel in the USA)

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<th>Telus Mobility (digital, IDEN) Terminal 3</th>
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<td>852.4750/852.4750</td>
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Telus Mobility (digital, IDEN) Terminal 3 (believed to be a similar service to Nextel in the USA)

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<td>853.7625/808.7625 853.7875/808.7875</td>
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<td>854.3250/809.3250 854.3875/809.3875</td>
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<td>856.8750/813.8750 856.9125/813.9125</td>
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<td>861.8375/816.8375 863.1250/818.1250</td>
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<td>864.4125/819.4125 865.1250/820.1250</td>
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<td>865.8375/820.8375</td>
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Greater Toronto Airports Authority

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<thead>
<tr>
<th>Greater Toronto Airports Authority (AVIS - Automatic Vehicle Identification System in the new giant parking garage)</th>
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<tr>
<td>915.0000/915.0000</td>
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This frequency is also used by Southern Ontario’s Highway 407, Electronic Toll Route transponder system. It permits frequent users of these facilities to drive in and out without stopping for toll registration.

Terminal 1 Parking - Fleetcom Inc

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<tr>
<th>937.8875/898.8875</th>
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<td>937.9125/898.9125</td>
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◆ Access to Pearson Airport
Now that the new terminal has been opened, the airport perimeter security stations have been removed and public access is permitted right inside the airport campus. This month’s picture of Pearson Tower was taken at the very heart of the airport. Airport roads are still heavily patrolled by roadside security vehicles, but scanner operator right in the middle of the airport is now possible (although probably not officially sanctioned). Be discrete and be careful.

July 2004
Morse Code Enters the 1970s!

Most people will tell you that the Morse Code is a dead language. Maybe so, but it has just added a new character. As of May 3rd, while this column is being written, the International Morse Code now officially includes the "at" sign (@), as made famous by Internet e-mail addresses. Yes, you can now send e-mail addresses in continuous-wave (CW) Morse telegraphy. (You can also send Morse Code in your e-mail, using periods and hyphens, but most non-radio people will think you're pretty strange. This is not necessarily a big problem, since they probably think that already if you're into utilities.)

Some operators have put @ into their Morse for years, by using the letters "AT" run together. But this, unfortunately, creates the existing character for "W." People can tell the difference between W and @ from context, but computers can't. It's just one more reason "wetware" produces better copy.

All this became moot when the International Telecommunication Union (ITU) took the advice of the amateur groups who are keeping Morse going, and wrote a whole new draft recommendation for its use on the radio. Along with adding the @ sign, it transferred this code from the wireline to the radio section of the ITU. Originally, all this was supposed to become official in early July, but things happened a little fast, probably for the first time in the history of telegraphy.

The new character is the first to be added in several generations. It sounds like "AC" run together – didadahdidahdit. The letters are kind of a memory device for "at, commercial," since the @ is still called the "commercial at sign" ("commat") in the standards for such things. Real old timers might remember when the only common use of the @ was to specify price per unit in business transactions.

Some of the hard core Morse Code fans are now grumbling that there is still no exclamation point. There used to be, but at some point apparently lost in ancient history, that character was changed to a comma. Ever since, official code tables have shown the ! as "None at present." A few years ago, all of us in one ham radio net actually started saying this in CW conversation, as in, "WOW NONE AT PRESENT." (Maybe utility fans really are strange.)

Some people are pushing for re-adoption of Morse's original exclamation point, which is dahdahdahdit. Unfortunately this already means something else in Polish, Arabic, Greek, and Russian national versions of the Morse Code. (You haven't lived until you've attempted to copy someone sending CW in the Cyrillic alphabet, as Russian military intelligence stations frequently did until only a few years ago.)

This is of more than academic interest as long as there's any CW code left on utility airwaves. It's still out there. It's getting pretty rare, and if you hate Morse there's certainly no reason to torture yourself to learn it, but it's out there. Not bad for a simple, binary code invented 150 years ago by a portrait painter.

**Havana Harmonics**

With tensions once again increasing between the United States and Cuba, it is probably no surprise that people all over the world are reporting mysterious gurgling noises on the high-frequency (HF) radio band. These come from Cuban jamming of Radio Marti and other stations. As always with Cuban radio engineering, however, there's way more to the story than that.

These high-powered transmitters are of a type known as "bubble" jammers, which cover the target signal with multi-frequency-shift-keyed audio pops of short duration. It sounds a bit like water gurgling down the bathroom sink. Hence the popular name given these transmissions – the "Havana Gurgler." This always sounds like some new rum drink, or what happens to people who have too many of the old ones.

For years, the gurglers have radiated some of the worst harmonics in recent history. Harmonics occur in any transmitter, creating spurious signals at integer multiples of the fundamental frequency. They are usually cancelled or filtered out. Not this time.

One gurgler is on the approximate frequencies of 18026 and 18090 kilohertz (kHz). These are in perfect time sync, and they most likely represent inverted double sidebands of the same suppressed-carrier transmitter, as spread out by the harmonic multiplication. Another gurgler hangs out around 14730. All of these are heard worldwide for a few hours daily, around 2300 Coordinated Universal Time. This is when Marti, a well-funded service of the Voice of America, is broadcasting to Cuba on 6030 and 7365.

This being afternoon in Los Angeles, propagation from Cuba is poor on such low frequencies. I needed to find another path. Therefore I got on the Internet, and surfed over to the remotely operated "DX Tuner" receiver in the Midwestern United States.

The DX Tuner network is very slick, and worth another column in itself. It creates a virtual receiver on your computer, using Flash and a Java applet. Access is at http://www.dx tuners.com, and it can be a truly definitive way to check on the origins of unknown utility signals. For free, one gets a few busy "demo" receivers in the United States and Europe. Increasing subscription levels bring access to more radios, with far more bells and whistles. (See this month’s feature article on User-Controlled, On-Line Tuners – ed.)

Bingo. Both Marti frequencies were audible, with jamming. Second harmonics (minus Marti) were on 12060 and 14730, and sure enough, very audible third harmonics were on 18090 and 22095. The signals were in good time sync, but spacing between the audio burst frequencies increased by the harmonic multiplier as they went up.

This spreading out is what gives the third harmonics their rather peculiar sound. It's easy to mistake them for military Automatic Link Establishment. Under perfect conditions, the jamming is far more random than ALE, but when HF fading and phase distortion go to work on them, things get a lot less certain. To the ear, the major giveaway is often just the jammer's hour-long duration.

Gurgle away until next month.
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 Numbers Intelligence Gathering and Monitoring Association.
Globe Wireless Idle Signals Revealed (Part 2)

This month's column completes the story of decoding Globe Wireless' idle or channel-free signal to reveal the station identifier present in that signal - an exercise that provides an ideal tutorial to decomposing unknown signals bit-by-bit (pun intended!).

First, let's review where we got to last month. We know the following about the composition of the idle signal:

- **Speed:** 100bd (or 10ms per bit)
- **Shift:** 200Hz
- **ACF:** 8 and 231
- **Synchronous:** Yes

After identifying these "external" characteristics of the signal, we had just started to look at the internal structure.

**From the Outside to the Inside**

For this job, we use a module that Hoka calls the Speed-Bit Analysis module. As you may recall from last month's column, this tool prints a line across the screen in a certain (user-settable) time period much like a fax machine. If a "1" is present, the line fills as it proceeds across the screen, if it's a "0" it leaves a blank behind and if there's no signal (noise), one generally sees neither solid white nor black.

To use this tool to uncover the internal features of the signal, one adjusts the time period in small steps, looking for a pattern that repeats vertically down the screen. Once a pattern emerges, we know that we have "synchronized" with some feature(s) of the signal.

In our case, we know that the signal has an ACF (autocorrelation function), so a good starting time period will be the repetition cycle time of the signal. We obtain this by multiplying the ACF (231 bits) by the bit time (10ms) of the signal, which is 2310ms. We indeed see a defined pattern with this setting (Figure 4).

We can also see that 50 idle signals are sent in a "round" - in 6 groups of 8 and one of two.

One can also see that there is also slight time shift (about 360ms) as each new group of 8 is sent. We're not yet sure why this happens.

In the case of the Hoka Speed-Bit Analysis module, one can move a left-hand and a righthand vertical cursor over various parts of the signal and read the time period (and therefore, number of bits) between their start and end. In the case of the GW signal, we first measured the pause between bursts (780ms), which means that the actual burst is 2310-780=1530ms (or 153 bits) in length.

So, how do we get to see these all-important 153 bits?

**Bit By Bit**

For really digging into the guts of a signal, we use a tool called, quite simply, the Demodulator. This module allows one to set each signal parameter (modulation type, speed, shift, etc) and simply dumps the raw Is and Os it demodulates to a file. Here's what we see in the case of WNU's complete 151-bit channel free signal burst:

```
1001010100000001111001010001100011001011110001
0111010001110010110010001101001101001111001
011110100011001001101001101001111001
0111010001110010110010001101001101001111001
```

As you can see, in itself, this is not very useful - we need a few other signals for comparison purposes and to test a few theories:

1. We need to take similar dumps from other GW stations. If the bit pattern varies, we can guess that the channel free signal carries frequency or channel information among other things.
2. We need to take similar dumps from other GW stations. By comparing the patterns, we may be able to tell the identifiers apart (if there are any!)

In the case of (1) what we found is that the bit pattern of the idle signal is the same on all channels used by a particular GW station. It's therefore probable that the channel-free signal contains no frequency or channel information.

In the case of (2) we checked most of the GW stations that were in range of our location (VCT, WNU, HEC, LSD836, KFS and KPH) and found that the leading portion of every station's channel free signal is the same:

```
1001010100000001111001010001100011001011110001
0111010001110010110010001101001101001111001
```

It seems that we're on to something! Looking beyond this part of the signal, we find that the trailing portion is different for each station. In the case of WNU, here is the trailing portion:

```
[trailing portion]
100011011001011001001101001001101101001111111
```

We can therefore surmise that this repeated 8 bit byte is the station identifier. We've done it!

Ben Mesander, who first aroused suspicions that the GW channel-free signal contained an identifier, has written a free Linux program to decode the ID from bit-by-bit dumps such as that shown above. Others have now ported the program to Windows (see Resources).

With the help of these programs and other listeners around the world, Ben has now catalogued just about all of these unique identifiers. Well, nearly unique, as it turns out. The program has revealed that a few distant stations appear to carry the same ID.

Chris Smolinski has also added GW identification to his excellent MultiMode software for Mac OS X (see Resources).

 Thanks again to Ben and other listeners for their help in writing this and last month's column.

Until next month, good digital DX.

**Resources**

- **Globe Wireless**
  - http://www.globewireless.com
- **Hoka Elektronik**
- **Ben's Globe Page**
- **GW Idle Signal**
  - http://neurosis.hungry.com/~ben/radio/GW_CH_free.wav
- **MultiMode**

**Figure 4: Speed-Bit Analysis**
Information Radio Is Back - from Bahrain or Ships?

Jeff Weston, BDXC-UK, discovered a notice on a navigational warning website concerning the Persian Gulf, about Coalition Maritime Forces broadcasts on 6125 at 0300-0800 and 15500 at 1400-1900 UT. It said they began 15 April, with popular music and info in Arabic, Farsi, Hindi, Pashtu, Urdu and English, on how to identify and report terrorist activity at sea.

These two frequencies are among nine others in a Merlin schedule for A-04 for an as yet unheard station called “Radio for Peace,” from sites in the UK and UAE, pointed out by Bernd Trutenau, BC-DX, although the times do not match exactly. Then Andy Sennitt at Media Network traced the origin of this to the Maritime Liaison Office (MARLO) in Bahrain. One of two handbills pictured on the MARLO web site mentions broadcasts on “Radio One,” though it’s not clear if this refers to shortwave. The mission of MARLO is to facilitate the exchange of information between the United States Navy and the commercial shipping community in the US Central Command’s area of responsibility.

Mika Mäkeläinen, of dxing.info, who last year had visited Qatar and the Gulf, found out more from Liaison Officer Ken Gazzaway of the Gulf of Oman and North Arabian Sea. Low power – only 250 watts – explained why DXers had not been able to monitor the transmissions. Negotiations were underway to transfer the transmissions to Merlin Communications via UAE or the UK. This would greatly increase power [250 or 500 kW]. The announcements also detail the Rewards for Justice program. U.S. offers rewards for information that prevents or favorably resolves acts of terrorism against the U.S.

Once the news was out, European DXers succeeded in picking up 15500-US, starting with Jan Savolainen in Finland, around 1600 UT, but a lot of splatter from Kuwait on either side. It sounded like a psyop transmission, talking about a million-dollar reward, with a phone number to call, 001 800 877 3927. Reception was better another day at 1730, with an ID sounding like “Radio Ma’alumatt,” the same name as the previous Information Radio broadcasts for Iraq and Afghanistan.

Three days later, on May 10, Dave Kernick in the UK heard Afghan music and ID at 1745 as “Radyo Ma’alumatt.” Thomas Roth in Germany also heard it, but with some interference also on USB, perhaps an attempt to jam. Another log from Savolainen said they seemed to ID as “Radyo Ma’alumati” (differs a bit in each language). The e-mail address mentioned is mail@rewardsforjustice.net and see the website for more details about the program, if not about these specific transmissions: http://www.rewardsforjustice.net

WRTH A04 Schedules

There is no more SW Guide, but WRTH provides over 200 A04 broadcasting schedules for International, Foreign service, and Target broadcasters, and a complete ‘By Frequency’ list. The file is just under 300K, 87 pages long, via http://www.wrth.com/WRTHA04WEB.pdf or http://my.web.taxi.co.uk/gauag (Sean D. Gilbert. International Editor, World Radio TV Handbook)
there's a mailbag in Greek, 'O Tahidromos (Marcelo Xavier Ferreira, Itambe, Greece, DXLD) Then their website gave 1 7510: http://www.krsi.net/us-en/
"Anticipating the shift from radio to TV and the Internet in large parts of our audience’s world, we must develop television as the premiere, and the Internet as the companion, instrument of America’s international broadcasting effort.” The Union has also filed a grievance against the Broadcasting Board of Governors for its role in implementing the Voice of America’s (VOA) new programming strategy. VOA’s expanded service to Pakistan, Radio Aap Ki Duniya in Urdu, officially launched on 10 May with the addition of MW 972 kHz via Orzu, Tajikistan, at 0200-2400 UT daily. The new 24-hour service to Afghanistan is now available via 5173 kHz, 0000-0100 UT.

As of May, VOA has launched a new service to Iraq, Iraq FM 8570 kHz, which is primarily aimed at young Iraqis living in the United States to help them maintain a cultural connection to their homeland. During the 0400 UT hour they bomb (Observer, Bulgaria)

21720; 1430-1517 Tashkent 17540, 17520, 17765, 17800, 21650, 21525, 21505, 21550, 21560, 21590, or 21515 kHz via Signal) 17525, 17505, 17745, 17765; and 21520, 21545, 21550, 21560, 21590 kHz are working well, R. Thailand dropped the direct broadcasts from Udorn, 5890 kHz as of April 18 (Andy Sennitt, Mark J. Fine, DXLD; Fyodor Brazhnikov, Slovensko.com via Ulis R. Fleming, Mike Terry)

The National Association of Shortwave Broadcasters at its 2004 annual meeting on May 7 elected Doug Goring as its new president. He is the former Director of Engineering for LeSEA Broadcasting, which owns SW stations WHRA, WHRI and KHWR. A few months ago, he left LeSEA to take an engineering position in Hawaii, but continues to be active in issues of importance to SW broadcasters.

The organization welcomed its newest member, VKOH [17775], which was recently sold by World Broadcasting (WJE in Kentucky) to a Hispanic church in Los Angeles and is known as La Voz de la Restauracion.

Also, the membership agreed to extend the Voice of the NASB DRM (digital shortwave) broadcasts once the current series ends in July. The original series was beamed to Europe, but the new series will be beamed to DRM listeners in North America.

NASB also hosted a meeting of the new USA DRM Group, at the HQ of Radio Free Asia in Washington, to form a national organization to promote the development of DRM (Digital Radio Mondiale) in the US. Outgoing NASB President Jeff White was elected Chairman of the new USA DRM Group (Jeff White, NASB)

VENEZUELA [non] After a few weeks, the new Radio Nacional de Venezuela in Spanish schedule appeared on the RNV website, pointed out by Francisco Jackson dos Santos, in radiorecutas, http://www.rnv.gov.ve/noticias/index.php?act=ST&f=2281=5173 and if you prefer, a colorful map at http://www.rnv.gov.ve/noticias/ondas/ondacortas1.jpg linked from an April 22 press release. Trouble is, nowhere is there any hint that the broadcasts are actually transmitted – nor is there any mention of the project’s website.

According to an interview with the project’s chief, the station will broadcast in English and Spanish, but the exact details of the transmission schedule are unclear. There is also no information on the equipment being used or the location of the transmitter.

The project is being funded by the government of Venezuela and is intended to reach a large audience in the country. However, the lack of information makes it difficult to assess the project’s potential impact.

Until the Next, Best of DX and 73 de Glenn!
Global Forum

Broadcast Logs
Gayle Van Horn
gaylevanhorn@monitoringtimes.com

0035 UTC on 13695
THAILAND: Radio. News talk on playwright into business news. Item on joint venture from Thai Airlines to merge with Singapore Air for cheaper fares. (Howard Moser, Lincolshire, IL) Khmer service 7260, 1115. (Gayle Van Horn, Brantosst, NC)

0001 UTC on 9736.9
PARAGUAY: Radio Nacional de Paraguay. Several IDs while monitoring program promos and band anthems. Colombian music followed by Spanish announcers' discussions. (Harold Frodge, Middletown, MD)

0205 UTC on 9560
CANADA: Radio Korea Intl. Male with newscast and ID, // 15575 via South Korea. (Stewart MacKenzie, Huntington Beach, CA)

0308 UTC on 6925 USB
PIRATES: Big Thunder Radio. Pop and weird tunes. Music relatively clean, but voice barely audible. Subsequent lagging 0330-0341* including rock tunes. ID per FAK posts. Voice of Captain Ron SW 6925 USB, 2245-2355+ Lubavitcher/Chassidic Radio noted from Brooklyn, New York 1709.85AM, 2350-2408+. (Frodge, MI)

0356 UTC on 6210
ETHIOPIA: Radio Fana. Poss. Amharic Male/female duo with talks to 0400. Mention of Radio Fana at 0400 then 'traditional' sound for Horn of Africa music. Fair signal // 6940. (Scott Barbour, Intervale, NH)

0418 UTC on 6019.96
PERU: Radio Victoria. Religious program to a capella hymns and station identification. Peruvians audible; Radio Melodia 5906.40, 0425-0430; Radio Union 6115, 0438-0443; Radio Ancash 4991.24, 0918-0930; Radio Altilo 5014.37, 0300-0315; Radio Del Pacifico 4975, 0830+. (Arnold Slaen, Buenos Aires, ARG)

0430 UTC on 9875
RUSSIA: Voice of Dramatic story segment to 0500 station identification. (Moser, IL) 9890, 1931 with report on the 1924 Art Festival held in the United States. Moscow Mailbag 9665, 0120. (Bob Fraser, Belfast, ME) Voice of Tigray Revolution 5500, 0412-0433 // 6350 poor. (Barbour, of Africa music. Fair signal // 6925 USB, 2245-2355+; Lubavitcher/Chassidic Radio noec from clean, but voice barely audible. Subsequent logging 0330-0341

0518 UTC on 9615
NEW ZEALAND: Radio NZ Intl. Lengthy discussion on water rights for agricultural area into stock report. (Moser, IL) News report 9885 at 0800. (Fraser, ME)

0850 UTC on 4722.83
BOLIVIA: Radio Unica. (Tent) Spanish/Aymara. Several regional tunes and regional announcements and time check. Bird signal at 0900 into Andean music and Aymara programming. Only partial ID audible mentioned "anda corta de 60 metros." Bolivia's Radio San Gabriel 6085, 0955-1010 in Spanish/Aymara programming. (Slaen, ARG) Radio Melodi 4796.52, 0925-0931. (Slaen, ARG)

0954 UTC on 4845
BRAZIL: Radio Metrologic. Portuguese. Station ID including station slogan and international news. Brazilians logged; Radio Difusora Acreana 4885, 0928-0935; Radio Elucuvar Rural 4925, 2220-2226 and 2300-2305; Radio Carcaso Nova 9675, 2250-2259.

0900 UTC on 3990.30
SURINAME: Radio Apinie. Identification into Hindi by announcer. ID and jingle into talk show. Jingle ad pauses past 1005. Next night audible at 0430 in Dutch with oldies tunes. (Garcia, MD)

0930 UTC on 4939.7
VENEZUELA: Radio Amazonas. Spanish sign on with national anthem and the revolution anthem. SW and MW frequency quote and mention of Free Territory of the Continent. (Garcia, MD)

1144 UTC on 3375
PAPUA NEW GUINEA: Radio Western Highlands. Vemecular Papuan pop tunes of fair-good quality. PNGs noted. Radio Milne Bay 3365, 1145; Radio East Sepik 3335, 1147; Radio Gulf 3245, 1149; Radio Southern Highlands 3275, 1148; Radio Saundean 3205, 1151; NBC 4890, 1152. (Jerry Lineback, KS/NASA Flash Sheet)

1150 UTC on 15700
BULGARIA: Radio. Bulgarian folk music. Report on Bulgaria's role in NATO on 9700 // 1700 to 2317. (Fraser, ME) 7500, 0240 Bulgarian service. (Woronka, NC)

1500 UTC on 17870

1505 UTC on 15410
USA: Radio Farda. Farsi ID into possible news format and talk. (Sam Wright, Biloxy, MS)

1730 UTC on 11890
PHILIPPINES: Radio Filipinas. English sign-on into national news and interview with Manila Bishop from the Catholic church. Radio Veritas 15360, 1500 English sign-on ID in Filipino service. (Garcia, MD) VOA-Philippines relay 15225 at 1755 with news commentary. (Fraser, ME)

1730 UTC on 9785
TURKEY: Voice of. Station sign-on into national newscast. Classical Turkish music 9830, 2340. (Fraser, ME)

1825 UTC on 17834.85
EL SALVADOR: Radio Imperial. (Tent.) Spanish program possibly called, "La Hora de la Palabra de Dios." Possible ID spot at 1832, occasional fair signal peak. Best heard in months. Usually only heard as a heterodyne. (Frodge, MI)

2021 UTC on 9895
NETHERLANDS: Radio. Research File focus on dinosaurs. Madagascar relay 7120 poor but readable. (Bob Fraser, Belfast, ME) 11655, 2017-2039 with Euroquest program. (Barbour, NH)

2142 UTC on 7105
BELARUS: Radio Minsk. Folk music at tune-in followed by news regarding national environmental concerns and US Embassy in Belarus. ID, "You are listening to Radio Minsk." between segments. Local music at 2115 followed by ID. Fair signal though audio quality a bit "muffled." (Barbour, NH)

2214 UTC on 6015
TURKEY: Voice of. Last Week in Turkey news segments // 9665. (Fraser, ME)

2215 UTC on 6180
CYPRUS: Cyprus BC Corp. Greek. Balalaika interval signal into extended announcements. Greek text at 2245 // 7210, 9760. (Garcia, MD)

2300 UTC on 12115
ICELAND: Rikisutvarpid. Presumed Icelandic news and pop music to item about Reykjavic. Audible the next morning on 12865 USB at 1410. (Garcia, MD)

2301 UTC on 7460
WESTERN SAHARA: Radio Nacional del Sahara, Algeria. Spanish ID, frequency quote into pop tunes by Julio Iglesias. Islamic studies and traditions closing at 00002 with national anthem. (Garcia, MD)

2318 UTC on 9590

2346 UTC on 6140
COLOMBIA: Radio Melodía. Spanish identification including medium wave frequency. "Toda Musica es la Hora Melodia" into news-cast at 0000. (Garcia, MD) 6139.73, 1032-1049 with web, phone number and ID. (Barbour, NH)

2350 UTC on 6925 USB
PIRATES: Undercover Radio. Very good reception with ID and email address. Comments of, "Don't let them see us, don't let them know what we are doing." Numbers from 2354-00 to sign-off. (Joe Wood, Vonore, TN)

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.

July 2004 MONITORING TIMES 41
AMATEUR RADIO
Montserrat (NA-103) 20 meter SSB. Full data color volcano aerial card. Received in 188 days for a SASE to Joyce M. Swallow- QSL Manager NBQET, 3137 Compton Road, Cincinnati, OH 45251-2645. (Larry Van Horn N5FPW, NC)

Canada-Prince Edward Island (NA-029) 10 meter SSB. Full data color card. Received in 63 days for mint stamps and SAE to: Michael J. McGirt, 3441 W. Oak Hill Dr., Crete, IL 60417. (Van Horn, NC)

Turks and Caicos Island, 80/40/15 meters SSB. Full data color cards. Received in 26 days from Jim R. Lorni-from QSL Manager, 814 Basswood Ct., Orange Park, FL 32065. (Van Horn, NC)

ANGUILLA
Caribbean Beacon, 6090 kHz. Full data card signed by Doris Huxxington. Received in 375 days for an English report and one US dollar. Station address: P. O. Box 690, Anguilla, British West Indies. (Joe Wood, Vonore, TN)

BONAIR
AWR, 6165 kHz. Full data Noah's Ark card with site as 150 kW. Signed with illegible signature, plus pocket calendar and stickers. Received in 97 days for an IRC. (Scott Barbour, Intervale, NH)

CLANDESTINE/PIRATES
WBMR-Black M. Radio, 6924.9 kHz. Full data qsl from Mike O. Farad. Received in 23 minutes for a report to: wbmrradio@hotmail.com. (Harold Fronge, Midland, MI)

Radio Free Cascadia International, 15045 kHz. Full data studio card unsigned. Station letter and Five Days Over Seattle audio CD. Received in 172 days for a pirate report and one US dollar. Station address: P. O. Box 703, Eugene, OR 97440. (Bill Wilkins, Springfield, MO: John Wilkins, Wheat Ridge, CO)

Voice of Captain Ron SW, 6925 kHz. Full data email verification, plus a friendly letter. Received in three days for an email report to: captainronsw@yahoo.com. (Andrew Yoder, PA/Cumbre DX)

DENMARK
Radio Danmark, 7560 kHz. Full data unsigned verification letter for "last day of service Dec. 31, 2003." Received in 90 days for an English report and two US dollars. Station address: Rosenorns Alle 22, DK-1999 Frederiksberg C, Denmark. Report sent to: rdket@dr.dk. (Arnaldo Slaen, Buenos Aires, ARG)

GERMANY
Bible Voice-High Adventure Gospel Communications Ministry, 15680 // 13725 kHz. Full data two colored graphic email reply from Gertrude Sheridan. Received in 14 days for an email report to: mail@biblevoice.org. Station website: http://www.biblevoice.org. (Gayle Van Horn, NC)

Bible Voice
THANK YOU FOR LISTENING! Receiving Confirmation Date: Aug. 29/03 Name: Gayle Van Horn Frequency: 15680 kHz Address: c/o Monitoring Times Magazine Frequency: 15680 kHz Time: 1032 Frequency: 11444 kHz Time: 1522 100 kHz USA 11444 kHz USA

zek电台voice@biblevoice.org "A voice of our calling..." Isaiah 43:3

ICELAND
AFRTS, 13855 kHz USB. No data reply with site only as Grindavik, from Patricia Huizinga-OIC. Received in one day for an email report to: kelavik@mediacen.牛奶.友好 email reply from Navy Chaplin Bruce Pierce, who operates a ham station there. (Barbour, NH)

ISRAEL
Geile Zohal-IDFR, 6973 kHz. Full data Microphone Man card with handwritten reply. Website http://www.glz.rsm.co.il. Received in 70 days for an English report and one IRC. (Barbour, NH)

MEDIUM WAVE
KBRI, 1570 kHz AM. Handwritten verification letter signed by Joey Rodgers-Manager, plus bumper stickers and business card. Received in 75 days for an AM report. Station address: c/o Brinkly Radio, 1501 S. Main Street, Brinkley, AR 72021. (Patrick Martin, Seaside, OR)

KEVA, 1240 kHz AM. Full data QSL card signed by Michael J. Richard-QSL/DX Test Coordinator. Received in 37 days for a taped report of their special DX Test. Station address: P. O. Box 190, 568 Airport Road, Evansston, WY 82930. (Patrick Griffith- NONNk, Westminster, CO) 45 days response for same. (Martin, OR)

KKOL, 1300 kHz AM. Second verification letter from Richard Harris-Contract Engineer, plus coverage map. Received in 31 days, as I wanted to QSL this station operating from the ship. They claim their signal goes well into Vancouver, but you sure would not know it from this direction. Station address: Salem Radio Seattle, 2815 Second Avenue, Seattle, WA 98124. (Martin, OR)

QWMA, 1520 kHz AM. Very nice full data letter marked as "QSL # 2", signed by Paul Walker-Assistant Program Director, plus transmitter photo. Received in 43 days for an AM report, tape of DX Test, and one US dollar. Station address: 1820 West Marks Road, Marks, MS 38646. (Griffith, CO)

TAJIKISTAN
Radio Free Asia, 15680 kHz. Full data Dolai Loma card signed by A.J. Janitschek-Manager, plus personal letter, schedule and RFA sticker under separate cover. Both received in seven days for US mint postage (returned). Station address: Suite 300, 2025 M. Street NW, Washington DC 20036. (Barbour, NH)

ZAMBIA
ZNBC, 4910 kHz. Full data white logo postcard signed by Patrick Nkulasa. Received in 50 days for an English report, CD and one US dollar. Station address: Mass Media Complex, Alick Nkhata Road, P. O. Box 50015, Lusaka 10101, Zambia. (Yoder, PA/Cumbre DX)

July Holiday DXing
British Virgin is. Territory Day, July 1
Hong Kong Region Establishment Day, July 1
Burundi Independence Day, July 1
Canada Day, July 1
Rwanda Independence Day, July 1
Belarus Independence Day (from German troops) July 3
Philippines Independence Day (from USA) July 4
USA Independence Day, July 4
Cayman Is. Constitution Day, July 5
Copia Verde Independence Day, July 5
Venezuela Independence Day, July 5
Malawi Republic Day, July 6
Nepal B'd Gyanendra, July 7
Solomon Is. Independence Day, July 7
Palau Constitution Day, July 9
Bahamas Independence Day, July 10
Mongolia Independence/Revolution Day, July 11
Kiribati Independence Day, July 12
France Bastille Day, July 14
French Guiana Bastille Day, July 14
French Polynesia Bastille Day, July 14
Iran Revolution Day, July 17
Colombia Independence Day, July 20
Belgium Independence Day, July 21
Egypt Revolution Day, July 23
Cuba Rebellion Day, July 26
Libya Independence Day, July 26
Peru Independence Day, July 28
Vanuatu Independence Day, July 30

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L ast month, we began a discussion about summertime shortwave listening. Hey, that radio likes getting out into the fresh air as much as you do! Packing it away just because it's not prime DX season is as unfair to your electronic friend as it is to you! And here's more proof.

**Sunday Mornings**

Arguably, for many of us, this remains the most relaxing time of the week, no matter the season. Very few of us feel guilty about pouring another cuppa and sitting barefoot in the sun or shade (whether inside or outside) while paging through the Sunday paper. Add that shortwave radio to the mix and you'll really be living!

My favorite Sunday morning listening for many years has been RCI's **(Radio Canada International)** nine to noon (EDT) offering. Michael Enright's *The Sunday Edition* has occupied this slot the last few years and, while I have to say I've enjoyed previous iterations a bit more, this remains a most enjoyable three hours. Enright has grown into the program - and into him - and everything about this association seems to have become much more comfortable with time.

During July and August, Enright takes a sabbatical and the program becomes *The Summer Edition* [1308-1600 UT, 95/513655/17600 kHz]. The already pretty easygoing, but always topical, agenda of artists and ideas gets even a little more breezy during the height of the summer warmth. A guest host guides us and into him - and everything about this association seems to have become much more comfortable with time.

Down under in Australia and New Zealand, the weather is cooler but the contests are hot. The Kiwis are in the midst of prime season for their national passion - rugby. RNZI (R. New Zealand International) gleefully cuts into its regular program schedule to give full play by play coverage to the matches of the national team, the All Blacks. During July, the All Blacks will be competing for the Tri-Nations and the Bledisloe cups and the country will be preparing for this year's in-run for the former and on the other side of the day, RNZI presents a nightly hour of familiar tunes on *Wayne's Music* [M-F 0105-0200, 15720]. Sunday nights are prime time for lively Cuban rhythms [R. Habana, W 0200-0300 & 0400-0500, 6000/9820; 0600-0700, 9550/9820/11760], or hear traditional Chinese tintamarre in *Jade Bells and Bamboo Pipes* [R. Taiwan International, W 0220 & 0320 UT, 5950].

There are loads of other options detailed in our monthly *Shortwave Guide* and you can just do some bandscanning yourself anytime for still more!

**Music and More**

Music goes with nearly every activity and summer is no exception. A great daily morning program with a wide and intelligently presented variety of global sound is *The Planet on Radio Australia* [M-F 1305-1400, 9590]. On the other side of the day, RNZI presents a nightly hour of familiar tunes on *Wayne's Music* [M-F 0105-0200, 15720].

For the latest DX and program schedules, audio archives and much more!
Convert your time to UTC.

Broadcast time on 2 and time off 4 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 hour.

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 (see 1); 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 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.

In the same column, irregular broadcasts are indicated “irr” and programming which includes languages besides English are coded “vl” (various languages).

Choose the most promising frequencies for the time, location and conditions.

The frequencies 6 follow to the right of the station listing; all frequencies are listed in kilo-hertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions.

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.

To help you find the most promising signal for your location, immediately following each frequency we’ve included information on the target area 7 of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas
af: Africa
al: alternate frequency
am: The Americas
as: Asia
au: Australia
c: Central America
dd: domestic broadcast
eu: Europe
ir: irregular (Costa Rica RFI)
m: Middle East
na: North America
om: omnidirectional
pa: Pacific
sa: South America
va: various

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 station and programs listed should be readily receivable in North America using a portable radio. Most broadcasters produce only 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 time” hours, 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.

Program Highlights

John Figliozzi

BBC Notes

The Proms

The 110th BBC Promenade Concert series begins on July 16 and continues until September 11. This unique summer music festival is renowned for its accessibility, in terms of program, price and availability. This issue of MT was prepared in late May and the BBC World Service schedule was not yet available; so about the only things we can say with certainty about the World Service coverage of The Proms are that the first and last nights will be “on” and more concerts will be presented in-between at various times of the day and night.

In addition to the several selected World Service broadcasts, every Prom concert (over 70 of them!) will be broadcast by BBC Radio 3. The good news for international fans is that all of these broadcasts will be streamed over the internet from the Radio 3 web site. Many also will be repeated there each afternoon at London time (1300 UT), and some will be archived for one week on the Proms web site. Consult <http://bbc.co.uk/proms radiotv/> for full broadcast information. The official website for The Proms is <http://bbc.co.uk/proms>.

Letter

“...is the name of the program replacing Alistair Cooke’s Letter from America. It’s a fitting title: honoring the tradition, whilst moving to – of necessity – an entirely new concept. One of a panel of international commentators reflects on some latest developments in his or her part of the world. [BBCCam S 0432. 1132]”

Other Notes

Radio Taiwan International now produces a single one hour package of programs each day (instead of the previous two). The programs, for the most part, are shorter, fresher sounding and presented with more “snap.”

Many favorites remain – among them, Jade Bells and Bamboo Pipes – but there are numerous new timings. For full details, consult this month’s MT program listings for RTI’s 0200 and 0300 broadcasts.

In another welcome development, Radio Slovakia International received a reprise. Their 0100 listings return to this month’s MT.
### Shortwave Guide

<table>
<thead>
<tr>
<th>Time</th>
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**SELECTED PROGRAMMING BEGINS ON PAGE 57**

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**MONITORING TIMES**

July 2004
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**Shortwave Guide**

**0400 UTC - 12AM EDT / 11PM CDT / 9PM PDT**

**0500 UTC - 1AM EDT / 12AM CDT / 10PM PDT**
Shortwave Guide

0800 UTC - 4AM EDT / 5AM CDT / 6AM PDT

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0900 UTC - 5AM EDT / 6AM CDT / 7AM PDT

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1000 UTC - 6AM EDT / 7AM CDT / 8AM PDT

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July 2004

MONITORING TIMES: 49
Shortwave Guide

1200 1300 Canada, CK2U Vancouver BC 6160da
1200 1300 China, China Radio Intl 9730sa 11760pa
1200 1300 Costa Rica, University Network 9725sa 11870am
1200 1300 Ecuador, HCJB 201200sa 21455am
1200 1300 Germany, Deutsche Welle 9655sa 15400eu
1200 1300 Malaysia, Radio Malaysia 7295do
1200 1300 Netherlands, Radio '91 4890da 9675irr
1200 1300 Singapore, Radio Singapore Intl 6080sa 6150sa
1200 1300 South Korea, Radio Korea Intl 9650sa
1200 1300 Taiwan, China Radio Taiwan Intl 7130sa
1200 1300 UK, BBC World Service 6195sa 9740sa
1200 1300 USA, Armed Forces Radio 4319us 5464sa
1200 1300 USA, Armed Forces Radio 5765us 6350sb
1200 1300 USA, Armed Forces Radio 12213sb 12659sb
1200 1300 USA, Armed Forces Radio 15121sa 15851sa
1200 1300 USA, KFBH International 9370na
1200 1300 USA, KUHJ Los Angeles CA 7425sa 7520sa
1200 1300 USA, WHRL Nassau NY 9495sa 9850am
1200 1300 USA, WINB Red Lion PA 13070am
1200 1300 USA, WJIE Louisville KY 7630sa 12635am
1200 1300 USA, WRMJ Miami FL 9955am 15725sa
1200 1300 USA, WTVJ Philadelphia PA 9370na
1200 1300 USA, WCWR Nashville TN 7465sa 9980sa
1200 1300 USA, WCWR Nashville TN 13845nu 15852na
1200 1300 USA, WWRB Manchester TN 9320na 1217nc
1200 1300 USA, WWYF Okeechobee FL 5850sa 5950sa
1200 1300 USA, WKNL New York NY 6915sa
1200 1300 Zambian Radio 8965sa
1205 1315 Austria, Austria Radio Intl 6155sa 13730eu
1215 1235 Austria, Austria Radio Intl 6155sa 13730eu
1215 1230 India, TNTV 7560sa
1215 1250 Egypt, Radio Cairo 17670as
1215 1258 Vietnam, Voice of 9840va 12020va
1220 1300 Australia, Australian Broadcasting Commission 12660sa
1220 1300 460 Australia, ABC 21617sa 21695as
1220 1300 Sri Lanka, SLBC 6155sa 15745sa
1220 1308 Switzerland, Radio 9520sa 9497as 9745sa
1220 1308 Turkey, Voice of 15255sa 15355eu
1220 1308 UK, World Radio Inter 1775sa
1225 1324 Austria, Austria Radio Intl 6155sa 13730eu
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1224 1320 Austria, Austria Radio Intl 1775sa
1300 1234 Australia, Radio Australia 9600sa 9475as
1300 1234 Czech Republic, Radio Prague Intl 13580eu 281745sf
1300 1230 Australia, ABC 15400pa
1300 1230 Canada, Canada Radio Intl 9815eu
1300 1230 Ecuador, HCJB 201200sa
1300 1230 Egypt, Radio Cairo 17670as
1300 1230 Romania, Romania Radio Intl 11830sa 15105eu
1300 1400 Anguilla, Caribbean Beacon 11775sa
1300 1400 Australia, Australia Radio 6007pa 9475as
1300 1400 Canada, CBC Northern Service 9625sa
1300 1400 Canada, CFCF Toronto ON 6070sa
1300 1400 Canada, CFYP Calgary AB 6030da
1300 1400 Canada, CKZN St John's NF 6160da
1300 1400 Canada, CKXV Vancouver BC 6160da
1300 1400 Canada, CBC Radio Canada Intl 9515sa 13655am
1300 1400 China, China Radio Intl 17805as
1300 1400 China, China Radio Intl 11760sa 11980sa
1300 1400 Costa Rica, University Network 9725sa 11870am
1300 1400 Germany, Voice Broadcasting 6010sa
1300 1400 Germany, Deutsche Welle 9655sa 15400eu
1300 1400 Germany, Deutsche Welle 6160sa
1300 1400 Germany, German Radio Intl 6110sa 13810me
1300 1400 Jordan, Radio 11690sa
1300 1400 Turkey, Voice of 15255sa 15355eu
1300 1400 Libya, Voice of Africa 21617sf 21695as
1300 1400 Malaysia, Radio Malaysia 7295do
1300 1400 Malaysia, Radio Malaysia 6095sa
1300 1400 New Zealand, Radio NZ Intl 6095sa
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### Shortwave Guide

#### 1700 UTC - 1 PM EDT / 12 PM CDT / 10 AM PDT

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#### 1800 UTC - 2 PM EDT / 1 PM CDT / 11 AM PDT

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### 1900 UTC - 3 PM EDT / 2 PM CDT / 11 AM PDT

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**Shortwave Guide**

**MONITORING TIMES**

**Mon 2100 UTC - 5 PM EDT / 4 PM CDT / 2 PM PDT**

**July 2004**

**55**
Headnotes:
1. Reception of Deutsche Welle's 0400, 0500, 0600, 1600, 1900, 2000 and 2100 broadcasts have proven generally reliable for some North American listeners, so we list the programs available at these times. Consult the frequency section of the SWG for channels to try. A suitably enhanced antenna for your receiver will help in some cases.
2. Listings for US-based independent shortwave broadcasters is limited to general interest programming that departs from their largely primary formats of religious and political fare. Please be aware that the schedules of these stations can be quite fluid and subject to change with little or no advance notice.
3. BBCWS stream abbreviations: (am)=Americas; (eaf)=East Africa; (eas)=Europe/North Africa; (me)=Middle East; (waf)=West Africa. This month, during the hours that the (am) stream is unavailable, we've identified the streams and frequencies that may provide acceptable reception for some North American listeners. A suitably enhanced antenna will help.
4. The Voice of Turkey, Voice of Nigeria, Voice of Vietnam and Channel Africa program schedules are somewhat dated, but we have not been successful thus far in obtaining updates directly from these stations. Another request has been made and the old schedules remain here with the expectation that changes have been minimal. Apologies for any inconvenience.
5. If you find an error in the listings, please consider it your solemn responsibility to let us know! Corrective e-mails (and postal mail) and updated program schedules are most welcome! Special thanks to John Bobbs of Silver Spring, MD for providing the Voice of Greece's summer schedule.

0000 UTC/8pm E/5pm P - Page 45 Freqs

BBC WORLD SERVICE (am)
0000 D News; 0005 S top of the Pops (British music charts), M Everywoman, T/H Documentary, W Masterpiece (artistic ideas), F Assignment, A Sports (music charts), M The Ticket (global arts survey), M People in the Know (Chino's leading personalities), T Biz China, W China In Focus (the language), W Czech Science, H Czechs in History (or) Czechs Today (both monthly) [or] Spotlight (travelogue), F Economic Report, A Stepping Out (Prague nightlife).

WBCQ, Maine
5105 kHz.: 0000 M Firestation Theatre Hour (classic rock)
9330 kHz.: 0000 S Allan Weiner Worldwide.
WHR, Maine
7580 kHz. 0005 T A For the People (continued).
WHRI, Indiana
7315 kHz.: 0030 S Dixing with Cumbee.

0100 UTC/9pm E/6pm P - Page 45 Freqs

BBC WORLD SERVICE (am)
0100 D News; 0105 S/M Global View (weekly review), M Music From Ukraine, T/A Ukroire Today (music); 0110 M/M Washington Post, T -A Fly By Night (magazine); 0115 S/M Washington Post Review, T -A Ukroire Today (magazine); 0120 S/M Washington Post Review, M Music From Ukraine, T/A Ukroire Today (music); 0125 S/M Moscow Mailbag, T -A Moscow Calling, W Voice of Russia; 0130 S/M Moscow Mailbag, T -A Moscow Calling, W Voice of Russia; 0135 T -A Time Off (sports).
VOICE OF AMERICA (Special English) 0130 T News; 0140 T Agriculture Today, W/H Science Report, F Environment Report, A In the News; 0145 T Science in the News, W Explorations, H Making of a Nation, F American Mosaic; A American Stories.

WBCQ, Maine 5105 kHz.: 0100 M Tesla's Ear; 7415 kHz.: 0100 S Marion's ABC (vintage recordings), M Radio New York International (cont'd), T The Secular Bible Study, A Tasha Takes Control. 9330 kHz.: 0100 M Odin Lives (old Norse legends/music).

WHRA, Maine 7580 kHz.: 0105 S Turn Your Radio On (southern gospel music).

WHRH, Indiana 7315 kHz.: 0105 S Turn Your Radio On (southern gospel music).

0200 UTC/ 10pm E/7pm P - Page 46 Freqs


RADIO AUSTRALIA 0200 D News; 0205 S Feature, M -F In Touch.

BBC WORLD SERVICE (am) 0200 D Radio News; 0210 S Views Behind the News, M -F Analysis, T -S National News; 0215 T -S Viewpoint; 0230 S/A Viewpoint (special topic), M Taiwan Reports and music; 0230 M The Jazz Place or Top Tens, T -S National News; 0235 S Songs of V and Music, H People, F Culture Express, A Bookworm; 0240 S, Bucharer Along Changing World, F Guest at the Microphone, A The Arts; 0245 S, Bucharer Along Changing World, F Guest at the Microphone, A The Arts; 0250 S World of the Week, H Families and Young, F Things Bulgarian; 0255 F New Music Lounge, A Groove Zone; 0240 S Helsinki World (indigenous culture), T Sound Postcard; 0245 T Let's Learn Chinese, W Life Unusual (the offbeat), H Instant Noodles (the weird). [This schedule also airs at 0700 for western North America.]

VOICE OF RUSSIA 0200 D News; 0211 M Sunday Panorama, T/S News & Views; 0230 D News in Brief; 0232 S Songs from Russia, M/F Russian by Radio, T Kaleidoscope (Russian events), W/M Musical Portraits, H Moscow Today, A Eurovision.

RADIO BULGARIA 0200 D News; 0210 S/M The Mailbox B¢ (letters), M The Jazz Place or Top Tens, T/S News Bulletin, 0235 S World of Stamps, T/A Reports and music; 0250 S Cuban music.

RADIO KOREA INTERNATIONAL 0200 D News; 0210 S Worldwide Friendship (letters, DX News), M Korean Pop Interactive (requests), T/W News Commentary, 0215 T/A Seoul Calling (magazine), 0230 T Korea Today & Tomorrow (periodical relations), W Korean Kaleidoscope (society), H Wonderful Korea (travelogue), T Seoul Report.

RADIO NEW ZEALAND INTERNATIONAL 0200 D RNZ News; 0205 S Feature, M/F In Touch with New Zealand (music, interviews, variety), A Eureka! (science)*, 0230 A Health Matters [or Environment Matters*.


RADIO TAIWAN INTERNATIONAL 0200 D News; 0210 S News Talk, M Taiwan Economic Journal, T Kaleidoscope (society), W On the Job, H Trends, F Politics Today, A Bookworm; 0220 S Taipei Magazine, M Discover Taiwan, M Mailbag Time, A Bamboo Pipes or And the Gates (traditional music), H People, F Culture Express, A Stage, Screen & Studio; 0230 M Asia Pacific (from R. Australia); 0235 S Sound Postcard, H Wisdom.com, F New Music Lounge, A Groove Zone; 0240 S Helsinki World (indigenous culture), T Sound Postcard; 0245 T Let's Learn Chinese, W Life Unusual (the offbeat), H Instant Noodles (the weird). [This schedule also airs at 0700 for western North America.]

VOICE OF RUSSIA 0200 D News; 0211 M Sunday Panorama, T/S News & Views; 0230 D News in Brief; 0232 S Songs from Russia, M/F Russian by Radio, T Kaleidoscope (Russian events), W/M Musical Portraits, H Moscow Today, A Eurovision.

0200 M Squad 51.

0215 T Closeup (current issues).

0230 T/A Radio News Talk, M Taiwan Reports and music; 0235 D News Talk, M Taiwan Reports and music; 0240 T/A World Business Review, F Australian Mosaic; A Background Briefing (documentary); 0250 S/A Analysis, H From Our Own Correspondent.

0300 UTC/ 11pm E/8pm P - Page 46 Freqs

BBC WORLD SERVICE (am) 0300 D News; 0305 S Current Affairs, 0305 S/RPM (documentaries)*, A Home Grown (NZ music)*, 0308 M/F Dateline Pacific; 0330 M New Music Releases, T Mailbox (letters & DX news) or RNZ Talk (station info), W Tradewinds (Pacific commerce), H The World in Sport, F Pictorial Correspondent, A Musical Chairs (artist spotlight)*. [May be preempted by live sport]

RADIO PRAGUE 0300 D News; 0305 S Magazine, M Mailbox, T/A Current Affairs; 0310 S Letter from Prague, M ABC of Czech (the language), W Czech Science, H Witness (eyewitness to history), A The Arts; 0315 S/W One on One (interview), M Encore [or Magic Carpet (both monthly)] or Czech Books (biweekly), T Talking Point (Czech issues), H Czechs in History [or Czechs Today (both monthly)] or Spotlight (travelogue), F Economic Report, A Stepping Out (Prague nightlife).

RADIO TAIWAN INTERNATIONAL 0300 D News; 0310 S News Talk, M Taiwan Economic Journal, T Kaleidoscope (society), W On the Job, H Trends, F Politics Today, A Bookworm; 0320 S Taipei Magazine, M Discover Taiwan, M Mailbag Time, A Bamboo Pipes or And the Gates (traditional music), H People, F Culture Express, A Stage, Screen & Studio; 0330 M Asia Pacific (from R. Australia); 0335 S Sound Postcard, H Wisdom.com, F New Music Lounge, A Groove Zone; 0340 S Helsinki World (indigenous culture), T Sound Postcard; 0345 T Let's Learn Chinese, W Life Unusual (the offbeat), H Instant Noodles (the weird). [This schedule also airs at 0700 for western North America.]

RADIO UKRAINE INTERNATIONAL 0300 D News; 0310 S Ukrainian Diary (weekly reporting), M Ukrainian Culture, A Ukraine Today (magazine); 0315 S The Whole World on the Radio Dial (DX program), 0330 S Hello From Kiev (listener letters/music), M Roots (culture & education), 0345 T/A Closeup (current issues).
Shortwave Guide

WRMI, Florida
7385 kHz.: 0500 S/M World Radio Network (relay).
WWCR, Tennessee
5070 kHz.: 0530 M-F Natural Health Clinic.

0600 UTC/2am E/11pm P - Page 48 Freqs

BBC WORLD SERVICE (eu) - 9410, 12095
0600 D The World Today; 0632 S The Interview (trends), A World Football.

BBC WORLD SERVICE (waf) - 7120

CHANNEL AFRICA, South Africa
0600 S Network Africa (week in review), M-F Dateline Africa (news magazine), A Tam Tam Express (governance in Africa).

DEUTSCHE WELLE
0600 D News; 0655 S Inside Europe, M Mailbag, T-A Newslink Africa; 0630 T Insight (international issues), W World in Progress (development), H Maggie Talks Business, F Living Planet (environment), A Spectrum (sci-techn.), 0645 T Business German.

AUSTRALIA
0600 S/A Grandstand (live sports action) on 9660, 12080, 15240, 17750 kHz.

RAVELY HABANA CUBA
0600 D News; 0615 S Weekend Japanology (Japanese life), M-F Songs for Everyone, W Japan Music Travelogue, H The Chat Room (interviews).

RAVELY JAPAN - NHK WORLD
0600 D News; 0615 S The Buzz (sci-techn.), A Verbatim (oral histories); 0610 M-F Regional Sports Report; 0620 M Ockham's Razor (science opinion), T In Conversation (about science), W Lingua Franca (about language), H The Ark (religious history), F Inside Out (Pacific views); 0630 S Hit Mix (pop/rock), A In Conversation; 0635 M Hit Mix, T Music Deli (diverse world/talk), W Jazz Notes, H Australian Country Style.

RAVELY AUSTRALIA
0600 D News; 0605 S The Buzz (sci-techn.), A Verbatim (oral histories); 0610 M-F Regional Sports Report; 0620 M Ockham's Razor (science opinion), T In Conversation (about science), W Lingua Franca (about language), H The Ark (religious history), F Inside Out (Pacific views); 0630 S Hit Mix (pop/rock), A In Conversation; 0635 M Hit Mix, T Music Deli (diverse world/talk), W Jazz Notes, H Australian Country Style.

RAVELY NEW ZEALAND INTERNATIONAL
1200 S Moody Presents, M-F Morning in the Mountains, A Hour of Decision, F Pacific Correspondent.

RAVELY CANADA INTERNATIONAL
1200 M-F The Current (current affairs-joned in progress).

RAVELY KOREA INTERNATIONAL
1200 D News; 1205 M-F Caribean Business; 1210 M-F Caribean Morning Report 2nd Edition; 1220 M-F Caribean Magazine; 1230 M-F Newsour (cont'd.),

HPCB ECUADOR
1200 S Moody Presents, M-F Morning in the Mountains, A Hour of Decision, 1215 M-F Proclaim; 1230 S The Living Word, M-F Renewing Your Mind, A DX Partyline.

RAVELY AUSTRALIA
1245 M Korea Today & Tomorrow (peninsula's radio); 1250 M Japan Musicscope, T Basic World; 1115 M Japan Musicscope, T Japan Musicscope, H The World in Progress (development issues), T EuroQuest (Europe in context), W Weekly Documentary, H Dutch Horizons, F The Good Life (development issues), A Amsterdam Forum (conversations).

RAVELY SWEDEN
1210 S In Touch with Stockholm (listener contact-1st/ Sounds Nordic (rock music exc. 1st), M-F Sixty Degrees North (regional report), A Network Europe (regional report)) on 9660, 12080, 15240, 17750 kHz.

RAVELY NEW ZEALAND INTERNATIONAL
1100 D News; 1105 S Forces Programme (for NZ personnel serving in PNG & E. Timor), 1108 M-F Dateline Pacific; 1130 M New Music Releases, T Mailbox (letters & DX news) or RNZI Talk (station info), W Tradewinds (Pacific commerce), H The World in Sport, F Pacific Correspondent.

RAVELY SWEDEN
1130 S In Touch with Stockholm (listener contact-1st/ Sounds Nordic (rock music exc. 1st), M-F Sixty Degrees North (regional report), A Network Europe (regional report)).
### Shortwave Guide

**European magazine-1st week/Sweden Today (2nd)/** Spectrum (arts magazine-3rd)/Studio 49 (topical discussion-4th); 1245 M Sports Scan, T Close Up (profiles of Sweden-1st), H Nordic Lights (1st)/Green Scan (ecology-2nd)/Heart Beat (health-3rd)/The S-Files (things Swedish-4th), F Review of the Newsweek.

| MONITORING TIMES | 61 |

| 1300 UTC/9am E/6am P - Page 51 Freqs |  |

**BBC WORLD SERVICE** (am)  
1300 D News; 1306 S From Our Own Correspondent (background), M-F Off the Shelf (book readings), A Write On (letters).

**CHINA RADIO INTERNATIONAL**  
1300 D News & Reports; 1310 S Report on Developing Countries; 1515 A Cutting Edge (sci/tech); 1305 S CRI Roundup; 1330 S In the Spotlight (cultural magazine), M People in the Know (China's leading personalities), T Biz China, W China Horizons (China outside Beijing), H Voices from Other Lands, F Life in China, A Listeners' Garden.

**RADIO AUSTRALIA**  
1300 D News; 1305 S Encounter (religion in Australia), M-F The Planet (diverse music from around the world), A The Music Show (cultural magazine), T Law Report, W Australia; 1555 S/A Listener Letters.

**RADIO NEW ZEALAND INTERNATIONAL**  
1500 S/A RNZ News, M-F Pacific Regional News; 1305 S Tagoto o te Moana, A New Music Releases; 1308 M-F Dateline Pacific; 1330 M Mailbox (letters & DX news) or RNZI Talk (station info), T Tradewinds (Pacific commerce), W The World in Sport, H Pacific Correspondent, F Sports Story.

**WHRA, Maine**  
17560 kHz.; 1330 S World Harvest Country Style.

**WHRJ, Indiana**  
15105 kHz.; 1330 S World Harvest Country Style.

**WRMI, Florida**  
15725 kHz.; 1200 A World Radio Network (relay).

**WMMC, Tennessee**  
15825 kHz.; 1300 M-F WorldWide Country Radio.

| 1500 UTC/11am E/8am P - Page 52 Freqs |  |

**BBC WORLD SERVICE** (am)  
1500 D News; 1506 S Documentary, M-F Health Matters, T Go Digital, W Discovery (science), H One Planet (ecology), F Science in Action, A SportsWorld (live action from 1406); 1532 S In Praise of God (worship service), A Quiz [or] panel game, T Music Review, W/F Westway (drama serial), H The Word (writers & writing) [exc. 24th, World Book Club (discussion)]; 1545 W Heart & Soul (beliefs & values), F What's the Problem? (advice).

**RADIO AUSTRIA INTERNATIONAL**  
1500 D News & Reports; 1510 S Report on Developing Countries; 1515 A Cutting Edge (sci/tech); 1525 S CRI Roundup; 1530 S In the Spotlight (cultural magazine), M People in the Know (China's leading personalities), T Biz China, W China Horizons (China outside Beijing), H Voices from Other Lands, F Life in China, A Listeners' Garden.

**RADIO AUSTRALIA INTERNATIONAL**  

**RADIO AUSTRIA INTERNATIONAL**  
1505 S/A Insight Central Europe; 1515 M-F Report from Austria; 1525 S/A Listener Letters; 1535 S/A Insight Central Europe; 1545 M-F Report from Austria; 1555 S/A Listener Letters.

**RADIO CANADA INTERNATIONAL**  
1500 D News; 1505 S The Sunday Edition (cont'd.), A Quirks & Quarks (science).

**RADIO JAPAN - NHK WORLD**  
1720 D News; 1730 S Music Time in Japan, A Hello from Tokyo (listener contact); 1715 M-F 4 Minutes (feature magazine).

**CHANNEL AFRICA, South Africa**  
1700 S Network Africa (week in review), M-F Dateline Africa (news magazine), A Tam Tom Express (governance in Africa).

**1600 UTC/12pm E/9am P - Page 52 Freqs**

**BBC WORLD SERVICE** (am)  
1600 S/A News, M-F Europe Today; 1606 S Sunday Sportsworld, A Sportsworld (live action from 1406).

**DEUTSCHE WELLE**  
1600 D News; 1605 S Mailbag, M-F Newlink Asia, A Hard to Beat (sport); 1615 A German by Radio; 1630 M Insight (international issues), T World in Progress (development), W Money To ks (business), H Living Planet (environment), F Asia This Week, A Cool! (youth culture); 1645 M Europe in Capitals (city profile).

**RADIO AUSTRALIA**  
1600 D News; 1605 S Books & Writing, M-F Bush Telegraph (rural/outback Australia), A Hindsight (social history); 1635 S Book Talk.

**VOICE OF AMERICA, Africa Service**  
1600 S/A Nightline Africa (weekend newsmagazine), M-F News & Reports; 1615 M-F Focus (a topic in-depth); 1625 M-F Sports, 1630 M-F Africa World Tonight.

**VOICE OF GREECE**  
1600 A Hellenes Around the World (Greek popular & traditional music, letters).

**WBCQ, Maine**  
17495 kHz.; 1600 A Alan Wainner Worldwide.

**WHRI, Indiana**  
15105 kHz.; 1600 A Sports Spectrum Live

**WRMI, Florida**  
15725 kHz.; 1403 S/A World Radio Network (relay).

**WWCR, Tennessee**  

| 1700 UTC/1pm E/10am P - Page 53 Freqs |  |

**BBC World Service (BBC)** - 21470  
1700 D News; 1706 D Focus on Africa; 1745 S-H Sports Roundup, F Football Extra.

**BBC World Service (me)** - 12095, 15565  
1700 D World Briefing; 1720 D British News; 1732 S Instant Guide (backrounders), M-F World Business Report, A The Interview (trend); 1745 S-H Sports Roundup, F Football Extra.

**C-CHANNEL, South Africa**  
1700 S Network Africa (week in review), M-F Dateline Africa (news magazine), A Tam Tom Express (governance in Africa).

**RADIO AUSTRALIA**  
1700 D News; 1705 S Sound Quality (innovative music), M-F Australia Talks Back (phone-in), A The Spirit of Things (spiritual matters).

**RADIO JAPAN - NHK WORLD**  
1700 D News; 1710 S Pop Joins the World, M-F Songs for Everyone, A Hello from Tokyo (listener contact); 1715 M-F 4 Minutes (feature magazine).

**ALL INDIA RADIO**  

**WBCQ, Maine**  
17495 kHz.; 1700 A Zombo's Mondo Record Party.

\[ July 2004 \]
1800 UTC/ 2pm E/11am P - Page 53 Freqs

1800 D News; 1910 D Commentary; 1915 W Instrumental Music—Old Masters, H/ T Hindustani Classical Vocal Music; 1830 S Sports Roundup (1st wk)/Feature (2nd)/Film Story (3rd)/Discussion (4th), M Faithfully Yours (letters), T Cultural Talk, W Book Review (1st)/Window on Science (2nd)/Times & Lives (biography-3rd), H General Talk, F Focus (magazine-1st)/Horizon (literature-2nd/4th)/Music (3rd), A For Youth (1st)/Indian Classics (books-2nd)/From the Archives (3rd)/Quiz Time (4th); 1840 M DXers Corner (2nd/4th), T Film Songs of Yesteryears, W Hits from Films, H Light Karnatak Music, F Light Instrumental Music; 1850 M Film Songs, F Light Music.

BBC WORLD SERVICE (afl) - 21470
1800 S News, M/F World Briefing; 1805 S From Our Own Correspondent, A The Ticket (global arts revue), 1820 M/British News; 1832 S Global Business (trends), M/F Fast Track (African sport), T Postmark Africa (answers), W Africa Live (phone-in), H Arbeat.

BBC WORLD SERVICE (me) - 12095
1800 D News; 1806 S Pick of the World (BBC's best), M/W Documentaries, T Masterpiece (cultural ideas), H Assignment (one topic), F Sports International (magazine); 1832 M Music Feature, T White Label (new music releases), W Charlie Gillett (world music), H The Music Biz, F John Peel (electic music); 1845 S Write On (letters).

RADIO AUSTRALIA
1800 D News; 1805 S Pacific Beat (Pacific islands magazine), F Pacific Review, A Best of 'Late Night Live' (interviews); 1815 F The Interview (trends); 1920 M/F Film Songs, W Light Music, H Classical Indian Vocal Music, A Regional Indian Devotional Music.

VOICE OF NIGERIA
1900 S Documentary, A Vox Humana (culture); 1930 S News & Reports, M/F World Business Report, A Insight (commentary).

VOICE OF AMERICA, Africa Service
1900 S News & Reports, M/F News, A Hip Hop Connections (music); 1906 M/F Border Crossings (music—exc. T Housecall (medical info)); 1923 S Sports; 1930 S Music Time in Africa (port 2), M/F Folk Songs, W Light Music, H Classical Indian Music, A Appalachian Country, H Radio Newsreel, H Panorama of Progress, F Focus (magazine-1st wk)/Horizon (literature-2nd/4th)/Indian Music (3rd), For Youth (1st)/Indian Classics (books-2nd)/From the Archives (3rd)/Quiz Time (4th); 2130 M DXers Corner (2nd/4th), T/F Calling the Falklands.

DEUTSCHE WELLE
1900 News; 1905 S Hard to Beat (sport), M/F Newslink Africa, A Religion & Society; 1915 S Inspired Minds, A Germany by Radio; 1930 S Views in Germany of [Melody Time, A World of Music, T Arts on the Air, W Living in Germany, H Cool (youth culture), F Focus on Folk, A Africa This Week; 1945 W Europe in Capitols.

RADIO NETHERLANDS
1900 S Documentary, A Vox Humana (culture); 1930 S News & Reports, M/F World Business Report, A Insight (international beliefs & values), F What's the Problem? (advice).

RADIO AUSTRALIA
1900 S Documentary, A Vox Humana (culture); 1930 S News & Reports, M/F World Business Report, A Insight (international beliefs & values), F What's the Problem? (advice).

WBCQ, Maine
17495 kHz.: 1800 A Radio Timtron Worldwide.

WHRI, Indiana
9495 kHz.: 1800 A World Harvest Country Style; 1805 S Pat Boone (variety), M/F Chuck Harder (populist political phone-in).

WRJ, Florida
15725 kHz.: 1800 S/A World Radio Network (relay).

WWCR, Tennessee
12160 kHz.: 1800 M/C News, A Real Talk Radio, 1830 M/F Stairway to Health.

1900 UTC/ 3pm E/12pm P - Page 54 Freqs

ALL INDIA RADIO

BBC WORLD SERVICE (afl) - 12095
1900 D News; 1901 A in Concert; 1906 S Top of the Pops (British music charts), M-F Focus on Africa; 1932 M/F World Business Report; 1945 MTHF Analysis, W From Our Own Correspondent.

BBC WORLD SERVICE (eaf) - 12095
1900 D News; 1901 A in Concert; 1906 S Top of the Pops (British music charts), M-F Focus on Africa; 1932 M-F World Business Report; 1945 MTHF Analysis, W From Our Own Correspondent.

DEUTSCHE WELLE
1900 News; 1905 S Hard to Beat (sport), M-F Newslink Africa, A Religion & Society; 1915 S Inspired Minds, A Germany by Radio; 1930 S Views in Germany of [Melody Time, A World of Music, T Arts on the Air, W Living in Germany, H Cool (youth culture), F Focus on Folk, A Africa This Week; 1945 W Europe in Capitols.

RADIO NETHERLANDS
1900 S Documentary, A Vox Humana (culture); 1930 S News & Reports, M/F World Business Report, A Insight (international beliefs & values), F What's the Problem? (advice).

RADIO AUSTRALIA
1900 S Documentary, A Vox Humana (culture); 1930 S News & Reports, M/F World Business Report, A Insight (international beliefs & values), F What's the Problem? (advice).

WBCQ, Maine
7415 kHz.: 1900 A The Local Roundup. 17495 kHz.: 2030 A World of Radio.

WHRI, Tennessee
5745 kHz.: 2000 S World Harvest Country Style.

WRJ, Florida
15725 kHz.: 2000 S/A World Radio Network (relay).

WWCR, Tennessee
15825 kHz.: 2000 H DX Pantyline; 2030 H World of Radio, F Ask WWCR.


2100 UTC/ 5pm E/2pm P - Page 55 Freqs

ALL INDIA RADIO
2100 D News; 2105 D Commentary; 2111 S Regional Film Songs, M/A Classical Indian Vocal Music, T Karnatak Vocal Music, W/H Instrumental Music, F Orchestral Music, W 2120 S Sports Roundup (1st wk)/Feature (2nd)/Film Story (3rd)/Discussion (4th), M Faithfully Yours (letters), T Cultural Talk, W Radio Newsrev, H Panorama of Progress, F Focus (magazine-1st wk)/Horizon (literature-2nd/4th)/Indian Music (3rd), For Youth (1st)/Indian Classics (books-2nd)/From the Archives (3rd)/Quiz Time (4th); 2130 M DXers Corner (2nd/4th), T/F Calling the Falklands.

DEUTSCHE WELLE
2100 News; 2105 S Hard to Beat (sport), M-F Newslink Africa, A Religion & Society; 2115 S Inspired Minds, A Germany by Radio; 2130 S Hits in Europe; 2030 M Insight (international issues), T World in Progress (development), W Money Talks (business), H Living Planet (environment), F Spectrum (sci-tech); 2045 M Business Germany.
Shortwave Guide

VOICE OF AMERICA, Africa Service
ALL INDIA RADIO
RADIO AUSTRALIA
RADIO CANADA INTERNATIONAL
RADIO CANADA INTERNATIONAL
RADIO JAPAN - NHK WORLD
RADIO AUSTRALIA
CHINA RADIO INTERNATIONAL
RADIO ROMANIA INTERNATIONAL

ALL INDIA RADIO
RADIO CANADA INTERNATIONAL
RADIO CANADA INTERNATIONAL
RADIO JAPAN - NHK WORLD
RADIO AUSTRALIA

All India Radio

RADIO JAPAN - NHK WORLD
RADIO AUSTRALIA

Radio Free Euphoria/Radio Three


2200 S/ A The World This Weekend, M - F The World of RADIO CANADA INTERNATIONAL
2200 S/ A The World This Weekend, M - F The World of

RADIO JAPAN - NHK WORLD
RADIO AUSTRALIA

2145 W Europe in Capitals.

2200 D News; 2210 D Press Review; 2215 S Tunes Spanning Centuries, M Last Week, T Live From Turkey, W Review of the Foreign Media, H Big Powers & the Aegean Problem, F Archaeological Settlements in Turkey, A: 2220 M Hues & Colors of Anatolia, W Letterbox, A: The Stream of Love or DX Calling, 2225 S/F Musical Memories, H In the Wake of a Contest; 2230 M/A Music; 2235 S Turks in the Mirror of Centuries, M From Past to Present; W Turkey's Off the Beaten Track Sites, H The Culture Parade, F The Travel Anitology of Anatolia, A: Turkish Arts.

WBCQ, Maine
5105 kHz.: 2200 M/F Radio Caroline.

WHRA, Maine
17650 kHz.: 2100 F DXing with Cumbre.

WHRI, Indiana
9495 kHz.: 2130 A DXing with Cumbre.
5745 kHz.: 2100 S DXing with Cumbre; 2105 M/H For the People (polkist political phone-in).

WRMI, Florida
15725 kHz.: 2100 W Wosveson (WVR's radio hobbyist program), A: A World Radio Network (relay), 2130 S Voice of the NASB (consortium of US private international broadcasters).

2200 UTC/6pm E/5pm P - Page 56 Freqs

BBC WORLD SERVICE (am)
2300 D News; 2306 S Documentary, M/F Outlook (magazine), A: A Pick of the World (BBC's best). 2332 S Quiz or panel game; 2345 M/F Off the Shelf (book readings), A: A Write On (letters).

CHINA RADIO INTERNATIONAL
2300 D News & Reports; 2310 A Report on Developing Countries; 2315 F Cutting Edge (sci/tech); 2320 A CH Roundup; 2330 S People in the Know (China's leading personalities), M Big China, T China Horizon (China outside Beijing), W Voices from Other Lands, H Life in China, F Listeners' Garden, A: A in the Spotlight (cultural magazine).

RADIO AUSTRALIA

RADIO AUSTRIA INTERNATIONAL
2305 S/A Insight Central Europe; 2315 M/F Report from Austria; 2335 S/A Insight Central Europe; 2345 M/F Report from Austria; 2345 S/A Listener Letters.

RADIO BULGARIA
2320 D News; 2320 S/F Folk Studio (Bulgarian folk music), M/F Events and Developments, A: A Views Behind the News; 2320 A Reports, T/A: A Tourmez for Music; 2330 F/T: Keyboard Bulgaria (Bulgaria and things Bulgarian); 2340 A Radio Bulgaria Calling (for radio hobbyists), S: Bulgarian Plaza (cultural magazine) or Walks and Talks (interesting places), M: A Answering Your Letters, T: A Magazine Economy, W: A The Way We Live, H: A History Club, F: Arts and Artists.

RADIO CANADA INTERNATIONAL
2300 D CBC News, 2305 A Quirks & Quarks (science), S: Global Village (world music), M/F As It Happens (interviews with newsmakers) (begun at 2230), 2330 W Dispatches (world events in Canadian perspective).

RADIO ROMANIA INTERNATIONAL

WBCQ, Maine
5105 kHz.: 2200 S World of Radio.
7415 kHz.: 2200 M Radio Weather, W World of Radio, H The Last Roundup (cont'd), F: Pob Sungenis Project.
7580 kHz.: 2300 A The Real Amateur Radio Show, S: Best of Complex Variables Studio.
5070 kHz.: 2345 A Ask WWCR.
5745 kHz.: 2330 A World Harvest Country Style.

WBCQ, Maine
5105 kHz.: 2200 M Best of Complex Variables Studio.

WHRI, Maine
5745 kHz.: 2205 A Turn Your Radio On (southern gospel music).

2300 UTC/7pm E/4pm P - Page 56 Freqs

BBC WORLD SERVICE (am)
2300 D News; 2306 S Documentary, M/F Outlook (magazine), A: A Pick of the World (BBC's best). 2332 S Quiz or panel game; 2345 M/F Off the Shelf (book readings), A: A Write On (letters).

CHINA RADIO INTERNATIONAL
2300 D News & Reports; 2310 A Report on Developing Countries; 2315 F Cutting Edge (sci/tech); 2320 A CH Roundup; 2330 S People in the Know (China's leading personalities), M Big China, T China Horizon (China outside Beijing), W Voices from Other Lands, H Life in China, F Listeners’ Garden, A: A in the Spotlight (cultural magazine).

RADIO AUSTRALIA

RADIO AUSTRIA INTERNATIONAL
2305 S/A Insight Central Europe; 2315 M/F Report from Austria; 2335 S/A Insight Central Europe; 2345 M/F Report from Austria; 2345 S/A Listener Letters.

RADIO BULGARIA
2320 D News; 2320 S/F Folk Studio (Bulgarian folk music), M/F Events and Developments, A: A Views Behind the News; 2320 A Reports, T/A: A Tourmez for Music; 2330 F/T: Keyboard Bulgaria (Bulgaria and things Bulgarian); 2340 A Radio Bulgaria Calling (for radio hobbyists), S: Bulgarian Plaza (cultural magazine) or Walks and Talks (interesting places), M: A Answering Your Letters, T: A Magazine Economy, W: A The Way We Live, H: A History Club, F: Arts and Artists.

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

John Babbis, Silver Spring, MD; Rich D’Angelo, NASWA Flash Sheet; Bob Fraser, Belfast, ME; DX Listening Digest, Anker Petersen, DX Window; ODXA/DX Ontario; Robert E. Thomas, Bridgeport, CT; Prime Time SW, Larry Van Horn N5FPW, MT Asst. Editor; Loyd Van Horn W4LHV, WRGC Sylva, NC; BCL News; Cumbe DX; Hard Core DX; NASWA Journal;
**Airshow Frequency Update**

Each year as we move well into the airshow season, Milcom reporters nationwide send in changes to the original frequency list we publish each March in Monitoring Times. Normally this consists of only one or two frequencies at the most. This year we have noted with interest several new frequencies being used by the famed Blue Angels flight demonstration team and a new VHF frequency for the Thunderbirds. We would appreciate monitor reports from air shows in other portions of the country to aid us in determining if these new frequencies are in widespread use.

<table>
<thead>
<tr>
<th>US Army Black Dagger Parachute Team</th>
<th>138.650 237.300</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Air Force 509BW B-2 Demo</td>
<td>388.850</td>
</tr>
<tr>
<td>US Air Force AETC T-6 Texan East Coast Team</td>
<td>283.700</td>
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<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
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<tbody>
<tr>
<td>254.500</td>
<td><em>New</em> (Observed at Fort Lauderdale, thanks Robert Wyman)</td>
</tr>
<tr>
<td>273.300</td>
<td><em>New</em> Fat Albert/Blues taxi out (Observed at Dobbs JARB, thanks to Mike Riffe)</td>
</tr>
<tr>
<td>275.350</td>
<td>Delta/Diamond formations</td>
</tr>
<tr>
<td>299.650</td>
<td><em>New</em>. Diamond, used by Boss for coordination with solos (Observed at Dobbs JARB, thanks to Mike Riffe)</td>
</tr>
<tr>
<td>345.900</td>
<td>Solo aircraft</td>
</tr>
<tr>
<td>381.00</td>
<td>Heard brief comms at end of performance (Observed at Dobbs JARB, thanks to Mike Riffe)</td>
</tr>
</tbody>
</table>

**Canadian Snowbirds**

272.100 Air-to-air

**Civilian Performers**

122.750 Patty Wagstaff  
122.775 Red Bull Team  
122.950 Sean Tucker  
123.150 Ian Groom (SU-31)  
123.475 Patty Wagstaff  
123.475 Red Eagles

**1-3 Aviation Regiment**

The 1st Battalion, 3rd Aviation Regiment from Hunter Army Airfield (AAF), Georgia, upgraded its helicopter fleet from 24 AH-64A to 24 AH-64D/28 Longbow helicopters in 2001. Recently an anonymous contributor passed along the frequency plan used by these Army Aviators. If you live near Hunter AAF, you might want to dedicate some memory space in your scanner to monitor the 1-3 AVN.

**VHF/UHF Radio**

<table>
<thead>
<tr>
<th>Chnl</th>
<th>Frequency</th>
<th>Usage</th>
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</thead>
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<td>12</td>
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</table>

**Helmet Training Squadron 8/18**

The United States Navy's Helmet Training Squadron Eight (HT-8), along with its sister squadron, HT-18, provides advanced helicopter flight instruction to all Navy, US Marine Corps, and US Coast Guard helicopter flight students as well as international students from several allied nations. Students who successfully complete the program earn the right to wear the coveted "Wings of Gold."

HT-8, the Navy's oldest helicopter training squadron, is based aboard Naval Air Station Whiting Field, Milton, Florida. Spencer Field is HT-8's primary helicopter training site. HT-8's mission is to provide primary and advanced helicopter training for: US Navy, US Marine Corps, Coast Guard, and Allied student naval aviators.

**MT Milcom**

regular Mike Riffe recently came across the frequency plan below for HT-8/18.

<table>
<thead>
<tr>
<th>Chnl Frequency</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 273.575</td>
<td>Whiting Field South Automatic Terminal Information Service (ATIS)</td>
</tr>
<tr>
<td>02 355.600</td>
<td>Whiting Field South Clearance Delivery</td>
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<tr>
<td>03 346.800</td>
<td>Whiting Field South Ground Control</td>
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<td>04 348.675</td>
<td>HT-8 (Eight Ball)</td>
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<tr>
<td>05 303.600</td>
<td>HT-18 (Factory Hand)</td>
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<tr>
<td>06 255.100</td>
<td>Navy Outlying Field (NOLF) Pace</td>
</tr>
<tr>
<td>07 250.000</td>
<td>Navy Outlying Field (NOLF) San Diego</td>
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<tr>
<td>08 358.800</td>
<td>Navy Outlying Field (NOLF) Santa Rosa</td>
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<td>09 361.100</td>
<td>Navy Outlying Field (NOLF) Harmon</td>
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<tr>
<td>10 237.900</td>
<td>Navy Outlying Field (NOLF) Harford</td>
</tr>
<tr>
<td>11 251.300</td>
<td>Navy Outlying Field (NOLF) Point Mugu</td>
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</table>
Site 8
Western Area Common
12 308.200
13 384.300 Green/Red Route
14 262.700 Black/Orange Route
15 377.100 Purple Route
16 280.350 HLT-IX-314
17 380.400 Primary Formation Common
18 328.200 Secondary Formation Common
19 385.400 Pensacola Approach Control
20 389.100 Eastern Airway Common/Elgin Monitor

**Monitoring Hawg Smoke**

Since we have already featured a US Army and US Navy unit, let’s take a look at another branch of service, the US Air Force. Hawg Smoke is the bi-annual bombing and tactical gunnery competition of the A-10 Thunderbolt II. Squadrions from across the country and around the globe, as far as we can see. As always, thanks, Jack.

Several reports indicate that Hawg Smoke 2004 was pretty much a wash out. So we move on to another month. Continuing where we left off in the May column, here are some more spectrum holes from the MT Milcom database.

**Raymond Calling**

Recently a member of one of the military newsgroups I belong to was asking for a current list of Raymond callsigns. The Raymond callsigns have been used for years to identify wing/group command posts, or groups with the new-defunct Tactical Air Command and currently with selected Air Combat Command bases.

The table below is current as of publication and is based on actual monitoring and the latest Department of Defense IFR Supplement publications.

**Spectrum Holes**

Continuing where we left off in the May 2004 column, here are some more spectrum holes from the MT Milcom database.
Exploring Your Aero World

Welcome once again to the aircraft column, your path to more interesting aircraft communications listening.

Part of the fun of this hobby is simply listening to certain known frequencies on a regular basis. Other enjoyable parts, at least for me, are exploring around just to see what I can receive on various frequencies and sometimes at the furthest distances I can. From time to time, I follow a plane’s transmissions from before take-off, through as many hand-offs as I can, until it simply can no longer be received. I am thrilled when I catch a pilot reading back a hand-off to an adjacent ARTCC in the 175-plus mile range.

At other times, it’s fun spending part of a day listening to law enforcement and news media aircraft or transoceanic airliners on HF flying to and from the coast. It’s all out there just waiting to be tuned in. In this issue, we will explore yet other areas of listening.

**An Interesting Search Range**

Mentioned last time was the allocations list, National Civilian Aeronautical Band Assignments by Larry Van Horn, Assistant Editor, Monitoring Times at: http://www.monitoringtimes/html/mtcivair.html. From that list, you can see that the 121.6 – 123.575 MHz range is not to be overlooked. Some rather interesting things can be found here, maybe not every day, but with persistent listening. In fact, you can program in a search, scanner model permitting, from 121.5 (the emergency and distress channel) to 123.575 and see what pops up over time.

Here, you may find law enforcement and news helicopters, fire fighting aircraft, fish and game, environmental monitoring, air-to-air, flight test, gliders, aircraft with jumpers, hot air balloons, airport ground control, air show, aerobatics, flight schools, Enroute Flight Advisory Service (EFAS / “Flight Watch”… 122.0), search and rescue, medical transport flights, and Flight Service Stations (The Aeronautical Information Manual - AIM describes FSS service as: “… pilot briefings, en route communications and VFR search and rescue services, assist lost aircraft and aircraft in emergency situations, relay ATC clearances, originate Notices to Airmen, broadcast aviation weather…” and more).

**Unicom Frequencies**

Also included in this frequency range are the more routine Unicom frequencies. Only a small portion of airports have control towers. The remaining smaller airports do not have towers and are called “uncontrolled airports.”

The pilots landing and departing uncontrolled airports self-announce their intentions and positions on a Unicom frequency assigned to the particular airport so that other aircraft in the area can be informed for obvious safety reasons.

Airports with a Unicom frequency (122.700, 122.725, 122.800, 122.975, 123.000, 123.050, and 123.075 MHz) will have a non-government Unicom operator available at least part of the time. The operators can offer information like wind direction and speed, altimeter settings, runways conditions, fuel availability, parking, lodging, etc., but have no control over air traffic.

It is not uncommon to hear pilots coordinating their flight activities with each other on the frequency. Many of the transmissions you hear from uncontrolled airports don’t include the ground side or they may be infrequent or otherwise hard to receive at any distance.

Note that airports with an operating tower (“controlled airports”) also have a Unicom frequency – 122.95. It is not used for pilot self-announcements, however, even if the tower communications equipment should fail. And that leads to the subject of CTAF.

**What is a CTAF?**

The Common Traffic Advisory Frequency (CTAF) is the designated, published frequency where pilots announce their intentions and positions when arriving at and departing from an uncontrolled airport. It is common for the Unicom frequency, mentioned above, to perform the CTAF function at non-tower airports. It is common for the tower frequency to perform this function during hours when the tower is closed or at other times when the tower has an unscheduled closure – the airport being “uncontrolled” at those times. The CTAF can also be a Flight Service Station frequency or a Multicom frequency.


A non-tower airport with an assigned Unicom frequency of 122.8, for example, would be listed as, “CTAF/UNICOM: 122.8.” Riverside Municipal Airport (CA), as another example, has a part-time tower with a frequency of 121.0. It is listed as, “CTAF: 121.0. RIVERSIDE TOWER: 121.0 [0700-2000].” If an airport has no tower, Unicom, or FSS, the frequency of 122.9 is used and will be listed as “CTAF: 122.9.”

◆ ATIS / ASOS / AWOS / A What?

Airport listening and FAA documents are loaded with acronyms and these three are definitely worth knowing.

ATIS

Automatic Terminal Information Service (ATIS) is a recorded, repeating message at selected airports and air bases. The transmitted message gives the time of the recording, many elements of the weather such as wind direction and velocity, “altimeter setting” (barometer reading), which runways are in use, and other types of information and notices, as needed.

The information is for the use of arriving and departing aircraft; offering it by way of a repeating message spares air traffic controllers from having to convey the information over and over while also relieving frequency congestion. Additionally, it allows the pilot to copy the information at times when cockpit duties may be less pressing.

Typically, at the end of the message before it repeats, there will be something like, “Advises initial contact that you have information Golf.” This lets the controller know at the outset that the pilot has the ATIS information.

The last word, “Golf,” represents the letter G using the phonetic alphabet. (For info on the phonetic alphabet, see: http://www.faa.gov/airpubs/AIM/Chap4/TBL422.GIF). When the message is updated, the next version will most likely be “information Hotel” – a progression through the alphabet. You may hear a controller say, “Information Golf is current.” This lets all who are listening on frequency know that Golf is the most current information.

A busy airport may have an Arrival ATIS and a Departure ATIS. For example, in a listing for Los Angeles International (LAX), “ATIS - 133.8 135.65 133.8 Arr (135.65 Dep).” In such cases, part of the alphabet may be used for the Arrival ATIS and another part for the Departure ATIS.

Over time, voice ATIS will probably be replaced by digital ATIS or D-ATIS. See: http://www.arinc.com/products/voice_data_comm/d_atis.html.

Related to ATIS, you may also hear “have numbers.” From the AIM, “...some pilots use the phrase ‘have numbers’ in communications with the control tower. Use of this phrase means that the pilot has received wind, runway, and altimeter information ONLY and the tower does not have to repeat this information. It does not indicate receipt of the ATIS broadcast and should never be used for this purpose.”

A truly memorable 9/11/2001 ATIS message, probably typical of many that day and in the days following: “Mather Tower — Attention all aircraft – effective immediately — until further notice – flight operations in the National Airspace System by U.S. civil aircraft, foreign civil aircraft, foreign military aircraft are prohibited except in accordance with Advisory 043. Any necessary service will be provided on tower frequency 120.65” LNC in the above example, are airport identifiers. By entering a three-letter identifier in the airport search box at http://AirNav.com, you will bring up that particular airport. Some U.S. airport lists will show the airport identifier with a “K” preceding the three letters, thus FTW is also KFTW. Either will work at AirNav.com. Some history on three-letter identifiers can be found at: http://www.skygod.com/asstd/abc.html.

◆ Fun in the Sun

On clear, sunny weekend days when there are many private planes in the air, the Unicom frequencies (mentioned above) can be quite active and entertaining to listen to. Program them in and take a listen. Aircraft call out the airport name when announcing their intentions to other aircraft in their area. It can be enjoyable to see how many airport names you can log on each frequency and see how far away the furthest airports are. It is useful to use AirNav.com to look up unfamiliar airports.

◆ Listen, Learn, Discover

If listening carefully for and logging the aircraft that self-announce on the various Unicom frequencies appeals to you, then seeking out and logging the ATIS, ASOS, and AWOS stations may have a similar appeal. See how many you can receive and how far away they are from you. You may note that the distance you can receive some of them will vary depending on weather and temperature. Since those stations are transmitting messages that continually repeat, they are easier to find when doing frequency searches. Even so, some may be so weak that it can take quite a bit of listening to identify them all.

Doing the above listening and logging can help you to determine the quality of your antenna system, your usable reception radius, and help you become more acquainted with what is typically in your range. Of course, the number of airports in your area will obviously be a factor in how many signals you receive and how much local air traffic you hear. If you can find other aircraft listeners in your area, it is often fun to compare notes on what each of you is receiving.

Until we meet again, see what you can discover in the aircraft band. Let me know if you hear something good.

![ASOS Sensor Group in Salinas, CA, always on duty (Courtesy NWS/NOAA)](https://example.com/ASOS_Graphic.png)

### ATIS / ASOS / AWOS

Some of the “Automated Surface Observing System” (ASOS) and “Automated Weather Observing System” (AWOS) stations may be within your receiving range. They collect various types of weather and visibility information. They transmit 24 hours a day in the 118-136 MHz range and can provide another angle on the weather if that is of interest to you. For info on the different AWOS system types, see: http://www.faa.gov/asos/awosinfo.htm

#### Information broadcast by an AWOS III (Courtesy FAA)

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<th>Wind direction</th>
<th>Dew point</th>
<th>Remarks</th>
<th>Wind gusts</th>
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<td>Density altitude</td>
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</table>

### ASOS / AWOS

For a great ASOS / AWOS U.S. map see: http://www.faa.gov/asos/map/map.htm. You can click on a state to show a map of stations and below that will be a list with frequencies. In airport frequency lists, ASOS / AWOS can appear like, “WX ASOS: 124.175,” and “WX AWOS-3: 120.675.” It is also not uncommon to see something like “WX ASOS at DAL (16 nm NE): 120.15, WX ASOS at FTW (16 nm NW): 120.70, WX AWOS-3 at LNC (20 nm E): 118.975.” Such notations inform the pilot where additional ASOS / AWOS stations may be with reference to a given airport. Nautical miles are represented by “nm.”

### Airport Identifiers

The three-letter groups, DAL, FTW, and
IBOC, the Next Step

Think fast, you've got two weeks to speak your piece... The FCC has issued a notice of proposed rulemaking and inquiry regarding the permanent rules for IBOC digital radio. You have until June 16th to comment—see http://www.fcc.gov/cgb/consumerfacts/howtocomment.html for information, or mail your comments to Marlene H. Dortch, Secretary; Federal Communications Commission; Office of the Secretary; 445 12th Street, SW; Room TW-204B; Washington, DC 20554. The docket number is MM Docket 99-325.

Some of the questions the Commission wants us, the public, to answer:
- Should there be a mandatory date for the end of analog broadcasts, like there is for TV?
- How many different programs should an IBOC station be allowed to carry on a single frequency? (each additional program degrades the audio quality of all programs broadcast)
- When stations air multiple programs on the same frequency, should they be required to air the hourly ID announcement on all programs, or only one?
- How can AM-IBOC stations be authorized to operate at night?
- How can the FCC deal with complaints of IBOC interference to other stations?
- Will FM translators pass IBOC signals?
- What about the fact that the iBiquity IBOC system is patented—all digital stations will be required to obtain a patent license?
- Should non-commercial stations be allowed to carry advertising on "subchannels"?
- Should the FCC come up with some kind of security system to prevent listeners from recording music off the air? (thereby obtaining a music collection without paying for it)

Note that the question of "should we adopt IBOC" is no longer on the table. It will happen, whether we like it or not. There are a few questions DXers will have to ask themselves:
- How do I work around IBOC interference?
- Will the IBOC system collapse once broadcasters realize how much interference it causes?
- Will the IBOC system collapse once broadcasters realize how much it costs?

A separate news release, in the same docket but with a deadline two days earlier on the 14th, asks for comments on authorizing AM-IBOC broadcasts at night. Technical reports compiled by iBiquity, and recommendations of the National Association of Broadcasters based on those reports, can be viewed at http://gulffox2.fcc.gov/ prod/ecfs/comsrch_y2.cgi; again, the docket is #99-325. I would suppose you could file comments on both releases in the same document.

**Bits and Pieces**

HDTV Ruckus: Just when Denver residents thought they might be getting high-definition TV... The launch of digital TV in the Denver market has been delayed by fierce neighborhood opposition to the installation of digital transmitters at the existing Lookout Mountain transmitter site. The changes would actually result in fewer towers at the site; stations KCNC, KMGH, KUSA, and KTVD would replace their separate towers with a common tower holding all four stations' antennas. After some ten years of legal battle, the Jefferson County Commission finally approved the stations' plans last year.

Then, in April of this year... Local residents and the city of Golden obtained an injunction, prohibiting construction from proceeding. Judge Brooke Jackson ruled the county Commissioners didn't allow enough time for opponents to respond to some of the documents submitted by the stations to support their zoning request.

(My guess: the locals don't want any towers up there—even though the towers were there for decades before they moved in. They figure if they can stop the construction until 2006, the stations will either build elsewhere or be forced off the air when analog is shut down, and the locals will get their wish. To heck with the hundreds of thousands of Denverites who receive their TV off-air; let them buy cable.)

KCNC, KMGH, and KUSA are currently operating temporary low-power digital transmitters on downtown Denver buildings. KMGH's, at 1.9 kilowatts on a tower only 65 feet high, probably doesn't reach past the city limits. KTVD doesn't yet have a digital signal at all.

DX Test QSL: Patrick Griffith, who sent the above information about digital TV in Denver, has also received a QSL letter from WQMA-1520 Marks, Mississippi. WQMA ran a DX Test broadcast on February 15th. Assistant Program Director Paul Walker, Jr., is a DXer. The address for QSLs from this station is 1820 West Marks Road, Marks MS 38646. As with any small-town station, you should enclose a self-addressed stamped envelope with your reception report. You might be surprised just how close to the (financial) edge most small-town radio stations operate.

Dead Air: Last month, I mentioned a new network called "Air America". This network airs liberal-leaning talk programs. Two of the network's stations, in Los Angeles and Chicago, briefly stopped carrying the network's programs in mid-April. According to the Los Angeles Times, a check paying for airtime failed to clear the bank; but the network says they stopped payment on the check when they learned KBLA-1580 had leased Air America's airtime to someone else. The dispute was settled a few days later, with the agreement calling for the Chicago station to drop the Air America programming. Three new stations—in upstate New York, Florida, and Colorado Springs—have been added to the network.

Openings: After a few months of poor conditions, things seem to be improving considerably. Radio Sawa—broadcasting from Djibouti to the Middle East—has been logged on the East Coast. In the South and Midwest, we've had a pretty impressive VH/UFH tropo opening. Have you heard anything interesting? Write me at 7540 Highway 64 West, Brasstown NC 28902-0098, or by email to dougsmit@monitoringtimes.com. Good DX!
Summer Static and Daylight

Every year, summer conditions change the nature of shortwave pirate radio activity in North America. Increased static levels on shortwave bands cause reception conditions to deteriorate somewhat compared to what we see during the winter. Diminished hours of daylight also reduce long distance pirate reception on 6925 kHz and adjacent frequencies.

But, none of these unfavorable reception conditions ever eliminate pirate broadcasting activity during the summer months. Several pirates still hang out on the North American pirate radio band, just below the Morse code portion of the 40 meter amateur radio band. Our readers heard several of them this month, and it is virtually certain that other stations will continue their activity during the summer. Although summer is never considered to be prime DX season for shortwave listeners, it pays to check out the pirate bands to hear the novel programming from pirate stations anyway.

Most pirates still operate either in upper sideband or lower sideband mode, in an attempt to increase their reception range. But, several stations still use AM mode, just like all commercial medium wave AM stations and like almost all shortwave international broadcasters. A smaller number of stations use other digital modes, such as Morse code, RTTY, and slow scan TV.

One principle is always in effect, no matter what seasonal conditions exist. You never know what you are going to hear from unlicensed pirate broadcasting stations. Their irregular and unpredictable broadcasting habits make pirate DXing an endlessly fascinating pastime.

This Year's Fest

We now have a photo of the participants in the 2004 pirate radio forum at the 2004 Winter Shortwave Listening Festival in Kulpsville, PA, near Philadelphia. Pictured from left to right, we see John T. Arthur, publisher of The ACE bulletin in of the Association of Clandestine radio Enthusiasts, still the largest hobby club in North America that specializes in unlicensed broadcasting; Allan Weiner, the owner and driving force behind licensed shortwave broadcaster WBCQ in Maine; Chris Lodbell, the editor of the pirate radio column in The Journal of the North American Shortwave Association, still the largest shortwave hobby club in the United States; and George Zeller, from the column that you are reading now.

Even though WBCQ is fully licensed, their philosophy is to encourage pirate radio program production. To encourage this, Weiner welcomes tapes of pirate radio stations for potential relay on WBCQ. Any stations that wish to take advantage of this meritorious policy, should forward their program tapes to Allan Weiner, WBCQ The Planet, 97 High Street, Kennebunk, Maine 04043 USA.

WNFC

According to a press release from Tom Ness and the Michigan Music Campaign, and a column by senior editor of the Detroit News Luther Keith, WNFC is a new FM pirate in Ferndale, MI. Its purpose is civil disobedience in protest of the FCC's foot-dragging performance in the low power FM issue. The call letters were selected to match the station slogan of "We Need Ferndale Community." Have any of our Michigan readers actually heard this station?

Local Areas Challenge FCC

We have been regularly covering Radio Free Brattleboro in Vermont, which is strongly supported by both the local community and the voting public. They remain on the air at press time, and they have requested a rare waiver from the FCC to continue broadcasting without a license to the local community. Meanwhile, the Florida state legislature has passed a law making it a felony under state law to broadcast a pirate radio station without a license from the FCC. The maximum sentence for a conviction is five years in prison and a $5,000 fine.

It will be very interesting to watch the FCC in upcoming months, as they receive challenges to their authority to regulate broadcasting from local legislation in places as diverse as Vermont and Florida.

What We Are Hearing

Our readers heard all of these North American pirate broadcasters this month. All pirates operate on a sporadic schedule, but shortwave pirate broadcasting increases noticeably on weekends and during major holiday periods. The new primary North American pirate frequency of 6925 kHz, plus or minus 30 or 40 kHz, remains the place to scan for the pirates. At least 90% of all North American pirate broadcasts are heard on 6925 kHz. The old 6955 and 6950 kHz frequencies are increasingly abandoned by pirates because of interference from licensed stations, but there are occasional broadcasts on nearby frequencies.

Big Thunder Radio- Vashek Korinek heard this one all the way from South Africa. Vashek, or Big Thunder, says that this has been their most distant reception so far. (Uses bigthunderradio@yahoo.com e-mail)

Black Mountain Radio- Thus for this new pirate has used weatherfall letters for its mix of rock and flute music. (Uses wbradio@hotmail.com e-mail)

Captain Morgan- Parody ads, rock music, and TV theme songs. (None, says to send reports to ACE, and has faded lately)

Ironman Radio- Most of their programming is rock music and identifications. (Belfast)

KRMl- The eclectic programming from Radio Michigan International is still with us. Some readers reported QSLs from them this month. (Uses krmil6955@yahoo.com e-mail)

Martians (unidentified)- Some pirate station has been relaying messages from the Sidonian underground civilization on Mars. This one remains cryptic, but it is an example of the unusual programming that you can hear on pirate radio. Undercover Radio apparently denies being the Martian relay site. (None; what is the purpose to Mars anyway?)

Oxyconhm Radio- Their drug advocacy format is unrelated to Rush Limbaugh. (Maybe none, but try Providence)

Phat Rock 1650- This isn't really a shortwave pirate station, but they do have a web site that features streaming audio that sometimes works. Check out their Las Vegas web site at http://www.phatrockradio.com on the Internet. (Unknown)

Pink Puma Radio- We know very little about this new music pirate so far. Some logs list their ID as the Voice of Pink Puma Radio. (None)

Radio First Term- Someone has been relaying old commemorating program about military entertainment stations from the Vietnam war era. (None)

Radio Free Speech- Many have noticed that Bill O. Rights' shows featuring comedy and advocacy for individual rights are normally broadcast in AM mode. (Belfast)

Radio Spaceman- This Euroradio made several appearances on radios in North America during the winter. Chris Lodbell received a saucer/ortha QSL for a report to the Netherlands. (Needle)

Ragnar Radio- Their rock music "from the Great Lakes" is sometimes supplemented by Morse code identifications. (Uses ragnarradio@yahoo.com e-mail)

Smooth Blues Radio- Not all pirates play rock music. Their blues programming often includes live concert recordings. (Uses smoothbluesradio@yahoo.com e-mail)

Sunshine Radio- A recent show featured a mix of British rock oldies and Christian rock. (None, but some replies via the grassrootsradiio@yahoo.com e-mail address)

Sycko Radio- They have returned with their well produced rock music format and an ID that sounds like
### SES Americom America-6

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Description</th>
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</thead>
<tbody>
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<td>Ku-Band - 72 degrees West longitude</td>
<td>17720.0 Data Transmissions</td>
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<tr>
<td>17740.0 Occasional video</td>
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</tr>
<tr>
<td>17780.0 Occasional video</td>
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</tr>
<tr>
<td>17800.0 Occasional video</td>
<td></td>
</tr>
<tr>
<td>17820.0 Occasional video</td>
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<tr>
<td>South American, Ku-Band beam transponder</td>
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<tr>
<td>17840.0 Occasional video</td>
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<td>17920.0 Occasional video</td>
<td></td>
</tr>
<tr>
<td>17940.0 Occasional video</td>
<td></td>
</tr>
<tr>
<td>South American, Ku-Band beam transponder</td>
<td></td>
</tr>
<tr>
<td>17960.0 Occasional video</td>
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<tr>
<td>17980.0 Occasional video</td>
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### PanamSat SBS-6

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<tr>
<td>11890.0 Occasional video</td>
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<tr>
<td>South American, Ku-Band beam transponder</td>
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<tr>
<td>11910.0 Occasional video</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>South American, Ku-Band beam transponder</td>
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<tr>
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### SES Americom America-5

<table>
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<td>3720.0 Data Transmissions</td>
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<tr>
<td>3740.0 Occasional video</td>
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### PanamSat Galaxy 11

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<td>3780.0 Data Transmissions</td>
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<tr>
<td>3800.0 Data Transmissions</td>
<td></td>
</tr>
<tr>
<td>3820.0 Data Transmissions</td>
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**Robert Smathers**

robertsmathers@monitoringtimes.com
Welcome to the July issue of Below 500 kHz. DXing during the warmer months presents some unique challenges for longwave enthusiasts. First, there are static crashes to contend with – sometimes lots of them. Lightning, even at distances of 100 miles or more, can generate enough noise to disrupt or even obliterate your listening.

The longer hours of daylight during the summer also limit the time most of us have available for nighttime "skip" propagation. The signals we enjoy during the winter traverse much longer distances and are not the same as those made inside the province. Full information for the recognition, and also to make one minor correction, is that some of the DXers have been able to identify noises that they hear as they monitor the LW/MW/SW bands. It contains .MP3 files of a dozen or more types of QRM, such as light dimmers, TV sets, computers, and computer speaker systems. I live in a rather noisy location, so I’ll be adding files to the site every few days."

"I’m hoping that people who visit the site will want to check out the various noises to see if they hear something like what’s bothering them. I am also asking that if someone is plagued by a noise they can’t identify, that they consider sending a sound sample to me. I’ll post it on the website as "unidentified" in the hope that someone else might recognize it."

**Summer Strategy**

- **Start Listening Early** – By doing your listening in the morning, you’ll bag some good catches before the noise has a chance to build up. Before 10 AM is best, since there may still be some nighttime skip in effect, especially on the higher LW frequencies (300 kHz and up).

- **Antennas are Everything** – Avoid the common “longwire” antenna, especially in the summer. These antennas frequently act as “noise collectors” particularly in urban and suburban locations. Many operators have noted that they seem to pick up every light dimmer and motor in the neighborhood.

- **Roadtrip!** – Planning a summer getaway? Why not pack your portable receiver, a beacon directory, and your logbook for some new-to-you signals. Imagine the excitement of tuning the band with an entirely new set of signals to hear. Just remember, even DXers need an occasional break, so when on vacation, be sure to log some quality time away from the radio too.

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Remembering OSCAR

One of the great things about amateur radio is that we share a history. Even if you have only recently passed your first license test, you join a family of folks who have contributed to the amateur radio art. Their stories are your stories now, too. It is a valuable part of being a ham to learn a bit about where we’ve been in order to get really excited about where we are going.

This all came to mind for me when I noticed that the amateur radio community was about to launch yet another Amateur Satellite. If all went according to plan, AMSAT OSCAR ECHO was launched on June 29, just a few days before you received this copy of MT.

I’m old enough to remember (barely) the launching of Sputnik I, (October 4, 1957, for anyone keeping track) and the subsequent launching of Explorer I (January 31, 1958). These two satellites signaled the beginning of the “Space Race” between the United States and the Soviet Union. Putting these two satellites into orbit was accomplished by the greatest minds in aerospace, electronics and communications technology in two different hemispheres at the cost of many millions of dollars. Yet I can’t help but chuckle when I also recall that a group of dedicated amateur radio operators, using what amounts to pocket change compared to Cold War Era space financing, managed to get their first satellite into orbit only around four years later on December 12, 1961.

For those of you new to either ham radio or the aspect of hamming related to amateur satellites, allow Old Uncle Skip to share some of our common lore.

Amateur Radio’s first satellite was OSCAR I. OSCAR I stands for Orbital Satellite Carrying Amateur Radio. OSCAR I was very tiny as satellites go, measuring only 9 x 12 x 6 inches. It weighed a touch under 10 pounds (4.5 kilograms).

OSCAR I was the brainchild of a group of hams in California (operating under the name of Project Oscar) who convinced the Air Force that hams could put up a satellite by having it hitchhike as ballast on one of their scheduled rocket/satellite launches. OSCAR I rode into orbit from Vandenberg Air Force Base in Lompoc, California, as ballast on the upper stage of a Thor Agena B rocket whose main mission was to deploy the USAF Discover 36 satellite. OSCAR I went into an elliptical orbit that ranged from 152 miles to 295 miles on an inclination of 81.2 degrees 91.8 minutes.

OSCAR I was a fairly basic experiment, not terribly different from the first Sputnik. OSCAR I had a 140 mW transmitter and a single monopole antenna. It had no receiver and its batteries were not rechargeable. All our first satellite could do was repeatedly send the CW characters “HI” on the frequency of 144.983 MHz. It dutifully performed this task for 22 days until its batteries drained. During that period of operation it was documented that the signal was heard by 570 amateur radio operators in 28 different countries.

Due to its relatively low altitude as satellites go, OSCAR I was only able to remain in orbit for a total of 50 days. Still, it was a great first effort, the predecessor of dozens of later amateur satellites.

A number of years ago, not too long after I was first licensed as a ham, I went to the recently opened Smithsonian National Air and Space Museum and saw a mock-up of OSCAR I in the hall that also displayed dozens of other satellites that changed the world. While other people stood in awe of gigantic telecommunications satellites, I smiled down on a little square box and remembered a bit of amateur radio history.

As you can imagine, quite a bit has happened since those first amateur satellite efforts in 1961. But let’s take a closer look at some of the early milestones that brought us to the place where amateur satellite communication is commonplace and within the capability of any dedicated ham.

OSCAR II was similar in design to OSCAR I, the main difference being that the transmitter’s power was lowered to 110 mW in order to increase the lifecycle of the onboard batteries. Like its earlier sibling, OSCAR II was launched from “Vandy” on another Thor Agena B on June 2, 1962. It only remained operational for 19 days and reentered the earth’s atmosphere on June 21, 1962. At the same time OSCAR II was constructed, another satellite of similar design was built with a 250 mW transmitter but it was never launched.

OSCAR III was the amateur radio world’s first true communications satellite in that it had a bi-directional transponder, allowing signals to be received and then retransmitted. An actual orbiting repeater! OSCAR III rode into its 590 mile high orbit on March 9, 1965, on board a Thor Agena rocket that was carrying seven USAF satellites as its primary payload. OSCAR III received signals on a 146 MHz uplink and retransmitted these signals through a 1 watt, 50 kHz wideband repeater on a 144 MHz downlink frequency.

The satellite also had two beacons. The beacon transmitters batteries were rechargeable and connected to solar cells. For this reason, while the transponder ceased operation after 18 days (having relayed more than 1000 signals for hams in some 22 countries), the beacons continued to send data for a number of months afterwards.

OSCAR IV took even more steps forward, but also signaled some of the amateur radio satellite community’s first disappointments. OSCAR IV rode on a Titan 3C booster carrying three USAF satellites on December 21, 1965, just four years after OSCAR I. OSCAR IV was designed by the TRW Radio Club in California. It was designed with solar cell rechargeable batteries and boasted a 3 watt wideband transponder that had an uplink of 144 MHz and a downlink of 432 MHz. This operational scheme proved to be a bit of a challenge for hams at that point in history, but many contacts were made, including the first U.S. to U.S.S.R. satellite contact.

However, problems with the boost phase of the flight left OSCAR IV in an extremely elliptical orbit. Communication was severely limited. Further, OSCAR IV only remained in operation for 85 days. It is believed that either the batteries or solar cells experienced failure due to the harshness of the space environment. At this point in history even the “pros” were still only beginning to understand the effects of extremes of heat and cold as well as dust and radiation on spacecraft.

Continued design and development occurred within the amateur radio community even though it was some time until any more satellites were launched. In 1969 AMSAT
was formed to further this process.

Oscar V was better known as Australis-Oscar 5 because it was designed and fabricated by a group of students in the Astronautical Society and Radio Club located at the University of Melbourne in Australia. In a joint effort with the newly formed AMSAT in the United States, Oscar V was launched on January 23, 1970, from Vandenberg AFB. It rode piggyback on a Thor Delta booster with the TIROS-M weather satellite.

Oscar V was placed into a 925 mile high polar orbit. It was a somewhat simpler experiment than Oscar IV had been. Weighing in at a little bit under 18 pounds, it contained two telemetry transmitters: a 50 mW unit transmitting at 144.050 MHz and a 250 mW unit transmitting at 29.450 MHz. It was equipped with 2 and 10 meter monopole antennas. It had no transponder, but did have a receiver that allowed a signal to be sent to turn the 29 MHz telemetry transmitter on or off from a ground station.

It was also the first amateur satellite to have a method of attitude stabilization. This was done in a rather novel manner by using a pair of bar magnets to passively align the satellite with the Earth's magnetic field. By doing this, the satellite's antennas were placed into a favorable orientation with ground stations. Oscar V had no solar cells, but its batteries did hold out long enough to keep the satellite in operation for a total of 52 days. During that time tracking and telemetry reports were logged by hundreds of ground stations in 27 different countries.

Oscar V became the last of what are now called the Phase 1 amateur satellite experiments. This early group of basic satellites served as proof of concept for many ideas that became the foundation of all future amateur satellite activities.

Earth Base

Now let's talk a bit about what hams needed back then to begin to hear, track and actually talk through these early Phase 1 satellites. Listening in on the early OSCARs was not something the casual "appliance operator" was likely to accomplish. You have to remember the era of the '60s. VHF/UHF communications gear was mostly in the hands of technically oriented hams. The now common world of 2 meter FM and repeater systems in every grid square was just beginning to come on line. Over the counter ham equipment for these bands was available, but expensive.

Hams were more likely to experiment with used and surplus commercial gear such as "taxi" radios. Another option was to build your own equipment or transverters for your existing HF gear. Not something for the faint-hearted, even today. Still, with a little luck, horse trading, and a current copy of the ARRL Handbook on your shelf, it was possible to find a receiver that could tune the right frequencies. With a bit more effort you could even get a station together to transmit and be one of those first folks to put a signal through OSCAR III or IV.

Then came the really challenging part. To maintain contact through one of these early satellites (and to most of the current ones as well) a ham needs a steerable antenna system. The antennas need to track the satellite along its path to make communication possible. Further, these antennas would be most efficient and maintain the longest possible QSO time if they could also be oriented along the vertical axis!

A search though any current ham store catalog or web site today will point you to a number of manufacturers of altitude/azimuth rotator units and dozens of satellite tracking software packages. Back in the '60s no commercial two-axis rotator units were yet on the market. And if you had told any but the most forward thinking ham that he or she would someday soon have a personal computer on the desktop, the laughter would have traveled farther than any of those satellite signals!

Folks had to come up with their own rotator systems, often cobbled together out of a pair of used TV antenna rotators. Calculating the Keplerian motion - the path of the satellite orbits was done by hand and slide rule (we're still a touch early even for personal hand calculators). Still, once you got the details worked out, you could have tons of fun experimenting with antenna designs. Because satellites usually tumbled in their orbits, novel ways were devised to resolve antenna polarization issues. Cross polarized Yagis, Quads and Helix antennas were all starting to pop up on satellite hams' roofs.

We've come a long way since those early days. Right now there are over 20 orbiting amateur radio experiments (including the ARIS ham station on the International Space Station). It is possible to assemble a complete satellite ground station out of any well-stocked ham suppliers catalog or web site. But it is good to remember how things were "back in the day" and to look toward the future while recalling those first small amateur radio steps into space.

Have fun. I’ll see you on the bottom end of 40 meters.

UNCLE SKIP’S CONTEST CORNER

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<td>RAC Canada Day Contest</td>
<td>July 1 0000 UTC - 2359 UTC</td>
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<tr>
<td>MI QRP July 4th CW Sprint</td>
<td>July 4 2300 UTC - July 5 0300 UTC</td>
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<tr>
<td>IARU HF World Championship</td>
<td>July 10 1200 UTC - July 11 1200 UTC</td>
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<tr>
<td>FISTS Summer Sprint</td>
<td>July 10 1700 UTC - 2100 UTC</td>
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<tr>
<td>QRP ARCI Summer Homebrew Sprint</td>
<td>July 11 2000 UTC - 2400 UTC</td>
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<tr>
<td>North American QSO Party, RTTY</td>
<td>July 17 1800 UTC - July 18 0600 UTC</td>
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<tr>
<td>CQ Worldwide VHF Contest</td>
<td>July 17 1800 UTC - July 18 2100 UTC</td>
</tr>
<tr>
<td>RSVG IOTA Contest</td>
<td>July 24 1200 UTC - July 25 1200 UTC</td>
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</table>

**Thanks**

Your loggings and news about unlicensed broadcasting stations are always welcome. Contact us via the e-mail address at the column, or submit a bulletin to the Free Radio Network. The best bulletins for submitting pirate loggings remain in the ACE box ($2 US for sample copies via the postal address above) and the e-mail address Free Radio Network, 351 East Main Street, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; Box 73, NL-7160 AB, Nede. The North American QSO Party loggings remain 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, and some pirates will QSL a report left on the FRN.

**Outer Limits continued from page 69**

"Psycho." But, this veteran remains mysterious. (None)

Take It Easy Radio - Rock music still dominates here, not always from the Eagles, but playing more country music. (Uses takeiteasyradio@yahoo.com e-mail)

Undercover Radio - Dr. Benway's music and comedy is fairly eclectic - always changing. (Merlin and undercoveeradio@gmail.com e-mail)

WBMR- Mike O. Farol at the relatively new Black Mountain Radio has been verifying some loggings left on the Free Radio Network web site. (Uses wbmradio@hotmail.com e-mail)

WBNY - This clandestine parody, Voice of the Rodent Revolution, returned around Easter as usual, but they are sometimes active at times other than holidays. (None, old address defunct)

WHYP - James Brown and Kost from North East, PA, continues to be one of the more active and clever pirates on the air today. His Lake Erie weather reports are not exactly live. (Providence)

WJFK - This John F. Kennedy memorial station remains a big mystery in the pirate radio world. Few people heard their broadcast this year (normally around November 22), but several DXers have received their QSLs, now marked with a 6925 kHz frequency that differs from QSLs issued in the past. (None, responds to unknown information sources)

WMPK - The all-time champion of techno rock continues to transmit "dance party" format on the pirate bands, with a "micro power radio" slogan. (Still none)

QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations. The cash defrays postage for mail forwarding and a souvenir QSL to your mailbox. Letters go to these addresses, identified above in parentheses: PO Box 1, Belfast, NY 14895; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; Box 73, NL-7160 AB, Nede. The Nether-
This month we’ll consider some rules-of-thumb about antennas. The rules are not necessarily wrong, but, as with most rules, there are exceptions to those rules. And, as always, it helps to keep the idea of antenna reciprocity in mind when thinking about antennas. That is, that antennas generally have the same characteristics (e.g., radiation patterns, feed point impedance, gain, etc.) for transmitting as for receiving.

**The Higher My Antenna the Better It Performs:**

Consider VHF or higher band antennas communicating with each other across relatively flat terrain. The propagation paths between antennas in these so-called line-of-sight bands may be blocked by buildings, hills, etc. in their immediate environment. However, once the antennas have been elevated sufficiently high that they can “see” each other over the tops of whatever is blocking their signals then increasing their height generally won’t improve communications. But there is a phenomenon called “multipath” which may still make received signal strength sensitive to relatively small variations in antenna height.

Some signal rays may arrive at one antenna on a direct line-of-site path (direct wave), while other rays of the signal may take a longer path, such as reflecting from the earth between the antennas (ground reflected wave) (fig.1). Time-of-travel difference for the various rays can cause them to arrive at the receiving antenna in-phase or out of phase, causing maximizing or minimizing of overall received signal strength. Depending on the situation, either raising or lowering an antenna a fraction of a wavelength may actually either increase or decrease signal strength.

Here’s another exception to the higher is better rule. Sky-wave signals in the HF and lower-frequency range often reflect from the ionosphere and return to earth. If signals leave a transmitting antenna at a low vertical angle they will travel far before refracting from the ionosphere, and returning to earth. If, on the other hand, they leave the transmitting antenna at a high (closer to vertical) angle, then they bounce back down much closer to the transmitting antenna.

A dominant feature in establishing what vertical-radiation angle a horizontal antenna will have is its height above earth. Ordinarily, positioning a horizontal, half-wavelength antenna a half wavelength above earth will provide low vertical angle performance, and thus support DX communications well. Mounting the antenna a quarter wavelength above earth gives higher-angle performance, and supports closer-in communication. So, if your horizontal antenna is at a height of a half wavelength, lowering it may actually improve reception of stations within a few hundred miles of your antenna. On the other hand, if your antenna is at a quarter wavelength height, and you raise it to a half wavelength the increased height will likely reduce close-in performance, but improve its long-distance performance.

**Tuning an Antenna to Resonance Will Improve Reception:**

Many antenna elements are designed to be tuned circuits, which means that they respond maximally to the frequency or band on which they are designed to operate. When an antenna element captures a signal at the element’s resonant frequency, that signal produces a greater signal-current flow than if the element were not resonant at that frequency. This alone might recommend always using resonant elements. But before we make this assumption let’s consider the effect of signal-to-noise ratio (S/N) on quality of reception at HF and the lower frequencies.

An example of received electrical noise is the “static,” or background noise that you usually hear on HF and lower frequencies when no other signal is present. Received noise, such as these pops and crackles, is actually a kind of radio signal, and so its strength is increased by resonant antenna elements just as is the desired signal’s strength.

Generally, below, say, 20 MHz or so, received noise is the predominant noise in a receiving system. Noise generated in the receiver is so much lower than this received noise that receiver-noise effects the S/N very little. This means that the N in the S/N is essentially the received noise. Increasing the signal-strength output from the antenna will increase noise as much as it does signal, and so S/N doesn’t change, and reception quality is not improved.

At frequencies above 20 MHz or so, the strength of received noise becomes low compared to the noise generated within the receiver’s circuits. So at these frequencies, especially VHF and higher, the receiver’s own noise usually sets the noise level for the S/N. So, at these frequencies, increasing antenna output increases the S part of the S/N without significantly increasing the N, and reception quality is improved.

The above statements are generalizations, and received-noise level varies with location and season as well as with frequency. But usually, for the reasons just given, at VHF and higher frequencies, tuning an antenna to resonance improves reception. On the other hand, at HF and lower frequencies, making antennas resonant simply to increase received-signal strength is not usually effective in improving reception.

From a different perspective, proper tuning of elements is quite important in the performance of beam antennas such as the Yagi-Uda. Element tuning is essential in determining the beam’s radiation and reception pattern. Proper tuning does improve S/N, and thus improves weak-signal reception by rejection of noise and interfering signals in off-beam directions. In fact, at HF or lower frequencies, this off-beam noise and interference reduction is usually more important to increasing quality of reception than is...
Some interesting talk about various unusual antennas and accessories: http://www.hard-core-dx.com/nordicdx/antenna/special/

A Half-Wave Dipole’s Feed-Point Impedance is 72 Ohms:

You may read that a half wavelength, center-fed dipole’s feed point impedance (FPI) is about 72 ohms, and that a quarter wave, sloped-radial, ground-plane antenna FPI is around 50 ohms, and so on. To get maximum signal transfer from antenna to feed line for receiving, or from feed line to antenna for transmitting, we must match antenna feed-point impedance, and feed-line impedance.

So should we use 72-ohm feed line as lead in for the dipole antenna? Not necessarily. If we actually measure our antenna for FPI we may find it to be anywhere from near zero to near 100 ohms! Seventy two ohms is the FPI value the antenna would have if it were located out in space. But we have the antenna in our backyard. There any nearby conductive objects, especially the earth, will interact electrically with the antenna and result in a change in its FPI.

Other factors can effect the value of an antenna’s FPI, particularly the location of the feed point along the length of the element. If we move the feed point progressively from the center of a half wave dipole toward either end, the FPI progressively increases from less than 100 ohms to a few thousand ohms!

In general, for practical antennas, FPI is often different from the text book, free-space value, and can be changed by changing the location of the feed point, the antenna’s height above the earth, or the proximity to nearby conductive objects.

A High SWR Causes Significant Power Loss and Poor Reception:

If your antenna doesn’t have the same FPI as your feed line’s impedance, then signal power will be reflected away from that junction. For reception this reflection is directed back into the antenna. For transmission the reflection is back down the feed line toward the transmitter. When signal power is reflected back into the feed line, the interaction of the reflected power and the power coming toward the junction will sum to cause standing waves. A large mismatch of impedances will cause a high standing-wave ratio (SWR).

For reception on HF and lower frequencies, not getting maximum signal from the antenna is not generally a problem for reasons discussed above. But for reception at VHF and higher frequencies, maximum signal transfer is important for reasons also discussed above. When transmitting, if an antenna-system tuner (such as a transmatch) is used at the transmitter, then signal reflected back from the antenna is returned again to the antenna, and essentially the only loss is feed line loss. For reasonable length lines, if low-loss feed-line is used then this loss is low even with rather high SWR values. On the other hand, at VHF and higher frequencies, matching between antenna FPI and feed line impedance provides lowered loss of transmitter power and improved reception.

And So:

It seems that the more we know about antenna performance the less tightly we adhere to rules-of-thumb. If you want to learn more about antennas, a good source is the ARRL Antenna Book. Few will want to read it all, but many find it a great reference and study source.

This Month:

Why don’t antennas trust their connectors?

You’ll find an answer to this month’s riddle, 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.

Some interesting talk about various unusual antennas and accessories: http://www.hard-core-dx.com/nordicdx/antenna/special/

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RADIO RIDDLES

Last Month:

I said: “Antennas” were once called “aerials.” Why do we now call them “antennas”? Well, early-on, wireless communications was accomplished at rather low frequencies. At these long wavelengths performance was much better with very high, long antennas. Such a high antenna was called an “aerial” which means “high in the air.”

However, as technology advanced, and shorter wavelengths also became popular, it became practical to use antennas which were not so high in the air. So “aerial” was no longer so appropriate. It was noted that insects had antennas which received information from their environment in some ways comparable to a receiving antenna receiving radio waves. In response to this, the term “antenna” was chosen to replace “aerial.”

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July 2004 MONITORING TIMES 75
Calling in a Substitute

As those who have followed this column for awhile know, all my "Radio Restorations" projects are done essentially in "real time," with the reader looking over my shoulder as I proceed. I don't finish projects in advance so that I can select only the most successful restorations for publication. I have occasionally been a bit embarrassed by being stumped for a time - but I've never before had to put aside a project before completion (though I came very close during the S-40 restoration finished a few months ago).

I've always felt that the immediacy of my real-time policy makes this column more interesting to the readers. Hey, look at the popularity of the TV reality shows! So I hope you'll be patient with me when I tell you that the NC-46 project has now been "voted out," so to speak.

Despite this, I think it will be instructive to report on the restoration work completed in this session - up and including the point where I discovered the radio's tragic flaw. That should certainly be helpful to anyone who may decide to undertake an NC-46 restoration.

Reversing the Owner Mod

Last month, I had removed the radio's bottom access panel and was very pleasantly surprised by the relatively untouched appearance of the wiring. The only owner mod seemed to be the installation of a d.p.d.t. switch and RCA phono jack on the rear apron. The first thing I did this month was to get out the schematic and trace the added wiring so I could remove it.

The mod turned out to be a phonograph cartridge plugged into the jack would be connected to the input of the radio's first audio stage. At the same time, plate voltage would be removed from the second i.f. stage to mute any radio signal being received. In the other position, the cartridge would be disconnected and plate voltage restored.

I removed the wiring and switch - restoring the permanent plate connection to the second i.f. tube. I decided to leave the RCA jack in place because it had been fastened with pop rivets that would have to be drilled out. Also it was obvious that the removal would leave a particularly crude-looking hole.

Next I turned my attention to the tubes, removing and testing them one by one. Those of you who were with me during the recently-completed "All American Five" restoration know that a positive test doesn't necessarily indicate a clean bill of health. However, all of the tubes did look good - showing no shorts and (with a couple of exceptions) easily surpassing the test criteria.

Cabinet and Controls

Two components of the NC-46's cabinet were going to require special attention. The front panel would need cleaning and polishing; the hinged lid would have to be cleaned and its crackle finish carefully oversprayed with a matching paint. Luckily, both of these parts were removable.

The lid was fastened to its hinges with machine screws, so removal was quite a simple matter. Removing the panel wasn't too much of a problem either, though it required a bit more work. First, the knobs had to come off, of course, and the large tuning and bandspread knobs were a little resistant.

After loosening their setscrews, I was able to twist them off while gripping their shafts with pliers behind the panel. Holding the knobs in my hands, I was surprised by their weight - until I noticed the heavy metal insets that had been installed to provide flywheel tuning action. Quite a luxurious touch!

Once the knobs were off, I could see that the shafts for the tuning knobs and the three lower controls were mounted on the chassis apron behind the panel - protruding through large clearance holes in the latter.

(Remember, for electrical safety, the chassis of this a.c.-d.c. radio must be kept from contacting the cabinet). The upper three switches were not in contact with the chassis, being mounted directly on the panel. Removing the switch mounting nuts and five retaining screws freed the panel so that I could slip it right off.

I wasn't ready to do the cosmetic work on the cabinet parts, or to begin the capacitor replacement. The designer of the NC-46 had gone wild with decoupling filters and I wouldn't have had enough caps on hand anyway. Looking around for other things I could do to advance the cause, I applied cleaner/lube to the volume and sensitivity controls as well as to the bandswitch contacts. Then I carried out the test that is putting this project on the shelf.

Enter the Tragic Flaw

At some point in my restoration of every communication receiver, I check the primaries of the antenna coils. It doesn't happen very often, but sometimes one of them will be found open - particularly if the set has been left connected long term to an outside antenna without lightning protection. Finding, once, that this had happened to a radio I valued quite a lot (the 10-meter coil primary was open), I became sensitized to the problem.

After I had cleaned up the bandswitch contacts, I decided to check the antenna coils. Connecting an ohmmeter across the receiver's doublet antenna terminals, I rotated the bandswitch through its four positions. To my amazement, only the broadcast band coil showed continuity! After verifying this by connecting my meter directly across the primary of each coil, I realized I had a problem on my hands.

Sure, these primaries had very few turns and could be rewound with patience and care. But disconnecting and removing them from their shielded enclosures would be quite a chore indeed - as well as trying to match and acquire the wire I would need for the windings. If this were a National HRO instead of an NC-46, a procedure like this would definitely be worth the work. As it is, I'm going to put the set together again so I don't lose anything and keep it on the shelf as a parts set for the better example that I hope will eventually turn up.

Speculating on how those coil primaries...
might have become wasted, I tested for continuity between the cabinet and the radio’s hot chassis. Sure enough, there was a direct short between them. Perhaps there is a shorted capacitor somewhere, or maybe one of the insulating bushings had been disturbed and reinstalled incorrectly.

Like most of these low-end radios, one of the doublet antenna connections had been strapped to cabinet ground so a single-wire antenna lead-in could be connected to the other. If the radio’s power plug had been inserted so that the cabinet was hot to ground, and if the antenna had some kind of leakage to ground, voltage from the power line would have appeared across the antenna coil in use and eventually burned it out. The same thing would have eventually happened to the other coils as the listener switched from band to band (amazingly, he seems not to have been knocked on his rear end first).

This is just a theory, but it does explain why so many of the coils were affected when it’s more usual to find just one burn-out.

**Substituting the NC-57**

Some time back, I purchased a National HRO-60 receiver from an estate. Since my sister lived near the seller, I had her pick it up for me. A little later, she e-mailed me to tell me that I had not one radio but two. The seller had thrown in a National NC-57 that I didn’t even know was being offered. After I got a look at the radio, I could see why it had been included at no charge. At first glance, it appeared to be in rather pathetic condition.

Yet, in spite of its scuzzy looks, the set seems to be complete. And it makes a certain amount of sense to substitute an NC-57 for the NC-46. As mentioned last month, this is the radio that appeared in 1947 to replace the NC-46 as a competitor to the Hallicrafters S-40. Though not built as massively as the NC-46, it has more features — including a power transformer — so there is no longer a hot chassis problem.

To remind you of some of the other features we mentioned last month, the NC-57 has an r.f. stage (an important lack in the NC-46) and even boasts a voltage-regulated oscillator. Like the S-40, but unlike the NC-46, it has a built-in speaker. Plus, it tunes all the way to the top of the 6-meter band (54 MHz) while the S-40’s range ends at 43 MHz. The radio has a fresh postwar look, though it definitely lacks the authority of the more traditional-looking NC-46 or the elegance of the Raymond Loewy S-40 design.

The worst thing about this particular example is the cabinet, which is badly scratched — especially at the top, but there are also plenty of scars on the sides and front. On lifting the lid, I found that all surfaces are covered with a heavy deposit of sticky-looking gray dust. Yet, looking a little closer, the chassis finish appears to be fairly decent under the dust. No obvious signs of corrosion from the presence of mice.

Another modification visible on the topside of the chassis was the rewiring of the send-receive switch. In the stock radio, it is in series with the center tap of the power transformer’s high-voltage winding. I could see where the original leads to the switch had been cut off, spliced together, and taped. The switch had then been crudely zip-cord wired in series with the speaker’s voice coil.

The cord originally ran under the lid and out of the radio to who knows where. Why the previous owner needed a speaker cutoff rather than a B plus cutoff is anybody’s guess. However, I’m concerned that if the radio had been operated without the load of the voice coil for any length of time, the 6V6 audio output tube might well have been damaged.

We’ll see.

Like the NC-46 this radio has a removable access panel in the cabinet bottom, which made it possible for me to get a look under the chassis without pulling the cabinet off of the front panel. I practically hold my breath when I’m about to get my first view under the chassis of a new restoration project. There may be burning, charring or other signs of electrical disaster or — perhaps worse — the almost inevitable signs of owner modification that might make the original circuit configuration difficult to untangle. And yet, these challenges are really what make restoration projects so much fun!

However, the chassis was very clean underneath and the solid, meticulous National Company wiring showed only a few mods. A couple of wires leading to the volume control — obviously for phono input — had been clipped just after leaving a rear-apron power socket keyway hole, which had been used as a convenient exit point. An obviously non-original power resistor, very likely a sign of some past problem that will have to be looked into, was wired into the power supply circuit.

I wasn’t able to test the power transformer under operating conditions because the line cord had deteriorated and was shorting. However, I checked all its windings for continuity and found that all were ok. And, yes, I definitely also checked the antenna coils.

Everything looked fine as I clicked the bandswitch up from the broadcast band through all the other positions — until I reached Band “E,” the highest frequency range. The ohmmeter needle immediately dropped from zero to infinity and I thought I had another problem on my hands. However, a look at the schematic showed a 100 pf capacitor in series with this winding. Hooking up my capacitor checker to the antenna terminals in place of the ohmimeter, I sure enough read 100 pf. So it looks like we’re in business. More next month when we’ll begin cleanup and recapping.

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**Underside of NC-57 chassis is quite clean and shows little evidence of tampering.**
CSI Flex Series Multiprotocol Decoder

Scanner listeners can use CTCSS, DCS, and other codes to help identify who we hear, though the codes are not employed for our benefit. They were developed to permit different radio user groups to share the same frequencies.

We reviewed the Optoelectronics DC-442 CTCSS/DCS/DTMF display in June 1998, but it has since been discontinued.

Connect Systems Incorporated has been manufacturing communications equipment controllers and tone displays in their USA plant for several years. We have described in previous columns how we use a CSI CD-1 decoder connected to a discriminator tap (before de-emphasis) in our receivers to display CTCSS, DCS, and DTMF codes. CSI has since replaced the CD-1 with the newer model CD-2, which is equipped with an RS-232 serial interface for connection to a computer.

We had an opportunity to try CSI’s new Flex multiprotocol decoder which displays CTCSS, DCS, DTMF, and LTR codes.

CSI Flex Decoder

CSI’s latest generation decoder is the Flex multiprotocol communications decoder. It is larger than the CD series and employs a 2-line LCD display instead of the simple 4-digit red LED display found in the smaller decoders.

The Flex decoder not only displays CTCSS, DCS, and DTMF tones, but LTR trunking data, as well. DCS codes are shown in both normal and inverse polarities simultaneously – for example, code 114 and its inverse of 712.

LTR trunked systems have been increasing in the VHF-high and UHF bands in this area and some of the local scanner club members monitor them and identify repeater users. While the LTR information: Area bit (0 or 1), the repeater number (1 - 20), the 3-digit ID code, and a GOTO code. The GOTO code may be unfamiliar to operations on them, too.

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LTR trunked systems have been increasing in the VHF-high and UHF bands in this area and some of the local scanner club members monitor them and identify repeater users. While the LTR systems are primarily used for business communications, we’ve logged school bus and other operations on them, too.

The Flex decoder displays the following LTR information: Area bit (0 or 1), the repeater number (1 - 20), the 3-digit ID code, and a GOTO code. The GOTO code may be unfamiliar to most monitorists because current trunk trunking scanners do not display it.

Data displayed on the LCD is also transmitted to a 9-pin RS-232 serial connector. This permits computer savvy hobbyists to use their computer to read data from the Flex decoder for logging or other analysis. The data format is ASCII and described briefly in the Flex instruction manual.

 CSI Flex decoder displays CTCSS and DCS

CSI Flex Series Multiprotocol Decoder

CSI’s Flex products are based on an innovative approach. All Flex series instruments use the same hardware – the Flex Series Universal Controller. If you buy one of the Flex products, you get the controller factory configured with the appropriate firmware and an instruction manual.

A C8051F124 microprocessor forms the brain of the Flex Universal Controller and the function performed by the controller is determined by firmware.

CSI provides electronic copies of instruction manuals and firmware for free download from its web page, http://connectsystems.com. Customers who own the Flex controller hardware can purchase a serial to JTAG interface module, download the firmware free and reconfigure the controller to serve a different purpose. If you purchase the Flex decoder, for example, you could “flash” new firmware and transform the instrument into a simplex repeater or multiprotocol generator! Later, you could flash it back to a decoder again.

You need CSI’s optional $70 FLEX-M programming module which connects your PC’s serial port to a JTAG (Joint Test Action Group) connector inside the Flex controller. Software to perform the flashing is available for free download from CSI’s web site, but it requires a Microsoft Windows operating system. We didn’t try flashing new firmware into the controller we borrowed from CSI.

Physical

The Flex controller requires 12 - 15 VDC for operation. You will have to furnish your own power supply.

The Flex controller construction is first rate. Surface mount components are used on a printed circuit board and the parts locations are clearly marked. The board is bolted to a steel chassis. The cover and front and rear panels are made of aluminum. It’s refreshing to see a metal cabinet when so many other radio accessories are housed in light weight plastic.

The LCD display is blank unless the decoder detects a code. You can change the LCD contrast by tweaking an internal potentiometer. A red LED lights whenever power is applied to the decoder.

The rear panel contains a barrier strip with 10 screw terminals, though you will only use four terminals for the decoding function: two terminals for the 12 to 15 VDC power and another two terminals for the discriminator cable. We recommend you use a short shielded cable between your receiver and decoder.

The remaining screw terminals and other jacks on the decoder’s rear panel are for use when the controller is programmed for other applications, e.g. as a telephone patch.

Performance

We tried the flex decoder with an ICOM IC-R8500 receiver and a Uniden/Bearcat BC9000XLT scanner. The IC-R8500 comes standard with a discriminator output jack and we added a discriminator tap to the BC9000XLT a few years ago. We had to change the position of the Flex’s internal jumper JP-3 in order to display LTR data when connected to the IC-R8500. CSI says that a future version of the decoder firmware will eliminate the need for this jumper.

The instruction manual describes how to adjust the decoder’s sensitivity, if required, using an internal jumper and a potentiometer. We found the original factory settings satisfactory.

The Flex decoder displays CTCSS and DCS slightly faster than our CD-1. We used a Hewlett-Packard audio analyzer to measure our Flex decoder’s CTCSS sensitivity at various tone fre-
The Flex decoder loads down our BC9000XLT more than CD-1 does, affecting the radio’s squelch control setting. That’s probably due to the way we implemented the BC9000XLT discriminator tap – with little isolation. We did not observe any loading with the IC-R8500.

The decoder’s LCD display is not backlit, making it more difficult to read than the CD-1’s brilliant red LED display.

None of CS1’s decoders have a power on/off switch. We drilled a hole on our CD-1’s rear panel to install a small toggle switch and would perform the same modification to a Flex controller after the warranty expired.

We are impressed with both the Flex decoder’s performance and construction. It is a professional and not a hobby grade product. The instruction manual contains schematics, board layouts, and a parts list, so there’s no need to purchase a separate service manual.

The Flex controller is available directly from CSI for $399 (desktop mount), $424 (rack mount version) or through dealers. Connect Systems, Inc is located at 1802 Eastman Ave., Suite 116, Ventura, CA 93303, phone (805)642-7184. Website: http://connectsystems.com

Monitor vs. Scanning Receiver

Every so often, John Strand posts a classified advertisement on the Internet looking to buy unmodified Regency ACT-R1 monitor receivers. If you’re a scanner collector, you already know that ACT-R1 is a simple, single channel crystal controlled receiver manufactured in the 1970s.

Why does John want ACT-R1 receivers? John answers, “While I own many scanners, I still find that I miss some critical traffic at the most inopportune times. Therefore, I prefer single-channel receivers. My daughter is a captain with a county fire department here in central California, and I prefer to keep an eye on her, especially during fire season.”

John continues, “Typically, I add a C.O.R. [carrier operated relay] to the receiver (a simple DC amplifier) and light a panel-mounted light when the particular frequency becomes active. My setup is similar to the traffic news position at the original KNX Radio news room, which was profiled in two or three issues of RCMA news in the olden days.”

“Scanners work okay for me for casual listening, but I prefer dedicated receivers for the really ‘hot’ stuff.” For example, John uses a 960 MHz receiver to monitor the highway patrol’s down-link from a remote base on a nearby mountain top. This permits him to hear the car traffic via 960, without relying on the low-band direct path.

John has been monitoring for a long time – “since before scanners were invented,” he writes. His original public safety receiver was a converted Motorola 5V.

John characterizes his supply of state-of-the-art radios as “fairly meager.” They include an ICOM IC-R7000, IC-R70, IC-R10, IC-32 walkie-talkie, IC-900A, and a Yaesu FRG-100A.

John writes, “Everything else is in the ‘boat-anchor’ league, i.e., [Motorola] Micors, Motrans, [GE] MVPs, Uniden 8100s, and my trusty Collins 5113, Hallicrafters SX-43, S-20R, and Hammarlund HQ-129X. I still have a special place in my heart for radios that glow in the dark!”

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When I browse the Internet I am always attracted to programs with monitoring sounding titles. Sometimes I come up with programs that are no way connected with radio monitoring. Other times the results are so narrow only Ham radio operators looking to win a specific contest would be interested. But sometimes, just sometimes, my diligence pays off.

The one we will look at this time has the nondescriptive name of MixW and has a butterfly for its icon. Neither the name nor the icon exactly elicits excitement in radio users. But MixW version 2.12 can do some amazing things for radio monitors.

◆ What’s In a Name?

The MixW Help file states, “MixW stands for a Mixture of different modes.” This program was designed for Hams and has the capability of receiving and transmitting a number of modes without the need of a TNC (terminal node controller) or decoding/encoding box between the radio’s audio and the computer. MixW version 2.12, which we will be looking at this time has the nondescriptive name of MixW and has a butterfly for its icon. Neither the name nor the icon exactly elicits excitement in radio users. But MixW version 2.12 can do some amazing things for radio monitors.

◆ Is There More?

You bet there is. Although pretty impressive as a decoder/encoder, MixW does much more, such as receiver control logging and multi-channel monitoring and analysis. So you think MixW might be worth a look from a monitoring perspective? I thought you might. So let’s start at the beginning with MixW’s computer requirements.

To use MixW you’ll need a computer running Windows 9x, ME, NT, 2000, or XP operating system, and a compatible sound card. That’s it. I’m running it just fine on my old HP Pavilion 3266 Pentium I 233MHz machine, with 128 Meg of RAM using Windows 98 second edition.

A 15 day trial version is downloadable from http://mixw.net. The program is about 2.5 Meg in size so be prepared to wait a bit if you connect to the Internet via dial-up. We will use a full registered version for this column. It is registered under my old Ham call WB2DUL, a ticket I received when I was thirteen years old and dinosaurs walked the earth.

Today we will use MixW to control a little ICOM IC-R10 via a homemade interface. The audio from the R10 will be used for decoding via the computer’s sound card.

◆ Up In Less Than 5

Once downloaded the program installed itself automatically, quickly and without a problem in less than two minutes. Clicking MixW’s butterfly icon, which will be installed on your Windows desktop, will bring up Figure 1.

Near the top right of Figure 1 you can see that we have tuned the R10 to 3.580.034 (MHz) and are in the CW mode. Fine-tuning is as easy as moving the cursor to the arrows under the frequency and clicking the mouse. Clicking the right arrows increases the frequency, while clicking the left arrows decreases it. The tuning step is set from the “Configure” drop down menu at the top. Then clicking the “TRCVR CAT/PTT” menu brings up the tuning step setting.

Tuning to a Ham band is done quickly via the drop down menu arrow to the right of the frequency. Alternatively, you can type the frequency right into the box via the keyboard. And if that’s not enough, just tune the radio manually and it will be reflected on the screen.

◆ The CAT’s Meow

While we are on this menu I should point out that this is also where we choose the radio that the CAT (Computer Aided Tuning) will control. Many different radios are supported by name. However, ICOM radios that are not specifically named, such as the R10, can be controlled by first selecting ICOM. Then select “Other” as the radio. Finally the ICOM set address of the model is entered. For the R10 this address is 53 in hexadecimal. Of course, the proper level converter is...
required to connect the radio to the computer. I found some great interface construction websites for ICOM radios at http://waldheim.at/wienerwald/550826/deutsch/icom_d.html. For other radios check this website  http://www.qsl.net/k1rr/control.html

◆ The Real Deal

Take a look at the lower section of Figure 1. Here we can see a graph of signals stretching across a frequency range, in this case 3.578 to 3.582. The peak in the middle is a CW signal. Decoding CW is very easy. First click the drop down Mode menu at the top of the screen. Then set the mode to CW.

Now look at the spectrum display. At the top of this display is a small blue “flag”. You will have to look very closely to see the flag in Figure 1. Now drag the small flag to the peak of the signal you wish to decode.

◆ Reading the Mail

Once you do this, decoded Morse code will be displayed in the area above the spectrum. Here, in Figure 1 we can see the actual identification “DE (this is) W1AW” which is the American Radio Relay League’s station in the state of Connecticut in the USA. This is one of their code practice sessions that is broadcast daily in a number of the Ham bands. Check their website http://www.arrl.org for times and frequencies.

The decoder performed very good even in a noise (QRM) environment. The only comment I have is that it doesn’t space words well. Perhaps this can be adjusted via one of the many, many features that I have not yet discovered.

◆ As Easy As RTTY

Figure 2 shows MixW decoding RTTY from a weather METEO station on 10.100.780 (MHz). In the received message area above the spectrum graph we can read that this is METEO weather station SIVX27. Figure 2’s spectrum display shows the two peaks corresponding to the two RTTY tones. RTTY stations are tuned to in a manner similar to CW. However in the case of a RTTY signal the flag in the spectrum display is dragged to a frequency equally between the two peaks.

Now we look at the line at the very bottom of the screen. You probably cannot see it in Figure 2, but this line is an active menu line. We can access the RTTY Settings screen by clicking on the baud rate and shift at the bottom of Figure 2. The resulting screen, Figure 3, allows the user to adjust the Shift, Baud rate, sense and other RTTY decoder parameters.

The user can also select the character set to be displayed including English, Russian, Swedish and others.

Start the process by selecting a shift so that the two lines in Figure 2 match the peaks. Here the correct shift is 183 Hz. Setting the correct Baud rate is more of a hit and miss activity, along with the “Inverted” sense parameter. But as you can see, the effort is well worth it. Once the correct parameters are set the RTTY copy was rock solid, even on weak signals.

◆ Logging In MixW

Again looking to Figure 2, the area above the message area is the logging display area. Each row represents a different logging. MixW automatically enters frequency and time entries into the log line. Other details are manually added to the log by click the “QSO Details” icon. This icon looks like a sheet of paper with an “A” on it and is located below and to the left of the Log area. Figure 4 then appears.

Here you can see that we have added some station details. From the call that we entered, SIVX27, the program determined that this is a Swedish station. This, of course, is based on Ham radio call sign conventions. But in this case I think it is correct. The logging section could use a bit of work to make it more monitor friendly.

◆ What a Ham! Not Really

We have not even touched on many of MixW’s capabilities – for example, the many other decode modes and log searching features. Not bad for a program that’s “just for Hams.”

MixW performed great without any surprises. The Help file is very basic but adequate. The on-line registered version of MixW 2.12 will cost you $50 in the US. I think it is well worth a look if you have a CAT capable radio. The fifteen day trial version is free at http://www.mixw.net. So what do you have to lose? Words of free advice to the makers of MixW …change the name!

Next time we’ll dig deeper on the internet, ignore their names and find some more programs that have been written with you, the radio enthusiast, in mind.

◆ Video Piracy

Video Piracy has everything you need to know about video piracy. Satellite, Cable, Videotape, DVD, etc. ISBN 0-97030992-4-4 Only $18.95. Free info 954-432-7943 ScramblingNews.com
Monitors who are consistently successful in monitoring the HF spectrum will tell you that their success is the result of their antenna systems just as much as the receiving equipment they use. The old adage “the more metal, the more signal” is the best formula for success. Those living in an apartment or condo know that not being able to put up an outdoor antenna can be a real hindrance to monitoring the HF radio spectrum.

The only real solution to this problem is to use one of the active HF antennas in the market. And while these antennas do perform well, they have their own set of problems that they bring to the listening equation.

First, noise loves antennas that are vertically polarized. If you want to see exactly how much noise you really have in your neighborhood, switch your HF antenna over from horizontal to vertical polarization. The difference can be startling.

Second, to make up for the smaller capture area of most active antennas versus a full size longwire or dipole, the active antenna uses an amplifier (the “active” portion of an active antenna). That amplifier not only amplifies stations you want to hear, but amplifies any noise at the same rate. If noise was an issue at your location with a vertical, it will be an amplified issue with an active antenna.

There is no easy answer to the noise problem, but the AOR WL-500 Window Loop goes a long way towards reducing some of the noise issues we have seen with other active antennas in the marketplace.

**The WL-500 Advantage**

During our test of the WL-500 we used it on a several receiver models, including the venerable Sony 2010 portable. My local shack RF environment tends to get a bit noisy at times with computer and television interference being the primary culprits. And while noise was still an issue using the WL-500, having the ability to turn and null out some of that noise was a definite plus. Compare that to some of the other active antennas on the market that only use an omnidirectional vertical whip antenna, and you realize that the WL-500 might be just the ticket for monitors who can’t put up outdoor antennas.

We took the WL-500 out of my shack environment and hiked into the woods with the 2010. Our noise issues disappeared and really let the WL-500 shine. The 16dB amplifier really helped pull out some nice DX on the 2010. The portability of this antenna will be especially appealing to the camper and traveler alike. Assembly was a snap and took about a minute and a half to accomplish.

**Quick Setup**

The loop is constructed of flexible twin cable braced by a center pole which splits into two sections so that it can be easily stored away. When set up, the loop forms a diamond shape with an approximate diameter of 23.6 inches (60cm). The loops covers 3.5 to 30 MHz with a range switch mounted at the termination point of the loop (switching at 10 MHz).

A length of screened cable is supplied, which is terminated to a RCA Phono plug to connect the loop to the control box. The control unit provides preselection and amplification terminated in a BNC socket for connection to the receiver. The unit exhibits good, strong signal handling characteristics.

The WL-500 can be powered using an internal 9VDC battery (battery consumption is around 16 mA) or an external 12VDC power source (not included) using the 1.3mm power socket.

While the WL-500 will operate below 3.5 MHz, performance in the medium and longwave portions of the bands will be enhanced if used with the optional 500LM bar element.

If you are looking for an excellent travel or camping shortwave antenna and space/weight is a consideration, then the AOR WL-500 should be on your short list of antennas you should consider for the task. The WL-500 sells for $198.95 plus shipping and is available from Grove Enterprises (ANT24).
nighttime openings on periods with higher flux levels. Because we are well into the decline of the current solar cycle, Cycle 23, I don’t expect a lot of long-range DX on the highest HF bands. Some sporadic-E will make reception of signals possible, though.

Twenty-five through 31 meters will be fairly good in the evenings and mornings. At night, those paths that remain open may be marginal. During periods of low geomagnetic activity that I expect this summer (we get less solar storm activity during the years closer to cycle minimum), this band may offer long distance DX all through the night. The most reliable band for both daytime and nighttime should be a toss-up between these two bands.

Forty-one and 49 meters offer domestic propagation during daylight hours and somewhat during the night. The tropical bands (60, 75, 90, and 120 meters) are not noticeably affected by the solar flux, but are degraded during geomagnetic storminess. Through the summer, expect these bands to be more challenging, though less this year, due to the geomagnetic activity levels expected. Look for Europe and Africa as far as possible during periods of intense sporadic-E ionization.

In addition, conditions for tropospheric ducting begin to form over wide areas of North America, and the Atlantic and Pacific Oceans. Watch for ducted high-pressure weather cells that produce conditions favorable for VHF DX. Stalled high-pressure weather cells, with pressures reaching above 1025 millibars, are known to cause ducting of VHF radio signals. When ducts occur, VHF radio signals may propagate through these ducts far beyond the normal line of sight distances.

Tropospheric ducting forms each year between Hawaii and the U.S. West Coast, and from San Francisco to Los Angeles, Denver to Dallas, Texas to Florida, the Great Lakes to the eastern seaboard, from the Great Lakes to Texas, Nova Scotia to Miami, and from the Midwest to the Southeast.

Advanced visual and infrared weather maps can be a real aid in detecting the undisturbed low clouds between the West Coast and Hawaii or farther during periods of intense subsidence-inversion band openings. This condition occurs also over the Atlantic. There is a great resource on the Internet that provides a look into current conditions. Bill Hepburn has created forecast maps and presents them at http://www.iprimus.ca/~hepburnw/tropo_xxx.html, which includes maps for the Pacific, Atlantic, and other regions.

Write Me
Do you have questions about space weather and radio propagation? Do you have observations about Aurora, Sporadic-E, or Meteor Shower propagation that you would like to share? Please write me an e-mail message or a letter.

I also invite you 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. I wish you a happy radio-monitoring season!

73 de NW7US, Tomas Hood
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(P.O. Box 213, Brinnon, WA 98320-0213)
Audio Amplifiers You Can Build

By Carl Herbert AA2JZ

The secret to being able to create working circuits, is by building, building, and more building! The more familiar you are with a variety of circuits, reading schematics and identifying parts, the better builder you will become. Here are circuits that are easy to build, and you can use one of them in your next project. Try one!

New builders are often intimidated by schematics presented in various magazines and books. The exotic looking circuitry has the tendency to “scare away” neophyte builders. The number of parts used to create them or the technical descriptions describing them can sometimes be intimidating.

Here are two easy to build audio amplifiers and a basic description of what the parts and their functions. Even the most inexperienced builder can complete and enjoy these circuits. Most of the parts can be found in the most frugal “junk box,” or can be purchased from the local parts source without excessive expense.

There is ample space on a Radio Shack RS 276-148 circuit board for the audio amplifier created using the LM386. This style of board is good for the new builder. It provides adequate space for parts, has side labels making identification of pin numbers much easier, and can be reused if desired. Just don’t allow your soldering pencil to put too much heat on the pads. They will remove themselves from the board if too much heat is applied.

The second circuit, designed by Jim Kortge, will require a larger board, such as RS 276-1499 or similar. I constructed these using “Modified Ugly Construction” techniques, also known as “Manhattan Style.” The soldering locations are small pieces of circuit board stock cut and placed on the base “ground plane” using an adhesive such as “Crazy Glue™.”

Not familiar with “Manhattan Style” construction? More information about this easy method of circuit construction is available on my website.3

“Old Faithful”

The first amplifier utilizes the reliable device known as the LM 386 (RS 276-1381).

The LM386 is a packaged audio amplifier, requiring only a few external parts to make it fully functional. This eight pin device has been the final audio amplifier in many QRP kits of recent years. The output from it is about 1/2 watt of audio, and will easily drive an 8 ohm speaker or headphones. See Photo A and Figure 1 for a photograph of the basic circuit and the schematic drawing.

Pinout diagram for the LM 386 Chip

There are numerous variations of this schematic, all based on the audio amplification provided by the LM386 chip. The components used in the circuit below, enable the chip to perform its function. R1, a 5K (5,000 Ohms) potentiometer, is a panel mounted variable resistor and does not show in Photo A. It is used to adjust the amount of low level audio allowed to enter the device for amplification. Often it is labeled “volume control or gain” on the front panel of a receiver.

Figure 1: The LM386 Audio Circuit

A second method used to manufacture capacitors is by creating multiple common plates of conducting material, one set for the positive and one set for the negative, and separating them with a dielectric. Picture this by holding your two hands in front of you, fingers spread apart. Now mesh them together, but leave an “air space” between each finger. The plates (fingers) on the left are one set of plates, and the fingers on the right are the other set of plates. The air space represents the dielectric material. Greater capacitances in a small space can be achieved using this method.

C3, a 10 µF electrolytic capacitor between pins 1 and 8, is used to connect portions of the internal amplifier sections to create additional gain. C7, the 220 µF capacitor is the “output coupling capacitor.” It con-

84 MONITORING TIMES July 2004
nects the speaker to the device while isolating the device from the ground connection of the speaker (or headphones).

R2, the 100Ω resistor, (omega being the symbol for Ohms) adjusts the input DC voltage (sometimes labeled as Vecc) to a level more usable by the device. C4 and C6, the capacitors next to it, provide a path to ground for stray noise that could be “hitching” a riding on the DC potential. They are called a “filter capacitors.” C4 also provides a measure of regulation of the DC voltage by charging and discharging in proportion to the variations that could be happening to the input voltage.

R3 and C6 are attached to pin #5, the audio output pin. Their function is to develop the audio output level, while isolating the pin from ground.

Variations (additional components) can be found in other publications. These adaptations are to increase gain, obtain a more stable operation, less operating noise, etc. They all begin with the basic circuit.

A More “Exotic” Circuit

The next figure, Figure 2, uses NPN transistors and an output transformer to provide audio amplification. Photo B is a picture of the completed circuit.2 Again, the volume control is panel mounted and does not show in the picture.

Don’t let this circuit intimidate you!

I like to begin construction from the output of the transformer and proceed to the volume control at the other end. Try to make your circuit board as “symmetrical” as possible. That is, make your circuit “look” like the schematic as much as is possible. The output leads from the transformer (RS 273-1380) red and white, are on the outer edge of the board. These are attached to the speaker tabs. The three input leads—yellow, black (center tap) and green—are towards the main part of the board.

The two NPN transistors feeding the input leads of the transformer, Q3 and Q4, are placed immediately following the transformer leads. Resistors can be placed “on-end” to save space. Q1 and Q2 provide low level amplification for Q3 and Q4.

NPN transistors are used in the circuit. These transistors are created having a “P” type material sandwiched between two layers of “N” type material. The schematic calls for PN2222 units. These aren’t the only devices that could be used here. 2N3094, NTE-123, 2N2222, MPS… (or any transistor that converts to NTE-123 as a low level audio amplifier) will work well in this circuit. Just be careful to use the correct “pin output” of the device you have to work with. The ones listed above all have the same “pin output.” That is, while looking at the flat side of the device, with the legs pointing downwards, the Emitter is on the left, Base in the middle and Collector is the pin on the right.

Hey! It Works!

These are “easy to build” circuits, and are a great way for the novice builder to practice building skills, and can result in a working audio amplifier to be use in your next receiver project. Wires should be dressed neatly to aid in finding any troubles you have. I use red wire (RS 278-501) for voltage lines and red (RS 278-502) for the audio connections. To make the ground connections, I use either RS 278-1341, pre-tinned solid bus wire or snippets of the red or white wire with the insulation removed. The colors aid me in identifying circuit wiring after construction is completed.

Either circuit could be the audio amplifier section for your next project. To test the amplifier, first check your wiring for errors and then check it again. When you are satisfied that all is as it should be, attach negative lead (-) to the ground leg and a positive (+) lead to the Vecc leg and apply power (12 vdc). Unless there appears to be a wiring error (usually denoted by the appearance of smoke), touch the circuit tab on R1 with your finger. You should hear a low audio hum from the speaker. If not, remove the power from the circuit and go back through the schematic, comparing it to your work, while checking for mistakes.

Poor Boy Audio Tester

Lacking an audio generator to check the operation of your circuit, your pocket portable radio will also serve double duty as a generator. Remove the outer cover exposing the speaker and its connecting wiring. Turn on the battery powered radio and select a station. Adjust the radio for a low audio output. Connect jumpers from each of the tabs on the speaker in the radio and attach the one attached to ground to the ground lead, which is often a black wire (R1 bottom) of your circuit, and the other, which can be any color other than black, to the audio input (R1 top). Apply power to your new circuit and adjust the volume of R1 to a comfortable level.

“Finis!” There you have it! Two audio circuits that aren’t difficult to build and can become an integral part of your next project.

Perhaps next time we can attach more circuits to the amplifier and be on our way towards a working receiver!

Happy building!

Acknowledgements

[1] LM 386 amplifier circuits are found in many publications today. I can’t claim to be the author of these circuits. They have been published in countless periodicals, etc.

[2] K8IQY, Jim Kortge, designed this circuit which was originally used in the first “2n2/40” rig in 1998, and published in the Winter Issue of QRP Magazine. He also used this circuit in his 2n2/30, “A 30 Meter CW Transceiver,” as published in the “Atlanticon 2003 QRP Forum,” March 29, 2003. Jim and N2APB, George Heron, the publisher of the “Forum,” kindly give their permission to include this circuit in this article.

[3] Visit my website at http://www.geocities.com/oghmcarl, and select “articles I have written.” (OGHM is what my offspring chose to call me, Old Gray Haired Man. Oh well.)

This is your equipment page. Monitoring Times pays for projects, reviews, radio theory and hardware topics. Contact Rachel Baughn, 7540 Hwy 64 West, Brasstown, NC 28902; email editor@monitoringtimes.com.
In the event of any kind of power outage, whether it is caused by weather, terrorism or other civil misadventure, it's a good bet that government entities will use local AM and FM radio stations to communicate with the populace. So naturally, every household will want a radio that can receive those stations even when the power is out. The ability to receive at least some shortwave stations would be useful as well, and so would a flashlight. In a perfect scenario, you would have all that without having to worry about batteries.

That's exactly where the Freeplay Plus radio from C. Crane Company comes in. The Freeplay Plus does not require batteries to provide you with virtually endless hours of radio and light during a power failure or at any location where power is not available. Weighing five pounds and measuring 11" W x 8" H x 8" D, the Freeplay Plus offers AM, FM and shortwave (3.0-18.1 MHz) radio reception and a magnetic, detachable flashlight with three white light emitting diodes and a six-foot reel-up cord.

What really sets the Freeplay Plus apart is that it has a three-way power system. We'll get to that in just a moment, but first let's take a guided tour of the Freeplay Plus.

On the front panel, at the extreme left is a 3.5-inch speaker behind a metal grill. To the right of that is a sliderule tuner for AM, FM, SW1 and SW2. Below that is a large tuning knob, and to the right of that is an ON/OFF/VOLUME knob. Further down the face of the radio is a knob for fine tuning shortwave reception.

On the right side of the Freeplay is a switch for selecting which radio band to receive (AM, FM, SW1 or SW2). Below that is a socket for plugging in an optional AC adaptor, and below that is a headphone jack.

On top of the radio is a large plastic carry handle, a switch for the LED flashlight, a solar panel, and a telescoping whip antenna. On the back of the Freeplay is a crank.

**This'll Give You a Charge**

Now, getting back to the three-way power system: flip out the crank and give it about 60 turns, and a clockwork generator puts out enough electricity to power the radio and the flashlight. Turning the crank requires some effort, but certainly a medium-sized kid could do it. Alternatively, place the radio in bright sunlight, and the solar panel provides enough juice to power the radio.

Finally (and here's the really cool part), the Freeplay Plus is equipped with a rechargeable NiMH battery back that you can charge up (1) from the crank – just wind the crank and let it run without turning on the flashlight or the radio, but it will take a lot of windings to fully charge the battery,

(2)from the solar panel – place the radio in direct sunlight for a full day, or

(3) from an optional AC adaptor – it takes about 12-15 hours to charge.

When the battery pack is fully charged, it will run the radio for about 40 hours.

**Pleasurable Listening**

I truly enjoyed listening to local AM and FM stations on the Freeplay Plus. I had no problem tuning them in, and I was surprised at the richness of the sound from the speaker. Tuning shortwave stations is more difficult because of the slide rule tuning; there's a mark at, say, 5 MHz and another at 6 MHz, and nothing in between to tell you exactly where you are. I found, nevertheless, that I could "band-scan" by tuning slowly with the main tuning knob and tweaking the reception with the fine-tuning knob. While I would turn to other radios for DXing, it sure is nice to have shortwave capability that doesn't require batteries or plug power!

In addition, I found the 3-LED flashlight is more than adequate for navigating a darkened house or campsite, and it is tremendously reassuring to know that you don't have to worry about running out of batteries.

A couple of notes: C. Crane says the crank mechanism should be good for 10,000 windings and the NiMH battery pack should last for five years and is replaceable. Just remember to fully charge it once or twice a year.

So, would I recommend the Freeplay Plus for your household's emergency preparedness plan? In a heartbeat. It has worthy AM and FM, with shortwave as a bonus, plus an LED flashlight, with solar and crank power to free you from batteries and the power grid. In addition to its emergency capabilities, you'll find the Freeplay Plus works very well as a radio for camping, trips to the beach, or just working in the yard.

The sale price of the Freeplay Plus is $109.95. For more information call C. Crane at 1-800-522-8863 or visit http://www.ccrane.com.
Did your antenna system survive the harsh winter weather?

Do Your Signals Seem a Little Weak?

It's Time to Upgrade Your Reception with These Fine Grove Products!

### Grove OMNI II

Designed by Bob Grove, this exclusive Grove product offers 25-1300 MHz coverage; lightweight, compact design, high performance, and low cost! Designed especially for wide-area metropolitan listeners, the 68" Omni can be mounted on a mast, in an attic crawl space, against a wall—just about anywhere convenient.

**BONUS FEATURE:** Although the Omni is essentially non-directional, a metal mast gives it useful directional properties. Overload interference from paging transmitters, weather stations, FM or TV broadcasters, or other sources may be reduced or eliminated when positioning the antenna on the mast at the time of installation! Similarly, a distant, weak signal may be peaked by the same technique!

Balun transformer with F connector, offset pipe, mounting hardware and full instructions included.

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### THE SCANTENNA

This omnidirectional scanner antenna will equal or outperform any competitor on the market. Its dipole-cluster design utilizes broadband techniques to provide continuous frequency coverage from 25-1300 MHz, offering superb reception of public safety, civilian and military aircraft, hams, personal communication devices, maritime, CB—anything in its frequency range!

- Approximate size 7-1/2’H x 4-1/2’W.

**SPECIAL:** Now includes 50’ of coax cable plus Motorola and BNC connectors!

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### Grove Skywire Dipole

High performance and low cost—an unbeatable combination! Why restrict your frequency coverage with the gaps found in expensive trap dipoles or unpredictable random wire when you can get unsurpassed full-frequency reception with the Grove Skywire? Comes assembled with Budwig center connector ready for your PL-259 (UHF male) equipped coaxial cable (50 or 75 ohms); includes two professional porcelain end insulators and complete instructions.

**HAMS!** Ideal for transmitting when used with a transmatch. (1.8-30 MHz at up to 250 watts)

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### SCANNER BEAM II

A standard of unexcelled performance for more than 20 years, our world-renowned Scanner Beam has been improved to provide better directivity!

- Ideal for 30-50 MHz low band reception, 54-800 MHz FM Broadcast and TV, 108-137 MHz aircraft, 137-174 MHz high band, 225-400 MHz military aircraft and satellites, 406-512 MHz UHF, and 698-960 MHz extended microwave mobile.
- The major lobe pattern is directional from 100-900 MHz, non-directional outside of that range.

**HAMS NOTE:** The Scanner Beam can be used for transmitting up to 25 watts on VHF/UHF with the following average VSWR: 50 MHz @ 1.9:1, 144 MHz @ 3:1, 222 MHz @ 3:1, and 430 MHz @ 1.5:1. 50-72 ohms nominal impedance.

- May be used with inexpensive TV antenna rotator or fixed in favored direction. Local signals still come in loud and clear from all directions. Balun transformer, offset pipe and all mounting hardware included (requires TV type F connector on your coax).

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### Professional Wideband Discone

The discone antenna is used by government and military agencies worldwide because of its wide bandwidth characteristics and non-directional coverage. Now Diamond offers a professional grade discone at a popular price.

- Designed for use with wide-frequency coverage VHF/UHF scanners and receivers, the Diamond DI30J discone consists of 16 rugged, stainless steel elements and is capable of transmitting up to 200 watts in the amateur 50, 144, 220, 432, 900, and 1200 MHz bands.
- As a receiving antenna, the D1303 is omni-directional for continuous 25-1000 MHz (and above) coverage. A base-loaded, vertical top element is used as a low band (30-50 MHz) frequency extender.
- The elements are arranged on a 24-inch support pipe equipped with two strong mounting brackets to accommodate any standard mast-pipe (1”to 2-1/8” diameter).

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### Additional Products

- CBL 50 50’ RG-6U  | $19.95* |
- CBL 100 100’ RG-6U | $24.95* |

*Plus $3 shipping

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**Call Today!**
What's New at Uniden

In a recent interview with Monitoring Times, Uniden's Product Manager Mr. Paul Opitz announced five new scanner models that will be added to their product line between now and the end of this year.

**BC-898T**

Uniden's newest scanner, the BC-898T, is almost identical appearance to the scanner it is replacing – the BC-895XLT. But looks are deceiving, and it is what is under the hood that truly separates these two radios in performance.

The 898T is a base/mobile scanner, memory channels, organized in 10 banks of 50 channels each and 1000 talk group channels. The BC-898T uses TrunkTracker III technology which allows the user to track the following trunk systems: Motorola Type I, Type II, Type III, Hybrid, SMARTNET™, and PRIVACYPLUSTM analog trunk systems, EDACS (including EDACS SCAT - Single Channel Autonomous Trunking), and LTR analog trunk systems. The BC-898T will not decode APCO-25 digital communications nor can it be upgraded for digital.

The BC-898T provides reception coverage from 29-54 MHz, 108-174 MHz, 216-512 MHz, and 806-956 MHz (less cellular). The scanner has 17 preprogrammed service search bands (including the NOAA Weather Service Band):

- 25.0-27.995 MHz Citizens Band/Busines Band
- 28.0-29.995 MHz 10-meter Amateur Band
- 30.0-49.995 MHz VHF Low Band
- 50.0-54.995 MHz 6-Meter Amateur Band
- 137.0-145.995 MHz Military Land Mobile
- 144.0-147.995 MHz 2-Meter Amateur Band
- 148.0-174 MHz VHF High Band

- Above frequency ranges searched in 5 kHz steps

- 108.0-136.975 MHz Aircraft Band
- 216.0-249.975 MHz HF High Band
- 225.0-299.975 MHz UHF Air Band
- 400.0-419.975 MHz Federal Land Mobile
- 420.0-469.975 MHz 70-cm Amateur Band
- 450.0-469.975 MHz UHF Standard Band
- 470.0-512 MHz UHF
- 806.0-823.975 MHz "800" Band Mobile
- 850.0-956.975 MHz "800" Band Base
- 895.0-956.000 MHz "800" Band

- Above frequency ranges searched in 12.5 kHz steps

Published specifications indicate that the radio will have a scan rate of 100 channels per second in conventional mode. Scan delay fixed at two seconds. The BC-898T features six level signal strength meter, and a rotary tuner/knob for either channel or frequency selection. Instant decoding of CTCSS (50 tones) and DCS (104 tones). CTCSS and DCS detection can aid scanning in several ways, allowing you to identify specific CTCSS or DCS tones if present, and the ability to search or scan by a specified tone.

Some of the other published features include a RS-232 DB9 PC interface, display backlight, priority scan, trunk scan and search, one-touch weather reception, SAME weather alert, AutoStore and much more. The case style and basic operation of the BC-898T remain unchanged from the previous model.

Pricing for the Uniden BC-898T was not established at press time, but check your favorite dealer for price and availability.

**BC-246T**

The next Uniden scanner that the consumers will see in the marketplace, probably in the fall, will be the new BC-246T TrunkTracker III handheld. While this radio is designed to replace the older second generation BC-245XLT, it doesn’t even come close to it in looks or performance. To quote Mr. Opitz, "The BC-246T is truly a revolutionary development in scanner technology, equivalent to when microprocessors were first put in radios."

Two features will make this radio stand head and shoulders above the rest. The first is Dynamic Memory Management – the BC-246T will have no banks! The radio will have a set number of memory locations that will be used to program frequencies, alpha tags and talk groups. This will allow the user to be completely flexible in programming trunk systems, conventional frequencies, and talk group IDs.

The second feature is guaranteed to draw scanner enthusiasts to this radio en masse – a revolutionary approach to scanning that Uniden has dubbed Close Call™ RF Capture Technology. While the details have not been fully released at press time, think of “Close Call” as a built-in, monitorable frequency counter incorporated in your new BC-246T.

Preliminary specifications for the BC-246T include:

- 0 Scan Banks using Dynamic Memory Management, up to 3300 memory channels (1600 typical if alpha tagging used on all channels). Programmed systems limited only by scanner memory
- 12 Preprogrammed and 10 Custom Search Ranges
- Preprogrammed with emergency dispatch channels for over 400 towns, cities, and counties
- 25-54, 108-174, 216-225, 400-512, 806-956 and 1240-1300 MHz coverage (excluding cellular)
- Close Call™ RF Capture Technology
- AA Battery Operation (no proprietary rechargeable battery packs)
- Alpha Tagging on a two-lined alpha display
- Backlit Display
- I-Call, Emergency Alert, Trunk Search, ID Blockout
- Internal Battery Recharging
- Internal Memory (5000 memory channels, 125 memory banks)
- PC Programming and Control (software extra)
- Scan, Single Frequency Search, Instant Search, Hypersearch: 300 steps/second
- AA Battery Operation
- One-Touch Weather
- AA Battery Operation
- Scan, Single Frequency Search, Instant Search, Hypersearch: 300 steps/second
- Priority Scan
- One-Touch Weather
- AA Battery Operation

According to Opitz, as noted above, all three of these radios will have some version of their new Close Call™ RF Capture Technology system incorporated within their design, and the BC-230 will also include a version of their new Dynamic Memory capability.

With the exception of the BC-898T, which has already been FCC type accepted and is in production, the four handhelds described above are still in development. Therefore specifications and features are subject to change.

- Larry Van Horn, N5FPW

**Icom IC-R20**

The Icom IC-R20 is an extremely wideband handheld receiver with frequency coverage from 150 kHz to 3305 MHz (less cellular in the U.S.). Reception modes are SSB/CW/AM/FM/WM, with CTCSS/DTCS/DTMF decode functions. It comes with a telescopic BNC antenna, but a ferrite antenna is built-in for medium-wave recep-
tion.

The R20 has a number of scan modes; the fastest is 100ch/sec in VFO mode. It also features Voice Scan Control, to help avoid stopping on data channels while scanning. Dual watch capability is available in specific bands, allowing simultaneous monitoring of two channels. The bandscope function shows active channels within a specified bandwidth (from 1kHz to 100kHz) both visually and audibly while sweeping.

1250 memory channels include 1000 memory channels, 25 scan edge, 200 auto-write scan (Max. 100 channels x 18 banks). Some channels are preprogrammed - TV Audio channels, weather channels (in U.S. versions), and popular shortwave frequencies. The large bucklit 2-line dot-matrix LCD supports 8 character alphabets.

Amazingly, in a receiver this size, the R20 also offers an audio recorder built-in with selectable recording times of 1, 2 or 4 hours! The lithium-ion battery allows long operation, and can also be charging while in use. PC control capability (CT-V) is available via the optional CT-17 cable and CS-R20 software CD.

The R20 comes with Telescopig Antenna, Belt clip, Battery spacer, Hand strap, Battery pack, and AC adaptor. This sophisticated receiver is expected to be available soon, with a street price of around $520.

ARRL's Vintage Radio

When people ask me in the genealogy classes I teach why they should compile their family history, my answer is simple. "How do you know where you are going if you don't know where you came from?"

I had the same sort of feeling when I reviewed a new American Radio Relay League publication called ARRL's Vintage Radio - articles about the lure of vintage Amateur Radio gear which were published in QST magazine.

Compiled by ARRL Staffer Steve Ford, WB8IMY. Vintage Radio lets you revisit the ham radio of yesteryear in a collection of articles describing vintage equipment and restoration. Included are personal experiences and interesting points in the history of Amateur Radio that will evoke a sense of nostalgia.

This collection covers vintage radio articles published between 1977 and 2003, and includes three year's worth of "Old Radio" QST columns by John Dilks, K2TQN. A selection of classic QST advertisements from the '20s through the '70s rounds out this fascinating look back in time. You will also enjoy ads from Collins, Drake, Heathkit and more.

ARRL's Vintage Radio (ISBN: 0-87259-918-3) $983 is a softcover book with 192 pages. Published by the American Radio Relay League, Inc. it can be ordered from the ARRL website (http://www.arrl.org), on their toll-free telephone line 1-888-277-5289 (Outside US +1-860-594-0355), or via snail mail at ARRL Publication Sales Department, 225 Main Street, Newington, CT 06111-1494 USA. Order ARRL catalog number 9183 - $19.95 plus shipping.

-- Larry Van Horn

Radio Propagation - Practice and Principles

By Ian Poole

A knowledge of radio propagation is vital for anyone associated with radio communication technology. Radio Propagation - Principles and Practice addresses the fundamental principles of radio signal propagation as well as the practical application. It provides a fascinating description of all the relevant information about radio propagation from HF to VHF, UHF and beyond, enabling the reader to be able not only to understand the underlying principles, but also be able to have a practical understanding of them so that he or she can use them to their best.

Written in Ian Poole's easy to read and understand style, the book provides a comprehensive description of everything that is needed to grasp the essentials of radio signal propagation, starting with radio waves themselves and how they travel. The book then describes the environment in which they travel around the Earth, detailing how it affects them. The Sun, its make-up and how it affects the upper layers of the atmosphere (the ionosphere) are all described in some detail along with the ionosphere itself.

Ionospheric modes of propagation are comprehensively explained as are the effects of solar disturbances on the ionosphere. An understanding of how to predict what conditions may be like is given along with a brief overview of propagation prediction programs. Other modes such as tropospheric propagation, meteor scatter, and satellite communications are also discussed.

Radio Propagation is 112 pages, published by the Radio Society of Great Britain in paperback form. It is available from the RSGB for GBP14.99 or from the ARRL (see contact info above), though it was not yet posted on their web page at press time. For more information refer to Audio Communications websites at http://www.audio-communications.com and also to h t t p : / / w w w . r a d i o - e l e c t r o n i c s . c o m

Quebec Radio Scanner CD

Canadian scanning hobbyist and ham radio operator Gilles Thibodeau (VE2KG) has updated his Quebec Frequency Directory for 2004. This information packed volume of scanning and ham radio related information is presented on CD-ROM. The target readership for this volume is the Quebec market in French-speaking Canada, although Gilles makes an attempt to appeal to French and English speakers alike. "Chapters" are organized as folders containing data, programs, PDF files, and images. Major topics include a substantial number of scanner and amateur equipment modifications (in English and French), amateur radio information such as the Canadian amateur callsign list and Morse code programs; 10 Codes for Quebec and nearby areas: electronic circuits, projects and schematics; ACARS information and programs, shareware and more. There is even an electronic catalog for a popular brand of semiconductors on the disk.

Changes since the previous edition include expansion of the section on trunking, especially the new Quebec Police Force trunk system, and supporting information about the Uniden BC780XLT scanner for those hobbyists who need to upgrade to follow local trunk systems.

The main feature of the CD is the frequency database. Over 14,000 frequencies are listed covering emergency services, Quebec provincial and federal police forces and trunking systems, as well as frequencies from nearby New England states. Files are in DBF format and can be searched using the enclosed software, or imported into commercial software supporting the DBF file format.

The CD is available by mail order ($30.00 postpaid in Canada. For shipping in the US add $1.00; overseas please request shipping charge). Contact Gilles by e-mail at ve2kgf1@hotmail.net, or the old-fashioned way at: Gilles Thibodeau, C.P. 193, Lac-Megantic, Quebec, G6B 2S6 Canada.

-- Rachel Baughn

Press releases may be faxed to 828-837-2216 or emailed to Rachel Baughn, editor@monitoringtimes.com
it is fortunate that the weather satellites NOAA-12, NOAA-15 and NOAA-17 continue to provide low-cost imagery (a format called automatic picture transmission), because during recent weeks, NOAA-16’s high resolution scanner has experienced increasing problems.

As always, the National Oceanic and Atmospheric Administration (NOAA) engineers have been working on the most effective means to minimize or even eliminate the cause of the problems. The older satellite NOAA-14 gave us a tantalizing few days of good high resolution (HRPT) imagery before reverting to the unsynchronized mode, and then finally failing.

More details at: http://noaasis.noaa.gov/NOAASIS/

LRIT and LRPT – Manufacturer Comments
As far as I am aware, the market for APT reception equipment for amateurs did not exist in the early 1960s following the launch of the Tiros satellites. I believe that some electronics experts first designed a framestore, using what were then relatively expensive components to decode the telemetry stream. During the 1970s and 1980s, component prices fell, computer options became available, and the market for amateur reception of the 137MHz band APT transmissions grew rapidly.

We have therefore had almost two decades during which the cost of low resolution weather satellite (WXSAT) equipment has steadily fallen. As discussed in recent editions of this column, this is about to change. Although APT is expected to continue until later this decade, and possibly beyond, the new WXSAT transmission format LRPT – from polar orbiting WXSATs – is on the way. LRIT (from geostationary satellites) started last year from the European WXSAT MSG-1 (now METEOSAT-8), and test transmissions are now continuing from GOES (see below).

I invited manufacturers to let me know of their development work, and have received an update from George Isleib of GTI Electronics.

He explains: “We are in the process of developing the LRIT system for the GOES system, and then the LRPT for the polar orbiters. One of the problems the manufacturers found is that the change to the replacement WEFAX system is rather complex, requiring a new receiver and software. The LRIT is BPSK with Viterbi and Reed Solomon encoding. I believe NOAA thought this system would run on a 3 foot dish but they dropped the signal strength by about 12dB from WEFAX, and made it 30 times wider with two carriers at both ends of the LRIT signal.”

One company has a receiver that sells for about $4000 – more than a complete ground station would cost when the GTI system meets the market. Many WEFAX users have anticipated that their current equipment could, with minimal modifications, be used for LRIT; unfortunately this is very much not the case. George adds: “The receiver requires a lot more work than a simple WEFAX or polar orbiter required prior to the newer formats.”

My thanks to George for his update. GTI Electronics website: http://www.gtielelectronics.com

GEO and RIG meetings held in UK
Meetings of weather satellite enthusiasts are invariably popular events. In Britain the Remote Imaging Group (RIG) has held regular meetings for many years and built up a significant membership. A few months ago a number of RIG committee members decided that they preferred a different style of group and therefore separately formed the Group for Earth Observation. In my capacity as a journalist/reporter on weather satellite matters, I was kindly invited to attend the first public meeting of GEO held in Leicester, at the National Space Centre on May 1st, and given a lift there by member Clive Finnis.

The room was full and the speakers included Gordon Bridge of Europe’s EUMETSAT, local radio amateurs from the Centre, David Taylor (the software writer), and members of the Dutch weather satellite group. Francis Bell welcomed the delegates and Charles Bishop, the CE of the Centre described its formation and current work. As an educational establishment designed to encourage a public interest in space engineering and astronomy, it had quickly proved viable and highly successful, particularly with the European Mars Explorer project.

Gordon Bridge spoke about the first year’s results from the new European all-digital WXSAT METEOSAT-8. It had so far provided a year of high quality, high resolution images to hundreds of amateurs across Europe who – due to the failure of an onboard component – had unexpectedly been able to receive the new HRIT images using low cost, off-the-shelf satellite receiving systems. Gordon showed several animation sequences using special color palettes to enhance features never before seen – such as exploding storm tops.

David Taylor spoke about the technology that the ongoing upgrading of computer systems was having on the new METEOSAT-8 computer reception hardware. Although one year ago the recommended system was for separate receive and data processing computers, the new 3GHz (plus) speeds were proving effective at doing the whole operation on one machine.

Robert Moore is a professor from Liverpool (coincidentally my home town!) who lives in north Wales and is a keen WXSAT enthusiast. He showed examples of his HRPT images and several amazing animations of images received from METEOSAT-8, including a severe storm that crossed Britain last November.

Ruud Jansen of the Dutch WXSAT group provided a live demonstration of receiving METEOSAT-8 imagery using a small dish placed outside the building. He used a 3GHz Pentium-4 machine to simultaneously receive and animate images whilst running an Orbiter Simulation program as well!

The RIG meeting was held on the same day in another town, and I have not received any reports about its proceedings.

Frequencies
NOAA-12 and -15 transmit APT on 137.50 MHz
NOAA-17 transmits APT on 137.62 MHz.
GOES-10 (west) and GOES-12 (east) use 1691 MHz for WEFAX
LRIT (the new digital format for geostationary WXSATs) is time-shared with WEFAX from GOES-12.

Abbreviations
APT – Automatic Picture Transmission
HRPT – High Resolution Picture Transmission
LRIT – Low Rate Information Transmission
LRPT – Low Rate Picture Transmission
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

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Ala Scan Email List, covering North Alabama and Southern Middle Tennessee - http://groups.yahoo.com/group/AlaScan

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"Adapt, evolve or die," was the message of Federal Communications Commission Chairman Michael K. Powell to the annual National Association of Broadcasters conference.

Broadcasting no longer has the exclusive ear of Congress it once did. Universal access to broadband connection and other wireless technologies is the new darling on the Hill. Over the last two years alone, the Commerce Department and the FCC have pushed to free up nearly 8 gigahertz of spectrum (more than 40,000 times the amount allocated to cellphone use) for new wireless applications.

This spectrum space is not an exclusive allocation, but is part of Powell's goal of efficient use of spectrum by frequency sharing. Two of the most recent bands proposed to be opened up for secondary use by unlicensed wireless devices and broadband providers are the 3650 MHz band (now in use by fixed satellite service earth stations), and unused bands of the broadcast television spectrum between channels 4 and 51 - television's "core" broadcast spectrum. These lower frequencies are very desirable spectrum, as they would allow more distant coverage by wireless internet providers and are not as easily blocked by obstacles as those in the 2.4 gigahertz range, for example.

Operation on these and previously opened bands would be on the condition that those wireless devices do not interfere with existing, licensed broadcast signals. Powell makes the case that there is very little "new" spectrum left to be distributed - the best that can be done is to "get more use out of spectrum that 80 percent of the time lies fallow."

This vision of the future relies heavily on the evolution of technology: "smart radio," "cognitive radio," or "software defined radio," which uses "frequency agile" techniques to detect traffic and switch to an unused channel. For example, frequency agile technology will be expected to protect licensed services from interference from other initiatives - broadband over power lines (BPL - see last month's Closing Comments). Monitoring Times will be running an informative series on software defined radio beginning next month.

FCC Abdicates to Market Forces

The American Radio Relay League says it generally supports the FCC's pursuit of efficient spectrum use and universal access to broadband, but urged the FCC to avoid large-scale deployment of cognitive radio technology - and especially of unlicensed devices in spectrum regularly used by licensed services - "until further experience with the technology is obtained." The ARRL also strenuously objected to a proposal to allow cognitive radio technology devices to operate under Part 15 in "undefined" rural areas at up to a sixfold increase in the currently permitted power level in several UHF bands that include amateur allocations.

The League questioned why the FCC was willing to put forth such proposals "without the slightest real-world test deployment" of the systems it wants to authorize.

Statements by Chairman Powell and by Commissioner Michael Copps appear to reflect a sea-change in the way the FCC defines its role as protector of the public interest. In the past this has meant protecting the public's access to mass media from interference - in other words, protecting broadcasting. Today it has shifted to ensuring individual access to all kinds of media via internet and broadband technologies - possibly at the expense of broadcasting. Instead of the FCC testing and coming up with proven, approved technology for spectrum sharing, it is allowing the market to do all the development and real-world testing.

Powell has said that the "laborious process" of government command and control "has served the country well to this point, but is futilely too slow to rapidly move things to new and better innovative uses."

In a speech at the Quello Symposium in February, Commissioner Michael Copps made this astonishing statement: "With ubiquitous [broadband] deployment ... new technologies would have a chance to prove how disruptive they can be. Otherwise we'll never know. Technology could do the disruption rather than having poor regulation disrupt the promise of technology."

A Forecast of Things to Come?

Sharing spectrum space is a commendable goal for efficient spectrum use. But, when you get more than one service using the same spectrum, sooner or later conflicts will arise. Proving or resolving the dispute isn't necessarily easy, nor is the public usually very understanding when their unlicensed Part 15 device suffers interference. Two recent incidents which involved hundreds of consumers and which received substantial media attention prove the point.

Back in February, more than a hundred car owners in the area around Las Vegas complained about malfunctioning keyless vehicle entry devices. Keyless entry systems operate on unlicensed frequencies shared with the military, and the Las Vegas incident occurred as the military was gearing up for the Red Flag air combat training exercise.

Traditionally, the 225-400 MHz spectrum has been used for worldwide military air-traffic control and tactical training communications. But this sporadically-used frequency range has now been tapped for another purpose. In last month's Microwaves column, Larry Van Horn uncovered plans for a new military land-mobile radio system to be located in the 380-399.9 MHz bands. As the first of these systems was tested in mid-May at Eglin Air Force Base, Florida, homeowners all over the Niceville, Valparaiso, and Crestview areas began reporting malfunctioning garage door openers.

Motorola Inc., the system contractor, said it would try to minimize the problem by running the system at slightly different frequencies. However, since the Air Force is entirely within its licensed frequency band of 225-400 MHz, users of garage door openers may have to change theirs, said a spokesperson for the FCC.

Similar radio systems have been requested for Pensacola Naval Air Station and other nearby installations, according to a Navy spokesman. One MT contributor reported that the entire US Air Force would be going to this digital trunked system for VHF ground communications.

Uncharted Territory

The FCC seems to be hoping market forces will take the ball and run - developing technology to satisfy the consumer and the FCC's demand for non-interference simultaneously. But will the manufacturers or the consumers necessarily play along?

John Catalano has reminded us more than once of grand ideas which never came to fruition simply because manufacturers had no guarantee the numbers were there to support product development, or because there was no assurance which technology would become the industry standard. If you can't get the micro-chip you can't make the product: simple as that, says John.

The FCC seems to have faith that there are technical solutions to most conflicts. Perhaps there are, but at what expense? Most Part 15 devices are not high-ticket items. Is it realistic to expect products such as wireless networking cards for computers, wireless connections to printers, keyboards, computers, and phones, garage door openers and keyless entry systems, etc. to be frequency-agile? Would anyone be able to afford them if they were?

Will the FCC's new approach lead to discovery or disaster? As we say so often in this column, "only time will tell." But get set for a bumpy ride. As with broadband over power lines, it's going to be hard to put this horse back into the barn once it gets out, and who's going to rein it in? Surely not the FCC?
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