Vol. 16, No. 1 January 1997

U.S. $3.95
Can. $6.25

Monitoring Times®

Your Personal Communications Source

Printed in the United States

MT Reviews ICOM R-8500

Illuminating Radio Dials for 15 Years!

Here are some dial-lighting milestones in the 15-year history of the world's only full-spectrum radio monitoring publication:

January 1982	✦	First bi-monthly issue
January 1984	✦	*MT* goes monthly
April 1984	✦	US numbers station found
June 1986	✦	*MT* merges with *Int'l Radio*
January 1988	✦	Tabloid *MT* becomes a magazine
October 1990	✦	First *MT* Convention
October 1990	✦	Gulf War Comms Coverage
February 1993	✦	Grove Awarded Governor's Cup
February 1996	✦	Bosnia Watch

NEW Xplorer

It's a receiver

a counter, a recorder, a decoder....

U.S. Patent No. 5,471,402

•Two-Line LCD display, first line displays frequency. Second line switches between either CTCSS, DCS, DTMF, Signal Strength, or Numerical Deviation.

NMEA-0183 GPS Interface,-Connect your GPS to the Xplorer for Mapping applications.
(GPS and Mapping Software not included)

The New Xplorer Test Receiver. Ideal for any two-way communications testing or monitoring. The Xplorer is a value packed performer integrating the functions of a CTCSS, DCS, and DTMF Decoder, Frequency Recorder, Nearfield Receiver and more into one hand-held unit. No more guessing when programming a frequency for monitoring-the Xplorer captures nearfield frequencies off the air from 30MHz - 2GHz in less than 1 second. The New Xplorer; providing the power of handheld portability with state of the art functionality and performance.

•Built-in Speaker. All frequencies received are demodulated for instant monitoring.

...and the last instrument you will ever NEED.

Features & Specifications

•Easy touch control pad. F1 & F2 keys control all Xplorer functions. Hold, Skip, Store and Lockout all enabled through the keypad.

- •Frequency Lock Out, Manual Skip, and Auto or Manual Hold
- •Internal Speaker, Audio Earphone/Headphone Jack
- •Built-in PC Interface, PC Connection Cable and Download Software included
- •Relative ten segment Signal Strength Bargraph
- •Optimum Maximized Sensitivity for increased nearfield distance reception
- •Tape Control Output with Tape Recorder Pause control relay and DTMF Encoder for audio data recording
- •High speed FM Communications Nearfield Receiver, sweeps 30MHz - 2GHz in less than 1 second
- •Two line LCD displays Frequency and either CTCSS, DCS, DTMF, Deviation or Signal Strength
- •NMEA-0183 GPS Interface provides tagging data with location for mapping applications
- •Frequency Recording Memory Register logs 500 frequencies with Time, Date, Number of Hits and Latitude/Longitude. *(Latitude & Longitude coordinates are only displayed in memory when used with GPS)*
- •Real-Time Clock/Calendar with lithium battery back-up
- •Built-in Rapid Charge NiCad Batteries with 5 hour discharge time and Power Supply included
- •Numerical Deviation Display with 1-10kHz and 10-100kHz ranges
- •Telescoping Whip full range Antenna included

Introductory Price $899

FACTORY DIRECT ORDER LINE 800•327•5912

OPTOELECTRONICS®

5821 NE 14th Avenue • Ft Lauderdale, FL • 33334 • Tel: 954-771-2050 • Fax: 954-771-2052
Visa • MasterCard • C.O.D.
Prices and Specifications are subject to change without notice or obligation

Contact Optoelectronics for mapping software available

Check Out Our Web Site: optoelectronics.com WWW.

Monitoring Times™

Vol. 16, No. 1 January 1997

CONTENTS

Cover Story

MT at 15: Interview with the Editors

By Gayle Van Horn

Radio has seen a lot of changes over the past fifteen years, and so has the monitoring hobby. Bob Grove, Larry Miller, and Rachel Baughn have each stood about five years at the helm of what is today the hobby's leading magazine. Their retrospective into the beginnings of the magazine, and their views of where it is going, are insightful into the course of radio listening itself.

John Bailey's original cover design features some of the more significant dates in *MT*'s colorful history. The story starts on page 8.

Reviews:

As promised, Bob Parnass winds up our comparison of the ICOM R8500 and the AOR AR-5000 with an in-depth look at the ICOM (p. 94). Magne gives the Sharper Image Pocket Portable VA100 a sporting chance—but is disappointed (p. 92). Bob Grove takes a quick look at a medium-wave classic: the RadioPlus+ Q-Stick antenna (p. 90). John Catalano conducts a brief overview of "The Best of the Best" in total monitoring environment software (p. 84).

DEPARTMENTS

MONITORING TIMES (ISSN: 0889-5341) is published monthly by Grove Enterprises, Inc., Brasstown, North Carolina, USA.

Address: P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902-0098
Telephone: (704) 837-9200
Fax: (704) 837-2216 (24 hours)
Internet Address: *www.grove.net* (web) or *mt@grove.net* (e-mail)
Editorial e-mail: *mteditor@grove.net*

Subscription Rates: $23.95 in US; $48.50 Canada air; and $85.95 foreign air elsewhere, US funds. Label indicates last issue of subscription. ***See page 103 for more information.***

Postmaster:
Send address changes to *Monitoring Times*,
P.O. Box 98, Brasstown, NC 28902-0098.

Editorial Staff

Correspondence to columnists should be mailed c/o Monitoring Times via e-mail (mt@grove.net) or via post office. Any request for a personal reply should be accompanied by an SASE.

RAMSEY

Synthesized FM Stereo Transmitter

Microprocessor controlled for easy freq programming using DIP switches, no drift, your signal is rock solid all the time - just like the commercial stations. Audio quality is excellent, connect to the line output of any CD player, tape deck or mike mixer and you're on-the-air. Foreign buyers will appreciate the high power output capability of the FM-25; many Caribbean folks use a single FM-25 to cover the whole island! New, improved, clean and hum-free runs on either 12 VDC or 120 VAC. Kit comes complete with case set, whip antenna, 120 VAC power adapter - easy one evening assembly.

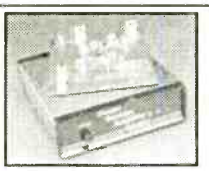
FM-25, Synthesized FM Stereo Transmitter Kit $129.95

Tunable FM Stereo Transmitter

A lower cost alternative to our high performance transmitters. Offers great value, tunable over the 88-108 MHz FM broadcast band, plenty of power and our manual goes into great detail outlining aspects of antennas, transmitting range and the FCC rules and regulations. Connects to any cassette deck, CD player or mixer and you're on-the-air, you'll be amazed at the exceptional audio quality! Runs on internal 9V battery or external power from 5 to 15 VDC, or optional 120 VAC adapter. Add our matching case and whip antenna set for a nice finished look.

FM-10A, Tunable FM Stereo Transmitter Kit. $34.95
CFM, Matching Case and Antenna Set. $14.95

RF Power Booster Amplifier



Add some serious muscle to your signal, boost power up to 1 watt over a frequency range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM Stereo transmitters, providing radio service through an entire town. Power required: 12 to 15 volts DC at 250mA, gain of 38dB at 10 MHz, 10 dB at 1000 MHz. For a neat, professionally finished look, add the optional matching case set.

LPA-1, Power Booster Amplifier Kit $39.95
CLPA, Matching Case Set for LPA-1 Kit. $14.95
LPA-1WT, Fully Wired LPA-1 with Case $99.95

Micro FM Wireless Mike

World's smallest FM transmitter. Size of a sugar cube! Uses SMT (Surface Mount Technology) devices and mini electret condenser microphone, even the battery is included. We give you two complete sets of SMT parts to allow for any errors or mishaps-build it carefully and you've got extra SMT parts to build another! Audio quality and pick-up is unbelievable, transmission range up to 300 feet, tunable to anywhere in standard FM band 88 to108 MHz. 7/8"w x 3/8"h x 3/4"h.

FM-5 Micro FM Wireless Mike Kit $19.95

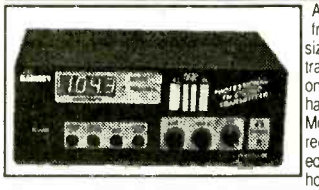
Crystal Controlled Wireless Mike

Super stable, drift free, not affected by temperature, metal or your body! Frequency is set by a crystal in the 2 meter Ham band of 146.535 MHz, easily picked up on any scanner radio or 2 meter rig. Changing the crystal to put frequency anywhere in the 140 to 160 MHz range-crystals cost only five or six dollars. Sensitive electret condensor mike picks up whispers anywhere in a room and transmit up to 1/4 mile. Powered by 3 volt Lithium or pair of watch batteries which are included. Uses the latest in SMT surface mount parts and we even include a few extras in case you sneeze and loose a part!

FM-6, Crystal Controlled FM Wireless Mike Kit $39.95
FM-6WT Fully Wired FM-6 ..... $69.95

Call for our Free Catalog !

Super Pro FM Stereo Radio Transmitter



A truly professional frequency synthesized FM Stereo transmitter station in one easy to use, handsome cabinet. Most radio stations require a whole equipment rack to hold all the features we've packed into the FM-100. Set frequency easily with the Up/Down freq buttons and the big LED digital display. Plus there's input low pass filtering that gives great sound no matter what the source (no more squeals or swishing sounds from cheap CD player inputs!) Peak limiters for maximum 'punch' in your audio - without over modulation. LED bargraph meters for easy setting of audio levels and a built-in mixer with mike and line level inputs. Churches, drive-ins, schools and colleges find the FM-100 to be the answer to their transmitting needs, you will too. No one offers all these features at this price! Kit includes sharp looking metal cabinet, whip antenna and 120 volt AC adapter. Also runs on 12 volts DC.

We also offer a high power export version of the FM-100 that's fully assembled with one watt of RF power, for miles of program coverage. The export version can only be shipped outside the USA, or within the US if accompanied by a signed statement that the unit will be exported.

FM-100, Professional FM Stereo Transmitter Kit $299.95
FM-100WT, Fully Wired High Power FM-100. ..... $429.95

Speech Descrambler Scrambler

Decode all that gibberish! This is the popular descrambler / scrambler that you've read about in all the Scanner and Electronic magazines. The technology used is known as speech inversion which is compatible with most cordless phones and many police department systems, hook it up to scanner speaker terminals and you're in business. Easily configured for any use: mike, line level and speaker output/inputs are provided. Also communicate in total privacy over telephone or radio, full duplex operation - scramble and unscramble at the same time. Easy to build, all complex circuitry contained in new custom ASIC chip for clear, clean audio. Runs on 9 to 15VDC, RCA phono type jacks. Our matching case set adds a super nice professional look to your kit.

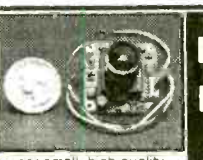
SS-70A, Speech Descrambler/Scrambler Kit $39.95
CSS, Custom Matching Case and Knob Set $14.95
SS-70AWT, Fully Wired SS-70A with Case $79.95
AC12-5, 12 Volt DC Wall Plug Adapter $9.95

Tone-Grabber Touch Tone Decoder / Reader

Dialed phone numbers, repeater codes, control codes, anywhere touch-tones are used, your TG-1 will decode and store any number it hears. A simple hook-up to any radio speaker or phone line is all that is required, and since the TG-1 uses a central office quality decoder and microprocessor, it will decode digits at virtually any speed! A 256 digit non-volatile memory stores numbers for 100 years - even with the power turned off, and an 8 digit LED display allows you to scroll through anywhere in memory. To make it easy to pick out numbers and codes, a dash is inserted between any group or set of numbers that were decoded more than 2 seconds apart. The TG-1 runs from any 7 to 15 volt DC power source and is both voltage regulated and crystal controlled for the ultimate in stability. For stand-alone use add our matching case set for a clean, professionally finished project. We have a TG-1 connected up here at the Ramsey factory on the FM radio. It's fun to see the phone numbers that are dialed on the morning radio show! Although the TG-1 requires less than an evening to assemble (and is fun to build, too!), we offer the TG-1 fully wired and tested in matching case for a special price.

TG-1, Tone Grabber Kit $99.95
CTG, Matching Case Set for TG-1 Kit. $14.95
TG-1WT, Fully Wired Tone Grabber with Case $149.95
AC12-5, 12 Volt DC Wall Plug Adapter $9.95

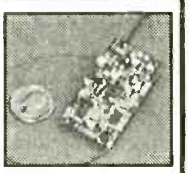
Mini-Peeper Micro Video Camera



Super small, high quality fully assembled B & W CCD TV camera the size of an ice cube! Provides excellent pictures in low light (2 lux), or use our IR-1 Infra-Red light source to invisibly illuminate an entire room on a pitch black night! Imagine the possibilities... build it into a smoke detector, wall clock, lamp, book, radio. Exact same camera that's in big buck detective catalogues and stores. Kit includes: fully assembled CCD camera module, connectors, interface PC board kit with proper voltage regulation and filtering, hook-up details, even a mini microphone for sensitive sound! Two models available: Wide Angle Lens 3.6mm/f2, adjustable focus lens, 92 degree view; Pinhole Lens 5.5mm/f4.5, 60 degree view. The Pinhole Lens is physically much flatter and provides even greater depth of focus. The camera itself is 1.2" square. The Wide Angle Lens is about 1" long, Pinhole Lens about 1/2", interface PC board is 1" x 2" and uses RCA jacks for easy hook-up to VCRs, TVs or cable runs. Power required is 9 to 14 VDC @ 150 mA. Resolution: 380 x 350 lines. Instruction manual contains ideas on mounting and disguising the Mini-Peeper along with info on adding one of our TV Transmitter kits (such as the MTV-7 unit below) for wireless transmission!

MP-1, Wide Angle Lens CCD TV Camera Outfit $169.95
MP-1PH, Pin-Hole Lens CCD TV Camera Outfit $189.95

MicroStation Synthesized UHF TV Transmitter



Now you can be in the same league as James Bond. This transmitter is so small that it can fit into a pack of cigarettes - even including a CCD TV camera and battery! Model airplane enthusiasts put the MTV-7A into airplanes for a dynamite view from the cockpit, and the MTV-7A is the transmitter of choice for balloon launches. Transmitter features synthesized, crystal controlled operation for drift-free transmission of both audio and video on your choice of frequencies: Standard UHF TV Channel 52 (which should only be used outside of the USA to avoid violating FCC rules), and 439.25 MHz or 911.25 MHz which are in the amateur ham bands. The 439.25 MHz unit has the nifty advantage of being able to be received on a regular 'cable-ready' TV set tuned to Cable channel 68, or use our ATV-74 converter and receive it on regular TV channel 3. The 911.25 MHz unit is suited for applications where reception on a regular TV is not desired, an ATV-79 must be used for operation. The MTV-7A's output power is almost 100 mW, so transmitting range is pretty much 'line-of-sight' which can mean many miles! The MTV-7A accepts standard black and white or color video and has its own, on-board, sensitive electret micorphone. The MTV-7A is available in kit form or fully wired and tested. Since the latest in SMT (Surface Mount Technology) is used to provide for the smallest possible size, the kit version is recommended for experienced builders only. Runs on 12 VDC @ 150 mA and includes a regulated power source for a CCD camera.

MTV-7A, UHF TV Channel 52 Transmitter Kit $159.95
MTV-7AWT, Fully Wired Channel 52 Transmitter $249.95
MTV-7A4, 439.25 MHz TV Transmitter Kit. $159.95
MTV-7A4WT, Fully Wired 439.25 MHz Transmitter $249.95
MTV-7A9, 911.25 MHz TV Transmitter Kit. $179.95
MTV-7A9WT, Fully Wired 911.25 MHz Transmitter $269.95
ATV-74, 439.25 MHz Converter Kit $159.95
ATV-74WT, Fully Wired 439.25 MHz Converter $249.95
ATV-79, 911.25 MHz Converter Kit $179.95
ATV-79WT, Fully Wired 911.25 MHz Converter $269.95

RAMSEY ELECTRONICS, INC.
793 Canning Parkway
Victor, NY 14564

Order Toll-free: 1-800-446-2295
Sorry, no tech info or order status at this number

Technical Info, Order Status
Call Factory direct: (716) 924-4560

VISA MasterCard DISCOVER

ORDERING INFO: Satisfaction Guaranteed. Examine for 10 days, if not pleased, return in original form for refund. Add $4.95 for shipping, handling and insurance. Orders under $20, add $3.00. NY residents add 7% sales tax. Sorry, no CODs. Foreign orders, add 20% for surface mail or use credit card and specify shipping method.

LETTERS

Four Whom the Bell Tolls...

Do you know your four-digit postal zip code extension? If your mailing address uses a route number, have you been assigned a 911 street address, instead? The P.O. has informed us they will begin delaying delivery of mail that does not contain these correct elements. Also, we will not be able to honor replacement requests for a month after non-delivery if your address does not comply.

If your label lacks the required information, please send your updated mailing address to us at P.O. Box 98, Brasstown, NC 28902-0098, or e-mail to *order@grove.net*. Thanks for helping us get *Monitoring Times* to your doorstep in the most speedy and economical way possible!

Propagation Report

We were pleased at the number of responses received on the redesign of Jacques d'Avignon's propagation predictions. Readers overwhelmingly chose the table format over the consolidated circuit graph. It was educational to discover how many folks do use such tools in their listening. Jim Gallagher, N7SYE, testifies to their value from his location in the mountains of Wyoming:

"I have used the table for several days and found it to be fast and accurate. My first time hits have more than doubled. I use the table in conjunction with the Shortwave Guide pages, using the BBC broadcasts as a baseline, and trying other areas to check. I also use the information to determine which bands are the most probable to scan for the appropriate areas and times. *It works!* I also correlate the tabular information and actual reception with the conditions worked out from the WWV SF, K, and A reports."

Try these techniques for yourself; they've been used by many long-time DXers, and the hands-on education you'll gain on propagation is something you'll never forget.

More Light on Laser Weapons

The August '96 issue of the "Ask Bob" column commented on why laser weapons aren't used in warfare. Dave Rogers, WA5EAH, Plano, Texas, wrote to say, "You need to read *Defense Weekly, Aviation Week* or any number of defense related periodicals. We have had active laser weapons in use for several years now."

To which Bob Grove replied, "Thanks, we do read *Aviation Week*, but I was unaware that we had ever tactically deployed a laser weapon in an actual battle situation. I know that research and development has been going on, but it was my impression that a practical weapon was not yet field-ready."

Thomas A. Frank, KA2CDK, of Middletown, Rhode Island, elaborated: "What makes you think laser weapons aren't used? OK, they haven't *officially* reached IOC (initial operational capability) yet, but they are quite real, and very effective at what they are designed to do. The 12 Aug. 1996 issue of *Aviation Week and Space Technology* has a photograph of a Russian Katushka rocket being destroyed in flight by a ground-based laser. Past issues have shown Sidewinder and Sparrow air-to-air missiles being destroyed in flight with an airborne laser, as well as a Titan II main fuel tank section on a test stand also being destroyed.

"They work well enough that a system known as ABL (airborne laser) will be in service by 1999 (hopefully), protecting our troops against short range ballistic missile attack (Scud type). The goal is to nail the missile while it is being boosted, so the debris lands on the shooter instead of the target (about time!).

"You list four points:

"1 - **Smoke:** All laser rangefinders and planned weapons operate in the mid- to far-IR region of the optical spectrum, which makes them more or less immune to the effect of smoke and other airborne particulates.

"2 - **Power supplies:** All of the lasers presently contemplated for use as weapons are chemical lasers—the ones that have been most widely discussed use a hydrogen or deuterium-fluorine reaction, or more recently an oxygen-iodine reaction (*AW&ST* 19 Aug. 1996).

"3 - **Line of sight:** This is not a limitation, given the intended use. Sure, a mortar or other artillery round can go over a hill—but a speed of light weapon for direct attack has some really obvious advantages, like no need to calculate lead (the beam is there before the target moves), and you can then track with the laser itself.

"4 - **Reflector as a defense:** Sorry, my friend, but this won't help. A sufficiently effective reflector to protect a target (like a missile) from destruction by a high energy laser will not survive: Just a trace of dust or dirt and it's all over. The front surface mirrors used in these lasers are fragile, delicate, and require a virtual clean room to maintain them. And they still sometimes melt from what little energy they do absorb. This is the most difficult part of making these devices into real weapons; you are correct in your belief that your average grunt isn't going to be using one of these things, but under the right conditions they are available and would be put into use if the President called for them (and they will be operational soon enough).

"So, you see, the days of the death ray are upon us. Fortunately (?), these things are not for anti-personnel use. Lasers are too expensive, complex, and fundamentally inefficient (in the cost-effective sense) to waste on people per se. They are for destroying missiles and other delicate flying things that *are* intended to kill people. Therefore, lasers are primarily defensive in nature and, to my mind, highly desirable. It's about time the Department of Defense put some effort into defense!"

He adds, "By the way, in the same issue you comment on the 'basketballs' on high tension lines. They actually make one with a secondary transformer winding in it to tap off a little bit of power from the HV line to run a strobe light for protection at night. No direct electrical connection. Nifty, huh?"

Diversity Monitoring

"Since I started reading *MT* years ago, I realized Bob was on to something," says Paul Halvorsen, N2LUG. "The magazine is well-written, balanced, and interesting across the entire spectrum (pun intended). Many times I see articles in which I have no interest. That's fine. More often than not, you do keep my interest throughout the magazine. That brings me to my point.

"You prosper where others fail by giving the entire hobby information on a wide variety of topics every month. That's the key...every month. You have quite competent writers that approach the topics they cover with an eye toward the real world (i.e. cost, process, time, etc).

"Diversification, as Bob says, is evident ... Novice or expert in electronics, beginner or master in the hobbies, you have something for everyone.

"Bob, if you keep the balance you have now, between business and editorial style, your business will be around for a long, long time and will continue to serve diverse and loyal consumers."

Letters are edited by Rachel Baughn for brevity and clarity. Send to P.O. Box 98, Brasstown, NC 28902 or *meteditor@grove.net*.

WiNRADiO™

The World's Most Surprising Communications Receiver

WiNRADiO card.
A new look in radios.

"The sensitivity seems to be pretty good across the whole range... ...unique and useful monitoring product...worth a serious look." Monitoring Times, October 1996

"...I don't know of any scanner , where I succeeded instantly in successful reception without studying the handbook..." Radio Scanner, August 1996

"Of all the cool PC cards you could stick in your computer, WiNRADiO takes the cake." internet.au, June 1996

"...high quality workmanship, good reception and easy usage." Chip, November 1996

"...a must-have for hackers. A scanner user's dream." Radio & Communications, May 1996

"The most innovative new product we saw at Dayton HamVention..." W5YI Report, June 1996

WiNRADiO software.
Virtual front panel on your PC.

"WiNRADiO has enticing possibilities...The manual is an exciting book not only because of its beautiful cover, high quality paper, and easy instructions, but also because it contains a mix of operating and technical information about various aspects of radio you might have forgotten or never knew." World Scanner Report, Volume 6, No. 7

Frequently Asked Questions

What are the advantages of having a PC-based receiver compared to a stand-alone one?

1. Communications receivers are similar to test instruments - the trend is towards PC-based instrumentation which allows many front-panel functions to be more flexible and informative compared to a traditional, dedicated control panel.

2. The PC-based software controls all the ancillary functions such as scanning parameters, memories, logging and various operation modes. Compared to hardware or ROM-based firmware control, this gives the receiver greater flexibility, a greater number and sophistication of ancillary functions, practically unlimited memory capacity, and the ability to customize the receiver for special applications.

3. Without the constraints of a fixed control panel, a receiver can have different "personalities" depending on the user's applications and preferences. New functions, for example frequency databases, can be easily added and integrated with the receiver.

4. A number of independent WiNRADiO receivers can be controlled by a single PC. This is very useful if you need to monitor a large range of frequencies on a continuous basis, or where various methods of multi-channel transmissions are employed.

5. A PC-based receiver allows the user to take advantage of the digital signal processing capabilities of the PC. Modern PCs are fast enough to do such signal processing, decoding and display in real time, as well as provide mass storage for received signals.

How can a PC-based receiver cope with PC-generated electromagnetic interference?

WiNRADiO is very well shielded. We use specially developed shielding materials, and innovative design methods to prevent any interference directly entering the receiver. After all, every modern scanning receiver is controlled by an in-built microcomputer; we have simply reversed the roles, and put a shielded receiver inside the computer.

Specifications

- Frequency range: 0.5 to 1300 MHz *(excluding cellular bands)*
- Modes: AM, FM-N, FM-W, SSB
- Sensitivity: 1uV nominal (typ. 0.25uV on FM-N)
- Step size: 500Hz-1MHz (SSB, CW: 5Hz BFO)
- Scanning speed: 50 channels/sec (FM)
- Operating system: Windows 3.1 or 95 (NT available soon)

Dealers

Advanced Digital Systems
St. Louis, MO
(314) 791-1206

CB City
Westhaven, CT
(203) 932-3832

Electronic Equipment Bank
Vienna, VA
(800) 368-3270

Grove Enterprises
Brasstown, NC
(800) 438-8155

Professional Wireless
Orlando, FL
(407) 240-2880

Radio City
Mounds View, MN
(800) 426-2891

Radioware
Westford, MA
(800) 950-9273

Scanners Unlimited
San Carlos, CA
(415) 637-0561

SSB USA
Mountaintop, PA
(717) 868-5643

The Communication Source
Arlington, TX
(800) 417-8630

The Ham Station
Evansville, IN
(800) 729-4373

Universal Amateur Radio
Reynoldsburg, OH
(800) 431-3939

Dealer enquiries invited.
info@winradio.net.au

News

- Scanning speed now improved to 50 channels/sec (FM)
- New software allows simultaneous operation of up to 8 receivers
- See us at http://www.winradio.net.au

Ham Spectrum Taken

As predicted in this column, Congress has ordered the reallocation of the 13-cm amateur radio band. The decision, which came as something of a surprise to the ham community, was contained in the 2,000 page omnibus budget resolution, HR 4278.

Hams have, in the past, been able to muster a large and vocal constituency to make their many demands heard, but a steady decline in the number of active hams combined with a public weariness at the heavy-handed ARRL has weakened its effectiveness.

According to *W5YI Report*, Brad Wyatt, the American Radio Relay League's Pacific Division Director, "repeatedly submitted written and verbal statements... work[ing] with the key Congressional members to avoid this outcome... but to no avail."

The new law reallocates 2305 to 2320 and 2345 to 2360 MHz, taking away a total of 30 MHz from the 2.3 GHz region. The rarely used ham frequencies have been transferred from the amateur service to commercial wireless services. HR 4278 requires that competitive bidding for the frequencies should begin no later than April 15, 1997, less than four months away.

The National Telecommunications and Information Administration originally identified 2300 to 2310 and 2390 to 2400 MHz for reallocation back in May of 1994. A recent attempt to take over amateur 2 meter frequencies for Low Earth Orbiting Satellites has been temporarily put on hold.

Three days after the President signed HR 4278 into law, taking away the 13-cm radio spectrum from hams, Bill Clinton celebrated Amateur Radio Week by sending the following greetings: "...thank[s to] our nation's amateur radio operators for their commitment to excellence and their willingness to work for the well-being of others. Best wishes for a wonderful week."

The FCC is Moving. Pass the Hat.

The FCC is moving. The FCC is not moving. The FCC is moving.

Right now, the FCC can be found in office buildings at M Street and all over the Washington, DC, area. In 1988, it told Congress that it needed a more consolidated location. Finally, after uncountable delays, the Commission scheduled its move for 1997.

The move is now off.

Lawmakers have refused to give the FCC some $30 million is claims it needs to actually make the move.

The whole thing was rough from the beginning. Most communications attorneys who have their offices near the current downtown location opposed the move. So did many FCC staffers.

Cordless Monitoring

"Call me back when you can, sweetcakes. The wife is out weeding the garden, and with the baby monitor going, she won't hear a thing!"

Cordless telephone eavesdropping as a weapon in the game of love got a boost when the following letter appeared in the November 1996 edition of *Glamour* magazine:

"Another high-tech trap for those who cheat: I was outside pulling up weeds in the garden with the baby monitor nearby when it picked up our cordless phone frequency. I heard my husband leaving sweet nothings on his girlfriend's answering machine." The letter is signed, G.W., St. Paul, Minnesota.

MIC-KEY M-O-U-S-E

Mickey Mouse gets jostled by rude teenagers. Dirty old men grab at Snow White's breasts. Tiny toddlers yank off Pluto's tail. According to Rich Baker, Disneyland's director of creative costuming, there's a war going on at the theme park and his actors and their expensive costumes are getting the worst of it.

Despite the fact that handlers with walkie-talkies are nearby, the bulky headpieces give the actors a very limited view of the crowd around them. That's why the company is installing new video cameras in the costumes.

The new cameras are as small as a ball point pen and can be hidden in almost any decoration. The performer inside the costume wears special glasses that show the camera's view in one corner of the lens.

A Disney spokesman declined to give out the frequency for the video transmitters and Bill Warren says that there are no plans to install the cameras in the costumes of all 150 characters. Presumably, Snow White will be the first to get the device.

Rock Around the Clock

Uncle Sam is going to set your clocks. (He already cleans your clock every year at tax time.)

According to reports, WWVB is getting a power boost. It turns out that the Navy had several transmitters sitting in a warehouse, unused. Surplus from the Cold War, they were snatched up by the National Institute of Standards station in Ft. Collins, Colorado. Soon, they'll be in place, pumping out a signal some four times stronger than the one it has today.

This would be of little interest outside of the hobby radio community if it were not for a new generation of clocks and appliances soon to make their way onto the market. Using miniature receivers, they will be able to receive the stronger WWVB signals and automatically keep your clocks accurate, reset them to adjust for daylight savings or standard time, even to add a leap second here and there as the government feels prudent.

Clocks and wrist watches which automatically adjust to government time are nothing new in Europe and Asia, but have been a novelty in the U.S.

Tower Dive

It was all over in a split second. As crews were installing a new antenna on a Cedar Hill, Texas, transmission tower, a gust of wind caught the gin used to hoist material to the tower. The device fell, breaking a guy wire and causing the tower to fall.

The 1,540 foot high tower fell to the ground, killing three workers, snapping power lines and causing a transformer to explode. According to witnesses, the men were hurled from the 1,300 foot level, "straight down into a snarl of tangled steel cables and shredded metal beams."

Firefighters from suburban Dallas rushed to the scene, battling blazes in a rattlesnake-infested cedar brake caused by the explosion of the transformer. Meanwhile, a power surge caused as the collapsing tower cut across

Radio World

Vol 20, No 23 — Radio's Best Read Newspaper

Tower Crash Kills Three

by Lee Harris

nearby high-tension wires set off burglar alarms all over the city, flooding police with false alarms at the height of the emergency.

The antenna was shared by four TV stations as well as several FM radio station. All were temporarily knocked off the air.

The Cedar Hill tower is just under a hundred feet taller than the Empire State Building.

NY News Feud

Time Warner owns the cable system that serves New York City. Time Warner also owns the Cable News Network and has refused to carry the competing news channels, Fox and Bloomberg.

When Time Warner wouldn't budge, Mayor Rudolf Giuliani didn't like that and ordered New York City's public access channels to air Fox and Bloomberg. The arrangement didn't last long. A federal judge nixed the idea. Local governments can't control programming, said the judge.

Getting Around the Censors

The VOA wants to get people watching radio programs. Taking a cue from C-Span, VOA TV plans to simulcast a number of foreign language radio service broadcasts on satellite TV, in the hopes of widening the Voice's estimated 120 million listeners.

According to the VOA's Ismail Dahiyat, there are over a million satellite dishes in Iran and half a million in China, despite the fact that ownership is punishable by large fines and even prison time. Still, it's hoped that once a dish is in place, even the most authoritarian regime won't be able to stop the free flow of information.

At present, VOA TV broadcasts five hours of programming in Arabic, English, Farsi, Mandarin and Russian. VOA-TV is separate from the USIA's World Net.

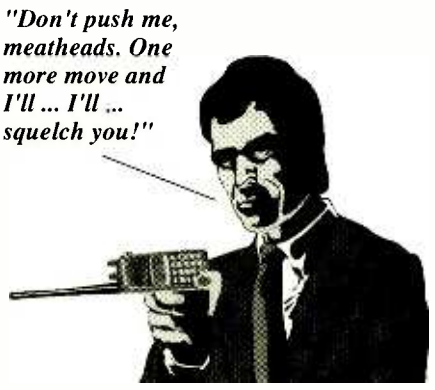
Stand Back! I've Got a Scanner!

Scanners got a black eye when Richard Sankin, 24 and his wife, Colleen Vaught, were arrested in New Hampshire for a string of bank robberies.

Police charged the couple with at least two robberies, including one in which Sankin allegedly told the manager to delay notifying the police and, holding up a scanner, warned that he would be able to tell if she complied.

Vaught allegedly assisted her husband by monitoring the scanner and notifying him of police activities via a two-way radio.

When police raided the couple's home



"Don't push me, meatheads. One more move and I'll ... I'll ... squelch you!"

they found large amounts of cash and ammunition, more than 40 automatic weapons, several military-style gas canisters, three grenades, "numerous magazines" and a scanner.

Fresh Start

Howard Stern has done it again. This time Stern got station WVGO-FM of Richmond, Virginia, in trouble with the FCC.

According to reports, Stern was talking about having sex with his wife; later he described female sexual organs. The FCC thought that he had gone too far and slapped the station with a $10,000 fine. Later, WVGO dropped the show.

The interesting part is that, while Stern's show originates on Infinity Broadcasting's WXRK-FM and is broadcast on some 35 stations across the US, only WVGO-FM was fined. FCC enforcement official Chuck Kelley says that he is "unsure if there are plans to ask Infinity['s owned] station if they carried the same comments as WVGO."

In any case, says another FCC spokesman, the fines would be considered first offenses and would be small. The thinking is because Infinity paid the FCC $1.7 million to settle a decade-long strong of indecency complaints last year, the slate was wiped clean and the fines start from scratch.

Send Us Your Clippings ...

"Communications" is written by Larry Miller with help from our worldwide team of professionals. Standing by to look for, clip out, and mail in radio-related newspaper stories are people like Harry Baughn, Brasstown, NC; Alex Blaha, Scanning Illinois, Joliet, IL; Bob Burdick, CT; Robert Compton, Mertztown, PA; Stan Draper, Los Angeles, CA; Maryanne Kehoe, Atlanta, GA; Michael Kuentz, Waterford, MI; James Mac Donald, Derry, NH; Peter Mraz, Habitrail, Michigan; Doug Robertson, Oxnard, CA; George Speck, Ft. Worth, TX; Billy Storer, Ft. Pierce, FL; Jim Weber, Colton, CA; Phil Yasson, Vancouver, WA; and Albert Zeck, San Francisco, CA.

We have also scoured a whole ream of publications looking for interesting stories and list their names in appreciation: *Glamour* (no kidding), *National Scanning, Radio World,* and *World Radio.* Special thanks goes to Fred Maia and the *W5YI Report,* and to Jeff Chanowitz for his original report on the VOA.

Lean, Mean, and 15!

The Evolution of Monitoring Times

Editor Rachel Baughn and former editors Larry Miller and Bob Grove reflect on the past and speculate on the future of the magazine and the listening hobby as a whole.

An interview with the editors
By Gayle Van Horn

This month we celebrate the fifteenth anniversary of *Monitoring Times.*

The January/February 1982 issue was an eight-page tabloid printed on news pulp, mailed to a few hundred hobbyists. Now, fifteen years later, *MT* has emerged as the leading source of monitoring information, read by tens of thousands of active listening hobbyists around the world.

Recently, I had the pleasure of joining two former editors, Bob Grove and Larry Miller, and our present managing editor, Rachel Baughn, to reflect on the past and their predictions for the future.

MT: Bob, let's start at the beginning. How long have you been interested in radio?

Bob: "I've always loved shiny metal gadgets like vacuum tubes and things that glow in the dark. By the time I was about eight years old, I found (in an abandoned shed) my first radio, and actually got it working. When I was nine or ten I had accumulated quite a bit of electronic junk. I got my amateur license when I was thirteen. Fortunately, I met a local radio ham who took me under his wing and taught me about radio. I've been an active ham since 1951 and found myself listening far more than hamming."

MT: How and when did Grove Enterprises begin?

Bob: "Up until 1978 when we moved to Brasstown, North Carolina, I was a school teacher and was also writing articles and books on radio for a variety of publishers. My last two years of teaching here in North Carolina were a period of transition, with ideas of being an entrepreneur in business for myself. About this time, my publishers were forwarding letters to me, and I began to see a pattern for manufactured goods that were not on the market—one of which was the Scanner Beam. That was our first product and remains today our longest running product."

MT: Rachel, how did you get started with Grove Enterprises?

Rachel: "When I first came to work in July 1982, I answered the telephone, handled the order desk, and balanced the ledger sheets. If we filled up one ledger sheet we were doing well. Three ledger sheets was a very good day."

MT: Bob, how did Monitoring Times begin?

Bob: "I found out there were no commercial publications dealing with radio. We had *Popular Electronics* and others, as well as some clubs, but there was no dedicated professional effort to put out a magazine on listening to the radio spectrum, so we were first to do that in January 1982. Our first issue was actually an expansion of the Grove catalog, which essentially has always been a buyers informational guide. This was our first attempt at getting away from a pure product magazine, and getting into an informational magazine."

MT: How many first issues of MT did you send out?

Bob: "It was 300 or 400 free issues as I recall. That issue is coveted by owners and is a collector's item."

MT: Where did you find those first recipients of MT?

Bob: "These were people who had bought products from us. By that point, we had our Signal Enhancer and were working on our preamp, so we had a number of small products available."

MT: By the second issue of MT, you reported response from readers had been overwhelming. Did you find it necessary then to begin a subscription fee for MT?

Bob: "Yes, the first issue was a big hit and hundreds of people were coming back saying, please, I want this on a regular basis. Within a few months, *Popular Communications* came out with their magazine. With such a huge response, we decided to at least try to make it break even, to pay for the printing."

MT: In the early days were you MT's sole writer, editor, and publisher?

Bob: (laugh) "Yes, I was. After a few issues, people began to contact me about their particular expertise. They were motivated like I was to get the information out there. At this point, we were still just breaking even. I no longer had an income and neither did Judy. She and I were working full-time at this so we could continue to live. As *MT* began to show a profit we immediately began to share those profits with our writers and we've been doing that ever since."

MT: Rachel, how did you move up to MT's layout department?


MONITORING TIMES

Space Shuttle Communications Monitoring

SPACE SHUTTLE

From The Editor...

REMEMBER WHEN...MT was a tabloid newspaper (and Bob Grove had jet black hair)? This first issue is now a coveted collector's item.

Rachel: "Originally, the local newspaper typed, laid out, and printed *Monitoring Times*. When Bob and Judy made the decision to bring the production of *Monitoring Times* in-house, so that we could keep the errors under somewhat better control, I immediately begged if there was any chance I could be assigned to that."

MT: In July 1986, MT merged with Larry Miller's International Radio (formerly Shortwave Guide) magazine. Looking back, do you think this was a major turning point for MT's future?

Bob: "Yes, it surely was. When we did that, we realized that we were now a contender in the market and our success was being honored by other publications. We welcomed every one of those subscribers of *International Radio*, and fulfilled their subscriptions with *Monitoring Times*" (which now included several columns from *IR*, including the shortwave guide section).

MT: Larry, can you tell our readers how you and Bob decided on the merge?

Larry: "Bob and I had talked for years casually, as we both owned magazines, he covering utilities and me with shortwave. The main idea was to merge and become full spectrum. I got a job out of it, Bob got a magazine, and the rest is history."

MT: What type of reader feedback did you receive after the premier issue of the new MT?

Larry: "It was absolutely great. We got mail constantly, almost exclusively saying it was the greatest thing they'd ever seen. It was an excitement that was around in the hobby that was unparalleled; it was a very exciting time to be involved in the hobby."

MT: Why did you to go to the magazine format in January 1988, versus the familiar newspaper tabloid format?

Bob: "The newspaper tabloid style always gave the impression of a grocery check-out line. Not only that, it's a lot easier to open a magazine than a newspaper or even a tabloid. It was a question of handling convenience, quality of the paper, readability of the articles and resolution of the photography. All of that would be enhanced by going to the magazine format."

Larry: "It was actually one of incremental steps to make a slightly better looking publication, perhaps, and eyeing towards the future and newsstand sales."

MT: Rachel, how did you get your job as managing editor of Monitoring Times?

Rachel: "Larry Miller had been the editor for the five years before and recommended that I take over when he decided to step down. At the onset, it was pretty scary to take responsibility for determining the content in terms of picking and planning feature articles, but I soon realized he had subtly been training me to do it. Because Larry Miller did not live in

WHERE IT BEGAN...was in the garage (far right) of Bob and Judy Grove's house in Brasstown. The business later moved into a newly constructed building behind their house (left), which also was quickly outgrown.

Provocative headlines stimulated brisk early sales of MT when it was still a tabloid newspaper.

Brasstown, as layout person, I was always the last one to see the magazine before it went to the printer and bore an ultimate responsibility for the magazine even before I became editor."

***MT:** Looking back, what do you think is the most significant achievement that Monitoring Times has accomplished in the past 15 years?*

Bob: "First is the timeliness of the material. No one gets out there faster with the information than we do. When we started, there was a four to six month lag between us and our nearest commercial competitor. Another is accuracy of reporting. We have always prided ourselves on integrity and accuracy. A third thing is that we have almost always been the first to break headline news. We were first to locate spy number stations and the Aurora aircraft. We've had a large number of firsts, and the other magazines either ignored it entirely or came on later pretending they knew that all along."

***MT:** Do you recall a feature that stands out as having an impact on the radio hobby?*

Bob: (laugh) "Yeah, there were two. *The Shroud of Turin* and *The Last Signal on Earth*. Although the articles were well written, we had egg on our face because it was not what the people wanted to read."

Larry: "Absolutely. *The Last Signal on Earth* I commissioned. I still think it was a good story, but perhaps it wasn't the right place or time. You can blame Bob for *The Shroud of Turin*. He said because they did radio carbon data measurements of the shroud it would be appropriate for us." (laugh)

***MT:** What do you think has been one of MT's most significant features?*

Rachel: "Larry Miller and Larry Van Horn love to point out the issue in which we scrapped all our plans and pulled together the Gulf War coverage. They both had comments from readers as to how on earth did we pull that out so fast."

***MT:** What do you think has been the magazine's most significant contribution to the radio hobby?*

Rachel: "There are several. *MT* is unique because it has so many aspects of the radio listening hobby all in one place. It's a weakness inasmuch as you can't go into enough depth in one particular area to satisfy some readers, but on the other hand, it's constantly tantalizing readers with some other aspect they haven't tried yet. I see the two strongest areas as being the *English Shortwave Guide* in the center and the utility section, which has solved a number of mysteries."

***MT:** Larry, tell us about the beginning of the English Shortwave Guide.*

Larry: "In the early days, I use to manually retype the entire section each month. I might add, that I used to check every single frequency for every hour. By the time I completed that, it was time to start typing again. It was terrible and I almost lost my mind."

***MT:** Do you think that MT remains on the cutting edge for information and technology?*

Larry: "I think it does. Rachel has a real tough job as things are really changing. I see those changes in the magazine with new additions, and with a bit of sadness when some things are let go or are cut back, but these are changing times."

***MT:** Are you planning any new changes to MT?*

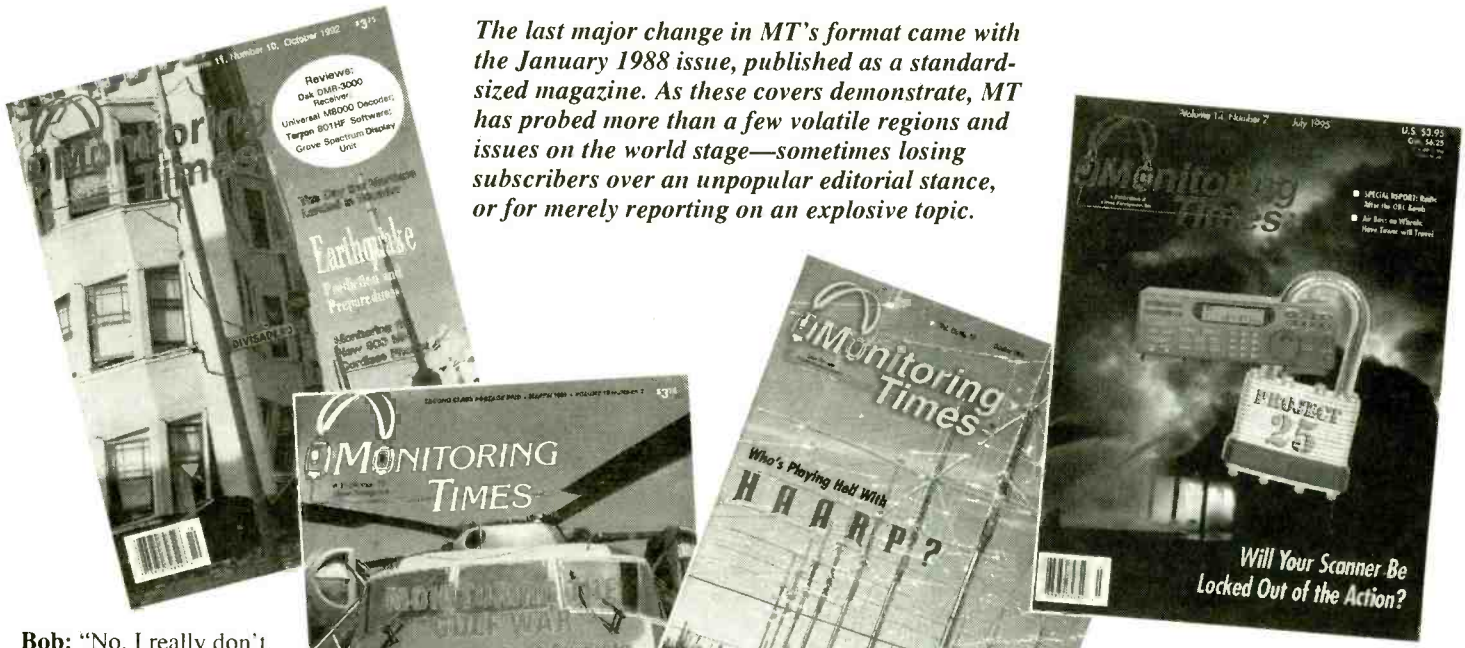
Rachel: "One of the things we have done in recent months has been to inaugurate a new column on PCS (Personal Communications Systems). We also want to explore ways in which the monitoring hobby can keep up with new technology, for example, reporting on equipment or software programs that can follow trunking or monitor digital communications."

***MT:** This past October, we wrapped up our seventh and final Grove Communications Expo. Do you see a void in the hobby with the lack of the convention?*

The July 1986 issue marked two important collaborations: the merger of* International Radio *with* MT, *and the introduction of 4-color covers, designed by John Bailey. For six years, Robin Miller, wife of editor Larry Miller, composed the magazine covers, until John Bailey took the position of full-time art director for Grove Enterprises.

Note on advertisement below: *As of 4/26/95 it became unlawful to market cellular-capable receivers in the US. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.*

The last major change in MT's format came with the January 1988 issue, published as a standard-sized magazine. As these covers demonstrate, MT has probed more than a few volatile regions and issues on the world stage—sometimes losing subscribers over an unpopular editorial stance, or for merely reporting on an explosive topic.



Bob: "No, I really don't. I regret it was not more successful. The conventions were a success, in that we did everything right and people kept coming back. But, we couldn't afford to continue to lose anywhere from six to ten thousand dollars every year. Seventy-five percent attended year after year, but it just wasn't growing, so it seemed to have outlived its usefulness."

Rachel: "Selfishly, the most wonderful part for me was to meet most of our writing staff face to face. Interacting with our readers also gave all of us a shot of enthusiasm and ideas that helped carry us through the year. I think there is still an interest within the hobby in opportunities for teaching and sharing information—perhaps on a smaller scale—and I'd like to promote such events."

MT: *For years, it has been rumored that Monitoring Times was in a constant battle for readers with Popular Communications. How do you see your relationship over the years?*

Bob: "Our relationship has always been very amicable. Tommy Knietel and I, although we have never met, have remained very good friends over the years. I was disappointed to see him retire but understood why he did. I still remain in awe at his girth of information sources and always enjoyed his writing style."

MT: *The radio hobby in recent years has gone through some difficult times and many changes. With the demise of several radio clubs, and more predicted, where do you see the future of the hobby?*

Rachel: "Unfortunately, I think simple economics has something to do with declining club membership and subscriptions to magazines, as it does with purchasing equipment. I see the hobby becoming more marginal—Before, when times were tough, folks still didn't give up their radios. It may also have to do with more competition for their attention by other 'fun stuff,' such as computers and the Internet."

Bob: "I see the future of the hobby merging, as the shortwave listeners, hams, and scanner listeners did. Most of those listeners now have both scanners and shortwave radios. I might add, that the entire listening hobby has also waned somewhat because of the upcoming computer and Internet age. We in turn, lost some of our subscribers, but *Monitoring Times* and *Satellite Times* are regaining subscriptions once again, so that's encouraging. The hobby may be making a recovery."

Larry: "I think it's going to centralize for awhile. I think what happens is, when things are going really good, there are lots of people in it who get involved doing clubs, publications, and small businesses. As the hobby cycles down it becomes very difficult to continue the clubs and smaller magazines. But, I still think things will centralize for the major publications."

MT: *Looking back, do you think that MT has remained a viable medium, or are you exploring other areas such as perhaps putting the magazine online?*

Bob: "First of all, a printed magazine is always far more convenient than an electronic magazine. If we put one-hundred percent of *MT* online, we would still have a substantial number of printed subscriptions and many of those would be from people who are online as well. I think the printed medium is a solid one that's going to be with us for some time. I'm not looking at a downturn for either *MT* or *ST*. I'm quite satisfied that their continued growth shows that there's a constantly increasing need for both magazines."

MT: *What do you think the hobby needs at this point to rejuvenate the enthusiasm?*

Bob: "Right now it's flat and the listening hobby in general is flat. People are feeling left behind as everyone is going to the Internet. While I would not predict the demise of the hobby, I would predict we are going to see, for years, Internet and computers out-do short-

wave and scanner listening. I don't think we will see any more nosedives in scanner or shortwave listening as long as the manufacturers continue to provide products."

***MT:** What changes are you planning in the future, to keep MT on the cutting edge?*

Rachel: "Besides the PCS column already mentioned, we aren't planning any major changes, just shifts in focus. For example, mods and tips on older equipment will shift more into Rich Arland's 'K.I.S. Radio' column, while Bill Cheek continues to move us into the world of microchips and computer-aided radio listening. As always, our faithful readers who send in news clippings and the free-lance feature writers who share their knowledge and expertise are to thank for much of our newsworthiness."

***MT:** Where do you see the radio-listening hobby in the future? Do you predict it will change because of the Internet or satellite delivered programming?*

Bob: "I think it's quite possible that publications will change as we have, to incorporate both sources of programming, so if you pick up a copy of *MT* or *ST*, you're going to see references to these alternative sources of programming. We might even see more powerful radio receivers being made that are capable of tuning more than shortwave programming."

***MT:** You now have a second magazine, Satellite Times—why the field of satellites, and what do you see as ST's future?*

Bob: "*Satellite Times* right now, is satisfying a very special niche, that is the person who is seriously interested in investigating other sources of information and entertainment from those birds. I expect *Satellite Times* to play a major role in disbursing information on personal communication services."

***MT:** Where do you see the radio hobby in 15 years?*

Bob: "In fifteen years I see it still existing as a viable independent form of intellectual recreation, but I see the radio hobbyist experimenting more with computers, the Internet, satellites, personal communication devices, and two-way radios that are license-free. Ham radio will still be with us, and though CW will long have been gone, there will be a lot of digital communications. However, I predict that probably not in the lifetime of humankind that there will ever be a replacement for the human voice!"

Rachel: "I think it will be a lot different. Where today's nostalgia is tube radio, tomorrow's nostalgia will be Bearcat and Uniden scanners and analog shortwave receivers. We'll cover it, of course, but if we're going to stay current with communications the magazine is going to have to cover whatever new technology comes along."

***MT:** What do you see in the future for MT, as it approaches the 21st century?*

Bob: "I see it continuing to have a role of dominant leadership as it has right now. *MT* is still a must-read in a number of military and government facilities, as well as in commerce. Overseas we are considered a reference for a variety of agencies. Anytime we publish an article we know we will be authoritative and accurate, the agencies referred to are often immediately on the telephone in order to get additional information. We have this position of enormous respect in professional circles and we respect that. Although we will grow we will never comprise our integrity."

Rachel: "As in PCS, the distinctions between mediums of communication—wireless or fiber optic, video or audio, digital or analog, encrypted or in the clear—will become increasingly blurred. Someday *MT's* department divisions may become irrelevant and we may have to redefine the way in which we cover the whole world of communications. At this point, its difficult to predict."

***MT:** How about a prediction for Monitoring Times next 15 years? Where do you see yourself?*

Bob: "I expect to start taking a little bit of time off because I work a long week. I think in the next fifteen years I'm going to be satisfied with the fact that the entire Grove Enterprises operation is being run satisfactorily by people whom I trust and I will be able to spend less time here, but always with an interest in what going on. We'll be different as the entire industry changes, but our power has always been the ability to change with the industry, and that's why we're still here. I will always be vitally interested in the success of Grove Enterprises and that we are satisfying the needs of our clients, but I will probably be taking a smaller role in the day to day operation."

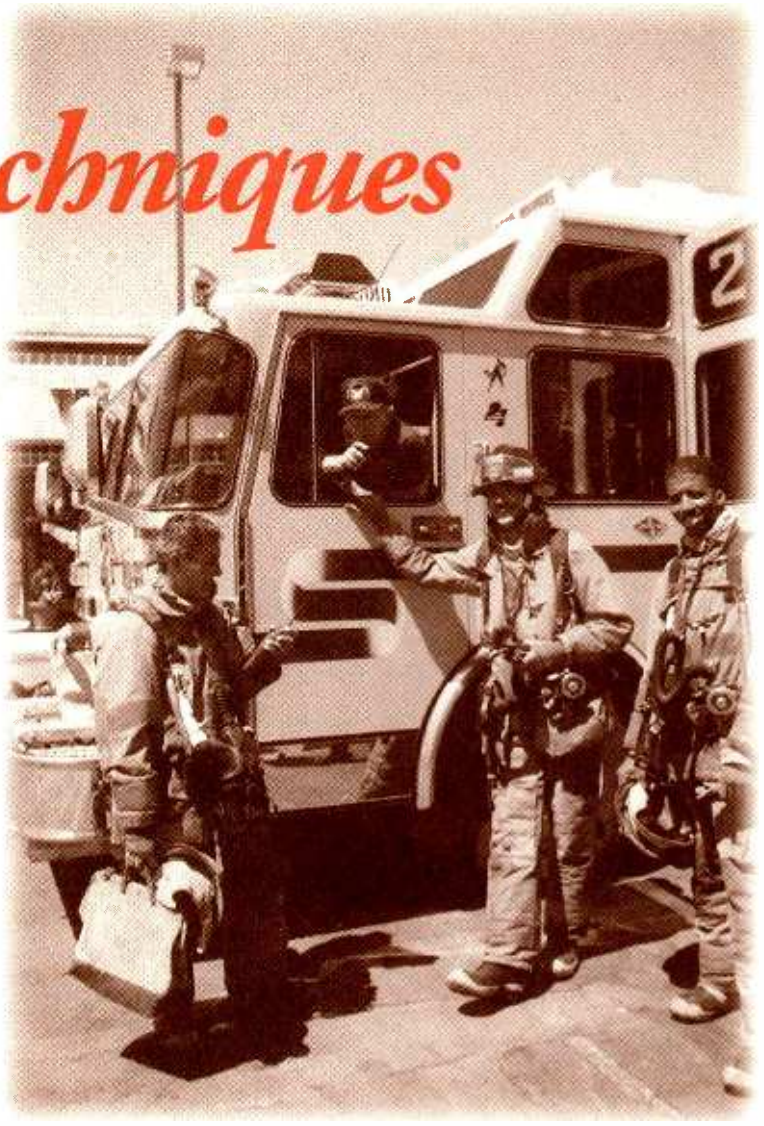
Rachel: Well, I hope to be with *Monitoring Times* until I'm ready to retire; whether as managing editor remains to be seen. For now, (laugh) what you see is what you get. I'm still enjoying it very much."

Larry: (laugh) "I think a Columbia Journalism Award or Pulitzer Prize is in line for several writers and editors. *Monitoring Times* has adapted since day one and the merger was a sign of that adaptation. Bob and Judy Grove are remarkable people who built Grove Enterprises from the ground up, and their integrity to their customers is what has established them as the best in the hobby. And, as a result, things will always do well as long as you have that Grove philosophy and keep it."

The spacious new headquarters building for Grove is located several miles from the original office. One look at the antennas on the roof suggests that Bob has been busy here.

Scanning Techniques

(That Really Work)



How can you graduate from scanning the local humdrum to scanning high drama? Here are some tips on gaining the easy familiarity with the scanning bands that advanced listeners enjoy. You'll soon find yourself immersed in information you ferretted out for yourself, just like the experts.

By Andy Barber

Searching for frequencies is a big part of the excitement afforded by the scanning hobby. Personally, I would bail out of the Cardiac Care Unit and run three miles in the snow for the chance of a new find. In my formative scanning years I relied completely on *Police Call* for frequencies. Inevitably, I was sucked into the vortex of scanning and became a true addict.

When I started noticing errors in local lists and *Police Call*, I elected to abandon them all and create my own using the following methods. The process is relatively simple...and it does not require lots of expensive equipment.

Equipment

One of several items you absolutely must have for a frequency hunt is a programmable scanner. An "Oh-my-gawd" modified Pro-2006 killer radio tethered to a commercial grade antenna on top of a 300 foot tower isn't necessary. A smaller unit will do for local stuff. You'll need a tape recorder with voice activated switch (VOX) capabilities, and pencils and paper. Buy a current issue of *Police Call*, and acquire maps of the area, too. *Police Call* and VOX recorders are available at Radio Shack and advertised in *MT*.

Optional equipment for your quest is a computer, used for filing and printing lists. You can get one that will work fine for less than you imagine. I bought an old "boat anchor" 286 PC with

a small hard drive and monitor for only $75. Another handy option is access to an Federal Communications Commission (FCC) Field Office or the FCC files on disk or CD-ROM. (OK...so a $75 computer has no CD-Rom drive, but you may have a friend with the right equipment, and some libraries have computers for public use.)

In addition, beg, borrow, or buy a portable frequency counter and you'll be armed to the teeth for the adventure.

■ Getting Started

Now that your horse is saddled, start by hiding your old lists someplace you won't be near very often, such as by your tools on your workbench. (Serious frequency hunting won't allow time for you to work on the house anyway.) Next, type a list of the public safety frequencies...PP-police, PF-fire, PM-emergency medical service (EMS), PS-special emergency, PL-city crews, PH-highway maintenance, PO-forestry conservation...as shown in the back of *Police Call*. (Public safety is the most popular, but this method works on other services, too.) On the list, cross off frequencies of which you are 100 percent, absolutely sure...not those you've been told or suspect are correct. Don't consider *Police Call* or other lists gospel, either. The integrity of your list depends on each entry being confirmed...no guesses!

Enter as many unconfirmed frequencies as your scanner will accept, hit "scan," and prepare to make notes on your list. Let the recorder run while scanning so you can play back anything you miss, but don't use the VOX yet. A VOX system can miss the first few syllables of a transmission, and Murphy's Law dictates that they will be the ones necessary to make positive identification.

The author at one of the dispatch positions at the Lenexa, Kansas, Police Dept.

Your notes must have as much information as possible, such as the call sign, agency, use, the channel number, locations, radio numbers, and general context of the conversation. Call signs are one of the most helpful bits of information you can get. Listen for the call signs (Morse code or voice) and cross reference them with *Police Call* to determine the licensee. If you can't copy Morse code, play the tape back, and listen to the first character over and over until you get the dots and dashes. Make small dots and dashes on paper if you need to, and match them up to a copy of the code you got from your ham radio friends. Repeat the process for the next character until you have them all.

As you make cross references to *Police Call*'s listings, don't fall prey to that large hairy monster called "assumption" by assuming that all frequencies are used as the listings show. A PL listing might be a PD frequency in reality. Dispatch centers may have access to frequencies of other services for interdepartmental coordination, so listen long enough to discover to whom it truly belongs.

Maps allow you to pinpoint locations you hear on the scanner. Monitoring a fire at an intersection you determine to be in the middle of Jonesville probably means you are listening to Jonesville FD. If you still have some doubt, try to get a call sign or wait to hear "Jonesville Fire to Engine 451."

When the user(s) are identified, cross the frequency off your list, lock it out of the scanner (or replace it with another one), and punch "scan" again.

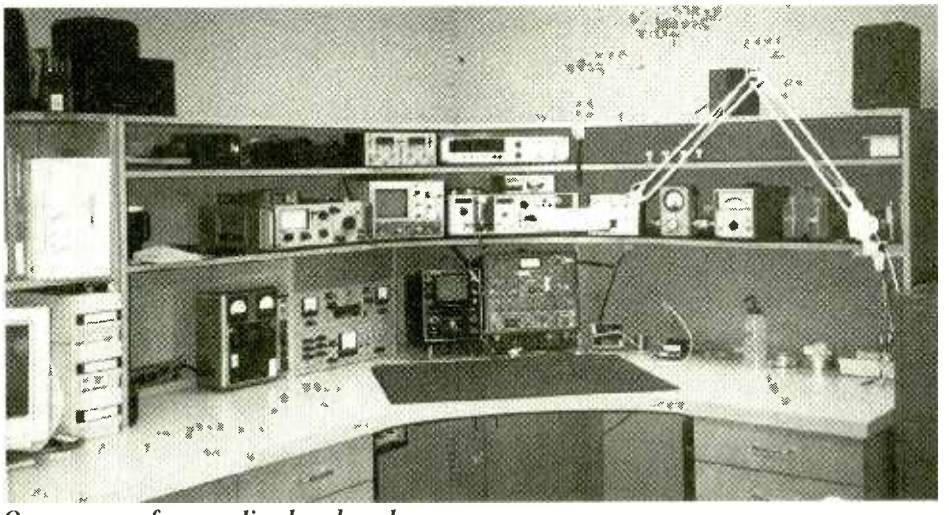
■ Using the VOX

Sooner or later you will need to get some sleep, go to work, or spend some quality time with the family. Unlike many of you, my wife is happy that I have a hobby, even though it means I must abandon her for hours while I camp out in the radio room. Oh, she tries to hide her enthusiasm by stomping around and gnashing her teeth, but she can't fool me. Anyway, when you must leave your monitoring post, stop the scanner on a frequency that is not very active. (The VOX does not get impatient listening to an inactive channel.) Mark the frequency on a cassette, turn on the VOX and let it cook. If you fail to mark the cassette you may forget what frequency you recorded, and your efforts would be in vain. Play it back when you return to the shack.

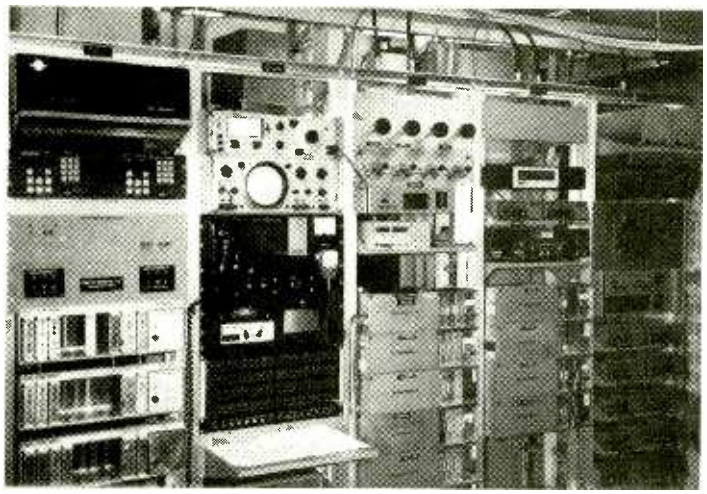
The priority feature on scanners lets you track two frequencies at once. Enter two unknown frequencies—one being the priority channel—and stop the scanner on the non-priority channel. Activate the priority function and use the VOX. Anything recorded with the periodic interruption would be the non-priority channel, and no interruptions would indicate the priority channel.

■ Other Methods

Direct contact with agencies is often overlooked; it's not illegal to call the agency and ask them for their frequencies. Law enforcement agencies generally don't mind that people have scanners, but unlike fire/EMS, the nature of the business requires a certain amount of secrecy to be effective. Therefore, some departments hesitate to give out information



One corner of our radio shop bench.



Our equipment room, filled with duplexers, voting equipment, monitors, test equipment, etc!

that might jeopardize that often illusory sense of secrecy. To minimize these effects I will make some suggestions.

Don't say, "Yeah man, what are your frequencies?" Instead try, "Hello. My name is so-and-so. I don't have an emergency...I can hold." Continue with, "I'm a radio hobbyist interested in frequencies you use. Can you help me?"

Remember, many dispatchers don't know the difference between a megahertz and an ice cube tray and couldn't tell you the frequencies if they wanted to. *Do not* use jargon, lingo, or codes. Dispatchers and cops hate when citizens do that. Be polite, and *ask* for information, don't demand it. If you get into a verbal shoving match with a dispatcher, you will lose.

Another option is a tour of the agency. Make appointments for a group tour ahead of time. Show up on time, and dress appropriately. If you arrive wearing T-shirts and shorts they may tell you to come back dressed differently...or give you the abbreviated short tour. Bring along some of your *quiet* school age children. Kids perfecting the art of whining will probably get the you the short tour. On the other hand, some dispatchers enjoy younger tour members best and go into great detail explaining things to them.

Bring a list of questions, and pad and pencil. Don't touch anything while inside. Doing so could also result in...yes...the short tour.

Make note of any call signs on the console, and scan the FCC license that should be displayed there. Inquire whether they can communicate with other agencies, and if so, what frequency or channel it is. Ask if they use repeaters or simplex systems, if they scramble anything, and what they monitor in dispatch. Request to see or get a map with district boundaries, and inquire what the radio numbers mean.

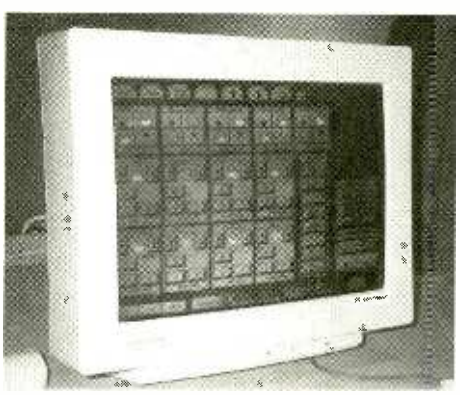
One more possibility is the Ride-Along program some police departments offer. If you ride along, follow the rules outlined in the paragraphs about tours, and don't try to speak "cop-ese." I've seen many officers, after dropping off a rider, engaged in much eyeball rolling mixed with disparaging remarks about the guy who "talked like he was a cast member of *NYPD Blue*."

Watch what channels he uses for what purposes. Note what frequencies are in his scanner, or ask if you can see what's programmed. Quiz him about things mentioned in the section about tours. Take notes...you can't remember it all.

Before you ride with an officer, be forewarned that you might become involved in some type of crime in progress. It may sound exciting, but it can be terrifying. If that happens, your children will wonder why you returned home with your hair sticking out like that of a frightened porcupine and why your eyes refuse to blink. Tell them it was nothing...someone just shot at the police car while you were in it.

■ Frequency Counters

Many articles have been published on technical methods for using frequency counters,



17" touch screen radio control/monitor screen which displays eight transmit/ receive modules and 20 monitor modules. No more buttons! (Mouse/ trackball also used to control functions.)

so I won't go into that. Here are a few tricks to minimize the number of times you are stopped by authorities who are curious why you are carrying a suspicious looking box.

When I can, I take my son with me. People watching my son and me wandering around their property are less apt to sic the locals on me than if I was alone. If your child holds and reads it for you, they'll most likely ignore you, thinking your remote control car has driven off into the sunset.

A home-brew flexible antenna made from good quality stranded wire and a BNC connector works OK, and doesn't draw attention like the telescoping antenna. I have asked security officers, and construction and utility crews to key up their radio so I can "check out" my new toy. Most have done so, amid some snickering, allowing me to acquire a newly confirmed frequency.

■ FCC Files

Regardless of your source for the FCC files, you still will be required to sort out the information after you retrieve it. I've discovered a few ways of wringing a little more information from them than you might think.

FCC files may show the address or phone number at the control point (dispatch center). During one trip to the FCC Field Office, I found a frequency issued to the state showing an address and room number at the capitol, but there was no clue to the actual agency using it. I called the capitol, asked the receptionist what agency was in room such and such, and was promptly informed of the user.

In another instance I simply called the listed phone number and waited to see who answered. If the files include the antenna site's location, go there and see if any signs indicate to whom it belongs. With the files, you can cross reference the different fields to discover more, and you can confirm information you have collected from other sources, also.

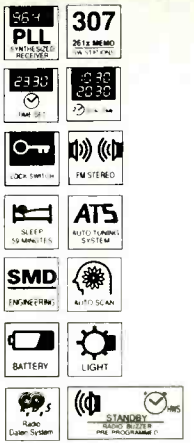
■ Organizing the Info

Periodically you will want to organize your work. (This is when a computer is handy.) First, create three lists made up of information from your original list plus the data you found during your search. Sort one of them by agency, one by frequency, and one by call sign. These won't be the finished product. They will be research copies to be used in the never-ending process of frequency hunting. Leave a space or two between each entry. You might want to re-do your unconfirmed list at this point, too. It will be much smaller and easier to deal with.

SANGEAN ANNOUNCES

THE WORLD'S MOST ADVANCED SHORTWAVE RECEIVERS

SANGEAN ATS-909



THE LAST SHORTWAVE RECEIVER YOU'LL EVER NEED TO BUY!!

THE SANGEAN ATS-909

- AM/FM Stereo/SW
- PLL Dual Conversion Receiver
- 306 Memories
- 28 SW Pages Preprogrammed at Factory
- 42 World City Times Preprogrammed
- Full RDS Reception
- 5 Tuning Methods
- Auto Tuning Methods
- Auto SW Search
- ATS Automatically Presets Memories
- Manual Editing
- USB/LSB Single Side Band Select
- RF Gain Control
- 3 Individual Timers
- Adjustable Sleep Timer
- Dual Time System
- Selectable Tune Steps
- Priority Key
- Wide/Narrow Filter
- Battery Indicator
- Signal Strength Meter
- Mono/Stereo Switch
- LCD Display Light
- Auto Daylight Savings Time Button
- Lock Switch
- Reset Switch
- Audio Record Output
- 9KHZ/10KHZ Switch
- Cassette Record Jack
- Tone Control
- Includes AC Adapter
- Includes ANT-60 Antenna
- Includes Carrying Case
- 8¼" x 5.0" x 1½"

AVAILABLE AT THE FOLLOWING DEALERS:

C.CRANE
(800) 522-TUNE (8863)
ccraneco@aol.com

ACE COMMUNICATIONS
(800) 445-7717
acecomms@aol.com

AFFORDABLE PORTABLES
For location nearest you call:
(714) 580-3548 Mail orders welcome

AMATEUR ELECTRONIC SUPPLY SHORTWAVE HEADQUARTERS
(800) 558-0411

AMERICAN FREEDOM
Box 430, Johnstown, CO 80534
For credit card, call (800) 205-0845

CANADIAN DISTRIBUTOR TEXPRO SALES CANADA
(905) 332-5944 FAX (905) 332-5946

COMMUNICATION ELECTRONICS, INC.
Ann Arbor, MI 48106
(800) USA-SCAN OR (313) 996-8888

ELECTRONIC EQUIPMENT BANK
Vienna, VA 22180
(800) 368-3270

GROVE ENTERPRISES
Brasstown, NC
(800) 438-8155 FAX (704) 837-2216

HAM RADIO OUTLET
12 Store Buying Power
(800) 854-6046/(800) 444-0047

LENTINI COMMUNICATIONS, INC.
21 Garfield Street, Newington, CT 06111
(800) 666-0908 Tech (860) 666-6227
FAX (860) 667-3561

LIFESTYLE FASCINATION, INC.
Lakewood, NJ 08701
(800) 669-0987

UNIVERSAL RADIO, INC.
Reynoldsburg, OH 43068
800) 431-3939

SANGEAN ATS-818CS

PLL SYNTHESIZED WORLD BAND RECEIVER WITH PROGRAMMABLE CASSETTE RECORDER

- All SW Bands from 120m to 11m
- BFO for SSB/CW Reception
- 45 Memory Presets
- Radio/Buzzer Clock Alarm
- Continous AM coverage from 150-29999KHz plus FM 87.5-108MNz
- Play/Record LED Indicator
- Programmable Recorder
- Ajustable Sleep Timer
- Auto-Stop Cassette Feature
- Dual Conversion Receiver
- 5 Tuning Methods

SANGEAN ATS-818: Identical to ATS-818CS without cassette recorder

WRTH

SANGEAN AMERICA, INC.

WORLD RADIO LEADERSHIP 1974 to 1996

2651 Troy Avenue, S. El Monte, CA 91733 • Tel. (818) 579-1600 Fax: (818) 579-6806
Shortwave "Hotline" Toll-Free 1-888-SANGEAN

Date or destroy the old ones to avoid confusing them with new ones.

So far you have dealt with raw data only. The next section describes how to make sense out of the organized information. A basic knowledge of radio systems will help.

■ Radio Systems

A *single frequency simplex* channel is like a Citizen's Band radio. Mobiles and bases transmit and receive on a single frequency. (Listen to that frequency to hear both sides.) *Two frequency simplex* systems incorporate a transmit frequency for mobiles, which the base receives, and a second transmit frequency for the base, which the mobiles receive. (Listen to both frequencies to hear both sides.) In a *repeater system* the mobiles and base transmit on one frequency that is received by the repeater. The repeater rebroadcasts those transmissions on a different frequency with more power. The bases and mobiles receive the repeater frequency. (Listen to the repeater output to hear both sides.) There are more variations, but most will fall into one of these three major categories.

UHF (450-465 MHz) systems are about as simple as a gong solo. Repeater outputs are 5 MHz below the inputs...period. For UHF-T band (470-512 MHz) the outputs are 3 MHz lower. Outputs for 800 MHz systems are 45 MHz below the inputs. Unfortunately, VHF HI (150-174 MHz) pairs can be most any combination of frequencies. Frequencies with the same call sign are most likely paired.

A mobile and dispatcher heard on the same frequency with equal strength probably indicates a repeater. If you hear strong bases, but the mobiles have varying signal strength on the same frequency, suspect a single frequency simplex system. If you hear mobiles on one and the base on the other, it is a two frequency simplex system. Mobiles are not as powerful as a base, and thus, harder to hear in a simplex system.

If you discover more than two VHF HI frequencies with the same call sign, the next paragraph might point you in the right direction.

Some systems have mobile licenses on the base/repeater output frequency. This is for car to car traffic, often called "talk-around." In a repeater system, talk-around bypasses the repeater to become a one frequency simplex system. It performs likewise in a two frequency simplex system. The number of mobiles for talk-around is usually the same as the number of mobiles listed for the input frequency, so listen to a pair that share same number of mobiles. What do you do if you discover two pairs with the same call sign and the same number of mobile licenses? Listen to them all, two at a time until you get the correct combination. Hey—not everything has a simple answer.

A frequency listed with no apparent mate could be a car to car frequency or a single frequency simplex system. If you suspect it is a single frequency simplex system, look either for a single license showing bases and mobiles, or two licenses...one for the bases and one for the mobiles.

If channel numbers are mentioned, like channel four, assume that there are at least channels one, two, and three, also. Listen to all frequencies licensed to that agency, and keep filling in the blanks until you have all four channels confirmed. Often in a repeater or two frequency simplex system you will find that channel "1" is the repeater or base, and channel "2" is talk-around. You will have difficulty hearing mobiles on talk around unless they are fairly close.

Your search must include all the frequencies...even those you assume are the trash trucks or water meter readers. Some of the best finds are those that appear uninteresting on the surface. I don't really care how those uninteresting frequencies are used as much as I care to know how they are *not* used. In other words, if I'm sure it is a meter reader then I'm equally sure it's not a secret detective frequency.

A prime example is a PO frequency listed in *Police Call* as licensed to a small suburb in my area. After letting the VOX do its thing I heard phone calls from citizens to the PD. Though dispatched by another agency, it has its own phone number for workday hours. If someone calls that number when the office is closed, it is automatically patched to the police car over that frequency. How many of you can say you hear the phone calls to your police department in a completely legal fashion? ... and on a forestry conservation frequency, at that!

■ The Finished Product

You will probably want two lists, one sorted by frequency, and the second by agency. You should have at least four columns ... frequency, agency/use, input, and call sign. In both lists, I put repeater channels in bold type, simplex channels in normal type, and trunked systems in italics as a way to keep them straight. An asterisk was inserted by input frequencies for easy recognition.

In the list sorted by frequency, *every* frequency needs to be included, even if it is an input. I elected not to include inputs for UHF and 800 MHz, since they are constant. For the list by agency, each frequency does not need to be shown as a separate entry, but each *channel* (which is made up of one or two frequencies) must be listed. See the examples.

Add columns for PL tones, channel numbers, and anything else you may want. Manufacture an attractive cover and staple it together. As you update your list, date or destroy the old ones. Last of all, make sure you send a copy of the list to the *Scanning Report* in *MT*.

Sample List by Frequency

Frequency	Agency	Input	Call Sign
158.775	**Jonesville PD disp**	**159.030**	**KAB123**
158.775	Jonesville PD talkaround	NONE	KA4567
159.030 *	Jonesville PD disp	to 158.775	KAB123
158.745	Jonesville PD car/car	NONE	KAB456
154.250	Jonesville FD disp	154.070	KBC321
854.9875	**Jones County conventional repeater**		**WBC123**
856-860.0375	*Jonesville City*	*811-815.0375*	*KAB321*

Sample List by Agency

Agency	Frequency	Input	Call Sign
Jonesville PD disp	**158.775**	**159.030**	**KAB123**
Jonesville PD talkaround	158.775	NONE	KA4567
Jonesville FD disp	154.250	154.070	KBC321
Jonesville PD car/car	158.745	NONE	KAB456
Jones County cnvntionl rptr	**854.9875**		**WBC123**
Jonesville City	*856-860.0375*	*811-815.0375*	*KAB321*

Selected Kansas and Missouri Frequencies

JOHNSON COUNTY KANSAS LAW ENFORCEMENT FREQUENCIES

EDGERTON CITY/PD	155.085	FAIRWAY CITY/PD	156.240
GARDNER CITY/PD CH 8	154.055	**JOCO S ZONE**	**158.775**
		JOCO N ZONE	**159.150**
KHP BONNER TOWER	868.6750	**JOCO INVESTIGATIONS**	**158.730**
KHP OLATHE TOWER	866.6875	**JOCO TAC CH 4**	**159.585**
KHP	*JO TRUNKED*	JOCO COUNTYWIDE	159.030
		JOCO JAIL	**159.210**
LEAWOOD PO CH 1	**453.950**	**JOCO COURT SERVICES**	**159.180**
LEAWOOD PO CH2	**453.625**	**COM. COLLEGE**	**453.775**
LEAWOOD PD TAC	158.850	**JOCO CIVIL DEFENSE**	**153.995**
LEAWOOD TRUNKED (future)	*856-857.2375*	*JOCO TRUNKED*	*856-860.9625*
LENEXA PO DISP	**460.325**	**MERRIAM CITY/PD**	**159.105**
LENEXA PO INFO	**460.450**		
LENEXA PD CAR/CAR	460.050	**M.E.R.S.***	**158.820**
MISSION CITY/PD	159.000	**OLATHE PO F 1,2 DISP**	**453.825**
		OLATHE PO F 3,4 INFO	**453.900**
OV. PARK TRUNKED	*856-860.9875*	**OLATHE PO F 6 TAC**	**453.750**
PRAIRIE VILLAGE TRUNKED	*858-860.2375*	ROELAND PRK CITY/PD	155.760
		ROELAND PRK CITY/PD	155.925
SHAWNEE PO	**460.175**		
SHAWNEE PO	**460.075**	WESTWOOD CITY/PD	156.240
INTERCITY	460.100	MUTUAL AID	868.0125
(SIMULCAST)	453.450	MUTUAL AID	868.5125

JOHNSON COUNTY FIRE & EMS FREQUENCIES

JOCO DISP CH 1	**154.250**	MED 1 (JOCO)	468.000/463.000
JOCO CH 2	**154.205**	MED 2 (JOCO)	468.025/463.025
JOCO TAC CH 3	154.785	MED 3 (JOCO)	468.050/463.050
JOCO TAC CH 4	154.415	MED 4 (JOCO)	468.075/463.075
JOCO TAC CH 5	154.295	MED 5 (MAST)	468.100/463.100
JOCO MUTUAL AID CH 6	154.285	MED 6 (MAST)	468.125/463.125
		MED 7 (MAST)	468.150/463.150
LENEXA CITY FIRE	154.145	**MED 8 (MAST) DISP F 2**	**463.175**
LEAWOOD CITY FIRE	154.325	**MED 9 (MAST) DISP F 1**	**462.950**
MERRIAM CITY FIRE	154.355	**MED 10 CALL IN (JOCO)**	**462.975**
OVERLAND PARK CITY FIRE	460.575		
OVERLAND PARK CITY FIRE	460.600		
OVERLAND PARK CITY FIRE	460.6375		

*Metropolitan Emergency Radio System

KANSAS LAW ENFORCEMENT, FIRE/EMS FREQUENCIES

POINT TO POINT	39.460	**KHP BONNER**	**868.6750**
STATE WIDE DISP	39.580	**KHP OLATHE**	**866.6875**
STATE WIDE CARS	39.700	**KHP LAWRENCE**	**868.8625**
KHP (not used much anymore)	44.94/45.18	**KHP PAOLA**	**868.8375**
KHP (not used much anymore)	44.98/44.82	**KHP HURON**	**866.7125**
KHP	*JO TRUNKED*		
MIAMI COUNTY			
MIAMI CO SO	**155.610**	**PAOLA PD**	**154.980**
MIAMI CO FD	**154.310**	PAOLA FD	155.940
MIAMI CO CD	39.640	PAOLA FD	154.340
OSAWATOMIE PD	155.700	**OSAWATOMIE ST HOSP**	**155.310**
OSAWATOMIE PD	39.640	OSAWATOMIE ST HOSP	39.500
LOUISBURG FD	154.160	AMBULANCES	467.975/462.975
LEAVENWORTH COUNTY			
LV CO DISP	851.5625	LV PD	453.200
LV CO TAC	852.5625	LV PD	453.350
LV CO (OTHER CITIES)	853.5625	LV FD	460.250
LV CO FD	154.385	LV FD	46.440
LV CO CD	155.820		
		FT LV MPS	164.500
ST PEN LANSING	**155.310**		
ST PEN LANSING	155.130	VA HOSP PD	166.200
DOUGLAS COUNTY			
DG CO DISP	39.220	**DG CO SKYWARN**	**155.160**
DG CO DISP	867.3375		
DG CO CD	155.805	LAWRENCE PD	158.790
DG CO CD	155.760	LAWRENCE FD	154.400
FRANKLIN COUNTY			
FR CO DISP	154.755	**OTTAWA PD**	**155.055**
FR CO CO	**155.835**		
		WELLSVILLE PD	154.725
WYANDOTTE COUNTY			
KCK PO BACKUP	**854.9875**	WY CO DISP	155.520
KCK PO DATA	**855.2125**	WY CO CH 2	155.430
KCK TRUNKED	856-860.7625	WY CO CH 3	154.950
KCK TRUNKED	856-860.9375	**WY CO CO**	**155.895**
KCK FD (NOW 800)	153.770		
KCK KARE (EMS) (NOW 800)	154.175		

MISSOURI LAW ENFORCEMENT FREQUENCIES

BELTON	**453.600**	**BLUE SPRINGS PO**	**155.865**
		BLUE SPRINGS PD	155.670
CASS CO SO	155.685		
		CLAY CO SO	155.700
CLAYCOMO PD	155.115		
CLAYCOMO PD	155.595	CMSU CAMPUS PD	155.130
GLADSTONE PO	**853.6375**	GRANDVIEW PD	155.550
GLADSTONE PO	**854.6875**		
		HARRISONVILLE PD	155.070
INDEPENDENCE PO	**453.300**		
INDEPENDENCE PO	**453.850**	JACKSON CO SO	155.790
INDEPENDENCE PO	**453.675**	JACKSON CO SO	155.970
		JACKSON CO DETS	156.150
JOHNSON CO MO	WARRENSBURG	JACKSON CO JAIL	154.755
KCMO N ZONE (old)	154.710	LAFAYETTE CO SO	155.490
KCMO METRO ZONE (old)	154.740		
KCMO CENTER (old)	154.860	**LEES SUMMIT PD**	**159.030**
KCMO S ZONE (old)	154.890	LEES SUMMIT CITY/PD	155.940
KCMO CITY WIDE (old)	155.640	LEES SUMMIT PD C/C	156.030
KCMO TAC (old)	155.850		
KCMO E ZONE (old)	156.090	LIBERTY PD	154.800
KCMO OETS (old)	**460.300**		
KCMO OETS (old)	**460.525**	MHP STATEWIDE	42.020
KCMO OETS (old)	**460.550**	MHP METRO DISP	42.060
		MHP METRO CARS	42.220
MO SO NET	155.370	MHP RURAL DISP	42.380
MO MUTUAL AID	155.475	MHP RURAL CARS	42.320
MO POINT/POINT	155.730	MHP SIMPLEX	42.120
NKC PD	460.125	PARKVILLE PD	155.250
NKC PD	460.425	PARKVILLE PD	155.625
PLATTE CO	(PARKVILLE)	RIVERSIDE PD	155.565
RAYTOWN TRUNKED	*856-860.1375*	WARRENSBURG PD	155.055
	856-860.5625	WARRENSBURG PD	155.415

MISSOURI FIRE/EMS FREQUENCIES

BELTON FD	154.400	CASS CO FD	153.845
		CASS CO FD	154.355
GLADSTONE FD	SEE PD	CASS CO FD	154.400
GRANDVIEW FD	154.430	INDEPENDENCE FD	154.310
JACKSON CO FD	154.220	JOHNSON CO FD	154.190
JACKSON CO FD	154.370		
		KCMO FD DISP	154.130 (old)
LEES SUMMIT FD	**453.900**	KCMO FD FIREGROUND	154.445 (old)
LEES SUMMIT FD	**453.525**	KCMO FD CAR/CAR	154.010 (old)
LEES SUMMIT FD	453.575	KCMO FD	see KC 800 Mhz
LEES SUMMIT FD	460.350		
		NKC FD	154.235
ODESSA FD	154.415		
		PRAIRIE TOWNSHIP	**460.575**
RAYTOWN FD	154.370		
		RIVERSIDE FD	154.190
SMITHVILLE FD	154.190		

KCMO PD/FD/CITY SERVICES G.E. SYSTEM.

In service as of 071596
856.2125 TO 860.2125
856.2675 TO 860.2675
856.4325 TO 860.4325
856.4625 TO 860.4625
856.7375 TO 860.7375

Bold = Conventional Repeater
Italics - Trunked System
Normal - Simplex System

Evaristo Mercado, Program Director, with the news.

Nicaragua's Radio Miskut

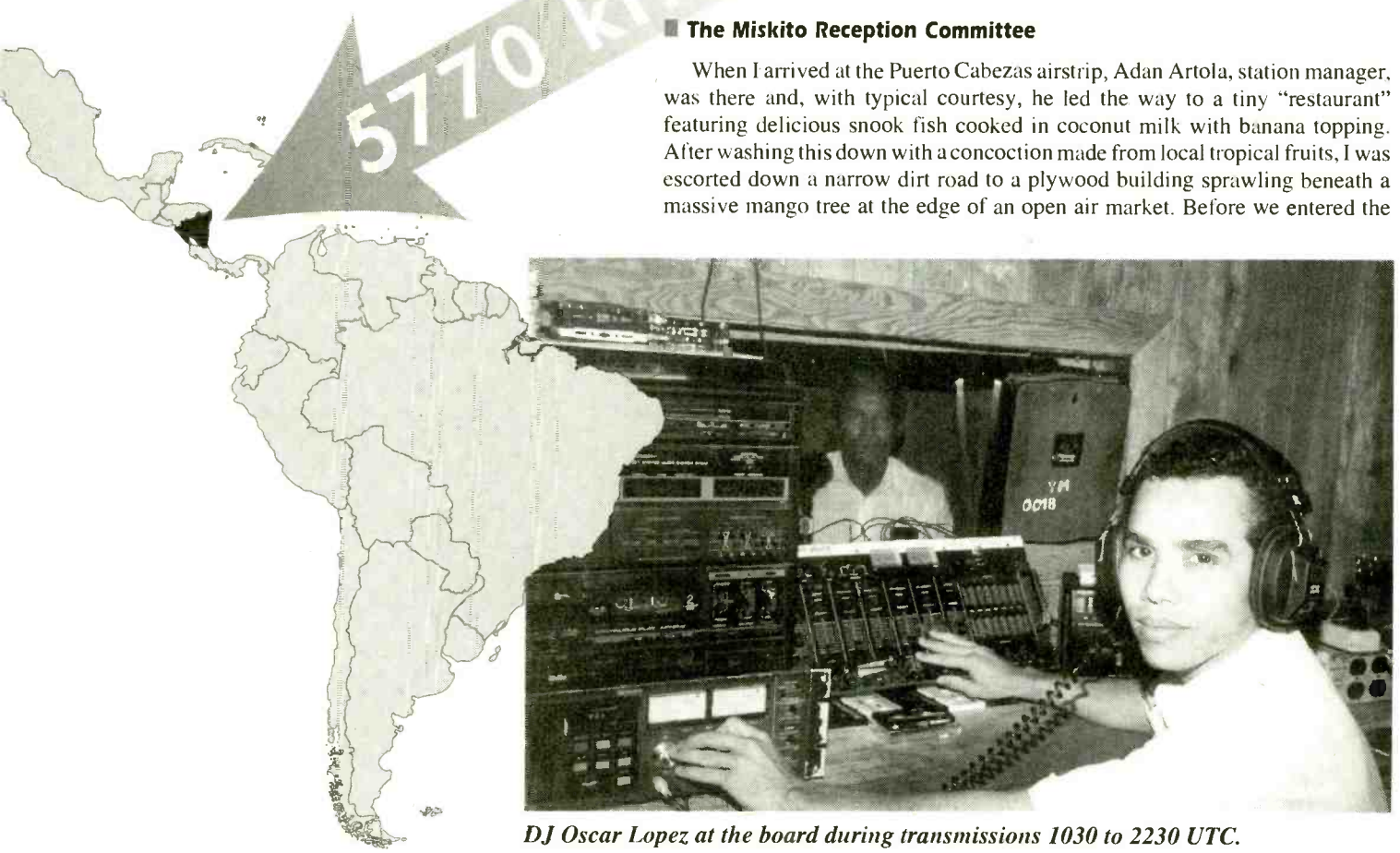
By John C. Freeman

In October 1994, Glenn Hauser's "Global Forum" column in *Monitoring Times* had a brief reference to Radio Miskut, "Nicaragua's only shortwave station." He wrote that the station was off the air due to "problems with two MSR 6214 modules," and that the facility had a 1 kW ITT MacKay transmitter on 5770 kHz. Right away, I could see where this *gringo* was going on his next vacation.

Christmas of 1995 was an ideal time to be heading south to warmer places, and Nicaragua was warm, indeed! On my arrival in Managua, I encountered rioting university students protesting budget cuts, and several people were killed. Undeterred, and with no signal from Radio Miskut in Puerto Cabezas audible on my Sony SW7600G, I felt a trip to Puerto Cabezas (and back) was essential.

The Miskito Reception Committee

When I arrived at the Puerto Cabezas airstrip, Adan Artola, station manager, was there and, with typical courtesy, he led the way to a tiny "restaurant" featuring delicious snook fish cooked in coconut milk with banana topping. After washing this down with a concoction made from local tropical fruits, I was escorted down a narrow dirt road to a plywood building sprawling beneath a massive mango tree at the edge of an open air market. Before we entered the



DJ Oscar Lopez at the board during transmissions 1030 to 2230 UTC.

studios of the only Nicaraguan SW station, Mr. Artola found me a shady place to sit and explained some Nicaraguan history, both recent and past.

The Miskito people are one of the largest groups of indigenous Indians remaining in the Americas. They shared eastern Nicaragua for at least the last thousand years with two other groups of Indians, the Sumo and Rama peoples.

Despite common *gringo* assumptions that the Miskito tribe was named for the local insect pest, it is claimed that the Indians were purveyors of firearms (muskets) to pirates and other adventurers during the 1600's, leading to the term "miskito" in honor of their weapons trade. Tales abound that adroit use of weapons has always been an essential part of Miskito culture.

What's behind this door? "Something to do with relief from oppression."

My host advised that I would learn more about the perils which the Miskito people have had to combat.

■ Inside the Radio Shack

As we entered the station building, about ten young men were sitting around chatting inside a large room. There were separate rooms for the DJ, the manager, and the transmitter. The structure was constructed of plywood sheets and almost devoid of windows. The manager's office had the only air conditioner.

Amazingly, the studio monitor was blaring out real down home Hank Williams, and the DJ, despite his humble surroundings, would not look out of place at any of dozens of U.S. AM stations. Oscar Lopez, the DJ, put in another tape and explained that American country music comprises the local Top 40 day in and day out.

Sylvia Babb, the secretary, was typing out news copy on an ancient manual typewriter in the hall. Elesterio Thomas, financial officer, explained how strapped for cash the station has been, and how eager he is to sell advertising to enable the station to continue operating. As I sat back and absorbed this, I experienced a strong case of *déjà vu*. This place is exactly like a station I once worked for in Mississippi! Another place: same ol' problems.

■ Public Service Radio

Mr. Artola explained that Radio Miskut evolved from a previously clandestine station started during the Sandinista government's war against the Miskito people in eastern Nicaragua in the 1980's. Just like so many other groups of indigenous peoples worldwide, the Miskitos did not take kindly to having their villages burned and their people taken to concentration camps.

The Miskitos felt forced to become part of the Nicaraguan revolution, which also featured the Contras, Oliver North, and others. Because Miskito Indians, I was told, do not want their lives disrupted or their resources exploited by Sandinistas or anyone else, during the time of open warfare hundreds of Miskito fighters answered the call to arms.

With them went a solid state SW radio set donated by "friends in the U.S." The gear consisted of an ITT MacKay MSR 8000 transceiver with an MSR 1020 linear amplifier feeding a wire antenna through an MSR automatic antenna coupler.

All this gear was carried by Miskito troops in transit cases through disease and insect infested swamps, jungles, and mountains in the war zone. Artola said the transmissions were for both military tactical purposes and for psychological support of the beleaguered Coastal Indian people.

Manager Adan Artola demonstrates kaput amplifier to the author. Note operational low power transmitter with added cooling fan!

■ Radio Miskut Today

Today, this same equipment is still the basis of the peacetime broadcasting station on 5770 kHz. The programming includes the usual news, country music, and such, but also is geared toward informational programs for farmers, homemakers, and children. An exemplary concern with anti-drug and other public health issues was evident on the program schedule.

Since the Moravian Church is widely attended by Miskito people, broadcasts of church services are featured. With Indian people spread out along the coasts of Honduras and Nicaragua over hundreds of roadless miles, shortwave broadcasting by Radio Miskut is a valuable resource, according to church representatives whom I met in Puerto Cabezas.

Fine. So why couldn't I hear Radio Miskut from Managua? The truth is that the 1 kW linear amp is *kaput*. Radio Miskut has to resort to running their exciter on AM barefoot into their dipole antenna on 5770. A quick review of the manuals convinced me that there might be thirty watts going to the antenna on a good day.

Cash is very scarce in eastern Nicaragua for new transmitters. Nevertheless, the low power does at least allow the population center of Puerto Cabezas to hear the station. The staff has proudly treasured reception reports from the U.S., Japan, and Europe dating from earlier days when the amplifier was still working. At that time, 500 watts of RF power was going into the half wave dipole forty feet off the ground there on the coast of northeastern Nicaragua.

■ Hope for the Future

The Miskitos live in one of the last unspoiled tropical paradises. They have a keen sense of the need to prevent outside exploitation of the local resources. This theme certainly resonates with the thinking of many other folks worldwide.

There is a great emphasis on education. The school donated by the U.S. Agency for International Development to the city of Puerto Cabezas is a local treasure. Several of the Radio Miskut staff are attending college. The area abounds in both natural beauty and natural resources. Certainly, specialized tourism and non-exploitative resource development would be welcome.

My personal prediction is that donations of usable equipment will soon get Radio Miskut back on with power, and maybe even on the MW band as well. This time, the Indians are going to win!

Shortwave Brings Hope to

By Henrik Klemetz

Shortwave radio is a means of communicating, usually over great distances. Even when that communication is of the one-way type, it may be instrumental in bringing comfort and hope to its listeners. Several of the foreign hostages taken captive by Colombian guerrillas have special reason to appreciate international shortwave services. For some of them, shortwave clearly helped them endure their ordeal.

Story #1

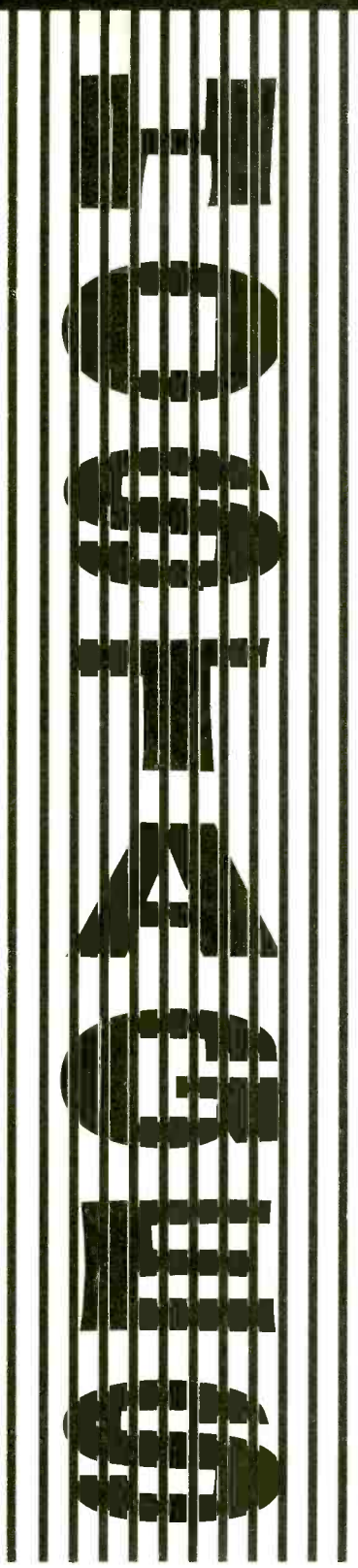
On December 14, 1994, two Swedish engineers, working with a hydropower project in Northern Colombia, were abducted by the Colombian rebel organization Fuerzas Armadas Revolucionarias de Colombia (FARC, or Colombian Revolutionary Armed Forces).

Released five months later, the two Swedes, Danny Applegate and Tommy Tyrving, said that the shortwave broadcasts from Radio Sweden played a significant role in keeping them psychologically fit at all times.

In January 1995, their employers, the Skanska construction company, managed to send them some provisions through the auspices of the International Red Cross. "They sent us clothes, two bottles of whisky, a novel about a Swedish undercover agent, a shortwave radio, and letters from our wives," Danny Applegate remembered.

Every morning, at 6 a.m., the two Swedes checked their outdoor receiving antenna in order to pick up the midday newsreel from the Swedish home service, relayed on shortwave.

Graffiti on a Bogotá wall demanding liberty for the kidnaped Swedish engineers



Armed police guards: who and where is the enemy?

The Swedish government spared no efforts in trying to get their two nationals released. In February, about two months after the kidnaping, a representative of FARC was invited to Sweden for talks with industrial representatives of that country.

At the same time, in Colombia, the International Red Cross, on its shortwave frequency of 6994 kHz USB, negotiated the logistics of release with the Colombian guerrillas. The two parties were using the cover names "Freddy" and "Luis," respectively. At one point, even the Swedish Ambassador, Sven Julin, participated in the on-air talks.

"Luis, Luis. This is the Swedish Ambassador. I have been listening to your talks, and I am 100% in agreement with the Red Cross. I agree with everything said so far. I have been talking to the [Colombian] Defence Department and I assure you that it's impossible to have the troops withdrawn from the two areas you suggest. So please find another alternative. Over."

With the help of professional negotiators, such as those of the London-based Control Risks Group, the two engineers were eventually freed. The Swedish firm says it paid no ransom, but Colombian intelligence sources believe that the guerrillas received some 6

million dollars, part of which may have been insurance money.

Story #2

While Radio Sweden frequently reported on the fate of their nationals, this was not the case of Radio Denmark during the time the Danish firm F. L. Smidth saw two of their employees kidnaped by the Ejército de Liberación Nacional (ELN, or National Liberation Army) guerrillas. On February 5, 1996, the Danish engineer Ulrik Schultz was captured when traveling in a car from Medellín to the Rio Claro cement factory. Along with him was his British working mate, Philip Halden; a German subcontractor, Karl Heinz Dresser; and a Colombian, Diego Blandón.

The German citizen regained freedom after a month's captivity, whereas the three others had to endure more than seven months in the jungle. A special team sent out by the Danish firm soon managed to get in touch with the guerrillas, sending the hostages clothes, medicine, and a couple of shortwave radios.

In March, Radio Denmark broadcast a secret message for the Dane—probably the only covert message to have been aired on that station since World War II. With the Beatles' tune "Help" as a clue, the message went, "Torben Skipper and Auntie from Valby send their warmest greetings to friends and family in South America, hoping to see you soon again."

An avid Beatles' fan, Schultz said afterwards that it still took him a couple of days to realize that this mysterious message was actually meant for him! "Auntie from Valby" was the nickname of the firm he was working for.

Per *DX Partyline*, a weekly DX program on Ecuadorian missionary station HCJB, the British citizen who was held captive with the Dane sent the station an e-mail message shortly after his release, saying, "My hours of listening to HCJB on shortwave radio helped more than I ever can explain. You at HCJB gave me hope and strength to bring me through."

Stories #3 and #4

Another kidnap victim who listened in to HCJB was the American, Raymond Rising, who was released from captivity in June 1996, after being held hostage by the Colombian FARC guerrillas for over two years. A trained radio technician, the Wycliffe missionary reportedly made himself a 60-foot antenna by unraveling a Scotch pot cleaning pad made of wire.

Missionary wives and children visit Colombia, in Feb. 1996, from left to right, Connie, Lee, Patricia, and Dora Tenenoff; Tania Rich with daughter Tamra; Nancy Mankins with Tania's daughter Jessica. At right, Dora Tenenoff, 12, with a picture of her dad Rich.

A fellow missionary with the Shell Mera mission in Ecuador said that Rising was not able to listen constantly, as there was a limited amount of batteries, "but whenever he tuned in it was at times when he needed encouragement the most."

There are at least three more Americans held as hostages by the Colombian guerrillas. The New Tribes missionaries, David Mankin, Mark Rich, and Richard Tenenoff, were abducted from their jungle mission station on the Panamanian border on January 31, 1993.

Three years later, in February 1996, their wives and children visited Colombia to stir up public opinion about their case. On November 2, 1996, messages of love and hope for their return to freedom were aired on HCJB World Radio.

Story #5

American agricultural writer Thomas R. Hargrove was released on August 22, 1995, after being held as a hostage by the Colombian FARC guerrillas for 333 days. A stirring account of his ordeal has been published by Ballantine Books under the title, *Long March to Freedom*. In his book, the shortwave broadcast issue comes alive once again.

At the outset of his kidnaping, he was often given a chance to tune in to the Voice of America or the BBC for their world news in English. But he never heard any mention of his specific case from any international broadcaster.

Local networks, such as Caracol, did, however, mention the Hargrove kidnaping. This bothered the guerrillas, so his listening was subsequently being cut down to nil. Nonetheless, Hargrove did not want his case to be forgotten by the media. "Keep my name on the radio, so it will be embarrassing for FARC if I disappear," Hargrove wrote on the 75th day of his captivity.

In a letter to the International Red Cross in Geneva, he requested that a representative be sent to visit him, and that he bring along "mail, vitamins, medicines, a shortwave radio, and books."

On the 212nd day in captivity, Hargrove sighs, "Lord, what a difference a radio would make in my life. Especially a shortwave radio. But even with a regular radio, I could listen to news in Spanish."

Having spent some time in Vietnam as a rice expert during the Vietnam War, Hargrove says that his captivity was actually "worse than anything he had been through in Vietnam." However, in an interview for *Agriculture Today*, on the Voice of America, the American agricultural specialist said he did not hold any resentment towards the people of Colombia.

"Those who held me were criminals," he said—and that was not the case with the majority of Colombians he had gotten to know.

For hostages in a foreign country, a shortwave radio can be a lifeline to one's home country.

1996 Index of Articles

FEATURES:

Broadcast:

Human Interest:

Miscellaneous:

Scanning:

Technology and Technical:

Utilities:

AMERICAN BANDSCAN

ANTENNA TOPICS

BEGINNER'S CORNER

BELOW 500 kHz

BOB'S TIP OF THE MONTH

CLOSING COMMENTS

JAN ..... Equipment: Room for more?
FEB ..... Scam That Wouldn't Die (Spectrum Antenna)
MAR ..... A Theory of Technological Evolution
APR ..... The Telecom Act - More protection than we need?
MAY ..... War of the Web: Round Two (by David Lindsay)
JUN ..... State of the economy
JUL ..... Radio Listeners: Are we really a threat?
AUG ..... Random Reflections
SEP ..... What the Heck is PCS?
OCT ..... The Pendulum Swings
NOV ..... Reporting What You Overheard - Is it ever legal?
DEC ..... Greetings from MT staff

COMPUTERS & RADIO

JAN ..... SatellitePro (Zephyr Services)
FEB ..... Lowe Airmaster 2.0 ACARS decoder
MAR ..... Market Watching; Scan Star Update
APR ..... AEA ACARS; ScanCat hardware - UniVersatile Interface
MAY ..... CAT squelch adapters (Yaesu, ICOM, universal)
JUN ..... K&L Message Tracker
JUL ..... Predictions / CD ROMs (HamCall and ESC)
AUG ..... AEA's Pakratt for Windows 2.0, Log Windows
SEP ..... WiNRADiO: 0.5 to 1300 MHz
OCT ..... WiNRADiO: Win-win?
NOV ..... News bytes; Universal Radio ACT-1 ACARS
DEC ..... Surfing for Monitoring Web Sites

DEMAW'S WORKBENCH

JAN ..... Build a Multipurpose Broadband Amp
FEB ..... Learning to Work with Diodes
MAR ..... Easy Circuit Boards
APR ..... Minimize Man-Made QRN
MAY ..... Build a Noise Squelcher
JUN ..... How to Tune Random-Length Antennas
JUL ..... Revitalizing Older Receivers
AUG ..... One Feed Line-Three Antennas
SEP ..... Choosing the Right Capacitor
OCT ..... Simple Receiver for the Beginner
NOV ..... Working with Toroids
DEC ..... Be a Mini-MF or LF Broadcaster

DIGITAL DIGEST

JAN ..... Internet for utilities
APR ..... High Seas Hi-Jinx (SITOR)
JUL ..... Digital Comms on Air and Sea (DACARS, Russian RTTY, USCG System Coord Net)
OCT ..... Review: Hoka Code-3 Gold

EXPERIMENTER'S WORKSHOP

JAN ..... Upgrading Computers - Part 3
FEB ..... Upgrading Computers - Part 4
MAR ..... PRO-26 S Meters and NFM Discriminator
APR ..... Ways to Design Circuits - Part 1
MAY ..... Ways to Design Circuits - Part 2
JUN ..... Ways to Design Circuits - Part 3
JUL ..... Ways to Design Circuits - Concl
AUG ..... LED Voltmeter
SEP ..... Tone Detector-Decoder
OCT ..... Directional Scanner Beam
NOV ..... ProbeScope from Radio Shack
DEC ..... Freq Record-keeping (APFTools)

FEDERAL FILE

JAN ..... Dept of Agriculture; Mineral Mgt Service; winter resolutions; Army police
FEB ..... FEMA telecommunications; Federal security, gov't or private? security freqs
MAR ..... Guarding Royal Visitors; Latin American military freqs; Gulfport Navy Seabee Center; US Forest Service-Calif; obscure Dept of Justice freqs; Yellowstone Park
APR ..... Alaska, HAARP; Army Corps of Engineers; Wright-Patterson AFB; NY area & McGuire AFB
MAY ..... Mountain or Molehill? (unid rptr); Wash DC Monitoring
JUN ..... Gov Surveillance Freqs - To publish or not to publish?
JUL ..... Houston's Mission Control Center; Manchester, KY, federal prison; Postal Inspection freqs; Disaster Preparedness unused freqs?
AUG ..... Towers off Key West; Privacy soapbox; websites
SEP ..... Coast Guard to the Rescue
OCT ..... Federal freqs at the Olympics; Feds on INMARSAT; Bureau of Prisons; Cactus; Gulf towers again
NOV ..... Telling who's who without a program; Nat'l Forest freqs; low power freqs
DEC ..... Modern Technology Catches Up (K&L Message Tracker); Fed Protection Agencies; Radio Traffic at OKC

K.I.S. RADIO

MAR ..... Buying equipment (recycled)
JUN ..... CB - The Ultimate Frugal Radio
SEP ..... Mobile Installations
DEC ..... Packet for the Penny-Pincher

MAGNE TESTS

(Reprints of Magne Tests reviews are not available.)
JAN ..... Lab measurements and features
FEB ..... Sony ICF-SW1000T
MAR ..... Grundig Traveller II
APR ..... AOR AR7030
MAY ..... Drake R8A
JUN ..... Radio Shack DX394
JUL ..... Sony ICF-SW40
AUG ..... Drake SW-1
SEP ..... Sangean ATS 909
OCT ..... BayGen Free-Play
NOV ..... Drake's Little Secret: the "SW8A"
DEC ..... Sangean ATS 303 Portable

NET NEWS

JAN ..... Sites that combine technologies
FEB ..... How to get on the Internet
MAR ..... Old-time radio on the net
APR ..... No News is Not Good News
MAY ..... Beating our own Drum (Grove site)
JUN ..... Audio on the Internet

ON THE HAM BANDS

JAN ..... Using old commercial gear
FEB ..... Surplus Saga Continues; Hamcalc
MAR ..... A Computer in the Ham Shack
APR ..... Info Sources for the New Ham
MAY ..... Better QSO's; Games; Vibroplex Bug; boat mount
JUN ..... Amplitude Modulation; Phonetic Alphabet
JUL ..... Going Mobile
AUG ..... Building QRP
SEP ..... Low Band Lowdown; Vibroplex key IDed
OCT ..... Plotting the MUF (Bandaid); QSOs
NOV ..... Heath HW-9 drift fix and offset adjustment
DEC ..... Apartment Dweller's Joystick

OUTER LIMITS

JAN ..... Quebec Clan; new Black Book editor
FEB ..... Pirate Radio book; Fundacion home page; KIWI still heard; FCC downsizing
MAR ..... '94,'95 Pirate Activity; Weiner's New Ship; Ham Band Pirate; Pirate Book
APR ..... La Voz del Cid, La Voz Popular; Local FM Pirates
MAY ..... Cuban Clans, Web sites, Texas pirate, local pirates, PiPa/FRW merger
JUN ..... Micro Pirates Widespread; Radio Alpha jamming RHC; Cumbre book project; Pirate awards; when to hear pirates

JUL ..... Govts Close Community Radio Stations; Clandestine Web sites; Pirate Radio Directory; K-2000 popular pirate winner
AUG ..... NA Pirates Heard in Eur & Asia; Bougainville Verie; Europirate web sites
SEP ..... Nigerian RDI changes sked; Costa Rican station arrests; Tasmanian pirate
OCT ..... R. Patria Libre returns; R Democrat Intl; Greek MW pirates; RFS mail trouble; KAOS official QSL
NOV ..... New Name for Nigerian Clan; Bougainville pirate? Wellsville maildrop replaced; FRN Grapevine returns; Europirate reception
DEC ..... Need more pirate sources?; R Kudirat time change; R Patria Libre sked; R Marti

PCS FRONT LINE

OCT ..... Emerging PCS Technologies: FCC auctions; narrow & broadband; Sprint Spectrum
NOV ..... Cellular history, frequency divisions, duplex; PCS no substitute for trunked radios
DEC ..... Cellular Signalling; modern-day scams

PLANE TALK

JAN ..... Volmet weather; City/Airport IDs; aero software update
FEB ..... Commercial Ground Stations; Domestic VHF Voice Services
MAR ..... Frequently Asked Questions
APR ..... The Bay Area TRACON
MAY ..... 50 Yrs before the Concorde (Lockheed Constellation); more Volmets
JUN ..... Readers' Corner - City codes; Sea-Tac freqs; "Lifeguard" flights; Dakar Aeradio
JUL ..... Oceanic Air Traffic Control new system
AUG ..... Airport Ground Control
SEP ..... SELCAL Directory; Cincinnati and Louisville freqs; Terminology
OCT ..... Radio Navigation: Radio Beacons
NOV ..... Omni-Directional VHF/UHF NAVAIDS
DEC ..... NAVAIDS: distance measuring equipment

RADIO REFLECTIONS

FEB ..... World's Oldest non-US Station; Silicon Valley - hi-tech roots
MAY ..... The Baron of Homespun - Powell Crosley
AUG ..... SWLing in the Early 40s
NOV ..... Real Radios Glow in the Dark (Antique Radio Store)

SATELLITE TV

JAN ..... Stealth TVRO: Hiding your dish; global updates; MMDS notes
FEB ..... Making Connections; updates on Telstar 402R, Alphastar, DBS race, HDTV
MAR ..... New Satellites; HDTV update; AMSAT update; SCPC answers
APR ..... FM in Your Backyard - Audio Subcarriers
MAY ..... TVRO Meets the Internet (Skylink); DSS break?; SCPC answers
JUN ..... Satellite Broadcasting Guide 96; FCC supports dish owners; new channels and Anik problems
JUL ..... Ingenius' Xchange Revisited
AUG ..... Repairing TVRO Gear
SEP ..... World Viewing (the International Channel)
OCT ..... Universal's SCPC-200 Satellite Audio Receiver
NOV ..... SBCA Show: Futurewatch
DEC ..... Baylin Pubs: "Miniature Satellite Dishes," "Home Satellite TV Installation & Troubleshooting Manual"

SCANNER EQUIPMENT

JAN ..... Plectron and Motorola Alert crystal scanners
FEB ..... Radio Shack PRO-2042
MAR ..... Fixing Older Bearcat Scanners
APR BC220XLT/BC230XLT
MAY ..... IF Compendium
JUN ..... Mods & Tips for BC9000XLT (keyboard trick, add jack for CTCSS reader, expand 800 MHz coverage, auto-store strategy)
JUL ..... Max Systems discone / Beartracker BCT-10
AUG ..... Control Tape Recorder w/your Scanner (BMI Nitelogger II)
SEP ..... Electra Corporation Lives!; Carrier-activated lamp, backlight disable switch for PRO-2022; baseband audio tap for PRO-2042; hot transformer may be OK; Yaesu FT50R dual-band walkie-talkie
OCT ..... Radio Shack PRO-2046 Mobile Scanner
NOV ..... Build a mobile mount for your radio
DEC ..... AOR's AR5000 All-in-One Receiver

SCANNING REPORT

JAN ..... Antenna farms; Curtis ESN phone reader; beeper monitoring; antenna safety; IF explanation (Kay)
FEB ..... Staying in hot water; wash & wear radio; radar and scanning; mall freqs; line repair crews; movie crews; bear tracking collars (Kay)
MAR ..... Scanning at the CES Show; Road-hazard alerting system; Las Vegas freq finding
APR ..... Scanning Amplified (preamps); Scanners in Movies and TV; monitoring trunked sytems; accurate frequency reports
MAY ..... Scanning on the (W-S) Cable Channel; Trunking survey
JUN ..... Scanning for Information On Line (Motorola press releases)
JUL ..... Scanning into the Wild Blue Yonder (airport scanning); your favorite scanner; mailbag (Buffalo)
AUG ..... Bunking with Trunking; other data activity; trunking in Huntsville, AL
SEP ..... Searching for school bus freq; more scanning on cable TV; end of RCMA?; New Hampshire rumor; scanners in movies
OCT ..... Wanted--Used Scanners; RCMA Kansas column; all-time favorite scanner
NOV ..... Mall Call; drive-through dilemma; wrong about NH; digital Olympics?; favorite scanner; Cajun freqs
DEC ..... The Great School Bus Caper; short history of shared repeaters; using the direct approach; scanners on film; scanning in NYC

SKYLINK

JAN ..... Wireless Publishing
FEB ..... GPS is Everywhere
MAR ..... Rising Tide of Wireless (AT&T, Sprint, Nexus)
APR ..... Is Wireless for Real?
MAY ..... Let There be Wireless (imminent developments)
JUN ..... Computer LANs going Wireless
JUL ..... Accurate GPS? Maybe someday
AUG ..... Wireless Web Allocations & news
SEP ..... Rising costs of wireless phone services

UTILITY WORLD

JAN ..... VOA ute test station; RAF Volmet shifts; AWACS callsigns; Mystic Star freqs/ designators
FEB ..... USAF MARS Stations Closing; ARIA has moved; MOSSAD nets
MAR ..... USAF MARS; Bosnia IFOR aircraft
APR ..... USAF MARS Going, almost Gone; Joint Endeavor Follow-Up; Where is 3E7?; Numbers stations and Internet; DoD Flight Info Pubs
MAY ..... Maritime Safety Broadcasts (NAVTEX skeds & freqs)
JUN ..... FBI on HF (freqs & callsigns)
JUL ..... Monitoring the National Guard; Australian Antarctic Comms; Ute World hits 100
AUG ..... It's Zulu Time - New Zulu designators and background; US Customs on HF; FACSFAC and Bluestar
SEP ..... NASA Aircraft (registration list); Esteem Highly and White Pinnacle IDed; fire season freqs
OCT ..... Who is Herb?; Maritime simplex channels; CAP frequencies and callsigns
NOV ..... Marine HF Scaling Down; RTTY press services leave HF; bad times in Bangui; troubles in Bahrain; LNZA ID'ed; Aviateca freq; Zulu designator update
DEC ..... Raymond Callsigns; TACAMO taking Looking Glass role; New RAF Freqs & Desig

WHAT'S NEW

A comprehensive listing of What's New is available in the 96 Index on the MT homepage at www.grove.net

Reviews:

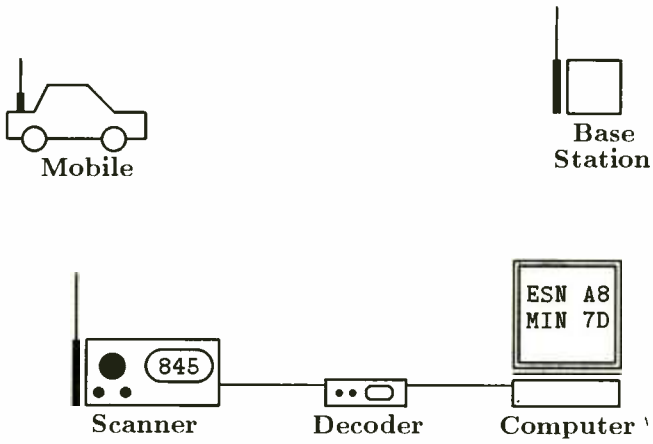
ANLI RD8H, RD78H, AT-2 antennas ..... May
Caig DeoxIT D5 ..... Mar
DXAID 4.5 ..... Feb
GAP "Titan DX" antenna ..... Aug
Grove TUN-4A ..... Jun
ICOM R-8500 vs. AOR AR-5000 (fea) .... Nov
LF Eng SkyMatch Active Antenna ..... Oct
Optoelectronics OS535 Interface ..... Jul
Optoelectronics Xplorer ..... Dec
Sky Scan Desk 1300 antenna ..... Apr
Sony SRF-42 AM Walkman ..... Jan

Reprints are available for $2 per article plus self-addressed, stamped envelope sent to MT Reprints, P.O. Box 98, Brasstown, NC 28902. Please specify column, title, and month.

Dan Veeneman
dan@decode.com

Keeping Up with the Cloneses

With any new technology come those who would misuse it, and cellular telephones have been no exception. If the Cellular Telephone Industry Association (CTIA) is to be believed, more than $650 million was lost to cellular telephone fraud in 1995, up from $482 million in 1994. This represents almost four percent of total industry revenues. The CTIA also claims worldwide fraud losses could exceed $1 billion for 1996. Although there is some controversy about how large actual dollar losses are, there is no doubt that fraud is widespread and growing.



There are four common types of cellular fraud currently being perpetrated. From least to most technically sophisticated, they are: phone theft, subscription fraud, tumbling fraud, and cloning.

Theft is simply the stealing of a cellular telephone and using it until the loss is reported. Baltimore, Maryland, police say that cellular phone thefts have risen as high as 22 a day. Most phones appear to be stolen by drug abusers to raise quick cash, but many reach the hands of more sophisticated criminals.

Subscription fraud is the signing up for cellular service using false or stolen identification, with no intention of paying the bill. New subscribers are typically given a one- to three-month grace period before shutting off the account, by which time the criminal could have made thousands of dollars worth of calls. Subscription fraud is not limited to traditional analog cellular. Even Sprint Spectrum, a new digital PCS service covered in the October 1995 column, is working to combat a rising tide of false applications for service.

For the next two types of fraud it is important to understand how calls are placed and authorized in an analog cellular system. For a more complete review, see this column in the December 1996 issue of *Monitoring Times*.

■ Call Authorization

Each cellular telephone has an electronic serial number (ESN) hardwired into the phone by the manufacturer. This number is supposed to uniquely and permanently identify each and every cellular phone ever made, and under FCC regulations is never to be changed. Also, when a cellular telephone is put into service it is assigned a mobile identification number (MIN) by the cellular service provider. This is the ten-digit area code and telephone number of the phone.

Each cellular telephone also has a "home" system, which is the local area served by their provider. When a call is placed, the ESN and MIN, along with other information, is transmitted from the phone on a reverse control channel (RECC) to the mobile telephone switching office (MTSO) via the closest base station. The MTSO looks up the ESN and MIN in a subscriber database to confirm that the phone is allowed to place a call.

When a cellular telephone is operating outside of its home system, it is said to be "roaming." When a roaming phone places a call, the ESN/MIN pair is still sent, but since the local system does not have a record for the subscriber, it has to make a remote validation request back to the home system. This request does not usually complete in timely manner, so most systems let the first call go through while waiting for a validation response. If the ESN/MIN pair turns out to be invalid, it is placed in a "negative" list and the system will block future calls from that phone.

■ Tumbling

Tumbling fraud takes advantage of a weakness in this call validation process by using a different ESN/MIN pair on each call. Specially modified phones "tumble," shifting to a new ESN/MIN pair after each call. These pairs are typically not valid in any system, but made up in such a way as to appear like a legitimate roamer. Occurences of tumbling in major cities has fallen dramatically with the introduction of fast databases and reciprocal validation agreements between cellular operators.

Cellular One has helped create a North American Cellular Network (NACN) which provides a standard set of roaming capabilities, including rapid call validation, for customers in several thousand cities.

■ Cloning

Currently the most lucrative form of fraud for cellular "bandits" is cloning. Using 800 MHz FM signal interception equipment, ESN/MIN pairs are "snarfed" as they are transmitted from the phone to the base station. Since cellular phones also identify themselves when turned on and re-establishing contact, bandits are known to frequent airports, mall parking lots, and bridge overpasses, or anywhere a large number of cellular phones may be in use.

In a typical setup, an 800 MHz-capable scanner is tuned to one of the reverse control channels, waiting to capture a mobile data transmission. When a cell phone transmits its ESN and MIN, the inter-

cepted data stream is passed from the receiver to hardware that extracts the digital ones and zeros that comprise the mobile message. These bits are then assembled by software that reproduces the ESN and MIN.

Certain test equipment may also be used to capture ESN/MIN pairs. Several companies manufacture devices intended for use by service personnel to test and tune phones sent in for repair. These devices are often portable and have the ability to read transmissions from nearby phones.

ESN/MIN pairs have also been gathered by computer crackers illicitly entering cellular system databases. In at least one case, however, information from the database was leaked by an employee of the company, and many security analysts caution that the largest risks come from the inside. Some less sophisticated crooks have collected carbon copies and receipts from trash dumpsters in back of businesses that sell cellular phones. This sport, called "dumpster diving," has proven to be surprisingly effective due to the careless disposal of documents by employees.

■ Reprogramming Phones

Regardless of the manner in which they were acquired, a cellular bandit uses the active ESN/MIN pair to reprogram a second cellular telephone, which becomes a "clone" of the original. Most modern phones allow the MIN to be changed from the keypad, often after entering a special access code. These codes were intended to be released only to authorized service facilities, but are relatively easy to determine from public sources, including technical manuals from the manufacturer.

Reprogramming the ESN is a more difficult challenge, but not insurmountable. Early phones had the ESN programmed into industry-standard read only memory (ROM) chips that were easily replaced. Some later phones stored the ESN in non-volatile memory that could be changed using special cables or connectors. Some phones had the firmware that controls the phone also on industry-standard ROMs, which could be replaced by enterprising individuals. Since a cellular telephone is essentially a radio controlled by a microprocessor, these persons would modify the portions of the phone's software that accessed the ESN, patching it to use the pilfered number instead of the one installed at the factory.

■ Fighting Fraud

Cellular service providers are fielding a number of preventative measures to combat cloning in analog systems.

In many cellular markets today users must enter a personal identification number (PIN) prior to placing a call. Similar to an automatic teller machine (ATM) PIN, the four-digit code is entered after dialing the destination number and pressing *send*. Since this number is sent via DTMF tones (the same touch-tones a landline phone uses) over a reverse voice channel, it will not be intercepted by a cloner listening to the reverse control channels. Bell Atlantic Nynex Mobile claimed an 80% reduction in fraud after implementing PINs, and Ameritech Cellular Services reported a 96% drop. This method is vulnerable, however, to a cloner using two scanners and a DTMF decoder. It has also proven to be annoying to many legitimate users.

A common way of detecting cloned phones is the use of customer profiling. A record is kept of the typical calling patterns from a cellular phone, and if any calls are made that stand out from this pattern, the customer is contacted to confirm that the calls were authorized. For example, if a customer typically makes two local calls per day, and suddenly four international calls appear in the span of two hours, a profiling system will notice the discrepancy and alert security personnel.

Some cellular operators offer the simple method of setting limits on dialing capabilities according to customer needs. If a customer will always use the phone within the home system, roaming can be disabled. If the customer will rarely make international calls, the account may be set to demand a PIN prior to placing those calls, but allow all local calls to go through without a PIN.

A more complex, and somewhat successful, method has been introduced in a number of major markets called radio frequency (RF) fingerprinting. A "signature" is created and stored for each authorized cellular telephone, consisting of characteristic parameters that uniquely identify the transmitter. The theory is that even between identical cell phones, individual components and tuning variations create enough differences in the transmitted signal that a base station receiver can distinguish one from another. Thus, when a cloned cell phone sends an ESN/MIN pair, the cell system will notice that the transmitted signal doesn't match the signature stored in the subscriber database, and deny the call. This system is not perfect, and trials are continuing to determine the effects of cellular telephone aging and transmission distortion on validation accuracy.

Since the fall of 1995 most new cell phones have been manufactured with the capability of authentication. In this process the cell phone and the base station exchange a "secret handshake" derived from a mathematical algorithm and a 20 digit number. A legal phone identifies itself by transmitting the answer to the algorithm. The keys to this process are stored in the telephone and in the cellular system database, and are never transmitted, so are not vulnerable to interception. This process is also transparent to the user, and requires no additional dialing steps.

Texas Instruments, among others, is working on a voice identification system that allows only previously-recorded users to place calls. At the time of purchase, or soon after, the user records a name or key phrase, which is stored in the cellular system database. Then each time the user wants to place a call, they must speak their name or key phrase and match the stored version to be validated.

This past summer AT&T Wireless Services spent several hundred thousand dollars on an advertising campaign in New York City, one of the major centers for fraud in the United States. Subways, buses, and billboards warned would-be criminals that cellular carriers and law enforcement agencies can track them down. It is not clear how effective the campaign has been.

■ Digital Systems

Digital systems provide a greater degree of security against cloning for two main reasons. First, equipment is not currently available to the general public that will decode the more complex signal formats sent by digital cellular telephones. Undoubtedly this situation will change in the future, but for now such equipment is difficult to obtain. Second is that the air interface will be encrypted by methods that will be very difficult for individuals to decode. Government agencies are maneuvering politically to have encryption strong enough to resist individual decrypting efforts, but weak enough to break using government resources. More on that in a later column.

As usual, send comments, questions, and criticisms to *dan@decode.com*. Until next month, happy monitoring!

Richard Barnett
ScanMaster@aol.com, Compuserve at 102354,3643

Rooting for Rotors

Other than good antennas and coax, there is perhaps no more important device for advanced scanner base installations than a quality rotor. A good rotor—which will run anywhere from $250 to $1000 or more, depending on the weight and wind loading of the antennas you wish to support and rotate—generally requires a tower.

Antenna towers, depending on the number of sections (i.e., height) you can erect, will add another $250 to $1000 when you add in a concrete footing, side arm brackets to hang a discone off the tower, connectors, electrical tape, etc..

The bottom line is that mounting a rotor is not an inexpensive proposition, particularly if you have to hire someone, such as an experienced two-way shop owner, to erect the entire tower. With a little legwork, though, you generally can find hams or scanner buffs in your area who will assist you in exchange for hot dogs and beer (only to be imbibed *after* the tower and rotor are up and tested!).

What are the benefits of a rotor? If you are only interested in using omnidirectional antennas, such as a discone, there are none. If, however, you wish to enter the world of true high-level scanning, then you're in for a treat. What you mount with a rotor, of course, are beam antennas. Beams, or yagis, which offer gain over omnidirectional antennas, provide the ability to sniff out distant signals.

Beams look like a VHF TV antenna, but with the elements positioned vertically, rather than horizontally. The higher the frequency you wish to sniff, the smaller the elements of the beam. Wideband models, such as the Grove Scanner Beam or Log Periodic models from Create and other manufacturers, offer gain across many bands. Narrow band beams, such as those from Antenna Specialists and other makers of professional two-way antennas, can have specifications that show them as narrow-banded as three or five megahertz (although this figure is typically related to transmit bandwidth rather than receive, which will be broader).

These specialized beams will generally offer the greatest gain, as much as 10 to 12dB of gain over a discone. Add a preamp at the antenna (not down behind your scanner), and—as long as you're not in a high RF area such as a city or near a one- or two-way transmission tower of any type—you'll suck in signals you never before dreamed of hearing.

So where does the rotor come into play? As the name implies, you point a beam at the signal you wish to hear. While sometimes signals will bounce off edifices of various types, and therefore you don't always know where to aim, generally speaking you'll want to point your beam in the direction of the signal.

You will often see beam antennas in your neighborhood that do not use a rotor, but are fixed in place. A towing garage would be an example of this type of radio user. These yagis are pointed at a repeater atop a tower and the towing outfit, for example, will use a mobile radio on the input side of a repeater to converse with its trucks in the field. The last thing the owner of the towing firm wants to do is swivel that beam. He needs it aimed at the repeater.

For scanner users, however, rotating a beam is essential to high-end monitoring. An inexpensive, quality rotor, such as the Yaesu G-450XL, will allow you to mount two or three beams on a ten-foot mast with an omnidirectional antenna at the top (this is how your scanner editor configured his setup). Most radio suppliers, including Grove Enterprises, will carry a choice of rotors. The rotor will come with an azimuth indicator and, from your listening post, you'll be able to aim the beam(s) in the exact direction of whichever signal you're seeking. It's just terrific to watch that indicator box as you swing your beam and hear a distant station get stronger as you home in on the right azimuth!

The Grove ROT-1 Heavy Duty Rotor.

A follow-up note to this story: I had my rotor up for less than a year when I turned the rotor control unit on one day and watched as the azimuth indicator swung wildly to the left and to the right. It then began doing complete 360's, as though it were co-starring in the *Exorcist.* Horrified, I ran outside and looked up, but saw a completely motionless an-

tenna. What was this? Was the control box shot or was it the rotor itself? If it was the rotor, it would mean taking down all the antennas, preamps, and coax and sending the rotor in for repair. What a nightmare!

I hoped that the problem was in the controller, whose azimuth indicator arm eventually stopped moving altogether. I sent the inside controller in for service. When told that there was nothing wrong with the unit, we grudgingly prepared to take down the antennas. There was one final item to check, though. A look at where the wiring harness connected to the rotor on the tower showed that one of the wires had broken, possibly caused by the temperature fluctuations of the winter and spring.

What a break for me! A little solder and we were back in business, without ever taking down any antennas. It has been stated many times before, but never often enough: Winterize your connections before the onslaught of snow and ice. You won't be sorry.

■ Trunking Debunking

In the August issue of *Monitoring Times*, we printed an anonymous letter from a reader in Huntsville, Alabama. The letter detailed significant problems with the Motorola trunked radio system that Huntsville had installed for its various city agencies. We called the Huntsville Police looking for someone who could rebut the claims of the letter writer. The police were very cordial and rebutted some of the claims, but corroborated most others.

In preparing the story for *MT*, we made it clear that, obviously, as with any new radio system, bugs oftentimes need to be worked out; however, on the whole, it is this writer's understanding that users of public safety trunked systems were generally satisfied with their communications.

As an example of this, during the recent Grove Expo it was obvious from casual monitoring that the Motorola trunking works extremely well in the Atlanta area. Not only does the city of Atlanta use Motorola for its trunked system, which was installed prior to the Olympics, but the entire region, including Cobb, DeKalb, and Gwinnett counties, all operate their own Motorola trunked networks with apparently excellent results.

A few weeks after the article in *MT* appeared, I received an e-mail from David Buckelew, Manager of Telecommunications, who was involved in the installation and operation of the Huntsville system. Although he appreciated that a call was placed to the Huntsville Police for verification of the anonymous letter, he felt the letter was rife with untruths. He stated that, unfortunately, the officer I spoke with was really not qualified to speak on the subject, and that officer evidently also disputes my representation of some of his comments.

Here, then, is his response, taken point by point, to the anonymous letter:

Item 1: *"The system is a Motorola Type 2 system"...."It currently uses (has licensed) 41 frequencies." (only 36 were listed in the article).*

Response: The city's 800 MHz radio system is a Motorola Smartnet system capable of Type I, Type II, and Type IIi protocols. It also meets APCO 16 standards and is further designed for migration into the pending standards of APCO 25.

Items 2 and 3: *"The Huntsville Police Department, Fire Department, and the city's Animal Control Department are currently on the system. The plans are to include all of the city departments on the system after the system becomes a little more stable."*

Response: All city departments were brought on line 14 September, 1995, which consisted of approximately 870 radios. As of today, the total is 1,376 which includes radios, sirens, and fire station alerting systems.

Item 4: *"Only two tower sites are used, with one on the north end of the city and one on the south end."*

Response: There are 'only' two towers in the Huntsville system by design. They are geographically located east and west of each other within the city on mountain tops in order to maximize coverage.

Item 5: *"No digital communications have been heard on any of the channels except, of course, the control channel. The control channel changes on a weekly basis, usually on Sunday night."*

Response: The city's system is analog rather than digital; therefore, 'no digital communications' would occur. I assume, though, the anonymous writer was referring to data transmissions when using the word digital. The city does currently have approximately 100 radios using data transmissions. These are used to alert all fire stations, to open and close doors, turn lights on and off.

Also, all emergency sirens in the cityare operated by the local Emergency Management Authority by data communication. Additionally, the police department has several radios that are encrypted for security purposes communicating data. The city is also planning to install mobile data computers in each police car

using 800 MHz. The control channel for the city's system changes every 24-hours and not on a weekly basis.

Item 6: *"The problems with the system have been unbelievable. The system crashes, resulting in a complete loss of communications."...."Police units frequently -and, unfortunately, unintentionally- get to talk with the fire dispatcher."..."The range of the radios is severely limited."..."The mutual aid program has also suffered because the deputies, in addition to the airport police, local university police, FBI, Secret Service, and the like, all used to monitor HPD's radio traffic in order to be able to offer assistance. Now, all of this coordination has to be handled by phone."..."The switch to trunking was totally unnecessary."*

Response: The system went online 14 September, 1995, and has never crashed or been down since that time.

I know of no such instance where a police unit talked with a fire dispatcher. However, particular units in some departments have the ability to interface directly with public safety dispatchers and individual units if required. In addition all radios within the city departments have common citywide talkgroups.

The old system provided for approximately 80% coverage of the city, whereas the new 800 MHz system provides for approximately 95% coverage of the city. Yes, we still have some dark spots. However, they are much fewer and the city is looking at ways to clear the more significant areas.

Communications by other agencies through the North Alabama Net is an available function under the control of the dispatchers via "cross patch" in the dispatcher consoles. The city has authorized other agencies access to the system and have assigned talkgroups for them to communicate. Additionally, local news media groups have been assigned radio identifications for monitoring purposes only by the Huntsville Police Department.

The switch to an 800 MHz trunked simulcast radio system was necessary by the city for several reasons. First, the police department's old VHF system had three channels—one for North Huntsville, one for South Huntsville, and one for Records—(and) was installed when the city had less than 100 police officers. The city now has approximately 400 sworn police officers.

Second, the city applied to (the) FCC for Petition of Frequencies. The only frequency the FCC would issue was 800 MHz (this can be verified by calling the FCC).

Third, in cases of emergencies, e.g., the tornadoes that hit the city in 1989, various city departments and other agencies were unable to communicate with each other using existing radio systems creating a major problem. With the new system the city now has established emergency talkgroups to accomplish any requirement.

Item 8: *"There is no simulcasting going on in Huntsville."..."Since the police officers were having a hard time with the new system and could not talk to each other, they came up with the solution...CB radios...."*

Response: The city's 800 MHz radio system is simulcasting from its two sites. In order to achieve the design coverage of 95%, which we have, the system must simulcast.

(Editor's note: We believe the anonymous letter writer was referring to the police and/or fire department rebroadcasting their 800 MHz communications over their old frequencies.)

We know of no police officers having problems communicating with each other. Additional talkgroups were provided to police for this very reason. In fact, with the old system there was no means for officers to communicate with each other with only three frequencies for everyone to share. CB radios have been in police cars for the last 20 years.

As of today, the County Health Department, City Housing Authority, and the Huntsville Utilities are using the city's system. Other municipalities and agencies have contacted the city about coming on the system.

The city of Huntsville has an excellent simulcast trunking system that has met or exceeded our expectations.

Sincerely,
David Buckelew, Manager,
Telecommunications

We're more than happy to publish a rebuttal on a subject about which we write. The city of Huntsville, Motorola, and Mr. Buckelew in particular, are to be commended for taking the time to present their case.

■ Sharing Scanners

Our recent proposal that readers who may have unused scanners donate them to those less fortunate resulted in a number of responses. Some one dozen *MT* subscribers called or sent e-mail offering to donate a radio or two. Some of these folks expressed interest in coordinating the program in their own state. While the response was less than we had hoped, there were some very gratifying stories.

A crime watch program in the New York area called and asked to be put on a list for donated scanners. This particular program has an excellent rapport with the police, we were told, and their use of scanners was a terrific, low-cost way for them to stay tuned-in to crime in their area.

One gentleman from Ohio called to say that, after reading the article, he brought one of his older scanners to his nephew who had been stricken with leukemia. The young boy couldn't have been more excited over the gift. His uncle was more than willing to coordinate similar efforts in his state.

While it is a cliché, it is this type of story that makes the effort worthwhile. This editor called a couple of Boston hospitals which were receptive to the idea of giving scanners to hospitalized kids. We hope to try this program soon, on a very small scale, in greater Boston. Perhaps when trunking scanners hit the market, and older scanners become obsolete, there will be more units available for donation.

Over the next couple of months we'll get back to more reader letters and frequency lists. Keep that mail and e-mail coming and help make "The Scanning Report" the hot place to be in '97!

Save big on monitoring radios

COMMUNICATIONS ELECTRONICS INC.™

New...radios available from CEI

For over 28 years, thousands of radio monitoring users have depended on communications gear from Communications Electronics. Now, as a *Monitoring Times* reader, you also benefit with exclusive big savings. Your **free fax-on-demand catalog** is instantly available by calling 313-663-8888 from your fax machine.

Bearcat® 3000XLT-A Radio Scanner

Mfg. suggested list price $699.95/**Special $329.95**
400 Channels • 20 banks • Twin Turbo Search/Scan Frequency Transfer • VFO Control • Automatic Store 10 Priority Channels • Selectable Mode • Data Skip Frequency step resolution 5, 12.5 & 25 KHz.

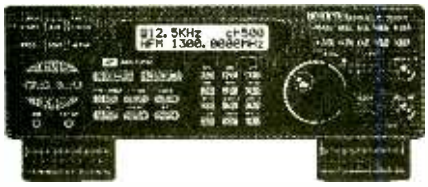
Size: 2-3/4" Wide x 1-1/2" Deep x 7-3/8" High
Frequency Coverage:
25.000-549.995 MHz., 760.000-823.995 MHz., 849.0125-868.995 MHz., 894.0125-1,300.000 MHz.

The Bearcat 3000XLT is the ideal handheld radio scanner for communications professionals. This handheld scanner scans at 100 channels per second and searches at a rate up to 300 steps per second. A selectable attenuator eliminates annoying intermodulation from adjacent frequencies in highly populated areas. Selectable AM, Wide FM and Narrow FM modes allow you to change the default receiving mode of the BC3000XLT. For maximum scanning pleasure, order the following optional accessories: **UA502** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **LC3000** Deluxe swivel leather carrying case $34.95; **BP2500** rechargeable nickel-cadmium battery pack for up to five hours of dependable use $29.95; **ANTMMBNC** Magnetic mount scanner antenna with BNC jack and 12 feet of cable $29.95. **ANTSGBNC** Glass mount scanner antenna with BNC cable $29.95. The BC3000XLT comes with AC adapter, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Order today.

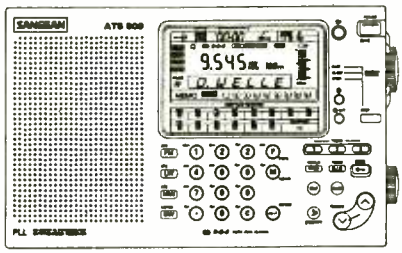
Bearcat® 9000XLT-A Radio Scanner

Mfg. suggested list price $769.95/**Special $344.95**
500 Channels • 20 banks • Alpha numeric display
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High
Frequency Coverage: 25.000-549.995 MHz., 760.000-823.995 MHz., 849.0125-868.995 MHz., 894.0125-1,300.000 MHz.

The Bearcat 9000XLT is superb for intercepting communications transmissions with features like TurboSearch™ to search VHF channels at 300 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a selectable attenuator to help eliminate annoying intermodulation from adjacent frequencies in highly populated areas and selectable AM, Wide FM and Narrow FM modes that allow you to change the default receiving mode of the BC9000XLT. Other features include ***Auto Store*** - Automatically stores all active frequencies within the specified bank(s). ***Auto Recording*** - This feature lets you record channel activity from the scanner onto a tape recorder. **Hi-Cut filter** to help eliminate unwanted static noise. You can even get an optional ***CTCSS Tone Board*** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **BC005** CTCSS Tone Board $54.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC9000XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty.



Shortwave Radio



Sangean ATS909-A Shortwave Receiver

Mfg. suggested list price $399.95/**Special $249.95**
Size: 8-1/4" Wide x 1-1/2" Deep x 5" High
Frequency Coverage: **LW: 153-513 KHz.; MW: 520-1710 KHz.; SW: 1711-29999 KHz.; FM: 87.5-108.0 MHz.**

Now...monitor the world on the most advanced shortwave receiver available from CEI. The Sangean ATS909 features 306 memories. Also features automatic tuning to automatically find all local stations with the push of a button, five tuning methods, eight character alphanumeric display, upper and lower single side band reception. Radio Data System (RDS) automatically shows station call letters on RDS equipped FM stations. RF Gain control, adjustable sleep timer, 42 world city times, dual time system, selectable manual tune steps, wide/narrow filter reduces adjacent station interference. Battery & Signal Strength indicator, 9KHz./10 KHz. switch. Lighted LCD Display, Lock Switch, separate audio recorder output & stand-by control jacks allows user to program tape recorder to turn on at three different times. Uses 4 AA batteries. When you order the ATS909 from us, you'll get a complete package deal including external AC adapter, portable antenna, carrying case and limited one year Sangean warranty.

Save up to $944.00

It pays to be a *Monitoring Times* reader. Order any scanner or transceiver from CEI. Send or fax this coupon with bar code from the front cover and get big savings.

VR204DAT8 8 channel digital audio logger	Save $750.00
BC890XLT Bearcat base/weather alert scanner	Save $10.00
PI256 RELM technician programming manual	Save $17.00
PI150 RELM technician programming manual	Save $17.00
LCWHS RELM swivel deluxe leather carrying case	Save $20.00
BCWHS RELM rapid charge no-cad battery charger	Save $10.00
SMMP RELM speaker/mic for WHS or MP radio	Save $10.00
BC002 Bearcat CTCSS tone board	Save $20.00
BC003 Bearcat switch assembly for BC002	Save $10.00
BC005 Bearcat CTCSS tone board	Save $20.00
EX711 Bearcat scanner external speaker	Save $10.00
LC3000 Bearcat 3000XLT deluxe leather carrying case	Save $10.00
BP2500 Bearcat ni-cad battery pack for BC3000XLT	Save $10.00
MB001 Mobile mounting bracket for BC9000/890XLT	Save $10.00
ANTSGBNC glass mount antenna with BNC	Save $10.00
ANTMMBNC magnet mount antenna with BNC	Save $10.00

Offer valid only on orders mailed or faxed with magazine bar code to Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Offer expires March 31, 1997. Limit one coupon per item. Coupon may not be used in conjunction with any other offer. Mention offer number AM.

CB/Ham Radios

Have fun and use our CB, GMRS, commercial and amateur radios to keep in touch with friends. For even bigger savings, Bearcat radio club members use the coupon on this page.

Cobra 148FGTL-A CB with frequency counter	$179.95
Cobra 29LTDWX-A CB with weather alert	$109.95
Cobra 2010GTLWX-A SSB CB Base (+$25.00 shipping)	$299.95
Maxon GMRS210+3-A GMRS transceiver/SPECIAL	$166.95
Ranger RCI2950-A 25 watt 10 meter transceiver	$219.95
RELM RH256NB-A 25 watt VHF mobile transceiver	$284.95
RELM WHS150-A 5 watt VHF handheld transceiver	$284.95
Uniden Washington-A SSB Base (+$25.00 shipping)	$199.95
Uniden GRANTXL-A SSB CB Mobile	$124.95
Uniden PRO538W-A CB & Weather	$54.95

Bearcat Scanners

Monitor fire, police, weather, marine, medical, aircraft and other transmissions with your Bearcat scanner.

Bearcat 9000XLT-A base/mobile	$344.95
Bearcat 3000XLT-A handheld	$329.95
Bearcat 890XLT-A base/weather alert	$209.95
Bearcat 860XLT-A 100 channel base	$139.95
Bearcat 760XLT-A base/mobile	$179.95
Bearcat 560XLA-A base/mobile	$69.95
Bearcat 220XLT-A handheld/SPECIAL	$184.95
Bearcat 178XLT-A base with weather alert	$99.95
Sportcat 150-A handheld with 800 MHz.	$144.95
Bearcat 148XLT-A base with weather alert	$79.95
Bearcat 120XLT-A handheld	$114.95
Bearcat 80XLT-A handheld with 800 MHz.	$129.95
Bearcat BCT7-A information mobile	$149.95
Bearcat BCT10-A information mobile	$139.95

Digital voice logger

Why miss any radio or telephone transmissions when you can record everything with an affordable Eventide brand digital communications logger? You get powerful performance with a single DDS-2 DAT drive that records more than 500 channel hours of storage. When you want to record trunking systems, for even more recording time, the Eventide VR240 Mark III logger gives you over two months of unattended recordings on up to 24 channels when ordered with *dual* 8 mm. high density CT tape drives. All systems include 60 channel hours (250 & 500 hours optional) of instant recall. Ideal for quickly replaying emergency calls or radio traffic. FCC approved telephone interface is built-in and beeps are selectable on a channel-by-channel basis. Other options include GPS time sync.

VR204DAT4 4 channel, single DAT drive, 500+ channel hours	$7,395.95
VR240DAT8 8 channel, single DAT drive, 500+ channel hours	$12,295.95
VR240DAT16 16 channel, single DAT drive, 500+ channel hours	$14,490.95
VR240DAT24 24 channel, single DAT drive, 500+ channel hours	$16,685.95
VR2408MM8 8 channel, single 8 mm. drive, 875+ channel hours	$15,595.95
VR2408MM16 16 channel single 8 mm. drive, 875+ channel hours	$17,790.95
VR2408MM24 24 channel single 8 mm. drive, 875+ channel hours	$19,985.95
Option-add 8 more record channels to a VR240 8 or 16 channel	$2,095.95
Option-add 2nd DAT drive to VR240DAT Mark III system	$2,995.95
Option-add 2nd 8 mm. drive to a VR240 8 mm. Mark III system	$5,699.95
Option-ECW40, satellite chronometer GPS for external time sync.	$1,895.95
Option-DTE, desktop enclosure for one VR240 Mark III system	$449.95
Supplies-120 Meter DDS2 data grade DAT tape (box of 10)	$374.95
Supplies-160 Meter Data Grade 8 mm. CT tape (box of 10)	$374.95

Tape logging products are special order, call 313-996-8888 to order.

Buy with confidence

It's easy to order from us. **Mail orders to:** Communications Electronics Inc., P.O. Box 1045, Ann Arbor, Michigan 48106 USA. Add $17.00 per weather station or radio product for UPS ground shipping, handling and insurance to the continental USA unless otherwise stated. Add $12.00 shipping for all accessories and publications. Add $12.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, Guam, P.O. Box or APO/FPO delivery, shipping charges are two times continental US rates. Michigan residents add state sales tax. No COD's. Satisfaction guaranteed or return item in unused condition in original packaging within 61 days for refund, less shipping charges. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Call anytime 1-800-USA-SCAN or 800-872-7226 to order toll-free. Call 313-996-8888 if outside Canada or the USA. FAX anytime, dial 313-663-8888. Dealer and international inquiries invited. Order from Communications Electronics Inc. today.

For credit card orders call

1-800-USA-SCAN

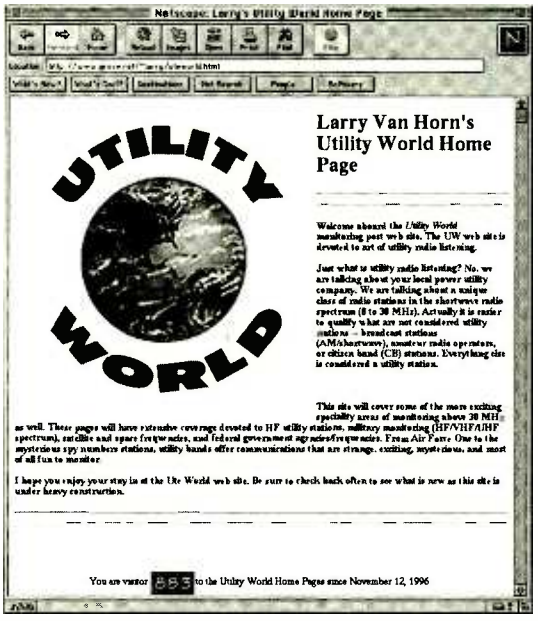
Communications Electronics Inc.
Emergency Operations Center
PO Box 1045, Ann Arbor, Michigan 48106-1045 USA
For information call 313-996-8888 or FAX 313-663-8888

Larry Van Horn, N5FPW
steditor@grove.net

The Government Rediscovers HF?

For a number of years now, numerous agencies within the United States federal government have been moving up in frequency away from the high frequency (HF) bands. Most government agencies routinely use the very high frequency/ultra high frequency (VHF/UHF) ranges for their day-to-day communications traffic. As this upward migration continued, dependence on HF eased, and government shortwave frequencies got quieter and quieter.

Most utility monitors agree that the last 10 years have been pretty dull on government HF frequencies—until last summer. I'm not sure what has caused the upturn in activity. Maybe it is election year politics, or it could be a renewed interest in HF communications. Whatever the reason, I have seen more activity the last six months on government HF channels than I have in the last 10 summers.



In fact, two of my past favorite agencies to monitor, the DEA and U.S. Customs Service, have both had higher than normal traffic levels, with a lot more of the communications in the clear than I can remember in recent memory.

My recommendation to ute listeners is to jump on the band wagon *right now* before they change their minds (as our government is very prone to do). Use the frequencies in Table One to monitor the listed government agencies. The table includes over 250 frequencies for 43 government agencies and companies that support various government programs.

So start the new year off right and make that New Year's resolution to keep track of what our hard earned tax money has paid for by monitoring the listed HF frequencies. And while you are at it, why don't you make another New Year resolution to report your logs and intercepts to the *Utility World* column in 1997?

■ *Ute World* Now Online

I have finally done it. After six months of talking about it, I have finally put *Ute World* online on the world wide web. During the middle of November, I finally designed and put up the pages put on the Grove Enterprises server.

What will you find on the *UW* home pages? WWW links, special reports, frequency and callsign lists, late breaking news, and much, much more. We even have a whole series of special research papers prepared by "Dr. EAM" himself—Jeff Haverlah on Emergency Action Messages, of course.

But the *UW* pages are even more than HF. I also have a huge interest in U.S. government VHF/UHF acitivity and of course, satellites. So expect the unexpected when you visit the *UW* home pages. In fact, the most popular page to date has been the military UHF satellite bandplans and background information.

The *Ute World* home page is a personal home page and it does not represent *MT* or Grove Enterprises. I would like to thank our GroveNet support team, especially John Dielbeck (our internet system administrator), for allowing my pages to go up on the web and for all the help they have given me.

So, right now go point that web browser to URL address:
http://www.grove.net/~larry/uteworld.html

The *UW* home page is simply just my small contribution to the nearly 500,000 other world wide web pages available to the folks who surf the internet. Enjoy!

■ Bayonne Global is back on the air!

Bayonne Global was off for some time while its personnel were deployed to support various military missions, including an 8-week exercise in Savannah, Georgia, according to the station chief, Joe Cirone. "We then had to do annual antenna maintenance and that was recently completed," Cirone said.

Cirone says their next deployment is scheduled for sometime this month and his crew will be gone for three weeks. You can normally hear Bayonne Global working military aircraft traffic on the Global HF System (GHFS) during weekdays on a variety of GHFS primary and discrete frequencies.

Bayonne is a leader in the Department of Defense (DOD) Automated HF E-mail/fax system which is interconnected to the LAN/WAN and the Internet. You might even want to watch the pages of *MT* in the near future for details about this radio system at Bayonne.

■ New Aero Home Page

If you are interested in HF aeronautical listening, check out a new home page on the internet put up by Steve Bottom in Cairns, Queensland, Australia.

Steve's site has frequency and callsign information on the Royal Australian Air Force, plus civilian aero frequencies for the South Pacific and Southeast Asia regions.

You can find *Sir Steve's Downunder Hideaway* at URL:
http://www.ozemail.com.au/~sirsteve

That's it for this month. I hope everyone had an enjoyable holiday season. Now it is time to see what you have been hearing in the *Utility World*.

TABLE 1: United States Federal Government HF Hot List

AT&T	6803.1 7480.1* 14360.0 20095.0
Bellcore	5099.1 7552.1 11451.0 18063.0 (Bell Communications Research)
Civil Air Patrol	4466.0 4469.0* 4506.0* 4582.0 4585.0* 4601.0* 4602.0* 4604.0* 4627.0* 4630.0 7635.0* 7682.0 14902.0
Drug Enforcement Administration (DEA)	7657.0 11076.0 14686.0* 18171.0
Defense Logistics Agency (DLA)	5063.5 11576.5* 17458.5 24740.0
Defense Mapping Agency (DMA)	7726.5 7812.5 13550.0 17520.0
Department of Energy (DOE)	6803.0* 7428.0 18416.0
Department of Interior (DOI)	3253.0 4863.0(L) 5380.0 5287.5 6766.0 7880.0
Department of Justice (DOJ)	7672.0* 10401.5 14541.0 18220.0
Director of Military Support (DOMS)	13722.0 14350.0 14402.0 20906.0
Environmental Protection Agency (EPA)	3360.0 4990.0 6821.0*
Federal Aviation Administration (FAA)	6870.0 7475.0 7611.0(L)* 8125.0 11288.0 11637.0 13312.0 13457.0 15851.0 19410.0 24550.0(L)
Federal Bureau of Investigation (FBI)	5058.5 7903.5 14493.5
Federal Communications Commission (FCC)	4481.5 7788.5 10653.5 14969.5
Federal Emergency Management Agency (FEMA)	5211.0 10493.0*
Other agencies to watch on these FEMA channels include the following state EOC offices: Alabama, Florida, Illinois, North Dakota, New Hampshire, Nevada, New York, South Carolina and the American Red Cross.	
Federal Highway Administration (FHWA)	5255.0 7419.0 9197.0 10891.0*
Immigration and Naturalization (INS)	5912.5(L) 9435.0(L) 14585.0(L) 24838.5
Maritime Administration (MARAD)	5255.0 7419.5 9197.0 10891.0
MITRE Corp	4952.0 12165.0* 20873.0
USMC Mountain Warfare Training Center (MWTC)	5031.5* 10179.5
NASA	3385.0 6982.5 14455.0*
National Guard (NG)	3277.0(L) 4001.5 4035.0 4240.0 4244.5 4250.0 4296.0 4441.5 4520.0 4555.0 4580.0 4607.0 4608.5* 4610.0 4653.0 4780.0* 4785.0(L) 4860.0 4867.0* 4927.5 4960.0* 5045.0(L)* 5062.0 5087.0 5203.5* 5205.0 5215.5 5432.5 5821.5 6010.0 6766.0 6910.5 6992.0 7361.0(L) 8038.5 8047.0* 8056.0 8057.5 8158.5 8161.5 8180.0(l0 8622.0 9357.0 13722.0* 14350.5 14450.0 14653.0 20906.0
National Coordinating Center for Telecom (NCC)	5236.0 10586.5# 14396.5* 18932.0
National Communications System (NCS)	2302.4 4619.4 6766.4 6768.4 9051.0 9054.0 9065.4 9067.0 9070.0 11428.0 11449.4 13801.4 13805.4 13809.4 13854.0 15614.4 18938.0 18946.0 25344.0 25347.0
National Technical and Information Administration (NTIA)	9973.0* 13423.0 18178.5
Office of Emergency Transportation (OET)	6870.0 7611.0(L) 9076.0 11029.5 13434.0* 13457.0 15851.0(L) 17422.5
U.S. Air Force MARS	3311.0* 4590.0 7540.0 13927.0 13993.0* 14408.0 14533.2(L) 14606.0 14832.0 15807.0 19937.0 20807.0
U.S. Air Force Reserve	4341.0 8495.0 11816.0
U.S. Army	9990.0 10165.0 10815.0 14930.0
U.S. Army MARS	3348.5(L) 6997.5(L) 13997.5 14403.5 14465.0 14488.5
U.S. Army Corp of Engineers (USACOE)	6785.0 11693.5 12070.0 16382.0
U.S. Army (WAR46)	4018.5(L) 4024.5(L) 5761.5(L) 7309.5* (1111th Signal Battalion)
2nd U.S. Army (GA)	8048.5 10797.5 16318.5 17478.5*
2nd U.S. Army (SC)	8048.5* 10797.5
U.S. Army Material Command (USAMC)	5087.0 10233.5* 14653.0 16077.0
U.S Coast Guard	4048.5 7528.5 11434.5 15473.5
U.S. Customs Service	8912.0 11494.0
U.S. Department of Agriculture (USDA)	5901.0 9270.0* 11494.0 14955.0
U.S. Navy	10710.0 13655.0*
U.S. Navy/Marine Corps MARS	4000.0 4041.0 4042.5 4402.5 4513.5 7363.5 7365.5 7381.0 7382.5 7386.0 7498.5 7684.0* 12222.0 14383.5
USTRANSCOM	4035.0(L) 4520.0 5300.0 5300.5 9120.0 9120.5* 10493.0 11628.5* 12057.0 20994.0
Veterans Administration (VA)	5038.5* 12076.0 23355.5
44th Med Brigade	6997.5(L) 13997.5 14488.5 14665.0

Notes:

1. * indicates a primary frequency, (L) indictaes LSB, and # indicates an automatic link establishment (ALE) channel. Unless otherwise indicated above, all modes are USB and frequencies in kilohertz (kHz).
2. Even though they are listed as members of the government HF SHARES system — Housing and Human Services (HHS) and the General Services Administration (GSA) HF frequencies have not been found. Current wisdom indicates that these two agencies may not be currently authorized HF operations/frequencies.

TABLE 2: Federal Government Hot List By Frequency Listing

2302.4	NCS
3253.0	DOI
3277.0	NG(L)
3311.0	USAF MARS*
3348.5	USA MARS(L)
3360.0	EPA
3385.0	NASA
4000.0	USN MARS
4001.5	NG(L)
4018.5	WAR46(L)
4024.5	WAR46(L)
4035.0	NG/ USTRANSCOM (L)
4041.0	USN MARS
4042.5	USN MARS
4048.5	USCG
4240.0	NG
4244.5	NG
4250.0	NG
4296.0	NG
4341.0	AFRES
4402.5	USN MARS
4441.5	NG
4466.0	CAP
4469.0	CAP*
4481.0	FCC
4506.0	CAP*
4513.5	USN MARS
4520.0	NG/USTRANSCOM
4555.0	NG
4580.0	NG
4582.0	CAP
4585.0	CAP*
4590.0	USAF MARS
4601.0	CAP*
4602.0	CAP*
4604.0	CAP*
4607.0	NG
4608.5	NG*
4610.0	NG
4619.4	NCS
4627.0	CAP*
4653.0	NG
4780.0	NG*
4785.0	NG(L)
4863.0	DOI(L)
4867.0	NG*
4927.5	NG
4952.0	MITRE
4960.0	NG*
4990.0	EPA
5031.5	MWTC*
5038.5	VA*
5045.0	NG(L)*
5058.5	FBI
5062.0	NG
5063.5	DLA
5087.0	NG/USAMC
5099.1	Bellcore
5203.5	NG*
5205.0	NG
5211.0	FEMA/State EOC/ARS
5215.5	NG
5236.0	NCC
5255.0	FHWA/MARAD
5287.5	DOI
5300.0	USTRANSCOM
5300.5	USTRANSCOM
5380.0	DOI
5432.5	NG
5761.5	WAR46(L)
5821.5	NG
5901.0	USDA
5912.5	INS(L)
6010.0	NG
6766.0	DOI/NG
6766.4	NCS
6768.4	NCS
6785.0	USACOE
6803.0	DOE*
6803.1	AT&T
6821.0	EPA*
6870.0	FAA/OET
6910.5	NG
6982.5	NASA
6992.0	NG
6997.5	USA MARS/44 MED(L)
7309.5	WAR46*
7361.0	NG(L)
7363.5	USN MARS
7365.5	USN MARS
7381.0	USN MARS
7382.5	USN MARS
7386.0	USN MARS
7419.0	FHWA
7419.5	MARAD
7428.0	DOE
7475.0	FAA
7480.1	AT&T*
7498.5	USN MARS
7528.5	USCG
7540.0	USAF MARS
7552.1	Bellcore
7611.0	FAA(L)*/OET
7635.0	CAP*
7657.0	DEA
7672.0	DOJ*
7682.0	CAP
7684.0	USN MARS*
7726.5	DMA
7788.5	FCC
7812.5	DMA
7880.0	DOI
7903.5	FBI
8038.5	NG
8047.0	NG*
8048.5	2nd USA
8056.0	NG
8057.5	NG
8125.0	FAA
8158.5	NG
8161.5	NG
8180.0	NG(L)
8495.0	AFRES
8622.0	NG
8912.0	USCS
9051.0	NCS
9054.0	NCS
9065.4	NCS
9067.0	NCS
9070.0	NCS
9076.0	OET
9120.0	USTRANSCOM
9120.5	USTRANSCOM*
9197.0	FHWA/MARAD
9270.0	USDA*
9357.0	NG
9435.0	INS(L)
9973.0	NTIA*
9990.0	USA
10165.0	USA
10179.5	MWTC
10233.5	USAMC
10401.5	DOJ
10493.0	FEMA/State EOC/ARS/ USTRANSCOM
10586.5	NCC
10653.5	FCC
10710.0	USN
10797.5	2nd USA
10815.0	USA
10891.0	FHWA/MARAD
11029.5	OET
11076.0	DEA
11288.0	FAA
11428.0	NCS
11434.5	USCG
11449.4	NCS
11451.0	Bellcore
11494.0	USCS/USDA
11576.5	DLA*
11628.5	USTRANSCOM*
11637.0	FAA
11693.5	USACOE
11816.0	AFRES
12057.0	USTRANSCOM
12070.0	USACOE
12076.0	VA
12165.0	MITRE*
12222.0	USN MARS
13312.0	FAA
14383.5	USN MARS
13423.0	NTIA
13434.0	OET*
13457.0	FAA/OET
13550.0	DMA
13655.0	USN
13722.0	DOMS/NG*
13801.4	NCS
13805.4	NCS
13809.4	NCS
13854.0	NCS
13927.0	USAF MARS
13933.0	USAF MARS*
13997.5	USA MARS/44 MED
14350.0	DOMS
14350.5	NG
14396.5	NCC*
14402.0	DOMS
14403.5	USA MARS
14408.0	USAF MARS
14450.0	NG
14455.0	NASA*
14465.0	USA MARS
14488.5	USA MARS/44 MED
14493.5	FBI
14533.2	USAF MARS(L)
14541.0	DOJ
14585.0	INS(L)
14606.0	USAF MARS
14653.0	NG/USAMC
14665.0	44 MED
14686.0	DEA
14832.0	USAF MARS
14902.0	CAP
14930.0	USA
14955.0	USDA
14969.5	FCC
15473.5	USCG
15614.4	NCS
15807.0	USAF MARS
15851.0	FAA/OET(L)
16077.0	USAMC
16318.5	2nd USA
16382.0	USACOE
17422.5	OET
17458.5	DLA
17478.5	2nd USA*
17520.0	DMA
18063.0	Bellcore
18171.0	DEA
18178.5	NTIA
18220.0	DOJ
18416.0	DOE
18932.0	NCC
18938.0	NCS
18946.0	NCS
19410.0	FAA
19937.0	USAF MARS
20095.0	AT&T
20807.0	USAF MARS
20873.0	MITRE
20906.0	DOMS/NG
20994.0	USTRANSCOM
23355.5	VA
24550.0	FAA(L)
24740.0	DLA
24838.5	INS
25344.0	NCS
25347.0	NCS

Utility Loggings

Larry Van Horn

UTILITY WORLD

Abbreviations used in this column

AM	Amplitude Modulation	RTTY	Radioteletype
AMC	Air Mobility Command	SAM	Special Air Mission
AMTOR-A	Amateur microprocessor teleprinting over radio system, mode A	SANA	Syrian Arab News Agency
		Selcal	Selective Calling
		SITOR	Simplex teleprinting over radio system
ANDVT	Advanced Narrowband Digital Voice Terminal	SITOR-A	Simplex teleprinting over radio system, mode A
AR	Aerial Refueling	Unid	Unidentified
CW	Continuous Wave (Morse code)	U.S.	United States
		USB	Upper Sideband
EAM	Emergency Action Message	USCG	U.S. Coast Guard
LSB	Lower Sideband	USN	U.S. Navy
MAP	Magrheb Arabe Presse	VIP	Very important person
NAVAREA	Navigation Area		

All transmission are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Time Universal)

2106.5 ANDVT secure communications monitored here at 2119. (Larry Fowler-NY) *This is a USCG law enforcement channel-Larry.*

2175.5 Two fisherman complaining about being boarded and accused of being two miles inside the boundary at 2323. Lots of XXX rated language used. (Fowler-NY) *Now there is a real big surprise, he, he-Larry!*

3047.0 Halifax Military working several unids re: submerged boat (sounded like). Very weak, mostly unreadable at 0445. (Jeff Jones-San Francisco, CA)

3150.0 Unid station, female with long series of letters phonetically at 0240. Possible Mossad. (Takashi Yamaguchi-Nagasaki, Japan)

3450.0 Unid station 2EL repeating "V BPX6 de 2EL" at 1100 in hand sent CW. (Yamaguchi-Japan)

4146.0 Sailing ship *Sagamoor* talking to a navy ship about being adrift in the Pacific at 0449. (Bob Madorin-KS)

4165.0 Unid station, female with long series of letters phonetically at 2110. Possible Mossad. (Yamaguchi-Japan) *SYN2 reported here-Larry.*

4194.0 UOPC-*Volga* (Russian sea-river cargo vessel) working UBO3-Petrozavodsk Radio in CW at 1803. (Robin Hood-UK)

4199.5 UHTD-*Omskiy 143* calling UJE-Nizhny Novgorod Radio in CW at 1723. (Hood-UK)

4270.0 Unid station, female with long series of letters phonetically at 2036 with interference from unid CW station 2RC8. Possible Mossad. (Yamaguchi-Japan) *PCD2 reported here-Larry.*

4360.0 Unid station, female with long series of letters phonetically at 2148. Possible Mossad. (Yamaguchi-Japan)

4442.0 Nightwatch with Andrews checking here for possible new data frequency at 0312. (Jones-CA)

4575.0 V-Single letter HF CW channel marker at 1001. (Yamaguchi-Japan)

4580.0 Zero-7 receiving traffic from Blacksheep. Blacksheep is too weak here to make out, but I did catch 07 say "repeat after deployed." From Blacksheep's cadence, it sounds like he could be passing coord stuff at 1608. (Jones-CA)

4665.0 Unid station, female with long series of letters phonetically at 2136. Possible Mossad. (Yamaguchi-Japan) *CIO2 reported here-Larry.*

4751.0 9-Lima and 0-November working each other for radio checks at 0449. (Jones-CA)

4880.0 Unid station, female with long series of letters phonetically at 2114. Possible Mossad. (Yamaguchi-Japan) *ULX2 reported here-Larry.*

4910.5 USCG Group Woodhole, MA, passed this frequency on to an aircraft to use with a USCG cutter for communications. (Roger Parmenter-Hyannis, MA)

5091.0 Unid station, female with long series of letters phonetically at 2040. Possible Mossad. (Yamaguchi-Japan)

5238.0 Unid station, female with long series of letters phonetically at 2120, weak. Possible Mossad. (Yamaguchi-Japan)

5284.0 Unid CW station 7NKW repeating "V CXT8 de 7NKW" at 1455. (Yamaguchi-Japan)

5425.0 USN Bravo Charlie network (day)/Bravo Whisket net (night) first noted at 1542. (Larry Fowler-NY)

5437.0 Unid station, female with long series of letters phonetically at 2035. Possible Mossad. (Yamaguchi-Japan)

5530.0 Unid station, female with long series of letters phonetically at 2110. Possible Mossad. (Yamaguchi-Japan) *A Nancy Susan Adam station has been reported here-Larry.*

5658.0 Emirates 418 working Addis Ababa Air Radio with position report enroute to Dubai at 1830. (Hood-UK)

5696.0 CAMSLANT Chesapeake working CG 2129 at 2314. CG 2129 informs CAMSLANT that he was unable to contact group Miami secure due to "Change in frequency designators." Said was unable to copy on 3E11 or 3E12. Contacted Miami and passed a secure frequency of 10608.1 MHz. (Fowler-NY) *CG fans and Rick Baker at WUN take note that the Echo designators we have now could and probably have changed-Larry.*

5700.4 Habitat working Tango-4-November. Moving to voice channel WY01. It seems these two are also working UHF comms at this time, so maybe WY01 is a UHF freq? Even with a lot of QRN here and weak levels, Habitat and T4N are readable at 2205. (Jones-CA).

5820.0 Unid station, female with long series of letters phonetically at 1414. Possible Mossad. (Yamaguchi-Japan)

6270.0 Unid station, female with long series of letters phonetically at 2036. Possible Mossad. (Yamaguchi-Japan)

6380.0 UCW4-St Petersburg Radio with traffic to UAOZ-*Ladoga 103* (ex UNIC) and UBEX-*Sibirskiy* 2128 (ex EMGF) then listening 4198/6286.5 in CW at 1718. UCW4-St Petersburg Radio working UCFW-*Volgo-Balt 103* (ex ERBJ) in CW at 1801. (Hood-UK)

6719.4 Magic Carpet Sierra working Habitat and others in what seems to be MCS's primary thing, which is a data-communications support role. They've been up on this frequency most of the day here in California. Good-readable at 2217. Perhaps MCS could stand for something like: Mission Communications Support.(?). (Jones-CA)

6745.0 Unid station, female with long series of letters phonetically at 2055. Possible Mossad. (Yamaguchi-Japan) *CIO2 reported here-Larry.*

6761.0 Ready 27 coordinating AR times with 259 at 2130. These Ready calls were AMC flights from Torrejon, Spain. (Fowler-NY)

6785.0 Unid CW station 6PXJ repeating "V ABYZ de 6PXJ" at 0950. (Yamaguchi-Japan)

6915.0 Lockheed "Flight 6150" calling 5927 at 1708. No joy. (Jones-CA)

7453.5 C-Single letter CW HF channel marker at 1145. (Yamaguchi-Japan)

7547.0 English female 3/2-digit number station at 1330, also noted on 10529. (Yamaguchi-Japan)

7605.0 Unid station, female repeating Charlie Oscar Echo, then into long series of letters phonetically at 1450. Possible Mossad. (Yamaguchi-Japan)

7688.5 Alpha-1-Delta briefly working 5-A, 2-C, and 4-A for signal checks then gone at 2318. (Jones-CA)

7909.0 ANDVT secure communications noted here at 2350. Is this a USCG secure channel? (Fowler-NY) *You bet-Larry.*

7918.0 Unid station, female with long series of letters phonetically at 0240. Possible Mossad. (Yamaguchi-Japan) *FYH reported here-Larry.*

7955.8 AAR7PF working unid station, having trouble receiving. Told other station to give him and call using AMTOR-A and a selcal of RGPF at 2010 in LSB. (Fowler-NY)

7982.0 Unid station, female with long series of letters phonetically at 1415. Possible Mossad. (Yamaguchi-Japan)

8000.0 Abnormal 20 with test count at 0153. (Fowler-NY)

8010.0 Unid station calling Victor Echo Xray for a radio check at 2145. (Fowler-NY)

8014.0 English female 3/2-digit number station in AM at 1115. (Yamaguchi-Japan)

8056.0 Scrambled analog communications at 0355. (Jones-CA)

8078.5 The "Rear" calling any station this net for a radio check. No joy at 2208. (Jones-CA)

8306.0 BBYG working BTBD, passing message traffic from BING at 1932. Said conditions perfect for attack against scurvey dog. BTBD responds with: Weather-Clear, Wind-from the NE at 10, Equipment-100%, and Morale-high and willing. (Fowler-NY) *Interesting, either USN ship or, even better, Marine Corps on Navy amphib getting ready for a landing exercise-Larry.*

8312.0 BRUR working BZIV and BTBD passing traffic at 1535. Same bunch on 8306.0. (Fowler-NY)

8346.0 UTNR-*Chupa* with crew messages to UBO3-Petrozavodsk Radio in CW at 1542. UYCX-*Volgo-Balt 219* (Russian sea-river cargo vessel working UBO3-Petrozavodsk Radio in CW at 1749. (Hood-UK)

8528.5 EBA-Spanish Navy, Madrid, Spain, with CQ and warnings for NAVAREA 3 in 75 baud RTTY at 0959. (Hood-UK)

8540.0 USU-Mariupol Radio with currency exchange rates in 50 baud RTTY at 0710. (Hood-UK)

8722.0 CUL-Lisbon Radio with traffic list at 0930. (Hood-UK)

8782.0 Beijing Volmet sending aviation weather in very distorted USB with distinct heavy interference from Taipei Radio at 1025. Not heard on usual 8849. (Yamaguchi-Japan)

8861.0 Khabarovsk Volmet at 0815 and Irkutsk Volmet at 0825 with aviation weather reports in Russian. (Yamaguchi-Japan)

8904.0 Unid CW station sending 5-letter groups at 0010. (Yamaguchi-Japan)

8912.0 Unid station conducting test counts at 2213. (Fowler-NY)

8942.0 Singapore, Manila, and Hong Kong air radio working various aircraft at 0835. (Yamaguchi-Japan)

9016.0 Stripe working Nightwatch 01 at 1839. Stripe asked NW01 if they could contact them this way in the future? NW01 said no, try 8968 (GHFS); that it was a good frequency for them since they had to monitor it all day anyway. Stripe then asked if NW01 was monitoring the Vincent CINC net. NW01 said they were monitoring that presently. Then Stripe asked if NW01 would contact them on that one right now and they replied as soon as their radio operator was freed up. (Fowler-NY) *Interesting exchange, Larry. Vincent is a code word for a scrambling system and CINC, of course, is Commander in Chief-Larry.*

9019.0 Unid station with test count transmission at 1938. (Fowler-NY)

9093.0 Unid CW station transmitting 5-digit groups at 1045. (Yamaguchi-Japan)

9130.0 Unid station, female repeating "Echo Zulu India," then into a long series of letters phonetically at 0240. Possible Mossad. (Yamaguchi-Japan)

9143.0 Cowboy working Strider for KL-43 data traffic at 0105. (Jones-CA)

9251.0 English female 5-digit Lincolnshire Poacher number station at 2125. (Yamaguchi-Japan)

9258.0 NNNORRC working NNNOCMQ with morale phone patches at 0226. Switched to 7684 kHz at 0247. (Fowler-NY)

9283.0 EAM with RYLP3A preamble initiated by 4IQ at 0022. (Fowler-NY)

9292.0 ANDVT communications at very strong levels at 0300. (Jones-CA)

10001.0 Unid CW station ARL repeating "DE ARL" at 0115 with heavy interference from time station BPM on mainland China. Any comments? (Yamaguchi-Japan) *Nothing that I know of that is legal-Larry.*

10046.0 4XZ-Israeli Naval Radio, Haifa, with V CW marker at 1225. (Yanaguchi-Japan)

10072.0 Caledonian 269 working Speedbird London at 1216. (Hood-UK)

10090.0 Khabarovsk Volmet, Russia, with aviation weather reports at 0538. (Yamaguchi-Japan)

10091.0 Unid station AMDL repeating "V HKYJ de AMDL QSY 20" at 0605 in hand sent CW. (Yamaguchi-Japan)

10204.0 Kiwibird working Badblood at 2204. Also heard on 11244 at same time working Tipic 14/18. (Fowler-NY)

10213.0 CNM29-MAP Press Agency, Rabat, Morocco, with news in French in 50 baud RTTY at 1719. (Hood-UK)

10529.0 English female 3/2-digit number station in AM at 1323. Extremely powerful signal in dead band conditions. Also noted on 7547. (Yamaguchi-Japan)

10536.0 CFH-CANFORCE Meteo with aviation weather in 75 baud RTTY at 1723. (Hood-UK)

10830.0 Unid CW station 4XML repeating "V BFR4 de 4XML" at 0926. (Yamaguchi-Japan)

10994.0 EAM preamble RYLP3A initiated by K9W at 1832. This frequency had EAM broadcasts throughout the day and into the night from various letter-number-letter callsigns. (Fowler-NY) *This is a USN Pacific region network frequency with NPM the net manager-Larry.*

11080.0 SANA News Agency, Damascus, Syria, with schedule for English and French as 1000 to 1100, 1400 to 1500 and 1800-1900 daily. 50 baud RTTY at 1048. (Hood-UK)

11175.0 Mudbug 01 calling Nightwatch 01, no joy at 1605. Then Mudbug 01 changes callsign to Hurlburt Field and calls for any station, Albrook answers. (Duke Rumley-Mayodan, NC)

11244.0 Navy 01 calling Goldpost, no response. Bott 51 and Zamia 99 with a group message for Goldpost at 1900. Zamia 99 and Turbo 55 passing message group to Kiwibird at 2100. Also heard Navy 02 calling Kiwibird, no response. (Fowler-NY)

11267.0 EAM broadcast by T9I at 1830. (Fowler-NY)

11387.0 Singapore Volmet at 0920, Sydney Volmet at 0930 and Bangkok Volmet at 0940 with aviation weather reports. (Yamaguchi-Japan)

11565.0 Unid station, female with long series of letters phonetically at 1443. Possible Mossad. (Yamaguchi-Japan)

11647.0 Scrambled voice monitored on this frequency at 1944 (not ANDVT). (Fowler-NY) *The only thing I show here is a Mystic Star allocation with a Ft. Allen, PR, site-Larry.*

12070.0 Tollroad working Nightwatch 01 on Zulu 211 at 1954. (Fowler-NY)

12506.0 UJFO-*Professor Multanovskiy* (research/passenger charter vessel) with crew messages to St Petersburg in 50 baud RTTY at 0644. Vessel en-route Argentina and Antarctica. (Hood-UK)

12565.5 UWCC-*Sergey Lazo* sending crew messages to UUI-Odessa Radio in 50 baud RTTY at 0701. (Hood-UK)

12627.5 USU-Mariupol Radio with message to USBT-*Komsomolets Armenii* for Km Borodavke in 50 baud RTTY at 1539. USU-Mariupol Radio with message to UHLE-*Semyon Lapshenkov* Ukrainian refrigerator cargo vessel with crew messages to URL-Sevastopol Radio in 50 baud RTTY. (Vessel is ex UPGS). (Hood-UK)

12797.0 UDK2-Murmansk Fisheries Radio with traffic to UHLE-*Semyon Lapshenkov* (MB-0014) in 50 baud RTTY at 1545. (Hood-UK)

12950.0 Unid station, female with long series of letters phonetically at 1356. Possible Mossad. (Yamaguchi-Japan) *SYN2 reported here-Larry.*

13533.0 Unid station, female with long series of letters phonetically at 1446. Possible Mossad. (Yamaguchi-Japan)

14270.0 Unid CW station transmitting 5-digit groups at 0945. (Yamaguchi-Japan)

14469.0 English female 5-digit Lincolnshire Poacher number station at 1120. (Yamaguchi-Japan)

14698.0 EAM with FLMCQ4 preamble initiated by H2X at 2045. EAMs continued into the night on this one. (Fowler-NY)

14863.0 Andrews calling SAM 26000. No joy at 2145. (Jones-CA)

15016.0 Badblood passing a voice message: "For Skymaster ACAP 369 - four group message JEJ AB2 XII CDS" to 1EZ at 2127. (Fowler-NY)

15046.0 Tollroad working Nightwatch 01 on Zulu 230 at 1953. (Fowler-NY)

15084.0 Continuous EAM traffic by trigraph callsigns at 1932 and into the night. (Fowler-NY)

15095.4 Habitat working unid at 1630. (Jones-CA)

16117.0 Foxtrot-9-India with three (that I'm aware of) EAMs. I missed all but the last characters of the first one. The second one was a 48 character (I think 48; it was close to unreadable) EAM to FLG3FC. The third EAM was 20 characters for FLMCQ4. All heard beginning at about 2252. (Jones-CA)

16471.0 UYQQ-*Volzhskiy 37* (Russian sea-river cargo vessel) working Helsinki Radio for phonepatch at 0926. (Hood-UK)

17410.0 Unid station, female with long series of letters phonetically at 0942. Possible Mossad. (Yamaguchi-Japan)

17499.0 English female 5-digit Lincolnshire Poacher number station very weak at 10000. (Yamaguchi-Japan)

17904.0 Honolulu air radio working New Zealand 81 at 0455. (Yamaguchi-Japan)

18634.0 USN Foxtrot net working a foreign accented Juliet operator and Xray working blue forces. Missiles launched and Vigilant Watch mentioned. (Fowler-NY)

19002.0 SAM 201 working Andrews on F-943 with signal checks and patches. Also heard on: 18393.0, 15011.0, 13440.0, and 11214.0 around 1931. (Jones-CA)

22527.0 USU-Mariupol Radio with identification and frequencies as 6355/8540/12697/17141.6/22527 in CW at 0900. (Hood-UK)

22595.7 SVB7-Athens Radio, Greece, with CQ CW marker at 0710. (Yamaguchi-Japan)

Glenn Hauser, P.O. Box 1684-MT, Enid, OK 73702
E-mail: <ghauser@hotmail.com>; fax: (405) 233-2948, ATT: Hauser

Just Another Month on Shortwave...

But what a month, with unexpected developments! We lose Antarctica, at least for a while, but Dniester and Red Cross Broadcasting seem gone for good. No more English from Abu Dhabi, but Jordan gives us more. Voice of Nigeria makes a comeback, so Radio Kudirat has some competition. A VOA transmitter burns up, and at least one country broadcasting Radio Free Asia backs out when pressured by China. Radio Australia and Radio Canada International still face uncertain futures, but BBC fires up its new relay in Thailand. Flanders seems to have found an obvious solution to its poor coverage. Some stations manage to clash with themselves—Austria and WRNO. Or clash with each other due to poor planning—Austria and BBC.

There's never a dull moment with clandestines concerning Colombia, Germany, Kurdistan. When is Radio Cairo not a shortwave station? Tom Meijer turns up on a new medium. Unusual QSLs or offers of QSLs for a price emerge from Chile, Ecuador, Georgia, Italy. Moscow becomes a Christian broadcaster; sex crimes charged at a US gospel shortwave station. And DX turns into terrible reality on HCJB.

And now, the details...

ALBANIA R. Tirana English to Eu 1715-1730 on 7155, 6185, good on both, all news. And 1930-2000 on 7270 and new 6270, stronger on 49m (Tom Sundstrom, NJ, *World of Radio*) To NAm still 0145-0200 on 7160, 0230-0300 on 6140, 7160 (HFCC)

ALGERIA RAI new English time 1600-1700 on 15205.16, //17745 weak under Portugal, best on 15160.56 (Brian Alexander, PA) 17745 is blocked by Portugal only on weekends (gh) Followed by Spanish at 1700-1800 (Jay Novello, NC)

ANTARCTICA LRA36, 15476, made its final broadcast of the year Nov 8 until 2052* without saying when it would resume (Rubén Guillermo Margenet, Argentina via Gustavo Fernando Durán, *World of Radio*)

ABC AUSTRALIAN BROADCASTING CORPORATION ONLINE

RADIO AUSTRALIA

IN TOUCH WITH THE WORLD

AUSTRALIA Bob Mansfield, business executive inquiring into ABC's future, asked Foreign Affairs Dept to take over RA, but that was turned down since it would have made RA a govt mouthpiece like VOA (Tony Wright, Sydney *Morning Herald* via the late Brian Anderson, *Australian DX News*) RA's *Media Report* airs only twice, Sat 2030 and Sun 0430 (RA website)

AUSTRIA ORF's new 7325 to NAm 0000-0300 propagates well, but faced conflict with BBC still using it at 0230-0300 only from Ascension when Austria is also in English. Earlier English at 0030 kept getting mixed up with Austria's own Spanish broadcast (gh)

BELGIUM [non] A tidbit emerging from Grove Expo is that RVI is negotiating with R. Nederland for relays via Bonaire, Madagascar, says Frans Vossen (Jeff White, *Radio-Enlace*) *That would finally end RVI's serious reception problems-gh* SENTECH has started relaying RVI from South Africa (*SENTALK*) *But not to be found in actual schedule, yet?-gh*

CANADA Nothing new to report as of early Nov re RCI funding; nobody in the govt has had anything to say on the subject for months. We hope it doesn't get to the point it did last winter, when everybody received layoff notices, and we had to undertake big lobbying push—but it might happen again (Bill Westenhaver, PQ, *Continent of Media*) Former president of CBC Pierre Juneau has appealed to the Liberal govt to provide long-term, stable funding for RCI. He's also the former head of CRTTC and deputy minister of communications (RCI via BBCM) Hotsheets giving CBC/RCI program previews, especially for weekend shows like *Sunday Morning* may be accessed at **http://www.radio.cbc.ca/radio/services/hotsheets/weekend_hotsheet.html** (gh)

CHILE R. Esperanza, 6089 can be QSLed via me for $2 and some postcards to: Mr. Saul Vergara Valenzuela, QSL-Editor, P.O. Box 52248, Correo Central 1, Santiago. The station itself cannot afford to reply to reports (Vergara) *Not clear what his connection with the station is, maybe proxy, but says he is registered listener CE3-016 -gh*

CHINA Xinhua news agency announced it would stop SW transmission of press in English Jan 1, replace by satellite (BBCM)

COLOMBIA Voz de la Resistencia, clandestine reactivated daily 2155-2220/2230v on 6231.1, whereas 6250, R. Patria Libre has been off. *El Espectador* newspaper said the FARC station, Resistencia, had an E-mail address in Costa Rica: **<elbarcino@laneta.apc.org>** (Henrik Klemetz, *Dateline Bogotá*)

COSTA RICA REE has taken up residence on 9630, destroying the band +/- 20-30 kHz on all equipment here. I don't know how the CR engineers get away with ... the crud thrown off on the sidebands (Tom Sundstrom, NJ)

RFPI inaugurated new 10 kW AM transmitter on 15050, then replaced antenna with 3-element delta quad; 10 kW also used at night in USB on 6205 //7385 AM (gh) *Global Community Forum/Far Right Radio Review* call-in has been live UT Fri 0200, but tried UT Sun 0400 and may switch permanently to that time. Also is considering Internet-casting for RFPI (gh) *Micro-Power Broadcasting* is off the schedule, as producer is away writing a book (RFPI)

CUBA When RHC's 9820 was super-strong at 0613 it was accompanied by parasites on 9720, 9920. Eu service at 2100 on 13715-AM and 13725-usb accompanied by strong mixing product 13705-lsb (gh) On *Rebelde-DX* Arnie Coro said this would move to 31mb, but still had not done so by mid-Nov. *Rebelde-DX* airs UT Sats around 0530 on 5025, +/- 10 minutes (gh)

CZECH REPUBLIC R. Prague resumed morning broadcast to us like last winter, 1400 on 13580 (Joe Hanlon, PA, *World of Radio*) Great to hear Prague mid-morning again like 25 years ago (Ivan Grishin, Ont.)

ECUADOR R. El Buen Pastor, 4815, needs US$10 to send a QSL and pennant. Reports welcomed to Correo Central, Saraguro, Loja (Takayuki Inoue Nozaki, *Electronic DX Press*)

La Voz del Upano reactivated on 4870 at 0015-0200* and on 5040 at 2300-2334* on a Fri, -2306* Thu (Brian Alexander, PA)

On HCJB, at least two *DX Partylines* have concluded with heart-rending family messages to three missionaries kidnapped and missing since 1994 in Colombia or Panamá (gh and Anker Petersen, DSWCI *DX Window) See MT feature, this issue-ed.* Preliminary HCJB sked on page 56 last month was changed at last minute so that there is no break at 0400-0500 on 9745, and 0500 programs air an hour earlier, including *DXPL* Sun 0409. Europe remains at 0700-0900 on 5860, NAm/Carib 1100-1600 on 12005 and 15115, not 12025 (gh)

EGYPT [non] Radio Cairo is the name of a highly recommended exotic restaurant in Sydney, Australia (Maarten van Delft, DSWCI *SW News*)

ETHIOPIA [non] V. of Oromo Liberation sked is Mon/Wed/Sat 1600-1700 on 9870. Address P.O.Box 510610, D-13366 Berlin, Germany (via Bruno Pecolatto, *Pirate News* via *The Four Winds*) *via Russia?*

GEORGIA Foreign service in English: 0630 on 11805; 0830, 0930 and 1730 on 11910; 1630 on 6180; 1930 in 11760 (Vladimir Gukasov, Georgia, via MIDXB via *Panlview*)

R. Abkhazia, 9494.77, QSLed with long friendly letter in English, postcards, giving sked as 0430 and 1530, external service Tue and Sat 1130-1300, 1700-1830, confirmed

All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; Z-96 = Summer season; W-96 = Winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there.

9495 is in Abkhaz capital Sukhum, power as 5 kW, also mentioned 9508 (Jerry Berg, MA, *Fine Tuning*)

GERMANY Trans World Radio via Jülich: 1630-1700 daily in Romanian on 5895, 1830-1900 Turkish (exc Sun Kurdish) on 7155 (TWR via *Panlview*) German Foreign Office at first banned the broadcast of Democratic Voice of Burma via Jülich, then lifted the ban. Norway has been carrying it (Catholic News Agency via *BC-DX*)

AWR via Jülich update to last month: 5900 from 0500, not 0400. Add 9835 at 2000-2200 in French to Africa. See also ITALY (Adrian Peterson, AWR)

R. Bremen closure of SW 6190 is not necessarily permanent, not for technical reasons. Listeners are invited to send their opinion (Frank Helmbold, Bremen, *BC-DX*)

GUAM AWR *Wavescan* now via KSDA: Sun 1030 7455, 1230 13720, 1630 7400, 2330 15610 (Adrian Peterson, AWR)

GUIANA FRENCH RFO Cayenne, 5055, spectacular signal but het from Faro del Caribe 5054.6, 2225 French and Anglo pop and techno, French ragga and zouk, RFO jingles, break for news 2300-2308, still at 2415 with Saturday evening dance party (Jay Novello, NC)

GUYANA GBC irregular on 3290, but when on is very well received in S Florida at 0900-1000, 2300-0100 (Bob Wilkner, DSWCI *DX Window*) and 5950 at 0800-0900+, English, Christian, and Hindi music, strong carrier but slight distortion and low modulation, but then missing for at least a week (Brian Alexander, PA)

HUNGARY R. Budapest W-96 in English: Eu 2000-2030 3975, 5970, 9840; 2200-2230 3975, 5970, 9835; NAm 0200-0230 5905, 9840; 0330-0400 6195, 9840 (RB website via Büschel)

INDONESIA VOI contemplates freq change for external service currently on 9525 due to complaints from Europe; English hours at 0100, 0800, 2000. On Radio Day, Sept 11, three listeners from Scotland, Germany, and Japan were guests of RRI, visiting Jakarta and Bali, winners of a quiz. A similar quiz is planned for 1997 (Bob Padula, *Electronic DX Press*)

IRELAND United Christian Broadcasters, 6202.79 from before 1900, peaking at 2045, still there at 2330, new 2 kW transmitter? (Jerry Berg, MA, DSWCI *DX Window*) Much stronger than old 6198.95, varies 6202.5-6203.2; has nice full-data QSL, no r.p. (Martin Elbe, *BC-DX*) It's a pirate (*Cumbre DX*)

[non] After a good start the first week, West Coast Radio Ireland usually ruined on 5910 by ute bleedover from low side; try the 1800 Thu broadcast to Africa instead on 11665.

ISRAEL Kol Israel's *High Tech Scene* heard Wed at 2025 on 9365, 9435, 7465, 15640 (Edwin Southwell, World DX Club *Contact*) by Ben Dalfen, who used to do *DX Corner* (gh)

ITALY R. Internazionale, 7500, 3 weeks after an E-mail report to the station at <**word@cdc.it**>, I received E-mail from Tommasi Paolo: a .pcx Paintbrush file with a graphic showing front of a QSL, station name, "QSL 1996", "7500", pix of antique radio, no details. Is this the new world order of QSLing? (Jerry Berg, MA, *Cumbre DX*)

RAI on new 6010 in English 0050-0109 //9675, 11800 (Brian Alexander, PA)

JORDAN R. Jordan English to NAm expanded to 1200-1730 on new 11690; hourly news, nice mix of EZL, classical music. (Joe Buch, DE, *Cumbre DX*)

KAZAKHSTAN [non] R. Kazakhstan English at 1030 on new 9620, 11840 via Kiev relay (Winfried Soroe, *BC-DX*)

KENYA VOK, 4935 as early as 1830 with light music, 2000 English news, meditation and s/off with anthem 2107 (Roger Chambers, NY DX Camp) Previously heard on 4885 instead of 4935 to 2107* (Art Delibert, MD, *Cumbre DX*)

KURDISTAN R. of Islam, V. of the Islamic Movement in Iraqi Kurdistan, heard early Nov 1700-1800 on 4136, 4400, 6305; had not been heard since Jan (BBC Monitoring)

MALAWI MBC sent sked showing new 9625 with 50 kW at 0815-1510, preceded and followed by 3380 (*Panlview*) But 3380 missing lately in usual 1800-2000 window (Chris Hambly, Australia, *W.O.R.*)

MALI Surprise new occupant of BBC's vacated 15070 is CRI relay in the 1600 hour, a distorted spur from 15130 //spur on other side 15190; no sign of Iceland (gh)

MÉXICO R. Educación, 6185, plans power increase from 5 to 20 kW, hours increase from 12 to 16 per day, and to add Russian (Jaime Báguena, RN, visiting station for *Radio-Enlace*)

MOLDOVA [non] R. Moldova Int'l, via Galbeni, Romania, includes 25-min English on 7500 M-F at 0330 and 0430 Am, 2200 and 2300 Eu (BBCM) All the staff of R. Dniestr Int'l is out of work (R. Rossii *Klub DX* via Nikolay Pashkevich, *BC-DX*)

MONGOLIA R. Ulaanbaatar new English sked to Mar 31: 1330 to Au/SAs on 12085; 1530 Au/SEu and 1930 Eu both on 9745, 12085 (Alexander Ageenkov, Russia, *rec.radio.shortwave*)

NETHERLANDS [non] Tom Meijer, former *Happy Station* host can now be heard on a Hasbro Interactive CD-ROM game *Othello* narrating on-disk history of the game. Just as much fun as Elvis sightings! (Joe Ekaitis, *rec.radio.shortwave* via George Thurman)

NEWFOUNDLAND CBC Radio in Goose Bay programs 1 kW 6160 with local morning show, then CBC programming. We get about three reports a year but would like more. Is anybody listening? (Don Lockhart, <**dlockhar@nlnet.nf.ca**>, *rec.radio.shortwave*) Labrador program well heard here in Delaware 1230-1300, but may skip over Nfld. (Joe Buch, *Cumbre DX*) *Site is St. John's, quite a distance from Goose Bay-gh*

NEW ZEALAND Due to interference, RNZI changed its first two frequencies of the day to 6070 at 1650, 9810 at 1753 (RNZI)

NICARAGUA R. Miskut on 5770 2310-2335* in Spanish, suppressed carrier USB, very weak. Last year they were on very late Xmas eve until 0336* and New Years Eve to 0733* (Brian Alexander, PA) One night in Nov they were on past 0100 (Roger Chambers, NY) *See MT feature, this issue - ed.*

NIGER La Voix du Sahel on 5021.37 ex-5020 and stronger than before, new transmitter? At 1930-1935 (Don Phillips, UK, DSWCI *DX Window*)

NIGERIA Voice of Nigeria, external arm of R. Nigeria, was back on air Nov. 11 after more than 13 months absence caused by transmitter problems. Had been off since Sept. 1995. Began tests to NAf, EAf, SAf, Eu. Of the five transmitters bought from Switzerland early in 1996, only three so far installed and tested. The one serving WAf has yet to be installed. VON expected to resume full transmission the following week (AFP via David Alpert) *No frequencies given, but I checked former 15120 and there were African music-only tests in the 1600-2000 period for several days, never any announcements. Check other former VON frequencies 11770, 9690, and to WAf 7255-gh*

FRCN started broadcasting from Abuja Nov. 5 (R. Nigeria via BBCM) *New capital, replaces Lagos-gh*

NORWAY NRK cancelled all but one of the Sunday morning English beams to NAm when propagation is best—just 1600 on 11840 (gh) Clash with WEWN at 0100, 0200 on 7520, so maybe moved to 7440, and also tested 6090 (Joe Hanlon, George Thurman)

PAKISTAN R. Pakistan, 11570.3, 1400-1410 English news (Roger Chambers, NY DX Camp)

PERÚ R. Ayabaca in Ayabaca, Piura Dept., on 7143 at 2200 with comunicado, want-ad for a missing mule, rather weak, announces "7150 para el Perú y el mundo" (Henrik Klemetz, *Dateline Bogotá* via DSWCI *DX Window*) R. La Voz del Marañón, Cajamarca seems to use one transmitter in the morning 1130, 1225-1305 on 5636.9, and another in the evening, 0125-0209 on 5604.9 (Pedro F. Arrunátegui, Lima, *Chasqui DX*)

POLAND PRW English W96: 1300-1355 on 11815, 9985, 7270, 7145, 6095; 1830-1855 on 7285, 7270, 6095, 6000; 2030-2125 on 7285, 6095, 6035 (Wojtek Zaremba, Poland) *Noted new 9985 but all we could hear was KHBN-gh.* 9525 still on at 1300 but heavy interference (Jay Novello, NC)

PORTUGAL R. Portugal's English to NAm has been at 0130, 0230, 0330 and now is at 0430-0500 UT Tue-Sat on 6150, 9570 (gh)

R. Renascença seems to switch on SW 9680 only for sports events, heard Sunday after 1600 with football (Matthias Gatzke, Germany via Kai Ludwig, *EDXP*) Also on a Wed 1810 (Jay Novello, NC)

ROMANIA RRI quite good at 2100 to Eu on 7195, but NAm service virtually inaudible—at 0200, 6155 buried by RCI, and nothing heard at 0400 (Tom Sundstrom, NJ, *W.O.R.*)

РАДИО ГОЛОС РОССИИ
RADIO VOICE OF RUSSIA

RUSSIA VOR WS winter program sked shows *The Christian Message from Moscow*, Russian Orthodox stories and music, in NAm service Sun 0431 and 2331. *You Write to Moscow*, mainly E-mail to <**letters@vor.ru**>, Wed 0046, 0346, Thu 2346, Sun 0346 (via Bob Thomas, CT) VOR's best, often only audible freq here after 0200 is 5930, which is from Petropavlovsk-Kamchatsky (gh, OK)

Having eliminated dozens of languages since the days of R. Moscow, USSR, VOR's most exotic remaining tongue is Nepali, 1445-1500 on 9875, 7350, 7155 (via BBCM)

SLOVAKIA AWR *Wavescan* sked: Sun 0400 on 9450, 0530 on 5905, 2130 on 6055 (Adrian Peterson, AWR)

SOMALIA R. Mogadishu, V. of the Somali People, 6854, English news segment at 1957-2016 surrounded by Somali (Rich D'Angelo, PA, *Fine Tuning*)

SOUTH AFRICA R. Oranje stopped SW on Oct. 27, as the new owners' licence does not include SW (Kathy Otto, SENTECH)

SPAIN Contrary to published sked, REE's English to Europe on Sat is curtailed due to Spanish sports broadcasts—just 2235-2256 on 6125, including *Distance Unknown* at 2244, but African service is almost an hour, 2235-2330 (*DUnk*)

SRI LANKA SLBC in Hindi at 0025-0430 on 11895 ex-11800/11880, also 1500-1700 on 11895 only, seems the NHK Ekala transmitter. English to India on 9730 ex-9720 at 0030-0430, 1230-1600 (Alok das Gupta, India, *EDXP*) Domestic, not external services shifted 30 mins earlier due to timezone change to UT+6 (Victor Goonetilleke, UADX via *BC-DX*) 11895 steady and enjoyable with subcontinental music at 1515 (Jay Novello, NC, *W.O.R.*)

VOA relay here will be very important for Asian coverage, but was set back Nov 5 when a 500 kW Marconi transmitter was destroyed by fire, cause unknown. The other three probably undamaged, and tower structural problems being corrected. Target date is still Sept 1997 (Kim Elliott, VOA *CW*)

SWITZERLAND Red Cross Broadcasting Service note says they stopped their broadcasts at the end of Oct (Michiel Schaay, *BC-DX*)

TAHITI RFO, 15167.4 in French talk, mentions of Papeete, 1600 news, fair signal (Joe Karthaus, Ont., *Cumbre DX*)

TAIWAN [non] VOFC via WYFR made same change as last winter for English to Eu at 2200-2300 on 5810 and 9985 (gh)

THAILAND BBC Asia Relay Station was formally opened Oct. 30 at 0700 by HRH The Duke of Edinburgh, at Nakhon Sawan, 250 km N of Bangkok. Will transmit in 14 languages from Caspian to Pacific. Cost 30 megapounds, took two years to build, houses 4 x 250 kW, fed by satellite from UK. Will start with English, Cantonese, Mandarin. Seven antenna arrays already operational. Fully automatic station needs only two British staff, with operation and maintenance carried out by Thai personnel trained on-site (BBCWS via BBCM)

R. Thailand WS in English via VOA Udorn, W-96 as amended: 0000 Af 9680, 0030 Am 11905, 0300 Am 11890, 0530 Eu 15115, 1230 Au/As 9810, 1400 Au/As 9530, 1900-2000 Eu 7295, 2030-2045 Eu 11805 (BBCM and Dan Ferguson) *9810 is most reliable here, tho fluttery-gh*

TURKEY VOT at 0400 to NAm on 7340 clashed with VOA Botswana, so Turkey moved to 7300 (Bob Thomas, CT)

UKRAINE RUI DX program gave correct times for English and full freq list as in HFCC: 2200 on 5905, 5940, 6010, 6020, 6080, 7115, 7160, 7205, 7380; 0100 on 5905, 5915, 5940, 6010, 6020, 6080, 7150, 7160, 7180, 7205, 7290; 0400 on 5915, 6020, 7150, 7180. Many of these are inaudible and/or conflict with other stations, but we can count on 7150 and maybe 7180 (gh)

UNITED ARAB EMIRATES UAE Radio, Abu Dhabi D-96 sked no longer shows English at 2200-2400, no longer on the air at that time, just Arabic at other times (Bob Padula, *Electronic DX Press*)

U S A R. Free Asia, 11615 testing as "Channel One, RFA program channel" with continuous loop tape between 1300 and 1400 on some dates in Nov (Sheldon Harvey, PQ; Alok Das Gupta, India; gh) *Presumably for new Tibetan service to have started at beginning of Dec. That frequency also used later in day by Armenia, which also relays RFA Chinese at other times-gh.* Tibetan to be half-hour news show repeated three times daily, and Chinese will be expanded to 5-1/2 hours daily in first quarter 1997 (Richard Richter, RFA, Reuters via Boston *Globe* via Malcolm Kaufman) RFA 1500-1600 on new 11880 via megawatt Tajikistan, instead of 7495, possibly switching error (Klaus Lieberwirth, *BC-DX*) Kazakhstan relays missing since Nov 1: 1500 on 5865, 2300 on 5855; also Tajikistan at 1500 on 7495 (Wolfgang Büschel, *BC-DX*)

One host government pulled the plug on RFA under pressure from Beijing. They didn't want to defy the Chinese (Richard Richter, RFA, Reuter via David Alpert) People from the Chinese Embassy in Washington visited RFA wanting to know relay sites, but no one would tell them (Ben Barber, *Washington Times* via Chet Copeland)

A federal arbitrator ruled that R. Martí management did not directly retaliate against four research analysts, who had charged that their jobs were eliminated because of their political views. But Judge Joseph A. Sickles did fault managers of U.S. government broadcasts to Cuba for permitting a climate of harassment to exist against the analysts—including "vicious on-air attacks" against them—and for failing to take action against suspected troublemakers (Christopher Marquis, *Miami Herald* via Aaron Pilchick)

VOA Europe must be privatized as it will lose government funding at the end of 1996. *Broadcasting and Cable* reported that a new private company, VOA Global would acquire it and is negotiating with Clear Channel Communications and ABC Radio Network (VOA *Communications World* via BBCM) VOA Director Geoffrey Cowan becomes Dean of the Annenberg School of Communications at USC in Jan (*Columbia Journalism Review*)

New mailing address of VOA Greenville is 3919 VOA Site B Road, Grimesland, NC 27837. Gordon Thompson was kind enough to drop carrier immediately on 11935 for me to hear Romania on 11940 at 1300, so I sent them some cookies (Gigi Lytle, TX, *Continent of Media*) VOA cancelled morning Spanish broadcast, then resumed it a few weeks later, 1200-1230 on 15265, 13675, 12025, 11890, 7370 (Tracy Wood, VA) Some English services were cut to find the money (VOA *CW* via Wood) *Communications World* tested restored 0030 Sun to Ams via Delano 9455, hope to continue (Kim Elliott)

American Gold, rock hits from the 50s to the 70s, airs Mons at 2200 on 13710, 12080, 11975, 7415, 6035 (*VOA Guide* via foreign correspondent)

Due to an unannounced numbers station popping up on 5850, WSHB moved 2000 and 2100 broadcasts to 5835 (C. Ed Evans, WSHB) New host of MRI's *Letterbox* is Jay Jostyn. Stopped reading letters from MRI listeners in US (Jim Moats, OH, *W.O.R.*)

Lloyd Gerald Pond, 51, who worked nights as a technician at KTBN (7510 kHz), was charged with two counts of forcible sodomy. Police said he coerced a 14-year-old girl into posing for lewd photographs in her underwear and performing oral sex in a warehouse at KTBN. If convicted, Pond faces up to life in prison. He was also the narrator of *Times and Seasons*, a weekly Mormon program often decrying the evils of child and sexual abuse, syndicated nationally. It was immediately pulled from Salt Lake City outlets (Associated Press)

WRMI, 9955, as of mid Nov: *Viva Miami* M-F 2300-2325, rest last 30 mins—Tue-Sat 0115, Sat/Sun 2100, Sat 2200, Sun 0030. Also 1st and 5th Sat 2130; Sun following 2nd, 4th, 5th Sats 0000. *VM* in Spanish Tue-Fri 0230; *Con Frecuencia* Sat 0230, Sun 1200. AWR *Wavescan*: M-F 2230, 2345, Sun 1345, are repeats. New editions Sat 2330, Sun 1300, Mon 0200 (Jeff White, WRMI) Relays off shortwave of Kol Israel Spanish news recorded at 2050 are at 0315 Tue-Sat, 0400 Sun/Mon (White via Doni Rosenzweig, *rec.radio.shortwave*)

On WWCR, *Ham Radio and More* resumed live airtime Sun 2306-2400 on 5070; see **http://www.goodnet.com/~lenwink/hrm.htm** (Len Winkler, *rec.radio.info*) *Net Connection* expanded to an hour at 0400 Mon on 5070. *Inventor/Entrepreneur Hour* is new, Sun 0200 on 5070, Thu 0900 on 3210. New time for *Presidential Address* is Sat 2030 on 15685, replacing Sun 0000 on 3215 (Adam Lock, WWCR) Whatever happened to the *Antichrist* on WWCR? I can't find it. Was one of WWCR's better shows; at least it made sense (Richard F. McCarthy, AL) Whatever you think of it, only two episodes were produced and it got to be very repetitive, so removed from sked, but may appear at unpredictable times reaching unsuspecting new audiences. Bro. Stair usage of 2390 expanded for winter to 1300, wiping out morning broadcasts, too, of Huayacocotla and/or Atitlán (gh)

WORLD OF RADIO on WWCR as of early Dec: Thu 2130 on 9475, Sat 1230 on 7435, 1800 (temporary) 12160, Sun 1000 on 3210, Mon 0030 on 5070, Tue 1330 on 15685, Wed 1230 on 15685. See our website for latest update.

WRNO monitored at 2236 on 7356.2, wandering around afternoons. What gives? (Don Steelman, TX, *W.O.R.*) WRNO is using a 10 kW backup military transmitter (Brother Stair) One evening at 0403 heard both Brother Stair and Monday Night Football on 7395. What's going on? (Jim Moats, OH) WWL audio was crosstalking into WRNO transmitter for hours at a time; one afternoon I also heard two different Limbaugh hours mixing!-gh

Two mediumwave harmonics heard the same morning: on 3120 = 2 x 1560, KDDA, Dumas AR at 1216; on 2920 = 2 x 1460, WXRQ, Mount Pleasant TN at 1214 (gh, OK)

UZBEKISTAN R. Tashkent now has English to Europe at 2030-2100, 2130-2200 on 7105, announcing wrong frequencies, and also offering commercial time (Andreas Erbe, Germany via Kai Ludwig, *EDXP*) Also very strong on 9540, 4850 (Wolfgang Büschel, *BC-DX*)

ZAÏRE Due to fighting in eastern Zaïre, three Voix du Zaïre transmitters have been refurbished and are back on the air—100 kW from Kinshasa [15244.5], 5-10 kW serving Bandundu and other areas [probably 7100 in Kinshasa, not yet reported], and a 2 kW for Kinshasa (Voix du Zaïre via BBCM) The Burundian pro-Hutu clandestine R. Democracy, reportedly from Uvira, Zaïre, not heard since end of Oct on 7040 due to conflict in the area. Voix du Zaïre was still heard on 15244.5 around 0500-1900 (BBCM)

Until the Next, Best of DX and 73 de Glenn!
http://hudson.idt.net/~khecht19/radio/shortwave/ghauser

Broadcast Loggings

GLOBAL FORUM

Gayle Van Horn

0008 UTC on 4854.4
PERU: La Voz de la Selva. Spanish. Station ID "por radio la Voz de la Selva" into regional music. Co-channel interference noted. (Pedro Arrunategui, Lima, Peru/*The Four Winds*).

0013 UTC on 5767
PERU: Radio Estelar. Spanish. Station identification to regional ads and music. (Arrunategui, Peru/*The Four Winds*)

0020 UTC on 9690
THAILAND: Radio Thailand. Story on *Conference of South Asia*. Station noted on 7210 at 1910 with national headlines. (Jerry Witham, Keaau, HI)

0049 UTC on 4814.9
BRAZIL: Radio Difusora Londrina. Portuguese. Regional programming to station ID. Brazil's **Radio Bandeirantes** heard in Portuguese on 9645 at 2201. Local information, items on Sao Paulo, ads, jingles and ID at 2245.(Arrunategui, Peru/*The Four Winds*)

0110 UTC on 9737.2
PARAGUAY: Radio Nacional. Spanish. Newscast topics to ID. Local time check to Spanish vocals. (Tom Banks, Dallas, TX)

0200 UTC on 3290
GUYANA: Voice of Guyana. Phone-in talk show to eastern standard time check. Recitations to 0300 ID and local weather report and forecast. (Alden C. Wires, Jr., East Point, GA)

0254 UTC on 3270.06
NAMIBIA: NBC. Afrikaans. Lively African music, possible //3289.95, which is generally too weak to confirm. (Al Quaglieri, Albany, NY/*The Four Winds*)

0315 UTC on 4820
BOTSWANA: Radio Botswana. Religious sermon in unknown dialect. American gospel music amid severe QRM and signal fade by 0435. (Silvi, OH)

0335 UTC on 9550
UKRAINE: Radio Ukraine International. Music program of Ukrainian composers of classical and popular music. Station ID to program/frequency schedule. (Daniel Hill, Anchorage, AK via Keaau, HI)

0405 UTC on 6479.8
PERU: Radio Altura. Spanish. Andean music hosted by enthusiastic DJ. Station IDs to 0435*. CW interference. (Witham, HI)

0408 UTC on 6009.96
MEXICO: Radio Mil. Spanish. Romantic Spanish ballads to occasional ad segments and taped station IDs. (Quaglieri, NY/*The Four Winds*)

0435 UTC on 7130
YUGOSLAVIA: Radio Yugoslavia. Regional news on Bulgaria and Bosnia-Hercegovina to musical Radio Yugoslavia ID break. (Witham, HI)

0440 UTC 15200
UZBEKISTAN: (Tent) Uzbek Radio. Presumed Uzbek. Regional pop music with comments from female announcer. Interval signal to presumed ID format at 0500, followed by news. Typical mid-eastern style music at 0510. Weak on parallel 15165. (Witham, HI)

0558 UTC on 4918.9
ECUADOR: Radio Quito. Spanish. Modern Spanish music to ID and station promo. DJ chatter to US pops, noted signal best in LSB. (Mark Veldhuis, Netherlands via email)

0605 UTC on 5100
LIBERIA: Radio Liberia International. Morning prayer and lively regional music. ID at 0610 as, "Radio Liberia, the Voice of Peace" into rhythmic religious melody. Fax interference. (Hill, HI) Station noted 5100 at 1905 in French and English. (Serra, Italy/*The Four Winds*)

0614 UTC on 4914.4
PERU: Radio Cora del Peru. Spanish. Regional music, announcements and IDs. Signal weaker by 0710. SINPO=24444. (Veldhuis, Netherlands)

0632 UTC on 5076.7
COLOMBIA: Caracol. Station IDs to commercials. Spanish pop vocals, news, and jingles. (Christian Kammler, Moers, Germany via email)

0706 UTC on 5810
USA: KAIJ. Taped programming segment of Dr. Gene Scott's Sunday sermon from Los Angeles. (Edward H. Schwartz, Chicago, IL)

0715 UTC on 5860
VATICAN STATE: Vatican Radio. Lecture in English on Satan's influence on Adam. (Schwartz, IL) (Robert Hillton, Charleston, SC)

0745 UTC on 7510
USA: KTBN. Religious programming during fund-raising session from Anaheim Convention Center. (Schwartz, IL)

0756 UTC on 9575
MOROCCO: Radio Medi 1. Arabic/French. Pop music to announcements and ID. Commercial with Arabic jingle and song. News summary alternating with music breaks. French ID at 0825, pop song, French ads, news including commentary about Israel/Palestine situation. (Serra, Italy, *The Four Winds*)

0935 UTC on 9580
AUSTRALIA: Radio Australia. *Country Wide* feature on communal life. (Bob Fraser, Cohasset, MA)

1006 UTC on 21669.97
SAUDI ARABIA: BSKSA. Arabic/Indonesian. Vocals to Arabic talk at 1019. Military march music to world news. Station ID to Islamic religious text. (Serra, Italy, *The Four Winds*)

1030 UTC on 6195
ANTIGUA: BBCWS relay. *Composer of the Month* series featuring Anton Bruckner. Noted on 9515 at 1445. (Fraser, MA)

1325 UTC on 15340
NORWAY: Radio Norway International. *Nordic Report* on security in the Nordic nations. (Fraser, MA)

1412 UTC on 11402
ICELAND: Rikisutvarpid. Presumed news in Icelandic //13860 to 1438. Monitored 1945-2006 on 11402, //13860 barely audible. (Silva, OH)

1531 UTC on 3223
INDIA: Air India Radio. English news to ID. Several AIR outlets heard on 3345, 3365, 4760, 4800, 4920, 4950. AIR-Aizawl noted on 5050, 1540-1546 with English news and AIR ID. (Veldhuis, Netherlands)

1620 UTC on 5060
CHINA: Xinjiang People's BC Station. Presumed Mongolian. Nice selection of Mongolian folk music to 1630, brief announcement and ID. Sentimental dance music running beyond the hour to signal fade-out. (Hill, HI)

1620 UTC on 5985
TANZANIA: Radio Tanzania. Presumed Swahili. Music and announcements to clear ID at 1630, continuing format to 1700. Voice of Tanzania heard in Swahili on 11734 at 1715. Mentions of Tanzania and Zanzibar during news with speech excerpts. Lengthy report to ID and native drums signal at 1800. (Witham, HI)

1645 UTC on 15240
SOUTH AFRICA: Channel Africa. Wednesday's *Health Forum* program with update on disease control in Gabon and Sudan. Afro pops to 1655. (Larry Michalski, West Seneca, NY) Noted 9530, 1610-1625 with news and afro pops. (Banks, TX)

1646 UTC on 4769.9
NIGERIA: Radio Nigeria. Reggae music to English announcement and ID. Time signal tone to time check and newscast. SINPO=34444. (Veldhuis, Netherlands)

1705 UTC on 11690
JORDAN: Radio Jordan. News update on the Middle-East to weather forecast. Easy-listening instrumentals by Zamfir to 1730. (Michalska, NY)

1726 UTC on 15475
GABON: Afrique Numero Un. French DJ format for chat and pop music. (Silvia, OH)

1755 UTC on 9548
BANGLADESH: Radio Bangladesh. Story on history of the Islamic religion, into regional music. (Witham, HI) Bengali service noted on 9548//7185. (Serra, Italy/*The Four Winds*)

1900 UTC on 11655
NETHERLANDS: Radio Netherlands. *Sounds Interesting* show including a tour of the Dutch Tax Museum in Rotterdam. (Fraser, MA)

1935 UTC on 11720
BULGARIA: Radio Bulgaria. *Midweek Mailbag* heard on //9700, both frequencies very good. (Fraser, MA)

2020 UTC on 11605
ISRAEL: Kol Israel. Report that digital cellular phones may upset heart pacemakers. (Fraser, MA)

2030 UTC on 7115
CYPRUS: BBCWS relay. English teaching program featuring skits on the lifeboat rescue and a seaside hotel's mysterious guest. (Fraser, MA)

2024 UTC on 7195
ROMANIA: Radio Romania International. French and English service noted with IDs and features over amateur radio traffic. (Lee Silvi, Mentor, OH via email)

2240 UTC on 7345
CZECH REP.: Radio Prague. Feature on first Czech racing car built in 1900. (Fraser, MA)

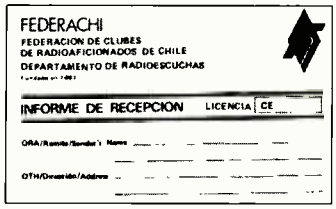
2330 UTC on 9900
EGYPT: Radio Cairo. Sign-on IDs, to readings from the Koran. (Fraser, MA)

2345 UTC on 4815
BURKINA FASO: Radio Burkina. French. Very good signal for regional program to 0011. (Silvi, OH)

Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times (or e-mail gayle@grove.net)*
English broadcast unless otherwise noted.

Gayle Van Horn, gayle@grove.net

Welcome To 1997!


FEDERACHI
FEDERACION DE CLUBES DE RADIOAFICIONADOS DE CHILE
DEPARTAMENTO DE RADIOESCUCHAS
INFORME DE RECEPCION LICENCIA CE

What a great way to begin the year! Amid the winter AM radio DX season, the International Radio Club of America (IRCA) has released the 4th edition of the *Mexican Log*. The *IRCA Mexican Log* lists all AM stations in Mexico, by frequency, including call letters, addresses, schedules, and more. Prices to IRCA members are $6.50 (US/Canada/Mexico/seamail), $7.50 (rest of the Americas airmail), $8.00 (Europe/Asia airmail), $8.50 (Australia/New Zealand airmail). Non members add $2.00 to the above prices. For additional information write; IRCA, Ralph Sanserino, P.O. Box 1831, Perris, CA 92572-1831.

Looking for QSL tips? Want to increase your return rate? Bill Plum's *Foreign Airmail Postage For Successful QSLing-The SASE Method*, is receiving rave reviews among DXers. Practical tips from successful hobbyists are yours at an affordable $5.00. In addition to this fine publication, Bill offers the best service for mint postage and mailing supplies in the hobby. Tell Bill *MT* sent you. The address is:Airmail Postage & DX Supplies, 12 Glenn Road, Flemington, NJ 08822-3322.

For our Latin enthusiasts in the United States, Chile's *Radio Esperanza* is verifying reception reports of their English/Spanish broadcast (6089.98 kHz at 0720-0835 UTC). Reports may be in either language; enclose $2.00 with your report. Estimated turn-around time is 2-1/2 weeks. Send your report to: Radio Esperanza Shortwave Report, Atten: Saul Vergara V., (Lic.# CE3-016) Calle Francisco Cerda #824 Recoleta, Santiago, Chile.

WWCR is on the web now. You can check out their site at: **http://www.wwcr.com.** Our thanks to Adam Lock of WWCR in Nashville, Tennessee, for the update.

You want one more? Okay, have you heard of Hard-Core DXing? Don't get ahead of me, folks ... This is a shortwave/mediumwave E-mail list, spreading the latest information about new stations, loggings, QSLing, and propagation from rare, weak, and previously unheard broadcasting stations. To subscribe by E-mail (or unsubscribe) send a message to: **listserv@kotanet.fi** and put in the subject line "subscribe hard-core-dx."

Welcome to 1997—the year to share your tips or QSL news with *QSL Report*!

AIRCRAFT TRAFFIC

U.S. Naval Reserve Patrol Squadron 91, PM 294/Orion P-3C, 11175 kHz USB. Full data prepared QSL confirmed with verifier's initials. Squadron sticker with a miniature "Black Cats" squadron emblem. It would appear this unit is descended from PBY "Catalina" night patrol "Black Cat" squadron of WW2. QSL address: USNR VP-91, Patrol Wing Pacific, Moffett Federal Airfield, CA 94035. (Rick Albright, Merced, CA/*World Utility News* via e-mail)

P2-CBA, 6622 kHz USB. Pilatus Britten-Norman BN-2A-21 *Islander* enroute to Aiome-Madang, PNG. Full data prepared QSL card verified, plus color photo of aircraft and regional aero chart enclosed. Received in 36 days for an English utility report. QSL address: Island Airways Pty Ltd., Chief Pilot, P.O. Box 747, Madang, Papua New Guinea. (Steve McDonald-VE7SL, Mayne Island, BC Canada/*World Utility News* via e-mail)

C-GMOC, 5680 kHz USB. Beechcraft Super King Air 200 at 119W/66N Great Bear Lake enroute Yellowknife. Full data prepared QSL card verified, plus color photo of aircraft. Received in 15 days for an English utility report. QSL address: Ptarmigan Airways Ltd., Box 100, Yellowknife, NWT X1A 2N1 Canada. (McDonald, CAN)

AUSTRALIA

VL8K-Katherine, 5025 kHz. Full data station QSL card, signed by Arie Schellars-ABC Transmission Manager. Received in 33 days for an English report. Station address: c/o The Project Manager, Remote Area Broadcasting, ABC GPO Box 9994, Sydney NSW Australia. (Eric M. Walton, Vancouver, BC Canada)

GERMANY

RTE/Radio Telefis Eireann, 15600 kHz. Full data RTE scenery card unsigned, for special broadcast via Deutsche Telecom/Julich. Received in 44 days for an English report and one dollar. Station address: Donnybrook, Dublin 4, Republic of Ireland. (Randy Stewart, Springfield, MO)

DAN-Norddeich Radio, 8483 kHz. Full data *Utlandshorn Receiving Station.* No data QSL card unsigned. Received in 12 days for an English utility report and two IRCs. Station address: Postfach 11 90, 2980 Norden 1, Germany. (Darren R. White, Hattiesburg, MS)

MEXICO

Radio Mexico International, 9705 kHz. Spanish freq/time QSL card unsigned. Station program/frequency schedule and personal letter from Juan Mort. Received in 34 days for an English report and one U.S. dollar. Station address: Apartado Postal 21-300, Mexico DF 04021, Mexico. (Robert Swanson, Gibsons, BC Canada/via e-mail)

NETHERLANDS ANTILLES

PJC-Curacaoradio, 8694 kHz. Full data "Crest" QSL card with station stamp, signed by R. Sprock. Received in 23 days for an English utility report and one U.S. dollar. Station address: Postbus 103, Willemstad, Curacao, Netherlands Antilles. (White, MS)

SAO TOME

VOA relay station, 4750 kHz. Full data over-sized card of Niagara Falls, unsigned. Received in 18 days for an English report. Station address: Atten: QSL Desk, Audience Mail Division, Room G-759C, 330 Independence Ave., S.W., Washington, DC 20547. (Stewart, MO)

SHIP TRAFFIC

Sealand Consumer WCHF, 156.8 MHz USB (Container Vessel). Full data prepared QSL card verified. Received for an English utility report and one U.S. dollar. QSL address: Sea-land Service, Inc., P.O. Box 71306, San Juan, Puerto Rico 00936-1306. (Hank Holbrook, Dunkirk, MD)

Woodwind WBS7369, 156.8 MHz USB (74' Schooner charter boat). Full data prepared QSL card verified plus vessel's brochure. Received for an English utility report and mint stamps. QSL address: Running Free Inc., P.O. Box 3254, Annapolis, MD 21403. (Holbrook, MD)

Atlantic Erie C6HH4, 156.8 MHz USB (Cargo Vessel). Full data prepared QSL card verified. Received for an English utility report and mint stamps. QSL address: Barber Ship Mgt., 307 Tchoupitoulas St., New Orleans, LA 70130. (Holbrook, MD)

SINGAPORE

Radio Singapore International, 6015 kHz. No data form letter signed by Sakuntala Gupta-Head of Programming and unsigned QSL card. Received in 56 days for an English report. Station address: P.O. Box 5300, Farrer Road, 5300 Singapore 912899. (Walton, CAN)

SOUTH KOREA

KBS/Radio Korea International, 11715 kHz. Full data *Year of Literature* card. Station stickers, *RKI Newsletter*, and a three cassette Korean language course. Received in 131 days for an English follow-up report and one U.S. dollar. Station address: 18 Yoido-dong, Youngdungpo-gu, Seoul 150-790 South Korea. ((Brandon M. Artman, West Chester, PA)

YUGOSLAVIA

Radio Yugoslavia, 11870 kHz. Full data "XVII Cent" QSL card unsigned. Frequency schedule and station sticker enclosed. Received in 75 days for an English report and three IRCs. This was my first response after sending five reports over seven years. Station address: P.O. Box 200, Hilandarska 2, 11000 Beograd, Yugoslavia. (White, MS)

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5,6,7, or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively.

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 (7:30 pm Eastern, 4:30 pm Pacific).

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

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

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am:	The Americas	as:	Asia
na:	North America	au:	Australia
ca:	Central America	pa:	Pacific
sa:	South America	va:	various
eu:	Europe	do:	domestic broadcast
af:	Africa	om:	omnidirectional
me:	Middle East		

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News

Programming Tips by Jim Frimmel

Nigeria

By the time you read this Radio Nigeria may be back at its regular schedule on shortwave after a long absence due to out-of-commission equipment. Listen on 11770/9690/7255/15120 for them and for testing on 15120 afternoons in the U.S.

Hong Kong

Be prepared for an onslaught of feature programs and news reports dealing with the return of this British Colony to Chinese rule this summer. Radio Netherlands provides one such program in its documentary series during the last week of January (see selected programs).

Wavescan

Jeff White of WRMI in Miami advises that AWR's *Wavescan* program is expected to be expanded to a 30-minute format, possibly as early as this month, and is expected to be hosted by Dr. Adrian Petersen of Adventist World Radio in Indianapolis.

Communications World

Kim Elliott, host of this popular SWL program on VOA, succeeded in getting a temporary return of the program on Dec 1st and 8th at 0030 UTC Sun on 9455 kHz. The transmission was from Delano, CA, and beamed to Canada. If VOA can obtain soft sponsorship similar to the kind on PBS and NPR, broadcasting may continue in this new time slot and you could still be hearing it as you read this. Reception in the U.S. should be excellent.

Nonstop Hip Hop

VOA is broadcasting almost a full hour of rap music beginning at 1110 Wednesdays to Asia. Does the U.S. really need to broadcast 50 minutes of rap music? How about a repeat broadcast of *Communications World* at 1130? It's heard well in North America on 5985 and 9760 kHz and would be doing a favor to listeners in Asia as well.

Virtual Reality Radio

Take a spin in a 1957 Chevy convertible while listening to 10 internet radio stations in five countries (France, Italy, USA/Hawaii, Canada, Australia). Click on the dashboard radio buttons to change stations. Drop in on SteelStudio's web page (**www.steelstudio.com/vrml/overdrv.html**) for a test drive.

Win a Trip to China

China Radio International's "Relics Cup Knowledge Contest on Tour and Investment in Shaanxi Province" rewards the top six winners with a free trip to Beijing and Shaanxi. Contest entries are due before the end of February. Contestants are required to answer six questions that were broadcast in September and November. Runners-up receive a variety of Chinese handicrafts and silk scarfs.

Your Name in Lights!

... or at least in ink within the *Monitoring Times* Shortwave Guide. Please send us your "best catches" on the worldwide shortwave bands — QSLs, that is — and we will try to use them in future issues of *MT*. Your QSLs will be returned.

Frequencies

0000-0030	Australia, Radio	13605pa	15510as	17750as	
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	7375na	9485na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, R Canada Intl	5960am	9755am		
0000-0030	Canada, R Canada Intl	6040am	9535am	11940am	
0000-0100	China, China Radio Intl	9710na	11695na		
0000-0100 vl	Costa Rica, Adv World R	7375am	9725am	13750am	15460am
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0100	Ecuador, HCJB	9745am	21455am		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0015 vl	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0045	India, All India Radio	7155as	9705as	9950as	11620as
		11660as			
0000-0100	Lebanon, Voice of Hope	9990va			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100 vl	Papua New Guinea, NBC	9675do			
0000-0100	Russia,Voice of Russia WS	5940na	7105eu	7125na	7180na
0000-0100	Spain, R Exterior Espana	6055na			
0000-0030	Thailand, Radio	9680af			
0000-0100	Ukraine, R Ukraine Intl	5905eu	5940eu	6010eu	6020eu
		7180na	7205eu	7290eu	

0000-0100	United Kingdom, BBC WS	5965as	5970sa	5975va	6175na
		6195as	7265as	7325va	9410as
		9590va	9915sa	11750sa	11955as
0000-0030	United Kingdom, BBC WS	7110as	9580as	11945as	15280as
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0100	USA, KTBN Salt Lk City UT	7510am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430sa	13840as	
0000-0100	USA, Voice of America	7215as	9890as	11760as	15290am
		17735am	17820as		
0000-0100 twhfa	USA, Voice of America	5995am	6130am	7405am	9455am
		9775am	13740am		
0000-0100	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0000-0100	USA, WGTG McCaysville GA	5085am			
0000-0100	USA, WHRI Noblesville IN	5745am	7315am		
0000-0100	USA, WJCR Upton KY	7490na			
0000-0100 mtwhf	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100 mtwhf	USA, WVHA Greenbush ME	9900af			
0000-0100	USA, WWCR Nashville TN	3215am	5070am	5935am	
0000-0045	USA, WYFR Okeechobee FL	6085na	11855ca		
0005-0010	Croatia, Croatian Radio	5895eu	7165eu		
0030-0100	Australia, Radio	9660pa	11640as	12080pa	13605pa
		13755pa	15365pa	17715as	17750as
		17795pa	17860pa		
0030-0055	Austria, R Austria Intl	7325na			
0030-0100	Iran, VOIRI	6050na	9022na	9685na	
0030-0056	Lithuania, Radio Vilnius	6120na			
0030-0100	Netherlands, Radio	5905as	7305as		
0030-0100	Sri Lanka, Sri Lanka BC	9730as			
0030-0100	Sweden, Radio	6065am			
0030-0100	Thailand, Radio	9655as	11905as		
0035-0040	India, All India Radio	4860do	7110do	11830do	11870do
0050-0100	Italy, RAI Intl	6010na	9675na	11800na	

Selected Programs

Sundays

0000 UK, BBC London (am/as pac): Newsdesk. World news and dispatches from overseas and UK correspondents.
0000 UK, BBC London (south as): World News. Broadcast on the hour of 5, 10, or 15 minutes in length.
0005 UK, BBC London (south as): Spotlight. Focus on the theater.
0010 UK, BBC London (south as): Country Style. Wally Whyton plays a selection of the best in country music.
0025 UK, BBC London (south as): Words of Faith. People of all faiths share how their scripture gives authority and meaning to their lives.
0030 UK, BBC London (am): Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
0030 UK, BBC London (as pac/south as): Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
0045 UK, BBC London (am/as pac/south as): Britain Today. News about Britain.

Mondays

0000 UK, BBC London (am): Chimes of Big Ben (1). Hear the famous bells at this time on the first Monday of each month.
0000 UK, BBC London (am): Newsdesk. See S 0000.
0000 UK, BBC London (as pac): Chimes of Big Ben (1). See M 0000.
0000 UK, BBC London (as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0005 UK, BBC London (south as): From Our Own Correspondent. See S 0330.
0025 UK, BBC London (south as): Words of Faith. See S 0025.
0030 UK, BBC London (am): Development '97. See S 0615.
0030 UK, BBC London (as pac/south as): On the Move. See S 0445.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Tuesdays

0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0005 UK, BBC London (south as): New Ideas. See S 2330.
0025 UK, BBC London (south as): Words of Faith. See S 0025.
0030 UK, BBC London (am): Global Concerns. See S 1615.
0030 UK, BBC London (as pac/south as): Record News. See S 0445.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Wednesdays

0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0005 UK, BBC London (south as): Pop Short. See T 1525.
0010 UK, BBC London (south as): Variable Feature. See S 1130.
0025 UK, BBC London (south as): Words of Faith. See S 0025.
0030 UK, BBC London (am): Folk Routes. See S 0030.
0030 UK, BBC London (as pac/south as): Variable Feature. See S 1130.
0040 UK, BBC London (as pac/south as): Science View. A five-minute science program.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Thursdays

0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0005 UK, BBC London (south as): Take Five. See M 2310.
0010 UK, BBC London (south as): Variable Feature. See S 1130.
0025 UK, BBC London (south as): Words of Faith. See S 0025.
0030 UK, BBC London (am): From Our Own Correspondent. See S 0330.
0030 UK, BBC London (as pac/south as): Jazz Now and Then. See S 1230.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.
0054 Radio Netherlands: Documentary. Hong Kong Goes Home (30th). See F 2354.
0054 Radio Netherlands: Documentary. The Birthing Room (2nd). See W 1254.
0054 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (9th,16th,23rd). See A 2354.

Fridays

0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0005 UK, BBC London (south as): The Insider's Guide. A look behind the scenes to bring the inside story about Bush House.
0015 UK, BBC London (south as): Write On. See S 0350.
0030 UK, BBC London (am/as pac/south as): Good Books. See S 1145.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Saturdays

0000 UK, BBC London (am/as pac): Newsdesk. See S 0000.
0000 UK, BBC London (south as): World News. See S 0000.
0005 UK, BBC London (south as): Going Solo. See S 2310.
0010 UK, BBC London (south as): Seven Days. Roundup of the week's news, plus sports highlights, finance and the weather.
0025 UK, BBC London (south as): Words of Faith. See S 0025.
0030 UK, BBC London (am): Seven Days. See A 0010.
0030 UK, BBC London (as pac/south as): From the Weeklies. Review of the British weekly press.
0045 UK, BBC London (am/as pac/south as): Britain Today. See S 0045.

Hauser's Highlights
VOICE OF RUSSIA

English to North America to March 30

2300-2400	7180, 7125, 7105, 5940
0000-0100	7180, 7125, 7105
0100-0200	7125, 7105
0200-0300	13665, 12030, 9580, 7345, 7105, 5930, 5920
0300-0400	9580, 7345, 7175, 7105, 6150, 5940, 5930, 5920
0400-0500	9580, 7345, 7175, 6150, 5930, 5920
0500-0800	7330, 7175, 6150, 5930, 5920, 5905

(5920 is not used on Sundays and 5905 actually opens at 0530)
Note that VOR no longer attempts to serve us in the mornings, although it is on the air to other areas. (**http:///www.vor.ru/Eng_N_A.htm**)

Frequencies

0100-0200	Australia, Radio	9660pa	11640as	13755pa	15240pa
		15365pa	15415as	15510as	17715as
		17750pa	17795pa	17880pa	
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200 vl	Canada, CBC N Quebec Svc	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100 0200	Canada, CFVP Calgary	6030do			
0100 0200	Canada, CHNX Halifax	6130do			
0100 0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na	
0100-0127	Czech Rep, Radio Prague	6200na	7345na		
0100-0200	Ecuador, HCJB	9745am	21455am		
0100-0150	Germany, Deutsche Welle	5960na	6040na	6085na	6145na
		9640na			
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do		
0100-0200	Indonesia, Voice of	9525na			
0100-0128	Iran, VOIRI	6050na	9022na		
0100-0110	Italy, RAI Intl	6005na	9675na	11800na	
0100-0200	Japan, R Japan NHK World	11790as	11840as	11860as	13630na
		13650as	15475as	15590as	17685as
		17810as			
0100-0200	Lebanon, Voice of Hope	9990va			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0125	Netherlands, Radio	6020na	6165na		
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia,Voice of Russia WS	7105na	7125na	7240na	9550na
0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200	Spain, R Exterior Espana	6055na			
0100-0200	Sri Lanka, Sri Lanka BC	9730as			
0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	
0100-0200	Ukraine, R Ukraine Intl	7150na	7160na	7180na	7205na
		7290na			
0100-0200	United Kingdom, BBC WS	5970sa	5975va	6175va	6195as
		7265as	7325va	9410as	9560va
		9590va	9915va	11750sa	11955as
		15280as	15360as		
0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, Voice of America	7115as	7205as	9740as	11705as
		15250as	15370as	17740as	21550as
0100-0200 twhfa	USA, Voice of America	5995am	6130am	7405am	9775am
		13740am			
0100-0200	USA, WEWN Birmingham AL	5825eu	6890na	7425na	7520sa
0100-0200	USA, WGTG McCaysville GA	5085am			
0100-0200	USA, WHRI Noblesville IN	5745am	7315am		
0100-0200	USA, WJCR Upton KY	7490na			
0100-0200 mtwhf	USA, WRMI/R Miami Intl	9955am			
0100-0130 s	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Uzbekistan, R Tashkent	5040eu	5955eu		
0100-0126	Vietnam, Voice of	5940na			
0100-0130 mtwhfa	Yugoslavia, Radio	6195na	7115na		
0115-0130 f	Greece, Voice of	6125na	7448na	9420na	
0130-0155	Belgium, R Vlaanderen Int	5900na	9925sa		
0130-0150	Greece, Voice of	6125na	7448na	9420na	
0130-0200 s/vl	Malta, VO Mediterranean	15550as	17570au		
0130-0200	Netherlands, Radio	9860as	11655as		
0130-0200	Sweden, Radio	7265am	7290am		
0130-0156	Vietnam, Voice of	5940na			
0140-0200	Vatican State, Vatican R	5980as	7335as		
0145-0200	Albania, R Tirana Intl	7160na			
0150-0200	Germany, Deutsche Welle	5960na	6085na		

Selected Programs

Sundays

0100 Japan, NHK/Radio: News. World news from NHK International.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0110 Japan, NHK/Radio: Asia Weekly. A magazine of news from other Asian broadcasters, entertainment update and music.
0111 Japan, NHK/Radio: Asian News Summary. This ten-minute wrap-up of regional events is heard as a segment of the program Asia Weekly.
0121 Japan, NHK/Radio: Business Report. A summary of regional financial news heard as part of the program Asia Weekly.
0125 Japan, NHK/Radio: Entertaining in Asia. A segment of "Asian Report" which focuses on an aspect of entertainment in the region.
0130 UK, BBC London (am): Variable Comedy/Quiz Feature. These programs are panel quizes and other light entertainment in a format heard in America decades ago.
0130 UK, BBC London (as pac/south as): Asian News. News bulletins with the latest reports from across the continent and the region.
0135 UK, BBC London (as pac/south as): Sports Roundup. The latest sports news.
0145 UK, BBC London (as pac/south as): Letter from America. See S 0030.
0146 Japan, NHK/Radio: Asia Kaleidoscope. Life in Japan and the region.
0155 Japan, NHK/Radio: Tokyo Pop-In. A sample of the Japanese music scene.

Mondays

0100 Japan, NHK/Radio: News. See S 0100.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0110 Japan, NHK/Radio: Let's Learn Japanese. See S 0510.
0125 Japan, NHK/Radio: Media Roundup. See S 0525.
0130 UK, BBC London (am): Seeing Stars (1). See S 0430.
0130 UK, BBC London (am): Short Story. See S 0430.
0130 UK, BBC London (as pac/south as): Asian News. See S 0130.
0135 UK, BBC London (as pac/south as): Sports Roundup. See S 0135.
0145 UK, BBC London (am): On the Move. See S 0445.
0145 UK, BBC London (as pac/south as): The Farming World. Reports on new developments from around the world.
0150 Japan, NHK/Radio: Viewpoint. See S 0525.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

0100 Japan, NHK/Radio: News. See S 0100.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0111 Japan, NHK/Radio: Asian Top News. The most important stories from other Asian media organizations are summarized in a new 10-minute format.
0121 Japan, NHK/Radio: Profile. An in-depth interview with a Japanese personality.
0130 UK, BBC London (am): Outlook. See M 1405.
0130 UK, BBC London (as pac): Development '97. See S 0615.
0130 UK, BBC London (as pac/south as): Asian News. See S 0130.
0135 UK, BBC London (as pac/south as): Sports Roundup. See S 0135.
0145 UK, BBC London (south as): Development '97. See S 0615.
0151 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0155 Japan, NHK/Radio: News. See S 0100.
0155 UK, BBC London (am): Words of Faith. See S 0025.

Wednesdays

0100 Japan, NHK/Radio: News. See S 0100.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0111 Japan, NHK/Radio: Asian Top News. See T 0111.
0121 Japan, NHK/Radio: Enjoy Japanese. Learn and practice the Japanese language.
0130 UK, BBC London (am): Outlook. See M 1405.
0130 UK, BBC London (as pac/south as): Asian News. See S 0130.
0135 UK, BBC London (as pac/south as): Sports Roundup. See S 0135.
0145 UK, BBC London (as pac/south as): Health Matters. See M 0545.
0151 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0155 Japan, NHK/Radio: News Summary. See S 1155.
0155 UK, BBC London (am): Words of Faith. See S 0025.

Thursdays

0100 Japan, NHK/Radio: News. See S 0100.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0111 Japan, NHK/Radio: Asian Top News. See T 0111.
0121 Japan, NHK/Radio: Town and Around. Take a half-hour guided tour of the cities and towns of Japan.
0130 UK, BBC London (am): Outlook. See M 1405.
0130 UK, BBC London (as pac/south as): Asian News. See S 0130.
0135 UK, BBC London (as pac/south as): Sports Roundup. See S 0135.
0145 UK, BBC London (as pac/south as): From Our Own Correspondent. See S 0330.
0151 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0155 Japan, NHK/Radio: News Summary. See S 1155.
0155 UK, BBC London (am): Words of Faith. See S 0025.

Fridays

0100 Japan, NHK/Radio: News. See S 0100.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0111 Japan, NHK/Radio: Asian Top News. See T 0111.
0121 Japan, NHK/Radio: Enjoy Japanese. See W 0121.
0130 UK, BBC London (am): Outlook. See M 1405.
0130 UK, BBC London (as pac/south as): Asian News. See S 0130.
0135 UK, BBC London (as pac/south as): Sports Roundup. See S 0135.
0145 UK, BBC London (as pac/south as): The Learning World. See S 1130.
0151 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0155 Japan, NHK/Radio: News Summary. See S 1155.
0155 UK, BBC London (am): Words of Faith. See S 0025.

Saturdays

0100 Japan, NHK/Radio: News. See S 0100.
0100 UK, BBC London (am/as pac/south as): Newsdesk. See S 0000.
0115 Japan, NHK/Radio: Asian Top News. See T 0111.
0125 Japan, NHK/Radio: Music and Book Beat. What people in Japan are listening to and reading.
0130 UK, BBC London (am): Outlook. See M 1405.
0130 UK, BBC London (as pac/south as): Asian News. See S 0130.
0135 UK, BBC London (as pac/south as): Sports Roundup. See S 0135.
0145 UK, BBC London (as pac/south as): Global Concerns. See S 1615.
0154 Radio Netherlands: Documentary. Hong Kong Goes Home (Feb 1st). See F 2354.
0154 Radio Netherlands: Documentary. The Birthing Room (4th). See W 1254.
0154 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (11th,18th,25th). James McDonald looks at the demands being placed on world water resources.
0155 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0155 UK, BBC London (am): Words of Faith. See S 0025.

Frequencies

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	9660pa	11640as	11695as	12080pa
		13605pa	13755pa	15240pa	15365pa
		15415as	17715as	17750pa	17795pa
		17880pa			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Canada, CBC N Quebec Svc	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, R Canada Intl	6155am	9535am	9755am	11725am
0200-0300	Costa Rica,RF Peace Intl	6205am	7385am		
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB	9745am	21455am		
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	7265as	7285as	7355as
		9515as	9615as		
0200-0230	Hungary, Radio Budapest	5905na	9840na		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0200-0300	Lebanon, Voice of Hope	9990va			
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0230 s/vl	Malta, VO Mediterranean	15550as	17570au		
0200-0300	Netherlands, Radio	9860as	11655as		
0200-0225	Netherlands, Radio	5905as	7305as		
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0230 m	Norway, Radio Norway Intl	7465na	7520na		
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0300	Philippines, FEBC/R Intl	15450as			
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0200-0300	Russia,Voice of Russia WS	5930na	7105na	7345na	9550na
		9580na	12030na	13665na	
0200-0300 mtwhfa	Russia,Voice of Russia WS	5920na			
0200-0300	Slovakia, Adv World Radio	11610as			
0200-0300	South Korea, R Korea Intl	7275as	11725am	11810am	15575am
0200-0300	Sri Lanka, Sri Lanka BC	9730as			
0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
		11825as	15345as		
0200-0300	United Kingdom, BBC WS	5970sa	5975va	6175va	7235va
		9410na	9560na	9590na	9605as
		9915sa	15360as		
0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KVOH Los Angeles CA	9975am			
0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	USA, Monitor Radio Intl	5850na	7535am		
0200-0300	USA, Voice of America	7115as	7205as	9740as	11705as
		15250as	15370as	17740as	21550as
0200-0300	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0200-0300	USA, WGTG McCaysville GA	5085am			
0200-0300	USA, WHRI Noblesville IN	5745am	7315am		
0200-0300	USA, WJCR Upton KY	7490na			
0200-0300 mtwhf	USA, WRMI/R Miami Intl	9955am			
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300 mtwhf	USA, WVHA Greenbush ME	5850eu			
0200-0300	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0226	Vietnam, Voice of	5940na			
0200-0230	Yugoslavia, Radio	6195na	7130na		
0215-0225	Nepal, Radio	7165do			
0230-0300	Albania, R Tirana Intl	6140na	7160na		
0230-0259	Austria, R Austria Intl	7325na	9495sa	9870ca	
0230-0245	Pakistan, Radio	7350as	11760as	15120as	15485as
		17705as			
0230-0300 vl	Philippines, R Pilipinas	11855me	15120me	15270me	
0230-0300	Sweden, Radio	6200na			
0230-0256	Vietnam, Voice of	5940na			
0245-0300	India, All India Radio	3945do	6045do	7110do	11830do
		15135do			
0245-0300	USA, WYFR Okeechobee FL	9355eu			
0250-0300	Vatican State, Vatican R	6095na	7305na		
0250-0300	Zambia, ZNBC Radio 2	6165do			

Selected Programs

Sundays

0200 Taiwan, V of Free China: Frequency Announcements/Anthem. Opening three minutes of each transmission.
0200 UK, BBC London (af/am/as pac/south as): Newsday. Coverage of the breaking stories and a background briefing on the main news issues of the day.
0203 Taiwan, V of Free China: News. Twelve minutes of world news.
0215 Taiwan, V of Free China: The Adventures of Taiwan. A young couple's escapades in Taiwan.
0230 UK, BBC London (af/am): People and Politics. Background to the British political scene.
0230 UK, BBC London (as pac/south as): In Praise of God. Weekly programme of worship and meditation.
0235 Taiwan, V of Free China: Mailbag Time. Letters from listeners and music requests.
0247 Taiwan, V of Free China: Let's Learn Chinese. Chinese lessons with commentary and translation in English.

Mondays

0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0200 UK, BBC London (af/am/as pac/south as): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. Chinese folk and temple music.
0230 UK, BBC London (af/am): Anything Goes. See S 0530.
0230 UK, BBC London (as pac/south as): Variable Feature. See S 1130.
0249 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Tuesdays

0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0200 UK, BBC London (af/am/as pac/south as): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Kaleidoscope. Spotlight on life in Taiwan.
0230 UK, BBC London (af/am): Omnibus. See M 1130.
0230 UK, BBC London (as pac/south as): Discovery. In-depth look at scientific research.
0236 Taiwan, V of Free China: Main Roads and Byways. Hop a tour bus to a Taiwan attraction.

Wednesdays

0200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
0200 UK, BBC London (af/am/as pac/south as): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Music Box. Some of the popular music of Taiwan.
0230 UK, BBC London (af/am): Composer of the Month. See M 0430.
0230 UK, BBC London (as pac/south as): Meridian. See S 0630.
0251 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Thursdays

0200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
0200 UK, BBC London (af/am/as pac/south as): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Perspectives. Issues facing the lives and conversations of Taiwanese people.
0230 UK, BBC London (af/am/as pac/south as): Assignment. A weekly examination of a topical issue.
0232 Taiwan, V of Free China: Journey into Chinese Culture. Conversation about a particular cultural activity in Taiwan.
0252 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.
0254 Radio Netherlands: Documentary. Hong Kong Goes Home (30th). See F 2354.
0254 Radio Netherlands: Documentary. The Birthing Room (2nd). See W 1254.
0254 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (9th,16th,23rd). See A 2354.

Fridays

0200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
0200 UK, BBC London (af/am/as pac/south as): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Confrontation. Two points of view on a controversial topic.
0230 UK, BBC London (af/am/as pac/south as): 30-Minute Drama. Variable drama programs.
0232 Taiwan, V of Free China: New Record Time. The latest releases of the popular music of Taiwan.
0247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Saturdays

0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0200 UK, BBC London (af/am/as pac/south as): Newsday. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Reflections. The best of Chinese literature.
0230 UK, BBC London (af/am): Science in Action. See S 0530.
0230 UK, BBC London (as pac/south as): People and Politics. See S 0230.
0249 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

FREQUENCIES

0300-0400	Australia, Radio	9660pa	11640as	12080pa	13605pa
		13755pa	15240pa	15365pa	15415as
		15510as	17715as	17750pa	17795pa
		17880pa			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFCX Montreal	6005dc			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030dc			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	Canada, R Canada Intl	6155am	9755am		
0300-0400	China, China Radio Intl	9690na	9710na	11695na	
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Costa Rica,RF Peace Intl	6205am	7385am		
0300-0305	Croatia, Croatian Radio	5895eu	7165eu		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB	9745am	21455am		
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6085na	9535na	9650na
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, R Japan NHK World	5960na	11790na	11840as	15230na
		17810as			
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0300-0400	Lebanon, Voice of Hope	9990va			
0300-0400 s/vl	Malta, VO Mediterranean	15550as	17570au		
0300-0325	Netherlands, Radio	9860as	11655as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia,Voice of Russia WS	5930na	5940na	6150na	7105na
		7175na	7345na	9580na	
0300-0400 mtwhfa	Russia,Voice of Russia WS	5920na			
0300-0355	S Africa, Channel Africa	3220af	5955af		
0300-0400	Sri Lanka, Sri Lanka BC	9730as			
0300-0400	Taiwan, VO Free China	5950na	9680na	11745as	11825as
		15345as			
0300-0330	Thailand, Radio	9655na	11890na	11905na	
0300-0315 mtwhf	Uganda, Radio	3340do			
0300-0400	Ukraine, R Ukraine Intl	5915na	7150na	7180na	
0300-0330	United Kingdom, BBC WS	5970sa	6135af	7235va	7325sa
		15360as			
0300-0400	United Kingdom, BBC WS	3255af	3955eu	5975va	6005af
		6175va	6190af	6195eu	9410na
		9600af	9605as	9895va	12095af
		15310as			
0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	USA, Voice of America	6035af	6080af	7105af	7290af
		7340af	7415af	9575af	9885af
0300-0330 smtwh	USA, Voice of America	4750af			
0300-0400	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0300-0400	USA, WGTG McCaysville GA	5085am			
0300-0400	USA, WHRI Noblesville IN	5760am	7315am		
0300-0400	USA, WJCR Upton KY	7490na			
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0345	USA, WYFR Okeechobee FL	9355eu			
0300-0310	Vatican State, Vatican R	6095na	7305na		
0300-0400 mtwhfa	Zambia, ZNBC Radio 2	6165do			
0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0310-0340	Vatican State, Vatican R	7360af			
0315-0330 s	Greece, Voice of	6125na	7448na	9420na	
0330-0357	Czech Rep, Radio Prague	7350as			
0330-0400	Hungary, Radio Budapest	6195na	9840na		
0330-0400 vl	Philippines, R Pilipinas	13770as	15330na	17730as	
0330-0400	Slovakia, Adv World Radio	9465af			
0330-0400	Sweden, Radio	7115na			
0330-0353	UAE, Radio Dubai	13675na	15395eu	21605na	
0330-0400	United Kingdom, BBC WS	9610af	11730af	11955as	15280as
0335-0355 vl	India, All India Radio	7110do	11830do	15135do	
0340-0350	Greece, Voice of	6125na	7448na	9420na	
0345-0400 irreg	Burundi, Radio Nationale	6140do			
0345-0400 as	Uganda, Radio	3340do			
0356-0400	Zambia, Christian Voice	3330af			

SELECTED PROGRAMS

Sundays

0300 UK, BBC London (all streams): World News. See S 0000.
0305 UK, BBC London (all streams): Sports Roundup. See S 0135.
0305 UK, BBC London (am): World Business Review. A look back at the previous week's business and a preview of upcoming events.
0330 UK, BBC London (af): African News. News bulletins with the latest reports from across the continent.
0330 UK, BBC London (am): Music Review. News and views from the world of music.
0330 UK, BBC London (as pac/south as): From Our Own Correspondent. BBC correspondents comment on the background to the news.
0330 UK, BBC London (eu): Music Review. See S 0330.
0335 UK, BBC London (af): Postmark Africa. Expert answers to any question under the sun.
0350 UK, BBC London (as pac/south as): Write On. Air your views about World Service; write to PO Box 76, Bush House, Strand, London WC2B 4PH.

Mondays

0300 UK, BBC London (all streams): World News. See S 0000.
0305 UK, BBC London (am): World Business Brief. See S 1205.
0315 UK, BBC London (all streams): Sports Roundup. See S 0135.
0330 UK, BBC London (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.
0330 UK, BBC London (am/eu): Variable Feature. See S 1130.
0330 UK, BBC London (as pac): Off the Shelf. Daily readings from the best of world literature.
0330 UK, BBC London (south as): Off the Shelf. See M 0330.
0345 UK, BBC London (as pac/south as): Variable Feature. See S 1130.

Tuesdays

0300 UK, BBC London (all streams): World News. See S 0000.
0305 UK, BBC London (am): World Business Report. See M 1205.
0315 UK, BBC London (all streams): Sports Roundup. See S 0135.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am/eu): Meridian. See S 0630.
0330 UK, BBC London (as pac/south as): Off the Shelf. See M 0330.
0345 UK, BBC London (as pac/south as): Country Style. See S 0010.

Wednesdays

0300 UK, BBC London (all streams): World News. See S 0000.
0305 UK, BBC London (am): World Business Report. See M 1205.
0315 UK, BBC London (all streams): Sports Roundup. See S 0135.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am/eu): Meridian On Screen. See T 1401.
0330 UK, BBC London (as pac/south as): Off the Shelf. See M 0330.
0345 UK, BBC London (as pac/south as): Variable Feature. See S 1130.

Thursdays

0300 UK, BBC London (all streams): World News. See S 0000.
0305 UK, BBC London (am): World Business Report. See M 1205.
0315 UK, BBC London (all streams): Sports Roundup. See S 0135.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am/eu): Meridian. See S 0630.
0330 UK, BBC London (as pac/south as): Off the Shelf. See M 0330.
0345 UK, BBC London (as pac/south as): Folk Routes. See S 0030.

Fridays

0300 UK, BBC London (all streams): World News. See S 0000.
0305 UK, BBC London (am): World Business Report. See M 1205.
0315 UK, BBC London (all streams): Sports Roundup. See S 0135.
0330 UK, BBC London (af): Network Africa. See M 0330.
0330 UK, BBC London (am): Focus on Faith. Alison Hilliard talks to church leaders about their hopes for the future.
0330 UK, BBC London (as pac/south as): Off the Shelf. See M 0330.
0330 UK, BBC London (eu): Focus on Faith. See F 0330.
0345 UK, BBC London (as pac/south as): On the Move. See S 0445.

Saturdays

0300 UK, BBC London (af/am/as pac/south as): World News. See S 0000.
0305 UK, BBC London (am): World Business Report. See M 1205.
0315 UK, BBC London (all streams): Sports Roundup. See S 0135.
0330 UK, BBC London (af): African News. See S 0330.
0330 UK, BBC London (am/eu): Meridian. See S 0630.
0330 UK, BBC London (as pac/south as): The Vintage Chart Show. See W 1215.
0330 UK, BBC London (eu): World News. See S 0000.
0331 UK, BBC London (af): African Quiz (1). A monthly test of the listener's knowledge of Africa.
0331 UK, BBC London (af): This Week and Africa. A roundup of the week's political developments across the continent.

Frequencies

0400-0500	Australia, Radio	9660pa	11880pa	12080pa	13605as
		15240pa	15365pa	15415as	15510as
		17750as	17795pa	17880pa	
0400-0500 as	Australia, Radio	11640as			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500 vl	Canada, CBC N Quebec Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, R Canada Intl	6150me	9505me	9645me	
0400-0500	China, China Radio Intl	9560na	9730na		
0400-0500	Costa Rica,RF Peace Intl	6205am	7385am		
0400-0500	Cuba, Radio Havana	6000na	6180na	9820na	9830na
0400-0500	Ecuador, HCJB	9745am	21455am		
0400-0450	Germany, Deutsche Welle	6015af	6065af	7225af	7265af
		9565af			
0400-0500 twhfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0400-0500	Lebanon, Voice of Hope	9990va			
0400-0430 s/vl	Malta, VO Mediterranean	15550as	17570au		
0400-0430	Mexico, Radio Mexico Intl	9705na			
0400-0458	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 m	Norway, Radio Norway Intl	7520na			
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0500	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia,Voice of Russia WS	5930na	6150na	7175na	7345na
		9580na			
0400-0500 mtwhfa	Russia,Voice of Russia WS	5920na			
0400-0455	S Africa, Channel Africa	5955af	9585af		
0400-0430	Slovakia, Adv World Radio	11600af			
0400-0430	Sri Lanka, Sri Lanka BC	9730as			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0500	Turkey, Voice of	7300na	9685eu	17705eu	
0400-0415	Uganda, Radio	5026do			
0400-0500	Ukraine, R Ukraine Intl	5915na	7150na	9550na	
0400-0500	United Kingdom, BBC WS	3255af	3955eu	5975af	6005af
		6175va	6180eu	6195eu	7160af
		9410af	9590am	9600af	11760va
		11955as	12095af	15280as	
0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, Voice of America	6035af	6080af	7145af	7340af
		7415af	9575af	9775af	
0400-0500	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0400-0500	USA, WGTG McCaysville GA	5085am			
0400-0500	USA, WHRI Noblesville IN	5760am	7315am		
0400-0500	USA, WJCR Upton KY	7490na			
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0400-0500	USA, WYFR Okeechobee FL	9985af			
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0430	Vietnam, Voice of	12020na	15010na		
0400-0500	Zambia, Christian Voice	3330af			
0400-0410	Zambia, ZNBC Radio 2	6165do			
0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0415-0440 vl	Italy, RAI Intl	5975eu	7275eu		
0415-0500 m	USA, WRMI/R Miami Intl	9955am			
0425-0500	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0430-0500	Australia,DefenseForces R	13525as			
0430-0455 mtwhf	Moldova, R Moldova Intl	7520eu			
0430-0500	Netherlands, Radio	5995na	6165na		
0430-0500 twhfa	Portugal, R Portugal Intl	6150am	9570am		
0430-0500	Swaziland, Trans World R	3200af	4775af	6070af	6100af
0430-0500	Switzerland, Swiss R Intl	9905na			
0430-0500	United Kingdom, BBC WS	7150eu	15420af		
0430-0500	USA, Voice of America	7170va			
0459-0500	New Zealand, R NZ Intl	11905pa			

Selected Programs

Sundays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): African News. See S 0330.
0430 UK, BBC London (am): From Our Own Correspondent. See S 0330.
0430 UK, BBC London (as pac/eu/south as): Short Story. Fifteen-minute dramas written by listeners from around the world.
0430 UK, BBC London (as pac/south as): Seeing Stars (1). A discussion of astronomical observations and special events for the near future.
0435 UK, BBC London (af): The Art House. No information available.
0445 UK, BBC London (as pac/south as): Record News. Focus on the most interesting new releases of classical recordings.
0445 UK, BBC London (eu): On the Move. A weekly program about travel and transport with Malcolm Billings.
0450 UK, BBC London (am): Write On. See S 0350.

Mondays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (am): Development '97. See S 0615.
0430 UK, BBC London (as pac): Composer of the Month. In depth looks at classical composers and their music. A different composer is featured each month.
0430 UK, BBC London (eu): Europe Today. All the latest news, analysis and comment.
0430 UK, BBC London (eu): Off the Shelf (Alternative). See M 0330.
0430 UK, BBC London (south as): Composer of the Month. See M 0430.
0445 UK, BBC London (am): Country Style. See S 0010.
0445 UK, BBC London (eu): Country Style (Alternative). See S 0010.

Tuesdays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (am): The World Today. See M 1615.
0430 UK, BBC London (as pac): Multitrack Hit-List. See M 1615.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (eu): Off the Shelf (Alternative). See M 0330.
0430 UK, BBC London (south as): Multitrack Hit-List. See M 1615.
0445 UK, BBC London (eu): Health Matters (Alternative). See M 0545.
0455 UK, BBC London (am): Off the Shelf. See M 0330.

Wednesdays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (am): The World Today. See M 1615.
0430 UK, BBC London (as pac): Variable Feature. See S 1130.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (eu): Off the Shelf (Alternative). See M 0330.
0430 UK, BBC London (south as): Variable Feature. See S 1130.
0445 UK, BBC London (am): Off the Shelf. See M 0330.
0445 UK, BBC London (as pac): Variable Feature. See S 1130.
0445 UK, BBC London (eu): The Farming World (Alternative). See M 0145.
0445 UK, BBC London (south as): Variable Feature. See S 1130.

Thursdays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (am): The World Today. See M 1615.
0430 UK, BBC London (as pac): Multitrack X-Press. See W 1615.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (eu): Off the Shelf (Alternative). See M 0330.
0430 UK, BBC London (south as): Multitrack X-Press. See W 1615.
0445 UK, BBC London (am): Off the Shelf. See M 0330.
0445 UK, BBC London (eu): From Our Own Correspondent (Alternative). See S 0330.
0454 Radio Netherlands: Documentary. Hong Kong Goes Home (30th). See F 2354.
0454 Radio Netherlands: Documentary. The Birthing Room (2nd). See W 1254.
0454 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (9th,16th,23rd). See A 2354.

Fridays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): Network Africa. See M 0330.
0430 UK, BBC London (am): The World Today. See M 1615.
0430 UK, BBC London (as pac): Focus on Faith. See F 0330.
0430 UK, BBC London (eu): Europe Today. See M 0430.
0430 UK, BBC London (eu): Off the Shelf (Alternative). See M 0330.
0430 UK, BBC London (south as): Focus on Faith. See F 0330.
0445 UK, BBC London (am): Off the Shelf. See M 0330.
0445 UK, BBC London (eu): Folk Routes (Alternative). See S 0030.

Saturdays

0400 UK, BBC London (all streams): Newsdesk. See S 0000.
0430 UK, BBC London (af): African News. See S 0330.
0430 UK, BBC London (am): The World Today. See M 1615.
0430 UK, BBC London (as pac/eu/south as): Jazz Now and Then. See S 1230.
0430 UK, BBC London (eu): Newsdesk. See S 0000.
0431 UK, BBC London (af): African Quiz (1). See A 0331.
0431 UK, BBC London (af): This Week and Africa. See A 0331.
0445 UK, BBC London (am): Off the Shelf. See M 0330.
0445 UK, BBC London (as pac/eu/south as): Seven Days. See A 0010.

Hauser's Highlights

GREECE: Voice of Greece to NAm

0000-0350 6125, 7450, 9425
1300-1450 11645, 15175
(ERA5 via Pete Costello, *rec.radio.shortwave*)
English news at 0130, 0340, 1440 (gh)

FREQUENCIES

0500-0600	Australia, Radio	9660pa	11880pa	12080pa	13605as
		15240pa	15365pa	17715pa	17795pa
		17880pa			
0500-0600 as	Australia, Radio	11640as			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Australia,DefenseForces R	13525as			
0500-0600	Bulgaria, Radio	7375na	9485na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	9560na			
0500-0600	Costa Rica, Adv World R	5030ca	6150ca	9725ca	
0500-0600	Costa Rica,RF Peace Intl	6205am	7385am		
0500-0600	Cuba, Radio Havana	9820na	9830na		
0500-0600	Ecuador, HCJB	9445eu	9745am	21455am	
0500-0550	Germany, Deutsche Welle	6120na	6145na	6185na	9650na
0500-0515	Israel, Kol Israel	7465na	9435na	17545af	
0500-0600	Japan, R Japan NHK World	6110na	11740as	11910as	11920na
		17810as			
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0500-0600	Lebanon, Voice of Hope	9990va			
0500-0510 mtwhf	Malawi, MBC	3380do			
0500-0530 m-a/vl	Mexico, Radio Mexico Intl	9705na			
0500-0525	Netherlands, Radio	5995na	6165na		
0500-0600	New Zealand, R NZ Intl	11905pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0500-0504	Pakistan, Radio	9645as			
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia,Voice of Russia WS	5930na	6150na	7175na	7330na
0500-0600 mtwhfa	Russia,Voice of Russia WS	5920na			
0500-0555	S Africa, Channel Africa	5955af	11900af		
0500-0600	Slovakia, Adv World Radio	7215eu			
0500-0556	Spain, R Exterior Espana	6055na			
0500-0600	Swaziland, Trans World R	3200af	4775af	6070af	6100af
		9500af			
0500-0515	Uganda, Radio	3340do			
0500-0600	United Kingdom, BBC WS	3255af	3955eu	5975va	6005af
		6175va	6195eu	7160af	9410va
		9600af	9640va	9740as	11760va
		11955as	15280as	15360va	15420af
		15575va	17640af	17885af	
0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	USA, KWHR Naalehu HI	9930as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, Voice of America	5970af	6035af	6080af	7170va
		7295af	9700va	9775af	11825me
		12085eu	15205me		
0500-0600	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0500-0600	USA, WGTG McCaysville GA	5085am			
0500-0600	USA, WHRI Noblesville IN	5760am	7315am		
0500-0600	USA, WJCR Upton KY	7490na			
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0500-0600	USA, WYFR Okeechobee FL	5985na	9985eu	11695af	
0500-0528	Vatican State, Vatican R	5882eu	9660af	11625af	
0500-0600	Zambia, Christian Voice	3330af			
0500-0510	Zambia, ZNBC Radio 1	7220do			
0500-0510	Zambia, ZNBC Radio 2	6165do			
0500-0530 vl	Zimbabwe, Zimbabwe BC	3396do			
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0559	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Romania, R Romania Intl	11940af	15250af	15365af	15370as
		17745af	17790af		
0530-0600	Russia,Voice of Russia WS	5905na			
0530-0600	Slovakia, Adv World Radio	11600eu			
0530-0600	Thailand, Radio	9655eu	11905eu	15115eu	
0530-0600 vl	Zimbabwe, Zimbabwe BC	5975do			
0555-0600	Malaysia, Voice of	6175as	9750as	15295au	

SELECTED PROGRAMS

Sundays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0510 Japan, NHK/Radio: Let's Learn Japanese. A course in the Japanese language.
0525 Japan, NHK/Radio: Media Roundup. Reception reports, DX/media news, and equipment reviews.
0525 Japan, NHK/Radio: Viewpoint. Opinions of a guest personality.
0530 UK, BBC London (af): African News. See S 0330.
0530 UK, BBC London (am): Science in Action. The latest in science and technology.
0530 UK, BBC London (as pac): Anything Goes. A variety of music and much more with Bob Holness.
0530 UK, BBC London (eu): Weekend. European magazine program co-produced by European broadcasters.
0530 UK, BBC London (south as): Anything Goes. See S 0530.
0535 UK, BBC London (af): Postmark Africa. See S 0335.
0550 Japan, NHK/Radio: Viewpoint. See S 0525.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Mondays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. The weekday magazine program of feature reports and the popular vocal music of Japan.
0516 Japan, NHK/Radio: Sports Spotlight. Focus on a current sporting event in the region.
0525 Japan, NHK/Radio: Japan Diary. Life in Japan as seen through the eyes of a foreign resident in Japan.
0530 Japan, NHK/Radio: Close Up. Featuring a Japanese person of note.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am): The Learning World. See S 1130.
0530 UK, BBC London (as pac): The Ed Stewart Show. Ed plays the music of internationally known vocalists.
0530 UK, BBC London (eu): Composer of the Month (Alternative). See M 0430.
0530 UK, BBC London (eu): Europe Today. See M 0430.
0530 UK, BBC London (south as): The Ed Stewart Show. See M 0530.
0545 UK, BBC London (am): Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Tuesdays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
0516 Japan, NHK/Radio: News Commentary. An editorial opinion on the current news.
0523 Japan, NHK/Radio: Japan Diary. See M 0525.
0530 Japan, NHK/Radio: Close Up. See M 0530.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am/as pac/south as): Omnibus. See M 1130.
0530 UK, BBC London (eu): Europe Today. See M 0430.
0530 UK, BBC London (eu): Variable Feature (Alternative). See S 1130.
0540 Japan, NHK/Radio: Japanese Culture Today. Comparing modern-day Japan with the customs of old.
0545 UK, BBC London (eu): The Learning World (Alternative). See S 1130.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.

Wednesdays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
0516 Japan, NHK/Radio: News Commentary. See T 0516.
0523 Japan, NHK/Radio: Japan Diary. See M 0525.
0530 Japan, NHK/Radio: Close Up. See M 0530.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am): Outlook. See M 1405.
0530 UK, BBC London (as pac/south as): Variable Comedy/Quiz Feature. See S 0130.
0530 UK, BBC London (eu): Omnibus (Alternative). See M 1130.
0540 Japan, NHK/Radio: Asian Report. Current events in the Asia-Pacific region.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0555 UK, BBC London (am): Voicebox. See T 2310.

Thursdays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
0516 Japan, NHK/Radio: News Commentary. See T 0516.
0523 Japan, NHK/Radio: Japan Diary. See M 0525.
0530 Japan, NHK/Radio: Close Up. See M 0530.
0530 UK, BBC London (af): Network Africa. See M 0330.
0530 UK, BBC London (am): Outlook. See M 1405.
0530 UK, BBC London (as pac/south as): Variable Feature. See S 1130.
0530 UK, BBC London (eu): Assignment (Alternative). See H 0230.
0540 Japan, NHK/Radio: Crosscurrents. Radio Japan's mailbag program.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0555 UK, BBC London (am): Science View. See W 0040.

Fridays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0515 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
0516 Japan, NHK/Radio: Japan Diary. See M 0525.
0516 Japan, NHK/Radio: News Commentary. See T 0516.
0523 Japan, NHK/Radio: Close Up. See M 0530.
0523 Japan, NHK/Radio: Japan Diary. See M 0525.
0530 Japan, NHK/Radio: Close Up. See M 0530.
0530 UK, BBC London (af/as pac/south as): Network Africa. See M 0330.
0530 UK, BBC London (am): Outlook. See M 1405.
0530 UK, BBC London (eu): Record News (Alternative). See S 0445.
0540 Japan, NHK/Radio: Business Focus. A segment of the Magazine Hour which spotlights an aspect of business in Japan.
0555 Japan, NHK/Radio: Tokyo Pop-In. See S 0155.
0555 UK, BBC London (am): Going Solo. See S 2310.
0555 UK, BBC London (eu): The Insider's Guide (Alternative). See F 0005.

Saturdays

0500 Japan, NHK/Radio: News. See S 0100.
0500 UK, BBC London (all streams): Newsday. See S 0200.
0510 Japan, NHK/Radio: This Week. A weekly variety show.
0530 UK, BBC London (af): African News. See S 0330.
0530 UK, BBC London (am): Outlook. See M 1405.
0530 UK, BBC London (as pac/south as): Music Review. See S 0330.
0530 UK, BBC London (eu): Science in Action. See S 0530.
0531 UK, BBC London (af): Talkabout Africa. See W 1615.
0545 UK, BBC London (am): Spotlight. See S 0005.
0555 Japan, NHK/Radio: News Summary. See S 1155.

FREQUENCIES

0600-0700	Australia, Radio	9660pa	9860pa	11880pa	12080pa
		13605as	15240pa	15365pa	15415as
		15530as	17715as	17880pa	
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0633	Australia,DefenseForces R	13525as			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0630 mtwhf	Canada, R Canada Intl	6050eu	6150eu	9740af	9760af
		11905me			
0600-0700	Costa Rica,RF Peace Intl	6205am	7385am		
0600-0700	Cuba, Radio Havana	9820na	9830na		
0600-0700	Ecuador, HCJB	9745am	21455am		
0600-0650	Germany, Deutsche Welle	7225af	9565af	11765af	13790af
		17820as	21705me		
0600-0615	Ghana, Ghana Broadc Corp	3366do	4915do		
0600-0700 vl	Italy, IRRS	3985va			
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0600-0700 vl	Kiribati, Radio	9825do			
0600-0700	Lebanon, Voice of Hope	9990va			
0600-0700	Malaysia, Voice of	6175as	9750as	15295au	
0600-0700	New Zealand, R NZ Intl	11905pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0600-0700	North Korea, R Pyongyang	15180as	15230as		
0600-0630 s	Norway, Radio Norway Intl	5965eu	7180af	9590me	
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia,Voice of Russia WS	5905na	5920na	5930na	6150na
		7175na	7330na	12025pa	12035as
		15460as	15470au	17570pa	21790au
0600-0700 mtwhfa	Russia,Voice of Russia WS	5920na			
0600-0700	S Africa, Trans World R	11730af			
0600-0610	Sierra Leone, SLBS	3316do			
0600-0630	Slovakia, Adv World Radio	13715af			
0600-0700	Slovakia, Adv World Radio	5905am			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	Swaziland, Trans World R	3200af	4775af	6070af	6100af
		9500af	9650af		
0600-0630	Switzerland, Swiss R Intl	9885af	11860af	13635af	
0600-0700	United Kingdom, BBC WS	3955eu	5975va	6005af	6175eu
		6195eu	7145pa	7160af	9410eu
		9600af	9640af	9740as	11760eu
		11955as	12095as	15280as	15310as
		15360va	15420af	15575va	17640af
		17790as			
0600-0700	USA, KAIJ Dallas TX	5810am			
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, Voice of America	5970eu	5995va	6035eu	6080eu
		7170va	7285af	9760me	11805va
		11825me	11950eu	15205me	15600eu
0600-0700	USA, WGTG McCaysville GA	5085am			
0600-0700	USA, WHRI Noblesville IN	5760am	7315am		
0600-0700	USA, WJCR Upton KY	7490na			
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WRNO New Orleans LA	7355am			
0600-0700	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0600-0700	USA, WYFR Okeechobee FL	5985af	7355eu	9985af	
0600-0620	Vatican State, Vatican R	5880eu	7250eu		
0600-0645 vl/m-f	Vatican State, vatican R	15215me			
0600-0630	Vietnam, Voice of	5925as	10060as		
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0600-0700	Zambia, Christian Voice	3330af			
0600-0605 mtwhfa	Zambia, ZNBC Radio 1	7220do			
0600-0630	Zambia, ZNBC Radio 2	6165do			
0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0615-0630	Switzerland, Swiss R Intl	5840eu	6165eu		
0630-0655	Austria, R Austria Intl	6015na			
0630-0657	Georgia, Radio	11805eu			
0630-0700	Vatican State, Vatican R	11625af	13765af	15570af	
0631-0640	Romania, R Romania Intl	7105eu	9625eu	11775eu	
0645-0700	Romania, R Romania Intl	15250pa	15370pa	17720pa	17790as
		17805as			

SELECTED PROGRAMS

Sundays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am/eu): Newsday. See S 0200.
0615 UK, BBC London (af): Development '97. Aid and development issues.
0615 UK, BBC London (as pac/south as): Letter from America. See S 0030.
0630 UK, BBC London (af): African News. See S 0330.
0630 UK, BBC London (am): Play of the Week. A different radio drama program each week.
0630 UK, BBC London (as pac): Meridian. One of the topical programs weekly about the world of the arts.
0630 UK, BBC London (eu): Jazz for the Asking. Record requests with Malcolm Laylock.
0630 UK, BBC London (south as): Meridian. See S 0630.
0631 UK, BBC London (af): African Perspective. A considered view of life and issues facing the African continent.

Mondays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am/eu): Newsday. See S 0200.
0615 UK, BBC London (af): Sports Roundup. See S 0135.
0615 UK, BBC London (as pac/south as): The Learning World. See S 1130.
0630 UK, BBC London (af): Network Africa. See M 0330.
0630 UK, BBC London (am): Composer of the Month. See M 0430.
0630 UK, BBC London (as pac/south as): Jazz for the Asking. See S 0630.
0630 UK, BBC London (eu): Europe Today. See M 0430.

Tuesdays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am/eu): Newsday. See S 0200.
0615 UK, BBC London (af): Sports Roundup. See S 0135.
0615 UK, BBC London (as pac/south as): The World Today. See M 1615.
0630 UK, BBC London (af): Network Africa. See M 0330.
0630 UK, BBC London (am): Omnibus. See M 1130.
0630 UK, BBC London (as pac/south as): Meridian. See S 0630.
0630 UK, BBC London (eu): Europe Today. See M 0430.
0630 UK, BBC London (eu): Variable Feature (Alternative). See S 1130.
0645 UK, BBC London (eu): Development '97 (Alternative). See S 0615.

Wednesdays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am/eu): Newsday. See S 0200.
0615 UK, BBC London (af): Sports Roundup. See S 0135.
0615 UK, BBC London (as pac/south as): The World Today. See M 1615.
0630 UK, BBC London (af): Network Africa. See M 0330.
0630 UK, BBC London (am): Global Concerns. See S 1615.
0630 UK, BBC London (as pac/south as): Meridian On Screen. See T 1401.
0630 UK, BBC London (eu): Europe Today. See M 0430.
0630 UK, BBC London (eu): Megamix (Alternative). See T 1615.
0645 UK, BBC London (am): Jazz Now and Then. See S 1230.

Thursdays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am/eu): Newsday. See S 0200.
0615 UK, BBC London (af): Sports Roundup. See S 0135.
0615 UK, BBC London (as pac/south as): The World Today. See M 1615.
0630 UK, BBC London (af): Network Africa. See M 0330.
0630 UK, BBC London (am): Assignment. See H 0230.
0630 UK, BBC London (as pac): Variable Feature. See S 1130.
0630 UK, BBC London (eu): Europe Today. See M 0430.
0630 UK, BBC London (eu): Sports International (Alternative). Live commentaries and interviews, features and discussions.
0630 UK, BBC London (south as): Variable Feature. See S 1130.

Fridays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am): Newsday. See S 0200.
0615 UK, BBC London (af): Sports Roundup. See S 0135.
0615 UK, BBC London (as pac/south as): The World Today. See M 1615.
0630 UK, BBC London (af): Network Africa. See M 0330.
0630 UK, BBC London (am): Variable Feature. See S 1130.
0630 UK, BBC London (as pac/south as): Variable Comedy/Quiz Feature. See S 0130.
0630 UK, BBC London (eu): Europe Today. See M 0430.
0630 UK, BBC London (eu): The Ed Stewart Show. See M 0530.
0645 UK, BBC London (am): Variable Feature. See S 1130.

Saturdays

0600 UK, BBC London (af/as pac/south as): World News. See S 0000.
0600 UK, BBC London (am/eu): Newsday. See S 0200.
0615 UK, BBC London (af/as pac/south as): The World Today. See M 1615.
0630 UK, BBC London (af): African News. See S 0330.
0630 UK, BBC London (am): People and Politics. See S 0230.
0630 UK, BBC London (as pac): Meridian. See S 0630.
0630 UK, BBC London (eu): Fourth Estate. John Eidinow and his team review the European press.
0630 UK, BBC London (south as): Meridian. See S 0630.
0631 UK, BBC London (af): African Quiz (1). See A 0331.
0631 UK, BBC London (af): This Week and Africa. See A 0331.
0645 UK, BBC London (eu): Global Concerns. See S 1615.

FREQUENCIES

0700-0800	Australia, Radio	6020pa	9580pa	9660pa	9710as
		9860pa	12080pa	15240pa	15365pa
		15415as	15530as	17715pa	17880as
0700-0800 as	Australia, Radio	11640as			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica,RF Peace Intl	6205am	7385am		
0700-0800	Ecuador, HCJB	5860eu	9445pa	21455au	
0700-0800 as	Eqt Guinea, R East Africa	15186af			
0700-0800 mtwhf	Eqt Guinea, Radio Africa	15186af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 vl	Italy, IRRS	3985va			
0700-0800	Japan, R Japan NHK World	7230eu	11740as	11850pa	11920as
		15165me	17810va	17815af	
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800	Lebanon, Voice of Hope	9990va			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	9750as	15295au		
0700-0710	Malaysia, Voice of	6175as			
0700-0715 mtwhf	New Zealand, R NZ Intl	11905pa			
0700-0758 as	New Zealand, R NZ Intl	11905pa			
0700-0750	North Korea, R Pyongyang	15340af	17765me		
0700-0745	Romania, R Romania Intl	15250pa	17720pa		
0700-0800	Russia,Voice of Russia WS	5905as	5930na	6150na	7175na
		7330na	12025au	12035as	15460as
		15470pa	17570pa	21790au	
0700-0800 mtwhfa	Russia,Voice of Russia WS	5920na			
0700-0710	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Trans World R	4775af	6100af	9500af	9650af
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom, BBC WS	3955eu	5975am	6175eu	6190af
		6195eu	7145va	7325eu	9410eu
		9600af	9640va	9740as	11760as
		11940af	11955as	12095va	15280as
		15310as	15360va	15400va	15575me
	17640va	17790as	17830af	17885af	
0700-0730	United Kingdom, BBC WS	6180eu	11780eu		
0700-0715	United Kingdom, BBC WS	6005af	7160af		
0700-0800	USA, KAIJ Dallas TX	5810am			
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9975am			
0700-0800	USA, KWHR Naalehu HI	9930au			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0700-0800	USA, WHRI Noblesville IN	5760am	7315am		
0700-0800	USA, WJCR Upton KY	7490na			
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0700-0745	USA, WYFR Okeechobee FL	7355eu	9985eu		
0700-0800	USA, WYFR Okeechobee FL	9455af			
0700-0800 vl	Vanuatu, Radio	3945do	7260do		
0700-0745 vl/m-f	Vatican State, Vatican R	4005eu	5880eu	7250eu	9645eu
0700-0800	Zambia, Christian Voice	6065af			
0700-0800	Zambia, ZNBC Radio 2	6165do			
0700-0800 vl	Zimbabwe, Zimbabwe BC	5975do			
0710-0800 vl	Papua New Guinea, NBC	4890do			
0715-0730	Switzerland, Swiss R Intl	5840eu	6165eu		
0720-0800 vl	Chile, R Esperanza	6089am			
0730-0745 s	Greece, Voice of	7450eu	9425eu	15175au	
0730-0735	India, All India Radio	15185do	15260do		
0730-0800	Netherlands, Radio	9830au	11895pa		
0730-0800 as	Palau, KHBN/Voice of Hope	9730as			
0740-0800	Guam, TWR/KTWR	15200as			
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0745-0755	Greece, Voice of	7450eu	9425eu	15175au	
0745-0755 as	Monaco, Trans World Radio	7115eu			
0755-0800 mtwhf	Monaco, Trans World Radio	7115eu			
0759-0800 as	New Zealand, R NZ Intl	9700pa			

0800 UTC

0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9510as
		9580pa	9710pa	9860pa	12080pa
		13605pa	15530as	17715pa	21725as
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0835 vl	Chile, R Esperanza	6089am			
0800-0900	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
0800-0827	Czech Rep, Radio Prague	7345eu	9505eu		
0800-0900	Ecuador, HCJB	5860eu	9445pa	21455au	
0800-0900 as	Eqt Guinea, R East Africa	15186af			
0800-0900 mtwhf	Eqt Guinea, Radio Africa	15186af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900	Indonesia, Voice of	9525as			
0800-0830 vl	Italy, IRRS	3985va			
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900	Lebanon, Voice of Hope	9990va			
0800-0900	Malaysia, Radio	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295au	
0800-0900	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9830au	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0850	Pakistan, Radio	15470eu	17900eu		
0800-0900 as	Palau, KHBN/Voice of Hope	9730as			
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia,Voice of Russia WS	7220as	9875pa	12025au	12035as
		15460as			
0800-0810	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	9570au	13670eu		
0800-0820	Swaziland, Trans World R	4775af	6100af	9500af	9650af
0800-0900	United Kingdom, BBC WS	6190af	6195va	9410eu	9600af
		9740as	9805va	11760as	11940af
		11955as	15280as	15310as	15400va
		15575me	17640va	17790as	17830af
		17885af			
0800-0815	United Kingdom, BBC WS	3955eu	7145va	12095eu	
0800-0900	USA, KAIJ Dallas TX	5810am			
0800-0900	USA, KNLS Anchor Point AK	6150as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu	11550pa	15665eu	
0800-0900	USA, WEWN Birmingham AL	5825eu	7425na		
0800-0900	USA, WHRI Noblesville IN	5760am	7315am		
0800-0900	USA, WJCR Upton KY	7490na			
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0800-0830 vl	Vanuatu, Radio	3945do	7260do		
0800-0900	Zambia, Christian Voice	6065af			
0800-0805 mtwhfa	Zambia, ZNBC Radio 2	6165do			
0800-0900 vl	Zimbabwe, Zimbabwe BC	5975do			
0805-0810	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0816-0900 mtwhf	New Zealand, R NZ Intl	9700pa			
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0855	Austria, R Austria Intl	6155eu	13730eu	15240as	17870au
0830-0900	Belgium, R Vlaanderen Int	5985eu	9925eu	9940au	
0830-0900	Georgia, Radio	11910eu			
0830-0840	India, All India Radio	7250do	15185do	15260do	
0830-0900 vl	Italy, IRRS	7125va			
0830-0900	Netherlands, Radio	5965pa	9830au	13700pa	
0830-0900	Slovakia, R Slovakia Intl	11990au	17550au	21705au	
0850-0853 s	Russia, R Pacific Ocean	7185as			
0855-0900	Guam, TWR/KTWR	11830pa			

HAUSER'S HIGHLIGHTS
R. SLOVAKIA INTERNATIONAL

English programs at 1930, rebroadcast at 0100, 0830, and 1730

Mon *Slovakia in an International Context, Sport, History, Culture, Foreign Relations, One View*
Tue *Tourism News* alt with *Slovak Personalities; Front Page Daily Review*
Wed *Business News, Currency Notes, Front Page Daily Review-2nd ed.*
Thu *Domestic Politics, Education, Science; Regional News* bi-monthly
Fri *Culture News* alt with *Slovak Lesson; Slovak Kitchen, Back Page News*
Sat *Review of the Week, Best of* a feature this week
Sun *Listeners' Tribune, Slovak Music,* and anything goes
(http://www.xs4all.nl/~xavcom/rozhlas/angl.html)

FREQUENCIES

0900-1000	Australia, Radio	5995pa	6020pa	6080pa	9510as
		9580pa	9710pa	9860pa	12080pa
		13605as	21725as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa		
0900-1000	Costa Rica,RF Peace Intl	6205am	7385am		
0900-1000	Ecuador, HCJB	9445pa	21455au		
0900-1000 as	Eqt Guinea, R East Africa	15186af			
0900-1000 mtwhf	Eqt Guinea, Radio Africa	15186af			
0900-0950	Germany, Deutsche Welle	6160pa	7380as	9565af	11715as
		15145af	15410af	17800af	17820pa
		21600af			
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-0915	Guam, TWR/KTWR	15200as			
0900-0955	Guam, TWR/KTWR	11830pa			
0900-1000 m-f/vl	Italy, IRRS	7125va			
0900-1000	Japan, R Japan NHK World	7125as	11815as	11850au	
0900-0930 vl	Kiribati, Radio	9825do			
0900-1000	Lebanon, Voice of Hope	9990va			
0900-1000	Malaysia, Radio	7295do			
0900-0920 mtwhf	Monaco, Trans World Radio	7115eu			
0900-0905 a	Monaco, Trans World Radio	7115eu			
0900-0925	Netherlands, Radio	5965pa	9830au	13700pa	
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 s	Norway, Radio Norway Intl	13800au			
0900-1000 as	Palau, KHBN/Voice of Hope	9730as			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Russia,Voice of Russia WS	7220as	9675pa	9835au	9875au
		17860au			
0900-0930	Switzerland, Swiss R Intl	9885pa	12075au	13685pa	
0900-1000	United Kingdom, BBC WS	6190af	6195va	9410eu	9740as
		11750as	11940af	12095eu	15190sa
		15280va	15400va	15575me	17640va
		17705eu	17830va	17885af	
0900-0915	United Kingdom, BBC WS	6065as	7180as	9580as	11760as
		11955as	15310as	15360as	17790as
0900-1000	USA, KAIJ Dallas TX	5810am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430as	13840au
0900-1000	USA, WEWN Birmingham AL	5825eu	7425na		
0900-1000	USA, WHRI Noblesville IN	5760am	7315am	9930am	
0900-1000	USA, WJCR Upton KY	7490na			
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000 as	USA, WVHA Greenbush ME	13825af			
0900-1000	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0900-1000	Zambia, Christian Voice	6065af			
0900-1000 vl	Zimbabwe, Zimbabwe BC	5975do			
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-1000	Canada, CKZN St John's	6160do			
0930-0955	Georgia, Radio	11910eu			
0930-1000	Netherlands, Radio	5965as	7260as	9810as	9830au
0930-1000	Philippines, FEBC/R Intl	11635as			

1000 UTC

1000-1100	Australia, Radio	5995as	6020pa	6080pa	9510as
		9580pa	9860pa	13605as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa		
1000-1100	Costa Rica,RF Peace Intl	6205am	7385am		
1000-1030	Czech Rep, Radio Prague	17485af	21705me		
1000-1100	Ecuador, HCJB	9445pa	21455au		
1000-1100 as	Eqt Guinea, R East Africa	15186af			
1000-1100 mtwhf	Eqt Guinea, Radio Africa	15186af			
1000-1100	India, All India Radio	13700as	15050as	17387au	17890as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100 vl	Italy, IRRS	7125va			
1000-1100	Lebanon, Voice of Hope	9990va			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			
1000-1100 vl	Malaysia,RTM KotaKinabalu	5980do			
1000-1025	Netherlands, Radio	5965pa	7260as	9810as	9830au
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100 as	Palau, KHBN/Voice of Hope	9730as			
1000-1100 vl	Papua New Guinea, NBC	4890do			
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Russia,Voice of Russia WS	7150va	7220as	9675pa	9835pa
		9875au	11655as	11800as	12025as
		13785as	15490as	15560as	15580as
		17755as	17860as		
1000-1100	United Kingdom, BBC WS	5965na	6190af	6195va	9410eu
		9740as	11750as	11760as	11940af
		12095eu	13745va	15190sa	15280va
		15310as	15400af	15575me	17640va
		17705va	17790as	17830va	17885af
1000-1100	USA, KAIJ Dallas TX	5810am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	6095na	7395sa	9430as	13840as
1000-1100	USA, Voice of America	5985pa	6165am	7405am	9590am
		11720pa	15425pa		
1000-1100	USA, WEWN Birmingham AL	7425na	15665eu		
1000-1100	USA, WGTG McCaysville GA	9400am			
1000-1100	USA, WHRI Noblesville IN	6040am	9495am	9930am	
1000-1100	USA, WJCR Upton KY	7490na			
1000-1100	USA, WMLK Bethel PA	9465eu			
1000-1100 as	USA, WVHA Greenbush ME	13825af			
1000-1100	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1100 vl/m-f	Vatican State, Vatican R	11740af	15210af	17550af	
1000-1030	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as	15010as		
1000-1100	Zambia, Christian Voice	6065af			
1000-1005 mtwhfa	Zambia, ZNBC Radio 2	6165do			
1005-1010	Croatia, Croatian Radio	5895eu	7165eu		
1030-1055 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15240as	17870au
1030-1100	Guam, AWR/KSDA	9870as			
1030-1100	Guam, TWR/KTWR	9870as			
1030-1100	Kazakhstan, R Alma Ata	9620eu	11840eu		
1030-1100	Netherlands, Radio	7260as	9810as		
1030-1100	Sri Lanka, Sri Lanka BC	11835as	17850as		
1030-1055	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me

HAUSER'S HIGHLIGHTS

BBC RELAY, NAKHON SAWAN, THAILAND

W-96 HFCC Registrations
All 250 kW

5965 2100-2200 45 degrees	9600 0100-0215 325 degrees
5965 2200-2300 20	9600 2300-2400 40
5965 2300-2400 45	9750 1700-1900 325
5975 1500-1830 290	11750 0800-1400 290
5990 1300-1615 45	11955 0300-0500 45
5990 2200-2400 40	11955 0900-1130 25
6085 1400-1500 305	15280 0000-0530 50
6140 1515-1615 255	15280 0900-1100 25
7160 2200-2300 25	15310 0000-0300 290
7180 1100-1615 25	15380 0030-0300 305
9510 1830-1900 305	15445 0230-0245 300
9580 0900-1310 45	15445 0800-0830 325
9580 2200-2300 20	17790 0300-0530 290
9580 2300-0100 45	21660 0300-0530 020

(HFCC via *BC-DX*)

Note that these may be phased in gradually, and until in full operation, some may come from other sites.

GROVE
BUYER'S GUIDE

UPS 2nd Day Air Shipping at Ground Rates on All Products We Sell!

For an extensive comparison of the two world-class receivers shown here, please see Bob Grove's review on the World Wide Web at: **www.grove.net/grovereview.html.** The receivers were also reviewed in the November issue of *Monitoring Times* magazine.

Coming Soon: The new ICOM R10. See p. 5!

Grove Buyer's Guides are printed as integral sections of Monitoring Times magazine and also distributed separately on request. Three distinct Guides are published on a rotating basis, featuring: scanners and accessories; shortwave products and accessories; and software, books and satellite communications equipment. Requests for catalogs can be made by phone, fax, snail mail or e-mail (see below). Our catalog is also on the World Wide Web at: **www.grove.net/hmpgcat.html**

Grove Enterprises
P.O. Box 98
7540 Hwy. 64 W.
Brasstown, N.C. 28902
1-800-438-8155 US & Can.
(704) 837-9200
FAX (704) 837-2216
e-mail: *order@grove.net*
web: *www.grove.net*

SCANNERS

Great Products, Great Values from the Radio Equipment Leaders

ICOM vs. AOR

Want the Best Communications Receiver in the World? Grove has them Both!

R-8500

"For intuitive ease of use, display readability, and professional appearance, the ICOM wins hands down."
—Bob Grove
11/96 Monitoring Times

NEW FROM ICOM: an affordable, compact, tabletop receiver with continuous 100 kHz-1999.99 MHz frequency coverage (less cellular) in precise 10 Hz steps—longwave, shortwave, VHF/UHF, all services and modes (wide and narrow FM and AM, USB, LSB, CW). Add high sensitivity, IF shift, selectable AGC timing, audio peak filter to automatically enhance modes, built-in RS232C and CI-V for direct computer control, 1000 memory channels in 20 banks, multiple scanning selections with priority function and selectable delay, S-meter settable squelch, noise blanker, and 12 VDC / 120 VAC operation.

High stability crystal oscillators combine with automatic frequency control circuitry for outstanding stability. Multiple tuning speeds optimize signal hunting. Alphanumeric display aids in identifying memorized frequencies. Automatic memorizing of search-discovered active frequencies, skipping of unwanted channels, three antenna connectors for optimal choices for frequency ranges, even voice scan to ignore noisy channels, and even optional voice synthesizer--an incredible array of advanced features! See detailed specifications on pp. 8-9.

ACCESSORIES

ACC06	High Stability Crystal Unit	$295.95
ACC07	FL-52A CW Narrow Filter	$189.95
ACC08	Voice Synthesizer Unit	$57.95
ACC72	TV-R7100 Adaptor	$339.95
ACC74	CT-17 Level Converter	$134.95
BRK04	Mobile Mounting Bracket	$35.95
BRK05	MB-23 Carrying Handle	$12.95
MAN01	Service Manual	$57.95

ORDER SCN 1
$1999.95
Plus $17 UPS Shipping

NOTE: An intermod problem with the first R-8500 units manufactured (as reported on in MT by Bob Grove) has been corrected. ALL UNITS SOLD BY GROVE WILL BE THE NEW, UPGRADED MODEL.

AR-5000

AOR HAS SCOOPED THE MARKET with their new AR5000 extended-frequency coverage receiver, tunable from 10 kHz through 2600 MHz (less cellular) and offering 650 memory channels. For the first time, you can hear VLF time signals and naval communications, international shortwave broadcasting, worldwide single-sideband communications, civilian and military aeronautical transmissions, VHF/UHF public safety radio, ham repeaters, microwave earth satellites, and much, much more all on one receiver!

This triple-conversion luxury receiver offers outstanding sensitivity (0.15 microvolt SSB, 0.3 microvolt VHF/UHF FM, 0.6 microvoltAM), rapid 50-channel-per-second scan/search speed, 1 Hz to 1 MHz programmable tuning steps, all mode reception (AM/FM/LSB/USB/CW), selectable IF bandwidths (3/6/15/40/110/220 kHz), superb frequency stability (+/-1 ppm,0-50 deg. C.), mobile or fixed power (12 VDC / 120 VAC), and much, much more. See detailed specifications on pp. 8-9.

ORDER RCV12
$1895.95
Plus $17 UPS Shipping

"For compact installation requirements, widest frequency coverage, and the greatest variety of options, select the AOR."
—Bob Grove
11/96 Monitoring Times

The Renowned AR-8000

Full 800 MHz Restorable AOR Quality Scanners!

***After you purchase and receive your AR 8000, we can restore the missing 800MHz for only $40 plus return shipping.**

With wide frequency coverage—500 kHz-1900 MHz (less cellular, restorable), 1000 memory channels, AM/FM/SSB reception, selectable tuning steps from 50 Hz-999.995 kHz. An oversized, edgelit LCD window holds 44 bold alphanumeric characters.

Autostore, RS232 control, second-radio cloning, power saver, keyboard beep defeat, and selectable-channel display blanking. Dial tunes frequencies and channels. Dual VFOs and 30-channel-per-second scan/search speed.

Each channel may be programmed for frequency, mode, audio or carrier squelch with programmable 1-99 second delay, 10-dB attenuator, step size, channel offset, and channel designator. Any channel priority sampling, LCD, S-meter/spectrum display unit!

Interchangeable NiCd/alkaline batteries (4AA NiCds and charger included); a universal external power jack for mobile use; an internal ferrite antenna for medium-wave reception; illustrated 115-page owner's manual. See detailed specifications on pp. 8-9.

The most feature-packed handheld scanner available!

ORDER SCN27
$599.95

SHIPPING
$9 UPS
$10 US Priority Mail
$14 Canadian UPS
$12.50 Canadian APP

ACCESSORIES

ACC157	Optolinx Universal Interface	$129.95
BAT 1	AA Alkaline batteries	$.79
BAT 13	Extra AA Nicad batteries	$2.75 ea
CAS 2	Genuine Leather case for AR-8000	$29.95
CTR 8	Optoelectronics Scout 3.1	$399.95
ACC156	SAC-8000 Interface Cable	$34.95
PWR 2	Desktop Charger	$59.95
SFT 2	Scancat Gold Software	$94.95

OPTOLINX UNIVERSAL INTERFACE

This replacement for the popular CX12 computer interface connects your AR8000 or 2700 to a PC for full computer control; decode DCS and CTCSS tones and DTMF telephone digits with the DC440 decoder connected to your AR3000A receiver. It will computer control the Icom R7000, 7100 and 9000. You can even use the OPTOLINX to receive longitude and latitude coordinates from any GPS or LORAN receiver with NMEA 0183 output. Or connect it to the Opto Scout frequency recorder to download its memory, and use it with the M1 frequency counter and Optolog software for computer controlled data logging of intercepted frequencies.

ORDER ACC 157
$129.95

SHIPPING
$6 UPS
$7 US Mail
$10.50 Canadian UPS
$11.50 Canadian APP

Grove Modification/Trade-In Services

Grove Enterprises can perform many of the equipment modifications that you may need to turn a good scanner or receiver into a great one. Or, if you're in need of a quality used piece of equipment, Grove may have what you need

Modifications, excluding cellular mods, are available for new equipment at the time of purchase from Grove, as well as for used equipment. Before returning your scanner or receiver for modifications, or if you would like more information about our trade-in service, please call 704-837-7081.

Simply explain the type of modification or service you desire. If the requested service is available, Grove will issue you a service order number and advise you of the modification fee and the return shipping charges.

Ship your equipment to Grove enclosing a check for the modification and return shipping. A five to seven day turnaround time is possible for simple mods requiring no new parts.

- Scan/Search Speed Increase
- Frequency Restoration (800-900 MHz)
- Improved Audio (Radio Shack PRO43)
- Lightning Static Protection (Sony 2010)
- Factory Accessory Installation
- Memory Channel Increase
- AR8000/Scout 40 Reaction Tune Modification

Grove can perform mods on most models from: ICOM, AOR, REALISTIC, SONY (2010 only), AND UNIDEN; *call for a complete list.*

See our site on the World Wide Web for an up-to-date list of trade-ins. Set your browser to www.grove.net/hmpgmods.html

AR-3000A

Here's the Professional Wide-Coverage Desktop Scanner

Imagine: A fully-restorable, general coverage shortwave receiver and wide-frequency-coverage scanner, in one compact instrument!

The AOR AR3000A offers 100 kHz-2036 MHz (less cellular—restorable) frequency coverage, continuous tuning dial, AM/FM/SSB mode reception, 400 memory channels and 50 channel per second scan/search rate.

High sensitivity and sharp selectivity let you hear signals lesser scanners and shortwave receivers miss.

Operates on 13.6 VDC for compact mobile installations; 120 VAC adaptor included. See specifications on pp. 8-9.

**After you purchase, we can restore the missing 800MHz for only $65.*

ORDER SCN26
$1062.95

SHIPPING
$11 UPS
$18.50 US Priority Mail
$19.50 Canadian UPS
$21.50 Canadian APP

ACCESSORIES

CVR 3	GRE Super Converter	$84.95
SFT 2	ScanCat Gold Software	$94.95

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

Introducing the Radio Shack PRO-2045

This latest generation scanner from Radio Shack features wide frequency coverage, data skip, tuning dial and direct-entry keypad, 200 channel memory, direct weather scan with weather alert, 50 ch/sec scan and 300 ch/sec search speed, 10 priority channels, CTCSS option, and many other advanced features.

Sets compactly on your desk or under the dash for 29-54, 108-174, 216-512, and 806-1000 MHz (less cellular) frequency coverage. Automatic AM/FM mode selection may be manually changed; automatically counts the number of hits on memorized channels; permits exchange of memory between channels; operates from 12 VDC or 120 VAC; attenuator may be programmed for individual channels to reduce interference; beep tone is defeatable.

A great radio at a great Grove price! See detailed specifications on pp. 8-9.

ACCESSORIES

ACC130	CTCSS decoder	$46.95

ORDER SCN 3
$319.95

SHIPPING
$9 UPS
$16 US Mail
$16.50 Canadian UPS
$20.50 Canadian APP

PRO-2046 Mobile Scanner

Allows Instant Police, Fire, Emergency, etc. Search

Sporting wide frequency coverage (29-54, 108-174, 406-512, and 806-956 MHz less cellular), 100 memory channels in 10 banks, high sensitivity, and fast scan/search speed, this new mobile scanner allows instant Service Search (Police/Fire/Emergency, DOT, HWY, and Public Service), data channel skip, any-channel priority and delay, and instant weather broadcast access.

Tune up and down automatically from any displayed frequency, lock out up to 20 unwanted or busy frequencies in the search sequence, temporarily store up to 10 search-discovered frequencies for quick recall. Your new PRO-2046 comes with DC power cord, mobile mounting bracket and full instructions. See specifications on pp. 8-9.

New Low Price!

ORDER SCN 7
$239.95

SHIPPING
$7 UPS
$9.50 US Priority Mail
$15 Canadian UPS
$12.50 Canadian APP

Uniden BCT 7

Tiny Scanner is Mobile Giant for Law Enforcement Scanning

This tiny scanner has factory-programmed scan banks for law enforcement (state-selectable highway patrol!), firefighting, weather broadcasts, medical emergency teams, highway maintenance crews, and on-scene news reporters! You can even enter up to 100 of your own frequencies for private scanning anywhere from 26.9-27.4 (all 40 CB channels!), 29.7-54, 108-174, 406-512, and 806-956 MHz (less cellular).

Special Feature: The BCT-7 BearTracker flash-alerts you to radar speed patrols up to three miles away by intercepting their mobile extenders! Brightly-backlit LCD display has high visibility, while powerful three-watt audio blasts through the noisiest mobile environment!

Comes ready to go with AC adaptor, DC power cord, cigarette lighter cord, mobile mounting bracket, telescopic antenna, frequency guide, complete instructions, and even a mobile antenna! See detailed specifications on pp. 8-9.

ORDER SCN21
$179.95

SHIPPING
$9 UPS
$16 US Priority Mail
$17.50 Canadian APP
$16.50 Canadian UPS

ACCESSORIES

ANT 4	Magnetic Mount Mobile Antenna	$29.95
ANT 13	Windshield Mount Ant.	$29.95
ANT 20	No-tenna	$19.95
ANT 30	Stealth Mobile Antenna	$29.95

UNIDEN *Beartracker* BCT 10

Tiny and inconspicuous, the new Beartracker BCT-10 easily snaps on your vehicle's sun visor, or may be conveniently set on your dashboard; simply touch the STATE button until the appropriate two-letter code (including Canadian provinces) is displayed, then listen for highway patrol communications, including radar traps. A visual and audible warning alarm may be selected to alert you to activity; unwanted channels may be locked out; an LED numerical signals strength meter gives you a relative indication of the distance of radio signals.

The BCT-10 automatically scans through 866 preprogrammed law enforcement frequencies in the 37-46, 138-172, and 423-508 MHz bands with an average sensitivity of 0.4 microvolts. Instant, pushbutton weather access is also provided for all U.S. NOAA and two Canadian Coast Guard channels.

Built-in speaker allows police communications monitoring, or an external speaker may be plugged in for vehicle-filling sound; may be muted for alarm-only function. Status lights identify types of communications being monitored.

Accessories include visor bracket, suction windshield mount, cigarette lighter power plug, DC power cord, stub and wire antenna. See specifications on pp. 8-9.

ORDER SCN22
$179.95

SHIPPING
$9 UPS
$16 US Mail
$16.50 Canadian UPS
$17.50 Canadian APP

Order Line: 1-800-438-8155; *Product Support Info.:* (704) 837-7081

Not *MIR*-ely Great for Terrestrial Listening ...

Shown: Uniden BC9000XLT with GRE Super Converter

Put your new Uniden* BC9000XLT*—our best selling desktop scanner—through its paces, monitoring frequencies as high as 1.3 GHz (including cellular when combined with the GRE Superconverter, on sale with this package)*!

The **Uniden BC9000XLT** makes it easy to bridge the gap between terrestrial and orbital monitoring. This superb desktop scanner is for serious monitors of the 25-550, 760-1300 MHz (less cellular) spectrum—and the missing cellular frequencies can be restored by adding our discounted GRE Super Converter! The BC9000XLT features 500 memory channels, tuning knob, 16-digit alphanumeric display with adjustable brightness, powerful 2.2 watts of audio, tone control, and CTCSS tone squelch option.

The intuitive layout of the panel makes operating a breeze! Rubber-padded tilt feet combine with the large tuning knob for additional comfort during periods of serious signal searching. Search lockout of up to 50 frequencies prevent unwanted interruptions. This scanner means business. See detailed specifications on pp. 8-9.

The GRE Super Converter, reduced to $79.95 when purchased with the BC9000XLT, gives this unit no-gap coverage in the 800 MHz range (unlawful to monitor cellular telephone conversations!).

Call now and order this incredible package now and we'll have it on your doorstep in two days!

ORDER SCN30
$389.95

and CVR 3
$79.95

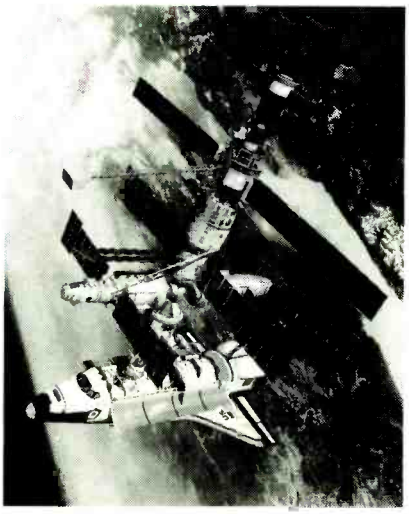
Reduced from $84.95 for this special package only.

SHIPPING
$9 UPS
$16 US Mail
$16.50 Canadian UPS
$20.50 Canadian APP

ACCESSORIES

ACC 130	CTCSS tone board	$46.95
Installation Fee		$20.00
BRK 2	Mounting bracket	$15.95
CVR 3	GRE Superconverter	$84.95
DCC 3	Cig. Lt. Pwr. Adapt.	$12.95

* *Note: It is unlawful to listen to cellular telephone conversations*



Monitor the Space Shuttle at 259.7 MHz and the Russian Mir Space Station at 143.625 MHz.

Bearcat

Uniden BC3000XLT

A Great Full-Range Hand-Held Scanner at a Bargain Price!

Featuring continuous 25-550, 760-1300 MHz (less cellular) frequency range, 400 memory channels, 10 priority channels, 100-channel-per-second TurboScan, automatic storage of search-discovered frequencies, selectable-channel overload attenuator, mode and step selection, data skip, and reduced-intermod design.

Strong audio guarantees crisp reception in noisy environments; up to 50 frequencies may be locked out of the search function to eliminate unwanted interruptions; battery save circuit extends charge life during inactive reception periods; handsome, rugged styling makes this handheld scanner an outstanding choice. See detailed specifications on pp. 8-9.

ORDER SCN29
$369.95

SHIPPING
$8 UPS
$10 US Mail
$13 Canadian UPS
$13 Canadian APP

ACCESSORIES

BAT 15	Replacement battery pack	$31.95
CAS 6	Carrying Case	$19.95
DCC 7	Universal DC adapter	$15.95
PWR 2	Desktop Charger	$59.95

Uniden BC-890XLT

This popular, low cost scanner features wide frequency coverage (29-54, 108-174, 216-512, 806-956 MHz—less cellular), 200 memory channels, 100-channel-per-second TurboScan, weather alert, CTCSS (optional), channel activity counter, 10 channel priority, search autostore, tape recorder output, memory channel transfer, and much, much more!

See pp. 8-9 for detailed specifications.

ORDER SCN19
$269.95

SHIPPING
$9 UPS
$16 US Mail
$17.50 Canadian APP
$16.50 Canadian UPS

ACCESSORIES

ACC 96	CTCSS Squelch Decoder	$59.95
Installation Fee		$20.00
BRK 2	Mounting bracket	$15.95
CVR 3	GRE Superconverter	$84.95
DCC 3	Cig. Lt. Pwr. Adapt.	$12.95

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

UNIDEN BC230XLT

Here's the update of the revered BC220XLT

Uniden now includes a spare battery and charger with their popular hand-held scanner. Frequency coverage 29-54, 108-174, 406-512, and 806-956 MHz (less cellular). 200 memory channels in 10 banks include 10 priority channels for instant access to important transmissions regardless of monitoring status. TurboScan and TurboSearch provide 100 channel per second scanning and 300 channel per second searching! Preprogrammed service search affords single-key access to police, fire, emergency, aircraft, marine and weather frequencies! Data skip avoids noisy data transmissions, stopping only on valid communications!
See pp. 8-9 for detailed specifications.

ORDER SCN24
$239.95

SHIPPING
$8 UPS
$10 US Mail
$14 Canadian UPS
$12.50 Canadian APP

ACCESSORIES

BAT 8	BP 120 battery pack	$19.95
DCC 7	Universal DC adapter	$15.95
CAS 9	Leather case	$19.95

Comes with its own battery charger and spare battery.

Coming Soon to Grove: New ICOM R10

Finally, here's ICOM's replacement for the venerable R1! Just check these features: • 500 kHz-1300 MHz (less cellular) frequency range • AM FM and SSB reception modes • Built-in spectrum display • 1000 channel memory • Computer controllable • Wide dynamic range resists overload • Zero-wait state signal capture! *Call today for price and availability!*

ICOM R100
Mobile Desktop Scanner*

New Low Price!

For the full-spectrum listener, this compact scanner is hard to beat: tuning range from 100 kHz-799 MHz, 900-1856 MHz* with direct keypad entry or knob tuning, 100 channel memory, switchable preamp and attenuator, programmable 24-hour clock timer, 10 search ranges, LCD bargraph S meter, AM and wide/narrow FM mode detection (no SSB) just begin the list of features. Comes with VHF/UHF telescoping antenna, HF wire antenna, DC power cable, mounting bracket, fuses, speaker plug, cable ties, and screws. See detailed specifications on pp. 8-9. Prices subject to change due to yen fluctuations.

**After you purchase and receive, we can restore the missing 800-900MHz for $40 plus $10 shipping.*

ACCESSORIES

CVR 3	GRE Super Converter	$84.95
SPL 2	SCPC splitter	$64.95

ORDER SCN14
$679.95

SHIPPING
$10 UPS
$17 US Priority Mail
$18 Canadian UPS
$19.50 Canadian APP

Save $$$ on RAM Upgrades for PCs!

Through a special distributor-direct arrangement, we can offer you for a limited time high-quality RAM expansion at INCREDIBLE savings! Adding 4 more mb to your computer's 4 mb RAM will virtually double Windows speed! These 72 pin, double sided SIMMs feature gold contacts and offer 60-70 nanosecond access speed (check your computer specifications for speed and parity requirements). These are standard replacement units—at a great price which includes FREE first class shipping!

4MB (1x32) 70 ns, non-parity .... RAM 04 ..... $25.35
8MB (2x32) 70ns, non-parity ..... RAM 08 ..... $54.95
16MB (4x32) 60 ns, non-parity ..... RAM 16 .... $141.95
16MB (4x32) EDO 60 ns, non-par. . RAM 16E .. $141.95*

For use with Pentium processor only

WiNRADIO

The first wide-frequency-coverage receiver that installs into your computer!*

Imagine—plug a small PC card into your computer, load the simple software, and turn your PC into a potent, wide-coverage monitoring station! User-friendly software allows all the usual receiver controls, plus much more. Rugged shielding resists interference from the host computer. Enjoy continuous 500 kHz through 1300 MHz (less cellular) frequency coverage; multimode reception of AM, wide and narrow FM, and single-sideband; up to 16 memory banks with a virtually limitless number of channels; display records in memory by frequency, callsign, or comments field; scan by bank, grouping, or mode; and automatically search for activity by entering your choice of frequency limits.

BNC connector allows attachment of your antenna system, while a mini-jack permits connection of speaker or earphones. One-microvolt nominal sensitivity assures weak-signal pickup.

Easy installation, full instruction manual included. Can be used with DOS 3.0 and a 286 platform, but this unique receiving laboratory unleashes its power with Windows 3.1, requiring 386 or higher, 1 Meg RAM, 1 Meg hard disk space, VGA monitor; or Windows 95, requiring 486 or Pentium, 4 Megs RAM, and an SVGA monitor. See specifications pp. 8-9.

**See September and October, 1996,* Monitoring Times *for full review. Reprint $4.*

ORDER RCV16
$589.95

SHIPPING
$9 UPS
$14 US Priority Mail
$16 Canadian UPS
$15.50 Canadian APP

ACCESSORIES:

TUN 4A	Grove TUN 4A Minituner Plus	$99.95
ANT 1	Grove Scanner Beam Antenna	$59.95
ANT 2	Grove Skywire Antenna	$39.95
ANT 3	Grove Mini Skywire Antenna	$29.95
ANT 7	Scantenna	$39.95
ANT 9	Wideband Discone Antenna	$87.95
ANT 15	Skymatch Active Antenna	$99.95

Scancat-Gold for PCs

Use your 640k (or better) computer to control your AOR, Drake, Kenwood, ICOM, Yaesu, JRC, Lowe, WJ, and Radio Shack PRO-2005/6/35/42 with this fast, all-new software program! Operates from the RS-232 port. Just check the features listed below:

For listeners—

- Integrates multiple data sources and removes duplicates
- Search between any two frequencies in any tuning step
- Autolog new active frequencies while scanning and create disk files (link up to 15 disk files)
- Display spectrum analysis on screen or printer
- Scan frequencies from up to 15 disk files and 4500 freqs
- Import from text formats and virtually any database
- Link up to 15 search banks, output to any printer or disk
- Automatic "birdie" lockout, rapid DTMF capture/storage with OPTO 456
- Scan VHF and HF ICOM receivers simultaneously
- Access large shortwave and scanner databases (provided)

For commercial users—

- Demographic search for frequency coordination and usage profiling
- ASCII file logging of date, time, signal strength, air time
- Unlimited file sizes
- Macro control by frequency of dwell, hang, resume, threshhold, audible alarms
- Unattended on/off times for logging and searching
- Stores terminal control commands in comment field
- 800MHz restorable on AOR AR8000 & PRO-2035/42

Works with any IBM compatible system.

ORDER SFT 2
$94.95

SHIPPING
$4.50 UPS or First Class
$6 Canadian APP
$6.50 Canadian UPS

Tech support after the sale from Computer Aided Technology call (318)687-2555.

* Because software is easily copied, it is not refundable. Defective copies will be replaced at no charge.

New — Scancat Gold for Windows®

Now you can get all the Scancat Gold features plus:

- No-conversion, direct scanning of DBASE, FOXPRO, ACCESS, BTRIEVE files!
- Movable and split columns for viewing all data on one screen!
- Spectrum analysis with storage and mouse-selectable frequency recall!
- Graphic receiver tuning by mouse, slide rule, or on-screen knob!
- Interactive and simultaneous database, maps and scanning functions!
- Map and graphic image identification of stations with instant hot-spot tuning!
- MODEM terminal supports X-Y-Z up/down loading at 28.8 K!*

ORDER SFT02-W
$99.95

SHIPPING
$4.50 UPS or First Class
$6 Canadian APP
$6.50 Canadian UPS

* Because software is easily copied, it is not refundable. Defective copies will be replaced at no charge.

OTHER SOFTWARE

Grove has great values on all the latest software for scanner enthusiasts, hams and shortwave listeners. See our special Buyer's Guide featuring Software, Books and Accessories for complete details (published as an insert to the November edition of Monitoring Times magazine and available separately from Grove by request). Our software stock includes, but is not limited to, the following. Please call for additional information or availability on items not shown here:

PRODUCT	CODE	PRICE
SCAN MANAGER PRO v.1.1 (Computer Control Software for Hams, SWLs)	SFT 13	$68.95
MESSAGE TRACKER BASIC 3.0 (Record and recall pager messages)	SFT 11	$179.95
MESSAGE TRACKER PRO 3.0 (Advanced version of above)	SFT 12	$279.95
CD-ROM REPEATER MAP BOOK (Ham callsign database for all platforms)	BOK 101CD	$29.95

ScanStar™

ScanStar for Windows Plus (Adv.)

This powerful new software package, ready for Windows 95, 3.1, or WFW 3.11, will restore full 800 MHz coverage and allow you to customize the band plan on theAR8000, as well as display spectrum analysis and support printing on the AOR AR3000A, Drake R8 and R8A, R7100, and the PRO-2006 and PRO-2035 or PRO-2042 when equipped withOptoElectronics OS456 or OS535. Scan-controls up to 10 radios at one time; dual-receiver priority handoff for window viewing; sub-list scanning for split channels and trunk groups; monitoring assistant with frequency following for reception logging; user-defined database files. Blend up to 25 groups and search ranges; tactical display for all in "viewpicture;" scans, searches and logs PL/DPL/ DTMF tones; provides alarm for high priority channels via wave files or PC speaker; opens multiple files at the same time with full-feature editor; browses and imports dBase files like the popular Grove FCC database; commercial logging features include air time, hit count andPL/DPL/ DTMF loggings per channel; import/export from other formats like ASCIIand ScanCat. Order SFT9.*

ScanStar for Windows SE (Basic)

Has many of the incredible features of the SFT-9 described above, except the basic package has no support for the Drake R8 and R8A and certain others. Call our tech line for details. Order SFT10.*

ScanStar Commercial

ScanStar Commercial offers all the features of the popular ScanStar Professional edition plus: Multi-radio scanning with search/save (handoff) and peer strategies; Use any combination of radio type or port, port sharing for CI-V devices; Graphical User Interface (GUI) command center shows activity, history and status of channels in real time; Quickly reconfigure as the action unfolds!; Priority system with 256 levels and selectable preemption; High resolution VGA/SVGA/ S3 graphics modes: 32 bit code for maximum performance on 386, 486 and 586 processors.; 640X480, 800X600 & 1024X763; and much more! Order SFT11.*

* Requires IBM PC 386/486/586 with 4 MEG RAM, hard disk, VGA/SVGA, mouse, serial port(s), DOS 5/6 or OS/2 3.0, warp. Windows and 286 not supported. Supports: R7000, R7100, R9000, FRG9600, AR3000, AR8000, NRD535, R8, and MR8100 and Optoelectronic's OS456, OS535 and DC440. Because software is easily copied, it is not refundable. Defective copies will be replaced at no charge.

SFT09: **$159.95**
SFT10: **$99.95**
SFT07: **$129.95**

SHIPPING
$4.50 UPS or First Class
$6 Canadian APP
$6.50 Canadian UPS

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

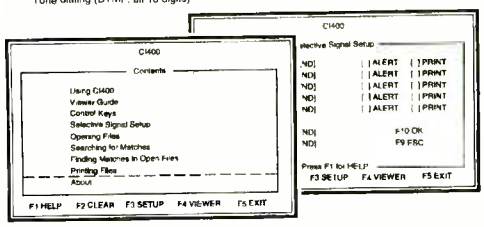
M-400 Universal Decoder

Access an entire dimension of coded communications signals.

SPECIFICATIONS
MODES: Baudot (45, 50, 57, 100 baud)
ASCII (75, 110, 150 baud)
SITOR A & B (Automatically selected)
FEC-A (96 & 144 baud)
SWED-ARQ (S, M and L lengths)
FAX (120 LPM/576 IOC, to parallel printer port)
Paging (GOLAY, POCSAG)
ACARS
Encoded squelch (CTCSS, all 41 frequencies, DCS, all 104 codes)
Tone dialing (DTMF, all 16 digits)

FILTER: Low tone (mark) 1275 Hz
Shifts: 170, 425, 850 Hz, plus 100-1000 Hz variable
INPUTS: Speaker, 4-16 ohms @ 100 mW max
Discriminator, 10K ohms @ 0.25 V max
OUTPUT: ASCII 8 bit Centronics standard, DB25 connector
DISPLAY: Two-line, 20 characters each 57 dot matrix LCD
POWER REQUIRED: 11-16 VDC @ 200 mA, AC adaptor included
SIZE: 8-3/4"W x 2-1/2"D x 8"D
WEIGHT: 2 lbs

ORDER DEM 9
$399.95
SHIPPING
$9 UPS
$18 US Priority Mail
$20.50 Canadian APP
$22 Canadian UPS



Add Screen Capture Interface!

Want to see a full-screen display of intercepted text messages? Connect the new CI-400 between the M400 and your IBM compatible computer (286, DOS 3.3 or better); requires 8 bit slot, 215 kB disk storage for program files, 3.5" floppy. Recommended: mouse, color monitor, hard drive. Includes interface card, cable, software, manual.

Features automated software installation, on line help, autosave of incoming text, 80 character/25 line display, file print capability (no fax capability). Alerts/prints up to five user-defined search strings (SelCals); blocks two undesired messages (reverse SelCals); visual and audio alerts for text matches which can be selectively routed to the printer.

SFT 14 Screen Capture Interface for M400 $109.95

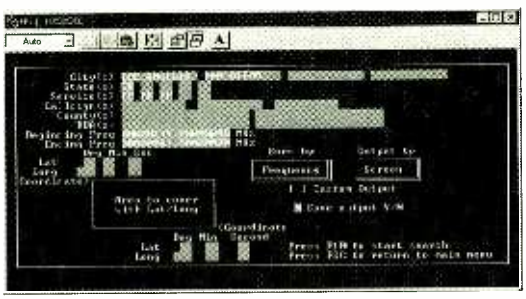
Connected to your shortwave receiver (SSB mode), you can read RTTY, SITOR, FEC-A, SWED-ARQ, and even FAX pictures when used with a printer! There is no Morse code or packet capability. A jack is included to attach an external speaker so that you can still listen if your internal speaker is disconnected when using the M-400.

Input jacks provided for either audio or discriminator interconnect. AC wall adaptor, full manual and pair of 1/8" (3.5 mm) plugs included. *Your parallel printer will allow full page hardcopy.*

1996 Enhanced Grove FCC Database v6.0

Available on both CD-ROM and High Density Diskette

The new Grove FCC Database is a spectacular compendium of all the licensees in the FCC Master File! Public safety, railroad, business, industrial, broadcast, maritime and many, many others. You can sort through fields like city, service, state, callsign, antenna height, output power, county, and many more! The program can also be custom-tailored to fit your specific searching needs using any available information you have.



Simply choose from either CD-ROM or High Density Disk.

Grove FCC Database on CD-ROM offers a unique and useful mapping program. This program shows you on a map where your desired station is including major roadways, cities, state and county borders. To operate the mapping program you must have a VGA card, 386 or higher processor, 4 M RAM, 10 M free hard disk space, and a mouse is recommended.

Shipping for both CD-ROM and High Density Disk: $4 First Class Mail

Diskette:
FCC96 (Indicate State)-HD
— CA, TX, FL **$49.95**
Additional Data Disks **$39.95**
— All Other States **$39.95**
Additional Data Disks **$29.95**
CD-ROM:
FCC-CDM w/ Mapping: **$169.95**
FCC-CD w/o Mapping: **$99.95**

Send in your old version for trade-in and get a new FCC-CD (w/o mapping) for only $49.95

Optoelectronics Frequency Scout

The **Frequency Scout** is an advanced pocket frequency counter with memory and a selectable, silent vibrator or audible beeper to alert you to signal presence. With continuous 10-2800 MHz frequency coverage and 13 millisecond intercept time, the Scout accurately displays frequencies on a 10-digit, backlit LCD. High sensitivity captures weak signals for hundreds of feet, depending upon conditions.

Connected to your ICOM R7000, R7100, R9000 (ICOM CT-17 interface and audio cable, or OptoElectronics CX 12 required), or easily-modified AR8000, you can automatically receive any intercepted signal within its frequency range!

Relative signal strengths are displayed on a 16-segment hargraph, and up to 400 different intercepted signal frequencies may be automatically stored in memory for later recall. Continuous operation for at least 8 hours on a fast two-hour-rechargeable battery. Antenna sold separately.

ORDER CTR 8
$399.95

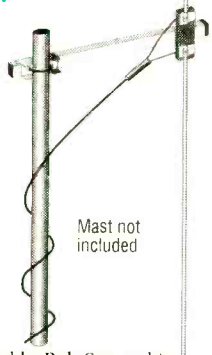
SHIPPING FOR EACH
$7.50 UPS
$9 US Priority Mail
$12 Canadian UPS
$10.50 Canadian APP

ACCESSORIES

ANT 19	4"-18" telescoping whip	$14.95
ANT 8	7"-46" long-range tele. whip	$16.95
ANT 27	Low profile 1-1/2" close-range antenna	$33.95
BRK 3	Universal Belt Clip	$4.95
CAS 8	Leather Case	$15.10

A great new omni-directional scanner antenna with flexible mounting options!

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!

Comes with balun transformer, F connector, offset pipe, mounting hardware and instructions. Choose 50 or 100 feet of coax from page 10.

ORDER ANT 5
$19.95

SHIPPING
$11 UPS
$12.50 US Priority Mail
$13.50 Canadian APP
$18 Canadian UPS

Grove's Scanner Specification Guide

Scanner	AR 3000A	AR 5000	AR 8000	ICOM R100	ICOM R8500	Radio Shack Pro 2045	Rea
Catalog Page #	2	1	2	5	1	3	
Grove Order #	SCN 26	RCV 12	SCN 27	SCN 14	SCN 1	SCN 3	
Grove Price	$1,062.95	$1995.95	$599.95	$679.95	$1999.95	$319.95	
Frequency Range	100kHz-824 MHz, 849-869 MHz, 894-2036 MHz	10 kHz-2600 Mhz (less cellular)	500kHz-1900 MHz (less cellular)	100 kHz-800 MHz, 900-1856 Hz	100 kHz-1999.99999 MHz (less cellular)	29-54, 108-174, 216-512, 806-1000 MHz (less cell.)	29-54 512
Keypad Entry?	Yes, plus tuning dial	Yes, plus tuning dial	Yes	Yes	Yes	Yes	
Tuning Steps	Programmable 50 Hz-999 kHz	Programmable 1 Hz-1 MHz	50 Hz-999.995 kHz	1/5/8/9/10/12.5/15/20-/25 kHz	10/50/100 Hz 1/2.5/5/8.9/10/12.5/20/25/-100/1000 kHz custom	5/12.5 kHz	
RIT, Fine Tuning	Tuning dial	(Not necessary)	Tuning dial	Tuning dial	No	Tuning Dial	
Display	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD, alphanumeric display	Backlit LCD	
Dimmer	On/off	Yes	On/Off	On/Off	Yes	No	
Recommended Use	Serious wide-spect mon.	Wide spectrum monitoring	Gen. purpose wide-freq	Gen. purpose wide freq. incl. FM, TV aud.	Serious wide-spectrum monitoring	General Purpose	Ger
Receiving Modes	AM/NFM/WFM/LSB/USB/CW	AM/NFM/WFM/LSB/USB/CW	AM/NFM/WFM/USB/LSB/CW	AM, NFM, WFM	AM/FM (w/ AFC)/USB/LSB/CW/RTTY	AM, NFM	
Memory	400 chan. w/ backup	650 Channels	1000 channels	100 channels	1000 channels	200 channels	1
Scan	50 channels/sec.	50 channels/sec. w/ priority	30 channels/sec.	3 modes/20 channels/sec.	40 chan./sec., multifunction	50 channels/sec.	34
Banks	4	65	20 (50 channels ea.)	Programmable	20	10	
Channel Lockout	Scan & search chan.	Yes	Yes	Yes	Yes	Yes	
Priority	4 channels	Yes	Any channel	Yes	Yes	10 channels	
Search	50 channels/sec.	50 channels/sec.	30 channels/sec.	10 ranges	Yes, with automemory write	100/300 ch./sec.	300
Delay	Yes, variable	Yes	Programmable	3 programmable functions	Yes	2 sec. any chan.	2 s
Squelch	Yes	Yes	Audio/carrier activ.	All modes	Yes	Yes	
Clock	Yes	Yes	No	24 hr. timer w/ sleep	No, sleep timer	No	
Audio Output Power	1.2 W @ 4 ohms	1 W	180 mW	2.5 W	2W @ 8 ohms	1 W	
Record Audio Output	Yes	Yes	No	Yes	Yes	No	
Recorder Activator	Yes	No	No	Yes	Yes	No	
Signal Strength Ind.	Yes	Analog S-meter	LCD bargraph	LCD bargraph	S meter with center tuning indicator	No	
Computer Interface	RS232C	Yes, all functions	RS232	No	RS232C and CI-V	No	
Conversion Scheme	Triple conv.	Triple (622.2/10.7 MHz, 455 kHz)	Triple up/quad. on WFM	Triple conv	Triple conv	Double conv	
Sensitivity	0.25-0.35uV	0.6 uV or better	.025-3 uV	0.4-10 uV	0.2 uV SSB, 0.5 uV NFM	0.5-0.8 uV nom. (NFM)	
Selectable Preamp.	No	Yes	No	Yes	No	No	
Selectable Atten.	Yes	Yes	Yes, chan. selectable	Yes	-10/-20 dB	Yes	
IF Selectivity	(-6/-60 dB): SSB 2.4/4.5 kHz; AM/NFM 12/25 kHz	3/6/15/40/110/220 kHz	SSB (-6/-50 dB): 4/15 kHz; AM/NFM: 12/25 kHz; WFM 180/800 kHz	(-6 dB) Narrow FM: 180 kHz wide FM: 6 kHz AM	5.5/12/150 kHz FM; 2.2/5.5/12 kHz AM; 2.2 kHz SSB/CW	n/a	22/30
Noise Blanker/Limiter	No	Yes	No	Yes	Yes	No	
Antenna Connector	BNC Integral whip	3, programmable frequency ranges	BNC	SO239/N	SO-239 (UHF)(0.1-30 MHz), N (30-2000 MHz)	BNC	
Dimensions	5.5"W/3"H/7.875"D	8.5"Wx3.5"Hx10"D	6"H/2.75"W/1.5"D	5.8"W/2"H/7.1"D	11.25"W/4.5"H/8.25"D	9.25"W/3.25"H/8"D	7"
Weight	2.5lbs.	7 lb. 10.5 oz.	13 oz.	3.1 lbs.	18 lbs.	2 lbs.	2
Power Requirement(s)	9-16 VDC	13.8 VDC 2.1 A or 120 VAC @ 60 Hz	4AA cells (NiCds supplied)	12 VDC	12 VDC/120 VAC @ 60 Hz	120VAC/12 VDC	
Warranty	One year	One year	One year	One year	One year	One year[2]	
Accessories Incl.	Tele. whip/AC adapt./DC adaptor/Manual	Manual/AC adaptor	AC adaptor/flex antenna/DC cord/manual/carrying strap/belt clip	VHF/UHF tele. ant./HF wire ant./DC power cable/mounting bracket/fuses/speaker-plug/cable tie/screws	Manual	Whip/AC adaptor	DC mou

Universal SCPC-200 Satellite Audio Receiver

Easily Receive Hundreds of SCPC Radio Channels On Your Standard TVRO Home Dish Satellite System!

Replacing the ever-popular SCPC-100, this flexible, new, microprocessor controlled receiver has automatic LNB drift compensation and offers direct frequency tuning with frequency readout on a high contrast LCD, and direct transponder tuning as well. Its large memory bank of 50 channels, wide/narrow bandwidth selection and automatic tuning indicators add to the feature list which also includes digital frequency lock-on, service name readout, and standard 70 MHz baseband output (tunable 50-90 MHz).

High quality audio is available from either a line output or 8 ohm speaker jack; RF input is standard 950-1450 MHz from C and Ku band LNBs. Powered by either 120 VAC, 60 Hz, or 12 VDC @ 500 mA, the SCPC-200 measures 12"W x 1-3/4"H x 8"D and weighs 8 lbs.

ORDER RCV28
$399.95

SHIPPING
$9 UPS
$18 US Priority Mail
$22.00 Canadian APP
$20.50 Canadian UPS

SCPC SPLITTER FOR YOUR SATELLITE DISH!

Connects in seconds between your satellite cable and receiver, then to your R7100 and R100 antenna port, no modification necessary!

ORDER SPL 2
$64.95

PLUS $5.50 UPS
$6.50 US Priority Mail
$11 Canadian UPS
$10 Canadian APP

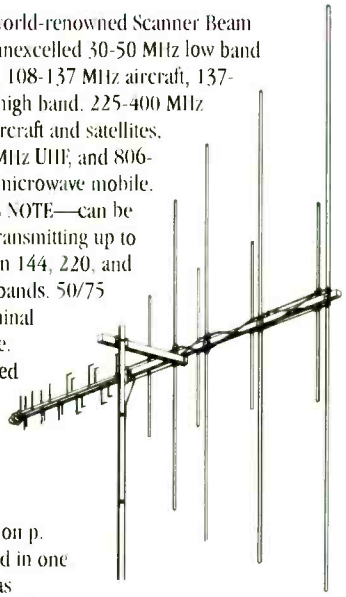
UPS Second Day Air at Ground Rates on ALL PRODUCTS!

Prices and other Specifications Subject to Change without Notice

Pro 2046	Uniden BC-230XLT	Uniden BC-890XLT	Uniden BC-3000XLT	Uniden BC-9000XLT	Uniden BCT-7	Uniden BCT-10	WiNRADIO
3	5	4	4	4	3	3	5
N 7	SCN 24	SCN 19	SCN 29	SCN 30	SCN 21	SCN 22	RCV 16
-9.95	$239.95	$269.95	$369.95	$389.95	$179.95	$179.95	$589.95
)-174, 406-956 MHz :ellular)	29-54, 108-174, 406-512, 806-956 MHz (less cellular)	29-54, 108-174, 216-512, 806-956 MHz (less cellular)	25-550, 760-1300 MHz (less cellular)	25-550, 760-1300 MHz (less cellular)	26.9-27.4/29.7-54/108-174/406-512/806-956 MHz (less cellular)	37.02-46.02/138.3-172.02/423-508.48 MHz	500 kHz-1300 MHz (less cellular)
es	Yes	Yes	Yes	Alphanumeric	No	No	Yes
5 kHz	5/12.5 kHz	5/12.5/25 kHz	5/12.5/25/50 kHz	5/12.5/25/50 kHz	5/12.5 kHz	N/A	50 Hz-1 MHz
o		Cont. tuning dial	No	Tuning knob	No	No	Yes
t LCD	Backlit LCD	Backlit LCD	Edgelit LCD alphanumeric	16-character	Backlit LCD	2-Digit LED	On screen (PC)
o	On/off	No	On/off	High/low/off	No	No	N/A
purpose bile	VHF/UHF utilities	General purpose	Gen. purpose scanning	Serious scanning	Casual Public Service Monitoring	Highway Speed Patrol Detection	Custom Listening Requirements
NFM	NFM, AM (aero) det. by freq. range	AM, NFM	WFM, NFM, AM (selectable)	WFM, NFM, AM	AM (air), NFM	VHF low, VHF high, UHF	AM, wide/narrow FM, SSB
annels	200 channels	200 channels	400 channels	500 channels	Pre-programmed by service plus user-selected frequencies	866 pre-programmed frequencies	Virtually unlimited
nels/sec.	100 channels/sec.	100/20 channels/sec.	100 channels/sec.	100 channels/sec	100 channels/sec.	N/A	50 ch/sec (FM mode)
)	10	10	20	20	12 service bands	N/A	16
s	Yes	Yes	Yes	Yes	Yes	Yes	Yes
s	10 channels	10 channels	10 channels	10 channels	No	N/A	Yes
nels/sec.	300 channels/sec.	w/ autostore	300 steps/sec.	300 steps/sec.	Yes	N/A	Yes
y chan.	2 sec. any chan.	2 sec. all chan.	2/4 sec., chan.-selectable	2 sec., chan.-selectable	2 sec., all channels	2 sec., all channels	Programmable
s	Yes	Yes	Yes	Yes	Yes	N/A	Yes
)	No	No	No	No	No	No	Yes
V	180 mW	2.7 W	320 mW	2.2 W	3 W	1 W	200 mW
)	No	Yes	Spkr. & earph. jacks	Yes	No	No	8 ohm mini-jack
)	No	No	No	Yes	No	No	No
)	No	No	No	No	No	LED	On Screen
)	No	No	No	No	No	No	Expansion Slot
onv	Double conv.	Dual conv.	Triple-up conv.	Triple-up conv.	Double conversion	N/A	Triple Conversion
ave.	0.5 uV nom NFM	0.75-1.1 uV			0.5-0.7 uV	0.3-0.5 uV	0.35 uV NFM ;1 uV SSB;1.5 uV AM (nom.)
)	No	No	No	No	No	No	No
)	No	No	No	Yes, chan. selectable	No	No	Yes
-6/-50 dB						N/A	(-6dB) AM/SSB 6 kHz; NFM 17 kHz; WFM 280 kHz
	No	No	No	No	No	No	No
)	BNC	BNC	BNC	BNC	BNC	BNC	BNC
/7.5"D	6"H/2.5"W/1.7"D	10.5"W/3.5"H/7.5"D	7.4"H/2.7"W/1.5"D	10.5"H/3.36"W/7.5"D	5.25"Wx1.62"Hx7"D	3"Wx5.25"Dx1.3"H	PC expansion card
3 oz.	2 lbs.	3 lbs. 14 oz.	13 oz.	4lbs.	1lb. 11 oz.	7 oz.	N/A
DC /DC	Battery	120VAC/12 VDC	6.5 VDC	12 VDC (AC adapt. incl.)	12 VDC	13.8 VDC	PC bus powered
ear²	One year	One year	One year	One year	One year	One year	One year
Mobile bracket	Flex antenna/belt clip/manual/earphone, extra battery pack/drop-in charger	AC adaptor/tele. whip/instructions	Rechargeable bat. pack/AC wall adaptor-charger/belt clip/flex antenna/earphone/manual	AC adaptor/tele. whip/owner's manual	Mobile bracket, DC cord, cigarette lighter cord, AC adaptor, telescopic whip, mobile whip	Windshield mount, visor mount, built-in antenna, DC power cord, hard wired power cord	3-1/2" disk, manual

Famous Grove Scanner Beam

6-9 dB gain over other scanner antennas!



Our world-renowned Scanner Beam provides unexcelled 30-50 MHz low band reception, 108-137 MHz aircraft, 137-174 MHz high band, 225-400 MHz military aircraft and satellites, 406-512 MHz UHF, and 806-960 MHz microwave mobile.

HAMS NOTE—can be used for transmitting up to 25 watts on 144, 220, and 420 MHz bands. 50/75 ohms nominal impedance. May be used with inexpensive TV antenna rotator (available on p. 12, or fixed in one direction as required for those elusive, distant stations. 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—available on p. 10). Approximate size 8'H x 5'W.

ORDER ANT 1
$59.95

SHIPPING
$11 UPS
$12.50 US Priority Mail
$13.50 Canadian APP
$18 Canadian UPS

Shipped only in US and Canada

Professional Wideband Discone

Best Discone on the Market for VHF/UHF Receivers and Transmitters

The discone antenna is used by government and military agencies worldwide because of its wide bandwidth characteristics and non-directional coverage. Now Diamond offers this professional grade discone at a popular price.

Designed for use with wide-frequency coverage VHF/UHF scanners and receivers, the Diamond D130J 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 D130J 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 accomodate any standard mast-pipe (1" to 2-1/8" diameter). Choose 50 or 100 feet of coax from page 10.

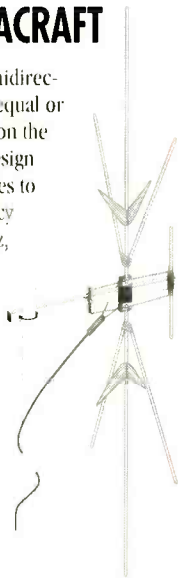
ORDER ANT 9
$87.95

SHIPPING
$8 UPS
$8 US Priority Mail
$10.50 Canadian APP
$15 Canadian UPS

SPECIFICATIONS

Frequency coverage	25-1300 MHz
Impedance	50 ohms nominal
Power rating	200 watts
Connector	UHF
Antenna style	Discone
Vertical length	66 inches
Weight	2.2 pounds

THE SCANTENNA FROM ANTENNACRAFT



This full-frequency, 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! Requires TV type F connector on your coax—available below. Approximate size 7-1/2"H x 4-1/2"W.

ORDER ANT 7
$39.95

SHIPPING
$11 UPS
$8 US Priority Mail
$11.50 Canadian APP
$18 Canadian UPS

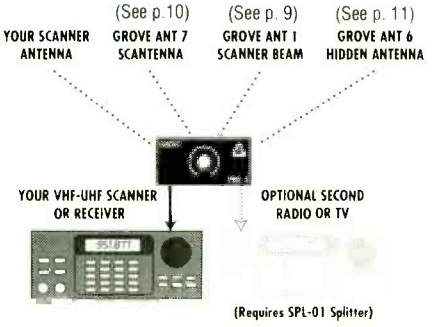
Shipped only in U.S. and Canada

Grove PRE-5A VHF/UHF Signal Booster

Now Grove has integrated its high-performance preamplifier and control box into one convenient unit, offering improved performance. The new PRE-5A offers wide dynamic range and low noise for weak signal boosting, and improved overload (intermod) reduction unmatched in other 30-1000 MHz preamplifiers.

Single knob operation offers continuous gain control from -10 dB attenuation to +18 dB amplification. Switched off, signals are automatically routed from the antenna directly to the receiver, bypassing the preamplifier.

Use the new PRE-5A with up to 100 feet of Grove low-loss coax to your antenna and enjoy improved VHF/UHF reception on scanners, TVs, FM stereos, and other receiving equipment (not to be used for transmitting). Powered by 12 VDC @500 mA; AC adaptor not included.



ORDER PRE 5A
$89.95

SHIPPING
$6.50 UPS
$8.50 US Priority Mail
$11.50 Canadian APP
$10.50 Canadian UPS

ACCESSORIES

PWR 21	500MA Power Supply	$9.95
SPL 01	Splitter	$2.95
ADAPTOR KITS:		
ADPK 3	BNC/F	$9.95
ADPK 6	Motorola/BNC	$9.95
ADPK 9	N/F	$12.95

Also perfect for use with the OMNI and Discone

PRE-5 SPECIFICATIONS:
GAIN: Continuously adjustable —10 dB to +18 dB
FREQUENCY RANGE: 30-1000+ MHz
NOISE FIGURE: 3.5 dB
3RD ORDER INTERCEPT POINT: +27 dBm
DIMENSIONS: 4"W x 2"H x 3"D
WEIGHT: 10 oz.
CONNECTORS: Low-loss type F
POWER REQUIRED: 12 VDC 500 MA(nom.)

GRE Super Converter

Receive continuous 800-1000 MHz on your programmable scanner

Looking for the best way to get uninterrupted 800-1000 MHz coverage in your desktop scanner? These high-sensitivity converters from GRE will fill in the gap!

Simply install a nine-volt battery (not supplied) or AC adaptor (optional); BNC connectors are provided to interconnect with your scanner. Use an 800 MHz-capable external antenna or attach a whip adjusted to about 4" (or 12" for gain) like the Grove ANT-19 ($14.95) or ANT-8 ($16.95).

When you tune 406-512 MHz on your scanner, you will be receiving 806-912 MHz! Just add 400 to the frequency displayed on your scanner, and you'll know your receive frequency when the converter is switched on. A handy bypass switch allows you to restore normal operation of your scanner without having to remove the converter.

ORDER CVR03
$84.95

SHIPPING
$6 UPS
$7 US Priority Mail
$8.50 Canadian APP
$10Canadian UPS

ACCESSORIES

ANT 22	High gain 800 MHz portable ant.	$29.95
PWR 13	Universal power supply	$9.95
BAT 4	9volt battery	$2.25

Premium Low-Loss RG6-U Cable and Adaptors

Have you had trouble finding the right coaxial adaptors for linking your antenna and receiver? We can help! Simply tell us what adaptors you need, or what antenna and radio you will be using. We will provide you with a cable which is ready to attach between your antenna and receiver!

RG 59U
(25 feet w/ adaptors)
ORDER CBL 25
$9.95

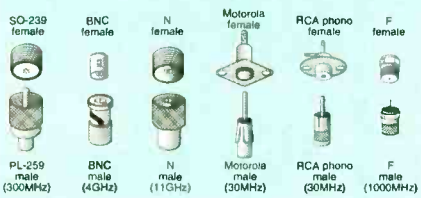
$5.50 UPS
$5.50 US Priority Mail
$7 Canadian APP
$12 Canadian UPS

RG 6U
(50 feet w/ adaptors)
ORDER CBL 50
$14.95

$6.50 UPS
$6.50 US Priority Mail
$8 Canadian APP
$13 Canadian UPS

RG 6U
(100 feet w/ adaptors)
ORDER CBL 100
$19.95

$7 UPS
$7.50 US Priority Mail
$9 Canadian APP
$17 Canadian UPS



ADAPTORS AVAILABLE

ADP 1	UHF Female to F male
ADP 2	F Female to PL259 Male
ADP 3	F Female to N Male
ADP 4	F Female to Male 1/8" Mini-Plug
ADP 5	N Female to BNC Male
ADP 6	UHF Female to Male 1/8" Mini-Plug
ADP 7	UHF Female to N Male
ADP 9	F Female to BNC Male
ADP 10	UHF female to BNC Male
ADP 11	UHF female to RCA male
ADP 12	BNC female to N male
ADP 13	BNC/BNC (right angle elbow)
ADP 14	F female to RCA male
ADP 15	N female to F male
ADP 17	BNC female to F male
ADP 18	F female to 2 wires
ADP 19	UHFfemale to 2 wires
ADP 22	Motoraola female to BNC male
ADP 23	UHF female to UHF female barrell–$1.50
ADP 24	BNC female to PL259 male
ADP 26	F female to F female barrel—$2.00
ADP 27	Banana Plug—$2.00
ADP 28	F female to PAL fem. Satellite700
ADP 29	3.5mm female to 2.5mm male min. plug—$1.50
ADP 30	Dual BNC fema. to BNC male T-adaptor—$1.50
ADPK 10	F female to Motorola male
ADPK 13	F male to F male 3ft.cable—$2.50
ADPK 14	F/Motorola cable, 3ft.—$2.50
ADPK 15	PL259 male to PL259 male 3ft.—$2.50
ADPK 16	BNC male/ BNC male 3ft cable

Unless otherwise specified, adaptors may be ordered separately for $5.95 each. Free shipping if ordered with other products; $2.50 for one or more shipped alone.

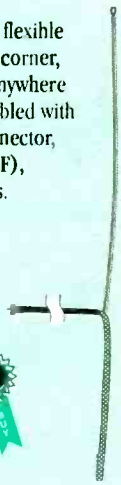
If you are unsure which adaptor is needed, call Chanel or Sue at 704-837-7081 or e-mail them at tech@grove.net for assistance.

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

The Unique Grove HIDDEN ANTENNA

The Hidden Antenna may be used alone with your scanner for improved signal reception over your attachable whip, or may be connected to the powerful GRE PRE-1 or Grove PRE-5 for considerably increased signal strengths.

This five-foot, thin-profile, flexible wire antenna can be hung in a corner, behind a drape— just about anywhere out of sight. Comes fully assembled with 20 feet of coax and F male connector, with 3 adaptors for PL259 (UHF), Motorola and BNC connections.



ORDER ANT 6
$19.95

SHIPPING
$6.75 UPS
$4.50 US Priority Mail
$6.50 Canadian APP
$10 Canadian UPS

The Grove No-Tenna™

Turn Your Car into a Giant All-Band Antenna!

Imagine: strong, clear, continuous frequency coverage of shortwave and scanner signals without having to mount an antenna anywhere on your car! No invitation to theft, suspicion, breakage, low overhangs, hole drilling, scraped paint, or cables through doors or windows. **No visible antenna whatsoever!** The 8' cable mounts in seconds, using your entire car body as a giant, 1-1000 MHz, all-band antenna!

Ideal for city dwellers, travelers, reporters, investigators—anyone who doesn't want a visible receiving antenna on his vehicle (not for transmitting).

Full instructions and universal connectors for RCA, BNC and 1/8" (3.5mm) miniplug included. If you own an ICOM R-100 be sure to specify a PL-259 adaptor.

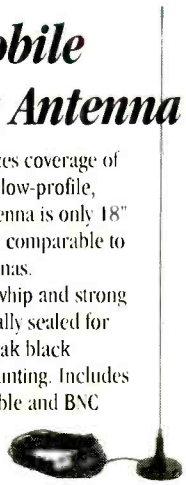
ORDER ANT 20
$19.95

SHIPPING
$5 UPS
$5 US Priority Mail
$6 Canadian APP
$6.50 Canadian UPS

STEALTH *Mobile Monitoring Antenna*

A unique design optimizes coverage of the 30-960 MHz bands; this low-profile, magnetic-mount mobile antenna is only 18" high, yet offers performance comparable to much bulkier scanner antennas.

Rugged, stainless-steel whip and strong magnetic base are hermetically sealed for waterproof construction, sleak black finished for unobtrusive mounting. Includes 14 feet of small-diameter cable and BNC connector.



ORDER ANT 30
$29.95

SHIPPING
$7.50 UPS Ground
$7 US Priority Mail
$10 Canadian APP
$15 Canadian UPS

Windshield Mount Scanner Antenna

No holes and no magnets, this 22" Valor Glas-Master is designed for today's wide-frequency-coverage mobile scanners, 30-1200 MHz (not for transmitting). Simply clean an area on your rear window (cleansing pad included) and stick the antenna base to the glass. A companion coupler on the inside of the window does the rest!

15' of cable with BNC and Motorola connectors included—no assembly required.

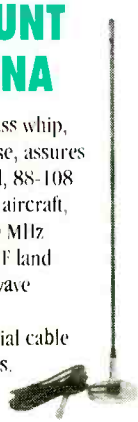
ORDER ANT 13
$29.95

SHIPPING
$7 US Priority Mail
$7.50 UPS
$10 Canadian APP
$15 Canadian UPS

MAGNETIC MOUNT MOBILE ANTENNA

This sleek, black, 24" fiberglass whip, mounted on a strong magnetic base, assures reception on 30-50 MHz low band, 88-108 MHz FM broadcast, 118-136 MHz aircraft, 136-174 MHz high band, 225-400 MHz military aircraft, 406-512 MHz UHF land mobile, and 806-960 MHz microwave mobile.

Equipped with 12 feet of coaxial cable with Motorola and BNC connectors.



ORDER ANT 4
$29.95

SHIPPING
$7.50 UPS
$7 US Priority Mail
$10 Canadian APP
$15 Canadian UPS

(Also available: **ANT 4W** is the whip antenna alone for your 3/8" x 24 TPI threaded mount, $12.95 plus $6.50 UPS shipping)

From Max Systems: High Gain 800 MHz Portable Antenna

The Max Systems antenna will make a tremendous improvement in 806-960 MHz reception over the whip provided with your hand-held or desktop scanner! (Not usable in other frequency ranges.)

Equipped with standard BNC connector; rugged ground-plane construction for optimum performance. Only 7-1/2" tall. Ideal for use with GRE converters.

ORDER ANT 22
$29.95
With straight connector for handhelds

ORDER ANT 23
$34.95
With right-angle conn for desktop use

SHIPPING: $7 UPS; $8.50 US Priority Mail; $11.50 Canadian UPS; $15 Canadian APP

Universal Whip

Replace that inefficient flex antenna with our universal full-length whip—and stand back! Extendable from 7 to 46 inches, the ANT-8 is made of chrome-plated brass and equipped with a standard BNC base. Transmits on 45-960 MHz; receives 25-1300 MHz. If your interest doesn't include 30-50 MHz low band, choose our new ANT-19 with its full adjustability from 4"-18" (transmits and receives from 144-960 MHz). ANT-8B has right-angle BNC adaptor. ANT-8N has right-angle N adaptor.

Order ANT 8 (7"-46") **$16.95**
ANT 19 (4"-18") **$14.95**
ANT 8B **$21.95**
ANT-8N **$23.95**

SHIPPING: $5.50 UPS; $5 First Class Mail; $4.50 Canadian APP; $10 Canadian UPS

High Gain Flex Antenna

This "rubber duckie" really makes a difference on handheld scanners. The 12" Austin Condor is guaranteed to improve weak signal scanner reception—on all frequency ranges—over the original scanner antenna.

ORDER ANT 14 ..... **$29.95**
ORDER ANT 14B (BNC right-angle conn.) **$34.95**
ORDER ANT 14N (N right-angle conn.) **$36.95**

SHIPPING: $6.50 UPS; $5 US Priority Mail; $10 Canadian UPS; $6.50 Canadian APP

GROVE'S SCANNER ACCESSORY MART

Magellan GPS Receivers

Ruggedly built and waterproof, yet barely more than 6" high and weighing only 10 ounces, these pocket precision receivers home in on 1.2-1.5 GHz global positioning satellites, using their signals to establish your exact location to within 100 yards in as little as 2-1/2 minutes from a cold start (35 seconds warm start), even your altitude, and allows you to plot and track your motion as well, so you can find your way back if necessary.

Ideal for pinpointing campsites, fishing holes, boating, travelers, trailheads, map locations, landmarks. Selectable graphic screens assist you in tracking and plotting where you've been, where you're going, and where you *ought* to be going! Shows distances, directions, times, speed, course corrections, latitude/longitude coordinates, all on a backlit LCD display.

Up to 17 hours of continuous use on one set of standard alkaline AA cells. Operates over a 14 to 140 degree Fahrenheit temperature range. Lanyard strap inlcuded.

All these features make the GPS 2000 Satellite Navigator (above) an incredible value. Or select the upgraded GPS 3000 (left) and get two additional navigation screens, a data port (RTCM 104 in, NMEA out), OSGB coordinates, 100 additional waypoints, 5 more routes, external antenna capability, celestial calculations, swivel mounting bracket, batteries, manuals, and a carrying case.

ORDER GPS 2000 **$149.95** ORDER GPS 3000 **$249.95**

SHIPPING FOR EACH: $9 UPS; $13 US Priority Mail; $15 Canadian APP; $16.50 Canadian UPS

Accessories For BOTH		
ACC 13	Instr. video for 2000	$14.95
ACC 14	Instr. video for 3000	$14.95
CAS 7	Carrying case (GPS 2000 only)	$9.95
BAT 1	AA Alkaline Batteries	$.79
BAT 13	AA Energizer Batteries	$2.75

GP 3000 EXTRA Accessories		
ACC 11	Power/ Data Module and External Antenna Kit, 20' Coax	$149.95

Auto Antenna Multicoupler

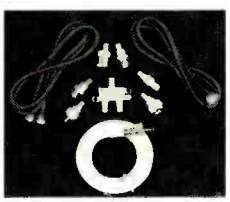
Enjoy excellent 30-960 MHz mobile scanner reception using your existing AM/FM auto antenna? That's right; no holes, no magnets, no scratched paint—no clumsy cables going through doors and windows!

The Para Dynamics PDC 63 Mobile Multicoupler takes only seconds to install and allows simultaneous use of your AM/FM car radio as well as your mobile scanner. Comes equipped with your choice of Motorola or BNC connector.

ORDER CPL-63M (Motorola) $14.95
ORDER CPL-63B (BNC) $16.95

SHIPPING: $5.50 UPS; $5 US Priority Mail; $10 Canadian UPS; $6.50 Canadian APP

Dual Scanner Multicoupler



Connect two scanners (or one scanner with separate antenna jacks) to one antenna cable! Insertion loss only 3dB maximum; port isolation typically 25 dB; impedance 50-75 ohms. Package consists of a wide-frequency-coverage splitter (25-1300 MHz or more) and three output cables with adaptors for UHF (PL-259), Motorola, F, and BNC connectors (input and output).

ORDER CPL-SC **$29.95**

SHIPPING
$5.50 UPS
$5.50 US Priority Mail
$6.50 Canadian APP
$7 Canadian UPS

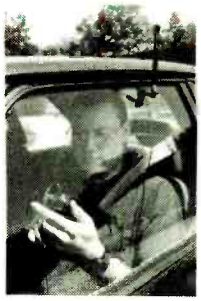
Pro Antenna Switch

Switch your scanner, shortwave receiver, ham transceiver, or any other radio device operating at frequencies as high as 1000 MHz with this superb, die-cast, waveguide-cavity antenna switch. Handles up to 2500 watts PEP for transmitting, VSWR under 1:1.2, insertion loss only 0.2 dB, and port-to-port isolation 60 dB. Automatically grounds unselected port. Standard UHF (SO-239) connectors mate with PL-259 and other adaptors.

ORDER SWC 1 **$25.95**

SHIPPING
$5 UPS
$4.50 US Priority Mail
$10 Canadian UPS
$6.50 Canadian APP

Car Window Antenna Clip



Dramatically increase your mobile range with a hand-held scanner or two-way radio without resorting to a permanent or magnetic whip. Simply slip this unobtrusive, durable custom bracket on a side window and roll it up! Equipped with standard BNC connector to accommodate most compact whips.

ORDER BRK 9 **$28.95**

SHIPPING
$5.50 UPS
$5.50 US Priority Mail
$6.50 Canadian APP
$7 Canadian UPS

Heavy Duty Rotator

Ideal for the Grove Scanner Beam, amateur VHF/UHF antennas, TV and FM antennas, this rotator features a heavy-duty motor with high torque (tested through 70 MPH winds) with brake pads to protect the drive train. Two synchronized motors give precise station location; extra-strength machine gears overcome ice loads without binding. Mounts on masts up to 2" diameter. Requires 3 conductor cables (optional). Fast and easy installation.

ORDER ROT 1 **$59.95**

SHIPPING
$7.50 UPS
$11.50 US Priority Mail
$18 Canadian UPS
$14.50 Canadian APP

ACCESSORIES:

CBL 2	50 feet 3-conductor cable	$5.95
CBL 3	100 feet 3-conductor cable	$8.95

Lightning/EMP Protector

While nothing can withstand a direct lightning hit, the Grove LAR-1 connects between your antenna cable and radio to prevent induced voltages from nearby lightning strokes and high-powered transmitters from burning out your equipment*

Uses state-of-the-art gas discharge technology. Extremely low signal loss—0.2 dB at 1500 MHz! Ideal for protecting scanners, shortwave receivers, CB and ham equipment, VCRs, TVs, satellite receivers, FM stereo systems, and more. May be used with transmitters up to 100 watts, and at frequencies up to 2000 MHz.

		SHIPPING
LAR1F (with F conn)	$19.95	$5 UPS
LAR1B (with BNC conn)	$24.95	$4.50 US Pr. Mail
LAR1P (w/ PL-259 UHF conn)	$24.95	$6.50 Can. APP
LAR1M (with Motorola conn)	$29.95	$9.50 Can. UPS

*Will not prevent AC power line surges. Appearance may vary from illustration.

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

GROVE'S SCANNER ACCESSORY MART

SP200A Signal Enhancer!

The Grove SP-200A combines these features—speaker, adjustable notch/peak filter, audio amplifier, bass and treble equalizers, audio squelch, recorder activator and noise limiter—all in one attractively styled solid oak cabinet! This quality accessory is guaranteed to improve reception on any receiver, scanner or transceiver.

Peak desired signals while reducing or even eliminating interference. Ideal for voice, music, CW or data. Equipped with stereo-mono headphone jack for privacy. Heavy-duty AC power supply is included at no extra charge! The cabinet is hand-crafted in the mountains of North Carolina.

ORDER SPK 13
$199.95

SHIPPING
$8 UPS
$17.50 US Priority Mail
$15 Canadian UPS
$20.50 Canadian APP

NEW! Universal Headset

This lightweight headset with volume control is ideal for stereo music as well as communications applications. The adjustable headband with cushioned earpieces affords maximum comfort, while the 20-20,000 Hz frequency range assures brilliant highs and thundering bass. Six foot cord is terminated in a 3.5 mm (1/8") stereo plug; 1/4" stereo adaptor included.

ORDER HDP 2
$19.95

SHIPPING
$6.50 UPS
$6.50 US Priority Mail
$10 Canadian UPS
$8 Canadian APP

Clip-On Mini Speaker

Great for hand-helds, this tiny (2" square), lightweight (2-3/4 oz.) speaker plugs into any standard 1/8" (3.5 mm) earphone jack and provides excellent, concentrated sound when clipped to a lapel or collar. Ideal for crowded or noisy locations where you don't want your scanner blaring and don't want the confinement of an earphone.

ORDER SPK 9
$10.95

SHIPPING
$5.50 UPS
$4.50 US Priority Mail
$9 Canadian UPS
$5.50 Canadian APP

ACCESSORY
ADP 29 3/32" (2.5 mm) adaptor *(for BC200XLT, etc.)* $1.50

Cassette Audio Adaptor

Listen to your scanner over your car or home stereo! Imagine—any electronic component that you own with an audio output jack (including your scanner or shortwave receiver) can be played directly through your home stereo system, portable "boom box," auto stereo or any other cassette player to provide full, rich sound! Shaped like a normal cassette, this adaptor slides into your cassette player. Your scanner or audio device then attaches to the adaptor with a 1/8" (3.5 mm) stereo or mono plug (included with flexible cord). Requires no power.

ORDER ACC 79
$9.95

SHIPPING
$2 First Class
$4 UPS
$5.50 Canadian APP
$6 Canadian UPS

Noise-Cancelling Speaker

This low-cost mobile and base speaker is ideal for scanners, CBs, mini-portables, and other communications accessories that would benefit from an external speaker. A pushbutton high-frequency-rolloff switch reduces crackling, pulse noise. Measuring approximately 4" square, this compact accessory speaker is rated at 10 watts and comes with 10' cable and 1/8" (3.5 mm) miniplug. Hinged mobile mounting bracket included.

ORDER SPK 6
$16.95

SHIPPING
$5.50 UPS
$4.50 US Priority Mail
$9 Canadian UPS
$5.50 Canadian APP

Sun Visor Mobile Speaker

Clever, convenient, and barely 1-1/4" thin; simply slide this 5-1/2" x 3" dual speaker on your vehicle's sun visor for high quality, concentrated sound. Ideal for noisy environments. Includes 6' cord with 1/8" (3.5 mm) miniplug.

ORDER SPK 15
$16.95

SHIPPING
$5.50 UPS
$4.50 US Priority Mail
$9 Canadian UPS
$5.50 Canadian APP

Did You Miss Us?

No Problem—We're on Tape!

High quality audiocassettes are now available for all the seminars of the 1996 Grove Communications Expo, putting you right there at the expert's podium! Order the complete set for a big discount!

TP-01	International Broadcasters Forum	$19.95
TP-02	Special Interest	9.95
TP-03	Nature's Radio Spectrum, by Cary	9.95
TP-04	AM DX - A Great Way to Start, by Smith	9.95
TP-05	DX S/W Broadcast Bands, by Arland	9.95
TP-06	Illicit Pirate & Clandestine Broadcasting, by Zeller	9.95
TP-07	Making Propagation Work For You, by Arlond	9.95
TP-08	ACARS - Aviation's New World Wide Web, by Evans	9.95
TP-09	DXing the HF Utility Bands, by Van Horn	9.95
TP-10	Digital Communications - a Medium in Transition, by Evans	9.95
TP-11	Scanning - Making the Beginner A Pro, by Grove	9.95
TP-12	The Future of Public Safety Monitoring, by Barnett	9.95
TP-13	Antenna Basics Class - Learning Your ABC's, by Grove	9.95
TP-14	Monitoring Big Brother - Government Radio Listening, by Van Horn	9.95
TP-15	Advance Surveillance Techniques, by Fulford	9.95
TP-16	Trunking Technology, by Graham	9.95
TP-17	Scanning the Unknown, by Wyman	9.95
TP-18	Legal Listening in the 90's - Passing Go & Staying Out of Jail, by Rodriguez	9.95
TP-19	Getting Started in Beginner Satellite, by Reitz	9.95
TP-20	GPS: The Simple Science & Exploding Industry, by Dye	9.95
TP-21	Monitoring Russian Satellites, Telemetry & Earth Imagery, by Wallach	9.95
TP-23	Monitoring INMARSAT, by Oickersan	9.95
TP-24	History of OSCAR Satellite, by Maglicane	9.95
TP-25	AMSAT Phase 3D Update, by Baker	9.95
TP-26	Beyond the Domestic Arc & Other Satellite Stuff Nobody Ever Told You About, by Taylor	9.95
TP-27	Beginners Guide to Bug Hunts, by Fulford	9.95
TP-29	Internet & Radio Hobbyist, by Van Horn	9.95
TP-30	Computer Software for the Radio Hobbyist, by Catalano	9.95
TP-31	Satellite Tracking Software, by Kelso	9.95
TP-33	FM/TV: 1000 miles TV Reception - You Can Do It, by Smith	9.95
TP-34	Visually Observing Earth Satellites, by Kelso	9.95
TP-35	Banquet, by Dr. Ron Parise	9.95
TPSET-96	Complete Set of 32 Tapes	$269.95

* Because tapes are easily copied, they are not refundable. Defective copies will be replaced at no charge.

SHIPPING
$2.50 per tape (not to exceed $7.50)
$7.50 for set

Based upon the Supreme Court rulings of McLeod vs. Dillworth (1944), Bellas Hess (1967) and the proposed Brooks legislation (H.R. 2230), effective September 1, 1990, Grove Enterprises will no longer collect sales or use taxes apparently invalidly levied by states against residents when they purchase from us in North Carolina. We have neither economic presence nor nexus in these states as established by the U.S. Supreme Court.

To Speed Your Order, Follow These Simple Steps:

Postal Orders: Include the product name or description, catalog number, price, shipping charge per item (overpayments for multiple items will be refunded), your name, shipping address (or billing address if different), shipping method, and payment method. Include a check, money order or credit card number (Mastercard, Visa, Discover Card), expiration date and issuing bank. Please send no cash or stamps. C.O.D. is an additional $5.50 per package, available UPS ground rate only, payable upon delivery by cash, certified check or money order. Mail your order to Grove Enterprises, PO Box 98, Brasstown, NC 28902.

E-Mail Orders: Be prepared with the information requested above and send it to: order@grove.net.

Phone Orders: Be prepared with the information requested above and call toll-free: (800) 438-8155; outside the U.S. and Canada call (704) 837-9200 (no collect calls please).

Fax Orders: Prepare the information requested above and fax it to: (704) 837-2216.

U.S. Shipping and Delivery: Unless you are notified of a delay, all parcels are shipped within one working day upon receipt of your order to the 50 United States by UPS 2nd Day Air at normal ground rates. UPS Next Day Air is available at additional cost. Express and Priority Mail are also available; contact us for charges.

U.S.Postal Service delivery is typically within 10 days of shipment, although book rate delivery may take up to four weeks. If you do not receive your parcel by the end of these time frames, call us to put a tracer on your order.

Purchase Orders: Written purchase orders are accepted from city, state and federal agencies and institutions. Terms are net within 10 days, with an additional 1-1/2% per month service charge beyond 10 days.

Foreign Shipments: Place your order as described above, contacting us for shipping costs. Payment is expected by International Money Order or a bank draft drawn in U.S. currency drawn on a U.S. bank. Post Office insurance does not apply to some countries and we do not assume any responsibility for losses beyond proof of shipment. No CODs accepted from APOs, FPOs or addresses outside the U.S.A.

Order Blank 1/97

Is this an address change? _____ *Yes!* _____ *No!*

If this is your first order, where did you hear about Grove Enterprises? _____

Shipping Address:

NAME: _____

STREET ADDRESS: _____

_____

CITY _____ STATE_____ZIP_____

DAYTIME PHONE: (Area Code) _____

Billing Address

NAME: _____

STREET ADDRESS: _____

_____

CITY _____ STATE_____ZIP_____

HOME PHONE: (Area Code) _____

Payment Method:

Personal checks subject to verification.

❒ CHECK ❒ MONEY ORDER
❒ COD ❒ MASTERCARD
❒ VISA ❒ DISCOVER CARD

Shipping Method:

❒ UPS 2ND DAY ❒ US PRIORITY/FIRST CLASS MAIL
❒ UPS NEXT DAY ❒ BOOKRATE (*Book orders only*)

Product	Stock #	Quantity	Price	Shipping	TOTAL
Customer Service: If you are confused about what equipment to order, call Sue or Chanel at 704-837-7081, 8:00-5:00					
Monitoring Times **magazine subscription**		1 year*	$23.95 (US)	----------	
NEW! **6-month subscription to *MT* magazine**		6 months*	$12.95 (US)	----------	
Satellite Times **magazine subscription**		1 year**	$19.95 (US)	----------	

* Two-year subscription to *Monitoring Times*, $45.95; Three years, $67.95. Foreign air mail, one year $85.95

** Two-year subscription to Satellite Times, $38; Three years, $56. Foreign air mail, one year $68.00

Credit Card Orders:

Card Number: _____

Exp Date: _____

Signature: _____

TOTAL $ _____

NC Residents add 6% Sales Tax $ _____

TOTAL ENCLOSED $ _____

Mail order to: Grove Enterprises, P.O. Box 98, 7540 Hwy. 64 West, Brasstown, NC 28902; **Phone:** (800) 438-8155; (704) 837-9200; FAX (704) 837-2216; Online at *www.grove.net*

GROVE'S SCANNER ACCESSORY MART

Interference Eliminators

Ideal for suppressing overload interference from AM and shortwave broadcasters, CB, Aircraft and more. Reject unwanted signals by 40 dB or more; reduce intermod interference by at least 120 dB! Filters can be combined for deeper rejection or multiple frequencies. Simply choose your filter(s) from the list below and specify your antenna connectors.

FTR 6: 30-2000 MHz Bandpass Filter. Removes AM broadcast, CB and shortwave interference from scanners

FTR 8: 118-137 MHz Band Reject Filter. Removes aircraft interference from scanners

ORDER FTR 6 or 8
$29.95

ADAPTOR KITS:

ADPK 1 PL-259 (UHF)	$9.95
ADPK 3 BNC/F	$9.95
ADPK 6 Motorola/BNC	$9.95
ADPK 9 N/F	$12.95

SHIPPING: $5 US Priority Mail; $6.50 Canadian APP; $10 Canadian UPS

GRE Super Amplifier

Boost the range of your hand-held scanner. GRE Super Amplifier has 20 dB (adjustable) gain from 100-1000 MHz! BNC connectors allow the Super Amplifier to be mounted between the scanner and antenna; a bypass switch permits the unit to be disabled without having to remove it. A 9-volt alkaline battery (not supplied) will provide up to 24 hours of continuous operation; a convenient external power jack permits the unit to be used continuously from a 9 V DC wall adaptor (not supplied).

ORDER PRE 1
$49.95

SHIPPING: $6.50 UPS; $6 US Priority Mail; $10 Canadian UPS; $7.50 Canadian APP

ACCESSORIES

ANT8	7"-46" long-range tele.whip	$16.95
ANT 22	High gain 800 MHz antenna	$29.95
PWR 13	Universal power supply	$9.95
BAT 4	9volt battery	$2.25

Variable Attenuator

Reduce scanner and shortwave intermod and desensitization with this variable attenuator. Adjustable from 0 to 20 dB attenuation from 0-1000 MHz or higher! Can also be used to reduce distortion when connected between a radio's audio output and your tape recorder! Equipped with F connectors; adaptors available from list below.

ORDER ATT 1
$9.95

SHIPPING
$5.50 UPS or Priority Mail
$6.50 Canadian APP
$7 Canadian UPS

Adaptor Kits

ADPK 1	PL-259 (UHF)	$9.95
ADPK 3	BNC/F	$9.95
ADPK 6	Motorola/BNC	$9.95
ADPK 9	N/F	$12.95

NIGHTLOGGER II

Tape Automatic Recorder Activator

This respected product is now improved, offering manual-auto switch, line-spike protection, "record" indicator lamp, removable/replaceable cables, internal monitoring speaker, volume control, adjustable dropout time delay, and dry-contact relay switching. Ideal for unattended recording of scanner traffic, shortwave programs, events, and official communications record logging. AC adaptor, audio and control cables included.

ORDER ACC 2
$69.95

SHIPPING
$5.50 US Priority Mail
$6.50 UPS
$7.00 Canadian APP
$10 Canadian UPS

Desktop Stand/Charger

Looking for a way to use your handheld transceiver or scanner as a desktop unit, powering or charging it from the AC line? Two cables are provided to fit the majority of radios which require 12 VDC, center pin positive (+). A second charge jack allows powering an accessory or second radio simultaneously at up to 350 mA current drain.

Ideal for popular 12-volt-charged radios from Uniden, Icom, AOR, Yupiteru,Trident, and more.

ORDER PWR 2
$59.95

SHIPPING
$6.50 UPS
$6.50 US Priority Mail
$8 Canadian APP
$10.50 Canadian UPS

Power Pocket

A sealed, rechargeable, lead/acid battery which provides 12 volts at 2 ampere-hours for rugged, extended-life applications! Encased in a secure pouch with a belt loop and shoulder strap provision, a completely discharged Power Pocket can be recharged in only 6-8 hours and will hold a useful charge for up to half a year! You can expect 3 to 5 years lifetime from this compact unit which comes complete with cigarette lighter receptacle to fit a variety of Grove power adaptors. AC charger included at no additional cost.

ORDER BAT 16
$59.95

SHIPPING
$6 UPS Ground
$5.50 US Priority Mail
$7.50 Canadian UPS
$10.50 Canadian APP

Pro Power Supply

Operating from 100-115 volts AC, this rugged, compact (5"W x 3"H x 5"D) lab power supply is ideal for powering those mobile and portable, battery-operated scanners, shortwave radios, CB rigs, and other equipment. Adjustable from 9 to 15 volts and provides up to 5 amps DC. Over-current protected. Includes binding posts as well as cigarette lighter jack for powering your accessories. Large meter shows voltage and current.

ORDER PWR 3
$59.95

SHIPPING
$6.50 UPS Ground
$5.50 US Priority Mail
$7.50 Canadian APP
$10.50 Canadian UPS

Weather-Proof Flex-Tape!

Ideal for securely wrapping coax couplings and splices without heat or mess. Forms a tight, flexible, waterproof seal for wiring, plumbing, automotive, marine, and other hostile environments. Easy to apply; remains pliable for years without leaving a sticky residue like putty sealants. Resists water immersion, sunlight, abrasion, impact, and most chemicals. 22-foot roll.

ORDER ACC 168
$1.95

SHIPPING
$1.50 First Class
$4 UPS
$6 Canadian UPS
$5.50 Canadian APP

Mobile DC Power Converter

It's hard to find a DC operated accessory that *won't* work with the new Grove DCC 3 cigarette lighter adaptor. Equipped with the six most popular power plugs and switchable among 1.5, 3, 4.5, 6, 7.5, 9, and 12 volts at up to 800 mA current, this mobile powerhouse is the most versatile we've ever seen!

ORDER DCC 3
$12.95

SHIPPING
$5.50 UPS
$4.50 US Priority Mail
$7 Canadian APP
$9 Canadian UPS

Alkaline/NiCd Batteries

BAT 06	AAA Batteries	$.75 ea.
BAT 01	AA Batteries	$.79 ea.
BAT 02	D Batteries	$1.19 ea.
BAT 03	C Batteries	$1.09 ea.
BAT 04	9V Batteries	$2.25 ea.
BAT 13	AA NiCd rechargeable Batteries	$2.75 ea.
BAT06S	12-pack AAA Batteries	$6.00

FREE SHIPPING w/PURCHASE OF ANY OTHER BATTERIES!

SHIPPING
$3 UPS or US Priority
$5.50 Canadian APP
$6.00 Canadian UPS

Order Line: **1-800-438-8155; *Product Support Info.*: (704) 837-7081**

GROVE'S SCANNER ACCESSORY MART

Portable Power Station

A rugged, battery power source that can actually run your high-powered monitoring equipment and other accessories when needed, yet provide enough reserve power to start your car if that battery is dead! The Power Station is a compact powerhouse built around a 12 volt, 7 ampere-hour, rechargeable gel cell housed in a rugged ABS carrier. You can choose 3, 6, 9 or 12 volts output. Dimensions 7lbs, H8" x W7 x 4.5.

ORDER PWR 1
$59.95

SHIPPING
$6.50 UPS
$5.50 US Priority Mail
$7.50 Canadian APP
$10.50 Canadian UPS

Universal Power Supply

Our universal **PWR 13** AC adaptor is especially rugged, capable of switching to your choice of 3, 4.5, 6, 7.5, 9 or 12 volts DC at a current of 500 milliamps (1/2 amp)! Another switch lets you choose + or - polarity.

An array of plugs on its interconnect cord assures proper mating to any electronic accessory. Plugs into standard house current (120 VAC, 60 Hz).

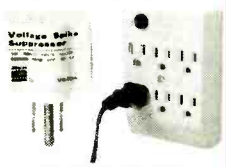
Also available: **PWR 12** light duty Universal Power Supply (same plugs and voltages as above, but reduced amperage and no polarity switch), and **PWR 19** standard 12VDC at 200 mA with standard 2.1 mm plug (center +).

PWR 13 ..... $9.95
PWR 12 ..... $4.95
PWR 19 ..... $7.95

SHIPPING: $5.50 UPS
$5.50 US Priority Mail
$6.50 Canadian APP
$7 Canadian UPS

AC Surge Protectors

Protect your delicate radio, computer, TV, stereo, test equipment, and other electronic equipment from devastating power-line voltage spikes and current surges. For all standard U.S. and Canada power lines (120 VAC, 1875 W, 60 Hz, 15 A).



Not shown to scale

ORDER LAR 2 (single outlet)
$3.95

ORDER LAR 3 (6 outlets)
$4.95

SHIPPING: $1.50 First Class (LAR2); $2.00 for LAR3

Color Radio Wall Map

Ideal for hams, shortwave listeners and scanner hobbyists alike! Shows worldwide callsign prefixes, basic spectrum allocations from 300 kHz-3 GHz, phonetic alphabet, ham bands by license class, and Morse code symbols. Colorful, informative, accurate. Measures 37" x 25". Nationally advertised at $19.95 Order **CHT 4**. Also available: new 1996 30" x 40" official government Color Wall Chart of United States Radio Spectrum, 9 kHz-3 GHz. Order **CHT 1**.

ORDER CHT 4
$14.95

SHIPPING
$4.50 UPS/US Priority Mail
$2.50 Bookrate

ORDER CHT 1
$9.95

SHIPPING
$6 UPS
$2.50 Bookrate

Metro West Battery Packs

The "Pro-Pack 1200" is a double-life battery pack for the popular Uniden BC200XLT, BC100XLT, BC205XLT, and Regency 4030 hand-held scanners with 1200 mAH charge capacity, twice that of the original equipment. The replacement look-alike slips right on the scanner to replace the original. Includes AC wall charger. **Order BAT 9.**

Charge your high-capacity Metrowest battery like the pros with this drop-in charger (not for original Bearcat battery pack). Automatic circuit provides a full charge in just seven hours, yet prevents overcharging! Powered by your 12 VDC wall adaptor. **Order PWR 15.**

Original replacement Uniden BC200XLT battery pack (also fits BC100XLT, BC205XLT and Regency 4030). **Order BAT 14.**

BAT 9 ..... $79.95
PWR 15 ..... $49.95
BAT 14 ..... $39.95

SHIPPING: $6 UPS; $7 US Priority Mail;
$10 Canadian UPS; $8.50 Canadian APP

Universal Belt Clip

A quick press firmly attaches this strong, plastic belt clip to your frequency counter, handie-talkie, cellular or cordless phone, camera, pager, test equipment, portable radio, or virtually any other flat surface!

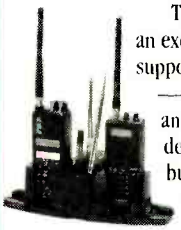
ORDER BRK 3
$4.95

SHIPPING
$2.50 First Class
$4 UPS
$5.50 Canadian APP
$6Canadian UPS

Scanner Mounts

Get organized in your car! The hand-held radio caddy at left attaches to the inside ledge or your car's window for super convenient access. Order the **BRK 11.**

For console mounting, the **BRK 1** (at right) holds one hand-held, while the **BRK 7** holds two (or one scanner and a beverage container)—with a handy compartment in the middle for other accessories!



Their sturdy jaws do an excellent job of supporting your radio — even with cables and antennas connected — on a desk or table top or even the bumpy environment of a vehicle, plane or boat.

Need an even bigger mount? Order the **BRK 10** Deluxe Mobile Organizer with room for two scanners, frequency organizer, cassettes and CDs, notepads—and more!

BRK 1 ..... $9.95
BRK 7 ..... $12.95
BRK 10 ..... $14.95
BRK 11 ..... $7.95

SHIPPING BRK 1, 7 & 10: $6 UPS; $5 US Priority Mail; $7 Canadian UPS; $10 Canadian APP
SHIPPING BRK 11: $7 UPS; $6 US Priority Mail; $15 Canadian UPS; $13Canadian APP

Naval Amplified Speaker/ Recorder Activator

The HTS-3 is designed for handheld walkie talkies and scanners, this amplified speaker puts out a resounding one watt of audio in noisy locations!

Powered by AA nicads or alkalines (or 12V auto system via included cigarette lighter cord), battery saver automatically shuts off power when no sound is present. It activates a tape recorder whenever sound is present (1/8", 3/32" cables included)!

ORDER SPK 11
$29.95

SHIPPING
$6.50 UPS
$7 US Priority Mail
$10 Canadian UPS or APP

ACCESSORIES

BAT 1	AA Alkaline batteries	$.79
PWR 13	AC wall power supply	$9.95
BAT 13	Nicad AA batteries (4 required)	$2.75/each

UPS Second Day Air at Ground Rates on ALL PRODUCTS!

Frequencies

1100-1200	Australia, Radio	9580pa	9615as	9860pa	12080pa
		13605as	21725as		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1130 mtwhfa	Belgium, R Vlaanderen Int	6035eu			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, Adv World R	7375am	9725am	13750am	
1100-1200	Costa Rica,RF Peace Intl	6205am	7385am		
1100-1200	Ecuador, HCJB	12005am	15115am	21455au	
1100-1200 as	Eqt Guinea, R East Africa	15186af			
1100-1200	Eqt Guinea, Radio Africa	9530as			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17780af	17800af
1100-1200	Iraq, Radio Iraq Intl	13680eu			
1100-1200 vl	Italy, IRRS	7125va			
1100-1200	Japan, R Jaapn NHK World	6120na			
1100-1200	Lebanon, Voice of Hope	9990va			
1100-1200	Malaysia, Radio	7295do			
1100-1200 vl	Malaysia, RTM Kuching	7160do			
1100-1200 vl	Malaysia,RTM KotaKinabalu	5980do			
1100-1125	Netherlands, Radio	7260as	9810as		
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1150	North Korea, R Pyongyang	6575na	9975na	11335na	
1100-1120	Pakistan, Radio	15470eu	17900eu		
1100-1130 as	Palau, KHBN/Voice of Hope	9730as			
1100-1200 vl	Papua New Guinea, NBC	4890do			
1100-1200	Russia,Voice of Russia WS	9705as	11655as	13785as	15120as
		15460as	15490as	15560as	17755as
		17860as			
1100-1200	Singapore,R Singapore Int	6015as	6155as		
1100-1130	Sri Lanka, Sri Lanka BC	11835as	17850as		
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	9885as	11995as
		13635as			
1100-1200	Taiwan, Voice of Asia	9280as			
1100-1200	United Kingdom, BBC WS	5965na	6190af	6195va	7180as
		9410eu	9580as	9740va	11750as
		11760as	11940af	11955as	12095eu
		15220va	15310as	15575me	17640va
		17705va	17830af	17885af	21660af
1100-1130	United Kingdom, BBC WS	9700au	15190sa	15400eu	17790va
1100-1200	USA, KAIJ Dallas TX	5810am	9815am		
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395sa	9355eu	9430au
1100-1200	USA, Voice of America	5985as	6110as	9645as	9760as
		11705as	11720as	15425as	
1100-1200	USA, WEWN Birmingham AL	7425na	15665eu		
1100-1200	USA, WGTG McCaysville GA	9400am			
1100-1200	USA, WHRI Noblesville IN	6040am	9495am	9930am	
1100-1200	USA, WJCR Upton KY	7490na			
1100-1200 as	USA, WVHA Greenbush ME	13825af			
1100-1200	USA, WWCR Nashville TN	5070am	5935am	9475am	15685am
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1100-1200 vl/m-f	Vatican State, Vatican R	5880eu			
1100-1130	Vietnam, Voice of	7285as	9730as		
1100-1200	Zambia, Christian Voice	6065af			
1115-1127	Zambia, ZNBC Radio 1	7220do			
1115-1200	Zambia, ZNBC Radio 2	6165do			
1130-1200	Bulgaria, Radio	9440as			
1130-1200 vl	China, China Radio Intl	8660as	11445as	11700as	
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu		
1130-1200	Finland, YLE/R Finland	15245as	17685au		
1130-1200	Iran, VOIRI	11875me	11930me	15260af	
1130-1200	Myanmar, Voice of	5990do			
1130-1200	Netherlands, Radio	6045eu	7190eu		
1130-1200	South Korea, R Korea Intl	9650am			
1130-1200 f	Vatican State, Vatican R	15595as	17550au		
1135-1140	India, All India Radio	9595do	11620do	11710do	15185do

Selected Programs

Sundays

1100 Japan, NHK/Radio: News. See S 0100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1110 Japan, NHK/Radio: Hello from Tokyo. The weekend magazine program.
1130 UK, BBC London (af/as pac): Play of the Week. See S 0630.
1130 UK, BBC London (am/eu): Variable Feature. Special features and new series.
1130 UK, BBC London (south as): The Learning World. News and views about worldwide education.
1145 UK, BBC London (south as): Good Books. Recommendation of a book to read.
1155 Japan, NHK/Radio: News Summary. A five-minute news wrap-up.

Mondays

1100 Japan, NHK/Radio: Radio Japan News Round. Thirty minutes of world, regional, and Japanese news.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 UK, BBC London (am): Caribbean Report (Alternative). Weekday coverage of current affairs in the Caribbean region with emphasis on political and economic analysis.
1130 Japan, NHK/Radio: Close Up. See M 0530.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
1130 UK, BBC London (af): Meridian. See S 0630.
1130 UK, BBC London (am/as pac): Variable Comedy/Quiz Feature. See S 0130.
1130 UK, BBC London (eu): Omnibus. Each week a half-hour programme on practically any topic under the sun.
1130 UK, BBC London (south as): Variable Feature. See S 1130.
1145 Japan, NHK/Radio: Sports. A roundup of regional sports news.
1145 UK, BBC London (south as): BBC English. See S 1530.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Tuesdays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 Japan, NHK/Radio: Close Up. See M 0530.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
1130 UK, BBC London (af/as pac/eu): Meridian. See S 0630.
1130 UK, BBC London (am): Jazz Now and Then. See S 1230.
1130 UK, BBC London (south as): BBC English. See S 1530.
1145 Japan, NHK/Radio: Japanese Culture Today. See T 0540.
1145 UK, BBC London (am): Variable Feature. See S 1130.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Wednesdays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 Japan, NHK/Radio: Close Up. See M 0530.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
1130 UK, BBC London (af/am/as pac/eu): Variable Feature. See S 1130.
1130 UK, BBC London (south as): BBC English. See S 1530.
1141 Japan, NHK/Radio: Asian Report. See W 0540.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Thursdays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 Japan, NHK/Radio: Close Up. See M 0530.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
1130 UK, BBC London (af/eu): Meridian On Screen. See T 1401.
1130 UK, BBC London (am): From Our Own Correspondent. See S 0330.
1130 UK, BBC London (as pac): Meridian. See S 0630.
1130 UK, BBC London (south as): Variable Feature. See S 1130.
1145 Japan, NHK/Radio: Crosscurrents. See H 0540.
1145 UK, BBC London (am): The Learning World. See S 1130.
1145 UK, BBC London (south as): BBC English. See S 1530.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Fridays

1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1105 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1130 Japan, NHK/Radio: Close Up. See M 0530.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 0515.
1130 UK, BBC London (af/eu): Meridian. See S 0630.
1130 UK, BBC London (am): Focus on Faith. See F 0330.
1130 UK, BBC London (as pac): Music Review. See S 0330.
1130 UK, BBC London (south as): BBC English. See S 1530.
1145 Japan, NHK/Radio: Business Focus. See F 0540.
1154 Radio Netherlands: Documentary. Hong Kong Goes Home (31st). See F 2354.
1154 Radio Netherlands: Documentary. The Birthing Room (3rd). See W 1254.
1154 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (10th,17th,24th). See A 2354.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Saturdays

1100 Japan, NHK/Radio: News. See S 0100.
1100 UK, BBC London (all streams): Newsdesk. See S 0000.
1110 Japan, NHK/Radio: This Week. See A 0510.
1130 UK, BBC London (af): Focus on Faith. See F 0330.
1130 UK, BBC London (am): People and Politics. See S 0230.
1130 UK, BBC London (as pac/eu/south as): Meridian. See S 0630.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Hauser's Highlights

Fixed Frequencies available to VOA Greenville but no longer in regular use at specific times

1854.5	13491.5	18275
5745	14526	18414
6873	14638	18605
7651	14800	18782.5
7770	14810	19261.5
10235	15650	19480
10380	15715	19505
10454	15752	19532.5
10506.5	15765	19721.5
10869	15770	20060
11150	16222	20125
12210	18215	23770
		23968.5

(VOA Greenville via Gigi Lytle)

Frequencies

1200-1300	Australia, Radio	5995pa	9580pa	9615as	9710as
		9770as	9860pa	11660as	11800pa
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Brazil, Radio Bras	15445na			
1200-1230	Bulgaria, Radio	9440as			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1230	Canada, R Canada Intl	6150as	11730as		
1200-1300	China, China Radio Intl	7385na	9715as	11660as	11795pa
1200-1230 vl	China, China Radio Intl	8660as	11445as	11700as	12110as
1200-1300	Costa Rica, Adv World R	5030am	6150am	9725am	13750am
1200-1300	Costa Rica,RF Peace Intl	6205am	7385am		
1200-1300	Ecuador, HCJB	12005am	15115am	21455am	
1200-1300 as	Eqt Guinea, R East Africa	15186af			
1200-1300	Eqt Guinea, Radio Africa	9530as			
1200-1300	France, Radio France Intl	9805eu	11600as	11670as	13625am
		15155eu	15195eu	15325af	15530ca
1200-1230	Iran, VOIRI	11875me	11930me	15260af	
1200-1300	Iraq, Radio Iraq Intl	13680eu			
1200-1300 vl	Italy, IRRS	7125va			
1200-1300	Jordan, Radio	11690eu			
1200-1300	Lebanon, Voice of Hope	9990va			
1200-1300	Malaysia, Radio	7295do			
1200-1300 vl	Malaysia,RTM KotaKinabalu	5980do			
1200-1250	Myanmar, Voice of	5990do			
1200-1300	Netherlands, Radio	6045eu	7190eu		
1200-1206	New Zealand, R NZ Intl	9700pa			
1200-1300	Russia,Voice of Russia WS	9725as	9755as	9820as	9875as
		11655as	11880as	13785as	15120as
		17755as	17860as		
1200-1300	Singapore,R Singapore Int	6015as	6155as		
1200-1300	South Korea, R Korea Intl	7285va			
1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	United Kingdom, BBC WS	5965na	6190af	6195va	7180as
		9410eu	9580as	9740va	11750as
		11760as	11940af	11955as	12095eu
		15220va	15310as	15575me	17640va
		17705va	17830af	17885af	21660af
1200-1300	USA, KAIJ Dallas TX	5810am	9815am		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9355as	9430au	9455sa
1200-1300	USA, Voice of America	6110as	9760as	11705as	11715as
		15425as			
1200-1300	USA, WEWN Birmingham AL	7425na	15665eu		
1200-1300	USA, WGTG McCaysville GA	9400am			
1200-1300	USA, WHRI Noblesville IN	6040am	9495am	9930am	
1200-1300	USA, WJCR Upton KY	7490na			
1200-1300 as	USA, WVHA Greenbush ME	13825eu			
1200-1300	USA, WWCR Nashville TN	5935am	7435am	9475am	15685am
1200-1300	USA, WYFR Okeechobee FL	5950na	11830na	11970na	
1200-1245	USA, WYFR Okeechobee FL	7355na			
1200-1230	Uzbekistan, R Tashkent	5060as	5975as	6025as	7285as
		9715as			
1200-1300	Zambia, Christian Voice	6065af			
1200-1300 mtwhf	Zambia, ZNBC Radio 2	6165do			
1206-1300 occsnal	New Zealand, R NZ Intl	6105pa			
1215-1300	Egypt, Radio Cairo	17595as			
1230-1300 as	Australia, Radio	5995pa			
1230-1300	Bangladesh,Bangla Betar	7185as	9548as		
1230-1300 mtwhf	Finland, YLE/R Finland	11735na	15400na		
1230-1235	India, All India Radio	4860do	6185do	17865do	
1230-1300 w	Indonesia, RRI Sorong	4875do			
1230-1300 a	Monaco, Trans World Radio	7115eu			
1230-1255 s	Monaco, Trans World Radio	7115eu			
1230-1300	South Korea, R Korea Intl	9570as	9640as	13670as	
1230-1300 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1230-1300	Sweden, Radio	11650na	13740as	15240na	
1230-1300	Thailand, Radio	9505as	9655as	9810as	
1230-1300 s	USA, WRMI/R Miami Intl	9955am			
1230-1300	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as	15010as		
1240-1250	Greece, Voice of	11645af	15650af	17525af	

Selected Programs

Sundays

1200 UK, BBC London (af/as pac): Play of the Week (from 1130). See S 0630.
1200 UK, BBC London (am/eu/south as): World News. See S 0000.
1205 UK, BBC London (am/eu/south as): World Business Brief. Focus on the market week.
1215 UK, BBC London (am): In Praise of God. See S 0230.
1215 UK, BBC London (eu): Britain Today. See S 0045.
1215 UK, BBC London (south as): A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
1230 UK, BBC London (af): Jazz Now and Then. Sarah Ward presents a mixture of jazz for all ages.
1230 UK, BBC London (as pac): Andy Kershaw's World of Music. Recordings of diverse music from around the world.
1230 UK, BBC London (eu): Anything Goes. See S 0530.
1245 UK, BBC London (af/am): Sports Roundup. See S 0135.

Mondays

1200 UK, BBC London (all streams): World News. See S 0000.
1205 UK, BBC London (all streams): World Business Report. Latest news from the markets in the Far East, Europe and the USA.
1205 UK, BBC London (am): Caribbean Business Program (Alternative). Economic analysis in the region.
1210 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): Variable Feature. See S 1130.
1230 UK, BBC London (af): Global Concerns. See S 1615.
1230 UK, BBC London (am): Variable Feature. See S 1130.
1230 UK, BBC London (as pac): Off the Shelf. See M 0330.
1230 UK, BBC London (eu/south as): Andy Kershaw's World of Music. See S 1230.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0135.

Tuesdays

1200 UK, BBC London (all streams): World News. See S 0000.
1205 UK, BBC London (all streams): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Business Program (Alternative). See M 1205.
1210 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): John Peel. See M 1330.
1230 UK, BBC London (af): Folk Routes. See S 0030.
1230 UK, BBC London (as pac): Off the Shelf. See M 0330.
1230 UK, BBC London (eu): Variable Comedy/Quiz Feature. See S 0130.
1230 UK, BBC London (south as): Multitrack Hit-List. See M 1615.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0135.

Wednesdays

1200 UK, BBC London (all streams): World News. See S 0000.
1205 UK, BBC London (all streams): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Business Program (Alternative). See M 1205.
1210 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.
1230 UK, BBC London (af): Variable Feature. See S 1130.
1230 UK, BBC London (as pac): Off the Shelf. See M 0330.
1230 UK, BBC London (eu): Composer of the Month. See M 0430.
1230 UK, BBC London (south as): Megamix. See T 1615.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0135.
1254 Radio Netherlands: Documentary. Hong Kong Goes Home (29th). See F 2354.
1254 Radio Netherlands: Documentary. The Birthing Room (1st). Michele Ernsting examines the joyful experience of bringing children into this world as told by Dutch midwives.
1254 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (8th,15th,22nd). See A 2354.

Thursdays

1200 UK, BBC London (all streams): World News. See S 0000.
1205 UK, BBC London (all streams): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Business Program (Alternative). See M 1205.
1210 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): Assignment. See H 0230.
1230 UK, BBC London (af): From Our Own Correspondent. See S 0330.
1230 UK, BBC London (as pac): Off the Shelf. See M 0330.
1230 UK, BBC London (eu): Assignment. See H 0230.
1230 UK, BBC London (south as): Multitrack X-Press. See W 1615.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0135.

Fridays

1200 UK, BBC London (all streams): World News. See S 0000.
1205 UK, BBC London (all streams): World Business Report. See M 1205.
1205 UK, BBC London (am): Caribbean Business Program (Alternative). See M 1205.
1210 UK, BBC London (am): Caribbean Report (Alternative). See M 1105.
1215 UK, BBC London (af/as pac/eu/south as): Britain Today. See S 0045.
1215 UK, BBC London (am): New Ideas. See S 2330.
1230 UK, BBC London (af): The Farming World. See M 0145.
1230 UK, BBC London (as pac): Off the Shelf. See M 0330.
1230 UK, BBC London (eu): Science in Action. See S 0530.
1230 UK, BBC London (south as): Focus on Faith. See F 0330.
1235 UK, BBC London (am): The Insider's Guide. See F 0005.
1245 UK, BBC London (af/am/as pac): Sports Roundup. See S 0135.

Saturdays

1200 UK, BBC London (all streams): World News. See S 0000.
1205 UK, BBC London (all streams): World Business Report. See M 1205.
1215 UK, BBC London (af): Britain Today. See S 0045.
1215 UK, BBC London (am): A Jolly Good Show. See S 1215.
1215 UK, BBC London (as pac): Science in Action. See S 0530.
1215 UK, BBC London (eu/south as/): Britain Today. See S 0045.
1230 UK, BBC London (af): Seven Days. See A 0010.
1230 UK, BBC London (eu): Variable Comedy/Quiz Feature. See S 0130.
1230 UK, BBC London (south as): Multitrack Alternative. See F 1330.
1245 UK, BBC London (af): The Insider's Guide. See F 0005.
1245 UK, BBC London (as pac): Letter from America. See S 0030.
1255 UK, BBC London (af): Book Choice. See S 1525.

FREQUENCIES

1300 1400	Australia, Radio	5995pa	9580pa	9615as	11800pa
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485dc			
1300-1400 vl	Australia, VI8T Tent Crk	2325do			
1300-1320	Brazil, Radio Bras	15445na			
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400	Canada, R Canada Intl	9640am	11855am		
1300-1400	China, China Radio Intl	7385na	9715as	11660pa	
1300-1330	China, China Radio Intl	7410as			
1300-1400	Costa Rica,RF Peace Intl	7385am			
1300-1400	Ecuador, HCJB	12005am	15115am	21455am	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Eqt Guinea, R East Africa	15186af			
1300-1400	Eqt Guinea, Radio Africa	9530as			
1300-1400	Iraq, Radio Iraq Intl	13680as			
1300-1400 vl	Italy, IRRS	7125va			
1300-1400	Japan, R Japan NHK World	11880as			
1300-1400 vl	Japan, R Japan NHK World	11895as			
1300-1400	Jordan, Radio	11690eu			
1300-1400	Malaysia, Radio	7295do			
1300-1400 vl	Malaysia, RTM Kuching	7160do			
1300-1400 vl	Malaysia,RTM KotaKinabalu	5980do			
1300-1400 occsnal	New Zealand, R NZ Intl	6105pa			
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as
		15430as			
1300-1330 s	Norway, Radio Norway Intl	9590eu	9910as	15605au	
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1355	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9985eu
		11815eu			
1300-1400	Romania, R Romania Intl	9690eu	11940eu	15380eu	17745eu
1300-1400	Russia,Voice of Russia WS	4740as	4975as	9705as	15460as
		17860as			
1300-1400	Singapore,R Singapore Int	6015as	6155as		
1300-1400 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	12075as	13635as
1300-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1300-1400	United Kingdom, BBC WS	5965na	5990as	6190af	6195va
		9410eu	9515va	9590va	9740as
		11750as	11760as	11940af	12095eu
		15220am	15310as	15420af	15575me
		17640va	17705va	17830af	17885af
	21470af	21660af			
1300-1400	USA, KAIJ Dallas TX	5810am	15725am		
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, KWHR Naalehu HI	9930as			
1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455am	13840as
1300-1400	USA, Voice of America	6110as	9645as	9760as	11705as
		11715as	15425as		
1300-1400	USA, WEWN Birmingham AL	9580na	11875na	15665eu	
1300-1400	USA, WGTG McCaysville GA	9400am			
1300-1400	USA, WHRI Noblesville IN	6040am	9930am	15105am	
1300-1400	USA, WJCR Upton KY	7490na			
1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WWCR Nashville TN	5935am	9475am	13845am	15685am
1300-1400	USA, WYFR Okeechobee FL	5950na	11830na	13695na	
1300-1345	USA, WYFR Okeechobee FL	11970am			
1300-1400	Zambia, Christian Voice	6065af			
1300-1330 mtwhf	Zambia, ZNBC Radio 2	6165do			
1315-1400 mtwhfa	Bhutan, Bhutan BC Service	5023do			
1330-1355	Austria, R Austria Intl	6155eu	13730na		
1330-1357	Canada, R Canada Intl	6150as	9535as		
1330-1400	Finland, YLE/R Finland	11735na	15400na		
1330-1400	Guam, AWR/KSDA	9650as			
1330-1400	India, All India Radio	11620as	13750as		
1330-1400	Mongolia, R Ulan Bator	12085as			
1330-1400	Netherlands, Radio	9895as	13700as	15585as	
1330-1400	Sweden, Radio	7155as	13740pa	15240pa	
1330-1400	Turkey, Voice of	9445eu	9630as		
1330-1355	UAE, Radio Dubai	13675eu	15395eu	17630eu	21605me
1330-1400 mtwhf	USA, WRMI/R Miami Intl	9955am			
1330-1400	Uzbekistan, R Tashkent	5975as	7285as	9715as	
1330-1400	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
		12020eu	15010eu		
1330-1400	Yugoslavia, Radio	11835eu			
1345-1400	Vatican State, Vatican R	9500as	11625as		

SELECTED PROGRAMS

Sundays

1300 UK, BBC London (all streams): Newshour. A comprehensive look at the major topics of the day, plus up-to-the-minute international and British news.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 Belgium, R Vlaanderen Intl: News. A world news summary.
1330 Sweden, Radio: In Touch with Stockholm (biweekly). A mailbag program with on-the-air link-ups.
1330 Sweden, Radio: Sounds Nordic (biweekly). The very latest and best in Swedish rock and pop music, interviews with the stars, and what's happening on the youth scene.
1335 Belgium, R Vlaanderen Intl: Radio World. Updates to international broadcasting schedules.
1345 Belgium, R Vlaanderen Intl: PO Box 26. Listener letters are read and answered in this mailbox program.
1345 Vatican State, Vatican Radio: With Heart and Mind. How this week's liturgical readings apply to our everyday lives.

Mondays

1300 UK, BBC London (af): Variable Feature (Alternative). See S 1130.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1315 UK, BBC London (af): BBC English (Alternative). See S 1530.
1330 Sweden, Radio: Sixty Degrees North. Reports, interviews and analysis from Stockholm and other Nordic capitals.
1330 UK, BBC London (af): John Peel (Alternative). Tracks from newly released albums and singles from the contemporary music scene.
1345 Vatican State, Vatican Radio: To the Ends of the Earth. A 25-episode series of bible-based radio dramas.
1348 Sweden, Radio: SportScan. A weekly review of all the news in sports hosted by Keith Foster.

Tuesdays

1300 UK, BBC London (af): BBC English (Alternative). See S 1530.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 Sweden, Radio: Sixty Degrees North. See M 1330.
1330 UK, BBC London (af): Multitrack Hit-List (Alternative). See M 1615.
1345 Vatican State, Vatican Radio: A Room with a View of the Vatican. The look at the activities of the Catholic Church in Rome.
1346 Sweden, Radio: MediaScan (1/3). Satellite news 85%; medium wave and shortwave news 15%.

Wednesdays

1300 UK, BBC London (af): BBC English (Alternative). See S 1530.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 Sweden, Radio: Sixty Degrees North. See M 1330.
1330 UK, BBC London (af): Megamix (Alternative). See T 1615.
1345 Vatican State, Vatican Radio: The Rome Report. A behind the scenes review of issues currently confronting the church and the world.
1346 Sweden, Radio: Money Matters. Al Simon presents news about the Swedish economy, business, consumer affairs, and Sweden's EU membership.
1354 Radio Netherlands: Documentary. Hong Kong Goes Home (29th). See F 2354.
1354 Radio Netherlands: Documentary. The Birthing Room (1st). See W 1254.
1354 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (8th,15th,22nd). See A 2354.

Thursdays

1300 UK, BBC London (af): Variable Feature (Alternative). See S 1130.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1315 UK, BBC London (af): BBC English (Alternative). See S 1530.
1330 Sweden, Radio: Sixty Degrees North. See M 1330.
1330 UK, BBC London (af): Multitrack X-Press (Alternative). See W 1615.
1343 Sweden, Radio: GreenScan. Environmental concerns and solutions.
1345 Vatican State, Vatican Radio: The Pope and the People. Recent public statements by the Pope and responses from the man on the street.
1346 Sweden, Radio: Horizon (4/5). Science and technology in Sweden.

Fridays

1300 UK, BBC London (af): BBC English (Alternative). See S 1530.
1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 Sweden, Radio: Sixty Degrees North. See M 1330.
1330 UK, BBC London (af): Multitrack Alternative. Latest developments on the British music scene.
1335 Sweden, Radio: A Review of the Newsweek. The major stories of the week, both from Sweden and their Nordic neighbors.
1345 Vatican State, Vatican Radio: Then and Now. A look back at an event in history.

Saturdays

1300 UK, BBC London (all streams): Newshour. See S 1300.
1300 USA, KNLS Anchor Point AK: Music/News/Commentary.
1330 Sweden, Radio: Spectrum (1). Sarah Roxstrom with the latest on Swedish music, drama, art, and film.
1345 Vatican State, Vatican Radio: By the Way. Putting a Catholic perspective on issues in the news.

I'm taking just a moment to let you know Monitoring Times is the best magazine for me. I'm a ham, SWL, scanner, and VLF listener. I've been listening since 1956. I know things are changing, but we keep right on listening. 570 News Radio here in Tampa plays old time radio shows at night. Boy, what a treat. Radio will never die. Thanks for a fine magazine.

—Jim Webb KE4VI, Tampa, FL

Frequencies

1400-1500	Australia, Radio	5995pa	9580pa	9860pa	11660as
		11800pa	12080pa		
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VI8T Tent Crk	2325do			
1400-1500 mtwhfa	Belgium, R Vlaanderen Int	13685na	13795as		
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500	Canada, R Canada Intl	9640am	11855am		
1400-1500	China, China Radio Intl	7405na	9535as	9785as	
1400-1500	Costa Rica,RF Peace Intl	7385am	15050am		
1400-1430	Czech Rep, Radio Prague	13580eu	17845af		
1400-1500	Ecuador, HCJB	12005am	15115am	21455am	
1400-1500 as	Eqt Guinea, R East Africa	15186af			
1400-1500	France, Radio France Intl	7110as	15405as	17560me	
1400-1500	India, All India Radio	11620as	13750as		
1400-1430 vl	Italy, IRRS	7125va			
1400-1500	Japan, R Japan NHK World	7125na	7200na	9535na	11705na
		11880as	11895as		
1400-1500	Jordan, Radio	11690eu			
1400-1500	Malaysia, Radio	7295do			
1400-1500 vl	Malaysia, RTM Kuching	7160do			
1400-1500 vl	Malaysia,RTM KotaKinabalu	5980do			
1400-1500	Netherlands, Radio	9895as	13700as	15585as	
1400-1500 occsnal	New Zealand, R NZ Intl	6105pa			
1400-1430 s	Norway, Radio Norway Intl	11730as	11840as		
1400-1410	Pakistan, Radio	9645as	11570as		
1400-1430 as	Palau, KHBN/Voice of Hope	9730as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia,Voice of Russia WS	7130me	7165me	9470me	9840me
		15205me			
1400-1500	Sri Lanka, Sri Lanka BC	9730as			
1400-1430	Thailand, Radio	9530as	9655as	11905as	
1400-1430	Turkey, Voice of	9445eu	9630as		
1400-1500	United Kingdom, BBC WS	5990as	6195as	9410eu	9515na
		9590va	9740as	11750as	11865am
		12095eu	15220am	15575me	17840af
		21470af			
1400-1500	USA, KAIJ Dallas TX	13815am			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	USA, Voice of America	6110as	7125as	7215as	9645as
		9760as	11705as	15205me	15395as
		15425as			
1400-1500	USA, WEWN Birmingham AL	9455na	11875na	15665eu	
1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WJCR Upton KY	7490na			
1400-1500 mtwhf	USA, WRMI/R Miami Intl	9955am			
1400-1500 s	USA, WRMI/R Miami INtl	9955am			
1400-1500	USA, WRNO New Orleans LA	15420am			
1400-1500 as	USA, WVHA Greenbush ME	15745na			
1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500	USA, WYFR Okeechobee FL	5950na	11830na	17760eu	
1400-1405	Vatican State, Vatican R	9500as	11625as		
1400-1500	Zambia, Christian Voice	6065af			
1400-1405 mtwhf	Zambia, ZNBC Radio 2	6165do			
1405-1410	Croatia, Croatian Radio	5920eu	7165eu	13830am	
1415-1425	Nepal, Radio	7165do			
1430-1455 s	Belgium, R Vlaanderen Int	13685na	13795as		
1430-1500	Canada, R Canada Intl	9555me	11915af	11935me	15325me
1430-1500 vl	China, China Radio Intl	8660as	9880as	11445as	15135as
1430-1440	India, All India Radio	3945do	6185do	9565do	9685do
1430-1440 mtwhf	Indonesia, RRI Uj Pandang	4753do			
1430-1500 vl	Italy, IRRS	3985va			
1430-1500 mtwhf	Portugal, R Portugal Intl	21515me			
1430-1500	Romania, R Romania Intl	11740as	15335as		
1430-1500	Sweden, Radio	9485as	9885na	11650na	15240na
1430-1500	United Kingdom, BBC WS	15400af			
1435-1445	Greece, Voice of	11645na	15175na		
1440-1500	Myanmar, Voice of	5990do			
1458-1500	Seychelles, FEBA Radio	9810as	11870as		

Selected Programs

Sundays

1400 UK, BBC London (all streams): News Summary. One minute news update.
1401 UK, BBC London (all streams): Variable Feature. See S 1130.

Mondays

1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1401 UK, BBC London (af): Omnibus. See M 1130.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
1430 UK, BBC London (af): Off the Shelf. See M 0330.
1430 UK, BBC London (af): Variable Feature (Alternative). See S 1130.
1430 UK, BBC London (am): Omnibus. See M 1130.
1430 UK, BBC London (as pac): Health Matters. See M 0545.
1430 UK, BBC London (eu): John Peel. See M 1330.
1430 UK, BBC London (south as): Record News. See S 0445.
1445 UK, BBC London (af): BBC English (Alternative). See S 1530.
1445 UK, BBC London (af): The Farming World. See M 0145.
1445 UK, BBC London (as pac): The Learning World. See S 1130.
1445 UK, BBC London (south as): Development '97. See S 0615.

Tuesdays

1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1401 UK, BBC London (af): Meridian On Screen. The latest cinematic offerings are discussed.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1430 UK, BBC London (af): BBC English (Alternative). See S 1530.
1430 UK, BBC London (af): Off the Shelf. See M 0330.
1430 UK, BBC London (am): Health Matters. See M 0545.
1430 UK, BBC London (as pac): Discovery. See T 0230.
1430 UK, BBC London (eu): Multitrack Hit-List. See M 1615.
1430 UK, BBC London (south as): Variabie Feature. See S 1130.
1445 UK, BBC London (af): The Learning World. See S 1130.
1445 UK, BBC London (am): Jazz Now and Then. See S 1230.
1445 UK, BBC London (south as): Health Matters. See M 0545.

Wednesdays

1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1401 UK, BBC London (af): Discovery. See T 0230.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1430 UK, BBC London (af): BBC English (Alternative). See S 1530.
1430 UK, BBC London (af): Off the Shelf. See M 0330.
1430 UK, BBC London (am): Country Style. See S 0010.
1430 UK, BBC London (as pac): Omnibus. See M 1130.
1430 UK, BBC London (eu): Megamix. See T 1615.
1430 UK, BBC London (south as): Variable Feature. See S 1130.
1445 UK, BBC London (af/am/south as): Good Books. See S 1145.

Thursdays

1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1401 UK, BBC London (af): Health Matters. See M 0545.
1405 UK, BBC London (am/as pac/eu/south as): Outlook. See M 1405.
1415 UK, BBC London (af): Record News. See S 0445.
1430 UK, BBC London (af): Off the Shelf. See M 0330.
1430 UK, BBC London (af): Variable Feature (Alternative). See S 1130.
1430 UK, BBC London (am): Network UK. Issues and events affecting the lives of people throughout the UK.
1430 UK, BBC London (as pac): Assignment. See H 0230.
1430 UK, BBC London (eu): Multitrack X-Press. See W 1615.
1430 UK, BBC London (south as): Sports International. See H 0630.
1445 UK, BBC London (af): BBC English (Alternative). See S 1530.
1445 UK, BBC London (af): Country Style. See S 0010.

Fridays

1400 UK, BBC London (af): News Summary. See S 1400.
1400 UK, BBC London (am/as pac/eu/south as): World News. See S 0000.
1401 UK, BBC London (af): Science in Action. See S 0530.
1405 UK, BBC London (am/as pac/south as): Outlook. See M 1405.
1405 UK, BBC London (south as): Outlook. See M 1405.
1430 UK, BBC London (af): BBC English (Alternative). See S 1530.
1430 UK, BBC London (af): Off the Shelf. See M 0330.
1430 UK, BBC London (am): Science in Action. See S 0530.
1430 UK, BBC London (as pac): Focus on Faith. See F 0330.
1430 UK, BBC London (eu): Multitrack Alternative. See F 1330.
1430 UK, BBC London (south as): The Insider's Guide. See F 0005.
1440 UK, BBC London (south as): Voicebox. See T 2310.
1445 UK, BBC London (af): On the Move. See S 0445.
1445 UK, BBC London (south as): Global Concerns. See S 1615.
1454 Radio Netherlands: Documentary. Hong Kong Goes Home (31st). See F 2354.
1454 Radio Netherlands: Oocumentary. The Birthing Room (3rd). See W 1254.
1454 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (10th,17th,24th). See A 2354.

Saturdays

1400 UK, BBC London (all streams): World News. See S 0000.
1405 UK, BBC London (all streams): Sportsworld. The weekly sports magazine.

Hello, Writers...

Do you have a topic you've always "thought about" writing up for Monitoring Times? Now is the time! Given our full-spectrum coverage, plus the interest in new technology on the one hand and nostalgia for the past on the other, there is no limit to appropriate subject matter to write about. Bone up on your research, warm up your pen, and you, too, can earn a little spending money!

Pitch your idea to the editor at mteditor@grove.net or call 704-837-9200 and ask for Rachel. Writer's Guidelines are available on the MT homepage at www.grove.net, or for an SASE.

Frequencies

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	9580pa
		9615as	9850pa	11660as	11800pa
		12080pa			
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1525 mtwhfa	Belgium, R Vlaanderen Int	13685na	13795as		
1500-1600 vl	Canada, CBC N Quebec Svc	9625do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, R Canada Intl	9640am	11855am		
1500-1600	China, China Radio Intl	7405na	9535as	9785as	
1500-1600	Costa Rica,RF Peace Intl	7385am	15050am		
1500-1600	Ecuador, HCJB	12005am	15115am	21455am	
1500-1600 as	Eqt Guinea, R East Africa	15186at			
1500-1600	Guam, TWR/KTWR	11580as			
1500-1530	Israel, Kol Israel	9390na	11605na		
1500-1600	Italy, Adv World Radio	7230eu			
1500-1600 vl	Italy, IRRS	3985va			
1500-1600	Japan, R Japan NHK World	7200af	7225af	9535na	15355af
1500-1600	Jordan, Radio	11690eu			
1500-1600	Malaysia, Radio	7295do			
1500-1600 vl	Malaysia, RTM Kuching	7160do			
1500-1600 vl	Malaysia,RTM KotaKinabalu	5980do			
1500-1530	Mexico, Radio Mexico Intl	9705na			
1500-1515 s	Myanmar, Voice of	5990do			
1500-1525	Netherlands, Radio	9895as	13700as	15585as	
1500-1600 occsnal	New Zealand, R NZ Intl	6105pa			
1500-1550	North Korea, R Pyongyang	9325eu	9640eu	9975na	13785me
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11740as	15335as		
1500-1600 vl/s	Russia, Voice of Assyria	7325do	9730do	9880do	

1500-1600	Russia,Voice of Russia WS	4740me	4940me	4975me	5925me
		7115af	7130me	7165me	9470af
		9585af	9635me	9840me	15205me
1500-1600	S Africa, Channel Africa	7155af	9685af		
1500-1600	Seychelles, FEBA Radio	9810as	11870as		
1500-1600	Singapore,R Singapore Int	6155do			
1500-1600 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1500-1530	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1500-1600	United Kingdom, BBC WS	5990as	6195va	9515na	9590na
		9740va	11750as	11865am	12095as
		15070va	15220am	15485af	15575as
		17705va	17830af	17840af	
1500-1530	United Kingdom, BBC WS	11860af	11940af	15420af	17880af
		21490af			
1500-1600	USA, KAIJ Dallas TX	13815am			
1500-1600	USA, KTBN Salt Lk City UT	7510am			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, Voice of America	6110as	7125as	7215as	9575me
		9645as	9760as	15205as	15395as
1500-1600	USA, WEWN Birmingham AL	9455na	11875na	15665eu	
1500-1600	USA, WGTG McCaysville GA	9400am			
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na			
1500-1600	USA, WRNO New Orleans LA	15420am			
1500-1600 as	USA, WVHA Greenbush ME	15745na			
1500-1600	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1500-1600	USA, WYFR Okeechobee FL	11830na	17760na		
1500-1600	Zambia, Christian Voice	6065af			
1530-1555	Austria, R Austria Intl	6155as	9495af	9655me	13730af
1530-1545	India, All India Radio	3945do	6185do	7140do	7410do
		9530do	9565do	9685do	9700do
		9910do	11740do		
1530-1600	Iran, VOIRI	7290as	9635as		
1530-1600	Mongolia, R Ulan Bator	9745eu	12025au		
1530-1600	Netherlands, Radio	9895as	12090as		
1530-1600	United Kingdom, BBC WS	7180as	11720as		
1550-1600 a	Vatican State, Vatican R	9940as	11640as		

Selected Programs

Sundays

1500 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
1501 UK, BBC London (south as): Play of the Week. See S 0630.
1505 UK, BBC London (af): The Art House. See S 0435.
1505 UK, BBC London (am): From Our Own Correspondent. See S 0330.
1505 UK, BBC London (as pac/eu): Sports Roundup. See S 0135.
1515 UK, BBC London (as pac): Concert Hall. Classical music concerts.
1515 UK, BBC London (eu): Development '97. See S 0615.
1525 UK, BBC London (am): Book Choice. Opening a newly published book.
1530 UK, BBC London (af): BBC English. For learners of English.
1530 UK, BBC London (am): Variable Feature. See S 1130.
1530 UK, BBC London (eu): From Our Own Correspondent. See S 0330.
1550 UK, BBC London (eu): Variable Feature. See S 1130.

Mondays

1500 UK, BBC London (af): John Peel (Alternative). See M 1330.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. Up-to-the-minute reports on the day's events from all over the continent.
1505 UK, BBC London (am/eu/south as): Sports Roundup. See S 0135.
1515 UK, BBC London (am): The Greenfield Collection. This classical music program replaces Ray on Record.
1515 UK, BBC London (eu): The Learning World. See S 1130.
1515 UK, BBC London (south as): Concert Hall. See S 1515.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (eu): Omnibus. See M 1130.
1545 UK, BBC London (as pac): Off the Shelf. See M 0330.

Tuesdays

1500 UK, BBC London (af): Multitrack Hit-List (Alternative). See M 1615.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am/eu/south as): Sports Roundup. See S 0135.
1515 UK, BBC London (am/eu): Variable Feature. See S 1130.
1515 UK, BBC London (south as): The Greenfield Collection. See M 1515.
1525 UK, BBC London (am): Pop Short. A five-minute popular music program.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (am): Discovery. See T 0230.
1530 UK, BBC London (eu): Variable Feature. See S 1130.
1545 UK, BBC London (as pac): Off the Shelf. See M 0330.

Wednesdays

1500 UK, BBC London (af): Megamix (Alternative). See T 1615.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am/eu/south as): Sports Roundup. See S 0135.
1515 UK, BBC London (am): Variable Feature. See S 1130.
1515 UK, BBC London (eu): Concert Hall. See S 1515.
1515 UK, BBC London (south as): From Our Own Correspondent. See S 0330.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (am): The Ed Stewart Show. See M 0530.
1530 UK, BBC London (south as): Meridian On Screen. See T 1401.
1545 UK, BBC London (as pac): Off the Shelf. See M 0330.
1554 Radio Netherlands: Documentary. Hong Kong Goes Home (29th). See F 2354.
1554 Radio Netherlands: Documentary. The Birthing Room (1st). See W 1254.
1554 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (8th,15th,22nd). See A 2354.

Thursdays

1500 UK, BBC London (af): Multitrack X-Press (Alternative). See W 1615.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am/eu/south as): Sports Roundup. See S 0135.
1515 UK, BBC London (am): The Farming World. See M 0145.
1515 UK, BBC London (eu): Jazz Now and Then. See S 1230.
1515 UK, BBC London (south as): Assignment. See H 0230.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (am): Megamix. See T 1615.
1530 UK, BBC London (eu): Network UK. See H 1430.
1545 UK, BBC London (as pac): Off the Shelf. See M 0330.
1545 UK, BBC London (south as): The Learning World. See S 1130.

Fridays

1500 UK, BBC London (af): Multitrack Alternative (Alternative). See F 1330.
1500 UK, BBC London (af/am/eu/south as): World News. See S 0000.
1500 UK, BBC London (as pac): East Asia Today. See S 2310.
1505 UK, BBC London (af): Focus on Africa. See M 1505.
1505 UK, BBC London (am/eu/south as): Sports Roundup. See S 0135.
1515 UK, BBC London (am): Concert Hall. See S 1515.
1515 UK, BBC London (eu/south as): Variable Feature. See S 1130.
1530 UK, BBC London (af): Outlook. See M 1405.
1530 UK, BBC London (eu): Music Review. See S 0330.
1545 UK, BBC London (as pac): Off the Shelf. See M 0330.
1545 UK, BBC London (south as): Seeing Stars (1). See S 0430.
1545 UK, BBC London (south as): Short Story. See S 0430.

Saturdays

1500 UK, BBC London (all streams): World News. See S 0000.
1505 UK, BBC London (all streams): Sportsworld. See A 1405.

Martin Fookes, presenter of Sportsworld on Saturdays

Frequencies

1600-1700	Algeria, R Algiers Intl	9545eu	9630eu	15160eu	15205eu
		17745eu			
1600-1700	Australia, Radio	5995pa	6060pa	6080pa	6090pa
		9580pa	9615va	9860pa	11660pa
		11800pa	12080pa		
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700 s	Canada, R Canada Intl	9640am	11855am		
1600-1700	China, China Radio Intl	4130af	11575as	15110af	15130af
1600-1700	Costa Rica,RF Peace Intl	7385am	15050am		
1600-1630	Ethiopia, Radio	7165af			
1600-1700	France, Radio France Intl	6175eu	11615me	11700af	12015af
		15210af	15460af	15530af	
1600-1650	Germany, Deutsche Welle	6150as	6170as	7225as	7305as
		9585as			
1600-1700	Germany, Deutsche Welle	7195af	9735af	11810af	13610af
		15145af			
1600-1700	Guam, AWR/KSDA	7395as			
1600-1630	Guam, TWR/KTWR	11580as			
1600-1630	Iran, VOIRI	7290as	9635as		
1600-1700 vl	Italy, IRRS	3985va			
1600-1700	Jordan, Radio	11690eu			
1600-1700	Malaysia, Radio	7295do			
1600-1630	Mexico, Radio Mexico Intl	9705na			
1600-1625	Netherlands, Radio	9895as	12090as		
1600-1650 occsnal	New Zealand, R NZ Intl	6105am			
1600-1630 s	Norway, Radio Norway Intl	9590af	11840na		
1600-1630	Pakistan, Radio	7230af	7350af	9485af	9900af
		11570af	11955af	15555af	
1600-1700	Russia,Voice of Russia WS	4740me	4940me	4975me	6175me
		7115af	7175af	7210af	7275af
		9470me	9505me	9585af	9635af
		11865af	13670af	15205me	
1600-1700 sm	Russia,Voice of Russia WS	6005me			
1600-1700	S Africa, Channel Africa	7155af	9685af	15240af	
1600-1700	Singapore,R Singapore Int	6155do			
1600-1700	Slovakia, Adv World Radio	13590as			
1600-1700	South Korea, R Korea Intl	5975eu	9515af	9870af	
1600-1700	Swaziland, Trans World R	9500af			
1600-1640	UAE, Radio Dubai	11795me	13675eu	15395me	17825me
1600-1700	United Kingdom, BBC WS	3915as	6195va	7135as	9410va
		9515na	9740va	11750as	12095as
		15070va	15485eu	17830af	17840va
		21660af			
1600-1615	United Kingdom, BBC WS	5990as	7180as	7205as	17705af
1600-1700	USA, KAIJ Dallas TX	13815am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	9355eu	9385af	18930af	
1600-1700	USA, Voice of America	6035af	6110as	7125as	7215as
		9645as	9760as	11920af	12040af
		13600af	13710af	15225af	15395as
		15410af	15445af	17895af	
1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15665eu	
1600-1700	USA, WGTG McCaysville GA	9400am			
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WJCR Upton KY	7490na			
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700 as	USA, WVHA Greenbush ME	15745va			
1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15695eu	17555eu
		17760eu	21525af		
1600-1630 a	Vatican State, Vatican R	9940as	11640as		
1600-1620 smtwhf	Vatican State, Vatican R	9940as	11640as		
1600-1630	Vietnam, Voice of	7400eu	9840eu		
1600-1700	Zambia, Christian Voice	3330af			
1600-1610 mtwhfa	Zambia, ZNBC Radio 2	6165do			
1605-1700	USA, WYFR Okeechobee FL	15215na			
1615-1700	United Kingdom, BBC WS	9510as	11860af		
1615-1630	Vatican State, Vatican R	5880eu	7250eu	9645eu	11810eu
1620-1630 mtwhf	Estonia, Radio	5925eu			
1630-1655	Austria, R Austria Intl	11780as			
1630-1700	Canada, R Canada Intl	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Slovakia, Adv World Radio	15620af			
1645-1700 irreg	Afghanistan, Radio	7200as			
1650-1700	Eqt Guinea, Radio Africa	15186af			
1650-1700 mtwhf	New Zealand, R NZ Intl	6070pa			

Selected Programs

Sundays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (af/am): Variable Comedy/Quiz Feature. See S 0130.
1615 UK, BBC London (as pac): In Praise of God. See S 0230.
1615 UK, BBC London (eu): Global Concerns. Update on environmental issues.
1615 UK, BBC London (south as): Letter from America. See S 0030.
1630 UK, BBC London (eu): BBC English. See S 1530.
1630 UK, BBC London (south as): Variable Feature. See S 1130.
1645 UK, BBC London (af): Variable Feature. See S 1130.
1645 UK, BBC London (am/eu): Britain Today. See S 0045.
1645 UK, BBC London (as pac): Seeing Stars (1). See S 0430.
1645 UK, BBC London (as pac): Short Story. See S 0430.
1645 UK, BBC London (south as): Variable Feature. See S 1130.

Mondays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (af): Fast Track. The latest African sports news and action.
1615 UK, BBC London (am): Meridian. See S 0630.
1615 UK, BBC London (as pac): Multitrack Hit-List. The UK Top 20.
1615 UK, BBC London (eu): The World Today. Examines thoroughly a topical aspect of the international scene.
1615 UK, BBC London (south as): Omnibus. See M 1130.
1630 UK, BBC London (eu): BBC English. See S 1530.
1645 UK, BBC London (af): The World Today. See M 1615.
1645 UK, BBC London (am/as pac/eu/south as): Britain Today. See S 0045.

Tuesdays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (af): Money Focus. African business magazine.
1615 UK, BBC London (am): Meridian On Screen. See T 1401.
1615 UK, BBC London (as pac/south as): Megamix. A youth magazine series which covers new trends, entertainment, sport and other issues.
1615 UK, BBC London (eu/af): The World Today. See M 1615.
1630 UK, BBC London (eu): BBC English. See S 1530.
1645 UK, BBC London (am/as pac/eu/south as): Britain Today. See S 0045.

Wednesdays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (af): Talkabout Africa. Telephone conversations with BBC correspondents on late-breaking African events.
1615 UK, BBC London (am): Meridian. See S 0630.
1615 UK, BBC London (as pac): Multitrack X-Press. New pop records, interviews, news and competitions.
1615 UK, BBC London (eu): The World Today. See M 1615.
1615 UK, BBC London (south as): Discovery. See T 0230.
1630 UK, BBC London (eu): BBC English. See S 1530.
1645 UK, BBC London (af): The World Today. See M 1615.
1645 UK, BBC London (am/as pac/eu/south as): Britain Today. See S 0045.

Thursdays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (af): Jive Zone. Get in the groove with all the latest sounds on the Afro music scene.
1615 UK, BBC London (am/as pac): Sports International. See H 0630.
1615 UK, BBC London (eu): The World Today. See M 1615.
1615 UK, BBC London (south as): Network UK. See H 1430.
1630 UK, BBC London (eu): World Business Report. See M 1205.
1645 UK, BBC London (af): The World Today. See M 1615.
1645 UK, BBC London (am/as pac/eu/south as): Britain Today. See S 0045.

Fridays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (af): African Perspective. See S 0631.
1615 UK, BBC London (am): Meridian. See S 0630.
1615 UK, BBC London (as pac): Multitrack Alternative. See F 1330.
1615 UK, BBC London (eu): The World Today. See M 1615.
1615 UK, BBC London (south as): Science in Action. See S 0530.
1630 UK, BBC London (eu): BBC English. See S 1530.
1645 UK, BBC London (af): The World Today. See M 1615.
1645 UK, BBC London (am/as pac/eu): Britain Today. See S 0045.
1645 UK, BBC London (south as): The World Today. See M 1615.

Saturdays

1600 UK, BBC London (all streams): World News. See S 0000.
1615 UK, BBC London (all streams): Sportsworld. See A 1405.

RADIO THAILAND

Donald Michael Choleva monitored R. Thailand on 9652 kHz.

FREQUENCIES

1700-1800	Australia, Radio	6060pa	6080pa	6090pa	9580pa
		9615as	9860pa	11660pa	11880pa
		12080pa			
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800 vl	Canada, CBC N Quebec Svc	9625do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	7150af	7405af	9570af	
1700-1800 as	Costa Rica, Adv World R	13750am			
1700-1800	Costa Rica,RF Peace Intl	15050am			
1700-1727	Czech Rep, Radio Prague	5930eu	9430af		
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Eqt Guinea, Radio Africa	15186af			
1700-1730	France, Radio France Intl	6175eu	11615me	11700af	15210af
		15365af	15460af	15530af	
1700-1800 vl	Italy, IRRS	3985va			
1700-1800	Japan, R Japan NHK World	6035na	7225na	9535na	11880as
		15205me			
1700-1730	Jordan, Radio	11690eu			
1700-1752 mtwhf	New Zealand, R NZ Intl	6070pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9975af	13785me
1700-1750 vl	Pakistan, Radio	9400eu	11570eu		
1700-1800	Russia,Voice of Russia WS	4740me	5940eu	6110eu	6130eu
		7115af	7130me	7175af	7180eu
		7210me	7255me	7275me	7305af
		7325af	7330eu	7440eu	9505af
		9585af	9890eu	13670af	
1700-1755	S Africa, Channel Africa	7155af	9685af		
1700-1730	Switzerland, Swiss R Intl	5850af	9885af	9905af	
1700-1800	Switzerland, Swiss R Intl	7410eu			
1700-1800	United Kingdom, BBC WS	3955eu	6190af	6195eu	7150eu
		9410va	9710as	9740as	11750as
		11760as	11860af	12095eu	15070va
		15400af	15485eu	15575af	17830af
		17840af			
1700-1745	United Kingdom, BBC WS	3915as	7135as	9630af	12095va
1700-1715	United Kingdom, BBC WS	9515va	9590na		
1700-1800	USA, KAIJ Dallas TX	13815am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KVOH Los Angeles CA	17775na			
1700-1800	USA, KWHR Naalehu HI	6120as			
1700-1800	USA, Monitor Radio Intl	9355eu	9385af	18930af	
1700-1800	USA, Voice of America	6035af	6040eu	6110as	7125as
		7215as	9645as	9760me	11920eu
		12040af	13600eu	13710af	15205me
		15395as	15445af	15580af	17895eu
1700-1800 mtwhf	USA, Voice of America	5990as	6045as	9525as	9670as
		9770as	12005as	19795as	
1700-1800	USA, WEWN Birmingham AL	11875na	13615na	15665eu	
1700-1800	USA, WGTG McCaysville GA	9400am			
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1700-1800	USA, WYFR Okeechobee FL	15695eu	17555eu		
1700-1800	Zambia, Christian Voice	3330af			
1700-1800 a	Zambia, ZNBC Radio 2	6165do			
1700-1800 vl	Zimbabwe, Zimbabwe BC	4828do			
1715-1730	Albania, R Tirana Intl	6185eu	7155eu		
1715-1800	United Kingdom, BBC WS	7160va			
1730-1800	Georgia, Radio	11910eu			
1730-1800	Guam, AWR/KSDA	9370as			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1730-1800	Romania, R Romania Intl	11740af	11940af	15340af	
1730-1800	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1730-1800	Swaziland, Trans World R	3200af			
1730-1800	United Kingdom, BBC WS	6180eu			
1730-1800	Vatican State, Vatican R	9660af	11625af	15570af	
1745-1800	Bangladesh,Bangla Betar	7185as	9548eu	15520do	
1745-1800	India, All India Radio	7410eu	9650eu	9950af	11620af
		11935af	13750as	15075me	
1753-1800 mtwhf	New Zealand, R NZ Intl	9810pa			
1800-1900	Australia, Radio	9580pa	9860pa	11880pa	12080pa
1800-1830	Australia, Radio	6060pa	6080as		
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8K Katherine	2485do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bangladesh,Bangla Betar	7185eu	9548as	15520do	
1800-1900	Brazil, Radio Bras	15265eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica,RF Peace Intl	15050am			
1800-1827	Czech Rep, Radio Prague	5835eu	9430af		
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Eqt Guinea, Radio Africa	15186af			
1800-1900	India, All India Radio	7410eu	9650eu	9950af	11620af
		11935me	13750as	15075as	
1800-1900	Japan, R Japan NHK World	11880as	15205me		
1800-1900	Kuwait, Radio	11990na			
1800-1900 s	Morocco, RTVM Marocaine	17815af			
1800-1825	Netherlands, Radio	6020af	9605af	11655af	
1800-1900 mtwhf	New Zealand, R NZ Intl	9810pa			
1800-1900 vl	Pakistan, Radio	11570eu			
1800-1900 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1800-1900	Russia,Voice of Russia WS	6130eu	7175af	7180eu	7305af
		7325af	7440eu	9505af	9890eu
		13670af			
1800-1900	Sudan, Radio Omdurman	9200af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1830	Swaziland, Trans World R	9500af			
1800-1900	United Kingdom, BBC WS	3255af	3955eu	6180eu	6190af
		6195eu	9410va	9740as	12095eu
		15070va	15400af	15575af	17830af
		17840ca			
1800-1830	United Kingdom, BBC WS	7150eu	7160va	9510as	11750as
1800-1900	USA, KAIJ Dallas TX	13815am			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625au			
1800-1900	USA, Monitor Radio Intl	9355eu	9385af	11550eu	18930af
1800-1900	USA, Voice of America	6040va	9760me	11920af	12040af
		13710af	15410af	15580af	
1800-1900	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
1800-1900	USA, WGTG McCaysville GA	9400am			
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1800-1900	USA, WJCR Upton KY	7490na			
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900 mtwhf	USA, WVHA Greenbush ME	11580af			
1800-1900	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1800-1900	USA, WYFR Okeechobee FL	15695eu	17555eu		
1800-1845	USA, WYFR Okeechobee FL	15695eu			
1800-1830	Vietnam, Voice of	7400eu	9840eu		
1800-1900	Yemen, Yemeni Rep Radio	9780do			
1800-1900	Zambia, Christian Voice	3330af			
1800-1810	Zambia, ZNBC Radio 1	7220do			
1800-1857	Zambia, ZNBC Radio 2	6165do			
1800-1900 vl	Zimbabwe, Zimbabwe BC	4828do			
1830-1900	Australia, Radio	7240pa	7330as		
1830-1900	Netherlands, Radio	6020af	9605af	11655af	15315af
		17605af			
1830-1855	Poland, Polish R Warsaw	6000eu	6095eu	7270eu	7285eu
1830-1900	South Korea, R Korea Intl	3970eu			
1830-1900	United Kingdom, BBC WS	6005af	9630af	9740va	
1833-1900	Cote D' Ivoire, RDTV	11920do			
1840-1850	Greece, Voice of	11645af	15150af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900 s	New Zealand, R NZ Intl	9810pa			
1858-1900 s	Germany, R Alpha & Omega	6110eu			

I can't recall how long I've been subscribing to Monitoring Times, but I thoroughly enjoy it. I read every issue virtually cover to cover. Your magazine is informative and entertaining; a definite asset to my radio hobby. I congratulate your staff on producing such a consistently excellent publication.

—Monte B. Carroll, Nashville, TN

FREQUENCIES

1900-2000 mtwhf	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	6080pa	7240pa	7330as	9580pa
		9860pa	11880pa	12080pa	
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-1920	Brazil, Radio Bras	15265eu			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica, Adv World R	13750am	15460am		
1900-2000	Costa Rica,RF Peace Intl	15050am			
1900-1930	Cote D' Ivoire, RDTV	11920do			
1900-2000	Ecuador, HCJB	11960eu	21455am		
1900-2000	Eqt Guinea, Radio Africa	15186af			
1900-1950	Germany, Deutsche Welle	9640af	9765af	11785af	11810af
		13690af	15135af	15425af	
1900-2000 s	Germany, R Alpha & Omega	6110eu			
1900-1910	Greece, Voice of	9375eu			
1900-2000	Guatemala, Adv World R	5980am			
1900-1945	India, All India Radio	7410eu	9650eu	9950me	11620eu
		11935af	13750as	15075as	
1900-2000 vl	Italy, IRRS	3985va			
1900-2000	Japan, R Japan NHK World	6035as	7140pa	9535na	
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-2000	Kuwait, Radio	11990eu			
1900-2000 smtwha	Malta, VO Mediterranean	7390va	7440va		
1900-2000	Netherlands, Radio	6020af	9605af	11655af	15315af
		17605af			
1900-1952 mtwhfa	New Zealand, R NZ Intl	9810pa			
1900-1958 a	New Zealand, R NZ Intl	9810pa			
1900-1930 s	Norway, Radio Norway Intl	5960eu	7485af	9590af	
1900-1930 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1900-2000	Romania, R Romania Intl	5955eu	7105af	7195eu	9690eu
1900-2000	Russia,Voice of Russia WS	4920eu	5940eu	6110eu	6130eu
		7180eu	7210af	7255af	7275af
		7305af	7325af	7440eu	9505af
		9585af	9890eu		
1900-2000	South Korea, R Korea Intl	5975eu	7275as		
1900-2000	Swaziland, Trans World R	3200af			
1900-2000	Thailand, Radio	7295eu	9655eu	11905eu	
1900-2000	United Kingdom, BBC WS	3255af	3955eu	5975me	6005af
		6180eu	6190af	6195va	9410af
		9630af	9740af	12095eu	15070va
		15400af	15575af	17830af	
1900-1915	United Kingdom, BBC WS	15105af	17880af		
1900-2000	USA, KAIJ Dallas TX	13815am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625au			
1900-2000	USA, Monitor Radio Intl	9355eu	9385af	11550eu	17510af
1900-2000	USA, Voice of America	4950af	6035af	7415af	9525pa
		9760me	11870pa	11920af	11975va
		12040af	13710af	15180pa	15410af
		15580af			
1900-2000	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
1900-2000	USA, WGTG McCaysville GA	9400am			
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WJCR Upton KY	7490na			
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000 smtwhf	USA, WVHA Greenbush ME	9930af			
1900-2000	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1900-1945	USA, WYFR Okeechobee FL	17555eu			
1900-1930	Vietnam, Voice of	7400eu	9840eu		
1900-2000	Zambia, Christian Voice	3330af			
1900-2000 vl	Zimbabwe, Zimbabwe BC	4828do			
1930-2000	Albania, R Tirana Intl	6270eu	7270eu		
1930-1955	Austria, R Austria Intl	5945eu	6155eu	9495af	13730af
1930-2000	Georgia, Radio	11760eu			
1930-2000	Iran, VOIRI	7260af	9022eu		
1930-2000	Mongolia, R Ulan Bator	9745eu	12085eu		
1930-2000 vl	Papua New Guinea, NBC	4890do			
1930-2000	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1930-2100 irreg	Somalia, Radio Mogadishu	6710af	6969af		
1930-2000	Sweden, Radio	6065eu	7240eu	9655af	
1930-2000	Turkey, Voice of	5970na	6000na		
1930-2000 a	Yugoslavia, Radio	6100eu	9720af		
1935-1955	Italy, RAI Intl	7235eu	9670eu	11905eu	
1945-2000 t	Belarus, Radiosta Belarus	7105eu	7180eu	7210eu	9875eu
1950-2000	Vatican State, Vatican R	4005eu	5880eu	7250eu	
1953-2000 smtwhf	New Zealand, R NZ Intl	11735pa			
1959-2000 a	New Zealand, R NZ Intl	11735pa			

2000-2100	Angola, Radio Nacional	3355do	9535do		
2000-2100	Australia, Radio	6080pa	7240pa	7330as	9580pa
		9860pa	11880pa	12080pa	
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2025	Belgium, R Vlaanderen Int	5910eu	9925af		
2000-2100	Bulgaria, Radio	7335eu	9700eu		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	11715af
		15110af			
2000-2100	Costa Rica,RF Peace Intl	15050am			
2000-2027	Czech Rep, Radio Prague	5930eu	7345af		
2000-2100	Ecuador, HCJB	11960eu	21455am		
2000-2100	Eqt Guinea, Radio Africa	15186af			
2000-2030 mt	Estonia, Radio	5925eu			
2000-2050	Germany, Deutsche Welle	5960eu	7285eu	9615eu	9670pa
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2100	Guatemala, Adv World R	5980am			
2000-2030	Hungary, Radio Budapest	3975eu	5970eu	9835eu	
2000-2100	Indonesia, Voice of	9525as			
2000-2030	Iran, VOIRI	7260af	9022eu		
2000-2025	Israel, Kol Israel	7465na	9365eu	9435na	15640af
2000-2100 vl	Italy, IRRS	3985va			
2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2000-2100	Kuwait, Radio	11990eu			
2000-2030 as	Latvia, Radio	5935eu			
2000-2030	Mexico, Radio Mexico Intl	9705na			
2000-2025	Netherlands, Radio	6020af	9605af	11655af	15315af
		17605af			
2000-2006 fa	New Zealand, R NZ Intl	9875pa			
2000-2100 mtwhf	New Zealand, R NZ Intl	11735pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2000-2050	North Korea, R Pyongyang	6575eu	9345as	9640af	9975as
2000-2100 vl	Papua New Guinea, NBC	4890do			
2000-2030 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu	9815eu	15515af
2000-2100	Russia,Voice of Russia WS	4920eu	5940eu	6110eu	6130eu
		7175af	7180eu	7305af	7325af
		9585af	9890eu	13670af	
2000-2015	Sierra Leone, SLBS	3316do			
2000-2030 irreg	Somalia, Radio Mogadishu	6854af			
2000-2100 mtwhf	Spain, R Exterior Espana	6125eu	11775af		
2000-2045	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	9885af	9905af	11640af	13635af
2000-2020	Switzerland, Swiss R Intl	6165eu			
2000-2030	Turkey, Voice of	5970na	6000na		
2000-2015	Uganda, Radio	3340do			
2000-2100	United Kingdom, BBC WS	3255af	3955eu	5975me	6005af
		6180eu	6190af	6195eu	7325eu
		9410af	9630af	11750sa	11835va
		11955as	12095eu	15070va	15400af
		15575eu	17830af		
2000-2100	USA, KAIJ Dallas TX	13815am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, KWHR Naalehu HI	11815as			
2000-2100	USA, Monitor Radio Intl	5835eu	7510eu	13840pa	
2000-2100	USA, Voice of America	6035af	7415af	9760me	11975af
		13710af	15205me	15410af	15580af
		17725af	17755af		
2000-2100	USA, WEWN Birmingham AL	7425na	13615na	17695eu	
2000-2100	USA, WGTG McCaysville GA	9400am			
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WJCR Upton KY	7490na			
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100 s	USA, WRMI/R Miami Intl	9955am			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100 mtwhfa	USA, WVHA Greenbush ME	9930va			
2000-2100	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2000-2100	USA, WYFR Okeechobee FL	5810eu	7355af		
2000-2045	USA, WYFR Okeechobee FL	21525af			
2000-2100	USA, WYFR Okeechobee FL	15565af			
2000-2030	Vatican State, Vatican R	7365eu	9645eu		
2000-2030	Zambia, Christian Voice	3330af			
2000-2005	Zambia, ZNBC Radio 2	6165do			
2000-2100 vl	Zimbabwe, Zimbabwe BC	4828do			
2005-2010	Croatia, Croatian Radio	5920eu	7165eu	9830eu	
2005-2100	Syria, Radio Damascus	12085na	13610eu		
2007-2100 fa	New Zealand, R NZ Intl	11735pa			
2025-2045	Italy, RAI Intl	7110af	9710af	11840af	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2030-2100	Slovakia, Adv World Radio	9455af			
2030-2100	Sweden, Radio	6065eu	7240eu	9655af	
2030-2045	Thailand, Radio	9655eu	11805as	11905eu	
2030-2100 as	USA, Voice of America	4950eu			
2030-2100	Uzbekistan, R Tashkent	4850eu	7105eu	9540eu	
2030-2100	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
		12020eu	15010eu		
2045-2100	India, All India Radio	7410eu	9910au	9950eu	11620eu
		11715pa	15225pa		

FREQUENCIES

2100-2200	Australia, Radio	7240pa	9660pa	9850pa	9860as
		11695pa	11855as	11880pa	12080pa
		13605pa			
2100-2130	Australia, Radio	6080pa	11800pa		
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2200 vl	Australia, VL8K Katherine	5025do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2200 vl	Australia, VL8T Tent Crk	4910do			
2100-2200 vl	Cameroon, Radio Garoua	5010do			
2100-2200 vl	Canada, CBC N Quebec Svc	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, R Canada Intl	5925eu	5995eu	7235eu	9805af
		11945af	15325eu	17820eu	17870eu
2100-2200	China, China Radio Intl	6950eu	9920eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica,RF Peace Intl	15050am			
2100-2200	Cuba, Radio Havana	13715eu	13725eu		
2100-2200	Ecuador, HCJB	11960eu	21455am		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	9615af	9670as	9765as	11785pa
		11865af	15275af		
2100-2200	India, All India Radio	7410eu	9910eu	9950eu	11620au
		11715au	15225au		
2100-2200 vl	Italy, IRRS	3955va			
2100-2200	Japan, R Japan NHK World	6035as	9825as	11850pa	
2100-2107 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Voice of Hope	9990va			
2100-2130 vl	Mexico, Radio Mexico Intl	9705na			
2100-2135 smtwh	New Zealand, R NZ Intl	11735pa			
2100-2200 fa	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2100-2200 vl	Papua New Guinea, NBC	4890do			
2100-2125	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2100-2200	Romania, R Romania Intl	5990eu	5995eu	7105eu	7195eu
2100-2200	Russia,Voice of Russia WS	5940eu	6110eu	7170eu	7180eu
		7320eu	7440eu	9890eu	
2100-2200	Slovakia, Adv World Radio	6055eu			
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, R Exterior Espana	6125eu			
2100-2110	Uganda, Radio	3340do			
2100-2200	United Kingdom, BBC WS	3255af	3915as	3955eu	5975va
		6005af	6120as	6180eu	6190af
		6195va	7325eu	9410va	9740au
		11750sa	11835va	11945as	11955as
		12095eu	15400af	15575eu	
2100-2130	United Kingdom, BBC WS	9630af			
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200	USA, KWHR Naalehu HI	11815as			
2100-2200	USA, Monitor Radio Intl	5835eu	7510eu	13840au	
2100-2200	USA, Voice of America	6035af	6070me	7415af	9595me
		9760me	11975af	13710eu	15205me
		15410eu	15580eu	17725eu	
2100-2200	USA, WEWN Birmingham AL	7425na	13615na	17695eu	
2100-2200	USA, WGTG McCaysville GA	5085am			
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WJCR Upton KY	7490na			
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200 a	USA, WRMI/R Miami Intl	9955am			
2100-2130 s	USA, WRMI/R Miami Intl	9955am			
2100-2200 mtwhfa	USA, WVHA Greenbush ME	9930va			
2100-2200	USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
		15685am			
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580eu	15565eu	
2100-2105	Zambia, ZNBC Radio 2	6165do			
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do			
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom, BBC WS	15390am	17715am		
2130-2200	Armenia, Voice of	7480eu	9965eu		
2130-2200	Australia, Radio	13755pa	17795pa	17860pa	
2130-2200	Finland, YLE/R Finland	6135eu			
2130-2200	Guam, AWR/KSDA	15310as			
2130-2200	Iran, VOIRI	6175au			
2130-2135 mtwhf	Latvia, Radio	5935eu			
2130-2200 as	Sweden, Radio	6065eu	7230af		
2130-2145	United Kingdom, BBC WS	11680sa			
2130-2200	Uzbekistan, R Tashkent	4850eu	7105eu	9540eu	
2136-2200 smtwh	New Zealand, R NZ Intl	15115pa			
2145-2200 a	Greece, Voice of	9425au			
2145-2200	United Kingdom, BBC WS	5990as	7160as	9580as	

2200-2300	Australia, Radio	11695pa	11855as	12080pa	13755pa
		15365pa	17795pa	17860pa	
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2300	Bulgaria, Radio	7390eu	9700eu		
2200-2300	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, R Canada Intl	5995eu	7235eu	9805af	11705eu
		11945af	13690eu	15150eu	
2200-2300	China, China Radio Intl	7110eu	7175eu		
2200-2230	China, China Radio Intl	3985eu			
2200-2300	Costa Rica,RF Peace Intl	7385am	15050am		
2200-2300	Cuba, Radio Havana	6180na			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eqt Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2230	Hungary, Radio Budapest	3975eu	5970eu	7250eu	9835eu
2200-2230	India, All India Radio	7410eu	9910eu	9950eu	11620au
		11715au	15225au		
2200-2230	Iran, VOIRI	6175au			
2200-2300 vl	Italy, IRRS	3955va			
2200-2225	Italy, RAI Intl	5975as	9710as	11815as	
2200-2300	Lebanon, Voice of Hope	9990va			
2200-2300	Malaysia, Radio	7295do			
2200-2225 mtwhf	Moldova, R Moldova Intl	7520eu			
2200-2300 smtwh	New Zealand, R NZ Intl	15115pa			
2200-2215	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2200-2208 vl	Papua New Guinea, NBC	4890do			
2200-2300	Russia,Voice of Russia WS	5940eu	6110eu	7180eu	7205eu
		7320eu	7360eu	7400eu	9890eu
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, Adv World Radio	6055af			
2200-2300 as	Spain, R Exterior Espana	6125eu	11775af		
2200-2205	Syria, Radio Damascus	12085na	13610eu		
2200-2300	Taiwan, VO Free China	5810eu	9985eu		
2200-2300	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu	6080eu
		7115eu	7160eu	7205eu	7290eu
		7380eu			
2200-2300	United Kingdom, BBC WS	3955eu	5905as	5975va	6175va
		6195va	9590va	9915va	11750sa
		11835va	11955as	12095eu	15400af
2200-2230	United Kingdom, BBC WS	9410eu			
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	7510eu	13770sa	13840as	
2200-2300	USA, Voice of America	7215as	9770as	9890as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2230 mtwhf	USA, Voice of America	6035af	7415af	11975af	12080af
		13710af			
2200-2300	USA, WEWN Birmingham AL	7395na	11820eu	13615na	
2200-2300	USA, WGTG McCaysville GA	9400am			
2200-2300	USA, WHRI Noblesville IN	9495am			
2200-2300	USA, WJCR Upton KY	7490na			
2200-2300 smtwhf	USA, WMLK Bethel PA	9465eu			
2200-2300 a	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 smtwhf	USA, WVHA Greenbush ME	5850af			
2200-2300	USA, WWCR Nashville TN	5070am	7435am	9475am	12160am
		13845am			
2200-2245	USA, WYFR Okeechobee FL	11580af	15565af	21525eu	
2200-2230	Yugoslavia, Radio	6100eu	6185eu		
2200-2210	Zambia, ZNBC Radio 2	6165do			
2207-2300 fa	New Zealand, R NZ Intl	15115pa			
2210-2300 vl	Papua New Guinea, NBC	9675do			
2215-2230	United Kingdom, BBC WS	11765sa	15390sa		
2230-2255	Austria, R Austria Intl	5945eu	6155eu	9495af	9880eu
2230-2257	Czech Rep, Radio Prague	5930na	7345na		
2230-2300	Sweden, Radio	6065eu	7325af		
2230-2300	United Kingdom, BBC WS	7325va			
2230-2300 mtwhf	USA, WRMI/R Miami Intl	9955am			
2240-2250	Greece, Voice of	9425au			
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	7155as	9705as	9950as	11620as
		11660as			
2245-2300	Vatican State, Vatican R	6065as	7305as	9600as	11830au

Frequencies

2300-0000	Australia, Radio	9660pa	11695as	11855as	13755as
		15365pa	17795pa	17860pa	
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-2325	Belgium, R Vlaanderen Int	5910eu			
2300-0000	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-2330	Canada, R Canada Intl	5960am	6040am	9535am	9755am
		11940am			
2300-0000	Costa Rica, Adv World R	5030am	6150am	7375am	9725am
		13750am	15460am		
2300-0000	Costa Rica,RF Peace Intl	7385am	15050am		
2300-0000	Egypt, Radio Cairo	9900na			
2300-2350	Germany, Deutsche Welle	6000as	6160as	7235as	
2300-0000	Guam, AWR/KSDA	11775as			
2300-0000	Guatemala, Adv World R	11775am			
2300-0000	India, All India Radio	9705as	9950as	11620as	13700as
		15145as			
2300-0000	Japan, R Japan NHK World	6180eu	9560as	9825eu	11850pa
2300-0000	Lebanon, Voice of Hope	9990va			
2300-0000	Malaysia, Radio	7295do			
2300-2325 mtwhf	Moldova, R Moldova Intl	7520na			
2300-0000 as	New Zealand, R NZ Intl	15115pa			
2300-2315	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-2330 s	Norway, Radio Norway Intl	5905sa	7275as	7465na	
2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-0000	Romania, R Romania Intl	7175na	9510na	9570na	11940na
2300-0000	Russia,Voice of Russia WS	5940na	7105na	7125na	7180na
		7330na			
2300-0000	Turkey, Voice of	6135na	7280na	9650na	9655na
2300-0000	United Kingdom, BBC WS	3955eu	5975va	6175va	6195va
		7295as	9580as	9590na	9915va
		11750sa	11945as	11955as	
2300-2330	United Kingdom, BBC WS	3915as			
2300-2315	United Kingdom, BBC WS	11835va			
2300-0000	USA, KAIJ Dallas TX	13815am			
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	USA, Monitor Radio Intl	7510af	13770sa		
2300-0000	USA, Voice of America	7215as	9770as	9890as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2300-0000	USA, WEWN Birmingham AL	6890na	13615na		
2300-0000	USA, WGTG McCaysville GA	5085am			
2300-0000	USA, WHRI Noblesville IN	5745am			
2300-0000	USA, WJCR Upton KY	7490na			
2300-0000 mtwhf	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000 s	USA, WVHA Greenbush ME	5850eu			
2300-0000	USA, WWCR Nashville TN	3215am	5070am	7435am	13845am
2300-2315	Vatican State, Vatican R	7305as	9600as	11830na	
2310-2315	Kyrgyzstan, Kygyz Radio	4010eu	4050eu		
2330-0000 as	Canada, R Canada Intl	5960am	6010am	9535am	9755am
		11940am			
2330-2359	Netherlands, Radio	6020na	6165na		
2330-0000	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as	15010as		
2335-2345	Greece, Voice of	7450sa	9935sa	11640sa	

Selected Programs

Sundays

2300 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
2310 UK, BBC London (af/am/eu): Going Solo. Mark Lowther presents demonstrates how musical instruments are sometimes featured alone.
2310 UK, BBC London (as pac): East Asia Today. News, analysis, press reviews and reports from BBC correspondents.
2315 UK, BBC London (am/eu): The Learning World. See S 1130.
2330 UK, BBC London (am): In Praise of God. See S 0230.
2330 UK, BBC London (as pac): New Ideas. Window on the world of technology. innovation and new products.
2350 UK, BBC London (as pac): Write On. See S 0350.

Mondays

2300 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
2310 UK, BBC London (af/am/eu): Take Five. A short series of human interest stories.
2310 UK, BBC London (as pac): East Asia Today. See S 2310.
2315 UK, BBC London (am/eu): Record News. See S 0445.
2330 UK, BBC London (am): Multitrack Hit-List. See M 1615.
2330 UK, BBC London (as pac): The World Today. See M 1615.
2345 UK, BBC London (as pac): Variable Feature. See S 1130.

Tuesdays

2300 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
2310 UK, BBC London (af/am): Voicebox. Experts and ordinary people take a light-hearted look at the English language.
2310 UK, BBC London (as pac): East Asia Today. See S 2310.
2310 UK, BBC London (eu): Voicebox. See T 2310.
2315 UK, BBC London (am/eu): Variable Feature. See S 1130.
2330 UK, BBC London (am): Megamix. See T 1615.
2330 UK, BBC London (as pac): The World Today. See M 1615.
2345 UK, BBC London (as pac): Development '97. See S 0615.

Wednesdays

2300 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
2310 UK, BBC London (af/am/eu): Science View. See W 0040.
2310 UK, BBC London (as pac): East Asia Today. See S 2310.
2315 UK, BBC London (am/eu): Country Style. See S 0010.
2330 UK, BBC London (am): Multitrack X-Press. See W 1615.
2330 UK, BBC London (as pac): The World Today. See M 1615.
2345 UK, BBC London (as pac): From Our Own Correspondent. See S 0330.

Thursdays

2300 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
2310 UK, BBC London (af/am/eu): Take Five. See M 2310.
2310 UK, BBC London (as pac): East Asia Today. See S 2310.
2315 UK, BBC London (am/eu): Variable Feature. See S 1130.
2330 UK, BBC London (am): The Ed Stewart Show. See M 0530.
2330 UK, BBC London (as pac): The World Today. See M 1615.
2345 UK, BBC London (as pac): The Farming World. See M 0145.

Fridays

2300 UK, BBC London (af/am/as pac/eu): World News. See S 0000.
2310 UK, BBC London (af/am/as pac/eu): Spotlight. See S 0005.
2315 UK, BBC London (am/as pac/eu): The Insider's Guide. See F 0005.
2325 UK, BBC London (am): Book Choice. See S 1525.
2325 UK, BBC London (as pac): Going Solo. See S 2310.
2330 UK, BBC London (am): Multitrack Alternative. See F 1330.
2330 UK, BBC London (as pac): The World Today. See M 1615.
2345 UK, BBC London (as pac): Seeing Stars (1). See S 0430.
2345 UK, BBC London (as pac): Short Story. See S 0430.
2354 Radio Netherlands: Documentary. Hong Kong Goes Home (31st). Marijke van der Meer is on location examining the issues related to the return of the British colony to Chinese rule.
2354 Radio Netherlands: Documentary. The Birthing Room (3rd). See W 1254.
2354 Radio Netherlands: Documentary. The Thirsty Earth (3-parter) (10th,17th,24th). See A 2354.

Saturdays

2300 UK, BBC London (af/am/eu): Play of the Week (from 2230). See S 0630.
2300 UK, BBC London (as pac): World News. See S 0000.
2310 UK, BBC London (as pac): From Our Own Correspondent. See S 0330.
2330 UK, BBC London (am): Anything Goes. See S 0530.
2330 UK, BBC London (as pac): Variable Feature. See S 1130.

MT Monitoring Team

Next Reporting Deadline: January 20, 1996

Gayle Van Horn, Frequency Manager, swbcsked@grove.net
Jim Frimmel, Program Manager, DXComp@aol.com

Jacques d'Avignon, Propagation Forecasts, Ontario, Canada
Dave Datko, CA
Loyd Van Horn, N.C.
monitor@limestone.kosone.com

THANK YOU ...

Additional contributors to this month's Shortwave Guide:

John Babbis, Silver Springs, MD; David K. Callender, Richmond, KY; C. Clifford Coffman, Hammond, IN; Bill Damick-TWR via email; Bob Fraser, Cohasset, MA; Carl T. Craig, Shelbyville, TN; Ed Evans-Monitor Radio Intl via email; Frank Hillton, Charleston, SC; John Horen, Fairbanks, AK; Rev. Michael G. Mayer, Dover, DE; Gregory Majewski, via email; Ed Mayberry, Austin, TX via email; Larry Michalski, West Senaca, NY; Jim Moats, Ravenna, OH; Clayton B. Sherman, Hoosick Falls, NY; Russell Sova, Wickliffe, OH; Robert E. Thomas, Bridgeport, CT; Larry Van Horn, Brasstown, NC; Mark Veldhuis, the Netherlands via email; Jeff White-WRMI via email; Sam Wright, Biloxi, MS; BBCMS; BBC *World Media*; BBC *Summary of World Broadcasts*; *DX Hotline*; *DX Ontario*; *DX Post*; *Fine Tuning*; *Hard Core-DX*; *NASWA Journal*; *DX Ontario*; Internet Shortwave Newsgroups; *Cumbre DX*; *World of Radio*.

Readers' Choice

By Jacques d'Avignon

Well, here you have it! The new format for the propagation forecasts has now been set. *Thank you* to everyone that answered the survey. We found out that there really are users of the forecasts "out there," and we received enough input to determine the format that will fill the most needs. This month we will discuss the changes and explain why they were made.

As we have only one page per month available for this service, the majority of the answers to the survey indicated that we should use a tabular format. This permits us to "scrunch" onto one page 30 circuits compared to the 24 that we had before. More importantly, residents of the US Midwest now have their own sets of forecasts and do not have to extrapolate between the East and West Coast graphs.

Please note that the forecasts now run from mid-month to mid-month, as shown by the dates above the table. This change has been prompted by reports that the magazines are quite often delayed in the mail. There will be some complaints that you will have to have two magazines opened on your desk for two weeks of the month. Don't worry, when the new issue comes out, go ahead and use it: the discrepancies between the two sets of forecasts will be minimal.

At the request of the majority, we are now using the OWF (Optimum Working Frequency), instead of the MUF (Maximum Usable Frequency) that was shown on the graphs as the highest curve. At the OWF, plus or minus, the chances are 90% of receiving a signal if the signal is there!

As it is safe to assume reciprocity most of the time, the circuits are now labelled "To/From." We know that these forecasts have been used, with success, by overseas listeners to listen to North America broadcasts.

In the October 1996 issue of *MT*, I have explained the reason why the OWF can be "0" at certain times. We have highlighted the 0's with a darker gray at the suggestion of a reader. However, when you see this do not despair completely: keep on looking in the frequency range last listed. You never know what is lurking out there!

Finally, let me describe four of the target areas used for the circuits. "Mediterranean" covers an area bounded in the North by Malta, in the East by Lebanon, in the South by all of North Africa and in the West by Gibraltar. "Middle East" is an area bounded by the Caspian Sea in the North, Saudi Arabia in the East, Yemen in the South, and by Eastern Iran in the East. "South East Asia" is an area that covers a wide area bounded by Sri Lanka, Central China, Vietnam, and Singapore. The "Far East" region comprises the broadcasters in the Western Pacific, Japan, and the Philippines.

Good DX, and "heads up"—the sunspot numbers are going up.

OPTIMUM WORKING FREQUENCIES (MHz)

For the Period 15 January to 14 February 1997 Flux=79 SSN=14

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
SOUTH AMERICA	20	16	12	10	9	9	10	10	9	8	8	9	9	0	14	19	21	21	22	23	23	23	23	22
WESTERN EUROPE	8	7	7	7	7	7	7	7	8	8	8	0	0	0	9	12	16	17	15	13	11	9	8	8
EASTERN EUROPE (P)	7	7	7	6	7	8	8	8	0	0	0	0	0	8	8	11	11	0	0	0	0	0	0	0
MEDITERRANEAN	11	11	11	9	8	8	8	9	0	0	0	0	0	0	0	13	16	15	13	12	0	0	11	11
MIDDLE EAST (P)	10	10	10	9	8	0	0	0	0	0	0	0	0	7	8	10	11	10	0	0	0	0	0	10
CENTRAL AFRICA	14	14	11	9	9	9	9	0	0	0	0	0	0	0	0	17	19	21	20	17	18	19	19	16
SOUTH AFRICA	12	12	11	10	9	10	10	0	0	0	0	0	0	0	14	19	20	21	19	18	16	15	14	13
SOUTH EAST ASIA (P)	17	19	17	13	0	0	0	0	0	0	9	9	9	9	9	9	11	10	0	0	0	0	0	0
FAR EAST	20	18	17	12	0	0	8	8	9	9	9	9	9	9	9	9	9	9	9	0	0	12	17	19
AUSTRALIA	19	20	20	16	0	0	0	0	10	10	10	10	10	9	8	9	13	12	0	0	15	16	17	18
TO/FROM US MIDWEST																								
SOUTH AMERICA	17	12	10	9	9	9	10	9	8	7	7	9	8	12	17	19	19	20	20	21	21	21	20	19
WESTERN EURDPE	8	8	8	8	8	8	8	8	8	8	8	0	0	11	13	16	18	17	16	14	12	10	9	8
EASTERN EUROPE	7	7	7	6	6	7	8	8	0	0	0	0	0	8	12	15	12	9	0	0	0	0	0	7
MEDITERRANEAN	11	11	10	9	8	9	8	8	0	0	0	0	0	0	15	18	19	17	14	12	12	11	11	11
MIDDLE EAST (P)	10	10	10	8	8	0	0	0	0	0	0	0	0	8	11	13	11	0	0	0	0	10	11	10
CENTRAL AFRICA	14	12	10	10	9	9	9	0	0	0	0	0	0	0	17	19	21	22	20	18	18	19	19	16
SOUTH AFRICA	12	12	10	10	9	10	10	0	0	0	0	0	0	14	18	20	20	21	19	18	16	15	14	13
SOUTH EAST ASIA (P)	15	16	12	0	0	0	0	0	0	0	8	8	8	8	8	11	10	0	0	0	0	0	0	0
FAR EAST	19	17	13	0	0	0	8	9	9	9	8	8	8	8	9	10	10	10	10	0	0	12	18	19
AUSTRALIA	19	20	15	0	0	0	0	10	10	10	10	10	10	9	10	14	13	12	0	0	15	16	17	18
TO/FROM US EAST COAST																								
SOUTH AMERICA	11	9	8	8	9	9	9	8	7	6	6	8	12	16	18	17	17	17	17	17	17	17	16	14
WESTERN EUROPE	8	7	7	7	7	7	7	7	7	7	7	8	11	16	17	18	18	17	16	14	12	10	9	8
EASTERN EUROPE	8	8	8	7	7	7	7	7	0	0	0	0	10	14	16	15	13	10	0	0	0	8	8	8
MEDITERRANEAN	11	9	9	8	8	8	8	8	0	0	0	0	13	17	18	19	19	17	14	12	11	11	11	11
MIDDLE EAST (P)	11	10	9	9	8	8	0	0	0	0	0	0	12	15	17	14	16	11	0	0	10	11	11	11
CENTRAL AFRICA	12	11	10	10	10	10	10	0	0	0	0	0	16	19	19	21	21	21	21	18	18	20	18	14
SOUTH AFRICA	12	11	11	10	9	11	11	0	0	0	0	0	17	20	20	20	20	21	19	18	16	14	14	13
SOUTH EAST ASIA (P)	12	10	0	0	0	0	0	0	0	0	0	8	9	11	12	11	0	0	0	0	0	9	8	8
FAR EAST	14	12	0	0	0	0	8	8	8	8	8	8	8	9	10	10	0	0	0	0	0	12	16	18
AUSTRALIA	18	0	0	0	0	0	0	11	11	11	10	10	9	11	15	14	13	0	0	0	15	16	17	18

SKIP AREY, N2EI
tjarey@mosquito.com

Finding Time

Every one of us, perhaps newcomers especially, wish for more time to play radio. Radio monitoring is one of the few hobbies that can be practiced in some form at any time of the day or night. But still, we have to sandwich our monitoring in between the rest of our lives—work, school, family obligations, (even other hobbies). Unless you've found that lucky lottery ticket or your rich Aunt Hephzibah left you her fortune, it is unlikely you can lead a life totally devoted to the radio hobby.

As you read through the various club publications you may marvel at the loggings listed by some folks who appear to have figured out how to get through life without sleep. Running up those logging totals does not require any magic really. It can even be done by somebody who "has a life." The real key is figuring out how to get the best mileage out of your radio monitoring opportunities as they present themselves while you go about the business of getting through the day's tasks.

First you need to take a look at your life with an eye for those times that you can devote an ear or two to radio monitoring. The standard image of a hobbyist tends to be someone who sits down to have a few hours' fun in the evening after work is done and the kids have gone to bed. But we all know the "standard" world is an illusion. To use myself as an example, those are the hours I sit down to do my writing *about* radio. While I may have a receiver or two playing in the background as I pull these columns together, I have to find other times of the day to get my serious listening in.

Many folks live in a wider world of tasks and distractions. For example, what if you work second shift? Those "traditional" hobby hours wouldn't work for you. So a brief glance at how your daily tasks and activities play out is important for you to begin to get the most out of the radio hobby.

Work around the "biggies"

Life is normally blocked around major obligations such as work or school. Along with these are a short string of more-or-less regular time occupiers, such as meals and sleep. Then comes that group of movable but necessary activities, such as shopping and quality time with the family. Yeah, I know this is a simplification, but I place it before you to give you an idea of the kind of things you need to look at to find time to play radio.

Now, those big tasks can't usually be moved. I don't think your boss is going to give you a few hours off in the middle of the work schedule each day to try and catch Radio Freedonia. So these are the things you just have to work around.

Flex a little and plan ahead

Meals and sleep can be somewhat adjustable, especially if you are single. But, if you are part of a family, any adjustments you make in this area will obviously require negotiation. Family meal times tend to be sacrosanct in many households. A classic problem I encounter on a regular basis is encountering great pirate radio activity every Sunday evening just as we sit down to supper. A strong desire to keep hearth and home on an even keel means I have to accept whatever my tape recorder hears during such meals.

Sleep can usually be adjusted a bit. An hour here or there can be stolen. Waking an hour or two earlier from time to time to catch the band opening toward Asia is fairly common practice among amateur radio operators. Shortwave listeners can find the same success with this technique. Medium wave listeners can track the sign-ons of stations as they come on the air or as they raise power at each station's local sunrise.

Medium wave listeners can also take advantage of a radio practice called Pre-Sunrise Authority. The key with sunrise listening is finding stations that take advantage of the FCC's policy of granting pre-sunrise operation at lower powers until they can switch to full power at the time appointed by the FCC. Local sunrise is determined, for bureaucratic purposes, on the 15th of each month. Regional and clear channel frequencies are the places to watch for station sign-on signals.

There are a few practical tips to early morning monitoring. Have your listening post all set up and ready the night before. Get up early enough to "wake up." Take a shower or get a couple of cups of coffee into your system so that you are alert to what you might hear. If you have a tape recorder have it running throughout the session, because things will happen quickly and you won't want to miss anything.

On the other end of the day, occasionally staying up an hour later can give you many great monitoring opportunities. This is especially true in the medium and shortwave bands where skywave propagation is substantially improved when you and the stations you are seeking share darkness. Rather than finding yourself falling asleep at your desk at work, plan your extended late night listening sessions on those evenings when the next day is an off day or holiday. Then you can sleep in the next morning.

Now let's discuss those movable activities, such as shopping. The obvious solution would be to do just that—move them away from those times when you might best enjoy the radio monitoring hobby. In order to reap

the best rewards from such life-changing steps, a bit of homework is necessary on your part. Use a resource such as *Passport to Worldband Radio* or the *World Radio TV Handbook* to get to know "what's on when." What's the point of sneaking out of the PTA meeting an hour early on a Tuesday if Radio Freedonia only broadcasts on Wednesdays? Getting to know your way around the bands will help you plan your forays into successful radio monitoring.

Another subject you will need to wrestle with is propagation. Even if you clear your calendar to hear a particular station at a particular time, things are only likely to work out if atmospheric conditions favor the path between you and the station. This means you will want to study Jacques d'Avignon's "Propagation Conditions" column closely each month. No sense in canceling out on that visit to Aunt Hephzibah if conditions aren't in your favor. You really want to stay on her good side so you'll have more free time in the future, right?

■ Time for scanning, too

Armed with a notion of when you can flex the time in your life, a good station schedule and a quick study of propagation should get you filling up that log book in no time. But what about folks who concentrate on scanning the VHF/UHF frequencies? Are they left out of the picture? After all, most frequencies within scanning range can be heard all the time.

Well, there are a few things that scannists should plan their life around. For example, I would assume that it is probably safe to say that your local police frequencies might be a bit more active on a Saturday night than on a Wednesday afternoon. See the point? You will need to figure out when to listen to get the most enjoyment from local scanning traffic.

A neat feature of some modern scanners is their ability to be connected to a computer. Systems such as this can utilize any one of several software packages that allow the scannist to conduct frequency activity studies. Often you can come up with a graphic representation of when certain frequencies are most and least active. This can serve to direct you to the frequencies you should frequent when you are free to enjoy monitoring in the course of your otherwise busy schedule.

That notion of getting up an hour or so early can also apply to VHF/UHF scannists. Early mornings, especially in the summer months, can produce some unique long distance signal reception. As the cool air of the evening is warmed by the sun, ducting can occur that allows signals from great distances to sometimes come in over local signals.

■ Change your base of operations

The above notions are a great way to begin to increase your monitoring opportunities in the hectic world we all live in, but there is more. Modern radio receivers benefit from small size, light weight, and a high degree of portability. This means that even more consideration can be given to finding time to monitor. Okay, let's say the spouse has requested attention be given over to a few chores on a Saturday morning. What's to stop you from strapping a portable scanner on your belt while you perform the expected tasks? Similarly, a small portable shortwave receiver can also be carried along as you work around the house.

If you become hooked on more than on aspect of the radio monitoring hobby, you may even want to save your pennies and look into purchasing one of the new portable DC to Daylight receivers that are on the market. These give you a lot of bandwidth in a small enough package that you can take it along wherever you go and enjoy medium wave, shortwave, and VHF/UHF monitoring all with one box.

Portable equipment, regardless if it is single purpose or DC to Daylight, might just give you a way to get around that traditional barrier of work. Most jobs have opportunities for breaks and meals. You can always pack your receiver with your lunch and do a bit of listening at such times. Who knows? You may even turn a coworker or two on to the greatest hobby in the world. Again, you will need to consult frequency and propagation resources to see what's best to monitor during your lunch break, but the rewards will be worth it.

If you commute to and from work and have travel time to devote to the radio hobby, I only have one thing to say to you: Why aren't you an amateur radio operator yet? Many hams carry two meter transceivers along with them on their rides to work. There are probably only a few areas of the country not covered by a two meter repeater system.

The important thing is to have fun with your radio, now that you've "found" the time!

Kevin Carey, WB2QMY
kevinc@mdsroc.com

Tuning into Radio's Sub-Basement

Last month we explored some of the fantastic sounds of nature that can be heard below 10 kHz including Whistlers, Sferics, Tweeks and the Dawn Chorus. To kick off 1997, let's look into available resources for "getting on the air" and learning more about this intriguing band.

Information Please...

Natural Radio is still a fairly well kept secret, but things are improving. For some time, *The Lowdown*, journal of the Longwave Club of America (LWCA) has had regular coverage of natural radio topics. In fact, back issues of the *Lowdown* could form the basis of a natural radio anthology. You can reach the LWCA at 45 Wildflower Road, Levittown, PA 19057, or check out their web site listed below.

For nitty gritty construction information (ELF through MF) it's tough to beat Ken Cornell's *Low and Medium Frequency Radio Scrapbook*, now in its 10th edition. For ordering information write the author at 225 Baltimore Ave., Point Pleasant Beach, NJ 08742.

The Internet is another excellent source of information. Almost weekly there seem to be new sites related to VLF natural radio. Listed below are three of my favorites. These contain links to many other radio-related sites:

Natural VLF Radio Homepage:
http://www.netcom.com/~spmcgrvy/index.html

Natural Radio Sound Files:
http://www-pw.physics.uiowa.edu/mcgreevy/

Longwave Club of America (LWCA):
http://users.aol.com/lwcanews/index.html

Getting on the Air

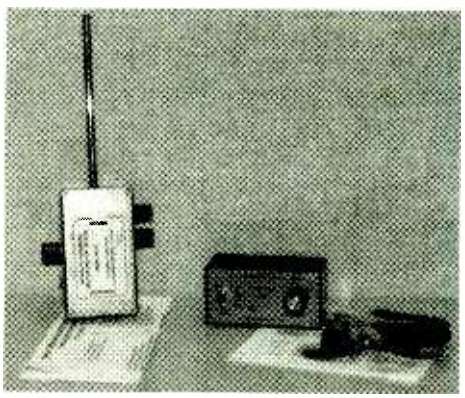
Fortunately, there are many receiving options available to the natural radio enthusiast. If you're a homebrewer, there is a complete schematic of a whistler receiver available on the Natural VLF Radio Homepage mentioned above. This set can be built completely with off-the-shelf parts from Radio Shack.

Stephen McGreevy, who maintains the VLF Natural Radio homepage, has granted permission for free dissemination of his homepage's information for non-commercial use. Therefore, if you don't have access to the Web, send me an SASE and I will mail you a copy of the schematic. This would be a very logical way to get started and is educational, too.

If building is not your bag, or you just want to get started with minimal fuss, there are at least two firms manufacturing ready-to-use natural radio receivers. One is LF Engineering Co., 17 Jeffry Road, East Haven, CT 06512. Ask for their free catalog. It contains a wealth of information on VLF receiving products and a well written tutorial on natural radio.

Another company making natural radio receivers is S.P. McGreevy Productions, 45 Elda Drive, San Rafael, CA 94903-3723. In addition to a selection of handheld receivers, S.P.M. Productions also carries a cassette recording of natural radio sounds.

If you'd like a more extensive sampling of natural radio sounds, a new CD set has been released with Stephen P. McGreevy's recordings entitled *Electric-Enigma.* It includes two booklets—one explaining the sound tracks and another that provides a general introduction to natural radio. This set is available from These Records, 112 Brook Drive, London SE11 4TQ, UK. You can check out their web site at: **http://www.ibmpcug.co.uk/~irdial/vlf.htm.**



Two popular units for Natural Radio monitoring. The S.P. McGreevy Productions handheld unit (Left), and the Low Frequency Engineering unit with tree-tapping probes and belt loop at right. See the text for address information.

Get INSPIREd

INSPIRE is short for "Interactive NASA Space Physics Ionosphere Radio Experiments." Since 1990 this NASA-sponsored program has brought the magic of VLF radio to high school classrooms and experimenters all over the country. It started out as an experiment to monitor scheduled transmissions from a shuttle-based VLF transmitter, but the program's focus has expanded to include studies of man made *and* naturally occurring VLF signals such as whistlers, tweeks, and chorus.

To see how you can get involved, surf to their homepage at: http://www.gsfc.nasa.gov/education/inspire/inspire.html or write the INSPIRE program at the following address: Bill Pine, Chaffey High School, 1245 N. Euclid Avenue, Ontario, CA 91762.

If you happen to be near the Washington, DC area, an **INSPIRE workshop** is being held on Saturday, February 8 at Gallaudet University. There is no cost to attend, but you must register promptly, as time is growing short. To sign up, send your name, address, telephone and Email address (if available) to Bill Taylor, INSPIRE Workshop, 518 Sixth St., SE, Washington, DC 20003.

There you have it, a brief introduction to some of the tools and references available for exploring nature's radio spectrum. I'd like to hear from you about your interest in natural radio. Would you like to see more coverage of this topic? If there is enough interest, we could explore topics such as whistler history, lightning detection, Sudden Ionospheric Disturbances, and more.

As I mentioned last month, *Below 500 kHz* will never lose its focus on the traditional aspects of longwave monitoring, but as the band changes its makeup, it provides us with an exciting opportunity to explore new territories and see how radio fits into our world. I hope to hear from you soon.

End Notes

Did anyone copy the October 23rd transmission of SAQ (Grimeton, Sweden) on 17.2 kHz? This station was to make a historic CW transmission on this date using an old time Alexanderson Alternator. Unfortunately, I was traveling during this time and was unable to monitor, but I'll bet someone out there caught this rare signal. For more information on SAQ, check their web site at: **http://www.telemuseum.se/Grimeton/.**

See you next month!

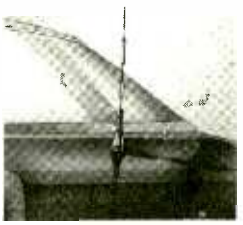
Austin Antenna

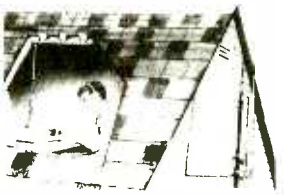
"The World Leader in Multiband Technology"

Manufacturers of multi-band Land Mobile, Microwave, and Scanner Antennas for Government Agency operations, Drug and Law Enforcement operations, Communications at the Kennedy Space Center and major networks such as NBC and ESPN.

The Ferret — *The Ultimate Omnidirectional Multiband Station Antenna*

CONDOR — *New Innovation brings New Dimensions for Portables !*





Spectra — *Superb Performance ! with Maximum Versatility for Mobile and Base Station*

Send $1.00 for an Austin Scanner Antenna User's Guide [a regular $3.95 value]

Austin Antenna 10 Main Street, Gonic, N.H. 03839 (603)335-6339

RADIO'S BEST SELLING MAGAZINES FROM OVER THERE . . .

Every month *Short Wave Magazine* has essential information on scanning, decoding, maritime beacons, propagation, satellites, broadcasting, and much more. In fact it has all the information a short wave listener could possibly want . . .

. . . features on new products, antennas, packet radio, HF band, vintage radio construction and other topics as well. *Practical Wireless* is the monthly magazine no radio amateur should be without.

AVAILABLE FROM THE FOLLOWING U.S. DEALERS

GILFER ASSOCIATES INC
52 Park Avenue, Park Ridge, NJ 07656
Free Toll: 800 Gilfer – 1

TUCKER ELECTRONICS
1801 Reserve Street, Gasland, TX 75042
Free Toll: 800 559 7388

ELECTRONICS EQUIPMENT BANK
Richard Robinson, 323 Hill Street, Vienna, VA 22180
Tel: 703 938 8105

. . . ARE NOW AVAILABLE OVER HERE

SUBSCRIBE NOW!

Buy both of Britain's best selling radio magazines in the US from Grove Enterprises, Inc.
PW-$45, SW-$45. Together-$80. Call to order: 1-800-438-8155; FAX 704-837-2216.
Visit our Internet site as www.grove.net.

Doug Smith, W9WI
72777.3143@compuserve.com

The Stations within the Stations

How many signals does your favorite FM station broadcast? It sounds like a dumb question, doesn't it? Of course, one station can only broadcast one signal at a time. But wait a minute! What about stereo? If you're hearing different audio from the left and right speakers, they must be transmitting at least two signals.

Would you believe your favorite FM station may actually be broadcasting as many as six different signals at the same time, all on the same frequency? So how do they do it? The answer is subcarriers.

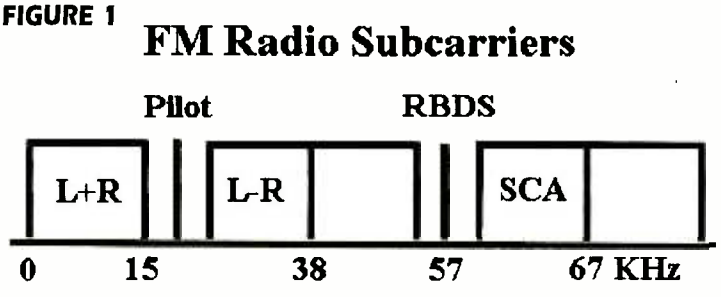
Many of you are already familiar with the concept of a carrier. Since audio signals cannot be efficiently transmitted through the air as-is, we use those audio signals to modify, or "modulate," a radio signal; that radio signal can be efficiently transmitted. Let's imagine that, instead of transmitting that "modulated" radio signal through the air, we used it to modulate another, higher-frequency, radio signal. Yes, this is possible, and it's what we call a subcarrier. And just as it's possible for several different modulated radio signals to share the radio spectrum, it's possible for several different subcarriers to share the same main radio signal.

Take a look at figure 1. This shows most of the possible subcarriers on an FM broadcast signal. The signal at the left, labeled "L+R," occupies the area from 0 to 15 kHz on the main FM signal. This is, in fact, the regular mono audio we listen to every day—a 50/50 mix of the left and right channels. Next, at 19 kHz we find the "pilot." This is an unmodulated "dead carrier," used as a reference signal for the other subcarrier circuits. Above this is the "L-R" signal, stretching from 23 to 53 kHz and centered at 38 kHz. The L-R signal is a mix of the left channel audio, and the inverted right channel audio (just as if you'd swapped the leads to your right speaker). This signal is combined with the regular mono L+R signal in a special circuit called a "matrix." The output of this matrix is the original left and right channel audio. Now, you know how stereo FM works!

But as the diagram shows, there's more. Above the L-R signal at 57 kHz, we find another narrowband subcarrier. This one is a relatively new development called the radio broadcast data service or RBDS. As the name implies, it allows the FM station to transmit digital data along with the audio. Here in the USA, RBDS serves primarily to help identify the station; it will also take an important role in the new EAS emergency broadcast system.

Finally, above the RBDS, is another subcarrier. This one is centered at 67 kHz and is commonly known as subsidiary carrier service (SCS), formerly known as SCA or subsidiary carrier authority. The SCS subcarrier is usually used to broadcast background music to retail stores. Public radio stations often use their SCSs to transmit reading services for the blind. And, a few FM broadcasters use SCS to cue live remotes, to transmit data on stock or agricultural prices, or for paging. It isn't shown on the chart, but a second SCS subcarrier is also available, centered at 92 kHz. It's used for the same purposes as the one at 67 kHz.

FIGURE 1



This diagram shows the locations of the various FM subcarriers within the transmitted FM signal.

Television has its own set of subcarriers. (see figure 2) The L+R, L-R, and pilot signals are there, just as they are for FM. I didn't forget to draw the line for the pilot—the pilot frequency is 15.75 kHz, so close to the top of the mono audio that you can't see the difference (and so close that sophisticated filters are required at the TV transmitter to avoid interference).

In TV, as in FM, the L-R signal is carried at twice the pilot frequency—in this case, 31.5 kHz. There is no RBDS for TV—it's much faster, and more efficient, to transmit data as part of the picture. Where you see the SCS for FM, in TV you see something called the second audio program or SAP.

Originally, the SAP was intended to provide a way for TV stations to broadcast in two languages at once. For example, Japanese stations carrying a news report of a speech by an American leader will often carry the speech itself—in English—on the SAP. Here in the USA, a number of other uses have been developed. Many public broadcast service (PBS) stations use SAP for something called descriptive video services, or DVS. A narrator describes the action in a play or other cultural event. This allows the blind, and those unable to watch the action for some other reason, to enjoy the program. Other stations rebroadcast the local NOAA weather radio. One station in Louisville uses SAP to transmit promotions for its newscasts to radio stations throughout central Kentucky.

Above the SAP, you'll notice one more subcarrier, titled "Pro." This stands for "Professional Channel," and this subcarrier is intended for internal use by the TV station. Most TVs won't receive this one. The vast majority of stations that use this subcarrier use it to cue reporters in the field, although a few also use it to return telemetry data on the operation of their transmitter.

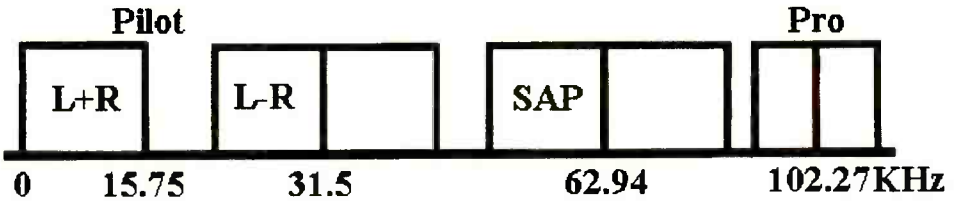
Unfortunately, AM broadcasters are "out of the loop" when it comes to subcarriers. You don't get something for nothing; adding one or more subcarriers to a FM or TV signal makes that signal wider. The FM and TV channels are wide enough to allow this. But at AM, stations are jammed right against each other. Anything that would make a station's signal wider would

AM CALL CHANGES

The AM stations below have been granted call changes:

Old call	New call	Location
WYFX-1040	WJNA-1040	Boynton Beach, FL
WIRA-1400	WYFX-1400	Fort Pierce, FL
WACC-830	WXTO-830	Hialeah, FL
WGNE-590	WDIZ-590	Panama City, FL
WMIY-880	WLVM-880	Fairview, NC
WJLK-1310	WADB-1310	Asbury Park, NJ
KKDD-1400	KSHP-1400	Las Vegas, NV
WDSY-1080	WPGR-1080	Pittsburgh, PA
WVKV-1080	WOKU-1080	Hurricane, WV
new-1000	WAIU-1000	Hackettstown, NJ

FIGURE 2 **TV Sound Subcarriers**



TV subcarriers are similar to, but slightly different from, those used for FM.

also cause interference to its neighbors. There is one minor exception. A very few AM stations have added a subcarrier at a very low audio frequency—about 40 Hz—used by electrical utilities to turn off unnecessary heavy loads like water heaters during periods of peak demand.

ECPA note

Now that I've tempted you with news about the signals within the signals, it's time for the reality check... Of course, it's perfectly legal to listen to the pilot, L+R, L-R, and SAP signals—they're broadcast for the use of the general public. SCS and Pro, however, are considered "protected communications" under the Electronic Communications Privacy Act (ECPA). You aren't allowed to eavesdrop on these signals without the permission of the station transmitting them. Of course, the ECPA doesn't apply outside the United States. Our overseas readers will find equipment for monitoring SCS and Pro advertised in *Stock Exchange* in the back of this magazine from time to time. Ramsey Electronics (their kits are available by special order at Radio Shack or see their ad in *MT*) also sells an SCS decoder.

Bits and Pieces

Several people have asked to see call-letter changes in this column. I haven't had access to that information in the past. (If you've seen call-letter changes in other publications, it's because they had access to commercial broadcast-rules services, at fees on the order of $1,000/year!) That information is now available on the FCC's Internet site, and I'll print it here as long as there's interest. Please keep in mind that call letters can change very quickly: by the time the postal service delivers your copy of *MT*, this information may already be obsolete.

As long as I'm mentioning the FCC and the Internet, let me remind those of you who are connected to the 'Net to check out their pages at **http://www.fcc.gov**. It's a great place to learn something about the way our domestic stations are regulated—and there's a lot of data of specific interest to DXers, too.

Another page you might want to check out is **http://members.aol.com/jeff560**. Jeff Miller's pages contain a wealth of information for those interested in the history of broadcasting in the United States. You'll also find a bit of shortwave information there.

While you're on the 'Net, drop me a line at 72777.3143@compuserve.com. Or, via the good old U.S. Postal Service, at Box 98, Brasstown NC 28902-0098. Good DX!

DX TEST BULLETIN

These special broadcasts provide a unique opportunity to hear and identify the following stations. If you hear these broadcasts, please report to the address provided.

Wed Jan 1 - KSTN-1420 (2171 Ralph Avenue, Stockton, CA 95206) will test at 5,000 watts nondirectional 3:00 - 8:00 am EST (0800-1300 UTC). Voice ID's, Morse code, and disco music. During the test, listeners can call the KSTN request line at (209) 948-1420 and wish friends and acquaintances a Happy New Year. No collect calls, please. Send reports to: Mr. Paul Shinn - Chief Engineer.

Sat Jan 4 - KXNO-1140 (Box 14805, Las Vegas, NV 89118) will test 3:00 - 3:30 am EST (0800-0830 UTC). Test tones, voice ID's, Morse code, and announcements. During the test, KXNO will switch between 10,000 watts nondirectional and 2500 watts directional. Send reports to: Mr. Tracy Teagarden (W2ATRK) - Chief Engineer.

Sun Jan 5, 12, 19, & 26 1997 - WWCN-770 (P.O. Box 9600, Estero, FL 33928) will test at 1,000 watts directional 3:00 - 4:00 am EST (0800-0900 UTC). Morse code ID's, test tones, & big band music. Note: This test will be repeated every Sunday morning at the same time during the month of Jan. Send reports to: Mr. "Joey C." - Program Director.

Mon Jan 6 - CFGO-1200 (1575 Carling Avenue, Ottawa, ON K1Z 7M3, Canada) will test at 50,000 watts directional 3:00 - 4:00 am EST (0800-0900 UTC). Morse code ID's, voice ID's, and Top 40/CHR music. Send reports to: Mr. Marc Germain - Chief Engineer.

Sat Jan 11 - KEZM-1310 (101 West Napoleon Street, Sulphur, LA 70663) will test at 50 watts directional 1:00 - 1:30 am EST (0600-0630 UTC). Morse code ID's and test tones. Send reports to: Mr. Bruce L. Merchant.

Sat Jan 11 - KPQ-560 (P.O. Box 159, Wenatchee, WA 98807; e-mail: kpq@kpq.com) will test at 5,000 watts nondirectional 3:00 - 4:00 am EST (0800-0900 UTC). Morse code ID's, voice ID's, and test tones. Send reports to: Mr. Michael H. Gilbert (WB7EUE) - Chief Engineer. (Arranged by J.D. Stephens for the IRCA CPC).

Mon Jan 13, 1996 - WAKK-1140 (P.O. Box 1649, McComb, MS 39648) will conduct a rescheduled DX test at 1,000 watts nondirectional 1:30 - 2:00 am EST (0630-0700 UTC). March music, test tones, voice ID's, and Morse code ID's. Send reports to: Mr. Richard Watts - Chief Engineer.

Mon Jan 13, 1996 - WAPF-980 (P.O. Box 1649, McComb, MS 39648) will conduct a repeat DX test at 5,000 watts nondirectional 2:00 - 2:30 am EST (0700-0730 UTC). March music, polkas, test tones, voice ID's, and Morse code ID's. Send reports to: Mr. Richard Watts - Chief Engineer.

These tests were arranged by J.D. Stephens for the International Radio Club of America Courtesy Program Committee. (Send 32-cent stamp, or US$1 or 1 IRC if overseas, to P.O. Box 1831, Perris, CA 92572-1831 for sample IRCA bulletin.

OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller
George.Zeller@acclink.com

It's Europirate Season

Winter propagation is definitely here, so 39 meter pirate reception within a few hundred miles of a transmitter drops off considerably an hour or two after the sun goes down. Fortunately, longer skip still exists, so this is the time to try for distant pirates. Especially for those in eastern North America, this is the season for DXing Europirates. Sunset on Saturday and sunrise on Sunday are the best times to try, usually between 6200-6300 kHz and 3880-4000 kHz. A few enterprising Europirates use frequencies in the North American pirate band above 6900 kHz.

As we see this month, Jesse Rose of Hampton, Virginia, proves that you can hear and verify Euros on our side of the Atlantic. His Radio Korak verie for a pop music transmission on 3927 kHz from Holland is a great catch!

NAPRS Pulls the Plug

Dick Pistek of NAPRS has announced his retirement before, but this time his farewell show near Halloween indicated that he means it this time. The **North American Pirate Relay Service** has been the leading relay transmitter for dozens of Europirate signals on this side of the Atlantic. He also regularly relayed domestic pirates and produced some of his own programming. Pistek became a major force in pirate radio broadcasting, so he certainly will be missed.

Zaire Conflict

Clandestine DXers who want to listen in to the civil war in Zaire have some targets to shoot for. **Radio Democracy,** the Burundi clandestine, broadcasts its pro-Hutu programming on 7040 kHz at 0430 UTC. BBCMS speculates that their transmitter is in Uvira, Zaire.

While not a clandestine, BBCMS reports that **Voix du Zaire** in Kinshasa has reactivated its shortwave transmitter on 15244.5 kHz. They are scheduled in French at 0500 and 1830 UTC. Meanwhile, **Radio Kudirat Nigeria, Voice of Democracy** continues its anti-Nigerian broadcasts at 1900 UTC on 6205 kHz, with occasional coverage of Zaire events.

Good Web Site

DXers interested in clandestine and pirate radio will want to check out the Free Radio Press internet site on the World Wide Web. Formerly known as the Radio Resisters Bulletin, this site is jammed with information about radio and politics. The URL is **http://www.passage.net/~mbrauns1** to access the material. Check it out!

What We Are Hearing

Your pirate loggings are always welcome via PO Box 98, Brasstown, NC 28902, or via the E-mail address at the top of the column. A *huge* bumper crop of DXers reported 52 shortwave pirates this month! All frequencies are in kHz, with times in UTC.

North American pirate stations listed here use the following addresses: PO Box 1, Belfast, NY 14711; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; PO Box 605, Huntsville, Alabama 35804; PO Box 1073, Sierra Madre, CA 91025; PO Box 293, Merlin, Ontario N0P 1W0; Postfach 220342, D-42373 Wuppertal, Germany; and PO Box 510, 4010 Basel, Switzerland. For return postage, enclose three 32¢ stamps in the envelope to USA addresses. $2 US or two International Reply Coupons go to foreign maildrops.

6YCAT, Voice of the Cat- 13900 at 1715. Most of the music on this station has a cat theme. Their call matches their on-air claim of a Jamaica QTH. Addr: Belfast. (Charles Crawford, Henderson, KY; Lee Silvi, Mentor, OH; Harold Frodge, Midland, MI; Shawn Axelrod, Winnipeg, Manitoba; Neil Wolfish, Toronto, Ontario)

Alan Masyga Project- 6955 at 2015. Although they stole their name from veteran DXer Alan Masyga, most of their shows are Alan Parsons Project rock music. Addr: Providence. (Howard E. Lyon, Oz; Chris Lobdell, Stoneham, MA; Barry Williams, Enterprise, AL; Wolfish; Crawford; Axelrod; Silvi; Frodge)

Back to Back Radio- 6953 at 2300. Harold points out that this new one spices its varied music with "lots of screaming and moaning." Addr: Belfast. (Rich and Talea Jurrens, Katy, TX; Frodge; Wolfish)

Big Johnson Radio- 6955 at 0245. This rocker was not widely heard this month, but their signal got into Texas. Addr: Providence. (Jurrens)

Bullfrog Radio- 6950 at 0000. Although this one plays rock and roll, recent shows have included discussions of Waco and Ruby Ridge. Addr: Belfast. (Randy Ruger, North Hollywood, CA; Silvi; Jurrens; Wolfish; Axelrod)

Cell Block 13- 6952 at 0500. The Warden says that he has repaired his transmitter, so his recent inactivity is over. A recent show discussed a prisoner who read about the station in this column! Addr: Stoneham. (Basil Shelley, Blythe, CA; Mike Ryan, Buena Park, CA; Jurrens)

Free Hope Experience- 6958 at 1930. Major Spook announced that new QSL cards have been printed, and that he's anxious to send them to listeners. Addr: Blue Ridge Summit. (Pat Murphy, Chesapeake, VA; Silvi; Williams; Frodge)

Friday Radio- 6955 at 2230. Don't look for this rocker on Monday, Tuesday, Wednesday, or Thursday. Addr: Providence and Merlin. (Jerry Coatsworth, Merlin, Ontario; Wolfish; Silvi; Frodge)

He Man Radio- 6957 at 0445. He Man's sexism parodies in upper sideband, the "Manliest of All Modes," have sort of a cult following. Addr: Blue Ridge Summit. (Jurrens; Williams; Axelrod)

Jerry Rigged Radio- 6955 at 2300. Recent broadcasts have included rock and roll from Pirate Radio Central. Addr: Providence. (Crawford; Wolfish; Frodge; Axelrod)

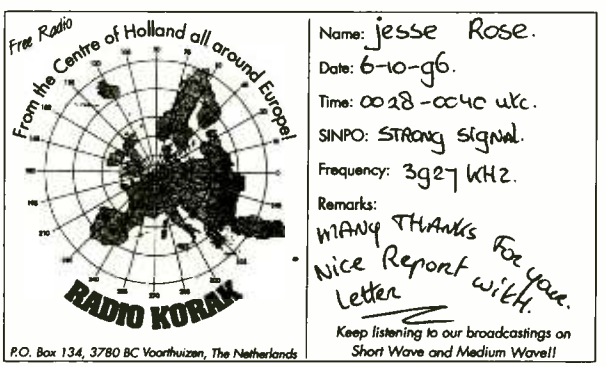
KHJ- 6958 at 2045. West Coast DXers were treated to a recreation of this Los Angeles commercial station's format from three decades ago, including ads for Studebakers, "The Common Sense Car." Addr: None. (Shelley)

KCHZ- 6955 at 0200. Basil heard the Yukon Jack show with this new call ID, but Rich and Talea heard him on the **Voice of the Abnormal.** Addr: Sierra Madre. (Shelley; Jurrens; Lobdell; Ryan)

KMCR- 6955 at 0230. This station is usually heard best on the West Coast, so Harold had an excellent DX log. Addr: Blue Ridge Summit. (Frodge; Ryan)

KOLD- 6958 at 0145. Aldo Batista's format is big band music of the 1940's. Addr: Stoneham. (Shelley; Ryan; Williams; Silvi)

KORN- 6955 at 0100. This new one uses



Jesse Rose snared Europirate Radio Korak.

a slogan of "Tower of Power from the Heartland," but little is known about it. Addr: None. (Jurrens)
Mystery Radio- 13900 at 1600. The Shadow's programs of obscure new age music are always distinctive. From time to time they run low power tests. Addr: Stoneham. (Shelley, Crawford; Axelrod; Williams; Wolfish; Lobdell; Silvi; Jurrens; direct from the station)
NAPRS- 6955 at 0000. Dick Pistek's farewell show was heard by numerous DXers. Addr: Belfast. (Ranier Brandt, Germany; William T. Hassig, Mt. Prospect, IL; Michael Prindle, New Suffolk, NY; Robert Ross, London, Ontario; Axelrod; Williams; Jurrens; Murphy; Rose; Silvi; Frodge; Lyon; Wolfish)
Radio Airplane- 6955 at 0530. It's been a while since we heard from Captain Eddy, who transmits his rock music from a Piper Cub aircraft in flight. Addr: Belfast. (Ryan; Jurrens)
Radio Anonymous- 6955 at 0345. After odd music, this new one instructed listeners to remember that they didn't hear the broadcast. Addr: None. (Murphy)
Radio Azteca- 6955 at 2300. Bram Stoker's DX parody shows are well produced and just plain funny. Stations like this keep people interested in pirate radio broadcasting. Addr: Belfast. (Ross Comeau, Andover, MA; Hassig; Silvi; Frodge; Williams; Jurrens; Wolfish; Murphy)
Radio BLANDX- 6950 at 0200. The original DX parody is back. This one is based on the *BLANDX* parody bulletin by Don Moore, featuring Ralph Jensen with many funny bits. Addr: Blue Ridge Summit. (Frodge; Wolfish)
Radio Eurogeek- 11092 at 1800. This station probably had the biggest pirate audience of 1996. It cleverly aired its broadcast just before the once a year special broadcast from Radio St. Helena, which was tuned in by scores of DXers. Programming included a *Media Network* parody with a kidnapping of Radio Netherlands' Jonathan Marks. Addr: Providence. (Brian Carling, Gaithersburg, MD; Rich D'Angelo, Wyomissing, PA; Cathy Zylka, North Tonowanda, NY; Lobdell; Lyon; Ross; Williams; Shelley; Axelrod; Crawford; Frodge; Comeau; Silvi; Jurrens; Murphy; Wolfish)
Radio Free Speech- 6955 at 0530. Bill O. Rights' hi-fi AM signal can be heard at just about all hours of the day and night, although like all pirates, his operations are unpredictable. Addr: Belfast. (Henry Poh, East Northport, NY; Rose; Shelley; Wolfish; Hassig; Lyon; Murphy; Comeau; Silvi; Wolfish; Frodge; Prindle; Coatsworth; Jurrens; Williams; Axelrod)
Radio Fusion Radio- 13900 at 1630. Normally they play rap music from the "College of Knowledge," but one show continuously played the Macarena song over and over. Addr: Providence. (Jim Laughlan, Youngstown, NY; Crawford; Silvi; Frodge; Axelrod; Wolfish; Jurrens)
Radio Hallowe'en- 6956 at 1900. MT's intelligent readers can guess which holiday causes this one to reactivate! Addr: Belfast. (Coatsworth; Frodge; Axelrod; Wolfish; Jurrens)
Radio KAOS- 6955 at 0145. Joe Mama is one of the most regular occupants of the pirate bands. His productions mix rock music, comedy, and novelty songs. Addr: Belfast. (Ruger; Silvi; Frodge; Prindle; Ryan; Coatsworth; Wolfish; Axelrod; Jurrens; Williams)
Radio Nine- 6955 at 0000. This pirate gives a new meaning to "numbers stations." In a recent show, they played songs about numbers. Ray heard a *real* numbers station at 0320 on 8160 kHz. Addr: Providence. (Ray Carmen, Akron, OH; Prindle; Frodge; Lyon; Silvi; Hassig; Jurrens; Wolfish)
Radio Sparks- 6955 at 2315. This slick Swiss Europirate still appears occasionally via North American pirate relays. Addr: Basel. (Brandt; Axelrod; Crawford; Wolfish)
Radio Three- 6955 at 0030. Sal Amoniac has added children's music to his oldies format. The news is that he at last has verified at least a few loggings printed in *The ACE*. Addr: None. (Rose; Silvi; Lyon; Wolfish; Axelrod; Williams Prindle)
Radio Titanic International- 6957 at 1930. Although rarely heard direct from Europe, this is probably the most frequently relayed Europirate in North America. Addr: Wuppertal. (Lyon; Wolfish)
RFM- 6955 at 2030. H. V. (as in Victor) Short's calm announcements and parody ads are chasers for his mellow music selections. Addr: Belfast. (Silvi; Murphy; Wolfish; Frodge)
Tellus Radio- 6955 at 0015. Radio Tellus appears to have reversed the order of the words in its identification. Their rock music shows continue, now with an announced maildrop. Addr: Providence. (Jurrens; Shelley; Rose; Comeau; Silvi; Frodge; Murphy; Wolfish; Axelrod; Prindle; Lobdell)
The Fox- 6956 at 2330. The operator of the Fox Broadcasting Network sometimes takes to the air with rock music shows. Addr: Blue Ridge Summit and Merlin. (Wolfish; Frodge; Silvi; Jurrens)
The Great Southland- 6955 at 0030. This Australian pirate has a relay relationship with North American transmitters, so we occasionally hear its rock and pop music broadcasts. Addr: Merlin. (Wolfish; Hassig; Frodge; Jurrens)
unidentified- 3893 at 0215. Some pirates occasionally transmit music in the 80 meter amateur band. This interference is frowned on by most pirates, but you can hear some strange things in this frequency range. Addr: None. (Keith Stein, Woodbridge, VA; Frodge)
Up Against the Wall Radio- 6955 at 2000. Owsley is among those pirates who has moved his operations to the afternoon for the winter. He often plugs the Free Radio Network internet web site. Addr: Providence. (Jurrens; Prindle; Silvi; Frodge; Wolfish)
Up Your Radio Shortwave- 6955 at 2230. Woody B. Serious programs some novelty and comedy music, but his shows are dominated by pro-leftist political comedy. Addr: Blue Ridge Summit. (Lobdell; Hassig; Shelley; Frodge; Murphy; Jurrens; Williams; Prindle; Coatsworth)
Voice of Anarchy- 6950 at 0015. After five years of inactivity, Leonard Longwire blew the dust off his transmitter, and is back with us. This time his show featured polka music from Europe, the USA, and Mexico. Addr: Blue Ridge Summit. (Ruger; Silvi; Jurrens; Wolfish; direct from the station)
Voice of Bizzaro World- 6955 at 0015. The station that does everything backwards is now sending out QSL's, as we see in our illustration this month. Addr: None, verifies logs in *The ACE*. (Frodge; Wolfish; Hassig; Jurrens; direct from the station)

Them broadcasting from the Planet Mirac

Voice of the Runaway Maharishi- 6955 at 0145. The Maharishi mixes rock music, novelty music, and comedy with his philosophical comments. Addr: Providence. (Ruger; Jurrens; Hassig; Silvi; Frodge)
Vox America- 6956 at 1900. They have returned with "Real Voice of America" rock music programming. Unlike the **Voice of America**, this pirate is apparently not struggling with budget cuts. Addr: None. (Silvi; Murphy; Frodge; Wolfish)
WAMP- 6955 at 0045. This parody station tweaks both **WWV** and the Alan Masyga Project with time signals giving "coordinated Alan Masyga time." Addr: Merlin. (Frodge)
WARR- 6955 at 0200. The frantic pace of this rock and drug pirate's transmission seems to have calmed down lately. They aren't on several times a day anymore. Addr: Belfast rumored but not confirmed. (Williams; Prindle; Hassig; Ruger; Comeau; Silvi; Frodge)
WBNY- 6953 at 2245. This clandestine parody is the voice of the Rodent Freedom Fighters. It usually surfaces at Easter to encourage revolt among rabbits, but it's extended its operations to other times of the year. Addr: Washington maildrop defunct. (Frodge; Jurrens; Wolfish)
We Love WLIS- 6955 at 0415. A new parody pirate has emerged, using WLWLIS call letters for a show of phony interval signals from stations in countries that don't exist. Addr: Providence. (Shelley; Frodge; Silvi; Jurrens; Williams; Axelrod; Wolfish)
WLIS- 6955 at 0015. The real WLIS, still featuring real interval signals used by international shortwave broadcasters, remains one of the most active North American pirates. Addr: Blue Ridge Summit. (Brandt; Axelrod; Shelley; Rose; Hassig; Coatsworth; Prindle; Crawford; Wolfish; Silvi; Frodge; Jurrens)
WPN- 6952 at 0315. The World Parody Network held a contest commemorating their first anniversary of pirate broadcasting, with station coffee mugs as prizes. Addr: Huntsville. (Shelley; Jurrens; Ryan; Williams)
WPRS- 6955 at 1400. Many pirates, including Willie B. Quiet's rock and comedy station, are using daylight hours more than usual for their shows because of winter propagation conditions. Addr: Providence. (Rose; Jurrens; Frodge; Ross; Williams)
WREC- 13900 at 1600. P. J. Sparx has joined a parade of pirates who are using this 13 MHz frequency during daylight winter hours with low sunspots. Here's another frequency to store in your receiver's memory. Addr: Belfast. (Crawford; Silvi; Williams; Coatsworth; Frodge; Lyon; Jurrens; Murphy; Wolfish)
WRMC- 6955 at 2300. At Radio Operation Mind Crime, the rock music is mixed with long political talks that are very critical of the system. Addr: Providence. (Ruger; Prindle; Frodge; Williams; Hassig; Silvi; Jurrens; Wolfish)
WSM- 6955 at 0245. The Grand Ole Opry Network sounds like Nashville's medium wave giant about thirty years ago, featuring ancient country music artists from long ago. Addr: Huntsville. (Joel Gosse, St. Paul, MN; Frodge; Axelrod; Silvi; Hassig; Williams; Jurrens; Wolfish)
X-Files Radio- 6955 at 1945. This new station mixed features from the TV show with songs from the CD, "Music In the Key of X." Addr: Providence. (Wolfish; Frodge; Lyon)

Ike Kerschner, N3IK

Making Resolutions

If you have been reading *On The Ham Bands* for any length of time you are aware of one theme that keeps popping up: *try something new*. I strongly believe that every amateur should set a goal and work towards it—not only to satisfy himself, but to justify the extremely valuable portion of the radio spectrum we inhabit. And, what better time to do that than the New Year?

- Why not try to handle some public service events this year, or upgrade to a higher class of license?
- Better yet, build a piece of gear, experiment with micro-waves, ATV, or satellites.
- Spend some time teaching others ham radio.
- If you do not have a computer, get one and learn to use it.
- If you are stuck in the rut of rag chewing with the gang on 75 or 2 meters, get out of it!
- Many of us do not know why or how our gear works, so take an electronics course.

Most of us will not make large changes or advances in the hobby, but every time we look into a new field we broaden our outlook, and that's the main thing this hobby is supposed to be about. As amateurs we should be in the forefront of technology. That's not always easy to do, given the speed at which knowledge is advancing, but it's fun trying.

Test Gear

Eventually most of us find a need for test equipment, but buying test gear is an easy way to go broke. The following outline of "what works and why" should help you decide what will help the most in your situation.

The VTVM

Whenever I am asked what test gear I use the most, I answer: the VTVM (vacuum tube voltmeter). Mine is an old Heathkit that I built about 25 years ago. The reason I use it more than anything else in the shop is because I can read volts in DC or AC (i.e. RMS) and peak to peak, resistance, and RF. The VTVM has an extremely high input impedance so it will not load a circuit and can be used to measure very low level stages. In addition it is very portable. True, it must be plugged into an AC outlet, but that's usually not a problem. While not as versatile as an oscilloscope, the VTVM can perform many o'scope functions and is easier to use.

An unusual feature of my VTVM is that it is analog. Having an analog meter is extremely useful when adjusting circuits that must be set to a peak: it is very easy to watch the needle on the VTVM swing up to the peak and then start to fall off. No digital meter no matter how expensive will be as accurate when peaking a circuit than the VTVM.

In addition, when working with RF the VTVM can tell you when you have maximum output from low level stages. In order to see RF you must use an RF probe, but most VTVM's come with an RF probe, and they are easy to make.

I do not think any VTVM's are being made today. FET meters are replacing them, and as long as the FET meter is analog it will do a decent job. However, two summers ago, I purchased three VTVM's in working order for 5 dollars at a hamfest. People seem to think you must have digital test gear to do the job and are almost giving away their VTVMs.

When using analog meters you must use a bit more care than is required with a modern digital meter. For example, you must be sure you are on the correct scale and are set up to read the desired input, and you must interpret the scale on the meter's face properly. However, a few minutes of reading known voltages and resistances will make you an expert.

VOMs

A volt-ohm-millimeter, as its name implies, will read voltage, resistance, and current. VOM's are available in both analog and digital models. A VOM is a handy device to do a quick check on voltage or resistance. The main drawback of the VOM is its lower input impedance—it will load down a low power stage, preventing accurate readings.

I have both analog and digital models in my shop and, for general checking, find the digital to be the handiest. In most cases, the VOM will be the only piece of test gear in a hamshack, as few of us want to get into servicing an expensive piece of ham gear.

Frequency Counters

There are many frequency counters on the market today. Even the least expensive counter is head and shoulders above any of the devices used in years gone by to measure frequency. In addition to being accurate, they are far easier to use than the frequency meters of yesteryear. While not a required instrument in the ham shack, a counter is handy, especially if you intend to do some servicing or building.

Oscilloscope

The ocilloscope, or o'scope, can be extremely useful. However, the average ham will not need this expensive instrument often. Prior to purchasing one it would be a good idea to become familiar with the instrument either by thorough reading or a good course at your local electronics school.

Don't jump on a bargain scope, because there aren't any! If you find a cheap scope at the local hamfest, remember that an inexpensive scope usually winds up being a paper weight.

There are two basic types of scopes: AC coupled and DC coupled. The least expensive scope is AC coupled, and its uses are extremely limited. The DC coupled scope is the only valid choice for a test instrument.

Scopes come with a wide variety of features. You are looking for DC coupled, dual trace (i.e. two inputs), and rated at 20 MHz or better. A usable basic unit of this type will run upwards of $200 or more.

Odds n' Ends

An **SWR bridge** is an essential part of every ham shack. Again, purchase a good unit and learn to use it properly. Be sure whatever you purchase will operate over the frequency range you normally use.

The **SWR analyzer** is a super piece of test gear for the ham who likes to play with antennas. I have a simple analog unit that does just fine, but if you can afford a more expensive digital unit, go for it.

A **field strength meter** or FSM is handy to have for checking presence of RF energy or comparing antennas. They are simple units that can be built with a diode and low current meter. Every *ARRL Handbook* has plans for one.

This is far from being the whole story on test equipment, but it's a start.

Happy New Year to one and all. 73 de Ike, N3IK

A Simple 455-kHz BFO for Your Receiver

Some shortwave receivers lack a BFO (beat frequency oscillator). Without a BFO we cannot copy CW or SSB signals, which sound like mush without it. Some imported portable short-wave radios are designed for only AM and FM signals. Also, older radios that use tubes may not have BFOs.

It is a simple and inexpensive procedure to construct a BFO for the lower intermediate frequencies (IFs) of many receivers. This month's column explains how it is done and provides circuit information for a two stage BFO circuit that can be connected to the detector in a receiver that uses a 455-kHz IF.

■ Beating the High Cost of Crystals

BFOs are designed to provide reception for the upper and lower sidebands of an SSB signal. SSB is used by most radio amateurs for phone communications. But, some commercial broadcasters also use SSB. There are many commercial and amateur CW signals to monitor. A BFO is essential for that mode, also.

Normally, two quartz crystals are switched in an oscillator to provide upper (USB) and lower (LSB) sideband reception. CW may be copied by selecting either the USB or LSB modes. Typically, the crystal frequencies are approximately 1.3 kHz above and below the center frequency of the IF. Thus, if the IF in a receiver happens to be 455 kHz, crystals for 456.3 and 453.7 kHz are used in the BFO. From an engineering point of view, the BFO should be set for a frequency on the IF response curve that is 20 dB down from the peak response (center frequency) of the IF system or IF filter. Since we are not interested in this aspect of BFOs, we will move on to the practical aspects of our discussion.

Crystals other than surplus computer types are extremely expensive. A quality 455-kHz crystal can cost $20 or more if it is supplied by a commercial manufacturer. Although a crystal provides excellent stability (minimal frequency change with temperature variations), we can build a coil and capacitor BFO that is stable enough for general use by hams and SWLs. A 50-cent RF choke, or a one dollar 455-kHz IF transformer will replace the two crystals under discussion. Figure 1 illustrates how a crystal-controlled BFO might be wired. The figure 2 circuit utilizes a coil and some capacitors to replace the crystals.

■ A Practical BFO

Please refer to figure 2. L1 is the primary winding of an imported 455-kHz transistor radio IF transformer.[1] The secondary winding is not used, nor is the tap on the primary winding. Use the two outer pins on the side that has three pins. Resonance is provided by the effective capacitance presented by C1, C2 C3, C4, C5, and D1.

Tuning is accomplished by means of D1 and R1. With the circuit values indicated in figure 1 there is a frequency change of 4 kHz (453 to 457 kHz) when R1 is adjusted through its range.

D1 is a voltage-variable-capacitance diode (VVC).[2] These devices are also known as tuning diodes or varactors. As the positive voltage applied to the D1 cathode is varied by adjustment of R1, the internal capacitance of D1 changes to shift the BFO frequency. R1 permits USB, LSB, and CW reception. The BFO creates an audible tone (beat note) during CW reception. For SSB it supplies the missing carrier for the transmitted signal. The carrier is included in an AM signal, and thus no BFO is required.

Q1 functions as a Colpitts oscillator. Capacitors C4 and C5 form a feedback divider that allows some of the output signal (emitter) to be fed back to the transistor input (base). This causes Q1 to oscillate at the chosen frequency. L1 and the related capacitors determine the resonant frequency.

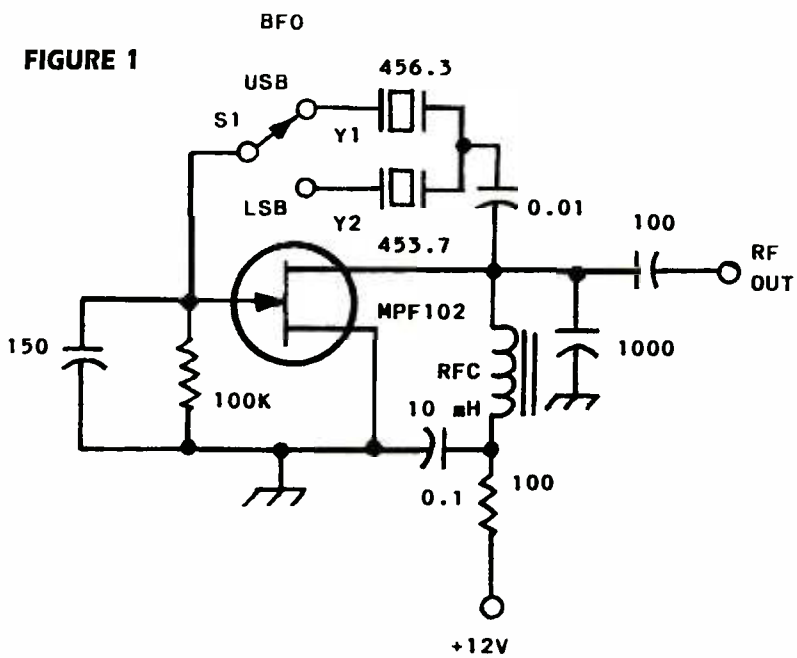
Frequency stability (minimal drift) is vital for CW and SSB reception. If the BFO drifts it becomes necessary to continuously readjust R1 to keep the received signal sounding right. Therefore, the types of capacitors used for C1 through C6 must be temperature-stable. For use at 455 kHz we may expect good performance from polystyrene, NP0 ceramic, or silver-mica capacitors.

D2 is a 9.1-volt Zener diode. It regulates the Q1 and D1 operating voltage to aid frequency stability: Voltage changes cause the BFO frequency to shift.

Q2 is used as a buffer and amplifier. It helps to isolate Q1 from load changes that may occur in the receiver. Such impedance changes can "pull" an oscillator and cause frequency shifts. Q2 also boosts the output from Q1 to a level that is suitable for injecting a low-impedance AM type of diode detector.

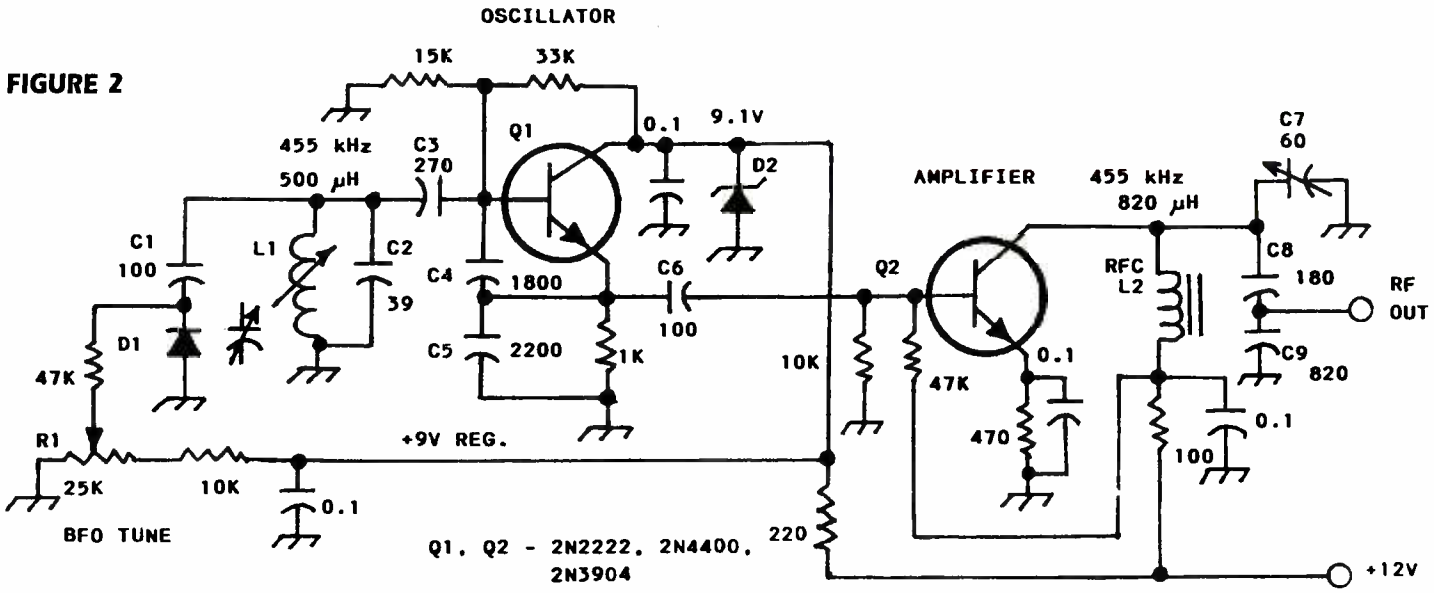
A low cost 820 microhenry RF choke is employed at L2 to provide a suitable inductance for the amplifier tuned circuit. C8 and C9 form a capacitive di-

FIGURE 1



Example of a crystal-controlled BFO for CW, USB, and LSB reception. Y1 and Y2 determine the BFO frequency. S1 selects the desired sideband mode.

FIGURE 2



Schematic diagram of a practical tunable BFO that permits reception of CW, upper sideband, and lower sideband. C1, C2 and C6, are NP0 disc ceramic types. Silver-mica capacitors may be used if ultimate stability is not a concern. C4 and C5 are polystyrene or silver-mica units. C8 and C9 and silver-mica or quality disc ceramic capacitors. C7 is a 60-pF mica, ceramic or plastic trimmer. D1 is a tuning diode that has a nominal 56-pF value (type MV2112, MV1644, or 1N5453A). A 15-pF air-variable capacitor may be substituted for the D1 tuning circuit. D2 is a 9.1-volt, 400-mW or 1-Watt Zener diode. L1 is the primary winding (highest dc resistance) of a 455-kHz IF transformer (Mouser no. 42IF203, black core). Remove the tiny fixed-value capacitor in the outer base of the unit. The secondary winding is not used. L2 is a Mouser no. 434-06-821K 820-microhenry RF choke. A transistor radio IF transformer (do not remove base capacitor) may be substituted for C7, C8, C9, and L2. BFO output can then be taken from the transformer secondary winding through a 0.01 µF blocking capacitor. R1 is a 25k-ohm linear-taper carbon control. Fixed-value resistors are 1/4-Watt carbon.

vider that resonates the Q2 output circuit at 455 kHz while providing a low impedance output point from which to extract the BFO signal. Trimmer C7 is adjusted for maximum power output (resonance).

■ Construction Notes

The BFO can be assembled on low-cost perforated board. You may prefer the more professional approach if you are skilled at laying out and etching PC boards. My unit is built on perf board. Almost any type of point-to-point "ugly" wiring is okay if you keep the leads short and direct. This practice aids stability.

The completed circuit should be enclosed in a shield box to prevent stray radiation of the BFO energy. For example, the second harmonic of 455 kHz could appear as an unmodulated carrier at 910 kHz on your receiver. A box can be made inexpensively from sections of single- or double-sided PC board.

R1 should be a quality potentiometer that can sustain frequent adjustment without becoming worn and noisy. I prefer the more costly 2-watt industrial controls of the Allen-Bradley variety.

Connection between the BFO and your receiver should be made with shielded cable. Miniature RG-174 50-ohm coax is suitable. Shielded cable will prevent unwanted radiation of the BFO energy into other parts of the receiver circuit.

■ Adjustment and Operation

A frequency counter is helpful for getting the BFO on 455 kHz. If you do not have access to a counter, tune your receiver to 910 kHz and connect a short length of hook-up wire to the output of the BFO. Place the wire near the antenna lead-in to your receiver. Adjust L1 for maximum S-meter response by tweaking its slug. R1 should be set at mid range for this step. Next, adjust C7 for a maximum S-meter reading. If you have no S meter, make these adjustments by ear. Tune for maximum quieting of the receiver background noise.

If you do not have a 12-volt power supply you may use a 9-volt transistor radio battery to power the BFO. Total current drain is on the order of 10 mA. Eliminate D2 if you use a battery.

BFO output energy should be connected to the anode of the receiver detector diode (side toward the last IF transformer) through a 100-pF capacitor. If your receiver uses a transistor instead of a diode in the detector circuit, route the BFO signal to the base of the transistor. The AM detector always follows the last IF transformer in a radio.

During reception you must adjust R1 to obtain an intelligible signal. First tune in the SSB or CW signal for maximum S-meter (or audible) response. Then adjust R1 for the desired CW-signal pitch, or set it to obtain the most natural sounding SSB voice characteristics.

The frequency stability of the tunable BFO is excellent. My test model drifted approximately 50 Hz during a 1-minute warmup. For the next hour the frequency varied only plus and minus approximately 5 Hz. My tests were conducted at a room temperature of 70 degrees F. My frequency counter was allowed to warm up for one hour before the drift tests were started.

■ Notes

1 — Most of the BFO parts are available from Mouser Electronics, 2401 HWY 287 N., Mansfield, TX 76063-4827. Phone: 1-(800) 346-6873 for catalog or to order.

2 — VVC diodes and other parts for the BFO are available from Hosfelt Electronics, 2700 Sunset Blvd., Steubenville, OH 43952-1158. Phone: 1-(800) 524-6464 for catalog or to order.

Jean Baker, KIN9DD

Instrument Landing Systems

Welcome aboard, everyone! Happy New Year to all. Today we'll talk about instrument landing systems (ILS). The purpose of an ILS is to provide an approach path of exact alignment and descent of an aircraft on its final approach to a runway.

A *precision* landing approach is a standard instrument approach procedure in which an electronic glide slope is provided, utilizing ILS or precision approach radar (PAR). A *nonprecison* approach is a standard instrument approach procedure in which no electronic glide slope is provided. That would include VHF omni range (VOR), tactical air navigation nondirectional beacon (TACAN NDB), localizer (LOC), airport surveillance radar (ASR), localizer directional aid (LDA), or simplified directional facility (SDF) approaches.

Precision approaches have lower minimums and can be used under lower visibility conditions than nonprecision approaches.

Minimums consist of weather condition requirements which must be met before an aircraft can land. The minimums will vary with the type of approach procedure available. The two terms used to describe ILS minimums are decision height and runway visual range.

Decision Height: A specified height at which a missed approach must be initiated by a pilot if the required visual reference to continue the approach to land has not been established; or, the height at which a decision must be made during an ILS or PAR instrument approach to either continue the approach or to execute a missed approach.

Runway Visual Range (RVR): An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end.

The lowest authorized ILS minimums in the United States, with all required ground and airborne systems components operative, are:

ILS Category I: Decision height not less than 200 feet and runway visual range of not less than 1800 feet.

ILS Category II: An ILS approach which provides for approach to a height above touchdown of not less than 100 feet and with RVR of not less than 1200 feet.

ILS Category IIIA: An ILS approach which provides for approach without a decision height minimum and with RVR of not less than 700 feet.

Photo credit: Harry Baughn

ILS Category IIIB: An ILS approach procedure which provides for approach with a decision height minimum and with RVR of not less than 150 feet.

ILS Category IIIC: An ILS approach procedure which provides for approach without a decision height minimum and without RVR minimum.

The approach course of the localizer is called the front course. The course line along the extended centerline of a runway, in the opposite direction of the front course, is called the back course.

The back course is normally not a precision approach, as there is normally no glide slope available for the back course, although some locations have a complete ILS system installed on each end of a runway. For example, on the approach end of a runway numbered 04 on one end; on the other end would be the approach end of runway 22. When such is the case, the ILS systems are not in service simultaneously. If the localizer fails, an ILS approach is not authorized.

Aboard an aircraft, the ILS localizer frequency is selected by the VHF radio navigation selector, which automatically tunes in the paired glide slope frequency. The VHF selector is the same that is used for the VOR, and carries the full range of VOR/ILS localizer frequencies.

The localizer transmitter operates on one of the 40 ILS channels within the VHF frequency range of 108.10 MHz to 111.95 MHz, on the odd tenths. Glide slope frequencies utilize the UHF band from 329.3 to 334.0 MHz. Each localizer frequency is paired with a glide slope frequency, e.g., localizer at 108.5 MHz and glide slope at 335.0 MHz.

Actually, the term glide slope is a misnomer, as the aircraft is certainly *not* gliding. Power is required to maintain the aircraft on the correct descent path with gear and flaps lowered. The glide slope transmitter provides the pilot with vertical guidance. Should the glide slope fail, the system reverts to a nonprecision localizer approach.

Glide slope transmitters are located between 750 and 1,250 feet from the approach end of the runway and offset 250 to 650 feet from the runway centerline. Signals are radiated primarily in the direction of the localizer front course, to provide vertical guidance along a correct descent angle. It is normally usable to the distance of 10 nautical miles; however, at some locations, the glide slope has been certified for an extended service volume which exceeds that distance.

A localizer identifies in Morse code with a three-letter identifier preceded by the letter I ("dit dit") transmitted on the localizer frequency, e.g., I + DIA. We'll have more on ILS in the February issue.

Readers Corner

Guido Maci in Ohio asks what is the difference between primary and secondary radar in regard to aircraft transponders. Well, Guido, primary (simple) radar detects echoes from an aircraft, but secondary radar causes the transponder to "burst into life" and transmit its data back to the controller's screen including identification, flight level, direction, etc.

Emil Begovic in Illinois tells us that a new station in the Chicago area—870 kHz on the AM dial—comes from O'Hare International Airport. It gives the status of parking lots, curb pickups (*there is **no** stopping in the **red** zone*!), FAA security restrictions, and other important information for travelers. Emil reports that it is a very low-powered station and audible in the Chicago area only.

That's it for today. Until February, 73 and out.

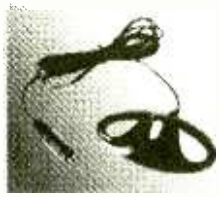
NEW PRODUCTS BROUGHT TO YOU BE ELECTRONIC DISTRIBUTORS

WATSON NEW PRODUCTS...

WHX-7000 Dual Bander

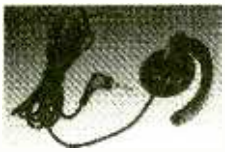
the WHX-7000 dual bander for handheld receivers and transceivers.
144/430MHz transmit and receive. Flexible helical, 8.5" long and fitted BNC plug

WEP-300K



8 Ohm - Kenwood connector, fits firmly over ear. Lead length 1.5M

WEP-400



Adjustable and removable soft pad. 3.15M lead - 3.5mm plug. K model has 2.5mm plug.

WSM-1900 25-1900MHz

Magnetic Mobile Mount. 1.25" micro-magnetic base, 2.75M coax BNC connector, for wideband receivers.

WSM-270 2M/70cm

1.25" micro-magnetic base, 2.75M coax BNC connector, 50W max.

WATSON

Quality Products from the UK!

Power Pod

Nite Glow Rings and low, mid, high LED's light the night for easy multiple HT & accessory connections to your cig lighter. Three foot cord allows mounting almost anywhere in your vehicle.

AR8000 AOR

All Mode Wide-Band World Band Radio Receiver A new breed of radio receiver which combines full computer compatibility with advanced wide-band radio receiver technology.

The AR8000 incorporates the latest PLL technology and offers a multitude of features including true carrier re-insertion SSB (CW) demodulation with 50Hz frequency steps. 4 level alpha numeric LCD indicates the frequency, signal strength, band scope and more. Selectable squelch system, auto-mode, auto-band-plan, serial communication port are all standard. There are a variety of scan/search commands to link banks, scan by mode, programmable delay scan, priority, auto memory store, step offset and a programmable power save circuit to increase the duration of operation from the NiCads. The list goes on and on!

AR8000 Leather Case

- Heavy duty top grain leather
- Made in USA
- Fits comfortably on belt

SCANCAT GOLD DOS OR WINDOWS VERSION!

SCANCAT presently supports:
- AOR3000/3000(A) & AOR2500, AOR-3030 HF receiver, AOR-8000 (Newest handheld)
- Drake R-8 • MOST Icom Radios • Kenwoods including TS-440, TS-450, TS850 & R5000
- Most Yaesus including FRG-8800 & FRG-9600 Yaesu, plus FRG-100, FT-840 and more!
- The NRD-525 & 535 JRC. • LOWE HF-150m • Watkins Johnson HF-1000
- Opto Electronics add-on boards for PRO series Radio Shack Radios

Now Available! Scancat Gold for Windows...Same great features and support you've come to expect ! Super windows graphic and commands for the smoothest possible operation. Now you decide...DOS or Windows 95 or 3.1

Software allows complete control of all functions supported by these radios through the standard manufacturer's interface. SCANCAT allows you to:
1. Enter any one frequency and increment up-down from that point
2. Enter any two frequencies and scan between them with ANY increment, time delay or pause.
3. Scan a file of frequencies, search by description or wildcards.
4. Create databases of frequency files. Sort by any field, and save to disk and/or send to printer.
5. Create 30 personal "Preset:" frequency BANDS for SW, aircraft etc, including increment and mode. The most popular presets are included in the program. Multiple scanning Banks, multiple scanning diskfile banks, unlimited file sizes, dual radio simultaneous scanning, comma delimited conversion, d-base support, scanport gold, direct import of TRS, Macro control per record, command line control, automatic birdie lockout, top hits table.

NEW PRODUCT RELEASE!

Airmaster 3 NOW Available!

Without a doubt LOWE's Airmaster 2 ACARS software and interface caused quite a stir in the world of airband listening. Hundreds of aviation enthusiasts are now using LOWE's ACARS software to supplement their monitoring activities. ACARS data comes in particularly fast, especially if you are in a busy location, and the screen soon fills up and scrolls over. Airmaster 3 will resolve these issues and others with many enhanced features:

LOWE

- Most options now have hot keys, access without having to pull down the menu
- The display of repeat messages can be suppressed and held in memory details of the last 50 messages received are checked against this list.
- Up to six strings of "alert text" can be specified, with program beep. This is designed to help in monitoring particular flight numbers or registration numbers.
- Advanced features for display message suppression and labeling as well as other new "Expert" features.

The Hugger

"At your fingertips" convenience for handhelds and cellular phones. Quick, easy "no holes" mounting using your car air vents. Flexible gripper arms hug your radio yet allows quick, easy release.

Electronic Distributors
325 Mill Street
Vienna, VA. 22180
Ph: 703.938.8105
Fax: 703.938.4525
EDCO

John Fulford, WA4VPY
email: johnf@emi.net

Sniffing Out the US Marshals

In November, in response to an observation by a South Florida contributor, we discussed the absence of reported traffic on any of the United States Marshall's radio frequencies. The vehicles used by the Marshal's Service now are sporting two 800/900 MHz antennas on them, usually the through-the-glass type mounts.

I was wondering if this was significant to only South Florida. I have been receiving e-mail from other parts of the country attesting to the same observation—no radio traffic on the 163.2000 MHz main channel—nor on any of the others.

On the evening news recently, they showed the latest Central Intelligence Agency employee arrested for spying arriving at the Alexandria, Virginia, Federal Courthouse. Although the CIA has its own Office of Security, they do not do the actual arresting and transportation of the prisoners, since the CIA has no arrest or subpoena power within the United States.

I always try to make it a habit of taping the evening news, just in case there is something I want to save or go back over. This was one of those nights. I kept replaying the arrival scenes of the U.S. Marshal's vehicle. Guess what? No 160 MHz antennas were visible. Could they have been using a disguise antenna on the vehicle? Perhaps, but the vehicle was one of those that only a police agency would buy—you know the look—plus it had red and blue strobe lights permanently affixed on the rear deck. Why spend the money to outfit a rolling billboard with a covert antenna? I have the feeling that the only 163 MHz radios the vehicle had in it were handhelds—if it had any at all.

The two 800/900 MHz antennas are similar to what is being seen down here in South Florida. One antenna is most likely for the cellular phone. Federal agencies are rapidly going to cellular phones. Mulder cannot operate on the *X-Files* without his. You rarely see either Mulder or Scully with conventional two-way radios.

The other antenna is probably for a local, or regional, Specialized Mobile Radio System, or SMR. These SMR systems operate on the 800/900 MHz band and have wide range coverage. You will have seen them if your police department or local government has gone to a "trunked" system. The large SMR systems operate 20 channels. It is most likely that Motorola radios are used, for several reasons. Two of the main reasons are that Motorola owns most of the SMR market, and the second is that Motorola has the necessary digital encryption required by the National Security Agency for the transmission of classified or very high level sensitive traffic.

To help settle this, one of our contributors will have to say definitely YES or NO as to whether the above speculation is on the correct path, or someone could take a trip down to the local United States Court House and get a look for himself. Perhaps one of our contributors who is in the news media will provide us with the answer, since they often have a reason for being there in the first place. Our readers want to know...

"Interesting" Communications

Back in 1995 the President of South Korea, Kim Young, paid a visit to Chicago. As the President made his visit to the Mid American Club and then on to the Sheridan Hotel, the protection was provided for him by the United States Secret Service. The main channel of 165.375 MHz was used. What was noticeable was the number of South Korean security agents talking into their own radios. Their transmissions did not match up with any of the 165 MHz transmissions, so it was time to go searching. The South Korean Security Service was found to be operating on 414.8500 MHz.

What's so interesting about this, you ask? This is one of the main channels used throughout the United States by the Secret Service Communications Personnel. Could this be a fluke and the Koreans happened to bring their own radios already on this frequency along on the trip? I don't think so—but we will never be sure.

For those of you in the Los Angeles area, the frequencies used by the Secret Service Communications Personnel offer some especially interesting communications. The repeater on the above channel of 414.8500 MHz in Los Angeles has telephone patch capability and offers many hours of "interesting communications."

Southeastern National Parks

With winter upon us, your thoughts may be turning to those of warmer temperatures and warmer places to visit. Being down in the Southeast, I travel up through Florida, Georgia, Tennessee, and North Carolina visiting relatives and friends. The national parks are a great source of wonder and entertainment for those on the road. Here are some of the National Parks and Monuments that I have visited and their radio channels.

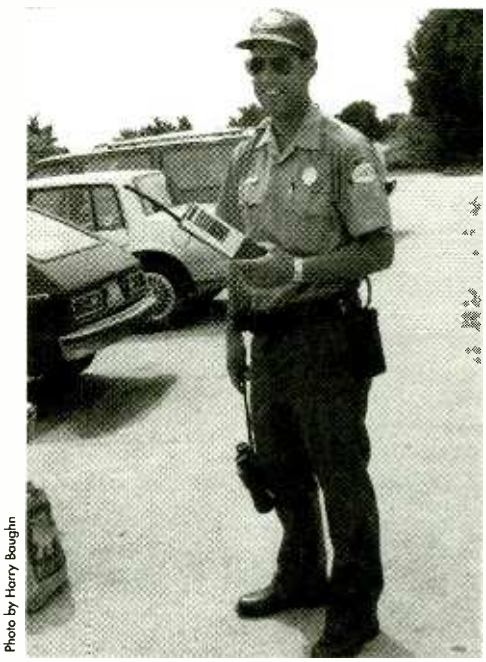


Photo by Harry Boughn

GEORGIA

Chattahoochee River National Recreation Area
166.3000(O) 166.9000(I)

Chickamauga and Chattanooga National Military Park
168.3250(O) 167.0750(I)

Kennesaw Mountain National Battlefield Park
171.7750(O) 172.4750(I)
166.3000(S) 166.9000(S)

Fort Pulaski
164.8000(O) 164.1000(I)

Ocmulgee
171.7750(S)

Cumberland Island
171.7250(O) 171.5250(I)
411.8250(O) 409.7500(I)

Andersonville National Cemetery
408.4750 (S)

TENNESSEE

Andrew Jackson National Historic Site

VHF antennas noted—no frequencies discovered

Big South Fork National River and Recreation Area

163.0750(O)	166.7500(I)168.3750(S)

Great Smoky Mountains National Park

167.1500(O)/166.3500(I)	Channel 1
167.1500(S)	Channel 2
168.2000(S)	Channel 3 (National Forestry Service)
168.7500(S)	Channel 4 (National Forestry Service)
167.1750(O)	166.3750(I)Channel 5 Blue Ridge Parkway

The radio numbers are:
400's—Little River District
600's—Cades Cove Area

The primary site is located at the radio tower at Clingman's Dome—which is probably the highest site in the Smoky Mountains. There is a UHF voting system which votes and repeats down to the U.S. Park Service located in Gatlinburg at the base of the mountain. The frequency of 415.1250 MHz repeats all traffic.

Other UHF link frequencies include:
408.475 408.525 408.625 408.775 412.125 MHz

Obed Wild and Scenic River

Shares radios with Big South Fork National River

Shiloh National Military Park

164.4000 (S)	164.4250(S)

Stones River

172.7750(S)

Ft. Donelson

167.1500(O)	166.3500(I)

NORTH CAROLINA

Blue Ridge Parkway

167.1500(O)	166.3500(I)—shares with Great Smoky Mountains
167.1750(O)	166.3750(I)—main channel
166.3000(S)	166.9000(S)
166.9750(S)	171.6750(S)
411.7000(O)	417.9250(I)

Carl Sandburg National Home

171.6750(S)

Wright Brothers Site

164.2000(S) 164.7250(S) 169.6500(S)

Ft. Raleigh

164.2000(S) 164.7250(S) 169.6500(S)

Cape Hatteras

Same as Carl Sandburg and Wright Brothers Sites

Keep in mind when visiting these sites that the United States Fish and Wildlife officers also operate within these regions. Their operations are generally confined to the low bands, as any monitor who has made their way through a sunspot cycle can tell you.

The frequencies generally used are:
34.25 34.41 34.81 34.83 34.85/ 34.43 MHz.

When the skip is in, these low band channels will be heard all over the United States—often to the point that communications are impossible and cell phones and other modes of communications are used.

Fish and Wildlife also operate handhelds on 168.2500 and 168.4000 MHz. Undercover

Photo by Harry Baughn

covert operations will be heard on 408.675 (Out) and 410.625(In).

Why have I taken this time to go into the workings of National Parks? Well folks, more than Smokey the Bear lives there. The national parks are the jumping off points for some of the major marijuana operations in the United States. If you get caught growing marijuana on your own property, you will forfeit your property to the government upon conviction. Therefore, many growers use national lands. What is the government going to do—seize its own land?

The National Park Service in the Smoky Mountains (the Park with which I'm most familiar) uses the main channel of 167.150 MHz for nearly all of its operations in the Park. You will hear all kinds of traffic on that frequency, from auto accidents to when a black bear has been sighted or even killed.

The National Park Service also recently purchased some very sophisticated speech encryption equipment. I have a feeling it is not for the morning bear reports. One also has to remember that there are numerous sensors scattered throughout the National Parks. These include vibration—such as someone or something walking on the ground—to thermal or ultrasonic. Not all sensors are land-based. Who knows how many may be up in the trees looking down? To go even higher, how many "spy" satellite photos of the National Parks are being taken daily and then passed to "appropriate authorities"?

While we are up in the mountains, let's

look at the following traffic intercepts for Kentucky, sent in by a reader who wishes to remain anonymous.

Kentucky Monitoring

Frequency	Use
166.3250	Tennessee Valley Authority (TVA) Rptr output - Land between the Lakes
172.7500	Above rptr input
163.025	Army Corps of Engineers
164.225	Martin Marietta Plant—Paducah, Ky.
164.250	Same
164.325	Same
164.375	Same
164.750	Same
164.625	Military Police—Ft. Knox
165.0875	Same
163.0000	Corps of Engineers—Louisville
163.0250	Same
163.4125	Same
163.4375	Same
163.5125	Same
165.2875	ATF
165.2375	Customs
165.5000	FAA—Security
163.9375	FBI
167.5625	FBI
170.8750	Bureau of Prisons
142.5000	Naval Ordinance
163.4875	Security Police—Standiford Field

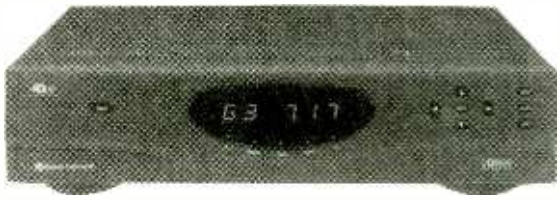
That's it for this month. Here's looking forward to another year. 73's - John, WA4VPY

Note on advertisement below: *As of 4/26/95 it became unlawful to market cellular-capable receivers in the Radio Progressive assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.*

Ken Reitz, KS4ZR

C-band's Future: The 4DTV Gambit

Last summer at the satellite industry's trade show, the General Instrument Corporation (G.I.) unveiled its vision of the future for the world of C-band satellite television. Originally dubbed "Triple Play" because of its ability to receive analog, VCII encrypted, and digital satellite signals, the new name is 4DTV. This is because someone forgot that it also receives digitally encrypted signals. Anyway, regardless of the name, trade show attendees were treated to a live demonstration of what turned out to be the only one of its kind 4DTV receiver.



General Instrument's 4DTV satellite receiver brings the world of digital television to C-band viewers. Many new innovations may make this the receiver of satellite TV's future. (Courtesy General Instrument Corp.)

Unless you've been confined to an isolation chamber for the last two years, you're aware that the small dish digital revolution has taken the sizzle out of traditional satellite TV sales. In addition, the FCC reinforced its stand against municipal zoning bans on small dish antennas. The result of all the promotion for direct broadcast satellite (DBS) is that it has been made an overnight success. And, prompted by easy money installs, lucrative subscription package commissions, and residuals, many dealers were more than eager steer customers away from C-band and push the new DBS systems.

Meanwhile, programmers were switching from analog to digital feeds (using equipment produced by G.I.) leaving C-band viewers with an uncertain feeling about the future. Was the switch to digital inevitable? Would the nearly 2 million C-band viewers be left in the dark? Is this a VCII *déjà vu*? Could the Shop At Home channel be far behind?

G.I. To The Rescue?

Traveling on the unsteady legs of a dubious steed, why, it's General Instrument and they've brought a new box: it's 4DTV! Yes, under a hastily drafted, better-late-than-never policy, G.I. has indeed come to the rescue of an entire industry they've previously cared for with benign neglect. At the show, G.I. personnel, including V.P. Maurice Niemen became unlikely cheerleaders for C-band, touting the wide program variety, wild feeds, back hauls, in-the-clear channels, and low cost *a la carte* subscription plans. Now, they said, C-band would be better than ever because, thanks to the generosity of G.I., viewers would be able to have access to those channels going digital in addition to all the other possibilities.

4D TV
DIGITAL SATELLITE RECEIVER

If the more than 3,000 satellite dealers who attended this summer's show were more than a little skeptical, no one should be surprised. Some of the older dealers still hold a grudge against G.I. for impeding their fortunes ten years ago with the introduction of scrambling to the fledgling industry. Newer dealers recall with suspicion a time just a few years ago when an alleged shortage of VCII RS modules caused prices to rise instead of fall. And current dealers question why VCII RS modules remain as expensive as they are. To this, add the growing resentment that G.I. failed to anticipate the DBS craze and waited two years to make digital reception a possibility.

At the show dealers were told that 4DTV would be available by December. And then, like a desert mirage that disappears as you get near it, G.I. moved the roll-out date to March of this year. There is speculation in the industry that production could actually be much farther away.

What Price 4DTV?

Even when it does finally hit the market, a retail price around the $1,300 mark with VCII RS module on board will take it in exactly the opposite direction that DBS and, indeed, C-band prices have been going. Many dealers shake their heads in disbelief that they'll be able to push such an expensive receiver. Other dealers wonder why stand-alone Digicipher boxes can't be added to existing receivers at a fraction of the cost. Why make consumers buy new receivers when all they may want is the Digicipher?

Dealers I talked to said that the addition of digital reception capability will not be the one thing that swings a C-band sale. Some, still stinging from previous relations with G.I. say they'll wait until G.I. licenses the unit to another manufacturer. They will not sell a product with the G.I. label.

Polishing the G.I. Image

General Instrument knows that dealer relationship repairs are in order and have made

AMSAT-NA Vice President for Engineering, Dick Jansson, WD4FAB (right), and AMSAT-DL's Konrad Mueller, DG7FDQ (left), perform final inspection of Phase 3D's 400 Newton kick motor in Konrad's well-equipped machine shop in Germany prior to shipment to Orlando for integration into the satellite. The motor is the same design that successfully powered both AO-10 and AO-13 to their final orbits. Phase 3D will have a highly elliptical "molniya" style orbit allowing long contacts from across continents. (Courtesy Keith Baker, KB1SF)

Some flight electronic modules for the Phase 3D undergoing final bench testing at the AMSAT-DL laboratory in Marburg, Germany, prior to shipment to Orlando, Florida, for integration into the satellite. (Courtesy Keith Baker KB1SF)

efforts in that direction. In press releases following the summer show G.I. announced a plan to offer a much needed credit financing program which would allow consumers to become pre-approved through one phone call from authorized dealers if they purchase the 4DTV. They also hope to help dealers by reducing the price of the VCII RS module and launching a promotional campaign extolling the virtues of C-band over DBS.

G.I. is counting on the enthusiastic sales efforts of new dealers untouched by previous bad feelings and interested in promoting the value of C-band reception: the international programming, news feeds, sports backhauls, SCPC reception, adult programming, distance learning potential, and a seemingly endless parade of new channels.

4DTV On Paper

Since there isn't a production line 4DTV to examine, let's look at the receiver on paper. In a sense, it's actually a hybrid between C-band receivers and the new DBS receivers. With the ability to receive analog NTSC signals, VCII encrypted signals, digital unencrypted, and digital encrypted (via G.I. Digicipher II system) signals, 4DTV will do it all. It has full compatibility with existing C- and Ku-band electronics, Dolby digital audio, high speed data ports for interfacing with your computer, and future High Definition TV (HDTV)—when, and if, it becomes a reality.

The receiver will feature an on-screen interactive program guide similar to DSS using a graphical user interface (GUI). Color coded icons allow the viewer to surf the channels by theme and have information displayed regarding program content, actors, thumbnail reviews, etc.

4DTV will have many of the functions familiar to all C-band viewers such as pay-per-view, program timer interface with your VCR, stereo audio subcarrier tuning and more. Software downloads will also be possible for information retrieval regarding satellites, channels, subcarriers and other options. In short 4DTV will take C-band viewing to a new height. And, for those who are willing to pay for it, 4DTV will provide excellent entertainment value.

No, Maybe, and Yes

Now let's look at what 4DTV won't do. It will not receive DSS, DISH, AlphaStar, or any of the other current DBS entities. Which comes as no surprise because none of those services are compatible with each other, either. It will not necessarily receive additional C-band services which go digital. That's because G.I. is not the only digital signal equipment maker. Scientific-Atlanta, for example, manufactures digital equipment and their signals, channel 24 on G5 for instance, are not compatible with G.I.'s. (As far as I know, S-A has no intention of making a consumer receiver.)

4DTV will receive only those G.I. Digicipher II encrypted channels which want a general C-band audience. Those Digicipher II encrypted signals intended solely for a private or cable-only audience will not be available to the C-band viewers. This is true even now with VCII RS in which a number of such scrambled channels are unavailable to the C-band market. It will, however, give viewers access to previously unavailable channels such as the PBS channels on the Ku-band side of Telstar 401.

Bottom Line

There's no doubt that 4DTV has a place in satellite television's future: Even though it is expensive, high-tech gear, it has a lot of potential. In a way, it can be viewed as an expensive car: Those who can afford the luxuries offered will be quite pleased with their investment. Those who are seeking more economical entertainment will have to be satisfied with DBS. Automobile buyers have been making the same choices for a long time, and, there have been Cadillac dealers for nearly 100 years.

Grove Expo Notes

It was a pleasure to meet the many *MT* readers in attendance at this year's Grove Expo. It was a time to renew acquaintances and make new ones. Among the featured speakers was AMSAT's Keith Baker KB1SF whose photos and updates on the progress of Phase 3D have been presented here since its inception. Keith provided the two photos in this month's column showing 3D's continued progress. Launch date is tentatively scheduled for April of this year when Phase 3D will be the only payload for the Arianne 5 launch vehicle.

This is the first such launch since the maiden launch of an Arianne 5 rocket ended in failure just 35 seconds into the mission. Following an exhaustive investigation new procedures were implemented, and the European Space Agency (ESA) is confident that the flight will be a success. The launch will be the biggest audience ever for an amateur radio satellite as press from around the world will be watching.

More than a few hams will be holding their breath, too. This launch will take with it the dreams, designs, and thousands of hours of volunteer effort from the many dedicated amateur radio enthusiasts from around the world. The rest of us (hams and SWLers alike) will enjoy the fruits of their labor for many years to come.

Bill Cheek
Internet: bcheek@cts.com

Frequency Record-Keeping Made Easy-II

Last month I introduced Mr. Reid Drummond's potent APFTools utility program that brings order to chaotic text files with frequency information. APFTools has the smarts to look for frequency numbers and adjacent descriptive text and then organize it into any of several different formats better suited for use in a computer, especially database managers.

Suppose you get an e-mail from a fellow hobbyist on the opposite coast where he discusses family, weather, job, school.....and "oh, by the way, here are some interesting frequencies for you....." APFTools intelligently extracts those frequencies from the text; makes an intelligent guess at descriptions or ID, and outputs a table into a separate file, ready for export into your database or spreadsheet manager.

To find the shareware ($5) APFTools file, version 3.01, look for: **APF301.ZIP 256532 11/13/1996 07:53.** APF301.ZIP is available from my BBS and FTP site, the file library on the Compuserve HamNet forum (GO HAMNET), and probably a number of other Internet and FTP sites.

FIG-1: PRINTED FREQUENCY LIST

Field 1 CHAN	2 FREQ	3 MODE	4 DLY	5 L/O	6 IDENTITY	7 COMMENTS	
161,	121.900,	NFM,	D,	L,	Blue Angels,	Ground Support	Record 1
162,	123.400,	NFM,			Blue Angels,	Common Airshow	Record 2
163,	141.560,	NFM,	D		Blue Angels,	Maintenance Charlie	(Etc.)
164,	142.000,	NFM,			Blue Angels,	Maintenance Alfa	
165,	142.025,	NFM,	D		Blue Angels,	Maintenance Delta	
166,	142.625,	NFM,	D	L,	Blue Angels,	Maintenance	
167,	143.600,	NFM,			Blue Angels,	Maintenance Channel	
168,	143.000,	NFM,	D,	L,	Blue Angels,	Maintenance Bravo	
169,	241.400,	AM,	D,		Blue Angels,	Air to Air Channel	
160,	250.800,	AM,	D,		Blue Angels,	Air to Air Channel	
171,	251.600,	AM,	D,		Blue Angels,	Demonstration	
172,	263.350,	AM,	D,		Blue Angels,	Flight Line common	
173,	263.500,	AM,	D,		Blue Angels,	Air to Air Channel	
174,	275.350,	AM,	D,		Blue Angels,	Comm 1 Lead & Formation	
175,	302.100,	AM,	D,		Blue Angels,	Comm 2 Talkback	
176,	302.150,	AM,	D,		Blue Angels,	Comm 3 Solos	
177,	307.700,	AM,	D,		Blue Angels,	Comm 2 Formation talkback	
178,	345.900,	AM,	D,		Blue Angels,	Air to Air Channel	
179,	360.400,	AM,	D,		Blue Angels,	Comm Solos	
180,	384.400,	AM,	D,		Blue Angels,	Air to Air Channel	
181,	391.900,	AM,	D,		Blue Angels,	Air to Air Channel	
182,	395.900,	AM,	D,		Blue Angels,	Air to Air Channel	
183,	362.600,	AM,	D,		Blue Angels,	Air Show Control	
184,	243.000,	AM,	D,		Military,	Emerg/Mayday/ ELT's	

------ Commas in these columns are the basis of Figure 2

Comma Delimited Text Files

One format that APFTools generates is a "comma delimited" ASCII text. We'll go into more detail this month because comma-delimited ASCII (ask'ee) is a universal data format that's compatible with all sorts of computers and software.

Why commas? Fig-1 shows a typical typewritten or printed frequency table. It's plainly understandable and useful, as is. If you are concerned with only a few frequencies, say less than 400 or so, then printed tables are adequate for most needs. Even index cards are fine by which to manage a few frequencies. But what about 500 to 25,000 or more? Even well ordered, printed tables are inefficient and expensive if more than a few pages.

You can efficiently manage a handful of frequencies in your head or on paper scraps. A computer can manage thousands....even millions, in a heartbeat. The freedom from drudgery and the access to volumes of information at the touch of a key are priceless. If you've been into radio for a while, or if you're new, but avidly interested, your frequency files will quickly grow beyond any simple pencil and paper management system. Let a personal computer give you more time to play radio and reduce the administrative work!

Commas aren't always necessary to enable computers to share data, but programmers everywhere more or less agreed on a standard method of letting a computer know where a column of information begins and ends. The lowly comma is one such standard.

A Computer Needs Software

A computer isn't intelligent, though. It does only what it's told and only as well as it's told. You do the telling, but there are a few things to know before a computer can manage your frequency records more efficiently than you can. Fortunately, the right kind of software minimizes what you need to know. It's basically a matter of learning how to use new tools.

It's relatively painless if you use a database manager or a spreadsheet program for frequency management. I mention spreadsheets, not because I like them, but because some of my associates arguably prefer them over database managers.

In some ways, there is little difference between spreadsheets and database managers. Both organize, sort, and arrange data better than humans. Spreadsheets are more for math calculations in limited quantities, though, while database managers are more for plain or raw information in virtually unlimited quantities. Nevertheless, I'll concede that spreadsheets can manage maybe even a few thousand frequencies about as well as database managers. On the other hand, the best spreadsheets choke and gag on more than 5-10,000 frequencies whereas some database managers can handle upwards of 2-billion records! Even the simplest database managers are good for 32,000 records.

Which Software Is Best?

I've said it before and I'll say it again: Microsoft Windows 95 (operating system) and the Microsoft WORKS for Windows integrated software are great choices for hobbyists and professional alike. WORKS is a combination word processor, spreadsheet, and database manager with enough power to run a small business. In fact, many small businesses are operated exclusively from the MS WORKS software. Priced at well under $100, and discounted to as low as $49, WORKS for Windows is hard to beat.

If you are an advanced hobbyist or a hard working technologist, a better choice for shop and shack might be Microsoft Office (Professional), the latest version of which is to be released this month as Office 97. The professional version offers Microsoft WORD (arguably the best word processor), EXCEL (inarguably the best of the spreadsheets), POWERPOINT (hands-down, the best presentation manager), and ACCESS (arguably the best database manager).

The standard version of Microsoft Office is the same as above except that the ACCESS database manager is not included in the package. You might have little or no use for the Power-Point program, but ACCESS and EXCEL are unequalled for handling all kinds of complex and voluminous information. Microsoft Office Professional is my choice for a production package.....but get this: I still use Microsoft WORKS for Windows, and if I had to, I could use it exclusively and still swim with the sharks!

Compatibility Basics

Spreadsheets and database managers are all somewhat alike, differing mostly in finer points that have no bearing on frequency data-

FIG-2: COMMA-DELIMITED FREQUENCY LIST

```
CHAN,FREQ,MODE,DELAY,LOCKOUT,IDENTITY,COMMENTS
161,121.900,NFM,D,L,Blue Angels,Ground Support
162,123.400,NFM,,,Blue Angels,Common Airshow
163,141.560,NFM,D,,Blue Angels,Maintenance Charlie
164,142.000,NFM,,,Blue Angels,Maintenance Alfa
165,142.025,NFM,D,,Blue Angels,Maintenance Delta
166,142.625,NFM,D,L,Blue Angels,Maintenance
167,143 600,NFM,,,Blue Angels,Maintenance Channel
168,143.000,NFM,D,L,Blue Angels,Maintenance Bravo
169,241 400,AM,D,,Blue Angels,Air to Air Channel
160,250.800,AM,D,,Blue Angels,Air to Air Channel
171,251 600,AM,D,,Blue Angels,Demonstration
172,263.350,AM,D,,Blue Angels,Flight Line common
173,263.500,AM,D,,Blue Angels,Air to Air Channel
174,275.350,AM,D,,Blue Angels,Comm 1 Lead & Formation
175,302.100,AM,D,,Blue Angels,Comm 2 Talkback
176,302.150,AM,D,,Blue Angels,Comm 3 Solos
177,307.700,AM,D,,Blue Angels,Comm 2 Formation talkback
178,345.900,AM,D,,Blue Angels,Air to Air Channel
179,360.400,AM,D,,Blue Angels,Comm: Solos
180,384.400,AM,D,,Blue Angels,Air to Air Channel
181,391.900,AM,D,,Blue Angels,Air to Air Channel
182,395.900,AM,D,,Blue Angels,Air to Air Channel
183,362 600,AM,D,,Blue Angels,Air Show Control
184,243.000,AM,D,,Military,Emerg/Mayday/: ELT's
```

base management. Any database manager or spreadsheet will do fine, depending on the volume of your data. A primary factor in your choice is the ability to import and export data in a variety of file formats starting with the aforementioned comma-delimited ASCII format. You'll also want built-in converters for the following formats: tab delimited ASCII; dBaseIII, dBaseIV, Excel, FoxPro, 1-2-3, and frankly, the more the merrier, but these are minimums.

A primary value is to be able to *import* frequency data from whatever source you happen to find it. If you're cruising the Internet and stumble on a huge FoxPro database for your region, you'll whine and snivel if you can't access that data. If your database manager or spreadsheet has built-in import converters, then you're "in like Flint."

Comma-delimiter Rules

1. A single comma separates each field of a data file. Extraneous (unintentional) commas are interpreted as field separators, too! Two adjacent commas (,,) mean that the field between them is blank.
2. A data field (column) is defined as the information at the right of a comma, and before the next comma. If there is no next comma before the record terminates with a carriage return <CR>, then that field is the last in the record. A field (column or cell in a datasheet) is an element of a table that contains a specific item of information, such as frequency.
3. A data record (row) is defined as a collection of information about something (frequency), regardless of number of commas, which terminates in a <CR> carriage return; (basically a line of information.)
4. One or more records with any number of fields constitutes a database, data set, or data file.

Figures 1, 2, and 3 are identical for all practical purposes, but Figure 1 is designed for easy reading while Figure 2 is for easy input, processing, and output by computers. Figure 3 is the visible output of a database manager, and therefore offers the best of both Figs 1 and 2.

FIG-3: FREQUENCY DATABASE

CHAN	FREQ	MODE	DELAY	LOCKOUT	IDENTITY	COMMENTS
161	121 9000	NFM	D	L	Blue Angels	Ground Support
162	123 4000	NFM			Blue Angels	Common Airshow
163	141 5600	NFM	D		Blue Angels	Maintenance Charlie
164	142 0000	NFM			Blue Angels	Maintenance Alfa
165	142 0250	NFM	D		Blue Angels	Maintenance Delta
166	142 6250	NFM	D	L	Blue Angels	Maintenance
167	143 6000	NFM			Blue Angels	Maintenance Channel
168	143 0000	NFM	D	L	Blue Angels	Maintenance Bravo
169	241 4000	AM	D		Blue Angels	Air to Air Channel
160	250 8000	AM	D		Blue Angels	Air to Air Channel
171	251 6000	AM	D		Blue Angels	Demonstration
172	263 3500	AM	D		Blue Angels	Flight Line common
173	263 5000	AM	D		Blue Angels	Air to Air Channel
174	275 3500	AM	D		Blue Angels	Comm 1 Lead & Formation
175	302 1000	AM	D		Blue Angels	Comm 2 Talkback
176	302 1500	AM	D		Blue Angels	Comm 3 Solos
177	307 7000	AM	D		Blue Angels	Comm 2 Formation talkback
178	345 9000	AM	D		Blue Angels	Air to Air Channel
179	360 4000	AM	D		Blue Angels	Comm Solos
180	384 4000	AM	D		Blue Angels	Air to Air Channel
181	391 9000	AM	D		Blue Angels	Air to Air Channel
182	395 9000	AM	D		Blue Angels	Air to Air Channel
183	362 6000	AM	D		Blue Angels	Air Show Control
184	243 0000	AM	D		Military	Emergency/Mayday, ELT's

Creating Comma-delimited Files

A comma-delimited ASCII file is easily created with a text editor. The MS-DOS resident editor, EDIT.EXE is adequate, but better ones are available at nominal cost, including the shareware QEDIT and BOXER editors. WORDPAD in Windows 95 will do for many needs. Better word processors like MS WORD and Corel WordPerfect are superior, provided you save the comma-delimited file back into a plain text (*.TXT) format after you're done editing.

Creating a comma-delimited file from a text file like Figure 1 is easy. First, import or load the raw file into your editor. Next, and most importantly, do a SEARCH for all existing commas and REPLACE them with semicolons. We don't want any commas in the file (yet)! Now manually edit the title line so that it appears like the first line in Fig-2. (Many databases and spreadsheets can recognize the first line of a comma-delimited file as header titles or field names and spare you the effort of typing!).

Now for the fun part: Replace the columnar format with commas and eliminate superfluous spaces. One way is to type a comma immediately after the channel number. This can be automated after doing a few, say five, and then mark-copy-paste that five into the column beneath for ten. Then mark-copy-paste the ten into the next ten empty spaces beneath for twenty, etc, until a whole column of commas has been created to separate the CHAN column from the FREQ column.

Now mark-copy-paste that entire column of commas into the next column just to the right of the FREQ column; and again for the MODE and the rest of the columns. The last step deletes superfluous spaces. First Search for strings of three spaces and Replace with nothing! Then Search for strings of two spaces and Replace with nothing. This should leave only the normal spaces between words in the IDENTITY and COMMENTS fields. There you have it: a comma-delimited text file, ready to share with others or to go into your database or spreadsheet.

There are other data exchange standards, but the comma-delimited ASCII text is probably the oldest and most universal, and certainly the simplest. I strongly recommend you develop the habit of using it when posting frequency lists to the public forums and in e-mail. It's like an orchestra playing to the same sheet of music.

Please let me know if you benefited from this miniseries and if you'd like more articles on data processing and management.

John Catalano, PhD
j_catalano@conknet.com

The Best of the Best: One Person's Opinion

As I was preparing my talk for Grove Communications Expo '96 this past fall, I realized how far we have come since the Computers & Radio column was inaugurated five years ago. Back then we had to dig deep to find any radio related software. Then times changed, and gradually, it seemed as if a new radio controller, database, or propagation predictor program was being introduced every week. Now, the pendulum has swung back, and it seems few new radio programs are being released or survive the early days following release.

Are any of the original commercial programs left? Have shareware programs kept pace? Is the Total Monitoring Environment (remember that phrase) a reality yet? The answers may surprise you.

Total monitoring what?

Two names, which you may remember from the early days, are still around and doing very nicely, thank you. Both have successfully striven to perform all the functions required for effective shortwave or VHF/UHF computer-based monitoring. These include: control of all radio functions from the computer console, storage and recall of station/intercept details, display of active frequencies in a graphical "spectrum" format, and the display of the alphanumeric output of a digital decoder such as AEA's PK-232.

These are all the operations necessary for serious monitoring, and what we dubbed the "total monitoring environment" many years ago. Today this environment is a reality in the best-of-the-best monitoring programs which we will re-visit.

It just keeps going and going and ....

One monitoring program, which justifiably retains the title of king of DOS radio programs, is called Scancat. The first version of Scancat, version 1.0, was designed so that the user could do all functions from three basic screens. Single keystrokes were used for most important radio commands.

Well, Scancat is still around, constantly adding new features and lots of new radios to its controls list. The latest DOS Scancat, version 6.0 Gold, has also added a graphical spectrum display, easy importing of data from many different sources, and the capability for use with various squelch detection adapters.

FIGURE 1

How has Scancat's user interface changed from version 1.0 to 6.0? Good question: very little to not at all. It's pretty amazing, but most of the same screens and commands have been maintained (see figure 1). The additional features since version 1.0 have been added without changing the initial program methodology. Once learned, it's learned for all versions. Two additional screen have been added, but Scancat still remains one of the easiest to use, yet powerful, monitoring programs. A Windows version of Scancat has recently been released.

PROGRAM NAME	WIN/DOS	PRICE	INTERNET ADDRESS www.	VOICE TEL#
SCANCAT - various	W/D	$70-100	scancat.com	(318) 636-1234
SCANMANGER PRO	WIN	$69	mindspring.com/~tony/kc4zgl.html	(770) 421-0348
SCANSTAR - various	WIN	$80-400	scanstar com	(408) 926-5630

FIGURE 2

And the price ...well

I happily paid $49.95, including shipping, for version 1.0. That was a great deal in 1990. In 1996 the price has gone up. Scancat's manufacturer, Computer Aided Technologies, now provides daily technical support via the telephone and their Internet page. Check figure 2 for details.

Seeing stars in windows

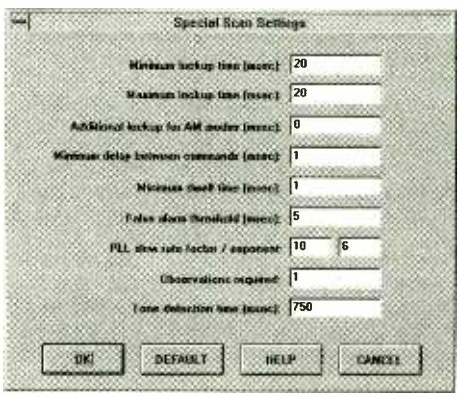
A few radio software companies were around when Windows 3.1 was introduced. In my estimation, the best one survived and has been continuously developed to the high level we see today. That program, ScanStar, now has many different versions. The latest consumer version, ScanStar Plus for Windows, version 5.84, uses a module called the Monitoring Assistant which makes control of just about any monitoring parameter just a point-and-click away. A split screen tactical display is where the action happens.

The configure module (see figure 3) is used to set up which receiver is to be used and its associated scanning parameters. For those who want to match their computer to their receiver for maximum performance, this screen is it. But if you just want to "load and go," pre-loaded default values can also be used.

ScanStar, by Signal Intelligence, provides an excellent Windows monitoring environment. Since version 5.84 does not have an integral digital decoder output screen, it seems to have been designed with the VHF\UHF monitor in mind. However, it does support control of Drake's R-8 and Japan Radio receivers. Of course, the standard Windows Terminal Screen could be used to display decoder output, but this is not exactly a simple keystroke operation. ScanStar is also available in Professional editions. Check their home page for details.

Both Scancat and ScanStar are available in a number of versions. So check their Internet sites, listed in figure 2, for further details. Both also provide downloadable demo programs.

FIGURE 3



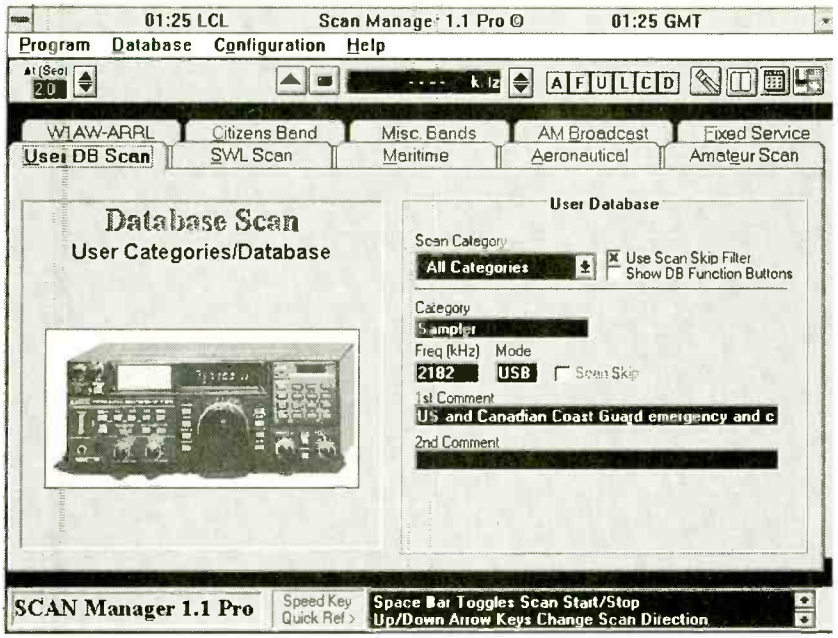


FIGURE 4

The new kid in town

A relative newcomer (two years) into the fray is ScanManager Pro, version 1.1—a hot, Windows based, shortwave program which does a lot with ease. Everything is controlled from a single screen (figure 4). You can see an image of an ICOM R-71 which is what I use with the program. Shortwave broadcasts can be accessed by country and time-of-day via the SWL Manager by clicking on the flag icon at the top right of the main screen. See figure 5 for the SWL manager screen.

From figure 4 we can also see "file folders." Clicking on them transforms your receiver into an AM broadcast band radio, a CB monitor, a ham band receiver, or an aeronautical HF band scanner. And that's just for starters. The file folder system is very easy to use.

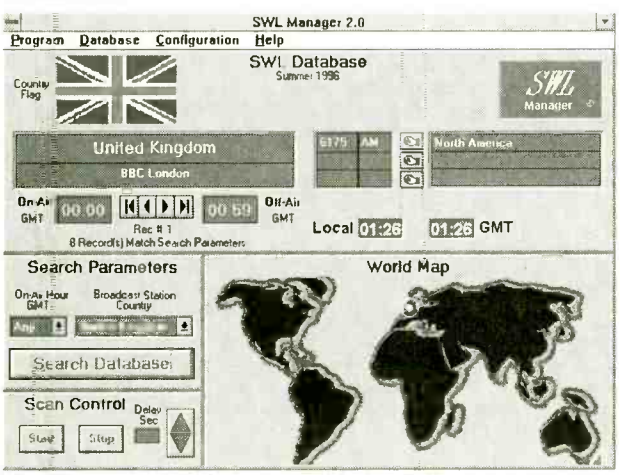
Pressing the F2 key launches the Windows-based decoder terminal program of your choice. AEA's PakRat for Windows and a PK-232 work very nicely with ScanManager to provide a Total Monitoring Environment. Check with ScanManager's Internet site to see if your radio is supported. ScanManager has significantly increased its price from its $19.99 introduction. But it has expanded its capabilities and now includes SWL Manager.

Any shareware out there?

Quite frankly, compared to the programs we have just discussed, no! I have yet to find one shareware program which provides the listener a total environment. If anyone knows of a program that has this flexibility and capability please let me known by E-mail so we can check it out.

Now let's not get confused: There are a number of good monitoring programs out there. These are simply my reflections and opinions, and should be used only as a starting point for your own search for perfection. Go out and try a few. Let me know what you find.

FIGURE 5



To be continued ....

Commercial decoders have come along way since this column started. AEA's FAX III, Hoka Code 3 Gold, and a number of ACARS decoders lead the pack. But shareware decoder programs do offer some very powerful alternatives.

Next time we'll finish our best-of-the-best review, concentrating on decoders. Till then, take advantage of the Winter DX season whenever old Sol cooperates.

SPECIAL EVENT CALENDAR

Jan 4	Morristown, TN	Lakeway ARC / Perry Hensley, KS4QK, 423-828-4848
Jan 4-5	Cape Coral, FL	Fort Myers ARC / Jackie Kampfert, KQ4MZ, PO Box 61183, Ft. Myers, FL 33906, 941-542-6675
Jan 5	Livermore, CA	Livermore ARK / Noel Anklam, KC6QZK, 474 Humboldt Way, Livermore, CA 94550, 510-447-3857
Jan 5	South Bend, IN	Michiana Valley Hamfest Assn. / Bob Denniston, KA9WNR, 21970 Kern Rd., South Bend, IN 46614, 219-291-0252
Jan 11	Glendale, AZ	ThunderBird ARC & ARCA / Mark Fellhauer, KC7BXS, 602-931-1204
Jan 11	Loveland, CO	No Colorado RC / General info 970-351-7327. Location: Larimer Co Fairgrounds, 700 Railroad Ave., 9am-3pm. Talk-in 145.115 (-offset, 100 Hz) or 146.85-.
Jan 11	San Antonio, TX	San Antonio RC / ric Smith, KC5BGK, 210-684-2513
Jan 11	Marathon, NY	Skyline ARC / Barbara Mudge, KB2TIK, 3364 Rt. 221 W, Marathon, NY 13803, 607-849-6751
Jan 11	San Antonio, TX	San Antonio RC / Eric Smith, KC5BGK, 210-684-2513
Jan 11-12	Sarasota, FL	Sarasota ARA / Fred Auerbach, WA3SSZ, 2786 Heather Place, Sarasota, FL 34235, 941-365-7679
Jan 12	Waukesha, WI	West Allis RAC / Phil Gural, W9NAW, PO Box 1072, Milwaukee, WI 53201, 414-425-3649
Jan 18	Crystal River, FL	Sky High ARC / Chad Johnson, W3IKO, 5050 North Amarillo Dr., Beverly Hills, FL 34465-2829, 352-746-1299
Jan 18	Hammond, LA	SE Louisiana ARC / Jack Stang, N5XVJ, 47081 Scott Dr., Hammond, LA 70401, 504-542-7605
Jan 18	Flint, MI	AR, Youth, SW Acad RC / Keith Allen, N8QNA, 1212 Crawford St., Flint, MI 48507, 810-232-5170
Jan 18	St. Joseph, MO	MO Valley, Green Hills, Ray-Clay ARCs / John Winkler, WB0VRA, Rte 1, Box 53A, Gower, MO 64454, 816-424-6484. Location: Ramada Inn at I-29 (exit 47) and Frederick Ave., 9am-4pm. Talk-in on 146.85 and 444.925. Adm $3.
Jan 18	Middletown, OH	SW Ohio Digital Sympos / Hank Greeb, N8XX, 6580 Dry Ridge Rd., Cincinnati, OH 45252-1750, 513-385-8363
Jan 19	Yonkers, NY	Metro 70cm Network / Otto Supliski, WB2SLQ, 53 Hayward St., Yonkers, NY 10704, 914-969-1053
Jan 19	Broadway, OH	Union County ARC / Gene Moore, N8YRF, 24461 Claibourne Rd., Marysville, OH 43040, 513-246-5943
Jan 19	Richmond, VA	Richmond Am Telecom Soc / Craig Spain, KE4CIT, PO Box 932, Chester, VA 23831, 804-526-9838
Jan 24-25	Kearney, NE	Midway ARC / Jerry Ramsey, W0PXD, PO Box 1231, Kearney, NE 68848, 308-237-7539
Jan 25	St. Charles, MO	St. Louis Repeater / James E. Welby, WB0ZJW, 6059 Sutherland, St. Louis, MO 63109, 314-353-2000
Jan 25	Albuquerque, NM	Albuquerque Winter Tailgate / Tom Ellis, WD5JMA, 505-291-8122
Jan 25	Gallatin, TN	Tennessee Valley AR Net / Bill Ferrell, N4SSB, 1253 Woodvale Dr., Gallatin, TN 37066, 615-230-7923
Jan 26	Villa Park, IL	Wheaton Community RA / WCRA, PO Box QSL, Wheaton, IL 60189, 630-545-9950
Jan 26	Odenton, MD	Maryland Mobileers ARC / Jim Botluk, KD3SI, 10 Tiburon Ct., Annapolis, MD 21403, 410-280-9815
Jan 26	Dover, OH	Tusco ARC / Howard Blind, KD8KF, 6288 Echo Lake Rd. NE, New Philadelphia, OH 44663, 330-364-5258
Feb 1	Amarillo, TX	Potter/Randall ARES/RACES / Ben Pollard, WS5R, PO Box 5378, Amarillo, TX, 79117 806-381-8810
Feb 1-2	Miami, FL	SE Div Conv / Evelyn Gauzens, W4WYR, 2780 NW 3rd St., Miami, FL 33125, 305-642-4139, Fax: 305-642-1648
Feb 1-2	Jackson, MS	Mississippi State / Travis Cliett, AB5ZE, 117 Beechtree Lane, Florence, MS 39073, 601-939-9236
Feb 2	Livermore, CA	Livermore ARK / Noel Anklam, KC6QZK, 474 Humboldt Way, Livermore, CA 94550, 510-447-3857
Feb 8	LaCygne, KS	Mine Creek ARC / Bill VanKirk, AA0CP, PO Box 83, Mound City, KS 66056, 913-795-2080
Feb 8	Blaine, MN	Robbinsdale ARC / Susan Baker, N0JND, 5300 Three Points Blvd., Mound, MN 55364-1124, 612-537-1722
Feb 8	North Charleston, SC	Charleston ARS , Jenny Myers, WA4NGV, 2630 Dellwood Ave., North Charleston, SC, 29405-6814, 803-747-2324
Feb 9	Mansfield, OH	InterCity ARC, Mansfield Emergency Rptr. / Pat Ackerman, N8YOB, 63 North Illinois Ave., Mansfield, OH 44905, 419-589-7133
Feb 9	Latrobe, PA	Chestnut Ridge ARC / Bill Demosky, K3AFS, 1740 Raymond Ave., Latrobe, PA 15650-3039, 412-539-1552
Feb 14-16	Orlando, FL	No Fla Section / Orlando ARC, John Lenkerd, W4DNU, 1046 Turner Rd., Winter Park, FL 32789, 407-645-2026
Feb 15	Oberlin, PA	Harrisburg RAC / Tom Hale, WU3X, PO Box 418, Halifax, PA 17032, 717-232-6087
Feb 15	Smithville, TX	Bastrop County ARC / Charlie Claiborne, N5JWP, RR 1, Box 32A, Smithville, TX 78957, 512-360-3670
Feb 16	Brighton, CO	Aurora Rptr Assoc / Janice Chistopherson KA7TYU, 4376 S. Argonne Way, Aurora, CO 80015, (303) 403-1883 or cknauer@skywarn.org (Chris Knauer KB9CCR). Location: Adams Co Fairgrounds, 9755 Henderson Road, 8:30am-2pm.

Send anouncements of events or club information to: Editor, Monitoring Times, P.O. Box 98, Brasstown, NC 28902-0098. Fax 704-837-2216; e-mail mteditor@grove.net. See MT's homepage on **www.grove.net** for complete listings.

CLUB CIRCUIT

North American Club Listings W-C

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). Worldwide. All bands with emphasis on SW. *Contact.* $22 overseas airmail. Meets every 6 weeks in Reading, UK.

Worldwide TV/FM DXers Association (WTFDA): P.O. Box 17333, Asheville, NC 28816 <www.users.sccoast.net/daustin/wtfda.html> Worldwide membership; TV DX, FM BC, VHF utilities. *VHF-UHF Digest.* Annual convention. $24 annual in U.S. $2 for sample.

Worldwide Ute News: Rick Baker, ae411@yfn.ysu.edu for info - worldwide membership; non-broadcast under 30 MHz. Free electronic newsletter WUNNEWS, join by sending e-mail to majordomo@grove.net with following in e-mail message: "subscribe wun." Through World Wide Web: http://www.leonardo.net/berri/wun. For paper version: $18/yr to Tim Braun, PO Box 16533, Washington, D.C. 20041-6533. Sample $1.50.

All Ohio Scanner Club: Dave Marshall, 20 Philip Drive, New Carlisle, OH 45344-9108. U.S. northeast of the Mississippi; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram.* $18 U.S, $21 Can/Mex, $28 ww. $3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685; wdx6aa@aol.com. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine.*SWL.*$24 US, $25 Can/Mex. $2 sample ($3 ww). Meets1st Sats 10am address above.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* $20 US, US$21 Can/Mex, US$27 ww.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF. Meets monthly. $2.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. $25 US, $2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, The Lexington Club, Rte 4/225 1/4 mi W of Rte 128.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park., Quebec, Canada J4V 3B1, (514) 462-1459, fax (514) 671-3775. Canada nationwide/membership open to all; General coverage. *The Messenger.* $28 Can, $25 US, $US30 or $Can38 ww. $2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) *Capitol Hill Monitor.* $10. Meets irregularly.

Central Florida Listeners Group: Mike Twyford KE4ORR, 207 Hill St, Casselberry, FL 32707-3424; (407)695- 6529, e-mail <mikiefl@concentric.net. Central Florida; All bands. Net on 146.820 MHz Sun 8 pm. Conf#10 on Laser BBS (407)647-0031 or Bullwinkle's Corner BBS (407) 896-5772.

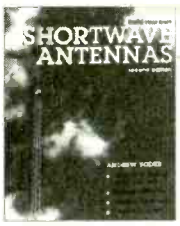
Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities.*

5 BOOKS FOR ONLY $4.95

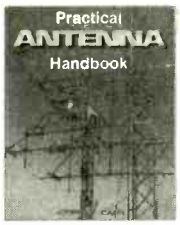
WHEN YOU JOIN THE **Electronics Book Club®**

VALUES TO $124.80

The leading source of information for electronics hobbyists for over 30 years!

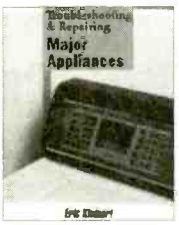


0765340 $16.95



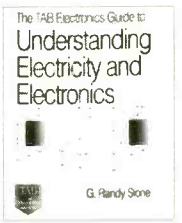
0111049-XX $49.95
Counts as 2/Hardcover

0339635 $24.95
Hardcover

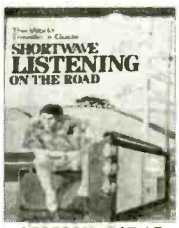


0350787 $44.95

0487375 $24.95



0582157 $26.95



076509X $17.95

0707618 $19.95

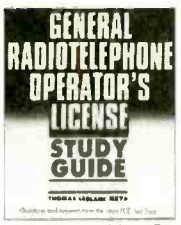
0449902X $19.95

0365946 $22.95

5869500 $19.95

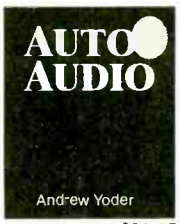
5870789 $11.95

033045X-XX $65.00
Counts as 2/Hardcover



0369364 $29.95
Hardcover

0235996-XX $32.95
Counts as 2



0765359-XX $32.95
Counts as 2/Hardcover

If coupon is missing, write to: Electronics Book Club. A Division of The McGraw-Hill Companies, P.O. Box 549, Blacklick, OH 43004-9918

As a member of the ELECTRONICS BOOK CLUB...
you'll enjoy receiving Club bulletins every 3-4 weeks containing exciting offers on the latest books in the field at savings of up to 50% off the regular publishers' prices. If you want the Main selection, do nothing and it will be shipped automatically. If you want another book, or no books at all, simply return the reply form to us by the date specified. You'll have at least 10 days to decide. If you ever receive a book you don't want due to late delivery of the bulletin, you can return it at our expense. Your only obligation is to purchase 3 more books during the next 12 months, after which you may cancel your membership at any time. And you'll be eligible for FREE BOOKS through our Bonus Book Program.

☎ PHONE: 1-614-759-3666
(8:30 a.m. to 5:00 p.m. EST Monday-Friday)

FAX:1-614-759-3749
(24 hours a day, 7 days a week)

Electronics Book Club®

A Division of The McGraw-Hill Companies, P.O. Box 549, Blacklick, OH 43004-9918

YES! Please send me the books listed below, billing me just $4.95, plus shipping/handling & tax. Enroll me as a member of the Electronics Book Club according to the terms outlined in this ad. If not satisfied, I may return the books without obligation and have my membership cancelled.

If you select a book that counts as 2 choices, write the book number in one box and XX in the next.
If you select a book that counts as 3 choices, write the book number in one box and XXX in the next two boxes.

Name_____

Address/Apt. #_____

City/State_____

Zip_____ Phone_____

Valid for new members only, subject to acceptance by EBC. Canada must remit in U.S. funds drawn on U.S. banks. Applicant outside the U.S. and Canada will receive special ordering instructions. A shipping/handling charge & sales tax will be added to all orders. MT197

A shipping/handling charge and sales tax will be added to all orders. All books are softcover unless otherwise noted. (Publishers' Prices Shown) © 1997 EBC

WHAT'S NEW?

PRODUCTS AND BOOKS OF INTEREST TO THE RADIO HOBBYIST

by Larry Miller

Guest Reviewers: Bob Grove, Jim Frimmel

Radio Kits

There was a time not so long ago when the world was very different, especially for kids. Back in those days, one of the most marvelous discoveries was radio. More than one wide-eyed boy (or girl!) awoke Christmas morning to find a long-awaited crystal radio kit under the tree. An intriguing gadget, crystal radios amazingly draw voices from out of thin air, using little more than what appear to be pieces of wire and a tiny germanium crystal.

The sense of awe that these little devices produced has, regrettably, been long lost on a society that weans its children on an endless stream of televised hyper-activity. Yet these same little, magical radios are still able to instill wonder in all but the most hardened child or adult—if someone will but take the time to show them.

Build someone you love a crystal radio kit this year. Make it a priority to share with them that same fun and amazement that you experienced the first time you sat before a radio and spun across the dial. Grove Enterprises is offering several radio kits this year.

There is the traditional crystal radio kit—no battery required!—that's easy enough for anyone to build. It's just $6.95 plus $5 UPS.

An AM/VHF model covers 520-1620 mediumwave (AM broadcast band). It's just $12.95 plus $6 shipping.

Finally, you can build your own shortwave radio—no soldering required—for just $12.95. Shipping, here, is also only $6. Very affordable, ¿no?

To order, call Grove at 800-438-8155 or write to Box 98, Brasstown, NC 28902.

Blast from the Past

Whether you are looking for a conversation piece, a coffee table reference, or a superb photo biography of broadcasting, look no further. *Blast from the Past - A Pictorial History of Radio's First 75 Years*, by B. Eric Rhoads, is a lavish chronicle which features nearly 1000 photographs of the events, the personalities, and the equipment that established radio as an historic phenomenon that shaped the news media, built empires, and changed the destinies of personalities and potentates.

A radio archivist, Rhoads leads us through the formative years, with the likes of Marconi, Tesla, Sarnoff, Edison, KDKA, and De Forest. Dozens of crisp photos take us on a nostalgic trip through this yesteryear of radio's beginnings. Orson Welles, George Burns, Eddie Cantor, Singin' Sam the Barbasol Man, Morton Downey, Major Bowes, One Man's Family, Archie's Tavern, The American School of the Air, Spike Jones, Jack Benny—the

names, the programs, and the memories, are endless. And the photos are resplendent.

Radio's First 75 Years is only $39.95 from Grove Enterprises, PO Box 98, Brasstown, NC 28902; order toll-free, (800) 438-8155.

— *BG*

Broadcast and Utes Combine

What's this? A new annual shortwave frequency guide?!

Despite going up against the industry giants—*Passport to World Band Radio* and *WRTVH*—German Joerg Klingenfuss has announced the publication of the 1997 *Shortwave Frequency Guide*. The *1997 Shortwave Frequency Guide* is the printed version of Klingenfuss' "Super Frequency List" on CD-ROM. (Klingenfuss, in an odd choice of words, boasts that the CD "already constitutes the international quasi-standard.")

In any case, the book is said to include all final 1997 clandestine, domestic, and international shortwave broadcast schedules worldwide, plus a complete guide to HF utility stations. Some listeners will appreciate the combination: Others feel that broadcast listening and utility monitoring are mutually exclusive. One shortwave listener noted dryly, "Now I'll know the call letters of that RTTY station that was interfering with what I want to hear."

Klingenfuss' main claim about this book is that it is more up-to-date than either *Passport* or the *WRTVH* and that it does not contain advertisements.

If you'd like more information, you can visit Joerg's web site at **http://ourworld.compuserve.com/homepages/Klingenfuss/** or you can contact Universal Radio at 800-431-3939 and get your copy for $29.95 plus $2.00 shipping. Their address is 6830 Americana Pkwy, Reynolds-burg, OH 43068.

Police and More

Did you get your copy of the *1997 Police Call* yet? What are you waiting for?

The new 1997 edition, like last year's, is a combination of the popular *Police Call* (public safety) and the highly successful *Police Call Plus* (edited by *MT* scanner columnist Rich Barnett). In addition to the comprehensive police, fire, and emergency medical frequencies, you'll also find 18 additional categories of two-way radio users—everything from utility companies to sports and entertainment.

There's the usual consolidated frequency list, the listener's guide (by Gene Hughes), 17,000 radio codes and signals, the FCC frequency allocation tables, maps, and a glossary of slang.

This is edition #34, folks—a history of service and excellence unparalleled in the scanning industry.

Police Call is sold by selected electronics retailers like Grove Enterprises as well as the nationwide network of Radio Shack stores. The price remains a very affordable $12.95.

Lightning Speed for the 'R8500

If you have an ICOM R8500 receiver, you already know the meaning of the word, "professional." If not, take a look at this issue of *MT's* Scanning Equipment column for a complete rundown on this high-end beauty.

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Hwy 64 West, Brasstown, NC 28902 Press releases may be faxed to 704-837-2216 or e-mailed to mteditor@grove.net.

Hard as it is to believe, there's a way you can take the R8500 up another notch: Delta Research has introduced the I-8500 Communications Manager. This thing adds lightning to an already hot radio. According to the manufacturer, the I-8500 can log signal level, frequency, mode, date, time, and optional Global Positioning Satellite (GPS) coordinates to a disk file at speeds in excess of 2400 channels per minute.

Here are some of the other features:

CyberScan Control Group Diversion: scanning for frequency hopping systems.

Activity Log Function: automatically calculates and records total spectrum usage time.

Trunking System Activity Log: Automatically records when trunking frequencies are 100% loaded.

(Optional) Multi-Receiver Frequency Hand-Off: Allows control of up to 125 ICOM receivers!

The I-8500 is Internet friendly. Registered users will have instant access to the latest production version of the Deltacomm I-8500. Just log into Delta Research's home page and select "download."

There's much more. I suggest that you contact Delta Research for more information. Their homepage is **http://www.delta.com@execpc.com** or call them at 414-353-4567. Their mail address is P.O. Box 13677, Wauwatosa, WI 53213. Mention *MT* when you call!

Power for Your Radio

Cutting Edge Enterprises has added a little muscle to their line of back-up power supplies.

We continue to urge every radio hobbyist to consider some sort of battery back-up. If the power goes out during a storm or emergency, you're going to find that

the battery that's in your radio right now is not going to be enough. You'll be left high and dry at the very time when you really need your radio most.

The Powerport 149 provides 12 volts DC and 140 watts AC power with 9 amp hours of storage capacity. Despite its larger capacity, the Powerport 149 is still compact, measuring 4" x 4.5" x 6" and weighing in at only 9 pounds.

The '149 is built around a sturdy 12 volt, 9 amp hour, gel cell battery and comes with a fully automatic wall charger that allows you to keep the unit plugged in year 'round, keeping the '149 not only ready for use but charged up in prime condition.

The Powerport 149 is available for $159.95 plus $14.95 UPS shipping. You can get more information or order by calling 800-206-0115. Mention *MT* when you call.

Going Tubular

Svetlana Electron Devices, Inc., has announced development of four triode "tubes" designed for use in high-end audio amplifiers. The new triodes have graphite anodes rated at 125 watts dissipation and the manufacturer claims that in single-ended operation, they produce significant power output with excellent "sonic" characteristics.

The four triodes in the series are heated directly from thoriated tungsten filaments in the same tradition as the 845 and 211A, but the size and filament power is lower.

There are, of course, those audiophiles and lovers of old radios that claim that tube-generated audio sounds best. Few will disagree that radios operating with tubes look best and these tubes look great: cylindrical hard glass envelopes, white ceramic bases, and softly glowing graphite anodes.

Brings back the feel of another era, eh?

In any case, if you'd like more information, contact Svetlana at 3000 Alpine Road, Portola Valley, CA 94028 or call 415-233-0429. Svetlana's also on the Web at **http://svetlana.entelechy-inc.com/**

Suspend Your Radio

Every once in a while, we plug something that has nothing particular to do with radio. In this case, the product is suspenders... Wait, don't tune out: this is family.

Harry Baughn, husband to *MT* Editor Rachel Baughn, works for Industrial Opportunities Incorporated (IOI), a sheltered workshop that employs handicapped adults. They make suspenders which are

marketed to the hunting and fishing market, as well as to Wal-Mart and several sporting good chains.

Actually, it's only a slight stretch to sell these to the radio market. There you are, out and about with your old Bearcat 200 plus an assortment of other gear hanging from your belt, and you're faced with a choice: cinch the belt uncomfortably tight, or live in danger of losing your pants.

Unlike suspenders that clip to your pants, these suspenders are unique in that they hook over your belt. Are you a volunteer firefighter, carpenter, or handyman? Not only does the suspender hold up your pants but it also supports the weight of your belt if you have handhelds, carpentry tools, knives, and so forth suspended from your belt.

You can check out the patented Perry suspenders on the world wide web at **http://www.grove.net/~ioi** or order from Grove at 800-438-8155. They're just $11.95 to $13.95 a pair, depending on style and color, plus shipping. And you'll be doing something nice for the folks at IOI.

MT REVIEW

The Quantum Stick by Radio Plus+

By Bob Grove

This compact ferrite rod antenna, sturdily housed in a rugged aluminum enclosure, substantially improves medium wave (standard broadcast AM) reception without any connection to a portable radio. Just set it on top of the portable so that it is close to the internal loop antenna and carefully peak the signal on the Quantum Stick.

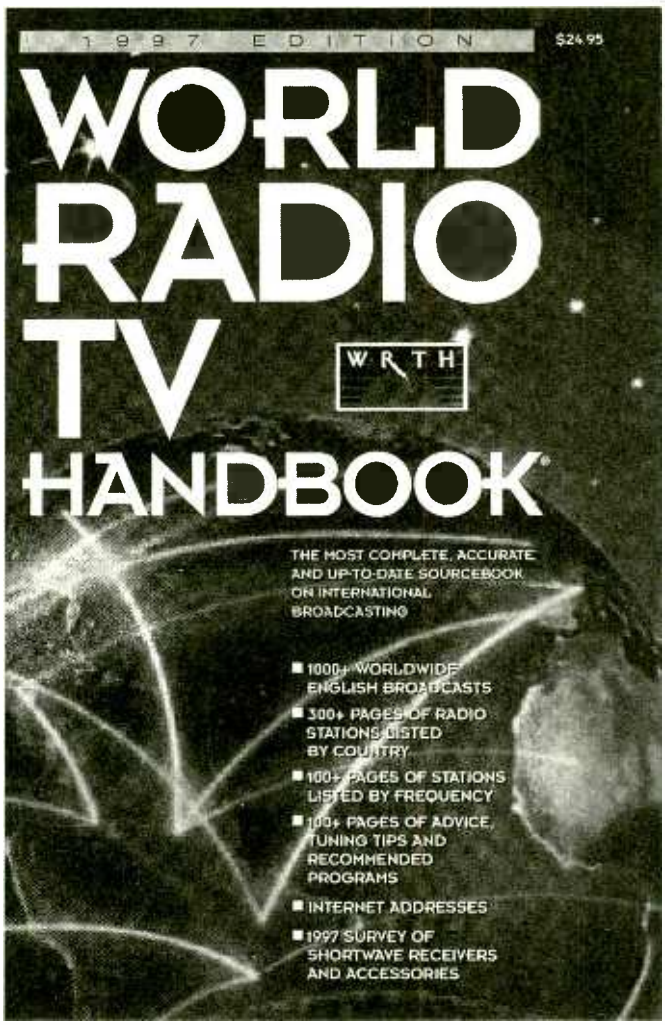
We tried it here at our offices and it worked very well; distant, weak stations came booming in when we tweaked the Q-Stick. The unit has a jack for direct connection to an external antenna as well, making mousey stations really roar! Useful for nulling out interfering stations as well.

Two models are available, the basic Q-Stick (medium wave only, $55) and the Q-Stick Plus+ (long wave and medium wave, $75); add $4 shipping. From Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504.

NEW!

World Radio TV Handbook 1997

The World Radio TV Handbook has been called the "authoritative reference for anyone seeking information on radio and television around the world" (Radio Australia). A must-have resource for radio novices and enthusiasts, it is the only complete annual to include the important winter broadcasting schedules. This feature sets this edition of the World Radio TV Handbook apart from all its competitors.



0-8230-7797-7. $24.95

Don't Miss These Features:

- details of stations on the long-, medium-, and short-wave bands, with contact information;
- mailing addresses, phone and fax numbers, senior personnel, and e-mail addresses;
- listings of medium-wave and shortwave broadcasts in frequency order;
- an hour-by-hour guide to 1,000 broadcasts in English;
- Internet addresses for international broadcasters;
- independent reviews of shortwave receivers and accessories;
- articles with detailed technical information, recommended programs, and tuning tips;
- a directory of international hobby clubs.

Available wherever books are sold, or call 1-800-451-1741

Get the Most Out of Your Radio

WRTH

Lawrence Magne
Editor-in-Chief, Passport to World Band Radio

Sharper Image VA100 Pocket Portable

With any product, you can always find something first-rate if you're willing to pay big bucks. But a fool and his money are soon parted, so the trick lies in finding value—that elusive intersection of what you're getting *versus* what you're paying.

For years, we have been trying to dig out real value among shortwave radios. We've found a few—especially in recent years. But even these good buys cost around $100 to $200.

■ Inexpensive and widely available

So it was with real interest that we came across a new $45 radio from the Sharper Image, a California mail-order firm that has stores worldwide. The way its catalog describes this radio—the "powerful" VA100—you can "hear late-breaking news direct from world capitals. And weather on the hiking trail or in your boat."

Some years back, this firm offered what it called the "Tunemaster." It was designed to look like a 1930s art deco radio, but inside was a solid-state receiver that covered the AM, FM, and shortwave bands. Thing is, it looked great, but its performance was just awful!

It took awhile, but they finally discontinued that model and started selling regular brands of shortwave portables, like Grundig. These are good radios, but the profit margins aren't likely to be as great as they would be on house-branded models.

Ergo, while we still find Grundig Yacht Boy 400 in the Sharper Image catalog, there's now also the VA100 house-brand offering. Ours VA100 turned out to be $57.19 by the time it was delivered, but that's still a lot less than $100 for a decent digital portable.

■ Nice size, good AM/FM coverage

The Sharper Image VA100 is pocket-sized, like a large pack of cigarettes. So it's really handy for taking along on trips. It's also nicely designed, and comes with stereo earpieces.

It covers AM all the way from about 520-1710 kHz, so it receives all the mediumwave frequencies that are used throughout the world. FM coverage is from 87-108 MHz—monaural through the speaker, but stereo through earpieces.

■ Weather to hear?

In the Sharper Image catalog description, it refers to the VA100 for hearing weather, which is interesting. As *MT* utility buffs know, in the United States, there is a coast-to-coast network of official 24-hour NOAA weather radio stations around 162 MHz. These give lots of details about regional weather, and also special alerts when dangerous weather is approaching. So when a radio is cited in this country specifically for its reception of weather, folks can't be blamed if they assume it is supposed to receive NOAA weather stations.

But it turns out this isn't so with the VA100. Presumably, Sharper Image means that you can hear weather from ordinary AM and FM radio stations' weather reports. (Except in the FM band, the VA100 only demodulates AM-mode signals, so it can't be used for shortwave utility weather services.) The VA100 as advertised is, to say the least, ambiguous.

■ Misses 22 meters and other bands

But, of course, the real reason you get a radio like this is for listening to shortwave broadcasts—world band radio. And, in fact, it does have shortwave coverage, but only of the 49, 41, 31, 25, 19 and 16 meter bands. It sails right over the 22 meter band as if it didn't even exist!

That 22 meter band was first laid out 17 years ago at the 1979 World Administrative Radio Conference, and it is fully legal and in operation. It's an important band anytime—but especially now, when we're in the trough of the 11-year sunspot cycle.

During the peak of that cycle, you can hear daytime stations on the really high bands, like 13 and even 11 meters, as well as the bands just below, like 16 and 19 meters. But by the low point in the cycle, reception drops by a band or two. So during the daytime, most stations are heard within the 25, 22, 19 and 16 meter bands. Indeed, during sunspot maximum—which is not all that many years away—22 meters tends to be an excellent evening band.

Of course, the VA100 also misses the tropical bands, plus the 13, 11 and 75 meter international shortwave broadcasting bands. Within the bands it includes, the frequency coverage is generally adequate, although the lowest ends of 49 and 31 meters are cut short.

■ The little antenna that can't

The first thing you do when you turn on a radio like this is to pull up the telescopic antenna. Unfortunately, on the VA100 that antenna, like a knee in a cast, doesn't even swivel, much less rotate.

With shortwave, a telescopic antenna works best if it's more or less vertical. This means that for best reception you have to leave the VA100 set upright on its tipsy little bottom, waiting for the least disturbance to send it, and the antenna, crashing down. You can't just lay the radio, like a turtle, on its back, as you can most other shortwave portables, or else the antenna will lie flat on the table, and reception is likely to suffer.

This is carrying cost-cutting to ridiculous extremes. We've come across lots of portables costing less than this one, and nearly all have antennas that swivel. Some even rotate.

Switch on the VA100, and whatever hopes you may have harbored about this radio are immediately dashed. To begin with, the itsy speaker sounds tinny and is tiring to listen to for extended periods of time. You'll notice that people who have these tiny radios for the first time will tell you how, no, that's really good, crisp audio, and they like it. "It really works well for something so little," they'll assure you. But come back a few months later, and what are they doing with the radio?

Point is, once the novelty wears off, that

kind of tinny sound is just too much for most people. But for occasional use on travels, it's acceptable.

When you tune the VA100 on shortwave, some major stations, out in the clear, come in nicely. But most come in mixed with howls worthy of Lon Chaney at full moon, plus modulation splash from adjacent channels—not to mention dih-dah and other image interference from utility stations operating 900 kHz higher. Weak-signal sensitivity is less than sterling, as well.

However, the tuning arrangement, which includes a slide-rule analog bandspread, is quite stable. There's no apparent drift, or at least there wasn't on our radio.

If $90 or $100 is too much to spend on a shortwave portable, especially if you're afraid it will be stolen, then the best bet is to get a cheap analog compact portable manufactured in China. These sell under a wide variety of ever-changing names all over the world—usually for the equivalent of $10 to $50. But $25 to $40 is typical in the United States, and that's about what they're worth. Most of these don't tune the 22 meter band, either, but a few do. If you can find one that does and which sounds good to your ears, you've done pretty well for what amounts to small change.

Because many compact analog portables have decent-sized speakers and are really cheap, they're much better values than tinny-sounding pocket radios like Sharper Image's VA100. Of course, if you can step up a notch, there are a few exceptional digital compact portables from Sony, Grundig, and Radio Shack in the $90-130 price range. These absolutely run circles around any cheap analog portable.

While the Sharper Image VA100 suffices for occasional use on trips, it's hard to imagine anybody—least of all somebody who thinks enough of shortwave to subscribe to *MT*—will find its performance to be anything short of disappointing, even as a throwaway. If you're a Sharper Image fan, forego this "bargain," and spring for the $199.95 Grundig Yacht Boy 400 they also sell. Yes, it's four times as much, but it is to the VA100 what a Honda Civic is to a go-cart.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

Bob Parnass, AJ9S

The ICOM R8500 Receiver

The R8500 is ICOM's latest wide coverage, high end receiver. Priced about $2000, it is in the same class as the AOR AR5000 receiver we tested last month. Bob Grove provided an R8500 overview and comparison with the AR5000 in November *MT*.

The R8500 tunes 100 kHz to 2000 MHz, somewhat less coverage than the 10 kHz to 2600 MHz range of the AR5000. We tested R8500 serial number 01075, the European version which includes cellular phone band coverage and cannot be marketed in the USA.

Memory Organization

Initially, the R8500's 1000 channels are partitioned into 20 banks of 40 channels each, a 100 channel skip bank (used to store frequencies to ignore during searches) and a 100 channel auto bank for automatic storage of frequencies found active during an auto search operation. Users can increase or decrease the number of channels in each bank by reallocating channels to and from a free pool. We discovered that the size of the skip and auto banks can be adjusted, too—a bonus not mentioned in the instruction manual.

Each memory channel has associated skip (lockout) and select flags, used during scanning operations. An eight character text label may be programmed for each memory channel, and a five character label for each bank. The EEPROM memory makes battery backup unnecessary.

Scanning and Searching

The R8500 boasts several ways to scan. The conventional memory scan allows one or all banks to be scanned. A select scan scans memory channels with the select flag set. A skip feature ignores channels flagged with the skip designation. All of the scans ignore blank memory channels without wasting time.

The 1986 vintage R7000 lacks a rescan delay. Both the R8500 and 1992 R7100A provide a global rescan delay, but it cannot be disabled, making it very difficult to scan trunked radio systems. One can halt the scan or search, pause for an adjustable period on an active frequency, or wait a minimum of 3 seconds after the transmission ends to resume. The AR5000's rescan delay is selectable on a per-channel basis—a more useful implementation.

The R8500, like the R7100A, supports 10 pairs of search limits. Step size and mode can be associated with each limit pair. Several step increments from 10 Hz through 1 MHz are provided as standard and one programmable step of 0.5-199.5 kHz. The step sizes were fixed in the earlier R7100A, which would coerce the frequency to the nearest integral multiple of the step size, making it impossible to search interstitial channels in 25 kHz steps (e.g., 460.0125, 460.0375, ... MHz).

Both the R8500 and AR5000 are more flexible and permit searching odd frequencies in 25 kHz steps. The setup procedure for doing this in the AR5000 is somewhat complicated and involves programming an "offset number." The trick to doing it in the R8500 is to program a custom offset of 25 kHz, even though the R8500 already has a 25 kHz step selection built in. The use of a custom offset overrides the frequency round-off, and that's good.

Auto store search stores 100 or more unique, active frequencies in memory. The R8500 waits on active frequencies until the transmission stops before storing the frequency in memory, so you can hear the action.

The AR5000, R7000, R7100, and R8500 search better than they scan because of noisy electromechanical relays which are activated when tuning across band boundaries (Table 1). You will be serenaded by an annoying clickety-clack of relays when scanning a mixture of VHF-high band and 860 MHz frequencies, for instance.

TABLE 1. FREQUENCY BOUNDARIES (IN MHZ) AT WHICH INTERNAL RELAYS ARE ACTIVATED

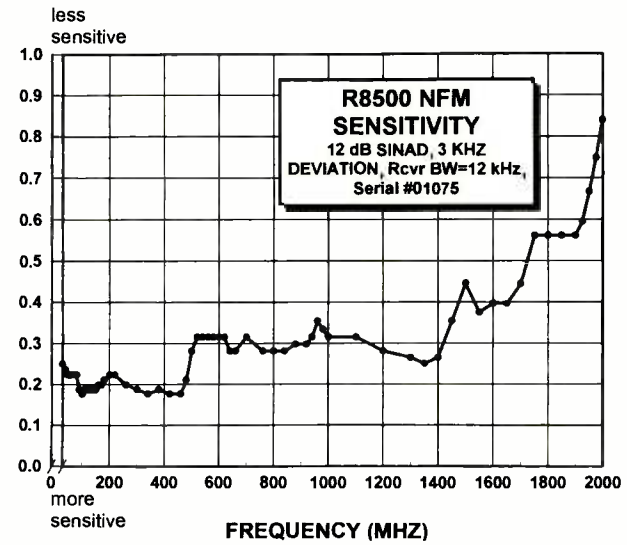
R7100	512	1025	1512	
R8500	500	1025	1200	
AR5000	40	400	1000	1600

Innards

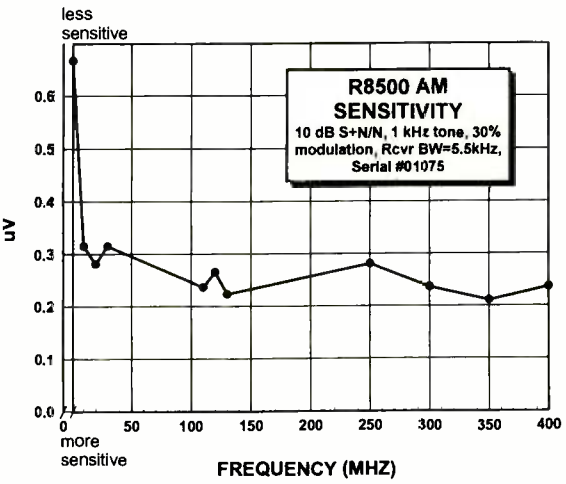
R8500 construction is impressive. A rugged, cast aluminum chassis is used to hold and shield the various circuit boards. There are additional shielded compartments on the boards, too. Good grounding and shielding are required to prevent a receiver from "hearing" its own circuitry, resulting in birdies.

Our R8500 remains cool while its external 13 VDC AD-55A power supply runs warm. The large padded tuning knob and rubber keys exude quality and are easy to operate, though some functions are selected by successive key presses. The yellow backlit LCD display has excellent contrast, making it much easier to read than the AR5000 display.

Triple conversion circuitry is used in the R8500, with a first IF of 48.8, 778.7, or 266.7 MHz, depending on band. The second and third IFs are 10.7 and 0.455 MHz. A wideband downconverter allows reception above 1025 MHz.



A 10.7 MHz IF output is included for connection to accessories like a panadaptor, but its 10 MHz wide bandwidth is trimmed to just a few kHz when tuning below 30 MHz. Another jack provides either AGC signal output or baseband audio.



While connected to a signal generator, our AR5000 provides more uniform sensitivity in the 1400-2000 MHz range than our R8500 (see graphs), but we notice more birdies using the AR5000. Also, there is a distracting 200 ms noise burst after each NFM transmission on our AR5000, versus a 50 ms noise burst on the R8500.

Bob Grove tested a different R8500 in the vicinity of a strong FM broadcast station which produced a whopping S9+40 dB S-meter reading. Bob was able to receive the second harmonic on his R8500. The strongest FM broadcast station in our rural-becoming-suburban area registers only S9+10 dB. Its second harmonic falls on an active television frequency, and we hear a heterodyne underneath the TV signal.

We used a signal generator and made measurements on seven fundamental frequencies between 60 and 200 MHz to test our R8500's ability to reject 2nd harmonics in the 120-400 MHz range. We repeated the same measurements using an R7100A, and the two receivers measured almost identically.

The R7100A and R8500 employ four similar bandpass filters in the front end to span the 30-1025 MHz region (compared with seven filters in the robust Radio Shack PRO-2006). One of the filters covers the 90-250 MHz range, so a commercial FM broadcast and its second harmonic would fall within the bandpass of the same filter. Normally, this shouldn't be a problem unless you live very close to a strong station. With a few exceptions, our R7100A, R8500, and AR5000 don't suffer from intermod.

The R8500 offers IF shift and an audio peak filter, useful for shortwave monitoring. Neither the R8500 nor AR5000 have a synchronous detector, favored by shortwave broadcast fans. The Japan Radio NRD-535D is better suited for shortwave utility listening under severe conditions due to its passband tuning, continuously variable bandwidth and IF notch filter.

Wrap-up

Our AR5000 and R8500 perform proficiently and we recommend them both. A $2000 receiver should include a 30 kHz bandwidth setting and defeatable rescan delay, selectable on a per channel basis. These capabilities are present in the AR5000 but missing from the R8500. The AR5000 is more flexible and includes several valuable features, like independent mode and IF and AF bandwidth settings, repeater offset memories, built-in DTMF display, and can be fitted with an optional CTCSS decoder. The R8500 is much easier to use than the AR5000 and has adjustable channel bank size .

ICOM R7100A owners might wonder if they should trade "up" to an R8500. The heftier R8500 offers similar performance, with the addition of shortwave coverage, smaller and more flexible channel banks, more step sizes, alpha labels, and a DB25 RS232 computer interface.

TABLE 2. R8500 MEASUREMENTS

Measurements, R8500 S/N 01075

MDS (Minimum Discernible Signal),
CW mode, 2.2 kHz bandwidth, fast AGC:
-132 dBm (.05 uV)
measured at approx. 10, 20, and 30 MHz
-125.5 dBm (.12 uV)
measured at approx. 1 MHz
Sensitivity, SSB/CW,
10 dB S+N/N, 2.2 kHz bandwidth:
0.42 uV @ 1 MHz
0.15 uV @ 10 MHz
0.13 uV @ 20 MHz
0.17 uV @ 30 MHz
Sensitivity, AM,
5.5 kHz bandwidth, 10 dB S+N/N,
1 kHz tone modulated 30%:
better than 0.4 uV,
10 - 400 MHz (see graph).
Sensitivity, FM,
12 dB SINAD, 12 kHz bandwidth:
better than 0.45 uV, 30 - 1500 MHz
reduced sensitivity 1500 - 2000 MHz
(see graph).
FM Modulation Acceptance:
10 kHz @ 12 kHz bandwidth
4.8 kHz @ 5.5 kHz bandwidth
Audio output:
1.9 watts @ 10% distortion into 8 ohms
Search rate (adjustable):
40 steps/sec. at fastest setting
Scan rate (adjustable):
40 channels/sec. at fastest setting

Clem Small, KR6A, CET

Prehistoric Radio!

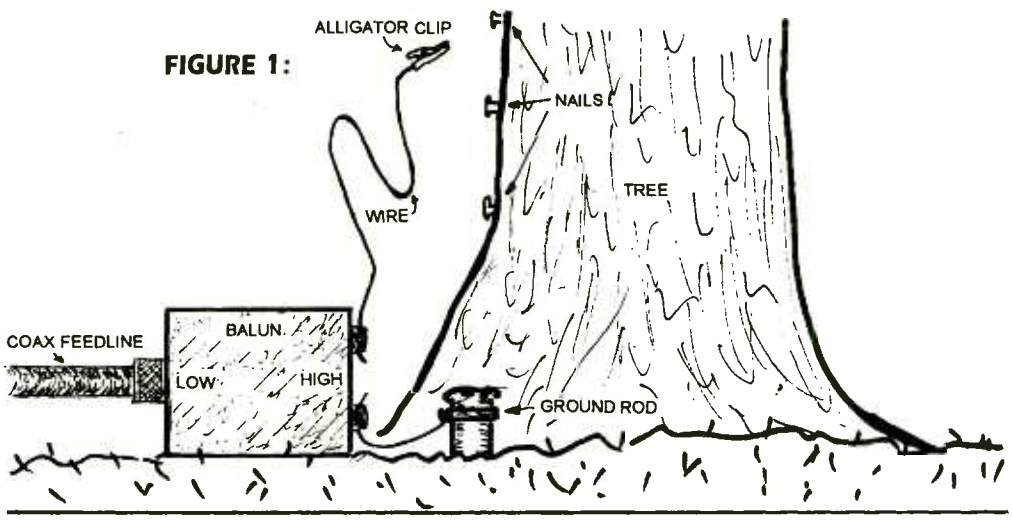
If you've been following the "Below 500 kHz" column, you know that natural phenomena right here on earth have been producing, transmitting, and receiving radio signals since time began. Lightning bolts, and some other mighty reactions in nature, produce great amounts of electromagnetic radiation in the light, heat, and the radio portions of the electromagnetic-wave spectrum. Lightning discharges from tropical storms in particular are continually producing wide-band radio waves that propagate worldwide. You receive these signals as bothersome static noise on the LF, MF, and on HF bands.

Weak-signal operators who do moon-bounce work are only too well acquainted with the radio signals which our own sun transmits. These noisy signals can totally mask over moon-bounce signals when the sun and moon are both in the same direction from moon-bouncer's antenna. Radio waves known as "cosmic noise" are continually bombarding our antennas with radio signals generated by natural reactions occurring in galactic space. As a matter of fact, the discovery that the source of this particular radio noise lay outside our solar system marked the beginning of radio astronomy. In radio astronomy, naturally occurring radio signals from space are studied in an attempt to learn more about the cosmos.

OK, so there were radio signals before we were around to know about it, but what about the reception of those waves? Who received those signals? No person received them, but they were received by every naturally-occurring conductor to which they propagated. And, once trees evolved, they provided natural, grounded-vertical Marconi antennas to receive these waves.

Well, but where was the receiver for those antennas? The resistance of the tree's "body" was the "receiver." This resistance dissipated much of the received energy as heat rather than as sound, like the loudspeaker does in our HF receivers.

Of course, natural transmission and reception still goes on today. Have you asked the trees near your home if they have received any RF signals lately? I have. And the trees which I asked told me that they receive lots of signals—and I haven't gone off my rocker! They receive lightning-generated signals just as they have since time immemorial, and they also receive the signals which man puts onto the airwaves today.



Connecting a feedline to a tree antenna. Nail small, thort, thin nails into the tree about every two or three feet, up to 10 or 15 feet high. Connect the clip to the various nails until best results are achieved. The balun is a 4:1 ratio or higher, high side to the tree.

How did I ask the trees? It's simple. I just connected a feedline to a tree, and connected the line to my receiver. I received a multitude of signals across the LF, MF, and HF bands. If I had tried other bands I would have, no doubt, received signals on those bands, too. As a matter of fact, a tall, live tree makes a decent LF-MF-HF antenna.

■ Tree-Antennas Throughout Radio's History

Old time radio expert Squires reported using trees as receiving aerials for distances of 50 kilometers. His method was to hammer a nail into the tree a few yards above the ground, and connect the receiver's antenna input connectors to the nail and to a ground.

Texanna Loomis, daughter of wireless communication pioneer Mahlon Loomis, says in her *Radio Theory and Operating* that "It has been found that a tree can be used for a receiving antenna, preferably an oak, by attaching a lead-in wire to the trunk of the tree."

Another old-time radio expert named Morecroft felt that reception came from the lead-in wire, rather than the tree itself. In my own tests I can't agree with Morecroft, because my lead-in was shielded, grounded coax, the attachment connectors to the tree were short, and the antenna performed much more like a long antenna than a short stub.

In more recent times there have also been reports of tree antennas. Cohen, in the April 1996 issue of *73 Magazine*, reports using a tree antenna on VHF and UHF with "mediocre-to-good results," but no acceptable results for lower bands. Perhaps his use of trees only 20 feet tall limited their performance on lower bands.

Also in *73* (May 1990), JA6HW and JA6AUI report using a 12 foot high tree for both transmitting and receiving on the 10 meter band with good results. Their article also says that hams used live-tree antennas in the 1930's, as did the U. S. Forces in Vietnam. In *Monitoring Times*, April 1989, Dr. Kosta reports that trees "frequently work better than conventional antennas" for television reception. In the September 1990 issue of *Monitoring Times* yours truly reports good results with a tall maple tree on LF through HF.

■ Tapping into Natural Radio

Figure 1 shows suggestions on utilizing a tree as an antenna. For HF, I suggest using the tallest tree available. Perhaps shorter trees would be better for VHF-UHF as in the 1990 *73* article discussed above—or perhaps not. As with any outside antenna it is wise to utilize some form of lightning protection.

RADIO RIDDLES

■ Last month:

I said, "Let's say that we could stain some radio waves, frozen at one moment in time, with some kind of dye so that we could actually see them. Of course we can't do this, except in our imagination. But if we did, how would the waves appear to us?"

For the area occupied by the waves at any one instant in time we would be trying to visualize the variations in the signal's electrical-field strength, and the reversals in field orientation (showing when the RF current changes direction of flow twice each cycle). This wouldn't look like a wavy line, or a sine wave graph as is represented in most texts on radio.

One way to imagine seeing the frozen waves is to envision that the space which the radio waves fill will show a darker shade of gray where their field strength is more intense, and a lighter shade where their field strength is weaker. For simplicity, let's consider only direct-wave propagation with no reflections or other impediments to the wave's travel between the transmitting antenna and receiving antenna.

In the space between the two antennas we would see bands of differing shades of gray oriented at right angles to the wave's direction of travel. There would be darker bands, less dark bands just next, even less dark bands next till a relatively light shade of gray was reached. Then somewhat darker bands, then even darker bands, and on to produce a sort of zebra-skin look. The darkest bands would be a half wavelength apart as would the lightest ones.

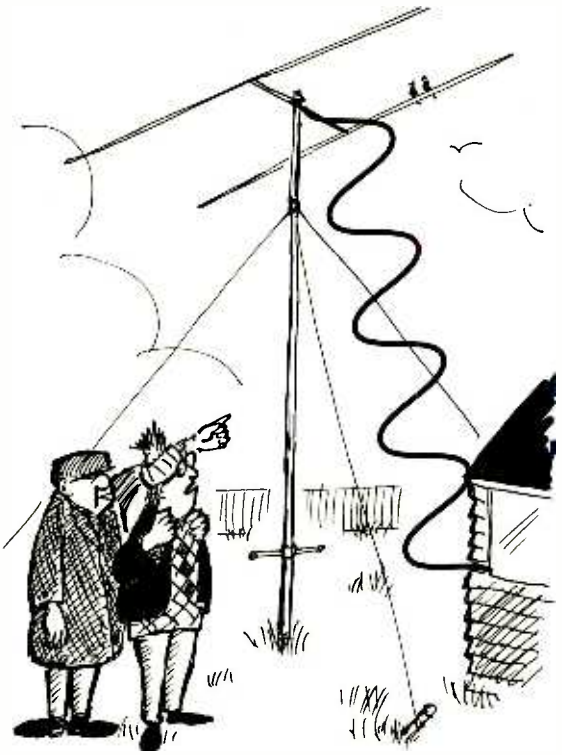
If we added a green tinge to our gray to indicate one orientation of the electrical field, and a red tinge for the field's other orientation then, starting at the middle of a darker band there would be greenish gray for a half wavelength along the direction of wave travel, a reddish gray for the next half wavelength, and so on.

Of course this picture is an over-simplification. For instance, we haven't talked about the wave's magnetic field, the polarization of the wave, or the spherical shape of the wavefront. But this simplified picture does cover the basic idea of radio waves in space.

■ This Month:

Let's say that, instead of freezing the waves, we had the advanced eyes and brains of some specialized android so that we could actually watch radio waves zip along on their 186,000 miles per hour flight from the transmitting antenna to our receiving antenna? How would those rascals look then?

You'll find an answer for this month's riddle, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.



"You know, I thought those were classic standing radio waves until I read Clem Small's column this month. Now, I don't know what the heck they are!"

Bob Evans
revans@astrol.magic.ca

GMDSS—
Global Maritime Distress and Safety System

Since the invention of radio at the end of the 19th century, ships at sea have relied on Morse code—invented by Samuel Morse and first used in 1844—for distress and safety telecommunications.

The need for ship and coast radio stations to have and use radiotelegraph equipment, and to listen to a common radio frequency for Morse encoded distress calls, was recognized after the sinking of the liner *Titanic* in the North Atlantic in 1912. The U.S. Congress enacted legislation soon after, requiring U.S. ships to use Morse code radiotelegraph equipment for distress calls. The International Telecommunications Union (ITU), now a United Nations agency, followed suit for ships of all nations.

Morse encoded distress calling has saved thousands of lives since its inception almost a century ago, but its use requires skilled radio operators spending many hours listening to the radio distress frequency. Its range on the medium frequency (MF) distress band (500 kHz) is limited, and the amount of traffic Morse signals can carry is also limited.

Over fifteen years ago the International Maritime Organization (IMO), a United Nations agency specializing in safety of shipping and preventing ships from polluting the seas, began looking at ways of improving maritime distress and safety communications. In 1979, a group of experts drafted the International Convention on Maritime Search and Rescue, which called for development of a global search and rescue plan. This group also passed a resolution calling for development by IMO of a Global Maritime Distress and Safety System (GMDSS) to provide the communication support needed to implement the search and rescue plan.

This new system, which the world's maritime nations, including the United States, are implementing, is based upon a combination of satellite and terrestrial radio services, and has changed international distress communications from being primarily ship-to-ship based to ship-to-shore (Rescue Coordination Center) based. It spelled the end of Morse code communications for all but a few users, such as amateur radio.

The GMDSS provides for a distress system which automatically sends the alert and provides location information, in situations where a radio operator might not have time to send an SOS or MAYDAY call, and, for the first time, it requires ships to receive broadcasts of maritime safety information which could prevent a distress from happening in the first place.

The GMDSS consists of several systems, some of which are new, but many of which have been in operation for many years. The system will be able to reliably perform the following functions: alerting (including position determination of the unit in distress), search and rescue coordination, locating (homing), maritime safety information broadcasts, general communications, and bridge-to-bridge communications. Specific radio carriage requirements depend upon the ship's area of operation, rather than its tonnage.

The system also provides redundant means of distress alerting, and emergency sources of power. The GMDSS consists of many separate systems which are being implemented in a coordinated and agreed-upon manner.

COSPAS-SARSAT

COSPAS-SARSAT is an international, satellite-based search and rescue system, established by Canada, France, the United States, and Russia. These four countries jointly helped develop a 406 MHz satellite emergency position-indicating radiobeacon (EPIRB), an element of the GMDSS designed to operate with COSPAS-SARSAT system. These automatically-activated EPIRBs, now required on SOLAS ships, commercial fishing vessels, and other ships, are designed to transmit to a rescue coordination center the vessel identification and exact location from anywhere in the world.

NAVTEX

NAVTEX is an international, automated system for instantly distributing maritime navigational warnings, weather forecasts and warnings, search and rescue notices, and similar information to ships. A small, low-cost, and self-contained "smart" printing radio receiver installed in the pilot house checks each incoming message to see if it has been received during an earlier transmission, or if it is of a category of no interest to the ship's master. If it is a new and wanted message, it is printed on a roll of adding-machine size paper; if not, the message is ignored.

A new ship coming into the area will receive many previously-broadcast messages for the first time; ships already in the area which already received the message won't receive it again. No person needs to be present during a broadcast to receive this vital information.

INMARSAT

Satellite systems operated by the International Mobile Satellite Organization (INMARSAT) are another important element of the GMDSS. Not only will the INMARSAT-A telex and telephone terminal be recognized by the GMDSS, but two new systems have been included as well.

The first is INMARSAT's SafetyNET service, a satellite-based worldwide maritime safety information broadcast service of high seas weather warnings, NAVAREA navigational warnings, radionavigation warnings, ice reports and warnings generated by the USCG-conducted International Ice Patrol, and other similar information not provided by NAVTEX. SafetyNET works similarly to NAVTEX in areas outside NAVTEX coverage.

The second system is INMARSAT-C, a low-cost telex and data telecommunication service now operational through U.S. and other coast earth stations. Both equipment costs and antenna size are much less than for INMARSAT-A.

Inmarsat also offers an EPIRB system similar to that offered by COSPAS-SARSAT. INMARSAT-C should have an integral satellite navigation receiver, or be externally connected to a satellite navigation receiver. That connection will ensure accurate location information is sent to a rescue coordination center if a distress alert is transmitted.

High Frequency

As a result of the GMDSS, the Coast Guard has begun to improve high frequency (HF) ship-shore radio safety services from communication stations to the maritime community,

as well as broadcasts of high seas maritime safety information over HF telex.

Search and Rescue Radar Transponders (SARTs)

The GMDSS installation on ships include one or more search and rescue radar transponders, devices which are used to locate survival craft or distressed vessels by creating a series of dots on a rescuing ship's 3 cm radar display.

Digital Selective Calling

Digital selective calling (DSC) is an integral part of the GMDSS and is used for transmitting distress alerts from ships and for transmitting the associated acknowledgments from coast stations.

DSC is basically a calling system. Each call consists of a packet of digitized info of one of four priorities: distress, safety, routine, or urgency. Messages can be routed to 'all stations' or to selected stations by using their selcal code. Distress messages are automatically broadcast to 'all stations.'

Terrestrially there are a number of channels allocated, one on MF (2187.5 kHz), five in the maritime HF bands (4207.5, 6312, 8414.5, 12577, 16804.5 kHz) and one on VHF (channel 70 156.525 MHz). All these channels are simplex.

DSC is further used for establishing ship-shore communication. A number of paired (duplex) channels are allocated to permit a suitably equipped ship or shore station to alert the other that it wishes to establish communication. The call will give the type of desired communication and the proposed frequencies for that communication. These are on MF/HF. For VHF, channel 70 is again used in simplex.

The information that can be passed by a DSC call includes:

- The caller's maritime mobile service identity or MMSI (a number that uniquely identifies the caller, similar to a phone number).
- The MMSI of the unit being called. This can be a specific unit or a group of units (for example, all Coast Guard units).
- The caller's location. This can be derived directly from an interface to a GPS, Loran, or satellite navigation receiver, or it can be entered manually.
- The requested working frequency and mode. This is the frequency and mode of emissions that will be used to transact business. DSC is only used for call set-up. Once the call is established, the two parties change to a working frequency and mode to continue the call.
- The priority of call (distress, urgent, safety, or routine). DSC can be used for anything from distress calls to setting up a routine phone patch through a commercial coast station.
- For distress calls, the DSC call can even indicate the type of emergency (fire, taking on water, etc).
- DSC calls are *selective* because, unlike traditional voice radio calls, DSC calls can be addressed to a certain user or set of users.

MMSI Code Formation

The formation of the MMSI codes for shore stations and vessels follow two different protocols.

The MMSI consists of nine numerical digits providing each station with a unique identity. Use is made of a three digit string (MID—maritime identification digits) to indicate nationality.

The location within the nine digit string differs between coast and ship station.

Ship station: MIDxxxxxx
Coast Station: 00MIDxxxx

MMSI Selected Examples

MMSI	Country
211 218	Germany
219	Denmark
224	Spain
227 228	France
230	Finland
232 233 234	Great Britain
244 245 246	Netherlands
338	Hawaii
339	Jamaica
345	Mexico
352 353 354 355 356	Panama
358	Puerto Rico
366 367 368	United States

Ship / Shore DSC Frequency Pairing

Coast Frequencies
1621.5 (rptd Norway), 1624.5 (rptd Denmark/Faeroes), 2177.0, 2177.5, 4219.5, 4220.0, 4220.5, 6331.0, 6331.5, 6332.0, 8436.5, 8437.0, 8437.5, 12657.0 (rptd used by WLO), 12657.5, 12658.0, 16903.0, 16903.5, 16904.0, 19703.5, 19704.0, 19704.5, 22444.0, 22444.5, 22445.0, 26121.0, 26121.5, 26122.0 kHz

Vessel Frequencies
2156.5, 2159.5, 2189.5, 4208.0, 4208.5, 4209.0, 6312.5, 6313.0, 6313.5, 8415.0, 8415.5, 8416.0, 12577.5, 12578.0, 12578.5, 16805.0, 16805.5, 16806.0, 18898.5, 18899.0, 18899.5, 22374.5, 22375.0, 22375.5, 25208.5, 25209.0, 25209.5 kHz

Distress and Safety Communications
MF/HF/VHF/UHF Freqs for GMDSS

CW: For the time being 500 kHz (CW)
DSC: 2187.5, 4207.5, 6312.0, 8414.5, 12577.0, 16804.5 kHz and 156.525 MHz
NBDP: 2147.5, 4177.5, 6268, 8376.5, 12520, 16695 kHz
NBNP/MSI: 490, 518, 4209.5, 4210, 6314, 8416.5, 12579, 16806.5, 19680.5, 22376, 26100.5 kHz
Voice: 2182, 3023, 4125, 5680, 6215, 8291, 12290, 16420 kHz, 121.5, 123.5, 156.3, 156.650, 156.8, 1530-1544, 1626.5-1645.5 MHz
EPIRB: 21.5, 243, 406-406.1, 1544-1545, 1645.5-1646.5 MHz
Radar Transponders: 9.2-9.5 GHz

Examples of GMDSS traffic

FORMAT SPECIFIER: SELCALL individual
CALLED PARTY ADDRESS: 352 - 403000
CATEGORY: SHIP'S BUSINESS
SELF IDENTIFICATION: 354 - 334000
TELECOMMAND: J3E telephone
TELECOMMAND: PAY-PHONE PUBLIC CALL OFFICE
RECEIVE FREQUENCY INFORMATION: 12345.0 kHz
TRANSMIT FREQUENCY INFORMATION: 12345.0 kHz
RQ
CHECK SUM OK
DATE 25-08-1996 TIME 19:59:12

FORMAT SPECIFIER: SELCALL individual
CALLED PARTY ADDRESS: 367 - 6000
CATEGORY: ROUTINE
SELF IDENTIFICATION: 367 - 0
TELECOMMAND: J3E telephone
SHIPS POSITION COORDINATES: NW LATITUDE 27 deg 49 min NORTH; LONGITUDE 97 deg 25 min WEST
RQ
CHECK SUM OK
DATE 21-08-1996 TIME 23:43:44

ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ
bob@grove.net

FCC Postscript Files Redux

In our November 1996 column a reader asked whether FCC documents in Postscript could be downloaded to a printer other than a laser. We answered that it probably could be downloaded to any readable printer. *MT* reader Allan Dunn suggests a caveat, however.

While in MS-DOS you can copy a text file to PRN or LPT1, if your reader downloads and copies a *.ps file to a non-Postscript printer, there will be a lot of garbage characters embedded in the readable text. These come from special format commands.

Allan continues by saying that there is some public domain software that will strip the unused characters from the text files, but the format will not be correct.

Q. *My scanner commonly "hangs up" on frequencies where I hear distorted pager and data signals, even though I'm scanning police frequencies. What causes this? (Herb Kynor, Phillipsburg, NJ)*

A. This is classical intermodulation ("intermod") produced by strong pager signals on non-police frequencies overloading your scanner. The circuitry allows the strong signal frequencies to mix in the radio, producing spurious frequencies which then pop up on unexpected—and usually undesirable—parts of the spectrum where they interfere with legitimate received signals.

Some ways to reduce intermod include directional antennas, poorer antennas, attenuators, external filters, better radios, and changing locations.

Q. *I am planning a railroad trip; what kinds of signals should I expect to pick up inside the metal car? (Michael Herman, NY, NY)*

A. The higher the frequency (the shorter the wavelength), the better that signals will penetrate the small window aperture to be received. Don't plan on good shortwave reception, but you should do well with a scanner, especially if you can locate the antenna at the window. Ideally, place the antenna in the center of the window, although adjacent passengers might not appreciate that! You may even find that the Grove ANT-20 "NoTenna" can be connected to a convenient metal screw or other contact point, enabling scanner and lower frequency shortwave reception as well.

Q. *Canadian Radio Shack outlets sell scanners with the 800 MHz cellular frequencies intact. Can I buy one there and bring it home? (JK, Salem, OR)*

A. Yes, if you can get through Customs, and you probably can. Since April of 1994 it has been unlawful to market in or import into the U.S. any scanner or converter which allows cellular frequency reception. Inventory acquired prior to that date may still be sold. The law does not apply to Canada.

Q. *If you were listening to maritime transmissions on April 15, 1912, what frequency would you have tuned in to hear the Titanic's "CQD?" (Jack Bessler, Lafayette, IN)*

A. Good question! At that time spark signals were extremely broadband, and the transmitters were tuned for maximum signal rather than specific frequency (or wavelength, as was then the measurement). In all likelihood, tuning between 100 and 300 kHz would have netted you the QSL—if they could have sent one! Any of our archivists out there have a better answer?

Bob's Tip of the Month

Remote Monitoring for Your Scanner or Shortwave Radio

William Mewes suggests an eminently simple way to be anywhere in your home—or around it—and yet hear communications from your base station radio. A wireless baby monitor, available inexpensively from discount stores or nearly free at flea markets and yard sales, is called into action here.

Simply place the baby monitor next to the speaker of your primary radio(s), then carry the portable receiver with you. You could even program your favorite hand-held scanner to the monitor's frequency.

Now you can enjoy base station clarity on your favorite signals while moving throughout your property! Neat idea, William.

Q. Where are the antennas on undercover vehicles with no visible antenna? (Wally Kneizah, Thousand Oaks, CA)

A. Over the years, many experiments have been made to conceal undercover, mobile, communications antennas. They have been imbedded in the window glass (OK for low power, but explosive with high wattage!), taped to the inner window glass, substituted for the factory AM/FM antenna, and slot-fed to the rear-deck speaker hole(s). Nothing works as well as a roof-mounted antenna, however.

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

INDEX OF ADVERTISERS

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

Ads for **Stock Exchange** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word — *Subscribers only!*
All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue if camera-ready copy or, $85 if copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

EXPERT RADIO REPAIR..on CB's, Scanner Radios, FM two-way radios, Amateur radios, cordless phones. Fair prices, reasonable turn around, flat rate + parts. Cellular modifications. Free estimate. (800) 660-1118. CTP, 517 Lower Terr., Huntington, WV 25705.

SCANNER/SW RECEIVER Electronic Data Log. Use your Electronic Organizer to log scanner/SW Receiver channels/frequencies, memory banks, call signs, services, operating modes, personnel, etc. Features instant global searches, password protection, & more! Send $5.95 US for complete instructions to: RPB Designs, P.O. Box 1636, Seaford, NY 11783-1636.

DX TOOLS for the serious radio listener. Quantum Loops, Q-Sticks, more. Stamp for catalog. Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504. (904) 434-3635.

HOW TO LOCATE AND: Research Anyone—How The Bad Guys Tap Phones/Bug Rooms—Conduct Video Surveillance—Install Latest Counter Measures—Hire ex-CIA/KGB Agents-Real Inside Secrets! Plus latest in night vision, how to order satellite photographs of anywhere on earth, find best book sources from CIA publications to ID changing, private detective schools, best newsletters, courses and associations, latest tricks. "Recommended" (or hated) by CIA directors and station heads, the world's most famous private detective, KGB colonels, Lee Lapin does it again! THE WHOLE SPY CATALOG $44.95 + $5.00 shipping. 1-415-513-5549. Intelligence Incorporated Dept E, 2228 S. El Camino Real, San Mateo, CA 94403.

GE SUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

FM MICRO BROADCASTING: Transmit many miles. 88-108 MHz. PLL. Kit or assembled. Mono/stereo, 1-100 watts. Call (250) 642-2859. R. Scott Communications.

SPORADIC WAVES! A newsletter that will surprise you ... FREE SAMPLE! All you need to do is ask; Pineapple Paradise Radio Company, P.O. Box 751, Chester, MA 01011.

RC-740X, band expansion for KENWOOD 741/742 series, ScannerWEAR WINDOWS software for ICOM, AOR, Opto receivers. See all at http://www.radioscan.com. Radio Control Systems Inc. (800) 560-7234.

SOUP UP YOUR RADIO with extra-narrow AM and FM filters, internal antenna booster, alignment, modifications, all done in our lab! Send $.32 stamp for details. Worldcom, Box 3364, Ft. Pierce, FL 34948. (407) 466-4640.

TEST EQUIPMENT BONANZA! Free shipping! Bird 4411W wattmeter, like new; elements for 2-30, 144-520, 400-1000 MHz, leather case. Orig. cost $1383 (order TIN75 $699.95). Tenney Jr. Environmental Test Chamber (order UTST-1 $2000.00). Hewlett Packard DraftPro Excel Plotter MDL#7576A (order UPTR2 $2000.00). Grove Enterprises, P.O. Box 98, Brasstown, NC 28902. 1-800-438-8155.

FOR SALE: ICOM R7100 RECEIVER full coverage (800 MHz) with UT36 voice synthesizer, like new $1195.00 OBO, includes air freight. Call Bob (607) 785-3420 after 4 pm.

PRO-46 HANDHELD scanner, 100 channel, 29-956 MHz, cellular restored. New in the box. $325.00. Call or fax Thomas at (513) 661-1234.

WANTED: SONY 2010, prefer mods (Quantum, KIWA, etc.) but will consider other. Excellent condition. $175. (212) 529-2452.

KENWOOD RZ-1, cellular $295. YAESU FRA-7700 with FRT-7700, excellent $100. ICOM CT-17 computer interface, mint $80. WB9YCJ/6. (714) 564-9010.

FOR SALE: ICOM IC-T7A Dual band FM Transceiver, mint condition, complete $295.00 will ship. Call Rudy (847) 358-1150.

SCANNER-REALISTIC PRO 34 HANDHELD. 200 channels, cellular modified. Very good condition. 7-1/2 years old. $140. Ira Paul, 1304 S. Main, Royal Oak, Mich. 48067.

GREAT WINTER READING! *US Scanner News*: 1/96-6/96, 8/96-10/96 (mint). *Scanner Journal*, 11/95 (mint). *REACTer* issues 3/96-10/96 (mint). *Traveler's Guide to World Radio* (mint). 1994 *WRTH*. 1994 *Passport*. *Betty Bearcat National* and *Mid-Atlantic* Books. 1996 *Police Call Plus* (Mid-Atlantic). $70 check prepaid (includes postage) takes all. Write about partial sales of above. Also, will tape local stations in Philadelphia area for $5 for 60-minute tape (Prepay with check). Brandon Artman, 515 Maryland Ave, West Chester, PA, 19380.

CAN GOD USE HAM RADIO? For an audiocassette on how you can use your hobby for the glory of God, send $4.00 to David Phenes, N2YEM, RR1 Box 16, Edgewood, IL 62426.

FOR SALE: NRD535 $850.00 and NRD525 $550.00. Call Jim (561) 967-4560.

PRO-2006, 6400 memories (keypad controlled), cellular, SS meter, auto-store, digital squelch, much more, excellent performance, $475 OBO. SONY ICF-2010, very nice, $275. Original boxes/manuals, shipping included. John, evenings (303) 904-3404.

"RADIO STUFF SALE!" Magazines, bulletins, books, radio station items, some equipment. Send 2-stamp business size SASE or $1 for list: G. Dexter, 213 Forest St., Lake Geneva, WI 53147.

McINTOSH MR-78, considered "Simply the Best" FM tuner ever made (*MT* July 93 p.49), $1190. TANDBERG 3001, $550. PIONEER TX-9100, $185. Want: DRAKE R8A, SW8 (new version), HF150. (412) 243-1569.

FOR SALE: All issues of M.T., 1988 through 1996, all in excellent condition. Make offer. H. Henriksen, 1317 Hayes Ave. Racine, WI 53405-3048.

MAGNAVOX D2999, excellent condition, $200 includes shipping. SONY ICF-2010 with KIWA filters, $240. Wanted: SONY ICF-6800W. (319) 393-8279.

GRE SUPER CONVERTER II, 800 MHz converter covers 810-950. Fits scanners w/BNC connectors, great for HTs! Mike (810) 750-8049.

NEW! Subscribe to MT for Six Months for only $12.95 (U.S. Second Class Mail)

Monitoring Times

Clip and mail this ad along with your payment or call us to subscribe or renew to Monitoring Times or Satellite Times!

Satellite Times

If you are currently a subscriber to Monitoring Times or Satellite Times, please check your label to determine the expiration date of your subscription.

	MT-6 months	*MT*-One Year	*MT*-Two Years	*MT*-Three Years	*ST*-One Year
US Rates	❒ $12.95	❒ $23.95	❒ $45.95	❒ $67.95	❒ $19.95
US 1st Class	❒ $25.95	❒ $49.95	❒ $97.95	❒ $145.95	❒ $32.95
Canada Surface*	❒ $19.95*	❒ $36.50*	❒ $69.95*	❒ $103.95*	❒ $28.50*
Foreign International*	❒ $28.95*	❒ $55.45*	❒ $108.95*	❒ $162.45*	❒ $46.50*

*All payments must be in U.S. Funds drawn on a U.S. Bank!

P.O. Box 98, Brasstown, NC 28902
1-800-438-8155

Name _____ Address _____

City _____ State ___ Zip _____ - _____ Country _____

CC# _____ Exp. Date _____

Signature _____

Give Us Four !

Do you know your four-digit postal zip code extension? If your mailing address uses a route number, have you been assigned a 911 street address, instead? The P.O. has informed us they will begin delaying delivery of mail that does not contain these correct elements. We will not be able to honor replacement requests for a month after non-delivery if your address does not comply.

28902-0098

Look at your label to see if it lacks the required information. If so, please send your updated mailing address to us at P.O. Box 98, Brasstown, NC 28902-0098, or e-mail to order@grove.net. Thanks for helping us get *Monitoring Times* to your doorstep in the most speedy and economical way possible.

CLOSING COMMENTS

By Bob Grove, Publisher

Monitoring Times: the First 15 Years!

It really is hard to believe that 15 years have passed since the germination of the first edition of *MT*. The initial publication was a natural evolution of the early Grove Enterprises catalogs which carried tidbits of helpful information for the radio listener. That first edition was also the first light of a full-frequency-coverage commercial periodical; all previous efforts were narrowly focussed—ham radio, CB, shortwave listening, and so on.

MT from the beginning has been dedicated to factual accuracy, journalistic integrity, and timely reporting; we have no equal in those respects. Many of our writers have earned their international reputations as the best in the business, and *MT* has contributed to their ascending reputations.

Although we receive many fine compliments from our readers (and they are much appreciated), some of the most flattering endorsements are unspoken. *MT* is required reading in many federal and military agencies; top representatives of major communications companies tell us they read about their new products in *MT* first; foreign governments count on *MT's* contents to learn more about worldwide communications systems and technologies. Even some of our competitors appear to follow our lead as we change directions.

One of the hardest tasks facing us, however, has been the on-going effort to keep *MT* editorially separate from the merchandising of Grove Enterprises products. Even though *MT* and our sister publication, *Satellite Times*, are wholly owned by Grove, we have always felt that it is our responsibility to be objective and balanced in our coverage of competitive products. It isn't always easy; in fact, it's *rarely* easy. But we do try, and that's what makes *MT* different, and what has made it the most respected, all-frequency, listeners' magazine in history.

And now we face a new reality, a shift in global communications via low frequency analog to high frequency digital—and the Internet. Shortwave broadcasters have already hit the satellites. Law enforcement scrambling and scanner-evasive trunking are seriously limiting many scanning enthusiasts. Monitoring of mobile and cordless telephones is illegal, and unauthorized decoding of scrambled communications is forbidden. Perhaps that is as it should be, but privacy legislation has made an enormous impact on the listening industry.

New technologies are automatically unmonitorable; emerging Personal Communications Services (PCS) are inherently digital, so even their voice modes are inaccessible to monitoring. Is it possible for progressive scanner manufacturers to make digital decoders for the listener? Perhaps, but first it must be established that the digitization is for spectrum efficiency and not security, because the Electronic Communications Privacy Act (ECPA) of 1986 outlaws privacy-compromising decoders.

But this does not mean that all is lost for the spectrum monitoring enthusiast. Many modes will remain in the clear for the foreseeable future. It is still an advantage for international broadcasters, as well as clandestines and pirates, to deliver their messages as economically as possible to target listeners, via conventional shortwave circuits, in easily-receivable, full-carrier, AM mode.

The majority of law enforcement, medical emergency, and firefighting agencies accept, and some even invite, public monitoring. Many non-law-enforcement government agencies communicate in clear voice. Nearly all businesses, news agencies, transportation, power companies, telephone repair crews, boats, aircraft, sporting events, and other VHF/UHF users are relatively unconcerned about casual interception. Ham radio, CB, GMRS, 49 MHz radios, and even the new Family Radio Service (FRS), will remain accessible to casual monitoring.

On shortwave single sideband, utilities listeners will continue to hear ship-to-shore, air-to-ground, illegal fishing fleets, military maneuvers, NASA Space Shuttle support, spy-number stations, embassy text messages, International Red Cross emergency relief teams, federal government agencies, Coast Guard rescue efforts, Hurricane Hunter aircraft, aviation weather broadcasts, standard time signals, and much more.

As the upswing of the solar cycle continues, more and more worldwide coverage can be expected; previously vacant bands in the 15-30 MHz range are already becoming more active.

The spectrum is not dead yet; in fact, it's very healthy.

Catch MORE Listening Excitement!

PC Programmable for Total Scanning Control!*

Using a PC and available third party FCC Master File licensee database info (on CD-ROM or HD Disks), quickly customize your IC-R10 to scan only the active channels you want – anywhere in the country! ICOM's CI-V computer interface is built right in! You can also quickly clone data from PC to IC-R10, or from one IC-R10 to another.

PC Ready!

Advanced Operation in an Easy to Use Package!

- Beginning listeners can start out using the IC-R10's ***easy mode:*** select 1 of 10 band scan programs set by ICOM's factory. As your listening preferences grow, the scans can be changed to follow the listener's desired settings!

Actual Size!
2.3"(w) x 5.1"(h) x 1.2" (d)

Uses Ni-Cd, Alkaline or other DC Power**

The IC-R10 comes with a battery pack that uses either "AA" alkalines or the ***included "AA" Ni-Cd batteries****. For frequent listeners, use the right-in-the-radio rechargeable Ni-Cds (AC wall charger plug also included). Infrequent listeners may prefer using alkalines for their long power storage capacity. Or use an external DC power source, like a car cigarette lighter!*

Next Generation Features for the Serious Listener!

- ***7 different scan types*** with ***priority watch*** include the all ***new "signal navigation" (SIG NAVI) scan.*** While you listen to a paused frequency, the SIG NAVI scan looks for the next busy frequency (within ± 100 kHz)!
- ***Tunable bandpass filters*** provide excellent image reception and help reduce intermod.
- A ***built-in 20 db attenuator*** helps block unwanted noise.

- A ***"real-time" band scope*** makes it easy to find busy frequencies and to note band conditions. *A handheld first!*
- The ***alphanumeric dot matrix display*** allows up to 8 characters per channel name and up to 10 characters per bank name.
- Large ***36mm† speaker*** for loud, crisp audio.
- ***1000 memory channels*** with an EEPROM. Memories are arranged in ***18 banks of 50 channels***, with 100 channels for auto memory write and program skip scan.
- Noise blanker, lock, sleep timer, auto frequency control (AFC), & more!

Impressive Specifications!

- ***Wide band performance!***
  500 kHz – 1.3 GHz coverage††
- ***All Modes, including SSB for SWL's***
  AM, FM, WFM, USB, LSB, CW

The All New, Advanced Performance, Affordably Priced

IC-R10

Next Generation Receiver

Call 206-450-6088 for a free brochure!

ICOM®
RECEIVERS
http://www.icomamerica.com

Communications Solutions

scantastic!

with a scout® frequency recorder, nothing transmits unknown.

You're driving down the road and you see 2-way communications taking place. **Now What?** Using your scanner you would have to take an educated guess as to what frequency to start scanning, and chances are you would never be able to capture the signal in time. **Problem Solved.** With the Scout just turn it on and frequencies from 10MHz-1.4GHz are captured in less than ten milliseconds, and record up to 400 frequencies in memory. Recorded frequencies are not duplicated, as the Scout will keep track of the number of hits per frequency.

Why Do I Need A Scout?

An intelligent question that every scanner owner should ask themselves. At the Races, a Sporting Event, Air Show, Ham Fest, Crime Scene, Etc. The Scout will capture unknown signals off the air so you can manually program them into your scanner. Or, use the Reaction Tune® function. The Scout automatically tunes your AR8000/AR2700 or ICOM R7000/7100/9000 to the frequency it captures in less than ten milliseconds.

U.S. Patent No. 5,471,402

Store Frequencies In Your Computer

All the Scout memories can be downloaded into your PC using the optional Optoelectronics OptoLinx and checked against the Spectrum FCC database. Now you can keep track of all the activity along your scanning journey.

With The Scout Frequency Recorder, Nothing Transmits Unknown.

Limited Time Only

$449

Includes, Scout, DB32 antenna CC30 Case and Spectrum Frequency Database

FACTORY DIRECT ORDER LINE 800•327•5912

OPTOELECTRONICS®

5821 NE 14th Avenue • Ft. Lauderdale, FL • 33334

954•771•2050 *tel* 954•771•2052 *fax* opto@igc.net *email* www.optoelectronics.com *web site*

Prices and Specifications are subject to change without notice or obligation