

ALL THE FREQUENCIES YOU NEED!



Monitoring
Times

Volume 24, No. 2

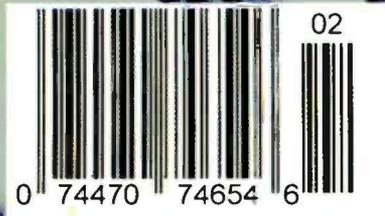
February 2001

U.S. \$4.25

Can. \$6.50

Printed in the
United States

*Eyes and
Ears on
the Weather*



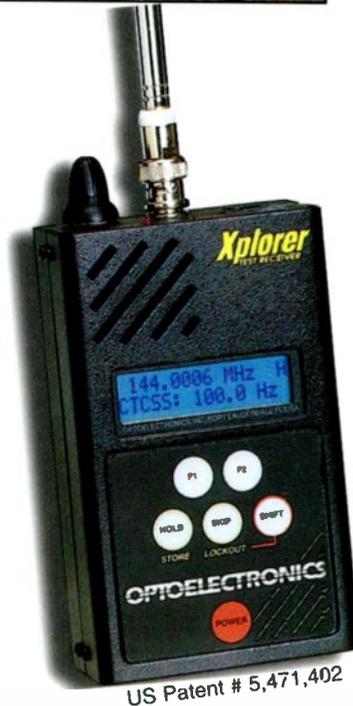
Discover the Unknown



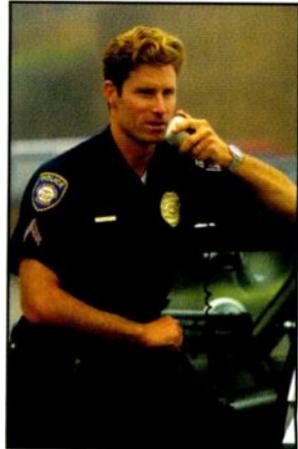
The Xplorer Test Receiver is a handheld nearfield receiver that locks onto the strongest signal in the nearfield in one second.

With its sensitive front end, the Xplorer is capable of locking onto a 5 watt UHF signal from as far away as 800 feet.

Once locked to a signal the Xplorer demodulates the FM audio and decodes any CTCSS, DCS, LTR or DTMF tones present.



Xplorer comes supplied with TA100S antenna, rapid charger, PC interface cable and software for memory download.



A unique feature of the Xplorer is its ability to lock out or lock in up to 10 different frequency ranges, like FM broadcast stations.

With 500 memories and an automatic time and date stamp you'll know exactly when the frequency was captured.

The Xplorer Test Receiver, ideal for checking out two-way radios or checking out the nearfield action.

OPTOELECTRONICS®

Order Direct 800-327-5912

5821 Northeast 14th Avenue • Ft. Lauderdale, FL 33334

Telephone: 954-771-2050 Fax: 954-771-2052

Email: sales@optoelectronics.com

www.optoelectronics.com

*Cellular frequencies blocked except for FCC approved users

SPECIAL!

\$699

Save \$200

Hurry!! Limited Time Offer

We make them tough.



**WINRADIO WR-3100e receiver still functional, after the surrounding house burnt down.
(Courtesy of the original owner Mr. Gene Wyman, Ketchikan, Alaska)**



**WINRADIO WR-3700e receiver still functional and without any mechanical damage,
after being run over by a "Unimog" army truck (weight approx. 4 tons).**

www.winradio.com

Check our website for details of our award-winning products.

info@winradio.com

Monitoring Times

Vol. 20, No. 2 February 2001



Cover Story

Eyes and Ears on the Weather

Whether it's a blizzard or a summer tomado, advance warning of approaching danger can make a major difference in fatalities or injuries to the public. Radio has always played a major role in disseminating information, and thanks to the National Weather Service, people on the go are never far from a source for weather information.

The National Weather Service has made great strides in establishing a network of local transmitters which now form an all-hazards network. But radio broadcasts aren't the only way of acquiring the information. See *The Fed Files* column on page 64 for more on the NWS and a full table of EMWIN data stream broadcast areas.

Weather facsimile transmissions from the U.S. Air Force have now been found on several frequencies, as reported in the *Utility World* column on page 32. Of course, you could also acquire the weather map directly from the satellites as in *View from Above* on page 63.

Canada has its own network of weather radio stations, and you can find the entire list in *Service Search* on page 30.

International ALE Networks 10

By Mike Chace

HF communications have received a real boost since the advent of automatic link establishment (ALE) systems, but their digital nature kept hobbyists shut out until Charles Brain made PC-ALE software freely available. In this feature article *MT* reveals some of the international nets identified as diplomatic, military, and business nets, as well as many unidentified users. Come join the intrigue!

Inside the Lower Colorado River Authority 14

By John Mayson

A huge state agency that covers all of central Texas, LCRA replaced its low band communications system with one of the biggest trunked systems in the U.S. However, programming your scanner for a 900 MHz EDACs system can be a little tricky, so here are tips and frequencies to get you started tuning in to this major system.

StarBand vs. DirecPC 18

By Ken Reitz KS4ZR

High speed internet access via satellite is no longer just a pipe dream or a rich man's toy: It has trickled down to the common man ogling the goodies at Radio Shack. In fact, two companies have announced two-way internet access via satellite: DirecPC and Starband. Here's a quick comparison between the two as well as the pros and cons of signing up.

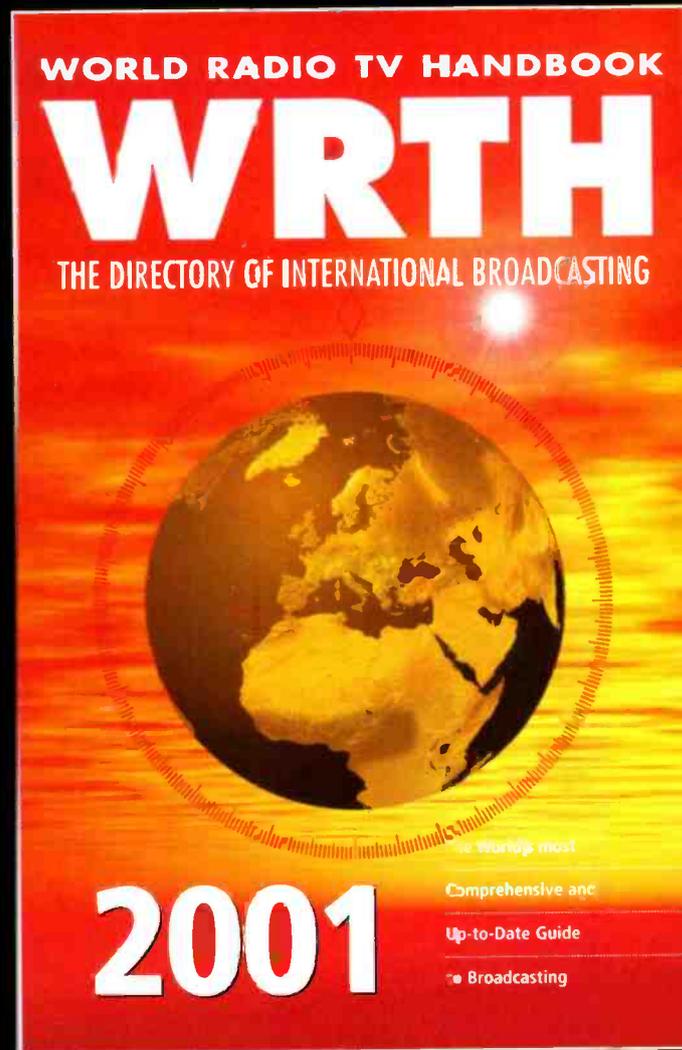
WWBS: The Little Station that Could 22

By Hans Johnson

What do you plan to do in your retirement? Charles Josey decided to erect a shortwave broadcast station in Macon, Georgia. All went well until the first signals went on the air ...

THE 2001 WRTH

PACKED WITH ALL YOU NEED TO LISTEN TO THE WORLD



with:

Hour-by-hour guides to international broadcasts in English, French, German & Spanish

80 pages of color — full of reviews, news, and views.

Available at all good bookstores and electronic retailers or contact:
Billboard Books, 770 Broadway, 8th Floor, New York, NY 10003-9595
(www.watsonguptill.com)



MONITORING TIMES
(ISSN: 0889-5341,
Publishers Mail
Agreement #1253492)
is published monthly by
Grove Enterprises, Inc.,
Brasstown, North
Carolina, USA.

Copyright © 2001 Grove Enterprises, Inc.
Periodicals postage paid at Brasstown, NC,
and additional mailing offices. Short excerpts
may be reprinted with appropriate credit.
Complete articles may not be reproduced
without permission.

Address: P.O. Box 98,
7540 Highway 64 West
Brasstown, NC 28902-
0098
Telephone: (828) 837-9200
Fax: (828) 837-2216 (24 hours)
Internet Address: www.grove-ent.com or
e-mail: mt@grove-ent.com
Editorial e-mail: mtditor@grove-ent.com
Subscriptions: order@grove-ent.com

Subscription Rates: \$25.95 in US; \$38.50
Canada; and \$57.50 foreign elsewhere, L.S.
funds. Label indicates last issue of subscrip-
tion. See page 106 for subscription
information.

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

Disclaimer:
While *Monitoring Times* makes an effort to
ensure the information it publishes is accu-
rate, it cannot be held liable for the contents.
The reader assumes any risk for performing
modification or construction projects pub-
lished in *Monitoring Times*. Opinion or
conclusions expressed are not necessarily the
view of *Monitoring Times* or Grove En-
terprises. Unsolicited manuscripts are accept-
ed. SASE if material is to be returned.

Owners

Bob and Judy Grove
judy@grove-ent.com

Publisher

Bob Grove, W8JHD
bgrove@grove-ent.com

Managing Editor

Rachel Baughn, KE4OPD
mtditor@grove-ent.com

Assistant Editor

Larry Van Horn, N5FPW

Art Director

Bill Grove

Advertising Svcs.

Beth Leinbach
(828) 389-4007
beth@grove-ent.com

Reviews:

Today's sophisticated wide cov-
erage receivers are like two receiv-
ers in one, and our reviews often
treat them that way. In this issue we
introduce the shortwave portion of
the AOR AR8600 mobile commu-
nications receiver (p.82). Many air-
ground communications are now
enacted via the digital ACARS sys-
tem, but the little, stand-alone, hand-
held ARD-2 from AOR can decode
and display the text with no radio or
computer necessary (p.80).

Computer programming your
scanner is convenient and some-
times a necessity. So far there is only
one software program for the Yaesu
VR-500 – the VR-500 Programmer
from RT Systems (p.84).

NTSC, PAL, SECAM ... These in-
compatible video formats can be ag-
gravating for anyone wanting to watch
international satellite transmissions,
but the Emerson Universal Multi-Sys-
tem Video Converter removes all ob-
stacles to viewing (p.87).

TABLE OF CONTENTS

Washington Whispers	5
<i>Reconsideration Urged on MURS!</i>	
Letters	6
Communications	8
Stock Exchange	90
Advertisers Index	90
Department Staff	90
Closing Comments	92
<i>Dialogue on Out-of-Band Broadcast- ing</i>	

First Departments

Getting Started	
Beginners Corner	24
<i>Your Beginner's Q&A</i>	
Ask Bob	26
Bright Ideas	27
Scanning Report	28
<i>Michigan Monitoring</i>	
Service Search	30
<i>Environment Canada Weatheradio</i>	
Utility World	32
<i>US Air Force ISB is Back</i>	
Utility Logs	33
Digital Digest	35
<i>Algerian Oil & Gas on HF</i>	
Global Forum	36
<i>Soviet Tests Burned the Ionosphere</i>	
Broadcast Logs	39
The QSL Report	40
<i>Veri Signers: Are They Worth It?</i>	
Programming Spotlight	41
<i>It's Your VOA</i>	

Listening Guide

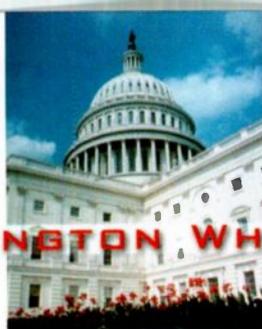
English Language SW Guide	42
MT Satellite Service Guide	62

Second Departments

View from Above	63
<i>The Risky Business of Satellites</i>	
The Fed Files	64
<i>Weather on Your Scanner</i>	
Tracking the Trunks	66
<i>Seeking Frequencies</i>	
Plane Talk	68
<i>Something for Everyone</i>	
American Bandscan	70
<i>Station Identification</i>	
Outer Limits	71
<i>Variety and Quantity Return</i>	
Below 500 kHz	72
<i>The Band is Hot!</i>	
On the Ham Bands	74
<i>Books for the New Year</i>	
Radio Restorations	76
<i>Rehabbing an RF Generator</i>	
Antenna Topics	78
<i>Interesting Aspects of Propagation</i>	

MT Reviews

Computers & Radio	80
<i>AOR's Pocket ACARS Decoder</i>	
Shortwave Equipment	82
<i>AOR's AR-8600</i>	
Scanner Equipment	84
<i>RT Software for the Yaesu VF-500</i>	
Easy Access	86
<i>Icom's Neat IC-718</i>	
MT Review	87
<i>Emerson Video Converter</i>	
What's New	88



Reconsideration Urged on MURS!

"...the FCC's decision as constructed will alter the fundamental purpose of these frequencies in a manner detrimental to business and industrial users that was not contemplated...." From Motorola Petition for Reconsideration

As Part of the FCC's 1998 Biennial Regulatory Review, on October 13, 2000, the FCC reallocated five low power VHF frequencies from the Part 90 Private Land Mobile Radio (PLMR, business band) to a newly-created Part 95 general use Multi-Use Radio Service (MURS.)

Instead of business-related communications, these frequencies (154.570, 154.600, 151.820, 151.880 and 151.940 MHz) may be used for any personal or business purpose. It is somewhat similar to the UHF (462-468 MHz) Family Radio Service (FRS) which has 14 channels in the 70-cm band. FRS' maximum power level is only one-half watt. MURS four times more powerful.

MURS offers certain capabilities not readily available from any other unlicensed personal and family communications service. For instance, vehicle-to-vehicle range, even with a 2 Watt ERP limitation, will be substantially better with MURS than with FRS, especially because it is permissible to use external vehicle antennas.

The key selling points of MURS is the higher power, increased range, and interference over FRS. Its key drawback is that it has only five channels, but the FCC said it would consider adding more channels if the service proved popular. The new service could be useful for unlicensed individuals wishing to work in conjunction with radio amateurs performing public service communications.

Many manufacturers are concerned that MURS will have an adverse impact on the sale of FRS radios of which Motorola is a major player. Kenwood expects the service to "take off" once manufacturers come out with some small, compact, low priced units, just like FRS. Retail prices should be in the \$100 bracket.

Reconsideration requested

Several parties filed Petitions for Reconsideration within the 30-day period allowed for such petitions. Two of particular importance were those filed by Motorola, Inc., and

the Personal Radio Steering Group Inc. (PRSG).

In its request for reconsideration, Motorola said that while it generally supports the elimination of licensing requirements for the five low power frequencies, it opposes the use of these channels for anything but industrial and business use.

In its formal comments to the Notice of Proposed Rulemaking, Motorola recommended that the frequencies be placed in a new unlicensed radio service category, called the "Low Power Industrial/Business Radio Service" that "will be designated for business users only and clearly distinguishes itself from the Family Radio Service and Low Power Radio Service frequencies in the Citizens Band Radio Service."

Motorola is also concerned that "The expanded availability of the frequencies to general consumers will increase traffic congestion and interference, thereby harming business users."

Motorola also points out that the Part 90 (business band) rules prohibits interconnection (phone patching) to the Public Switched Telephone Network (PSTN) without appropriate licensing. There is no such restriction for MURS "...which could lead to new and unintentional uses of the channels, to the detriment of existing users."

For example, Motorola anticipates the development of a two-watt cordless telephone that provides service – and interference – for miles from its intended base. There are no MURS restrictions on the use of external antennas nor on antenna height.

The Motorola Petition requests that the FCC set aside these new rules altogether, and return these frequencies to the Business Radio Service. It wants a prohibition on telephone interconnection and to preclude a dual-band 2 meter/70 cm CB (MURS/FRS) handheld radio from being marketed.

If the FCC were to take the action requested by Motorola (and we expect further intensive lobbying pressure from Motorola), MURS would simply be canceled, obliterated, gone.

Personal Radio Steering Group

The Personal Radio Steering Group, Inc. is an all-volunteer, not-for-profit Michigan corporation established by GMRS licensees.

Although it supports MURS, PRSG takes issue with some of its specifications and also filed a Petition for Reconsideration.

In the PRSG Petition, coordinator Corwin D. Moore, Jr. WB8UPM (Ann Arbor, Michigan) requests certain additional rule changes that would help retain much of the current nature of use of these frequencies.

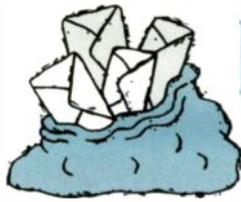
Their position is that "it is the nature of the usage of these frequencies, not the nature of the users," that is the critical factor in this reconsideration. "Besides, these frequencies already have personal users on them," Moore said.

PRSG points out that the FCC did not suggest any changes in transmitter power or connection to the public telephone system. The Order "...adopts a transmitter power limit based solely on ERP (effective radiated power)."

"This is a concept that is difficult for the typical citizen to understand or calculate, and is nearly impossible to measure directly," Moore said. "Because of this confusion and imprecision, the operator of a MURS station could reasonably question if it is permissible to use a radio with a transmitter rated at four-watts of output power" since the ERP would be less than 2 watts. Furthermore, connection to a high gain antenna would greatly exceed the 2-watt ERP limit making even a 2-watt radio illegal to use. For this reason, PRSG wants the FCC to replace the 2-watt ERP limitation with a maximum transmitter output power of 2 watts.

PRSG also wants the rules to be reconfigured to fulfill mobile communications needs as formerly authorized under Part 90 rules. The new rules might expand recreational use of base-station-to-base-station use. The rules should also limit antenna height, prohibit "repeater-like functions" and phone patching. PRSG also suggests that MURS be renamed to the "Mobile Use Radio Service."

"If the FCC were adopt our more modest changes (but leave the MURS service otherwise intact), personal use of these MURS frequencies will continue to increase. Our requested changes go more to technical issues that would not cause any significant disruption to plans for this new service, but that would retain its current mobile-use orientation," PRSG said.



LETTERS TO THE EDITOR

Tooling Down I-35

"Just finished reading *Monitoring Times* #12. I love your publication and when I read your article about scanning Interstate 35, I loved all the great tips. I remember many times seeing a police vehicle zip along and was unable to determine if it was a city cop, sheriff or highway patrol. I related to your article perfectly.

"Being a former US Army Criminal Investigation Division narcotics agent, I wonder how many people were monitoring my broadcasts during various raids we used to do in Germany? What a strange world we live in, you never know who might be listening."

- Paul Dale Roberts, Elk Grove, CA

John Mayson, the author of that article, sent the following reply to Robert Brock, who had asked why he didn't include information about the Texas Rangers.

"I'm glad you read my article about scanning I-35 in Texas. I did not include information about the Texas Rangers because I was focusing primarily on regular patrol-type law enforcement. However I am happy to provide you with what I know about the Texas Rangers.

"The Texas Rangers are a branch of the Texas Department of Public Safety (DPS). Senior Captain Bruce Casteel leads this elite police force.

"Competition to become a Ranger is tough. According to DPS you must live in Texas. You must complete 60 college credit hours. Most Rangers have degrees; some have advanced degrees and certifications. You must have a record of eight years of outstanding full-time law enforcement experience, two of which must be with the Texas DPS at a certain rank, and military law enforcement service does not count. You must pass stringent written and oral exams and you must be physically fit. If you meet all of this criteria all it gets you is a spot on the 'qualified to apply' list.

"Given the fact that there are only 107 Rangers, competition is fierce. There are usually 40 to 100+ applicants for every position.

"What do the Rangers do? Under state law, Texas Rangers are charged with four duties:

- (1) protect the life and property of Texans by enforcing the criminal statutes;
- (2) suppress riots and insurrections;

- (3) investigate major crimes; and
- (4) apprehend fugitives from justice.

"Of these, #1 and #3 occupy most of their time. Writers have called them a 'state FBI' or an 'elite investigative unit' and have compared them with Scotland Yard, Interpol, the investigative arm of the Royal Canadian Mounted Police, the French Surete and the FBI. Their powers are specified under state law as similar to county sheriffs with the exception that they have no state jurisdictional boundaries.

"I find this an interesting note: Chuck Norris is today's most famous fictional Ranger. While he is a sworn volunteer law enforcement officer for a city east of Dallas, the Texas Ranger's dress code prohibits beards, one of Chuck's defining physical characteristics.

"The Texas Rangers, when they use radios, simply use DPS frequencies. 155.505 MHz and 159.090 MHz are assigned exclusively to the Rangers. They can be found on 155.475 MHz, which is used mostly in narcotics enforcement. They are also assigned splinter frequencies of 159.0975 and 155.5125 MHz. However, I don't know of anyone who has ever monitored traffic on these frequencies. Since few Rangers perform patrol duties and spend much of their investigating crime scenes, they rely mostly on cellular phones and pagers.

"I hope I have answered your questions and we thank you for being a *Monitoring Times* reader."

- John Mayson

John also supplied the following web sites for folks interested in learning more about the Texas Rangers.

<http://www.texasrangers.org>

<http://www.texasranger.org> (singular)

<http://www.txdps.state.tx.us>

Corrections and Additions

"Philip Gebhardt's 'Attenuators Tame Your Outdoor Antenna' (Project Pages, December 2000) contained an incorrect equation. The proper equation for calculating R1 and R3 is $50(F+1)$ [numerator] over $F-1$ [denominator], which is actually much easier to calculate than the equation given. And while the equation for calculating R2 will work, a much simpler equation (which doesn't require knowing R1 or R3 in advance) will yield the same result: $25(F-1)(F+1)$ [numerator] over F [denominator]. These equations will provide the same val-

ues listed in Table 1.

-Allen Lutins

(Or you could just send in your \$7 of George Murphy VE3ERP and get your copy of Hamcalc and let a computer program run your math - See "What's New," p.87 - ed.)

"Leon Fletcher's article about San Francisco's radio heritage (*MT*, December 2000) erroneously states that New Mexico and Arizona were admitted to the Union in 1909. The correct year for these admissions was 1912. According to *The World Almanac*, New Mexico became a state on January 6, 1912, followed by Arizona on February 14, 1912."

- Perry Crabill, W3HQX

Living with a Heavy Radio

"Over the years, I've had a couple of suitcase-sized AM/FM/shortwave portables - a Zenith Transoceanic and a monstrous National Panasonic that could best be described as a boat anchor with a handle. The latter, especially, was a big hernia machine.

"The older I got, the less inclined I was to lug the big sets around, trying for a comfortable place to listen without incurring my wife's annoyance about 'cluttering up the living room.'

"When I got a Grundig Satellit 800, the computer age was well upon us, and I sought an answer to the old problem in an office-supply store.

"There I found an inexpensive com-





puter-printer stand that looks enough like furniture so as not to bother my wife. It has wheels, so it's easy to move from couch to a chair as desired, or to get out of the way during vacuum-cleaning. While the radio sits on top in place of the printer, the shelves that were designed to hold printer paper serve well for storing *Monitoring Times*, earphones, stereo speakers, power supplies and other paraphernalia.

"My wife is a lot happier with the appearance of the living room, and I have to lift the radio a lot less often than before. All you've got to do is remember to disconnect any external antennas or power cords before pushing the printer stand around"

- Robert Compton, Mertztown, PA

Many thanks for your letters. Send your kudos, comments, and corrections to *Letters to the Editor*, PO Box 98, Brassstown, NC 28902 or email mtditor@grove-ent.com and let us hear about your great monitoring times.

- Rachel Baughn, editor

Starting At Only
\$199.95 + S&H

- Wireless Alerts
- Wired Alerts
- Accessory Sirens & Lights

BRUCE Sound & Security
P. O. Box 1129
Mt. Sterling, KY 40353

Driveway Alerts

DON'T BE SURPRISED!
Install A Driveway Alert.



Driveway Alerts notify you when a vehicle comes into your driveway.

800-928-8222 zbruce@bellsouth.net
859-498-4914 Fax

DEDICATED TO THE SCANNING AND SHORTWAVE ENTHUSIAST. WE'RE MORE THAN JUST SOFTWARE!

NEW SUPPORT For Uniden BC-780

SCANCAT GOLD for Windows "SE"

Since 1989, The Recognized Leader in Computer Control
Once you use SCANCAT with YOUR radio, you'll NEVER use your radio again WITHOUT SCANCAT!

SCANCAT supports almost ALL computer controlled radios by: AOR, DRAKE, KENWOOD, ICOM, YAESU and JRC (NRD) Plus PRO 2000/6/35/42 (with OS456/535), Lowe HF-150, and Watkins Johnson

SCANCAT GOLD FOR WINDOWS "SE" (Surveillance-Enhanced)

FEATURES

- Selective Sound Recording using PC-compatible sound card. "Point & Shoot" playback by Individual hits
- Demographic search for frequency co-ordination and 2-way Usage Analysis
- Detailed logging to ASCII type files with DATE, TIME, Sig Str, Air Time
- 6 New Sweep Analysis Functions
- Exclusive "MACRO" control by frequency of Dwell, Hang, Resume, Sig. Threshold and even 6 separate programmable, audible alarms
- Command line options for TIMED ON/OFF (Unattended) logging/searches
- Run as many as 6 different CI-V addressable radios as "Master/Slave"
- New! Scheduling/Recording Functions

With Scancat Gold for Windows "SE" your spectrum never looked so good! Load virtually "any" database and Scancat "SE" will examine your database, plot each and every frequency, no matter what the range - and "paint" the entire analysis on your screen.

SEVERAL GRAPHICAL ANALYSIS MODES AVAILABLE
- IF THAT ISN'T ENOUGH, try this... *Multicolored, 3-D "Spatial/Landscape"*

SCANCAT GOLD "SE" **\$159.95 + S & H** UPGRADE SCANCAT GOLD V7.5.7 "SE" **\$59.95 + S & H**

SCANCAT'S WINDOWS FEATURES

- Unattended Logging of frequencies
- Scan Create Disk Files
- Spectrum Analysis to Screen OR Printer
- Supports PerCon, Mr. Scanner, and Betty Bearcat CD Roms
- Scan VHF & HF Icom's Simultaneously
- LINK up to 100 Disk files or ranges
- MULTIPLE search filters for Diskfile Scanning
- New - Programmable Favorite Frequency "Quick Buttons"
- Search by CTCSS & DCS tones with OS456/535 or DC440 (ICOM only)
- INCLUDES several large shortwave and VHF/UHF databases
- UNIQUE database management system with movable columns. Even SPLIT columns into doubles or triples for easy viewing of ALL important data on one screen.
- Exclusive "SLIDE RULE" tuner. Click or "skate" your mouse over our Slide-Tuner to change frequencies effortlessly! OR use our graphical tuning knob.

SCANCAT GOLD FOR WINDOWS (NON-"SE") **\$99.95 + S & H** UPGRADE TO V7.5.7 **\$29.95 + S & H**

All the features you EXPECT from a true Windows application such as:

* VERSATILE "Functional" spectrum analysis NOT just a "pretty face". Spectrum is held in memory for long term accumulation. Simply "mouse over" to read frequency of spectrum location, "CLICK" to immediately tune your receiver. You can even accumulate a spectrum from scanning DISKFILES of random frequencies!

* DIRECT scanning of most DBASE, FOXPRO, ACCESS, BTRIEVE files WITHOUT "importing"

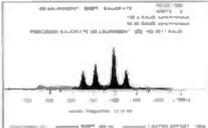
*\$5 U.S. \$7.50 FOREIGN

HOKA CODE-3 GOLD

"The Standard Against Which All Future Decoders Will Be Compared"

Many radio amateurs and SWLs are puzzled! Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know - but what about the many other signals?

There are some well known CW/RTTY Decoders but then there is CODE-3 GOLD. It's up to you to make the choice, but it will be easy once you see CODE-3 GOLD. All units have an exclusive auto-classification module that tells YOU what you're listening to AND automatically sets you up to start decoding. No other decoder can do this on ALL the modes listed below - and most more expensive decoders have no means of identifying ANY received signals! Why spend more money for other decoders with FEWER features? CODE-3 GOLD works on any IBM compatible computer with MS-DOS with at least 640kb of RAM and a VGA monitor. CODE-3 GOLD includes software and a complete audio to digital FSK converter.



Simulated Speed Measurement Module

Modes Included in BASIC package	ADDITIONAL Modes Included in STANDARD and PROFESSIONAL package
<ul style="list-style-type: none"> • Morse • RTTY/Baudot/Murray • Sitor CCIR 625-476-4 • ARQ - Navtex • AX25 Packet • Facsimile all RPM (up to 16 gray shades at 1024 x 768 pixels) • Heliscreiber-Synch/Asynch • ASCII • Pactor • WEFAX 	<ul style="list-style-type: none"> • Autospec - Mk's I & II • DUP-ARQ Artrac • TDM242/ARQ-M2/4-242 • TDM342/ARQ-M2/4 • FEC-A • SI-ARQ-ARQ-S • SWED-ARQ-ARQ-SWE • ARQ-E/ARQ1000 Duplex • ARQ-N-ARD1000 Duplex Variant • ARQ-E3-CCIR519 Variant • POL-ARQ 100 Baud Duplex ARQ • Piccolo • Coquelet • 4 special ARQ & FEC systems: TORG-10/11, ROU-FEC/ RUM-FEC, HC-ARQ (ICRC) and HMC-FEC • SYNOP decoder

CODE-3 GOLD is the most sophisticated decoder available for ANY amount of money.

CODE-3 GOLD VHF/SW DECODER \$450.00 Includes POCSAG & ACARS Plus * Modes/Options BASIC	CODE-3 GOLD VHF/SW DECODER \$595.00 With ALL Modes/Options STANDARD	CODE-3 GOLD PROFESSIONAL \$795.00 With ALL Modes/Options Plus Professional Analytical Package PROFESSIONAL
--	---	--

Now Available - Stridsberg Engineering Multicouplers - "Call for Quantity Pricing" <http://www.scancat.com/mltclqr.html>

FREE FREQ FILES **WEBSITE - www.scancat.com** **E-MAIL - info@scancat.com** **FREE DEMOS**

COMPUTER AIDED TECHNOLOGIES P.O. Box 18285 Shreveport, LA 71138
 Order direct or contact your favor dealer Phone: (318) 687-4444 FAX: (318) 686-0449 Info/Tech Support: (318) 687-2555 (9 a.m. - 1 p.m. Central M-F) Orders Only **888-SCANCAT 888-722-6228**

Oscar AO-40/Phase III-D Cliff-Hanger

After a successful launch (see last month), AMSAT OSCAR-40's 2-meter beacon went silent on December 13th while work on the propulsion system was in progress. Ground controllers had adjusted the satellite's orbit earlier that week, but as a result of fuel-valve problems, AO-40 ended up in a higher-than-planned orbit.

It had been hoped that an onboard computer timeout expected about December 16 would restart the beacon telemetry and give the ground crew some clues as to why AO-40 suddenly stopped transmitting, but for days nothing was heard on the 2-meter downlink frequency of 145.898 MHz.

NORAD confirmed the satellite was in one piece and the orbit was where it should be. Ground controllers sent the satellite "blind commands" and planned other "command-assist" routines to cycle the satellite through various receive, transmit, high-gain and low-gain antenna modes, hoping to avoid a hard reboot of the main computer.

On Christmas day, the amateur community received the excellent news that contact had been made with AO-40 through the L-band uplink and S-band downlink. "While we all realize that this is just the first step in many, without making this initial 2-way contact with AO-40, recovery would not be possible," said AMSAT-NA President Robin Haighton.

Congress Usurps FCC

In a last-minute ruling slipped into the budget bill, Congress put a ban on removing the cushions that protect FM channels, effectively killing the Low Power FM service initiated by the FCC. The FCC was allowed to license 9 stations in small markets to test the service, after which Congress itself will set the regulations and license the stations!

In the same bill, Congress also overturned regulations (already suspended by a federal court), which required broadcasters to give free air time to candidates to respond to personal attacks or political endorsements.

Supreme Court to Rule on Cellphone Taping

During a labor dispute in Wyoming a union negotiator using a cellular phone appeared to threaten a bombing attack on school board members. Someone recorded the conversation and placed the tape into the mailbox of a local radio talk show host who was opposed to the union position. That announcer gave the tape to another host who played the entire conversation on his show which was aired by WILK and WGBI in September 1993.

The two persons whose conversation was taped sued both talk show hosts and the radio

stations under state and federal laws for having used and disclosed the tape of their intercepted phone conversation.

In November 2000 the Supreme Court justices heard arguments on the constitutionality of state and federal wiretap laws which held these parties liable for airing the conversation. Their finding could define limits on telephone privacy and determine when news organizations may broadcast or print private phone conversations. Current laws prohibit disclosing contents of telephone calls that are illegally intercepted.

Justice Anthony Kennedy said there is "simply no precedent in the history of this court" for isolating certain types of speech, regardless of its content, and subjecting it to regulation. He said the laws restricting the use of wiretapped conversations have the effect of "suppressing speech that is valuable to the public."

Justice Stephen Breyer retorted that those laws preserve the privacy and dignity of individuals. And Justice Antonin Scalia said knowing that his private conversations could be published "inhibits my speech."

A ruling is expected later this year.

Local Enforcement of Citizens Band

HR2346 was passed by the 106th Congress and signed into law by President Clinton in late November. The law allows state and local governments to pass and to enforce regulations that prohibit unauthorized CD radio equipment. Stations licensed to the amateur radio service will remain under FCC oversight. A person affected by a local regulation may submit an appeal of the decision to the FCC.

NPR on Shortwave

NPR Worldwide, which transmits signature NPR programs to overseas audiences via FM radio rebroadcast, cable and satellite, has added shortwave transmissions and an international ad campaign to extend its global reach and visibility. The shortwave broadcasts deliver noted programs such as *Morning Edition with Bob Edwards* and *All Things Considered*.

Listeners with single side band shortwave receivers can pick up *NPR Worldwide* via the Armed Forces Radio and Television Service's global broadcasts. *Car Talk*, *Weekend Edition Saturday*, *Weekend Edition Sunday* and *Weekend All Things Considered* are included on shortwave. For a shortwave programming schedule and tune-in information, visit <http://www.npr.org/worldwide/shortwave.html> or call 1 202 513 2026.

DoD Contracts with Iridium

DoD awarded a two-year, \$72 million contract to Iridium Satellite LLC for unlim-

ited use of its global, satellite-based, secure telephone network. Iridium Satellite will contract with the Boeing Co. to operate and maintain the system's 73 satellites.

According to Dave Oliver, principal deputy undersecretary of defense for acquisition, technology and logistics, "Iridium will not only add to our existing capability, it will provide a commercial alternative to our purely military systems." The system offers mobile, cryptographically secure telephone services to small handsets anywhere in the world, North Pole to South Pole, 24 hours a day, officials said.

DoD used some 800 of the first-generation phones when the system was inaugurated in 1998. Connect time on that system was as much as \$5 per minute to some customers. Iridium Satellite LLC recently bought the bankrupt company's assets and expects to provide commercial service for about 80 cents a minute, Oliver said, while the Pentagon will pay 10 to 30 cents a minute. Advances in technology have also led to an improved handset by Motorola since the bulky first model. It is about twice the size of a typical cell phone and has a call-reliability rate of 95 percent, with a special encryption sleeve to ensure secure communications.

The U.S. military will use its Enhanced Mobile Satellite Services Gateway system at Wahiawa, Hawaii, to provide DoD Iridium users with direct-dial connection to the Defense Information Services Network and to public-switched telephone networks.

The Navy Hands it to the Palm

For the hundreds of sailors aboard the Navy's *U.S.S. McFaul*, queuing up to access a computer was part of the daily drill until



Feb 25: Hicksville, NY

LIMARC Winterfest 2001 Electronic Hamfair and Flea Market, located Levittown Hall, 201 Levittown Parkway, talk-in 146.850 (PL 136.5), 8 a.m., \$6 gen adm. For more info visit <http://www.limarc.org> or call 516-520-9311.

Feb 10 deadline: CIDX SW Listener Survey

The Canadian International DX Club announces its 3rd Annual CIDX Shortwave Listener Survey, honoring excellence in ten categories of international shortwave broadcasting. All shortwave listeners, worldwide, are invited to submit their top picks. For instructions, please visit the CIDX website at <http://www.anarc.org/cidx/>. All participants will have their names entered in a draw for a one-year membership in the Canadian International DX Club. Winners in each category will be presented with the annual Fessenden Awards.

more than a hundred Palm V handheld devices were issued this past summer. The 115 handhelds, along with the installation of infrared ports throughout the ship, are part of a pilot program to keep officers and supervisors connected and eliminate paper-based forms, sticky notes, and reports.

Earlier this year, the Navy deployed 2,000 Palm V handhelds to its Atlantic fleet. But the *McFaul* alone gets to test the feasibility of using infrared ports, because its crew is young and receptive to the technology. Sailors are able to send and receive email and coordinate schedules and checklists by syncing their device with one of the infrared ports located in work centers and high-traffic areas.

Sailors use the "beam" feature to send each other short messages, improving communication. A petty officer can send a message to three or four crew members about a task at hand, whereas in the past, the officer had to contact each one individually. The syncing of handhelds to infrared ports enables shipmates to share information on the fly, whether it's about a meeting or maintenance needs. And the only time sailors have to park their Palms in a cradle is to recharge them. That eliminates the need to wait in line at the workstation.

Police Off-Limits in U.K.

It's not nice to listen to the police in the U.K. When police raided the home of a York man last December in connection with an allegation that he had handled a stolen radio controlled model car, they found a scanner tuned to their own frequencies. The suspect pleaded guilty to using radio equipment without authority with intent to intercept police radio conversations. He was fined £250 with £50 costs and the charge of handling stolen goods was dropped.

Al Gross Dies

Al Gross, W8PAL, of Sun City, Arizona, passed away on December 21 at the age of 82.

Gross obtained his Amateur Radio license in 1934 at the age of 16, which helped shape the course of his career. Gross' first invention was a portable hand-held radio transmitter-receiver which he christened it the "walkie-talkie." During World War II he invented a two-way air-to-ground communications system used by the military behind enemy lines during the World War II.

"If you have a cordless telephone or a cellular telephone or a walkie talkie or beeper, you've got one of my patents," Gross once said. The Dick Tracy two-way wrist radio was based on Gross' concept of a miniaturized two-way radio.

Over the years, Gross worked as a communications specialist for several large companies. Since 1990, he had worked as a senior engineer for Orbital Sciences Corporation and was still on the payroll there when he died.

Gross received numerous awards and honors during his distinguished career; just this year he won the Lemelson-MIT Lifetime Achievement Award for invention and innovation and for playing a major role in the wireless personal communications field. *Monitoring Times* ran a series of stories on his life and achievements in September 1997.

Joe Carr Dies

Author Joseph J. "Joe" Carr, K4IPV, of Annandale, Virginia, died November 25 at the age of 57. Carr reportedly died at home in his sleep.

Carr was well known throughout the radio hobby as a prolific writer. Carr had contributed hundreds of articles over the years to various publications, including *Monitoring Times*, *QST*, *Popular Communications*, *Popular Electronics*, *73*, *Nuts and Volts* and others. At the time of his death, Carr was the "Antennas & Things" columnist for *Popular Communications*. He had written more than 100 books, including *Joe Carr's Loop Antenna Handbook*, *Practical Antenna Handbook*, *Receiving Antenna Handbook*, *Radioscience Observing, Vol 1*, and *Practical Radio Frequency Test & Measurement - A Technician's Handbook*.

Book publisher and author Harry Helms, AK6C, told the ARRL, "It's a shame most hams only knew him from his technical books and articles, for Joe's interests ranged from American history to world politics to genealogy to biomedical research," he said. "We had innumerable lengthy conversations over the years about such topics, all laced with Joe's sharp but good-natured humor."

Our sympathies are extended to Carr's wife, Bonnie.

"Communications" is compiled by Rachel Baughn, editor, from news reports submitted by our readers. Thanks to this month's reporters: Anonymous, Albany, NY; Doug Robertson, Oxnard, CA; Bob Stewart, Ft Worth, TX. Via e-mail: Wes Albright, Andy Cadier via Glenn Hauser, Robert Felton, John Figliozzi, Tom Hirsch, T. Martin, Hugh Stegman, Larry Van Horn, Robert Wyman, Surrey Electronics, and the ARRL Bulletin.

PCCardBox = ISA or PCI-card to
PCMCIA = use your
Wavecom decoder or internal
radio with your laptop



WAVECOM®
Professional real-time
data decoder/

analyzer/processor of radio communication
transmissions, variable IF-interfaces, all major HF,
VHF, UHF, SHF and SAT modes/ codes

BoardTerminal/MeteoCom®



For marine use: Weather and navigation with your
laptop. Navtex-, synop-, fax- and CW-decoder.



RadioCom®
RX+TRX DSP, CAT,
decoding CW, PSK31, SSTV,
FAX, RTTY, Scanning, etc.

ARMAP® **HAM-Label**
Graphic Logbook, HAM Maps and
QSL-cards



COMPUTER INTERNATIONAL

207 South Old-US-27
ST. JOHNS, MI 48879-1903

Tel/Fax: 1 877 977 6918 toll free

info@computer-int.com
www.computer-int.com



Rave Review
Pop Comm
April '96

SEE US ON THE WEB!
www.vikingint.com



Professional 10 HOUR RECORDER
"BUILT LIKE A BATTLESHIP"

- Heavy duty commercial recorder - NOT improvised from consumer models
- 12, 14, and 16 hour models also available
- BUILT-IN voice activation (add \$30)
- Applications information included
- Dimensions: 11.5 x 7.0 x 2.75"

**SPECIAL
Monitoring
Times Price..**

FREE
SPECIAL EQUIPMENT
CATALOG \$159

COD's OK Calif residents add tax. Sorry, no credit cards. Free catalog USA only, other countries \$5. Free shipping to 48 contiguous states on prepaid orders

Viking Systems International

100 North Hill Drive #42, Brisbane, CA 94005

Factory Direct Phone: (415) 467-1220 Fax: (415) 467-1221

"Since 1971"



International ALE Networks

By Mike Chace

Monitoring Times always likes to maintain leadership in bringing you the latest news and understanding of developments in our hobby. About a year ago, Charles Brain's incredible (and free!) PC-ALE program added a vital new component to the HF listener's arsenal – the capability to scan and monitor HF networks using the MIL-STD-188-141A Automatic Link Establishment (ALE) system. We covered it extensively then and since, and continue to enlarge our comprehensive coverage in this feature.

PC-ALE caused an explosion in a monitoring world struggling to keep up with the pace of developments in digital communications and HF modem technology. Many of the organizations covered by *MT's Digital Digest, Fed Files and Utility World* columns had migrated to new equipment beyond the decoding capability of even top-end hobbyist equipment. But, armed with a simple PC containing a standard soundcard and a copy of PC-ALE, these stations were now "back on the radar screen."

To boot, PC-ALE threw up dozens more new networks for monitors to track down and identify. In this feature, we cover those networks, both identified and unidentified in the hope that more information can come to light. In case you were wondering, US domestic and military ALE networks were extensively covered in a June 2000 feature article in *MT*, and won't be repeated here, even though many of these networks do, of course, have international coverage.

MIL-STD-188-141A ALE Redux

Despite the complicated designation and multiple capabilities of ALE, it's really quite a simple digital system consisting of 8 tones with a speed of 125bd, occupying a bandwidth of 1650Hz. The sound it makes is quite simply unmistakable (see Resources) and is mostly described as a rough "gurgling."

Just like SITOR-A's SELCALs, and AX.25 Packet Radio or PacTOR's addresses, stations in an ALE network respond to identifiers consisting of combinations of letters or numbers like "CRO," "CENTR4" or "000055555," for example. With the addition of "wildcard" identifiers, ALE can be used to address individual stations, groups of stations, or the whole network. As the examples suggest, identifiers can be either cryptic or meaningful, but generally they require some investigation to reveal the real owners of the signals. The database at Utility Monitoring Central (see Resources) now has well over 1,000 ALE unique identifiers recorded, about 20% of which have been positively identified.

In addition to the basic function of establishing communications between one or more stations, ALE is also used to regularly determine the availability and

quality of a link (or multiple links) between those stations (called Sounding and LQA - Link Quality Analysis). There are also a number of ways that networking commands and short operator messages can be passed between stations. PC-ALE can decode all these various modes.

Most organizations carry their ALE on the upper sideband (USB), but a few prefer LSB. Some also implement a special mode of ALE called LP (Link Protection), which renders the transmissions undecodable. Also, be aware that many ALE users have developed bad habits: for example, not changing their equipment's preset default identifiers and frequencies. There are numerous examples where entirely different networks operate on the same frequencies!

Diplomatic ALE Networks

Sweden

All Swedish Embassies are linked, through regional hubs, to MFA Stockholm with ALE and can be heard the world over. Actual messages are passed using a 2400bd MIL-188-110A PSK modem. Regional hubs frequently sound the links to their neighbors and to Stockholm on their assigned pool of channels.

Frequencies:

6980	7972	9070	9970	10150	10581
10587	11045	11157	11443	12225	12226
14350.5	14353.5	14404	14522	14812.5	15860
16105	16181	17415	17427	18686	18945
19423.5	20698	20942	20958	20985	22928.5
23526	23584	23591	26221		

Identifiers:

S00 MFA Stockholm
S00-99 Embassies

Romania

MFA Bucharest is linked to a number of its strategic embassies using ALE. The embassies mostly use tactical callsigns, many of which have been carried over from the old RTTY and ROU-FEC systems but few have been positively identified. Actual messages are carried on a modified 2400bd STANAG4285-type PSK modem.

Frequencies:

6689	6817	6863	7973	8025	8034	8050
9321	9322	10450	11425	13425	13468	13485
14406	16051	16321	17474	18503	20533	20550

Identifiers:

CENTR1, 2, 3, 4, 5
BLJ
CAM
FOL
GUB
HOL
KNY25
PHG
ONN33
YPM21
YPM23
YPM31
YPM37
ZJC
ZMF
ZPO
ZOW
ZUP
ZWP
ZYP

MFA Bucharest
Embassy Tel Aviv, Israel
Embassy Budapest, Hungary
Embassy Cairo, Egypt

Embassy Washington DC, USA
Embassy Berne, Switzerland
Embassy Brussels, Belgium
Embassy Stockholm, Sweden

Embassy Warsaw, Poland

Embassy Prague, Czech Republic

China

MFA Beijing is also connected to many embassies via HF ALE, traffic being carried on 2400bd MIL-188-110A-type PSK modems. Tactical callsigns are again used by embassies which makes identification difficult. A number of monitors have reported extensive operator chatter in USB voice before and after transfers.

Frequencies:

7885 9050 11105 14560

Identifiers:

115
116
118
124
161
162
166
176
YT315A
YT316A Possible Regional MFA Relay
YT362A
ZT201A Embassy Moscow, CIS?

Algeria

A number of Algeria's strategic embassies are now using the Racal MSM-1250 10-channel VFT modem which also performs set-up and link control with ALE. Identifiers are the abbreviated place names previously used on the old Coquelet-8 network.

Frequencies:

5784 10995 11475 14422 16080
16340 18758 19945 20340

Identifiers:

MAE MFA Algiers
ANK Embassy Ankara, Turkey
ATH Embassy Athens, Greece
BKO Embassy Bamako, Mali
GAO Embassy Garoua, Cameroon
NKT Embassy Nouakchott, Mauritania
NMY Embassy Niamey, Niger
RBT Embassy Rabat, Morocco
TLV Embassy Tel Aviv, Israel
TNS Embassy Tunis, Tunisia
TRN Embassy Tirana, Albania
TRP Embassy Tripoli, Libya

Military ALE Networks**Austria**

The Austrians have a contingent of peacekeeping troops in many UN-controlled zones throughout the world. ALE is used to trigger digital voice modems (vocoders), 2400bd MIL-188-110a PSK modems and other equipment.

Frequencies:

8021 10238 10259 10275 10875 14611
14675 19340 20320 20890

Identifiers:

AFD Earthquake Disaster Relief Unit, Turkey
AFDRU Earthquake Disaster Relief Unit, Turkey
AFT Earthquake Disaster Relief Unit, Turkey
AFTRU Earthquake Disaster Relief Unit, Turkey
ATCON UN Contingent, Kosovo
ATH Peacekeeping Contingent, Shkoder, Albania
ATHUM Peacekeeping Contingent, Shkoder, Albania
AUSCON UN Contingent, Nicosia, Cyprus
AUSBATT UN Contingent, Galan Heights, Syria
AUSLOG UN Contingent, Bosnia
BMLV1 Austrian Ministry of Defence, Vienna
BMLV2 Austrian Ministry of Defence, Vienna
NET1 Collective Call
NET2 Collective Call

Canada

A number of frequencies carry Canadian Military traffic, probably combined with other units such as the Coast Guard. ALE has been heard triggering USB voice, 300bd/850Hz KG84 encrypted RTTY and MIL-188-110A PSK modems. Three distinct networks appear to operate on each frequency, but do occasionally exchange messages with one another.

Frequencies:

4453 6980 7896 8050 8859 9232
10396 10156 10558 11163 11402 12185
12200

Identifiers:

Network 1: 12D, 12D1, 22D, 2LS
Network 2: CGE, CLC, CLC32, CLC44, CLC51, CLM, CLM21, CLM41, CLM46, CLM52, CRC, CRC1, CRC2, CRC3, CRM, CRM2, CRM4
Network 3: 123, CIP, CIP30, CIP38, CIP46, CIP302, CIS, CIS201, VDD, VEX

Colombia

The bases, ships and submarines of the Colombian Navy can be heard

on a variety of frequencies. ALE triggers Clover-2000 and MIL-188-110A PSK modems, an ANDVT vocoder and also plenty of USB voice chatter in both Spanish and English.

Frequencies:

4632 5500 7900 8300 8400 9085
9200 10486 10608 11155 11440 11455
13530 14582

Identifiers:

ATLANTICO Atlantic Fleet HQ
BARRANCA Barrancabermeja Squadron Base
BRIM1 1st (Atlantic) Naval Infantry Brigade
BRIM9 Naval Infantry Brigade?
CAL Corvette CMS2 "Caldas"
CALDAS3 Corvette CMS2 "Caldas"
CESYP Special Command, San Andres & Providencia Islands
COVENAS Covenas Air Base
CTG Cartagena Coast Guard Base
CTGENA Cartagena Coast Guard Base
ENS Naval Academy, Barranquilla
ENSB Naval Academy, Barranquilla
ESPARTANA Coast Guard Vessel "Espartana"
FSUBFA Submarine Flotilla HQ
GLORIA Sail Training Vessel "Gloria"
INI Inirida Port
LEG Leguizamo Naval Base
MAL Malaga Naval Base
MARQUEZ Coast Guard Vessel PM117 "Jorge Marquez"
PIJAO Submarine SS-28 "Pijao"
QUINDIO Survey Vessel B0153 "Quindio"
TUMACO Coast Guard Base, Tumaco
TURBO Coast Guard Base, Turbo

Denmark

The Royal Danish Air Force and its NATO contingents use ALE to establish communications. ALE usually triggers a MIL-188-110A PSK modem.

Frequencies:

2250 4841 5120 11130 1146812186
13435 15820 16280

Identifiers:

OWC
OWD Vaerloese
OWE Korup RCC
OWF
OWG Grazzanise, Italy
OWI
OWK
OWP
OWU
OWW

Romania

Romanian Forces can also be heard using ALE and MIL-188-110A-type PSK modems.

Frequencies:

13485

Identifiers:

RO1
RO2
RO3
RO4

Venezuela

A number of stations use ALE identifiers based on locations in the Venezuela interior and at the junctions

of major rivers, suggesting a Naval or Coast Guard operation.

Frequencies:

7810 11625 13475 15600

Identifiers:

ALI
CDD
CDDA
DYK
FDU
GUA Guasualito
GUASDUALITO Guasualito
MARACAY MAR Maracay
MARGARITA Margarita
MENEMAUROA Mene de Mauroa
MONTECANO Montecano
PTO Puerto Ordaz
PTOORDAZ Puerto Ordaz

MOI ALE Networks

A number of networks supporting various Ministries of the Interior (MOI) HF digital operations have transitioned to ALE-based equipment. Here are those positively identified thus far.

Morocco and Western Sahara

The Moroccan MOI can be heard using a combination of tactical and location-based identifiers on the following frequencies. Monitors have not yet reported any traffic following ALE.

Frequencies:

7740L 11442L 11489L 13879L
13900U 15000U

Identifiers:

DAKHLA Dakhla
DEPA
DEPJL
DEPL
DEPM
DEPN
DEPS
DEPT
DG
KENITRA Kenitra
TANTAN Tan Tan
WCNJL

Algerian Oil and Gas Networks

There are two Algerian networks with identifiers clearly connected to the extensive oil and gas fields in that country's interior. It's therefore very likely that at least one, and perhaps both networks are operated by SONATRACH - the Algerian government's energy company. Although the precise function of each network is unknown they are probably connected to communications and security operations, and remote monitoring of the pipes. SONATRACH is also known to have procured the Rascal MSM-1250 equipment which the ALE on these networks triggers.

Many ALE identifiers are the names of the fields themselves, or towns close by. Identifiers are also seen with

the common suffixes "GPL" and "30P". The assumption is that GPL is a contraction of Gas PipeLine, but the origin of 30P is unknown. Other identifiers carry the actual names of the pipelines - for example, Rhourde Nous which is on the LRI natural gas pipeline is "RNOUSLRI". It's likely that the many "SP" prefixed identifiers are guard posts or pumping equipment stations along the pipelines.

Frequencies Network 1:

5362 6981 7969 8055 9315 10244
11240 11466 11488 11489 18062

Identifiers:

ALG Algiers
ALR Alrar
AMC
BORMA Hornodet El Borma or El Borma
GT Gassi Touil
HAM El Hamra
HAMRA El Hamra
HBK Hassi Berkine or Hassi Berkoul
HMD Hassi Messaoud
HR Hassi R'Mel
INA In Amenas
INS In Salah
OHT Ohanet
RNS Rhourde Nous
TFT Tin Fouye Tabankart

Frequencies Network 2 (all LSB):

5784 6790 7739 10211 10275

Identifiers:

ALRARGPL Alrar
CNDG
DEB Debdeba
DEBDEB30P Debdeba
GASSIGPL Hassi el Gassi, Gassi El Adem or Gassi Touil
GASSI30P Hassi el Gassi, Gassi El Adem or Gassi Touil
GR1GPL GR1 Pipeline
GR2ORX GR2 Pipeline
HAMRAGPL Haoud El Hamra
HEH Haoud El Hamra
HEHGPL Haoud El Hamra
INA In Amenas
INAS30P In Amenas
MED Medera
MEDER30P Medero
OHT Ohanet
OHT1GPL Ohanet
OHT30P Ohanet
NOU Nouis
RNO Rhourde El Nouis
RNOUSLRI Rhourde El Nouis
SP1
SP130P
SP2
SP228
SP3
SP328
SP4
SP428

Algerian "KARIM" Network

The exact function of another Algerian operation, one using the long-known fictitious callsign "KARIM," is not yet fully known. It is most likely a Border Guard network.

Frequencies:

3620 5860 6945 8130 9175

Identifiers:

B12
B92
C13
C95
E13
H11
K33
O13
O23
P11
P12
KARIM2
KARIM3
R42
R52

Gabon Railways

The station identifiers of this network fit the locations of towns along Gabon's railway system. ALE appears to trigger mainly USB voice communications in French.

Frequencies:

7708 11200

Identifiers:

BB113
FRANCE Franceville
MBOUNGOU M'booungou
MILOLE Milolo
PCBOUUE Booué
PCWENDO Owendo
RC1
CC11
CC17

Tentatively Identified Networks**Australia**

This busy network was featured in Digital Digest a few months ago. The identifiers are strongly suggestive of the Australian Police, but as yet no traffic has been heard on any of the many frequencies.

Frequencies:

8055 9057 10450 11073.5 11164
12226 13375 14471 14675 14710
16270 18470 19060 19120 20420

Identifiers:

VBL, VCP, VCR, VJJ, VJZ, VKA, VKB, VKC, VKE, VKF, VKG, VKM, VJP, VKY, VKW, VOC, VOX, VTQ

UK

This very active and widely dispersed network carries three letter place name identifiers that are very suggestive of former British Diplomatic HF stations.

Frequencies:

6845 7992 9306 10392 10662
11008 11096 11523 12144 13149
13456 14580 14776 14814 15877
16640 16934 17490 18277 18974
19464 19977 20602 21867 23822
24268

Identifiers:

ALE identifiers and likely locations are:
ABA Addis Ababa, Ethiopia
AMM Amman, Jordan

ASI Asuncion, Paraguay or Ascension Island
AZQ Azores?
BLE Belgrade, Serbia
CUB
CYP Nicosia, Cyprus
DEL New Delhi, India
DKL possibly Dekhelia Sovereign Base, Cyprus
DUB Dublin, Ireland or Dubai, UAE
FCB
FP2
HFB
HSP Net Control Station, Hanslope UK
HS2 Net Control Station
ISL Islamabad, Pakistan
KIV Kiev, Ukraine
KUW Kuwait City, Kuwait
LAG Lagos, Nigeria
LUA Luanda, Angola
MOS Moscow, CIS or Mostar, Bosnia
PRI Paris, France or Pristina, Kosovo
RIY Riyadh, Saudi Arabia
RYN
SOG
SRP
YNA Vienna, Austria or Vicenza, Italy
YQE

Unidentified Networks**The "AFO, KAI, CH" Network**

This network also has a large number of frequencies and has been heard the world over. ALE bursts are often link-protected and precede 110A-type PSK burst modem activity. This network is rumored to be run by the Swiss Diplomatic Service.

Frequencies:

5802 6980 6985 7720 7725
7915 9185 9308 10190 10238
13452 13457 15888 15893 16143
17452

Identifiers:

AFO
AFO1
CH1
CH11
KAI
KAI1

The "000000" Network

Rumored to be Iranian in origin, this network sports a very distinctive set of numerical ALE identifiers beginning "000000". It appears that the leading 6 zeroes are also dropped sometimes.

Frequencies:

6966 7620 7820 10360 11492
11495 11556 12134

Identifiers:

0000001111
0000001220
0000001230
0000001240
0000001290
0000004444
0000005555
0000006136
0000006137
0000006138
0000006666

The "BB1" Network

So-called since the identifier BB1 appears to do all the work on a number of channels.

Frequencies:

6864 7734 10614 10900 11349

Identifiers:

102
BB1
TSR
TYS

The "Spanish Animal" Network

This network is probably a Central or South American Army operation and sports identifiers made up of animal names.

Frequencies:

8047 9025

Identifiers:

CENTELLA
DRAGON
LEOPARDO
PISIS
TIGRE

Angolan Network

The identifiers and propagation characteristics of this network suggest Angolan locations. The ALE precedes Rascal MSM-1250 modem traffic.

Frequencies:

7990 8859

Identifiers:

BGA Benguela
CUN Cunene
LD2 Luanda
KNK Kuando-Kubongo
KSL Kwanza-Sul

The "X7, A5" Network

So-called due to the appearance of these two identifiers on all channels. This network has also been linked with Algerian MOI or Military operations, but this is as-yet unconfirmed. This is perhaps due to the similarity with some of the identifiers in the Algerian "KARIM" network.

Frequencies:

5430 5754 5855 7650 7786 7830
8046 8164 8096 8334 11130 12160
14550

Identifiers:

202
333
3333
5
A4
A5
B1
DP2
EC3
EC6
GF5
GLOBAL
I5
K2

L4
O1
O2
P2
P4
Q4
R2
T6
U7
V3
W2
X7

The "2222, 3333, 5555" Network

This network is again rumored to originate from Algeria. The user is unknown.

Frequencies:

7753 7966 8334

Identifiers:

0000
222
2220
2221
2222
3333
5551
5552
5555
5556
5557

The "VFO, TAC" Network

This network has a wide variety of frequencies and has also been heard the world over. ALE triggers encrypted voice and high-speed modem activity. Link-protected ALE is also used.

Frequencies (all LSB):

6847 8080 10155 11429 12103
17466 20400

Identifiers:

23F DCH
23R FON
24E FR3
4P0 FVJ
APM HLA
ASI LIO
ARI NF9
B69 NR3
BRE OFM
BRZ PPZ
BUR RPI
CAZ SOS
CAS TAC
COS VFO
DCC

Acknowledgements

Thanks to Day Watson, Peter Thompson, Leif Dehio, Al W Hussein, Jack Metcalf, and MidAtlantic DXer for their help in putting this article together.

RESOURCES

Utility Monitoring Central
<http://www.mindpsring.com/~mika.chace>
Worldwide Utility News (WUN)
<http://www.wunclub.com>
MIL-188-141A ALE Spec
<http://www.its.blrdoc.gov/fs-1045a/>
MIL-188-141A ALE Sound Clip
<http://rover.wiesboden.neturf.de/~signals/WAV/MIL-STD-188-141A.WAV>

GROVE

UNIDEN

BC780XLT	SCN 49	\$349.95
BC245XLT	SCN 35	\$199.95
BC895XLT	SCN 9	\$194.95

ALINCO

DJ-X2T	SCN 3	\$269.95
DJ-X10T	SCN 1	\$349.95

AOR

AR8200IIB	SCN 50	\$559.95
AR3000AB	SCN 26	\$1062.95
AR8600	SCN 8	\$899.95

YAESU

VR-500	SCN 6	\$324.95
--------	-------	----------

ICOM

R10	SCN 4	\$289.95
R2	SCN 5	\$189.95
R3	SCN 7	\$499.95

ANTENNAS

Austin Condor	ANT 14	\$29.95
Grove Scanner Beam	ANT 1	\$74.95*
800 MHz Portable w/straight conn.	ANT 22	\$29.95
800 MHz Portable w/right-angle conn.	ANT 23	\$34.95
OMNI II Scanner	ANT 5	\$29.95*
Professional Wideband Discone	ANT 9	\$99.95*
2 1/2" Long Close Range	ANT 18	\$15.95
Scantenna + 50' coax	ANT 7	\$54.95*
Stealth Mobile Monitoring	ANT 30	\$34.95*
Universal Telescoping	ANT 19	\$14.95
H800 Skymatch Active	ANT 15	\$129.95
Active Duck	ANT 36	\$49.95
Select-A-Tenna	ANT21	\$59.95
Super Select-A-Tenna	ANT 40	\$189.95
AOR DA3000 Aerial Discone	ANT 11	\$129.00
AOR MA500 Wide Range	ANT 12	\$99.00
AOR SA7000 super-wide receiving	ANT 39	\$189.95

Shipping/Handling Charges

Total Order	Shipping Charges
\$1-\$99	\$5.95
\$100-\$399	\$7.95
\$400-\$899	\$11.95
\$900-\$1499	\$15.95
\$1500-\$1999	\$19.95
\$2000-\$2499	\$23.95
\$2500+	\$27.95

*price includes shipping within the US
Prices subject to change without notice.

ACCESSORIES

UNIDEN BC SCANNERS

Computer interface cable for BC895	ACC 15	\$29.95
Scanner Master Reaction Tuner	ACC 22	\$69.95
BP-180 Uniden battery pack	BAT 5	\$19.95
BP120 spare battery & charger	BAT 24	\$25.95
BC235/245 hard leather case	CAS 3	\$29.95
DC cord	DCC 7	\$15.95

ALINCO SCANNERS

EBP-34N Longlife NiCd battery	BAT 21	\$79.95
EBP-37N Standard battery	BAT 21A	\$39.95
EDH-16 battery case, 4 "AA"	BAT 22	\$9.95
DJ-X10T soft case	CAS 19	\$12.95
EDC-36 car lighter cable w/filter	DCC 14	\$23.95

AOR SCANNERS

Extended memory card for AR8200II	ACC 27	\$79.00
AR8200II leather case	CAS 21	\$29.95
AR8200II soft case	CAS 25	\$12.95
Tape recording lead for AR8200II	CBL 7	\$61.00
Computer control lead for AR8200II	CBL 8	\$109.00
Interface cable- Opto Scout/AR8200II	CBL 9	\$35.00
AC adaptor for AR8200II	PWR 24	\$21.95

YAESU SCANNERS

Cigarette lighter cable for VR-500	DCC 17	\$22.95
VR-500 cloning software and cable	SFT 25	\$39.95

ICOM SCANNERS

R3 battery pack	BAT 4	\$46.95
R2 soft case	CAS 20	\$29.95
R3 leather case	CAS 2	\$19.95
R3 Cigarette Adaptor	DCC 18	\$24.95
R3 drop-in charger	PWR 15	\$69.95
R2 CS-R2 cloning software	SFT 7	\$12.50
R3 software for Windows 95/98	SFT 14	\$19.95

MISCELLANEOUS ACCESSORIES

Audio cassette adaptor	ACC 79	\$5.00
50' of RG-6U cable	CBL 50	\$19.95*
100' of RG-6U cable	CBL 100	\$24.95*
Universal Cigarette Adaptor	DCC 3	\$12.95
GRE Super Amplifier	PRE 1	\$49.95
Scancat Gold for Windows	SFT 2W	\$99.95
Scancat Gold for Windows SE Upgrade	SFT 2SE	\$59.95
2001 Police Call CD-ROM	SFT 22-01	\$34.95
Professional antenna switch	SWC 1	\$25.95

Grove Enterprises, Inc.

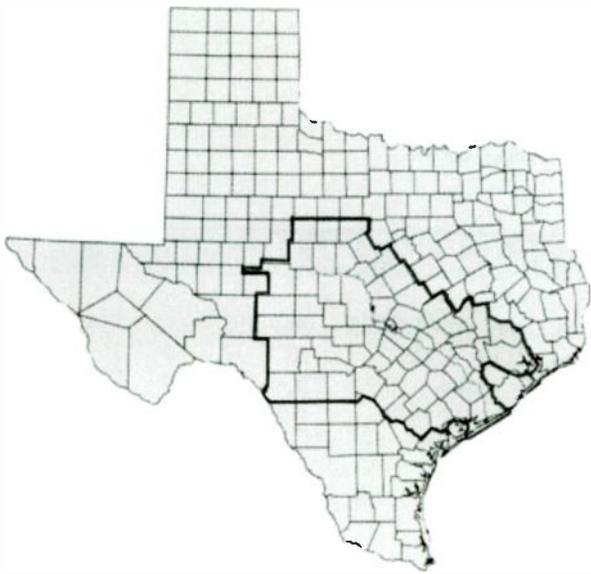
(800) 438-8155; (828) 837-9200

(828) 837-2216 fax

7540 Hwy 64 W; Brasstown, NC 28902

order@grove-ent.com

www.grove-ent.com



Inside the Lower Colorado River Authority

By John Mayson

Anyone who has spent time in central Texas has undoubtedly heard of the Lower Colorado River Authority or LCRA. According to their web site <http://www.lcra.org/>, the Lower Colorado River Authority is a conservation and reclamation district created by the Texas Legislature in 1934 and signed into law by Governor Miriam A. Ferguson to improve the quality of life in the Central Texas area. It receives no state tax money and cannot levy taxes. It operates on revenues from wholesale electric and water sales and other services.

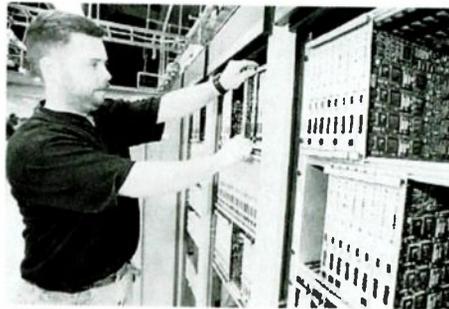
The LCRA supplies electricity to more than a million Texans through 44 wholesale customers, including 11 electric cooperatives and 33 cities. It also serves numerous water customers, including cities, the rice-growing industry and municipal utility districts. The LCRA also provides many other services to the region, including managing floods, protecting the quality of the lower Colorado and its tributaries, providing parks and recreational facilities, and offering economic development assistance, helping water and wastewater utilities and providing soil, energy and water conservation programs.

If the LCRA sounds a lot like the Tennessee Valley Authority (TVA) you're not far off. Both are Depression-era, quasi-government entities dedicated to soil and water management and power creation and distribution. Both also have created conservation and recreation areas inside their jurisdictions. However, they differ in that the TVA is federal and the LCRA is a state agency.

LCRA Communications

From a radio hobbyist's standpoint, the most interesting service of the LCRA is their 900 MHz Ericsson Com-Net EDACS trunked

radio system that covers an area larger than some states. How large is their system? It's a multisite, 35-tower system with data and telephone interconnect capabilities covering 58 out of Texas' 254 counties. The coverage area runs along the Colorado River basin, roughly from Kerrville, north to Richland Springs and



An engineer inspects the controller hardware at LCRA headquarters in Austin (source: LCRA).

Brady, southeast to Victoria and Bay City, and includes the area between San Antonio and Georgetown.

The towers are linked together with a hybrid fiber and microwave point-to-point network. Computers at LCRA headquarters in Austin control the entire system. There is plenty of space on the system that allows public sector groups to have clear and ready communications. Some of the users include: Texas Department of Transportation, San Marcos Police, Hays County Sheriff's Office, Elgin Police, and the Boerne Police. Due to FCC restrictions and the LCRA charter, service can only be provided to government, public safety, and non-profit entities.

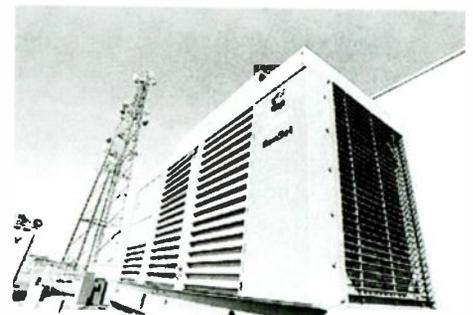
While cities and counties in central Texas have been proposing, building, and troubleshooting their own trunked systems, the

LCRA has quietly and successfully created what is one of the largest trunked systems in the United States. It offers virtually seamless communications to all of its users along a 300-mile long and 100-mile wide swath of central and southeastern Texas. It's quite an impressive system that is a lot of fun to monitor.

What You Will Need

Not too long ago LCRA relied on their VHF low band system for communications. Non-LCRA entities used their own VHF systems. As central Texas grew, LCRA outgrew their low band system and opted to build an EDACS 900 MHz trunked radio system. Prior to 1999 your only off-the-shelf solution to monitoring was scanning on a conventional scanner. With the advent of the Uniden BC245XLT and subsequent trunking capable scanners, true scanning of this system was made possible. The area is saturated with repeater sites, so even with the stock rubber duck antenna I can hear several of the repeaters.

As with all EDACS systems, the frequencies must be entered into your scanner in the correct LCN order. Determining the proper order often is a time consuming task unto itself. It's this procedure I find the most frus-



An Austin area tower and generator (source: LCRA).

trating, yet the most rewarding. There is virtually no useful information about this system published anywhere, so by monitoring and figuring out this system, you'll be blazing new trails. The information I present in this article comes from tedious research of the FCC database, driving out to different cities to monitor, and from various monitors on the CenTexComm email reflector hosted by eGroups.com. Fellow Austinite Robert Barker has been an enormous help to me in figuring out the talkgroups.



Twin towers of the LCRA Round Rock site and the Williamson County TRS.

The Future

Public safety communications are in a state of flux in central Texas. Bexar County, which includes San Antonio, is phasing out their Motorola analog trunked system in favor of a digital EDACS system. Austin has proposed a \$70 million digital Motorola trunked system for all of Travis County. Cedar Park chose not to join Williamson County's analog Motorola system and is instead building a trunked system of its own.

Mutual aid communications are virtually non-existent in central Texas, placing the lives of law enforcement officers and fire fighters on the line. When Travis County deputies and Austin police officers respond to a dangerous incident such as a hostage standoff, they have no way to talk to one another. Lack of communications in a high intensity, possibly lethal situation, is a dangerous mix to say the least.

We have problems within our city, too. A high-rise apartment building caught fire in downtown Austin. APD and AFD units responded, but again could not talk to each other. Firefighters needed police officers to

Table 1: Facts about the LCRA mobile radio system

The system can handle 12,000 mobile radios, though it is upgradeable to 40,000 mobile radios as growth demands system upgrades.

The system allows for 1,500 mobile data terminals (MDTs), though ultimately 10,000 MDTs can be used.

Data rate is 9,600 bps; it is spectrum efficient at 12.5kHz; and can migrate to 6.25kHz. The spectrum usage meets all current and proposed FCC requirements. The voice and data stream is currently analog and will eventually be digital.

Telephone interconnect capability, while limited, is available, as is portable coverage in designated locations.

Mobile coverage is 95 percent within the Colorado River basin and 90 percent elsewhere, providing reliable mobile communications to virtually every paved road in LCRA's service territory throughout Central Texas.

LCRA uses their trunked system to poll rain and river gauges, collecting and analyzing the data at their Austin headquarters.

control crowds and help with traffic control, but had to relay communications through two sets of dispatchers.

Listening to communications after a bank robbery has convinced me there is something seriously wrong with law enforcement communications in this city. Austin Police cannot speak directly to any neighboring jurisdictions including the various sheriffs' offices. The Texas Department of Public Safety, our state police, has a helicopter, but Austin relies on telephone calls and pagers to DPS to get the bird in the sky. Meanwhile the state troopers on the ground have no idea a bank robbery has taken place and could presumably drive right past the suspects.

I see the LCRA's trunked system as the perfect solution to central Texas radio woes. It would give police, sheriff, fire, and EMS units seamless wide area coverage. The system could easily be configured to allow effective mutual aid communications. A talkgroup or talkgroups could be

Table 2: Call letters assigned to the LCRA for trunked radio use

WPLV352: Burnet, Fowler Ranch
 WPLZ918: Lometa, Boerne, Brenham, Calumbus
 WPLZ920: Doss, Legion, Lukenbach
 WPLZ926: Cypress Mill, Mountain Top, Round Rock, Bostrap, Smithville
 WPLZ929: Flatonia, Gonzales, La Grange, Sealy
 WPLZ933: Valley View, Bay City, Washington
 WPMI700: Austin (North), Austin (South), New Taiton, Elgin, Hallettsville, Kingsbury
 WPMZ642: San Marcos, Richland Springs
 WPN5694: Junction
 WPQA513: Vonderpool, Schulenburg, San Antonio, Seguin
 WPQE347: Victoria, Brady, Mason

linked to the statewide VHF mutual aid pair or to the 800 MHz mutual aid frequencies allowing users not on the LCRA system or users from others parts of the state to communicate in time of crisis. Law enforcement could make use of the fleet talk to announce BOLOs. Since the infrastructure is already in place (at no cost to taxpayers, I might add), the various agencies would only pay for their radios and a monthly fee that would be a tiny fraction of the tens of million dollar price tags we're being handed.

In Closing

I have enjoyed figuring out the LCRA system. Lack of time has prevented me from driving out to every LCRA repeater to determine the LCN order and possibly find more users and talkgroups. I am very interested in hearing from you if you have information you'd like to share. You can visit my web site at <http://www.qsl.net/kc4vjo/radio/> or email me at jmayson.ee92@gtalumni.org.

About the author

John Mayson has been a radio hobbyist for almost twenty years and works as a test engineer in Austin, Texas.



Mansfield Dam (LCRA)

Table 3: Repeater Frequencies. LCN order is given when known.

Austin (North) 1=935.2500 2=938.7000 3=937.7000 4=936.6750 5=935.1375 6=939.7000 7=935.2250 8=935.4000 9=937.4500 10=937.9875 11=938.1875 12=939.4375 13=939.9250	939.9125 Boerne 1=935.4875 2=935.9500 3=937.0000 4=938.9625 5=939.9125 Brady 935.4875 937.4875 938.9625 939.9625	3=937.4500 4=938.0000 Elgin 1=935.6500 2=936.1750 3=937.2250 4=938.2500 5=939.2500 6=935.4250 7=936.2125 8=937.9625 9=938.2125 10=939.4875	Kingsbury 1=935.4125 2=936.0000 3=938.9125 4=939.0000 5=937.4375 6=939.4500 7=939.9000 8=939.9625	2=935.9000 3=936.3875 4=937.4875 5=938.4750 New Taiton 935.4375 935.9000 936.3875 937.4875	935.9750 937.9500 938.5000 Seguin 935.5000 936.4500 936.9000 937.4000 937.8875 938.1500 938.4000 938.4875 938.8875 939.4250
Austin (South) 1=935.2125 2=935.6750 3=936.2000 4=937.2000 5=938.2250 6=935.1750 7=936.7250 8=937.7500 9=935.2375 10=937.4625 11=938.6750 12=939.7500	Brenham 935.4625 935.9250 937.9750 939.1500 Burnet 1=935.7000 2=936.7000 3=936.9500 4=937.2500 5=937.7250 6=939.9375	Flatonia 935.2500 936.6750 937.7000 938.7000	La Grange 935.4875 935.9500 936.4500 937.1375 937.4500 938.0000 938.4000	Richland Springs 935.4625 935.9250 937.9750 939.1500 939.5000	Smithville 935.7000 936.7000 937.2500 937.7250
Bastrop 936.2375 936.4250 936.9250 937.3875 937.4125 937.9000 938.4500 939.1375 939.4750 939.6750	Columbus 936.4875 937.9250 938.4250 938.7250 939.7250 Cypress Mill 1=936.7500 2=937.1750 3=937.6750 4=938.1375 5=938.7500	Fowler Ranch 1=935.6500 2=936.1750 3=937.2250 4=938.2500 5=939.2500	Legion 1=935.4125 2=936.0000 3=939.0000 4=939.4500	Round Rock 1=935.4875 2=935.9000 3=937.0000 4=938.9625 5=939.9125	Valley View 1=935.7000 2=936.7000 3=937.2500 4=937.7250
Bay City 935.4875 935.9500 937.0000 938.9625	Junction 935.3875 935.9750 937.9500 938.5000 939.8875	Gonzales 935.4375 935.9000 936.3875 937.4875	Lometa 935.3875 935.9750 937.9500 938.5000	San Antonio 936.1500 938.0000 938.9250 939.9375	Vanderpool 935.3875 935.9250 938.5000 939.8875
	Mason 935.4625 937.4125 937.9750 939.5000	Hallettsville 935.2125 935.6750 936.2000 937.2000	Lukenbach 1=936.4250 2=937.3875 3=937.9000 4=938.4500	San Marcos 1=935.4625 2=935.9250 3=937.9750 4=939.1500 5=939.5000	Victoria 936.1500 938.0000 938.9250 939.9375
	Doss 1=936.4500 2=937.1375		Mountain Top 1=935.4375	Schulenburg 935.1375 937.6750 938.9000 939.9125	Washington 935.4125 936.0000 937.0000 939.4500

Table 4: LCRA Talkgroups

02-001 LCRA Control Center	02-087 LCRA	04-056 San Marcos Police
02-002 LCRA Control Center	02-091 LCRA River Operations	04-061 LCRA
02-010 Texas Department of Transportation	02-102 LCRA	04-072 LCRA
02-011 LCRA	02-103 LCRA	04-073 Unknown
02-025 Unknown	02-113 LCRA	04-081 Boerne Police Dispatch
02-050 LCRA Lockhart Power Crews	02-114 LCRA	04-082 Boerne Police Channel 2
02-051 LCRA Giddings Power Crews	02-122 Marble Falls Bike Rodeo	04-083 Boerne Police
02-052 LCRA Bastrop Power Crews	02-132 969 VFD Dispatch	04-087 MDT
02-054 LCRA Giddings Power Crews	02-133 LCRA	04-101 Fredricksburg Police Dispatch
02-062 LCRA TC24	02-136 Hays County Intercity	04-103 Fredricksburg Police
02-063 LCRA	02-141 Hays County Sheriff's Office Dispatch (155.865 MHz simul-cast)	04-121 Unknown
02-066 LCRA Control Center	02-142 Hays County Sheriff's Office	04-124 Unknown
02-073 LCRA Rangers Dispatch	04-011 Capital Area Rural Transportation Service	10-025 Elgin Police Dispatch
02-074 LCRA Rangers Car-to-Car	04-012 Capital Area Rural Transportation Service	10-026 Elgin Police Channel 2
02-075 LCRA Bike Rodeo	04-013 Capital Area Rural Transportation Service	10-031 Bastrop County Sheriff's Office
02-081 LCRA East Communications Center	04-014 Capital Area Rural Transportation Service A Channel	10-035 Texas Department of Transportation
02-083 LCRA Central Communications Center	04-051 San Marcos Police Dispatch	10-037 Texas Department of Transportation Courtesy Patrol
02-086 LCRA	04-052 San Marcos Police	10-043 Unknown
	04-054 San Marcos Police	10-073 Texas Department of Transportation
	04-055 San Marcos Police	10-079 Texas Department of Transportation
		15-143 LCRA EOC

Table 5: Determining LCN Order

LCRA was actually fairly kind to radio monitors when they planned their frequencies. Many of their sites are configured such that the LCN order is simply the numerical order of the frequencies. Here are a few tips that can help you determine the LCN order of an LCRA repeater. Some of these tips can be applied to any EDACS system.

Most, but not all, LCRA repeaters have the control channel on LCN 1. This will not apply to EDACS systems in general.

One feature of the Uniden BC245XLT is the ability to display the frequency being received while trunking. This is accomplished by pressing and holding down the LIMIT key until you hear two short beeps. If you have a second scanner, or are quick to take the Uniden out of trunk mode, you can determine if the LCN order of a particular frequency is correct by comparing where the scanner sent the reception of the transmission and where it actually went. This is best demonstrated with an example.

Suppose a local EDACS system has five frequencies: 935.0000, 936.0000, 937.0000, 938.0000, and 939.0000 MHz. Let's assume 936.0000 MHz is the control channel. Enter the frequencies in numerical order, and then enter the same frequencies into another scanner. Start trunk tracking the system with your Uniden, remembering to press and hold the LIMIT button.

Soon you lock onto a talkgroup. The Uniden is flashing between the talkgroup identifier and the frequency, which is 935.0000 MHz. On your other scanner in conventional mode, you hear the same conversation on 935.0000 MHz. You have now proven LCN 1 is 935.0000 MHz.

You continue scanning. You get another talkgroup, but you have an awful buzzing noise coming from your Uniden which is flashing 936.0000 MHz. Your conventional scanner has stopped on 939.0000 MHz. This tells you 939.0000 MHz is in the wrong slot. The EDACS system sent your Uniden to LCN 2 which should've been 939.0000 MHz. Instead you went to 936.0000 MHz which is the system's control channel. Swap the two. Your LCN order now looks like this:

- 1=935.0000 MHz
- 2=939.0000 MHz
- 3=937.0000 MHz (not verified)
- 4=938.0000 MHz (not verified)
- 5=936.0000 MHz (not verified)

Continue the process until you have determined all of the LCN designations. You might find that all the frequencies are not being used. On systems with many frequencies, you will want to scan in conventional mode, locking out the frequency as your hear traffic, until you no longer receive anything. Review your lockout list and place those frequencies at the top of your LCN order and the inactive at the bottom. While it is possible the active frequencies could be assigned a higher LCN number than the inactive, it's been my experience this is not usually the case.

Those of you with access to the Internet might want to visit the GTRAC LCN page at <http://ourworld.compuserve.com/homepages/brennan/eprog.htm> for more information about LCN.

Table 6: Key to Acronyms

BOLO: Be On the LookOut. When a major crime suspect flees the scene, law enforcement agencies will issue a BOLO asking all officers to look for this person.

EDACS: Enhanced Digital Access Communications System. A trunked radio system first developed by General Electric, then sold to Ericsson.

LCN: Logical Channel Number. Unlike other trunked systems, the order in which EDACS frequencies are entered into a scanner is important. Follow the LCN order (see Table 5).

LCRA: Lower Colorado River Authority. A governmental entity in Texas tasked with managing water, power distribution, and land in central Texas.

TRS: Trunked Radio System.

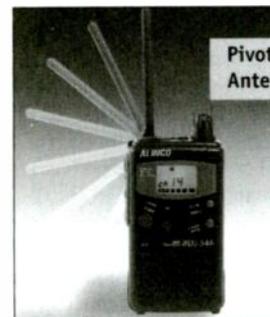
STOP! LOOK & Listen to This!

Alinco DJ-X10T – We've reinvented the multichannel receiver!

- 1200 memories plus two VFOs
- 100 KHz – 2 GHz coverage*
- WFM, NFM, AM, USB, LSB and CW modes
- Alphanumeric channel designations – up to 3 lines
- Multi-function Channel Scope™ display
- Internal "help" function
- PC programmable
- Beginner and Expert operating modes
- Automatic Memory Write Feature
- Auto timer on/off, internal clock
- Backlit display and keys



The Alinco DJ-S46 FRS radio will have YOU talking!



- NO License Needed
- Up to 2 mile range**
- 14 Channels
- FM Transmit/Receive
- NiCd, Alkaline or External Power
- Long Battery Life
- Self Storing Antenna
- Compact Size
- Simple Operation
- Lighted Display
- Accessory Ports
- Compatible with other FRS radios

Visit our web site!

Simple • Clean • Dependable

ALINCO
RADIO'S VALUE LEADER™

Dealer Inquiries Welcome

U.S.A. Alinco Branch: 438 Amapola Ave. Suite 130 • Torrance, CA 90501

Phone: (310) 618-8616 • Fax: (310) 618-8758

Internet: <http://www.alinco.com>

*Cellular blocked. **Effective operating range varies due to terrain, channel use, batteries and other conditions

A Family Affair
The R.L. Drake Story

A Family Affair
The R.L. Drake story

- Brand new!
- Printed October 2000
- 23 Chapters
- 300 Pages
- 150 Photos
- Glossy four color cover
- Over 150 pages of radio mods.
- \$29.95 (+\$4.95 ship)

John Loughmiller KB9AT reveals the behind-the-scenes history of the famous R.L. Drake Company, focusing on the glory days, when Drake was king in amateur radio. Every ham and SWL knew R.L. Drake from the outside, but now the inside story of this incredibly interesting company is told. This book also includes 150 pages of useful circuits and modifications for many Drake amateur radios. An entertaining read and a great technical reference for every Drake owner.

Universal Radio
6830 Americana Pkwy.
Reynoldsburg, OH 43068

- ◆ Orders: 800 431-3939
- ◆ Info: 614 866-4267

www.universal-radio.com



StarBand vs. DirecPC: High Speed Internet Access Via Satellite

By Ken Reitz KS4ZR

Five years ago most of us didn't know the Internet from a hair net and now we can't get through the day without checking our e-mail or surfing the Web. As with all modern electronic conveniences we've quickly found we're lost without them. Anyone want to give up their VCR? Digital satellite dish? Cell phone? I didn't think so. Still, with each of these contraptions it's not long before we've worked up a list of complaints.

One of the biggest complaints consumers have with the Internet has to do with the speed with which we can work the Web. While most computers now come with modems capable of 56 kilobits per second (kbps) many find that the best they can get out of their Internet Service Provider (ISP) is 32, 28 kbps or less. So, no matter how fancy your computer is, how fast the processor speed, or how high your modem is capable of operating, you can only go as fast as

your ISP connection. It's like trying to run a foot race with a couple of cinder blocks strapped to your ankles.

There are alternatives. Folks living in areas where digital cable service is provided may have access to high speed Internet service with speeds up to 500 kbps. The beauty of this service is that it doesn't use a telephone line at all. It uses fiber optic cable to allow expanded cable TV service, as well as two way Internet activity. Other areas are served with Integrated Services Digital Network (ISDN) and Digital Subscriber Lines (DSL) capable of duplexing your phone line with Internet access. You can get high speed Internet access and make and receive phone calls on the same line at the same time.

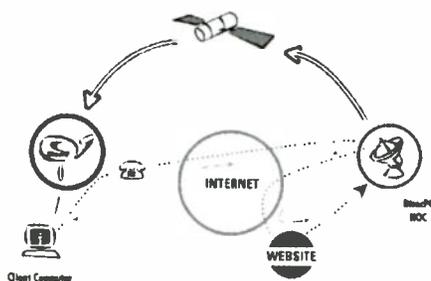
Unfortunately, digital cable service, DSL and ISDN lines are currently the privilege of select cities. The rest of us are left to plod along the information super highway at a walking pace. Or are we?

tions center at up to 56 K. (*See News Flash regarding the new DirecPC 4.0 - ed*)

While this plan has drawbacks, it certainly answers the problem of being able to receive high speed data necessary to download audio or video streaming web sites which are simply impossible on clogged land lines at speeds less than 56K. DirecPC also allows you to receive DirecTV programming via the same dish (called a DirecDuo system) which features a dual feed for downloading Internet data and satellite programming. A separate subscription for the video services is required.

If you want to keep your existing cable, C-band satellite or DISH network programming you can still get DirecPC by getting their single-function DirecPC dish with satellite modem. By starting out with a DirecDuo dish you can add DirecTV later if you wish. The single-function system typically retails for about \$150 while the

DirecPC One-Way Satellite Internet Service [<http://www.direcpc.com/consumer/what/services.html>]



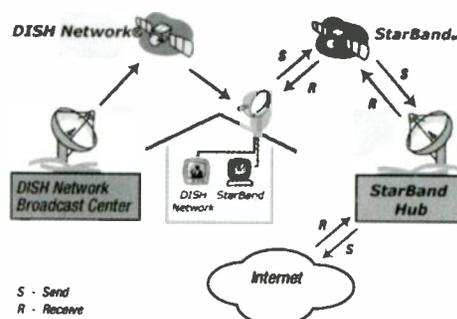
Accessing DirecPC's Operations Center via land line brings Internet data to your computer via satellite at speeds up to 400 kbps (eight times faster than a 56K modem).

Help from Above

Just as the small dish satellite TV revolution successfully challenged the domain of cable TV, satellite delivered Internet access is offering a real alternative to phone line Internet access. Particularly in areas where there's not likely to be high speed Internet service for years to come. There are currently two companies offering such service, each with their own little twist on delivery.

The first company to address the problem of high speed Internet access was DirecPC, a product and service of Hughes Network Systems. Using a 24 by 36-inch elliptical, off-set fed satellite dish for reception and a high speed satellite modem attached to your computer, web sites can come screaming down at 400 kbps. DirecPC 3.0 uses a standard telephone modem to route your Internet requests to their opera-

StarBand Two Way Satellite Internet Service [<http://www.gilat2home.com/howitworks/index.htm>]



Accessing StarBand Hub via home based satellite transceiver brings Internet data to our computer at speeds up to 500 kbps.

DirecDuo system typically sells for \$550. Limited Internet access (25 hours/month) can cost as low as \$20/month (you provide your own ISP), or, for \$30/month they'll give you the same limited access and their ISP. Unlimited access using your ISP is \$40/month while unlimited access with their ISP is \$50/month. DirecPC requires a VISA, Mastercard or American Express account for billing purposes.

The second company to enter the market is called **StarBand** and is the combined efforts of a strategic partnership which includes Gilat Satellite Networks, Microsoft, EchoStar (the bucks behind DISH Network TV) and the more than 7,000 Radio Shack locations which will be selling the StarBand system and the specially designed Compaq computers in which the satellite modem will be built in. StarBand differs from DirecPC in that it requires *no* phone line. Instead, the satellite modem is actually a satellite transceiver capable of sending as well as receiving high speed Internet data using the 24 x 36-inch StarBand dish. Download speeds may be as high as 500 kbps and uplink speeds as high as 150 kbps. This would be most useful in transmitting large chunks of data such as photographs.

You may use your current computer if it measures up to StarBand requirements (see chart) or you can have Radio Shack "build" a Compaq Presario 232 computer for you. To do so you'll have to deposit \$300 at your Radio Shack dealer and cough up another \$950 when your computer arrives. Thereafter, StarBand's

unlimited, high speed up/down link service will cost \$60/month. For customers who already have a capable computer the StarBand Model 180 satellite modem will be available through DISH Network dealers. The satellite modem plugs into an existing USB port.

StarBand/DirecPC Pros and Cons

If you're just starting out in the world of Internet activity and don't have a personal computer at home the StarBand/Radio Shack/Compaq computer seems a good route to take. You'll get a great computer tailor made for StarBand Internet use. If you've already got a computer capable of handling the high speed satellite delivery requirements, the initial investment in the dish/modem for either system will not be that significant. And, if you look just at the monthly service fees there's only \$10 difference between the two radically different services. Prices for both services are closely parallel to what you'd pay for a DSL line, if you could get one.

You only need to decide if you have to be transmitting high speed data to make the choice. For instance, if you're downloading streaming audio or video web sites there's no need for high speed uploading. Once you're connected to the site you're no longer using any uploading. With the DirecPC system you can still use your phone line to make and receive calls just as with StarBand until you wish to disconnect.

Either one of these two systems is just what people in rural or underserved suburban areas need to allow them to have high speed Internet

services. The comparisons between small dish satellite TV and what it's done for underserved cable-TV areas can't be ignored. It could be years before most areas of the U.S. are served by high speed data land lines. Still, other comparisons shouldn't be ignored either. Six years ago, at the dawn of the small dish satellite TV revolution, there were five satellite TV service providers. Now there are two.

With only two satellite-delivered high speed data systems on the market it's legitimate to ask which is more likely to survive. In addition, monthly subscription rates for original satellite TV programming were considerably less than they are now. It's entirely possible that quoted monthly rates for unlimited Internet access could rise as dramatically as they did for satellite TV, particularly if one service is forced out of the market.

Another consideration is system installation. StarBand installations must be professionally installed. This is because the system is actually a satellite transceiver and StarBand wants to make sure your signal is actually getting to the satellite. For this reason StarBand can't go mobile on the road with you, either. The installation has to stay put. On the other hand, DirecPC systems can be installed by the consumer and they can be carted around the country just as DirecTV and DISH satellite TV systems can.

In addition, while both claim to provide high speed service, there may be times when data delivery drops far below advertised speeds. StarBand states, "...StarBand's goal is to pro-



Austin Antenna

"The World Leader in Multiband Technology"

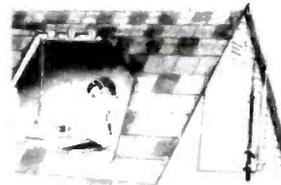
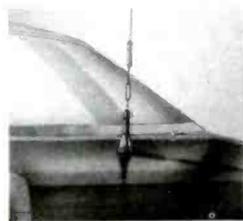
Manufacturers of multi-band Land Mobile, Microwave, and Scanner Antennas for Government Agency operations, Drug and Law Enforcement operations, Communications at the Kennedy Space Center and major networks such as NBC and ESPN.



The Ultimate Omnidirectional Multiband Station Antenna



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 P.O. Box 920 Truro, MA 02666 (603)335-6339

vide 150 kbps download speeds and upload speeds of 50 kbps during the busiest hours on the net." You have to decide if such a significant drop is worth paying a premium price. They also warn that "...StarBand reserves the right to limit 'bandwidth hog' activities such as audio and video streaming, and automatic file exchange applications (file-sharing)." And, finally, while you may have a personal web site on StarBand, you will not be allowed to host a web site using StarBand equipment.

DirecPC and StarBand System Requirements

DirecPC*

Processor: 200 MHz Pentium with available USB or PCI port
Memory: 32 MB RAM (minimum) and 20 MB hard drive space
Modem: 28.8 kbps
Down load speeds: Up to 400 kbps
Access speeds: Up to 56 kbps depending on your ISP
Operating System: Microsoft Windows 95/98 or Windows NT 4.0 (PCI) Windows 98 (USB)
Extra attractions: A DirecDuo dish can be configured to receive DirecTV programming.
Cost of service: \$50/month (includes unlimited online time and ISP)
Satellites used: GE-1 (103°W) and Galaxy 3R (95°)

StarBand*

Processor: Pentium-class with available USB port
Memory: 32 MB RAM, 10 MB hard drive space and a CD-ROM drive
Modem: StarBand satellite modem +
Down load speed: Up to 500 kbps
Up load speed: Up to 150 kbps
Extra Attractions: Some dish can be configured to receive DISH Network programming
Cost of Service: \$60/month includes unlimited online time and ISP
Satellites used: GE-4 (101°W) and Telstar 7 (129°W)

*Both services require a view of the southern sky for a direct line-of-sight with the satellite and use a 24"x36" elliptical, off-set fed dish. Each provides one e-mail account.

+ StarBand does not use a land based telephone line for transmitting data to the Internet.

DirecPC, which has tens of thousands of customers and has been up and running for several years, has long experienced system downgrading. As with StarBand, DirecPC customers find that download rates aren't always at top speed. This appears to simply be a fact of Internet access life. But, it's legitimate to wonder if either service will be able to keep up with ballooning subscriber lists and provide the advertised top speed. Furthermore, if you sign on with their ISP there might not be a local number for access depending on where you live. You may have to make a toll call to connect.

Both systems will suffer from "rain fade," a fact of life at Ku-band frequencies in which heavy rain makes microwave penetration impossible. The effect lasts only as long as the heaviest downpour when service goes back to normal. And, finally, reports indicate that DirecPC will introduce a high speed uplink component to its system which will put it in more direct competition with StarBand. No details on this proposed service were available as this was written.

How to Get Started

With continued growth in the numbers of consumers just getting on the information super highway on-ramp we can all expect congestion on Internet services which use traditional telephone lines to follow that trend. For the millions of Americans who will not have access to high speed data lines for years to come DirecPC and StarBand represent a turbo boost in Internet use enjoyment. Consider the pros and cons of each system and visit the web sites listed below to do a little digging before making a decision.

For information on DirecPC go to <http://www.direcpc.com>. DirecPC systems are widely available on the Internet and through major retailers such as Circuit City, Best Buy, etc. For a local dealer near you call 800-DIREPC.

Starband from the view of a "pilot"

By Bill Grove, MT Art Director

A few months back, I was one of the privileged many to be part of the Starband "Pilot" program. For a little bit of cash, Starband provided me with a complete Dell computer package bundled in tow with the proprietary satellite cards and software installed. Since our area is part of the technological black hole (we're about 5-10 years behind any major city) I was thrilled at the prospect of having high speed internet access in my home at a fairly reasonable rate. Here's what I've learned.

The Starband network offers two ways to access its system. First, you can go to Radio Shack and buy a pre-loaded Compaq computer with the satellite cards installed or second, you can go to an Echostar dealer and buy a USB box that sits outside your current computer (your computer must meet the minimum requirements) and serves the data between your computer and the satellite.

My choice would definitely be to have the USB box. As nice as it is to have another computer in the house, it's all but dedicated to serving the other computers that I own and have networked through the Dell (the dedicated Starband system). I don't use the Dell for anything else because, during the pilot program, if I used it, it crashed the connection to the satellite! Don't be too worried, because it's now quite stable and I'm sort of nudging towards using it again, but I'm still rather gun shy due to the initial experience.

Even so, if you don't need another computer in the house, the USB is still the way to go. Even if you *do* need another computer in the house, make sure the Compaq suits your needs. Since I come from a background of computer sales, I'm not particularly fond of "all-in-one" package deals. I prefer to build the system myself using the parts I choose. But that's off the subject... back to Starband.

There are amazingly wonderful things about Starband. First off... NO PHONE LINES... second... NO LOCAL ISP (Internet Service Provider). I can't stress those two enough. The fact that you don't rely on your local phone service or your local ISP is a blessing in itself. I have had entirely too many shouting

For more information on StarBand go to <http://www.starband.com> or your local Radio Shack dealer. Information on StarBand can also be found at select DISH Network dealers.

News flash from DirecPC

DirecPC is in the process of releasing its own two-way service, DirecPC Satellite Return. The new system offers return channel speeds up to 128 Kbps, optionally 256 Kbps, and delivers data at the same speeds as the current product, at rates of up to 400 Kbps. According to the company, "Pricing will be competitive to other available broadband services." Look for the service at DirecTV dealers, and from Earthlink, Pegasus, and Juno.

matches with both companies - each of them telling me the problem is the other's fault. Since I have had the satellite in, I haven't dialed into the ISP once. It's most gratifying! Not only am I completely isolated from the daily problems that plague the dial-up world, but this service is *really* fast. I average download speeds of around 600kbps, which roughly translates to 15 times your current best dialup speed. Nice.

Now the down side. Since you're chatting with a gadget that is 22,000 miles from Earth, you run into a small problem called "ping time." Ping time is the time it takes you to send a signal from your computer, to another computer, and back again. When you're dealing with Starband, the ping time is averaging around 750ms, which to humans isn't that much, but to a computer, it seems an eternity. So what does this mean in layman's terms? It means that you can't use VOIP (Voice Over IP, or real-time phone calls), you can't play games (it takes nearly a full second for you to realize that your friend has snuck around the corner and is launching a rocket right at you), and you can't do interactive video conferencing.

Fortunately, for most of the world, those things aren't *that* important. You still get your email, you still have your web pages at blazing speeds, you can still download your music and you can still send the photos of the kids to their grandparents. For most day-to-day internet use, this is a wonderful solution. You can also tie all the computers in your house into one Starband system so that everyone is online at the same time (this requires you to network your computers, but it's quite simple and fairly inexpensive). And remember, *no phone lines... no local ISP!*

Be aware that users should definitely NOT attempt this installation on their own. Starband won't even sell you a system without a professional installer, and in this case, they are right. This is not easy to install and *must* be mounted properly. Overall, the Starband gets a huge "two thumbs up" for providing fast, always-on internet access to the 40% of Americans that don't have another alternative for broadband. For more info, just drop by <http://www.starband.com>.

Two great new ways to get the most out of your favorite communications magazine.

MTX PRESS

&

Anthology 2000 Edition

Now-Receive your subscription to Monitoring Times at nearly the speed of light! No delays due to mailing, no lost or torn copies. Be the first to receive breaking news from the frontier of communications!

For less than the cost of a subscription in the U.S., you can be reading the entire *Monitoring Times* magazine anywhere in the world before U.S. subscribers receive their printed copies! Active utilities loggings, world hotbed frequencies, international broadcasting schedule changes, new product announcements! This is the exact same magazine that has gained a worldwide reputation for reliable radio information that's easy to understand, and products and projects of proven value.

For a mere \$19.95 U.S., **MT EXPRESS** gives you *Monitoring Times* magazine

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

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

One year subscription to **MT EXPRESS** only \$19.95 U.S., or for even greater savings, \$11 in addition to your printed subscription of \$25.95 in the U.S.

Imagine, your favorite MT articles and columns for an entire year on one searchable CD-ROM! Frequency lists, shortwave program guides, equipment reviews, construction tips, antenna projects, scanner and shortwave topics, even ads -- all on one powerful CD! And we even include Adobe Acrobat Reader 4.0 at no extra charge!



ORDER SFT-27-00

Only **\$19.95!** (\$14.95 for subscribers)

plus \$2.50 US Priority Mail or UPS

GROVE

800-438-8155

Grove Enterprises, Inc.
828-837-2216 (fax)

7540 Highway 64 West
Brasstown, NC 28902

email: order@grove-ent.com

WWW.GROVE-ENT.COM

WWBS: The Little Station that Could

By Hans Johnson

Retirement can take many different forms. For some, it's tooling around the country in an RV, for others, it's chewing the rag with scores of friends around the world. For Charles Josey, it was building a shortwave station.

Josey wasn't content to buy some parts off the shelf and assemble a station; he carefully shopped and scrounged to complete the construction. Charles has a real knack for finding parts for at a fraction of their cost. He also has the knowledge to put them all together. The real hurdles for WWBS weren't in its construction; rather they were difficulties associated with its location.

Charles' wife, Jo Ann, owned a commercial building on the edge of downtown Macon, Georgia. It was here, with a television station across the street and a recording studio nearby, that Josey built WWBS. Most American shortwave stations have settled in rural areas – after all, land is cheaper and there are less problems with neighbors, as there are a lot fewer of them.

A Reluctant Pioneer

Charles applied for a license to broadcast in amplitude modulation (AM), but the FCC required him to transmit in compatible single side band (SSB). Any radio could still potentially pick up WWBS, but the FCC hoped the lower power requirement would reduce potential interference. Or so it was hoped.

So by fiat, rather than by design, WWBS became the first compatible SSB station in the United States. (Fellow Georgia station WGTG was the first to use SSB, but it operates on SSB only, requiring a radio capable of

receiving SSB broadcasts.) The minimum power for an American shortwave station using AM modulation is 50,000 watts. A compatible SSB station only has to reach 50,000 watts at peak power, so WWBS' average power is about 12,500 watts, sometimes less.

The blessing in disguise has been greatly

reduced electrical bills for WWBS. WGTG had realized this as well. WBCQ in Maine also soon took advantage of the savings, placing its own compatible SSB transmitter on the air by early 2000.

Trouble with the Neighbors

Charles Josey had no trouble converting the station over to compatible SSB. He soon had authorization from the FCC to "test with programs" in late 1998. Yet, even in compatible single side band, WWBS was soon causing interference to both the television station and the recording studio. Josey, an amateur radio operator, tried to solve the problem in the amateur radio tradition – by extending a helping hand and trying to work with both parties.

Josey even went so far as to purchase the filters needed to eliminate the interference. Some of these filters were installed at the neighboring TV station, solving half of the equation, but the recording studio turned out to be much more problematic.

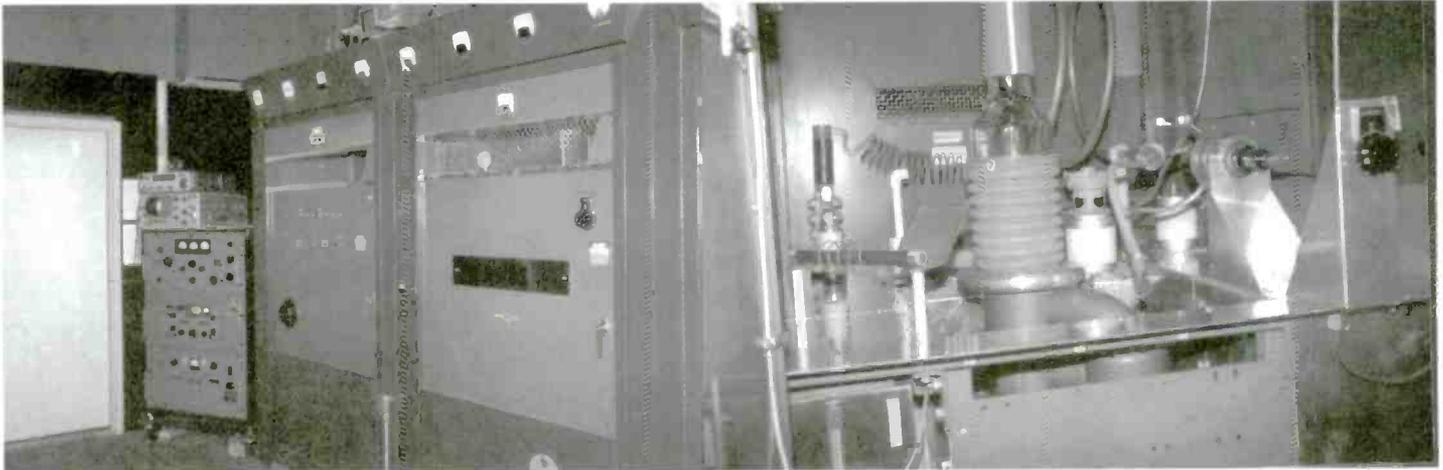
It seemed that no matter what WWBS did, even to the extent of completely rearranging its broadcasting schedule, the recording studio wasn't satisfied. Matters eventually turned ugly and in typical American fashion, the recording studio sued WWBS. The suit was eventually dismissed, but the ongoing problem delayed WWBS' ability to begin regular transmissions by several months. Charles Josey does state that they haven't had any interference problems since the fall of 1999.

A Change in Plans

As mentioned, the ongoing problem with the recording studio also took a toll on WWBS'



"Location, location, location" is critical in broadcasting as well as in real estate, and Macon, Georgia's WWBS is a prime example of the problems a less than ideal site can create.



Charles Josey has a knack for scrounging parts and constructed the station himself. Inadvertently, WWBS became a pioneer in US shortwave broadcasting because of the mode in which it broadcasts.

operating schedule. The Joseys' original plan was to broadcast Christian programming to Canada, particularly western Canada on a beam of 330 degrees, on weekend evenings. To placate the studio, WWBS tried a short-lived early morning service to Australia and New Zealand on weekends. Now the Joseys have settled on a European service, but given the broadcasts times, it amounts to a defacto North American service.

While their sincerity of wanting to air Christian programming and spread the Gos-

pel is never in doubt, one does wonder how much thought the Joseys gave to programming. It's as though all their energy was expended in simply getting WWBS on the air, with "details" such as programming assumed just to fall in to place. WWBS is giving away its airtime, so money is certainly not the motivation. But the Joseys have entered a rather saturated field, joining well over a dozen stations that are already broadcasting English language Christian programs for a North American audience.

How to Tune In

WWBS broadcasts four hours a week from 0000-0200 UTC Sundays and Mondays on 11900 kHz. As with other American stations, identification is on the half-hour, with Jo Ann identifying the station and asking for reception reports. Those reports can be sent to WWBS, P.O. Box 18174, Macon, GA 31209 or to wwbsradio@usa.com. The station does not have a website.

Listening is only half the fun... **POPULAR COMMUNICATIONS** is the other half.

If you enjoy radio communications in all its variety, you'll love **Popular Communications**

Since 1982 *Pop'Comm* has delivered thousands of pages of great reading for both the radio enthusiast and the professional communicator.

Name your favorite interest... *Popular Communications* is there for you. Whether you're into Short-wave Listening, Scanner Monitoring, searching out Pirate Radio broadcasters, CB Radio, Satellite Broadcasting, ACARS, or Ham Radio; you name it, we cover it, every month.

Popular Communications

Subscribe today and save over 54% off the newsstand price. Save even more with two or three year subs!

YES! Enter my Subscription to Popular Communications today!

Name _____

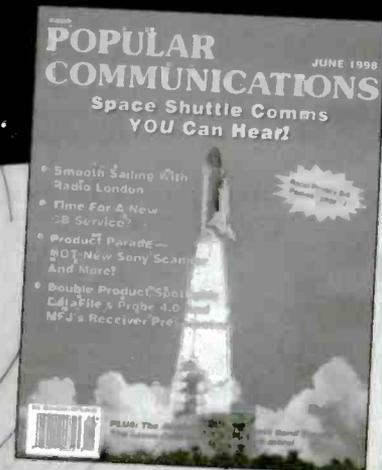
Address _____

City _____ State _____ Zip _____

() Check () MasterCard () VISA () AMEX () Discover

Card No. _____ Expires _____

Signature _____



	USA	Canada/Mexico	Foreign Air Post
1 Year	<input type="checkbox"/> 25.95	<input type="checkbox"/> 35.95	<input type="checkbox"/> 45.95
2 Years	<input type="checkbox"/> 45.95	<input type="checkbox"/> 65.95	<input type="checkbox"/> 85.95
3 Years	<input type="checkbox"/> 65.95	<input type="checkbox"/> 95.95	<input type="checkbox"/> 125.95

Allow 6 to 8 weeks for delivery

FOR FASTER SERVICE FAX 1-516-681-2926

MT 98

Popular Communications 25 Newbridge Road, Hicksville, NY 11801 Telephone (516) 681-2922

Your Beginner's Q & A

The last couple of months saw quite a lot of response from readers here at the Beginner's Corner. Some of you had questions, comments and tips of your own which I'd like to take this opportunity to share.

◆ Tunerless All-Band Antenna

It was really heartening to hear from so many *MT* readers on this subject. Obviously, antennas are a burning topic to all readers, but shortwave listeners are always looking for ways to improve reception. My thanks to everyone who took the time to write.

A number of readers wanted a little more detail about the connections at the 4:1 balun. It's really very simple; the insulation is stripped away from both sides of one end of the twin lead and inserted into the connecting lugs at the top of the balun. The lugs are then crimped with a pair of pliers and it's secure. It wouldn't hurt to solder the connection, but it's really not necessary.

Another question was about grounding the antenna during a thunderstorm. Common practice among hams is to drive an 8-ft copper grounding rod into the ground at the point where the antenna feed line goes into the house. A heavy gauge copper wire is attached to the rod and the wire fed into the house along with the feed line; an SO239 coax socket can be soldered to the end of the wire. When a storm comes up or you plan to be away from your receiver for extended periods of time, simply attach the antenna connector to the coax socket. Now, any voltage coming down the antenna is shunted directly into the ground.

Some who wrote indicated that they had never used an outside antenna, let alone built one. It was encouraging to see so many willing to take the plunge. That's what the radio monitoring hobby is all about: expanding your horizons. Those of you who have built and are using the antenna no doubt share the amazement I had in being able to effortlessly cruise the shortwave guide in the center of this magazine and tune in virtually any station listed. It really adds to the listening pleasure of the shortwave hobby to be able to do this.

One reader from New York noticed that the number listed for Amateur Electric Supply, the source for the 4:1 balun, was not correct. The correct number is 800-558-0411.

Another correction is that what I called the "Hy-Gain center connector" from Surplus Sales of Nebraska, is actually listed on their web site as the "Hygain Center Insulator."

There were a number of suggestions for other shortwave antenna subjects for future columns and I'll certainly check them out. These and other suggestions from readers are always welcome at the Beginner's Corner.

◆ The Perfect Shortwave Radio

Paul Perretta, an *MT* reader in Hawaii, writes in response to the November 2000 column: "...my renewed interest in ham radio was prompted by purchasing one of these [small portable shortwave radios] for \$89.95 new from a Radio Shack sale...in some four months of casual listening with an indoor piece of wire which is 1/4 wave at 28 MHz and 1/8 wave at 14 MHz I have heard some 1,400 plus different ham prefixes (all mode all band but mostly 14 and 28 MHz). Granted, this is no communication receiver...but it shows what can be achieved when you know where, how and when to listen!..."



Winner of the perfect shortwave radio search? The Sangean ATS-818CS or Radio Shack DX-392. Courtesy: Sangean

An excellent point, Paul. It also shows how much easier it is to receive than to transmit. Trying to get a signal out using a 1/8 wave at 14 MHz would be a real challenge.

Part of that same column showed how to tape shortwave programs for listening in the car on your daily commute. This prompted Judy May to comment: "Wow, you nailed what I do, even down to the radio! I use the Radio Shack version of the Sangean (DX-392), and

have been recording 'The World Today' for my commute ever since the O. J. Simpson trial gummed up our televised nightly news here in the U.S...."

She also comments "...my [radio] uses a few AA cells for the electronics and memory, but four D cells for the radio and recorder...I use Nicad rechargeable. I used to use an AC adapter, but in our new house the adapter gives the reception a real bad hum..."

It is surprising how many batteries a radio with built-in cassette player can take, and that's something consumers need to think about when making a portable radio purchase. Even rechargeable batteries can add considerable expense to your hobby.

As to the hum in the adapter, it may not be the adapter at all. Here are some things to try: Take the radio to other rooms in the house which are on other circuits and see if the problem persists. Next, look around the house for any dimmer switches which may not be turned completely off. Finally, get another adapter and try it. It's possible the filtering in your adapter (if it has any) is defective. It's certainly worth the \$15 or so to get one which works.

On the same subject, Byron Hinton commented that it should be possible to download BBC or other shortwave broadcasters, or any other broadcaster for that matter, from the Web to an MP3 player to listen later on a PDA device like a Palm Pilot or Handspring Visor. Sounds like a good idea, especially if your daily commute is actually a daily walk! I have a friend who downloads the BBC into a Palm Pilot and listens in the car - no radios involved!

◆ Other Beginner Issues

- *MT* reader Kermit Allen writes, "...I have just moved from Los Angeles to San Jose, California; can you tell me where or what books to get to use with my scanner so I can listen to the emergency services in this area?"

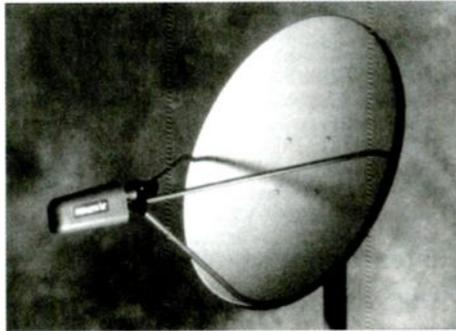
I've found that, in my area, local Radio Shack stores make unofficial frequency lists available to customers. These include local public services, ham repeaters, etc. They're usually included with the purchase of a scanner from the store as a way to get the customer started.

If none are available, the best place to look is *Police Call*. These scanner frequency list books are available from Radio Shack for

\$15 each. *Police Call* publishers have divided the country into seven regions with a separate book published for each region. Lists include frequencies for police, sheriff, fire, ambulance, race car teams, security, amusement parks, casinos, hotels and much more. The entire *Police Call* list for all regions is available on CD-ROM for \$35.

- There are a couple of satellite TV questions, too: Fabian Husley wanted information on a Uniden PS100 satellite receiver. The best place to go for information about any Uniden product is Uniden's toll free number: 800-235-3874. They can repair any Uniden product (satellite receiver, scanner, 10 meter transceiver etc.) for a reasonable fee. They also sell reprints of lost users manuals and schematics and often sell factory refurbished equipment at considerable savings. Check out their web site <http://www.unidenamerica.com>

- Several readers, including Joe Crawford, wanted to know if there was anything to be done with an old Primestar satellite TV system. Primestar was a standard Ku-band system and, while the receiver won't be of much use, the dish and LNB can be used with an analog receiver to tune in analog channels such as the sports and news backhauls on SBS-6 or the several channels of NBC programming and news feeds on GE-1. If you hook up an MPEGII receiver you'll get lots of interesting programming from around the world on Telstar 5.



Turn satellite entertainment junk into useful TVRO hobby. Courtesy: Primestar

Analog receivers can be found for \$25 or less at hamfests. MPEGII receivers can be bought for around \$200. For information on MPEGII receivers check out <http://www.smallear.com>, for a list of all available satellites and what's on them go to <http://www.lyngsat.com>.

- John Morris has been an *MT* reader for about 10 years but has stayed away from satellite reception because of the dish size and overall high cost. "Recently," he says, "satellite receivers have been finding their way into the local second hand store..." Now he's interested in taking advantage of the plentiful used equipment at cheap prices.

So, here are some tips on looking at used satellite TV gear. First, if there is no remote control find out if all functions can be performed using buttons on the front panel. You

may have to get a universal remote to operate the receiver. If there's no owner's manual you should be able to find one at <http://www.houstontracker.com>. Just about any receiver will work with any size dish 4.5-ft. and up.

You'll need a dish and the feed horn/LNB (the dish electronics). This might be where the used Primestar dish comes in! Used dishes complete with polar mount, dish drive and feed horn electronics can often be found very cheap at your local satellite dealer or for free from someone in your area switching over to the small dish systems. At any rate, you'll need a length of RG/6 coax to connect the dish to your receiver and possibly wires to connect to the servo motor to change polarity. If you are using an LNBF there won't be a servo motor and no need for the connecting wires because the polarity is changed by the receiver via the coax.

Set the dish up in your yard with an unobstructed view to the south and west. Take the receiver, a TV set and the connecting cable out to the dish and set it up. Make all the connections (LNB to the receiver, dish drive motor wires from the receiver to the dish drive motor, and output of the receiver to your TV set to channel 3 or 4—whichever the receiver outputs to). This way you can line the dish up on the Clarke Belt and get it operating before routing the cable back to the house and setting up a permanent installation.



Uniden BC780XLT

IT WAS WORTH THE WAIT...

THE ALL-NEW UNIDEN BC780XLT TRUNKTRACKER III!

This next-generation scanner is an astounding step forward! Follow conventional communications, or any of the three leading trunking technologies Motorola, GE Ericsson EDACS, or Johnson Letter simultaneously! Up to 500 channels and 10 priority frequencies may be stored in 10 memory banks. And if you don't know your local frequencies, simply use a computer and modem to dial Uniden's 900 telephone number, and SmartScanner technology will do the rest!

Other features include the life-saving S.A.M.E. weather alert function, alphanumeric display, continuous 25-1300 MHz frequency coverage (less cellular), 10 factory-preprogrammed service searches, brilliantly backlit LCD, fully backlit keys, AM/FM/WFM reception modes, base or mobile configuration, computer control, CTCSS/DCS squelch systems, and more!

Yes, the BC780XLT is the scanner we've all been asking for, and you can order it now from Grove Enterprises!



NOW IN STOCK!

**ORDER SCN49
for only \$349.95**

plus \$7.95 shipping in the U.S.

Grove Enterprises, Inc.

800-438-8155

7540 Highway 64 West

Brasstown, NC 28902

828-837-9200 828-837-2216 (fax)

order@grove-ent.com

**CALL
NOW!**

www.grove-ent.com

Q. On shortwave broadcast schedules I frequently see references to the "CIS;" what and where is this? (Bob Brossell, Pewaukee, WI)

A. On December 8, 1991, the leaders of three Soviet republics – Boris Yeltsin of Russia, Leonid Kravchuk of Ukraine, and Stanislav Shushkevich of Belarus – met in a summer cottage near Minsk and replaced the former Soviet Union with the Commonwealth of Independent States (CIS).

Q. What ever became of the old Regency scanners? Will we see any more of them soon? (Bob, e-mail)

A. RELM (Regency Land Mobile) is the current land mobile division of the former Regency Electronics which was purchased, along with Electra (Bearcat) by Uniden back in the mid-80s. No more Regency scanners were produced until a couple of years back with the HS100, HS200, MS100, and MS200 units. They weren't very successful in competing with the Uniden/Radio Shack dominated consumer radio market. I don't look for any more Regency scanners in the foreseeable future.

Q. What are the "bubble machines" I occasionally hear on shortwave? (E-mail request)

A. These are intentionally generated jamming transmissions among political adversaries. Several different types may be heard, including bubbles, sweepers ("swish-swish"), and the notorious "diesel engine" sound! The vast majority of these come from Communist and Eastern bloc countries and are intended to discourage international broadcast listeners from hearing programming

content with which the jamming country disagrees.

Q. My scanner preamplifier seems to clean up some of my weaker signals by reducing static, but on other signals it seems to do nothing. Would you advise me to put two preamps in series? (Tom, e-mail)

A. The purpose of a preamplifier is to increase the level of signals above the noise floor ("hiss") of the scanner. As such, a preamp must do two things: provide a very low noise figure, and add some gain.

The down side of all preamplifiers is that their excessive gain can drive scanners into strong signal overload, causing intermodulation (hearing a signal in several different places) and desensitization (strong signals drive the scanner's automatic gain control – AGC – circuitry down making all signals weaker). And if the preamplifier itself is not well designed, it too can become overloaded and generate its own intermod products.

My guess is that on the lower frequencies (30-50 MHz) your preamp shows no improvement. That's because most scanners have good, low noise RF amplifier circuitry for the lower frequencies, and atmospheric noise is already above scanners' noise floor. But at increasingly higher frequencies, the atmospheric noise drops and receiving circuitry becomes noisier.

Use the best antenna you can, and good, low-loss coax as well, but if most of your signals are still very weak, then select a low-noise preamplifier; but no, don't put two in series!

Q. My garage door opener has a label saying that it must not emit harmful interference, but it must accept harmful interference. Why

is this? (Mark Burns, Terre Haute, IN)

A. Garage door openers are admitted under Part 15 (unlicensed devices) of the FCC rules and regulations. Since they are unlicensed, licensed users of shared frequencies have higher priority.

Q. Is there anything better than the transistor to replace transistors in radios? (Robert E. Brock, Phoenix, AZ)

A. While new technologies are always being explored, currently there seems to be nothing revolutionary looming on the horizon. The transistor has been shrunk to the point where millions of them can be put on a small integrated circuit (IC), so it would seem that size reduction of transistors will continue rather than a replacement technology for some time to come.

Q. Are there voice communications in the 108-118 MHz frequency range? (Robert E. Brock, Phoenix, AZ)

A. No. The only services authorized there are airport AM VHF Omni Range (VOR) and transcribed weather broadcasts (TWB). If you are hearing two-way land mobile communications, they are probably images produced by your scanner from the 150.8-174 MHz VHF FM high band.

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 bgrove@grove-ent.com. (Please include your name and address.) The current Ask Bob is now online at our website:
www.grove-ent.com

You could have a thousand dollar receiver, but it won't receive that weak or distant station if you have a poor antenna. In contrast, you can take an old, barely running scanner and it will bring in previously unheard stations if you have a great antenna. This month, we have some great ideas about improving your antenna situation. These ideas are for passive, receive only antennas.

6

Live in an apartment or condo? Often on the road in a hotel? Travel in an RV? Buy (or make) a length of RG58 with a BNC connection on one end. I bought a 20-footer with a BNC at both ends. I simply cut it in half. At the bare end, peel back the exterior black cover and the braid shielding for about two inches. Now cut off that outside plastic and shielding. Wrap a small piece of black electrical tape around the cut so that about two inches of the inner plastic and the center feedline are exposed. Cut off about half of the plastic insulator, making sure that there is no contact between the braid and the now bare center wire.

Find a screw in the middle of a vertical window frame. Back the screw out about a quarter of an inch. Bend the center feedline into a hook shape, attach it, and gently retighten the screw. The entire window frame just became your quad antenna. I then use a length of electrical tape to hold it in place down along the window frame for a foot or so. You can also try a sliding door frame. Look for any vertical metal application. It works really great in my motorhome. May be low tech, but it is also low visibility and I love stealth.

7

If you intend to be monitoring while on the water, you can use a standard VHF marine antenna. Mount it anywhere, the higher the better. DO NOT use this same antenna for transmitting. You need a separate receive only antenna for monitoring. If you live near the ocean, you can try mounting these marine antennas on your roof or balcony. Marine antennas are especially made to tolerate a salt water climate.

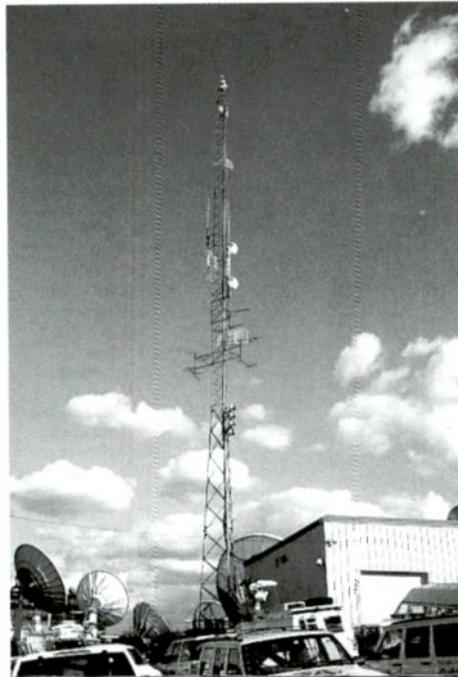
8

Find a creative location for a scanner mag-mount. Go outside, and look at the possibilities: the railing on your balcony, a metal overhang? Hint: it will

work upside down. Indoors, use a metal filing cabinet, desk, or cookie sheet. MFJ makes an "UltraLite" magnet mount antenna that is almost invisible. They are at 1-800-647-1800 or <http://www.mfjenterprises.com>.

9

Buy or build your own quarter wave ground plane, J-pole or discone antenna. There are many books and magazines with great antenna designs. Take a look in *QST*, or other ham magazines. Visit the ARRL at <http://www.arrl.org/shop>.



This antenna farm at a TV station represents big bucks! But for our readers, we have more thrifty ideas.

10

Outdoor antennas. You spent the big bucks for a great receiver or lots of little ones. Go all the way and consider a mast or tower. Naturally, the more extensive and complex involve many mast or tower sections. HF requirements are different from VHF and UHF. Personally, I prefer a tilt-up up with three 10 foot sections. On a hinged base, this mast can be easily handled by three or four people. Secured to the end of a roof line, this involves no guy

wires. See the small ads in the back of magazines *QST*, *CQ*, or 73.

Safety first. If you will be installing a metal antenna outside, remember that it can be a very hazardous job. Have friends help you, and look out for electrical lines and other dangers. Sloped roofs and climbing trees are for agile and nimble youth. Climbing or installing towers is a very dangerous and specialized job. Make certain you have the necessary safety equipment and special skills to do it.

11

Many of us have a TV antenna left over from the pre-cable/satellite days. You can convert that old TV antenna by turning it 90 degrees to be vertical instead of horizontal. If you do this, you need to drill some new holes in the mast hardware to enable you to achieve the new angle. It becomes a yagi beam and favors reception in the direction you point it. Imagine what you can do with a rotor! (If you don't have an old TV antenna, they are fairly inexpensive to purchase. Or maybe your neighbor, or a relative has an old one.)

12

Covert antennas. If you live in a condo or apartment you might be restricted to what you can install for antenna. There are antennas disguised as roof vents, flagpoles and even artificial trees. Use your imagination and the search feature on your internet browsers to find such products.

13

Listen to the shortwave bands? Need a long wire antenna? Consider a stranded stainless-steel nylon-coated wire. It is made for beading and can be found in jewelry hobby/supply stores in spools up to 300 ft. It cannot be soldered, but when stripped it fits into a crimp style banana plug. Experiment! Go outside and walk around your home (or apartment building). Are there any safe locations you could mount an antenna or hang a wire dipole? What about hiding it in a tree?

Next month, we explore getting the most from the 2001 *Police Call Books* and CD ROM. In April, we'll take a look at new ideas for your HT antenna. Stay tuned.

Public Safety in Lubbock Texas

The following tremendous report on the city of Lubbock was sent to us by the folks at <http://www.lubbockradio.net>. This is just the kind of detail that we love to see in *MT*, *Police Call*, and other publications. We'll also give you more details on the highly anticipated Bearcat 780XLT scanner. This month we'll focus on additional non-trunking features. But first, let's visit legendary Lubbock, Texas.

City of Lubbock, TX

EDACS trunked radio system (call sign: WPFW709)

FREQUENCIES LCN

1. 856.2375
2. 856.7375
3. 857.2375
4. 857.7375
5. 858.2375
6. 858.7375
7. 859.2375
8. 859.7375
9. 860.2375
10. 860.7375
11. 856.4875
12. 856.9875
13. 857.4875
14. 857.9875
15. 858.4875
16. 858.9875
17. 859.4875
18. 859.9875
19. 860.4875
20. 855.9875

TALKGROUP IDENTIFICATION

LPD-FLEET ALL-CALL	AFS
LPD-DISPATCH CH-1	01-010
LPD-ALTERNATE DISPATCH	01-012
LPD-SECONDARY	01-013
LPD-TLETS (RECORDS)	01-014
LPD-TALK-1	01-015
LPD-TALK-2	01-016
LPD-SUPERVISORS	01-017
LPD-TACTICAL-1/SWAT	01-021
LPD-TACTICAL-2/SWAT	01-022
LPD-ADMINISTRATION	01-023
LPD-TRAINING	01-024
LPD-COMMAND-1	01-025
LPD-COMMAND-2	01-026
LPD	01-027
LPD-CHANNEL-1 DISPATCH	01-031
LPD-CHANNEL-3	01-032
LPD-CHANNEL-7	01-034
LPD-CHANNEL-2	01-041
LPD-NEW-12/1999	01-D43
LPD-CHANNEL-4	01-044
FMO-FIRE MARSHAL OFFICE	01-052
LPD BACKUP DISPATCHING RADIO	01-060
LPD STATION 1, 18TH/AVE K	01-061
LPD STATION 2, MUNICIPAL DR	01-062
LPD STATION 3, MILWAUKEE/25TH	01-063
LPD STATION 4, UNIVERSITY/COLGA	01-064
LPD STATION 5, ZENITH	01-065
LPD STATION 6, INDIANA/34TH	01-D66

LFD STATION 7, SLIDE/3RD	01-067
LFD BACKUP DISPATCHING RADIO	01-070
LPD STATION 8, 50TH/AVE T	01-071
LPD STATION 9, 50TH/UTICA	01-072
LPD STATION 10, MLK BLVD	01-073
LPD STATION 11, AIRPORT	01-074
LPD STATION 12, 79TH/SLIDE	01-075
LPD STATION 14, 96TH/AVE X	01-076
LPD STATION 15, 80TH/VENTIA	01-077
CITY MARSHALS COURT	01-081
EOC-EOC-1	01-091
EOC-EOC-2	01-092
EOC-EOC-3	01-093
LPD-SPECIAL EVENTS-1	01-094
LPD-SPECIAL EVENTS-2	01-095
LPD-SPECIAL EVENTS-3	01-096
LCSD COMM-1	01-101
LCSD COMM-2	01-102
STREETS-CREWS CH-1	02-011
STREETS-CREWS CH-2	02-012
STREETS-SURVEYING-1	02-013
STREETS-SURVEYING-2	02-014
LP8L-CH-1	02-021
LP8L-CH-2	02-022
LP8L-CH-3	02-023
LP8L-CH-4	02-024
LP8L-CH-5	02-025
LP8L-CH-6	02-026
LP8L-CH-7	02-027
LP8L-METER READERS	02-032
LBB-AIRPORT OPERATIONS	02-042
LBB-AIRPORT MAINTENANCE	02-043
LBB-AIRPORT GROUNDS	02-044
LBB-AIRPORT TALK-1	02-045
WATER-CH-1 DISPATCH	02-051
WATER-CH-2	02-052
WATER-CH-3 ENGINEERING	02-053
WATER-CH-4	02-054
WATER-CH-5	02-055
WATER-CH-6	02-060
WATER-CH-7	02-061
WATER-CH-8 RECLAMATION	02-062
WATER-CH-9	02-063
WATER-CH-10	02-064
WATER-CH-11 CONTROL	02-065
WATER-CH-12	02-066
DIGITAL MODULATION	02-071
FLEET SERVICES	02-072
RADIO SHOP	02-073
LUBBOCK CO SHERIFF	02-074
RADIO SHOP	02-075
RADIO SHOP	02-076
RADIO SHOP	02-077
WASTE-CH-1	02-082
WASTE-CH-2 LANDFILL	02-083
WASTE-CH-3	02-089
PARKS & REC CH-1	02-091
PARKS & REC CH-2	02-092
PARKS & REC CH-3	02-093
PARKS & REC CH-4	02-094
CITIBUS-1 PRIMARY	02-101
CITIBUS-2 DRS	02-102
CITIBUS-3 MAINTENANCE	02-103
CITIBUS-4	02-104
CITIBUS-TECH SHUTTLES	02-105
CIVIC CENTER 1	02-111
CIVIC CENTER 2	02-112
TRAFFIC ENGINEERING 1	02-121
TRAFFIC ENGINEERING 2	02-122
ANIMAL CONTROL 1	02-131
ANIMAL CONTROL 2	02-132
BLDG INSPECTORS	02-133
HEALTH DEPARTMENT	02-141

USD POLICE	03-011
LUBBOCK EMS-1 CITY	03-021
LUBBOCK EMS-2 COUNTY	03-022
LUBBOCK EMS-3 ALTERNATE	03-023
LUBBOCK EMS-4 UMC	03-024

Patches (see the Nov. BC-780 article for an explanation of patches)

EMS-ST.MARY'S PATCH	15-126
HOSPITAL PATCH	15-127
HOSPITAL PATCH	15-130
AERO CARE PATCH	15-157

(Note: additional information including decimal codes can be found on the listed web site.)

Lubbock Police Department Unit Numbers

Unit No.	Description
100's	Day Shift Patrol
100	Day Shift Captain
101	Day Shift Lieutenant
1x0's	Day Shift Sergeants
200's	Evening Shift Patrol
200	Evening Shift Captain
201	Evening Shift Lieutenant
2x0's	Evening Shift Sergeants
390's	K-9 Patrol
400's	Night Shift Patrol
400	Night Shift Captain
401	Night Shift Lieutenant
4x0's	Night Shift Sergeants
500's	Traffic Units
501	Traffic Lieutenant
510	Traffic Sergeant
512-519	Motorcycle Traffic Units
520	Motorcycle Sergeant
540's	Parking Enforcement
591	Public Information Officer
599	Patrol Colonel
600's	Property Crimes
700's	Persons Crimes / Juvenile
800's	Special Operations
900's	Administration and Training
950	Chief
999	Administration Colonel
SE1	Emergency Operations Center
5M1x	City Marshals
5M80's	Texas Alcoholic Beverage Commission Officers
9M50's	South Plains Mall Security (off-duty PO)
Hotel	Mounted Patrol (Horse)
Tango	Traffic Units
Victor	Victims Assistance
5L + #	USD Police

Lubbock Fire Department Apparatus

Station 1*	18th and Ave. K	Engine 1	Truck 1
Station 2	Municipal Dr.	Engine 2	
Station 3	Milwaukee & 25th	Engine 3	Brush 3
Station 4	Univ. & Colgate	Engine 4	Truck 4
			Hazmat 4
			Brush 5
Station 5	Zenith	Engine 5	
Station 6	Indiana and 34th	Engine 6	
Station 7	Slide and 3rd	Engine 7	
Station 8	50th and Ave. T	Engine 8	
Station 9*	50th and Utica	Engine 9	
Station 10*	MLK Blvd.	Engine 10	
Station 11*	Airport		
Station 12	79th and Slide	Engine 12	Truck 12
			Hvy Rescue
			12
Station 14	96th and Ave. X	Engine 14	Scuba 14
Station 15	80th and Venita	Engine 15	Tanker 1 & 2

Bearcat 780 Update - Part 3

In part 3 of this series on the highly anticipated Bearcat 780XLT scanner, we continue our focus on non-trunking functions begun last month. In October we began by covering the 780's remarkable Ericsson trunktracking capabilities, and next month we'll wrap up the series with a look at Motorola trunktracking.

SEARCH OPERATION (Conventional Search)

You can program up to 10 search ranges in the BC-780. Once you begin searching, you can link the ranges together and turn them on and off just as you would turn on and off scan banks (this is known in Uniden-lingo as "Chain Search"). You can also change the search direction by pressing and holding (for two seconds) the up and down arrows. There is also a "Search Event Menu" in which you can set a multitude of parameters for each search range:

Step: Adjust the step size within the range, including the options of 5kHz, 10 kHz, 7.5 kHz, 12.5 kHz, 25 kHz, 100 kHz, Auto (default)

Mode: Change the mode (AM, FM, NFM, WFM)

Alpha Tag: Set an alpha tag (up to 16 characters) for the search range, such as "Lo Band Military"

You can also set additional parameters which will apply to all search ranges:

Delay: Just as you do for channels, you can set up to 8 levels of delay per search range, including: No delay, 1 second, 2 seconds, 4 seconds, -2 seconds, -5 seconds, -10 seconds, Infinite. The default setting is a two-second delay.

Note that the negative (or inverse) delays will allow you to hear snippets of conversation (such as 5 seconds of a transmission) before the scanner will resume scanning,

even if that transmission is continuing. This works well for search when you might just be interested in a sampling of what's happening within a range. An infinite delay means that the scanner will stop on any transmission (or squelch opening) and will hold there until the user resumes the search with a key press.

Attenuator: You can turn attenuation on for search ranges (20dB, we believe).

Tone Data: Using the system menu, you set whether you want the scanner to be in tone squelch or tone search mode. With tone search on, as soon as the scanner stops on any transmission during a search, it will begin looking for any CTCSS or DCS (digital) sub-audible tone. If a DCS tone is present, it will generally be found instantly. If a CTCSS tone is used, the scanner will check each of 38 possible tones until the correct tone is found. This is not as slick as the PRO-92 and PRO-2067 which find these tones instantly.

Tone Squelch in Search mode is where the 780 really shines. You can set the search ranges to only stop on transmissions with a CTCSS of 167.9, for example. One tone setting will apply to all search ranges. Additionally, you can do just the opposite by using Tone Lock (wasn't that once a rock band?) mode. In Tone Lock, you will be able to monitor all transmissions EXCEPT those with a tone of, for example, digital 023. (Note: You can also do this in standard channel programming.)

Record: You can flag all transmissions monitored in Search to be recorded via the tape-out jack.

Auto Store: Automatically program a bank with search hits if you desire.

Note: The very first time you set a range for a bank you must set the range through the Menu. After that, you can change the prescribed search range through the keyboard just as you would on any other scanner (or you can do it again in the Menu).

◆ DISPLAY

The large, backlit display on the BC-780 has a number of interesting features:

Two Lines of alpha (16 characters each): One line for Bank tags, Scan List Tags, and Search Range tags; One line for talkgroup and frequency tags. Both text lines will also display Menu items when required. The top alpha line will also display numeric talkgroup IDs.

Signal Strength Meter: six graduated signal strength bars

Frequency, mode, and talkgroup/subaudible characters: This portion of the display shows frequency (in large 7-segment characters) as well as the mode (in icons) and the sub-audible tone or talkgroup ID. Unlike other scanners which will only display a talkgroup number or a frequency in trunking mode, the 780 will show frequency and talkgroup (and your alpha text for the talkgroup can also display). In other words, while in trunking, you see every possible indicator. The talkgroup characters are used to display any subaudible tone that may be active in non-trunk mode.

Trunking repeater activity indicators: Unique to Uniden, these 30 small bars provide a great visual of repeater activity in a trunked system.

Channel/Scan List/Bank Characters: The

top left, medium-sized, 7-segment characters can display the active channel number (1-500), or, while in trunking mode, they can display the currently active Scan List and Scan List memory position, or the currently active bank. The user chooses which to display with the Select key.

Trunk Type Indicators: An L (for LTR), E (for Ericsson/EDACS), or an M (Motorola) will display for trunked systems based on the user setting.

Other: The other standard icon indicators such as Bank numbers (1-10), Search, Scan, RMT, etc.

◆ RS-232 INTERFACE

There are a multitude of uses for the RS-232 interface. Unlike most scanners, the BC-780 provides a standard DB-9 serial connection on the back of the radio. A simple serial cable is all you need to connect the 780 to a PC (these cables are available at most every office supply, electronics and computer store for just a few dollars).

Computer Programming: Like many other high-end scanners, you can program the 780 with external software or back-up what you have programmed into software. With 500 channels, 1000 talkgroups, 16 characters of alpha for each, and much more, this is an extremely useful feature.

Computer Control: The 780 is also fully computer-controllable. All aspects of the 780 can be controlled by remote software. Best of all, you can leave the 780 in remote mode and use either software or the keys on the scanner itself! It's fully bi-directional. Under computer control

all keys and the VFO on the 780 are operational!

Software from the folks at WinScan will be available for programming and control of the 780 shortly after its release (it runs at speeds up to 19.2kbps). The software will be available from Scanner Master and other dealers.

Cloning: With an adapter and two serial cables you can connect two 780s and clone the programming of one directly to another. Unfortunately you cannot clone with a BC-245, BC-895 or any GRE scanner.

SmartScanner: You can download frequencies, talkgroups, and alpha tags from Uniden's SmartScanner server via a phone line and modem connection.

◆ LTR TRUNKING

We are not very familiar with the operation of this aspect of the BC-780XLT, but you can trunk a Johnson LTR system. You can program IDs and scan them or search for IDs. The operation is slightly different than for Motorola and Ericsson trunking as LTR does not use a control channel but rather a subaudible method for operation.

More next month....

◆ Wrapping Up

After many years of writing the scanner column for *Monitoring Times* I will be stepping down in a few months. If you've been considering sending me material for future columns, I hope you'll do so right away. If I don't get a chance to use it, I'm sure the next editor will. Thanks very much for your support.

TrunkTrac®

New Version 5.2



TrunkTrac, the first, and one of the most sophisticated trunk tracking technologies available, is now even better. New pricing and additional features make TrunkTrac your best choice if you're serious about tracking Motorola Type I, II, Ili, and Hybrid systems. TrunkTrac now supports the BC895XLT, PCR1000, R7000, R7100, R8500, R9000, and the RS Pro 20xx series with an OS456/535 board installed.

Competing products cost more, don't decode the control channel, can't deal with Type I fleet maps, and won't properly decode many Type II talk groups. TrunkTrac's patented technology let's you do all that and much more. TrunkTrac consists of easy to use menu driven software, an FCC Class B approved signal processing board you plug into an ISA slot in your PC, a serial interface, and a discriminator buffer for your scanner. Everything you need, including cables, is supplied. With TrunkTrac you'll have access to Private Call and Interconnect activity and can follow up to four systems at once. Any combination of VHF/UHF/800/900 MHz systems, including FED-SMR trunking, is supported. TrunkTrac lets you assign a 35 character alpha tag (up to 1000/system) to all IDs. You can set Lockouts, Personality Files, Scan Lists, and much more. TrunkTrac lets you log system activity to an ASCII file for database import and traffic analysis. We think you'll like TrunkTrac so much it comes with a 30 day money back guarantee. And For a limited time, when you purchase TrunkTrac, we will install the discriminator mod in your scanner for free. **TrunkTrac ver 5.2.....\$297.95**

Scanner Master 40 Freeman Place, Needham, MA 02492
Toll Free Phone: 1-800-722-6701; Also: 781-292-1010; Fax: 781-292-1020

Environment Canada's Weatheradio Stations

ALBERTA

162.400 Brooks
162.400 Calgary
162.475 Cooking Lake
162.550 Crowsnest Pass
162.550 Drumheller
162.400 Edmonton
162.400 Edson
162.400 Flagstaff
162.400 Fort McMurray
162.400 Grande Prairie
162.475 Highvale
162.550 Holden
162.400 Lethbridge
162.400 Limestone Mountain
162.550 Medicine Hat
162.475 Peace River
162.550 Red Deer
162.550 Whitecourt

BRITISH COLUMBIA

162.550 Abbotsford
162.400 Campbell River
162.550 Castlegar
162.400 Cranbrook
162.550 Kelowna
162.475 Penticton
162.400 Prince George
162.400 Vancouver/Victoria
162.475 Vernon

MANITOBA

162.550 Brandon
162.550 Dauphin
162.550 Long Point
162.400 Portage
162.400 Riverton
162.550 Winnipeg

NEW BRUNSWICK

162.550 Dalhousie
162.475 Fredericton
162.550 Millville

162.550 Miscou Island
162.550 Moncton
162.475 St. Andrews
162.400 Scotch Hill
162.400 Trocadie

NEWFOUNDLAND & LABRADOR

162.400 Brent's Cove
162.400 Codroy Pond
162.550 Conche
162.550 Corner Brook
162.400 Gander
162.550 Grand Falls
162.400 Hampden
162.550 Hermitage
162.400 Marystown
162.550 Mount St. Margaret
162.400 Portland Creek
162.550 Port Rexton
162.550 Rose Blanche
162.400 St. Anthony
162.400 St. John's
162.550 Trepassy

NORTHWEST

162.400 Inuvik
162.400 Yellowknife

NOVA SCOTIA

162.400 Aspen
162.550 Bay St. Lawrence
162.475 Ben Eoin
162.400 Bridgewater
162.400 Cape Breton
162.475 Cheticamp
162.550 Halifax
162.550 Middleton
162.550 New Tusket
162.475 Oak Park
162.550 Port Hawkesbury
161.775 Sable Island
162.550 Shelburne
162.400 Truro
162.475 Yarmouth

ONTARIO

162.475 Beardmore
162.475 Collingwood
162.550 Cornwall
162.475 Fort Frances
162.400 Goderich
162.475 Kenora
162.400 Kingston
162.400 Kirkland Lake
162.550 Kitchener
162.550 Lavant
162.400 Lindsay
162.475 Little Current
162.475 London
162.550 Marathon/Pukaskwa Park
162.475 Montreal River
162.400 Mount Forest
162.550 Nipigon
162.475 North Bay
162.400 Orillia
162.400 Ottawa
162.475 Pembroke
162.550 Peterborough
162.550 Port Elgin
162.550 Rosseau
162.475 St. Catharines
162.400 Sarnia
162.400 Sault St. Marie
162.400 Sudbury
162.400 Temagami
162.475 Terrace Bay
162.475 Thunder Bay
162.475 Timmins
162.400 Toronto
162.475 Windsor

PRINCE EDWARD ISLAND

162.400 Bear River
162.400 Charlottetown
162.475 O'Leary

QUEBEC

162.400 Baie-Saint-Paul
162.475 Baie-Trinité
162.525 Beauce

162.400 Blanc-Sablon
162.425 Carleton
162.550 Chibougamau
162.550 Chicoutimi
162.550 Dégelis
162.550 Gaspé
162.475 Grand-Fonds
162.550 Harrington Harbour
162.550 Îles-de-la-Madeleine
162.475 Kegaska
162.550 Lac Mégantic
162.475 La Tuque
162.400 Longue-Pointe-de-Mingan
162.550 Mont-Laurier
162.450 Montréal
162.550 Montréal
162.475 Mont-Tremblant
162.425 Québec
162.550 Québec
162.550 Rimouski
162.475 Rivière-au-Renard
162.400 Rouyn-Noranda
162.400 Saint-Cléophas
162.475 Saint-Félicien
162.550 Sept-Îles
162.475 Sherbrooke
162.400 Trois-Rivières
162.475 Val-d'Or
162.550 Ville-Marie

SASKATCHEWAN

162.400 Lanigan
162.400 La Ronge
162.475 Lake Diefenbaker
162.400 Lloydminster
162.400 Midale
162.475 North Battleford
162.400 Prince Albert
162.550 Regina
162.400 Regina Beach
162.550 Saskatoon
162.400 Stranraer
162.550 SwiftCurrent
162.475 Whitewood
162.550 Yorkton

GROVE

ICOM

PCR100	RCV 44	\$199.95
PCR1000	RCV 45	\$349.95
R75	RCV 32	\$574.95
R8500	RCV 14	\$1469.95*

SONY

ICF-2010	RCV 2	\$349.95
ICF-SW77	RCV 10	\$469.95
ICF-SW7600G	RCV 11	\$169.95

AOR

AR-5000 Plus 3	RCV 42P	\$2139.95*
AR-7030 Plus	RCV 17	\$1399.95*

SANGEAN

ATS-505	RCV 4	\$129.95
---------	-------	----------

WiNRADiO

WR-1550 (External)	RCV 47-E	\$549.95
WR-1550 (Internal)	RCV 47-I	\$499.95
WR-3150 (External)	RCV 48-E	\$1849.95
WR-3150 (Internal)	RCV 48-I	\$1849.95
WR-3500 (External)	RCV 49-E	\$2395.95
WR-3500 (Internal)	RCV 49-I	\$2395.95
WR-3700 (External)	RCV 50-E	\$2895.95
WR-3700 (Internal)	RCV 50-I	\$2895.95

GRUNDIG

Satellit 800	RCV 33	\$514.95*
Yacht Boy 400 PE	RCV 22	\$184.95

MISCELLANEOUS

Drake R8-B	RCV 3	\$1159.95*
JRC NRD-545	RCV 21	\$1799.95
GE SUPERADIO III	RCV 5	\$59.95
Yaesu VR5000	RCV51	\$899.95

Shipping/Handling Charges

Total Order	Shipping Charges
\$1-\$99	\$5.95
\$100-\$399	\$7.95
\$400-\$899	\$11.95
\$900-\$1499	\$15.95
\$1500-\$1999	\$19.95
\$2000-\$2499	\$23.95
\$2500+	\$27.95

*price includes shipping within the US
Prices subject to change without notice.

PALSTAR

R30	RCV 18	\$495.95
R30 w/Collins filter	RCV 18C	\$549.95

ANTENNAS

Active Duck	ANT 36	\$49.95
Grove Skywire	ANT 2	\$39.95
H800 Skymatch Active	ANT 15	\$129.95*
Select-A-Tenna	ANT 21	\$59.95
Super Select-A-Tenna	ANT 40	\$189.95
Sony AN-LPI	ANT 26	\$89.95
Stoner-Dymek DA100E	ANT 24	\$184.95
WiNRADiO AX-31B	ANT 4	\$149.95
WiNRADiO Antenna Distribution Unit 3 in/6 out	ANT 37	\$9,910.00
WiNRADiO Antenna Distribution Unit 4 in/8 out	ANT 38	\$11,950.00

ACCESSORIES

ICOM RECEIVERS

UT-106 DSP upgrade kit	ACC 16	\$139.95
Remote control software for R75	SFT 24	\$79.95

SONY RECEIVERS

AC adaptor for SW7600G	PWR 9	\$19.95
------------------------	-------	---------

AOR RECEIVERS

CTCSS for AR5000 & AR5000+3	ACC 96	\$99.00
-----------------------------	--------	---------

WiNRADiO RECEIVERS

FSK decoder	DEC 1	\$399.95
Portable power supply	PWR 5	\$199.95
Digital Suite software	SFT 15	\$85.00
Database Manager software	SFT 16	\$49.95
Trunking Software	SFT 23	\$89.95

DRAKE RECEIVERS

VHF converter	ACC 43	\$219.95 + \$65 installation
---------------	--------	---------------------------------

JRC RECEIVERS

Wide-band converter (less cellular)	ACC 11	\$349.95
High stability crystal	ACC 12	\$99.95

MISCELLANEOUS

Scancat Gold for Windows	SFT 2W	\$99.95
Scancat Gold for Windows SE Upgrade	SFT 2SE	\$59.95
Professional Antenna Switch	SWC 1	\$25.95

Grove Enterprises, Inc.

(800) 438-8155; (828) 837-9200

(828) 837-2216 fax

7540 Hwy 64 W; Brasstown, NC 28902

order@grove-ent.com

www.grove-ent.com

US Air Force ISB is Back

Last month we noted how the weather transmissions from the United States Air Force had been tentatively spotted on 11120 kilohertz (kHz), in straight Baudot radioteletype (RTTY). This turned out to be for real. Better yet, there's now a parallel on 3231 kHz. Both of these strong, authoritative signals use 850-hertz shift and 75-baud speed. Depending on how your radio tunes RTTY, you might find them as much as 2.8 kHz away from these assigned carrier frequencies.

It gets even better. Both frequencies are independent sideband emission (ISB), and simultaneously carry the Air Force weather fax, bringing this interesting service to seven known frequencies. These are 3231, 4855, 7398, 7870, 11120, 17781, and 19363 kHz. Set your radio to upper sideband (USB), and in most cases tune a dial frequency 1.9 kHz lower. This fax is silent much of the hour, but often seems to get busy around 55 minutes after.

For the RTTY, use lower sideband (LSB) mode to get on-frequency, because this is how it is broadcast. The US military has done a lot of ISB in the past, and it's kind of a neat system. It's based on the technical nature of any suppressed-carrier modulation, where most output is in one or both of the modulation sidebands, around 1.5 kHz from the assigned frequency. Single sideband is most common, due to its great efficiency, but as we see here, it's perfectly possible to transmit both (double sideband), or even separate audio in each (ISB).

3231 and 11120 are usually parallel to each other, but not to the older, RTTY-only system on 7784 and 13530. The weather products are the same, but this other broadcast uses different transmitters and schedules and tends to be quiet for longer periods of time.

Some other agencies, such as Canadian Forces in Halifax, Nova Scotia, actually alternate RTTY and FAX on the same channel frequencies. This takes some quick retuning, so I doubled up on memories for these guys. You'll find CFH going strong in both modes, FAX on the hour and RTTY in the time left over, on or about their assigned frequencies of 4271, 6496.4, 10536, and 13510 kHz.

English Lady is Cuban?!

For years, everyone's wondered where The English Lady comes from. This name is kind of confusing, referring to the language of the bizarre sounding "numbers" broadcast, not to its country of origin. "She" is actually from Russia, as far as anyone knows. She's been designated E17 on the "official" list maintained by ENIGMA, the European Numbers Intelligence Gathering and Monitoring Association. This group is very much alive, even though it has stopped publishing its newsletter.

Problem is that the English Lady signal, beamed to the US in the early evening, is way too strong to come from Russia's hemisphere. Cuba and Central America have long been suspected.



John Maky, who does a lot of numbers listening, recently found E17 on the same transmitter as the Cuban Morse code numbers (M8), both going simultaneously on 4520 kHz at 0300. This is possible because the Morse is most likely on-off keyed by sending audio tones to special circuits in the exciter sections of Cuba's powerful broadcast transmitters. This audio has also been heard mixed with their voice numbers lady, the "Atencion!" station (V2). Well, it looks as if someone pushed the wrong button again, and now we know the English Lady is Cuban.

What Was THAT?!

Everyone's noticing a huge increase in the funny noises on HF. Suddenly, new technologies are spawning faster than insects in spring-

time. Sometimes, especially at night, it sounds as if the buzzes, beeps, and blips have taken over. Everyone wonders what these are. Speculation flies thicker than the noise itself. Radar? Propagation sounding? Research? Military?

Right at press time, we nailed one of these. It's the Ticking Clock Station, which sweeps a pulsing carrier downward across 25 or so kilohertz exactly once per second. This turned out to be an experimental radar system in New Jersey, set up to measure ocean currents. We wouldn't even know this much, had its unwanted third harmonic not been sweeping 14275 to 14350 kHz, also known as the busy end of 20-meter amateur! We hams don't like funny noises in our bands, unless we're making them, and the Federal Communications Commission got on it pretty fast. A better filter has been installed on the thing, and the fundamental has been shifted down to around 4375-4400 kHz, where it can still often be heard ticking away.

Then there's the 007 Station. This has nothing to do with James Bond, but its designers must like the number seven. At 7 and 37 minutes after each hour, it hits 3007 kHz with short data bursts from two different transmitters. It then proceeds to hit 4007, 5007, and so on, in 10-second intervals, clear to 29007 kHz. Yet another propagation sounder? Don't ask me!

Weirdest of the lot, though, is a continuous electronic bleat from somewhere in Asia, which comes and goes with the skip on 6417, 6445, 8588, and 8703.5 kHz USB. All four frequencies are in perfect sync. They do a weird, phase-noisy thump eleven times a second, while simultaneously repeating a relentless little song of sequential data tones. This tune stops every few minutes for some hissy databursts. Nobody has the slightest idea what all this is doing.

Adding to the HF chorus is the Razzar, a surface-wave radar made by Raytheon, which emits a truly nasty buzz. There's the Woodpecker, another oldie making a comeback, though this time as a far less obnoxious auroral radar. There are Throb, Stream, and Hell, all amateur direct-printing modes. And so it goes, into the new century. Guess HF isn't obsolete after all.

ABBREVIATIONS USED IN THIS COLUMN

ALE	Automatic Link Establishment
AM	Amplitude Modulation
ARQ	Automatic Repeat Request teleprinting system
CAMSLANT	Communications Area Master Station, Atlantic
CG	Coast Guard
CW	Continuous Wave (Morse telegraphy)
DE	From
DEA	Drug Enforcement Agency
DX	Distant Transmitter
E3	Enigma classification: Lincolnshire Poacher
E4	Enigma classification: Cherry Ripe
E10	Enigma classification: phonetic alphabet - NATO designators (Mossad)
E17	Enigma classification: English Lady - aka The Russian Man, ends 0000
EAM	Emergency Action Message
FAX	Radiofacsimile
FEC	Forward Error Correction teleprinting system
FEMA	Federal Emergency Management Agency
FM	Frequency Modulation
ID	Identifier
LDOC	Long Distance Operational Control
M8	Enigma classification: Cut numbers - ends AR ARAR SK SKSKSK (Cuba)
M22	Enigma classification: 4XZ
MARS	Military Affiliate Radio System
MFA	Ministry of Foreign Affairs
MWARA	Major World Air Route Area
NATO	North Atlantic Treaty Organization
PacTOR	Packet Teleprinting Over Radio
RAF	Royal Air Force
RSA	Republic of South Africa
RTTY	Radio Teletype
S17	Enigma classification: Czech Lady control 5FG
SAM	Special Air Mission
SESEF	Ship Electronics Systems Evaluation Facility
SHARES	Shared Resources
SITOR	Simplex Teleprinting Over Radio (modes A & B)
UK	United Kingdom
Unid	Unidentified
US	United States
V2	Enigma classification: Spanish Lady - (3 messages, all 150 count)
VHF	Very High Frequency

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

1752.0	EJK-Valentia Radio, Ireland, weather info and then a phone patch with an unknown aircraft, at 2034. (Patrice Privat-France)
2852.0	MGLI-British-sounding callsign repeated every 20 seconds in CW, no other traffic, for 30 minutes beginning at 2300. (Geoff Halligey-UK)
3208.0	RMP-Russian Navy, Kaliningrad, working vessel RZXW in CW, at 1957. (Ary Boender-Netherlands)
3231.0	KGWC-International weather circuit ID for US Air Force Global Weather Center, with FAX charts in the upper sideband, at 0523. KAWN-Weather ID for US Air Force Aviation Weather Network (main switch at Tinker AFB, OK), with RTTY weather

3415.0	ART-Israeli Intelligence (E10), with AM callup and "numbers," parallel on 5434, at 2030. (Boender-Netherlands)
3652.0	GYA-British Royal Navy, Northwood, with a smeary FAX weather chart, at 2320. (Day Watson-UK)
3855.0	DDH3-Hamburg Meteorological, Germany, with a FAX upper air chart, at 0641. (Watson-UK)
3963.0	V84W-Unidentified Russian station, with CW callup to AOXD, then 5-letter code groups in Cyrillic Morse, at 2120. (Boender-Netherlands)
4026.0	Cuban "cut" number station (M8), with 5-number CW groups, Friday at 0302. (Camillo Castillo-Panama)
4027.0	Cuban "Atencion" number station (V2), with Spanish 5-number groups in AM, Saturday at 0302. (Castillo-Panama)
4241.0	LGW-Rogaland Radio, Norway, in CW farewell message, final sign-off at 0002. (Watson-UK)
4721.0	Trout 99-US Air Force, in a patch to command post via Andrews, reported that an Air Force Chief of Staff was aboard, at 0533. (MADX-MD)
4742.0	Architect-British Royal Air Force Flight Watch Centre, working "Skywatch" at 0240. (Ron Perron-MD)
4848.0	"6-W-J"-Probable US military exercise, with 2 EAMs at 0048. (Jeff Haverlah-TX)
5399.6	Unid-Probably US Coast Guard GANTSEC (Greater Antilles Section), with "whale sounds" and possible drug interdiction in secure voice, identical to the more commonly heard 6815.6 frequency, at 0644. (Hugh Stegman-CA)
5598.0	Martinique 912-Commercial flight cleared by New York Radio out of flight level-350 for 340 at 0544. (MADX-MD)
5680.0	"9-W-L"-Probable US military exercise, with EAM, then "B-4-Y," with three special "EAM sequences" at 0622. (Haverlah-TX)
5696.0	Coast Guard Rescue 6003-US Coast Guard, with a patch via CAMSLANT to CG Group Mayport, at 0700. CG Rescue 6003, breaking off a later search and returning with an in-flight emergency for a bad left side engine, at 1530. (Allan Stern-FL)
5717.0	Tusker 44-Canadian rescue CC-130H, in a patch via Halifax Military to the Rescue Coordination Centre, in search of an overdue fishing boat, at 2351. (Perron-MD)
5841.0	Panther-US DEA, Bahamas, working Coast Guard 32C at 0356. (Perron-MD)
6316.0	UFN-Novorossiysk Radio, Russia, working vessel UDEW, Akademik Poustovoit, Sitor-A, at 1554. (Watson-UK)
6319.5	UCE-Arkhangelsk Radio, Russia, working vessel UCOZ, Maekhanik Semakov, Sitor-A, at 1559. (Watson-UK)
6379.0	4XZ-Israeli Navy, Haifa, with encrypted CW traffic, then back to usual "VVV DE 4XZ" marker, at 1924. (Watson-UK)
6501.0	CAMSLANT Chesapeake-US Coast Guard, working "Z-4-I," probably a cutter, at 0625. (MADX-MD)
6666.0	"9-A-L"-Probable US military exercise, with EAM at 0151. (Haverlah-TX)
6683.0	SAM 201-US Air Force VIP flight, a C-20B, in a patch via Andrews to SAM Command Post at 2221. (Perron-MD)
6697.0	"5-L-D"-NATO trigraph callsign for unknown aircraft working MKL, British Royal Air Force, Northwood, at 2158. (Perron-MD)
6739.0	Ascot 5052- Royal Air Force, working Architect at 0645. (Perron-MD)
6768.0	Cuban "cut" number station (M8), 5-number CW groups for GMIWD MNRIN DTNND at 1302. (Castillo-Panama)
6780.0	Unid-Weird male voice in English, giving numbers in 5-digit groups at 2116. (Gary Cohen-MA) [Probably Russian. -Hugh]
6784.0	Cuban "cut" number station (M8), 5-number CW groups at 1301. (Castillo-Panama)
6824.0	Cuban "cut" number station (M8), 5-number CW groups for GMIWD MNRIN DTNND at 1301. (Castillo-Panama)
6854.0	Cuban "Atencion" number station (V2), with Spanish 5-number groups in AM, at 0305. (Castillo-Panama)
6900.0	Lincolnshire Poacher (E3), British intelligence, Cyprus, with

- "numbers" in progress at 2016. (Boender-Netherlands)
- 6933.0 Cuban "cut" number station (M8), 5-number CW groups for RRAMI MUINN DRMGT at 1203. (Castillo-Panama)
- 6959.0 Lincolnshire Poacher (E3)-British intelligence, Cyprus, with female callup to 39221 and 5-figure groups, then usual 45-minute cycle, on at 2000, gone at 2045. (Sean-VA)
- 6960.0 Lincolnshire Poacher (E3), with female callup to 44250 at 2107, then a new message at 2200. (Cohen-MA)
- 6987.0 Unid-Weird English-speaking female voice (E17) with 5-figure "numbers" groups at 0411. (Castillo-Panama) [Russian, though not necessarily transmitted from there. -Hugh]
- 7535.0 SESEF-US Navy Ship Electronic Systems Evaluation Facility, Norfolk, VA, working destroyer USS Oscar Austin (DDG-79), at 1545. (MADX-MD)
- 7554.0 Cuban "Atencion" number station (V2), with Spanish 5-number groups in AM, at 0315. (Castillo-Panama)
- 7710.0 VFF-Canadian Coast Guard, Iqaluit, with FAX ice charts at 0530. (MADX-MD)
- 8127.0 VLB2-Israeli intelligence (E10a), with female phonetic callup, null message, at 0247. (Castillo-Panama)
- 8157.0 The English Lady-Bizarre Russian AM "numbers" voice (E17), repeating 5-figure groups in English, signed with "00000" at 0324. (MADX-MD)
- 8190.0 Unid Czech "numbers" (S17c), callup to 92034 in AM at 1250. (Boender-Netherlands)
- 8367.0 FUJ-Third harmonic from 2789 kHz, of French Navy, Brest, with 75-baud RTTY, but shift of 2550 hertz (3x850), repeating the usual test markers at 1140. (Watson-UK)
- 8437.0 4XZ-Israeli Navy, Haifa (M22), with CW marker at 0243. (Castillo-Panama)
- 8677.0 CBV-Valparaiso Radio, Playa Ancha, Chile, with fuzzy FAX weather charts at 2323 and 2336. (Watson-UK)
- 8715.0 UMF-Odessa Radio, Russia, working STB (Dry Transport Barge) Dinenko in CW, at 0350. (MADX-MD)
- 8825.0 New York Radio, MWARA North Atlantic net, taking position from US Air Mobility Command Reach 785T, went to 11309 and kept this one as secondary, at 0135. (Perron-MD)
- 8889.0 Unid French fishing trawlers in the Atlantic, discussing problems with video cassette recorders, at 1030. (Privat-France)
- 8971.0 Blue Star-US Navy, PR, working Hunter 02, probably British RAF on joint drug ops, given a coded frequency for US Coast Guard, at 0315 Molson 713-Canadian Forces aircraft, working Fiddle (US Navy, Jacksonville, FL), at 2059. (Perron-MD)
- 8974.0 Lince 12-Probable Spanish Air Force aircraft, working unid ground station at 2150. (Perron-MD)
- 8983.0 CAMSLANT Chesapeake-US Coast Guard, VA, working Rescue 6033 in a search, at 2130. Camslant working "T-4-G," a drug mission, at 2159. CAMSLANT sending "Q-3-B" to another frequency for Panther (DEA, Bahamas), at 2302. (Perron-MD)
- 9031.0 Ascot 3201-British Royal Air Force aircraft, working Architect (RAF Flight Watch Centre), at 0305. (Perron-MD)
- 9215.0 Unid CW station with callup to 792, then 5-figure "numbers," at 0231. (Castillo-Panama) [Again, most likely Russian. -Hugh]
- 10066.0 Calcutta Aero, India, working Lauda 20, position check, at 1815. (Privat-France)
- 10215.0 Cuban "cut" number station (M8), 5-number CW groups at 0903. (Castillo-Panama)
- 10493.0 WGY 908-FEMA Region 8, Denver, radio troubleshooting at 0059. (Perron-MD)
- 10536.5 CFH-Canadian Forces, Halifax, Nova Scotia, with clear FAX weather charts at 0535. (Bob Hall-RSA)
- 10581.0 S84-Swedish Embassy, Washington, DC, with 2400-baud serial modem traffic to S94, Mexico City, after ALE callup, at 0819. (MADX-MD)
- 10608.0 Turbo-Colombian Coast Guard, working Atlantico, probably the naval headquarters, at 2311. (MADX-MD)
- 10780.0 Cape Radio-US Air Force, telling King 2 that the space shuttle launch would be using 5180 kHz, at 0132. (Perron-MD)
- 10806.5 Unid-Male working "Zodiac," said he was alone until after "NBC," at 2046. (Duke Rumley-NC)
- 10917.7 RFFXOC-French Ministry of Defense, with long ARQ messages in 5-letter code groups, at 1600. (Hall-RSA)
- 11120.0 KGWC-US Air Force Global Weather Center, with FAX charts in the upper sideband, at 0405. KAWN-US Air Force Aviation Weather Network, with RTTY weather codes in the lower sideband of the same transmitter, at 0409. (MADX-MD) [Like 3231. -Hugh]
- 11175.0 Razor 22-US military aircraft, calling Mainsail (any station), no joy at 1650. (Haverlah-TX)
- 11235.0 Lince 12-Probable Spanish Air Force aircraft, working unid ground station, called this frequency "Bravo 3," at 2150. (Perron-MD)
- 11366.0 Unid-Ground station working "flight 23," in Portuguese, probably a Varig airlines LDOC, at 2331. (Perron-MD)
- 11637.0 FAAZFW-US Federal Aviation Agency, Fort Worth, TX, sounding in ALE at 0651. (MADX-MD)
- 12226.0 S00-Swedish MFA, Stockholm, with ALE call to S73, Lagos, at 0131. (MADX-MD)
- 12478.0 UCMR-Russian vessel Ivan Shadr, working Arkhangelsk in Sitor-A, no traffic, at 1217. (Watson-UK)
- 12590.5 RRR34-Moscow Radio, Russia, with traffic list in Sitor-B at 1445. (Watson-UK)
- 12666.5 RFFME-French Navy, possibly Toulouse, testing in RTTY at 2050. (Hall-RSA)
- 12710.7 PWZ33-Brazilian Navy, Rio de Janeiro, with RTTY (850/75) weather at 0530. (Hall-RSA)
- 13244.2 NNNOLA-US Navy/Marine Corps MARS, in a SHARES exercise with net control station AFA3HY, sending PACTOR messages (200/100), at 1839. (MADX-MD)
- 13257.0 Gonzo 4-Canadian Forces aircraft, calling Trenton Military, at 1715. (Perron-MD)
- 13392.0 DFZG-Serbian MFA, Belgrade, with RTTY (400/75) testing and then encrypted traffic, at 0656. (MADX-MD)
- 13530.0 Barranca-Colombian, Barrancabermeja, with ALE call to unknown Navy unit "Radgenabu," at 1642. Pesima-Unknown Colombian military, working Cotari in ALE, at 1704. (MADX-MD)
- 14404.0 S86-Swedish Embassy, Mexico City, with 2400-baud serial modem traffic to S91, Lima, Peru, after ALE callup, at 0640. (MADX-MD)
- 14982.5 RBV76-Tashkent Meteorological, Russia, with a very clear FAX weather chart, at 1520. (Hall-RSA)
- 15860.0 S00-ALE identifier of Swedish MFA, Stockholm, calling S31, Algiers, S45, Ankara, and S97, at 1400. (Watson-UK)
- 15973.0 SNN299-Polish MFA Warsaw, with ARQ traffic in Polish, then economic and cultural bulletins in English, then encrypted traffic for Baghdad, at 1502. (Watson-UK)
- 16344.4 Unid-Possibly Romanian MFA, using Romanian FEC mode for encrypted traffic, new frequency for this one, at 0641. (Hall-RSA)
- 16692.5 ZSC-Capetown Radio, with FEC weather bulletins, parallel on 4214 and 12601, at 0945. (Hall-RSA)
- 16840.5 BPO-Globe Wireless Barbados digital node, with channel marker at 2325. (Rumley-NC)
- 16903.0 MTF-British Royal Navy, Falklands, with RTTY (200/75) channel bulletins at 0745. (Hall-RSA)
- 16984.0 PWZ33-Brazilian Navy, Rio de Janeiro, with fast (850/200) RTTY news and weather in Portuguese, then weather in international code, at 2004. (Watson-UK)
- 17934.0 Boyeros-Cubana Airlines LDOC, working unid aircraft in Spanish, at 1639. (Perron-MD)
- 18560.0 BMF-Taipai Meteorological, with Chinese FAX weather charts at 0936. (Watson-UK)
- 18864.0 Cherry Ripe (E4)-British Intelligence, Pacific, parallel on 21866, with numbers at 0000 and 2300. (John Maky-AR)
- 19131.0 Atlas-US DEA, IA, working aircraft Flint 911 at 2133. (Perron-MD)
- 21866.0 Cherry Ripe (E4)-British Intelligence, Pacific, with numbers at 0000, 0100, and 2300. (Maky-AR)
- 22380.5 CBV-Valparaiso Radio, Chile, working several vessels in Sitor-A, at 1859. (Watson-UK)
- 22408.5 UFL-Vladivostok Radio, Russia, working vessel UHVL in Sitor-A, at 0857. (Watson-UK)
- 22818.5 EAE220-Spanish MFA, Madrid, with many encrypted Twinplex messages to Luanda, at 0858. (Watson-UK)
- 22863.0 Unid-Fast coded RTTY (500/100) from FAPSI, the Russian security and communication agency, at 0920. (Hall-RSA)
- 23370.0 HZN50-Jeddah Meteorological, Saudi Arabia, with RTTY (850/100) weather codes at 0914. (Hall-RSA)
- 23526.0 S84-Swedish Embassy, Washington, DC, with 2400-baud serial modem traffic to S93, Havana, after ALE callup, then same process with S94 (Guatemala) and S12 (Bogota), started at 1904. (MADX-MD)
- 24644.0 Cherry Ripe (E4)-British Intelligence, Pacific, with numbers at 2200. (Maky-AR)
- 25040.0 RFGW-French MFA, Paris, with coded messages in FEC, at 1529. (Hall-RSA)
- 26441.7 RFGW-French MFA, Paris with ARQ message to RFVIT (Navy, St. Denis), at 1245. (Hall-RSA)
- 26952.0 RFTJE-French Navy, Dakar, Senegal, testing in RTTY (850/75), at 0820. (Hall-RSA)
- 36500.0 Unid-Mexican Spanish-speaking FM male, as rebroadcast by a probable US military VHF repeater in WA, all afternoon starting at 2100. (Flash Parlini-WA)

Algerian Oil & Gas on HF

A few months ago, we described the techniques we used to identify the organization behind some pretty interesting ALE identifiers – the Washington Gas Light Company.

Our starter for this month's Digital DXing is in a similar vein, and serves as a great case study in the combination of intuition, detective research and some luck in getting to the bottom of an unknown ALE network ... Not to mention the ability to crack open another network and to gain insights into a far away country that one might otherwise never have known.

Since we cannot hear either of the networks in question here at "DD Towers," it's also a great example of the fun you can have even if all you have to go on is other people's frequencies and IDs.

◆ In the Beginning

Almost a year ago, a number of WUN listeners reported one, and then more frequencies carrying the same odd identifiers – GASSI30P, OHT30P, SP4, SP328, INAS30P, RNOUSLRI, and DEBDEB30P to name a few.

The speculation at the time was that this was some sort of net connected with UN peacekeeping operations in ex-Yugoslavia. The logic followed was that a number of the identifiers looked like ITU callsigns – SP for Poland, OH for Finland, DE for Germany, and so on. This was plausible since we also knew that most of these countries had provided detachments to the efforts in the Balkans.

Most people were satisfied with this explanation, and apart from yet more frequencies coming to light over the next month or so (see this month's International ALE Networks feature for more information) this is how things stayed for a while.

◆ It Gets Interesting

A few months ago, WUN contributor "RGA" made the observation that a number of the identifiers on this network had some similarities with another network. This one sported addresses such as ALG, ALR, OHT, BORMA, INA, HAMRA, RNS and TFT.

Since some of these identifiers appeared to be place names, and working on the hunch

that ALG was Algiers, RGA placed some bets on the other locations – ALR could be Ali bel Rida, OHT was probably Ohanet, and INA was probably In Amenas. Because the overlap of identifiers was quite large, RGA speculated that the origin of the other net was Algerian, too. We also knew that in one of the networks, ALE triggered Rascal HSM-1250 modem traffic, which was also being phased into the Algerian Diplomatic operations on HF. All in all, this was some pretty good detective work.

Unfortunately, and as is often the case in utility listening of this nature, since we knew that this was not the MFA (their ALE network was already well-known), and was probably not military, the good-old MOI (Ministries of the Interior) designation came to the rescue.

◆ MOI - More Observation & Investigation?

Unsatisfied with the MOI designation for our two Algerian networks, we dug a little deeper into the subject.

First, we plugged all the ALE IDs into a good search engine on the web. This sounds laughable, but you'd be amazed by what's indexed on the web these days. Unfortunately, this method yielded no result.

Secondly, we looked at the place names suggested by RGA. Hassi el Gassi, it was speculated, might be the location of the station with identifiers GASSI30P and GASSIGPL. Looking at the atlas, we noticed that "hassi" is Arabic for "well." At first, we wondered about water wells or oases, but pretty quickly realized that these wells were probably of the famous black liquid variety – little did we know that we had struck oil!

◆ Black Gold

Entering the search terms "algeria AND oil" took us into a world we had little knowledge of before embarking on this investigation. Following a few links quickly took us to the website of SONATRACH – the Algerian government's oil & gas company.

Clearly proud of their country's extensive fields of oil and natural gas, and the infrastructure that they had developed to extract, store, process and transport it, we were pleased to find that SONATRACH had produced a beautiful

map showing the locations of everything. Of course, most of these places don't exist in regular atlases, either paper or on-line.

From then on, it was the usual painstaking process of checking each of the oil and gas field names for correspondence with the ALE identifiers. Although there are still a few unknowns, this process pretty much yielded all the ALE identifiers in our previously-designated UN peacekeeping net, plus refined most of the IDs put forward by RGA in his analysis of the second network.

What we haven't determined, precisely, is the meaning of some of the identifier suffixes and prefixes (SP and 30P) and whether the networks are security or operations-related. Unfortunately, there appears to be little traffic on the networks to help us in this regard.

You can see the full results of our investigation in this month's feature article. Hopefully this article will inspire you to work on some of the unidentified networks we've covered!

◆ Spanish Diplomatic Service

Here's a reminder that you can provide your TWINPLEX module with a handy workout by listening for MFA Madrid and its various South and Central American embassies. Telex and 10 letter-group encrypted messages are to be heard most days on 15946.5 and 22818.5 kHz. Selcals used are in the TQxx-series.

Remember to set the module for the -200/-85/+85/-200Hz tone shifts, word interleave and F7B-I tone arrangement used. Failure to do so will result in garbled text.

◆ North Korean News Agency KCNA

One of the few press services still on HF, KCNA continues to transmit new from Pyongyang. The station uses Baudot at 50bd with a shift of 250 or 400 Hz. The current English schedule is as follows:

Target Area	UTC	Callsigns	Frequencies (kHz)
Asia	1000-1200	HMF46 & 86	8152 & 10580
Europe	1000-1200	HMF26 & 55	11430 & 15633
Americas	1230-1430	HMF36 & 52	11476 & 13580
Africa	1230-1430	HMF49 & 85	8020 & 11536

Until next time, enjoy the 1's and 0's.

Glenn Hauser

P.O. Box 1684-MT, Enid, OK 73702

wghauser@yahoo.com

www.angelfire.com/ok/worldofradio

Soviet Superpower Tests Burned the Ionosphere

In the late 70s, experiments were performed from Ukraine using 3 x 1000 kW transmitters in parallel. The antenna consisted of 13 vertical towers in the shape of a parabola (as viewed from an airplane) with various folded dipoles strung between all these towers. It also had a very narrow bandwidth (approx. 3 MHz), and a very narrow beamwidth (approx. 5-10 degrees). As a result, the gain they obtained from this antenna was a staggering 38 dB!

The reference signal they used it against was a 1000 kW transmitter with a 20 dB curtain antenna. The test signal was directed to the Washington / New York area. What happened was as follows. It started at 1000 kW; they increased power and monitored signal strength received in Washington. As the test transmitter power approached 2000 kW, they found that the received signal strength started to decrease. At 3000 kW the received signal was almost gone, but why?

Radiosondes and satellites were then dispatched to analyze the signal. What they found was surprising. At 3000 kW and 38 dB of antenna gain, the signal was of such power, that it was heating up a spot in the ionosphere. But instead of creating a solid area of reflection, they discovered they were actually burning a hole in the ionosphere and the signal was being shot off into space. They also noticed that the area of the ionospheric hole had an effect on approaching weather fronts. The weather fronts were being deflected around the ionospheric heated area, inadvertent weather modification.

So they reduced the power, received signal strength improved, but not much over the reference signal. They experienced lots of fading, especially when the ionosphere was unstable, that the solar winds

would push and pull at these heated-up areas of the ionosphere and move it around. They did, however, notice that as the ionospheric hole decreased in size, they were also able to transmit a second signal beamed to the same spot at much higher than the MUF and HPF; however, the received signal was very unstable, because of the lack of symmetry and alignment due to the number of hops. This method had been used before, but just for one hop.

The parabolic antenna was modified to a wider beamwidth (approx. 30 degrees) and the frequency range was expanded to 5.5-22.0 MHz. The result of this was a drop in gain to 29 dB, which is still fantastic.

The high power transmitter program was canceled, and soon after many of the engineers were laid off, but 20-30 were provided safe passage out of the Ukrainian SSR and ended up in Alaska working on the US HAARP project. ((c) Rick Slobodian, Alberta, after visiting Ukraine, via BC-DX)

They tried to serve North America with 3000 kW and an antenna with a gain of 38 dB, resulting in a ERP of almost 19 million kW (Kai Ludwig, Germany)

The original aim of these tests was to try to "optimize" jamming on SW (Bernd Trutenau, Lithuania, BC-DX)

Also, the widely observed USSR - Woodpecker signals originated from Ukraine territory near Poltava, as described in German magazines in the 70s. The row/fence of the giant antenna tower installations (maybe 8x8 or 16x16 dipole arrays?) could easily be seen from aircraft and spacecraft (Wolfgang Büschel, BC-DX)

ALASKA The former KGEI transmitter, which was purchased by Calvary Chapel and then stored in a potato hut in Idaho, was sold again in October 1999 to Aurora Communications. Last June, two tractor trailer rigs transported it to Ninilchik, Alaska, on the Kenai Peninsula not far from KNLS. The building is to be dedicated in August, and on the air by 2002 as a new service to Russia, in Russian, two or three hours of religious programming each evening repeated for different time zones. Some of the old KGEI engineers have come out of retirement to work on refurbishing the transmitter. It will run at 250 kW with three antennas - a corner reflector, a log periodic, and a TCI 611 curtain (Hans Johnson, Cumbre DX)

ASCENSION The whole island is almost one enormous antenna farm with RAF, GCHQ, USAF as well as ourselves. I have 70 employees here who are all from St Helena; they go home once every two years on the RMS boat. I'm lucky; I can escape every 8 months to the UK! You can see a few pictures of the Island here: <http://www.ascension-island.gov.ac/virtualtour/index.html> (BBC/Merlin staff, BCDX)

AUSTRIA [non] After several weeks of German, ORF finally got English on the Canadian relay 17865 at 1630 (Mike Horan, IL)

BHUTAN BBS introduced a new weekday morning service Nov 15 on 6035. M-F 0100-0530, 0800-1230. The second transmission begins with English announcements, program summary and followed by News in English at 0801. Signature tune at 0058 and 0758; Sa/Su 0400-1000. English continues at 1000-1100 with news at 1001 (Alok das Gupta, Calcutta, India, Electronic DX Press)

BOLIVIA Reactivated is R. Constelación, Guanay, on 4766.4 heard at 2230, relaying their FM (Rogildo Fontenelle Aragão, Bolivia, radioescutas)

*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; B-00=winter season, October 29-March 31; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

BRAZIL Rádio Difusora, Taubaté, SP, has returned to 4925, heard 0400-0430 with *Madrugada Difusora* (Ding with 570 and 4925 (Célio Romáis, DX Clube do Brasil) Also heard on 4925 thanks to this tip, 0655-0715 with announcements, international pop music and música popular brasileira (Enzio Gehrig, Dénia, Spain)

CANADA Allan McFee, a longtime CBC radio personality famous for his off-beat music choices and unusual stunts, died Dec. 12 at the age of 87. McFee is remembered for a 20-year on-air partnership with Max Ferguson and later as host of the *Eclectic Circus*, during the '70s and '80s. McFee had a reputation early on as a rebel at the CBC, joking on-air and clashing with producers and bureaucrats who tried to repress his act. One of the ways he'd vent his frustrations was to dot the studio ceiling with asparagus tips he'd thrown in the air (CBC Online via Ivan Grishin and Bill Westenhaver)

CANADA On *Maple Leaf Mailbag*, director of RCI Robert O'Reilly was talking about future programming plans. The idea is to increase in-house production - meaning there will be fewer CBC programs on shortwave as early as the next season (A-01). The other driving force is the application of their mandate, focused on broadcasting to non-Canadians overseas (Ricky Leong, QC) He virtually admitted that the CBC programming was temporary fill until RCI could produce more of its own programs. More RCI is fine, but not at the expense of CBC. At least one SW transmitter should be dedicated to continuous relay of CBC to the USA! (gh)

I have long contended, from decades back, that the CBC really should have been a cover-Canada-by-shortwave service rather than a local-AM and local-FM radio service. Let the local stations be regular commercial radio as in the US, and provide the great CBC programming to everyone with shortwave, beamed in-

land from both coasts. This would have had the side benefits of letting us here in the USA hear it well, and provide a great shortwave-receiver market which would have stimulated manufacturers worldwide to make many more SW receivers in a wide price range and with many more features than are now available. And no one would be talking about "the death of shortwave," as they do so often now! (Will Martin, MO, to RCI via DXLD)

RCI made a number of frequency adjustments in early December, so that from Sackville the 0200 hour in English uses 6040, 9755, 11725, 11990 (Bill Westenhaver, RCI) 2100 on 9805, 13650; 2300 M-F on 5960, 6040, 9755, 11865, 13730. Latest schedule is at <http://www.rcinet.ca/horaires/techsche.htm> (Ricky Leong, QC)

RCI's webcasts via <http://www.rcinet.ca> fill in some times when there is no English on SW, notably 0300-0500, scheduled: UT Sun 0300 The House, 0400 Global Village; Mon 0300-0500 Cross Country Checkup; Tue-Sat 0300 The World At Six; 0330-0500 As It Happens (gh)

CHINA On 2340 and 4975, Fujian PBS at 1530 with health phone-in. Almost all the Chinese regional stations on MW and SW now seem to carry endless phone-ins on the subjects of health, disease and sexual dysfunction for the entire evening every single day - with interruptions for advertisements promoting various pills, potions, clinics and even mental hospitals. It's struck me before that China seems to suffer from more than its fair share of hypochondria, but this is getting ridiculous! (Alan Davies, Vietnam, Cumbre DX)

CHINA [non] A schedule via Nikolay Rudnev and Anatoly Klepov, Rus-DX via BC-DX of foreign relays via CIS transmitters includes Falun Dafa Radio via Tajikistan: 9415 1400-1500 500 kW FDR. The Bulgarian site at 2200 moved from 12 to 9.3 MHz frequency range (gh) I got a verification by email - from Falun Dafa Radio 9330! Levi Browde answered fast and promised to come back later with additional info. The report was sent to editor@faluninfo.net and answered by levi@bestweb.net (Björn Fransson, Sweden, SW Bulletin)

CONGO DR Radio Télé Liberté, 15725, replied by E-mail in French from Olivier Kamitatu, MLCongo@compuserve.com Said they had a 20,000-man army fighting against the Kabila dictatorship; station would return to air in December. Web: <http://www.mlc-congo.org> (Paul Ormandy, New Zealand) RN Medio Network classifies it as a hate radio potentially inciting genocide

COSTA RICA RFPI has a new e-mail account radiopaz@racsa.co.cr (Willie Barrantes V, RFPI)

Due to a mistuned satellite downlink, TIDGS 9725 broadcast a string of numbers over and over, presumably some transponder ID info in (modulated) CW for at least two hours one evening, instead of University Network programming (George Thurman) On 4694.97 at 0217 Dr. Gene Scott preaching, very weak // 5030 and 11870 (Mark Mohrmann, VT) This is a difference product: 9725 minus 5030 equals 4695. I suspect one could find others by differing - and perhaps summing - all possible pairs of TIDGS frequencies (if both be on the air) (gh)

CZECH REPUBLIC R. Prague logged on 5055 at 0315 in Spanish, SINPO 33443 (Herman Römer, Netherlands, Benelux DX Club) From 0100 to 0327, R. Prague via Litomysl site uses 7345 and 6200 in English, Spanish and Czech to the Americas. 5055 is a rare mixing product between the two, which could also happen on 8490 (Wolfgang Büschel, BC-DX)

DOMINICAN REPUBLIC The decision to change from UT-4 to UT-5 was reversed after only one month; caused too many problems and was not properly authorized (Ultima Hora via Dino Bloise, FL)

ECUADOR HCJB's Allen Graham is on a fund-raising tour of the US until March, but, unlike his predecessor hosts of DX Partyline, has continued to produce the show on the road, sending voice files from his laptop to Quito where Jeff Ingram compiles them into abbreviated half-hour programs (gh)

EGYPT Radio Cairo with Arabic to South America after 2330 from Abis on 15590 and 17770 was suffering from a badly working noise gate, a unit which is used to mute noisy feed circuits when they have no audio. This noise gate did not open properly, resulting in just shreds of audio coming through. I am rather certain that the infamous audio on 9900 is caused by a similar malfunction, too; actually disappointing that they do not manage to solve such a minor problem. (Kai Ludwig, Germany, DXLD)

FRANCE Transmitter Documentation Project shows the old Issoudun facilities available, but nobody wants them, except when TDF had to substitute them temporarily for French Guiana. There are no less than eight 500 kW from 1973/1973, and probably another eight 100 kW from 1960/1962 still available. So TDF has really an abundance of spare capacity (Kai Ludwig, Germany, DX Listening Digest)

INDIA There are three new states in India, UTTARANCHAL (out of Uttar Pradesh), CHATTISGARH (out of Madhya Pradesh) and JHARKHAND (out of Bihar). Of these, Jharkhand already has a SW transmitter at RANCHI - the capital of the new state. Uttaranchal state is carrying programs from AIR NAJIBABAD via the Delhi transmitter on 6030 at 0200-0310 and 1215-1430. The program starts and ends abruptly and no freq announcements are given for the new services. This is using a dipole antenna on the Nepal beam (Alok das Gupta, Calcutta, India, Electronic DX Press)

IRAN VIRI's Radio Shalom service in English clearly is anti-Israel, with news about "the Zionist regime," etc. But I wonder, what's the point? VOIRI has English broadcasts aplenty. So it seems to be targeted specifically for an Israeli audience, especially under this name. But they won't get dedicated listeners (Silvain Domen, Belgium, DX Listening Digest)

IRAQ RII English 2000-2045, German 2045-2145, French 2145-2215, Turkish 2215-2300; also English 0200-0245, German 0245-0345, French 0345-0415, Turkish 0415-0500, then a foreign service in Arabic all on

11785 variable. Times vary by 5 minutes and the service is not daily; the 0200 service sometimes misses a language (Robertas Petraitis, Lithuania, World DX Club Contact)

KYRGYZSTAN Kyrgyz Radio, 4010, does not seem to have English at 0010 any more (Börge Eriksson, Sweden, SW Bulletin)

LIBERIA [non] KVOH Liberia may puzzle you. After High Adventure Ministries had to leave Lebanon, they hoped to install the transmitters in Liberia. Time will tell, but we did want to protect the frequencies (Anne Case, George Jacobs Associates via Crystal) I have been monitoring for GJA several years. I do not know of any case in which an Alternative frequency was actually used. Alternatives are of interest to frequency managers, but not to listeners. They serve to protect the frequencies (David Crystal, Israel)

LITHUANIA I heard R. Vilnius lament having to use the German relay 6120 for English to NAM at 0030. They say it costs them 3 times what two local sites would run. Tests on 6000 (swamped by Cuba) and 9735 have not received kudos from listeners. I've written them asking if they can retune to 9775, 9780 or 9785 (Bob Thomas CT) 9735 was considerably better than 6120 here, somewhat surprisingly (gh, OK)

MONACO [non] I looked at a high-resolution hiking map of the Côte d'Azur and Monte Carlo area, scale 1 cm = 1 kilometer. There never has been a broadcast transmitter location on Monaco soil, not on LW, MW, or SW at least from 1946 onwards. The known transmitter sites are from 200 to 3000 meters north of the border in France; and the Roumoules site is 102 km west (Wolfgang Büschel, Germany)

MONGOLIA VOM program schedule is unique as on one side presents its schedule, other side of folder the complete flight schedule of the Mongolian airline! A good idea to find a sponsor for program schedules (Wolfgang Schweikert, Germany, BC-DX)

NETHERLANDS/ANTILLES Banaire relay has been operating normally with temporary generators; permanent replacements to be in use by March. For a report and pictures of the staff there see <http://www.rnw.nl/realradio/features/html/bonaire001201.html> (Andy Sennitt, Media Network Newsletter via John Norfolk)

NEW ZEALAND ZLXA Engineer Steve Jepson says they are running full power 1 kW; just replaced some tubes so 3935 is actually putting out a better signal (via David Norrie, NZ, Cumbre DX)

NICARAGUA According to a personal letter from Evaristo Mercado Pérez dated Nov. 29, 2000, Radio Miskut [5770-USB] resumed transmission on Aug. 7, 2000, thanks to help from John Freeman. He was scheduled to visit the station on Dec. 10 to install a 3 kW power amplifier for shortwave. They now broadcast at 1200-2400 with VOA news relay at 1200-1230, 1700-1730 and 2300-2400. They would extend service until short after local midnight (i.e. 0600) on Christmas and New Year's day (Tetsuya Hirahara, Japan)

On 2879.64, Radio Maranatha, 2 x 1440 harmonic at 1026-1110, at 1042 a decent "Radio Maranatha" ID. A few pieces of anthems or hymns offer 1100 (Mark Mohrmann, VT)

OMAN BBC has started building a new 35 megapound relay in the eastern mainland town of al-Ashkharah, to replace existing Masirah Island station, built in 1966, which suffered interference due to new military installations. Expected to be completed in 2002, says resident engineer David Bones (Reuters via K4CC, swprograms)

PALESTINE [non] Of Iran's 24h Arabic broadcasts this one is known as Voice of Palestine: 0330-0430 Daily 7.250 9.610 (© BBC Monitoring)

PAPUA NEW GUINEA NBC, 4890, Dec 9 2006-2045, fading in with religious choral music, dead air, PNG and western Pacific/eastern Asia current weather conditions for Bougainville, Manus, Doru, etc. Peaked around 2040 but fading quickly by 2046. As bad as conditions were, I'm amazed this was coming in (Dave Valko, PA, hord-core-dx) Yes, an unheard-of time for this to be audible in USA (gh) Long-path (Bill Smith, TX)

PERU The Celendin station on 4655 kept changing names, most recently Radio Ecos del Edén instead of La Voz del Campesino, Dec 8 at 0020-0110.

Harmonic on 13565.4, Ondas del Pacifico, Ayabaca, heard signing on at 2050 with NA; something unique with this: I cannot hear it at all on fundamental 6782.7, but the harmonic booms in (Rafael Rodriguez R., Bogotá, D.C., Colombia) Very weak signal on 13565.33 tentatively this until 0311*, not a trace of audio on 6782.66 (Mark Mohrmann, Coventry VT, DX Listening Digest)

On 6797.56, Radio Ondas del Rio Mayo, Nueva Cajamarca; 1045-1106 with early morning show *El Modrugador*. At 1056 ID gave AM, FM, and "OAZ9Q 5045 kHz onda corta cobertura internacional." The shortwave frequency and callsign announced are fake (Takoyuki Inoue Nozaki, Tokyo, Relampago DX Logging)

Frequency list of active SW stations in Perú compiled by Hermod Pedersen: <http://www.hard-core-dx.com/nordicdx/ondas/peru/index.html>

RUSSIA VOR's scheduled one hour morning English to WNA at 1500 on 7180 via Far East was actually monitored running as late as 1700, apparently only on weekends (gh)

[non] The Maiac site in Moldova broadcasting VOR in English to NAM at 0200 on 7125 and 7180 was put off the air in early Dec due to ice storm damage. Several days later 7125 came back, apparently transferred to another site, Tbilisskoya (Olle Alm, Sweden, BC-DX)

VOR promoted that it had successfully carried out digital SW tests in November, after the fact, with Thomcast equipment from a site near Moscow (VOR news via Sergei Sosedkin) More digital tests were made in December from Irkutsk site to Japan (gh)

Shortwave Broadcasting

SAUDI ARABIA Bands scanning for something interesting to listen to while lunching at my favorite Chinese restaurant, from my table next to an east-facing window, I enjoyed virtuosic performances on the Holy Qur'an Station, 15205, scheduled with 500 kW at 1600-1800 toward us. The only (webcasting) American station I have found with such lovely music is KAZU, Pacific Grove CA, <http://www.kazu.org>, UT Tuesdays 0400-0600 on A Fezful of Possibilities (gh)

SLOVAKIA One station that could stand to change frequencies, at least to NAM, is Radio Slovakia Int'l. For English/ Slovak/French at 0100-0230, 5930 is bothered by splatter from WWCW 5935, while 7230 is QRMed off and on by hams. 9440 has only a tiny bit of splatter from Turkey on 9445, but is beamed to SAm and is only marginally useful here (Mike Moran, IL, *DX Listening Digest*) Previously used a 7 MHz frequency above the hamband; why such a retrograde move? (gh)

SRI LANKA SLBC All Asia Service in English heard at much stronger level than before from 0030 past 0130; // 9770 also very strong but severe QRM from Germany 9765 (Stephen Bass, OH, *Electronic DX Press*)

Clandestine on 7460, Voice of Tigers is back. Heard *1230-1255*. Audio is absolutely appalling (Abdul Karim, India, *Cumbre DX*)

SUDAN [non] Radio Voice of Hope via RN Madagascar 12060 and 15320 UT Saturday only 0426-0525 in English and local language; the lower frequency held up better (Richard McVicar, NY, swbc@topico.com)

Has online Web site at <http://www.radiovoiceofhope.net/> and also available online at <http://www.omroep.nl/cgi-bin/streams?/rnw/archief/voiceofhope/0530.ra> Each program will remain online for one week and will be replaced by the latest broadcast shortly after transmission (@ Radio Netherlands Media Network) QSLs can be sent via E-mail, hope@africanonline.co.ug E-mail response for a reception report in one day: QSL card will be sent via normal mail, was the message. (Paul Bailey, Tasmania, *DX Listening Digest*)

TAIWAN Before budget cuts for Jan 1 were announced, RTI English program grid showed two different sets of features rather than the 0300 broadcast being a repeat of the previous day's 0200. All start with news. All UT Mon-Fri end with *Let's Learn Chinese* [tho there may be different levels depending on day of week]; all UT Sundays end with *Mailbag Time*. Set one on Saturdays end with LLCh, Set two with *Taiwan Excursions*, along with the "middle" features. Set one is on these UT day broadcasts: 0200, 0700, 1200, 2200 including: Mon, *Jade Bells & Bamboo Pipes*; Thu, *Journey into Chinese Culture: Hot Spots*. Set two is on these UT day broadcasts: 0300, 1400, 1800, including: Sun, *Instant Noodles*; Wed *Floating Air*; Fri, *Miss Mook's Big Countdown* (from RTI grid via Christopher J. Williams, World DX Club Contact)

UKRAINE RUI got the message last month about interference on 9810. In early December changed to 9385, azimuth 307 degrees to Eastern Coast of North America Reports wanted to egorov@nrcu.gov.ua (Alexander Yegorov, Ukraine via Wolfgang Büschel) That includes English at 0100 and 0400 (gh) 9385 quality varies widely, from woeful to fair (Bob Thomas, CT) Fair to good (Brian Alexander, PA)

UAE HFCC-B00 data excludes Dubai assignments; there appears to be no official Web site for UAE-Dubai, it refuses to answer any of my QSL requests, and simple enquiries by fax and postal mail for schedules are consistently ignored. It is supposed to have services intended for Australia and Japan, but its reluctance to communicate is annoying. Perhaps I should go there and see what the problem is? There are many British expatriates working at UAE Radio Dubai, so it shouldn't be a problem at all (Bob Padula, *Electronic DX Press*)

UK What's a good alternative for hearing BBC's mailbag *Write On* (and replaced once a month by *Waveguide*) since only one broadcast is scheduled to Americas, Sat 0430? (Will Martin, MO) Try Sat 1945 from Ascension to Africa, usually audible here off the back on 15400 or 17830 (gh)

Subdividing BBC WS programming into categories *World News*, *World Living*, *World Showcase*, *World Insight* was a lousy idea. These names are so vague, that I never can remember which shows are in which category, and thus time block. And *The Weekend* is a separate category on the same level, to confuse things further. Even though BBC *On Air* is still monthly, the day-by-day listings only show broad titles at the next level down, e.g. *Essential Guide*, rather than the specifically-titled series currently running in that block, e.g. *Russia: Gold Domes, Black Earth*. If one has a program title, and wants to look up the details and timings for it, there is nothing to do but hunt through the pages until one finds it, since nothing is in alphabetical order, and the categories make no sense. Another example, *Body and Mind*, how health and medicine relate to you is under *World Living*, whilst *Health Matters*, the latest research - explaining where medicine is going, is under *World Insight*. *World Living* is so broad and vague it contains everything from religious shows to *Jazzmatazz* and *Poems by Post*. You might think *Omnibus*, about Charing Cross Road, would be under *World Living*. Nol It is part of *World Showcase*.

Many of the programs I like to hear are in the weekday 1400-1600 UT period, but I find myself constantly switching back and forth between the two webcast streams, European and American. Europe has one hour each of *World Showcase*, and *World Insight*. America has *World Living* and *World Insight*. Hmmm, both with *Insight* at 1500? But they are never parallel; often the same shows are one or more days apart. Does it make any programming sense that Americans need to hear one program on a Monday, Europeans on a Tuesday? No, they do this just to make everything more complex and confusing, not least to their own operators, let alone the listeners (Glenn Hauser, *DX Listening Digest*)

USA Ken Berryhill's musical shows provide sorely needed relief to all the religious and political palaver on WWCW's schedule. We've noticed a new one, *The Old Jazz Boy*, featuring Dixieland, Sunday 1930-2000 on 15685, repeated UT Monday 0030 on 3215. Other Berryhill shows were scheduled: *The Old Record Shop*, Sun 0730 3210; *Ken's Country Classics*, Mon 0700 and 0900 5070; *Profiles* (5 mins.) Sat 1200 15685, Mon 0400 3215. Since these are unsponsored, they may appear unexpectedly when a slot open up. For background on Ken Berryhill, and his original show *The Old Record Shop* see: http://www.wwcw.com/cr_ors.html Another new(?) music show has crept onto the WWCW program schedule, printed version for December: *Big Band Classics* with Warren Durham, Sat 1730-1830 on 12160, 2300-2400 on 5070. Then there is *Musical Memories* with Martha Garvin, Sun 1130-1200 on 5070 (gh)

As of Jan 6, my half hour program *Seldom Heard Radio* is heard on the first & third Saturday nights (technically Sunday AM on the east coast) at 0600 UT on WRMI 7385. This is a change from Friday nights. It follows *Scream of the Butterfly*. *Seldom Heard Radio* will continue to focus on obscure and lesser known folk, psychedelic and ethnic music from the 1960s to the present. Contact: Fred, *Seldom Heard Radio*, 36 West Main Street, Warner NH 03278 singinggrove@conknet.com

WVWF/WGTG announced that it has suspended work on its third transmitter and additional antennas. This is apparently connected to another Genesis Communications Network ending its airtime purchase on 9400/9320/5085 (Hans Johnson, *Cumbre DX*)

WRNO's transmitter is an amateur radio unit rated at 1 kW max. Used as a broadcast transmitter, they are running about 100 watts, but it does go into their log periodic antenna. This can only operate on 7355 and 7395 nominal, not on listed 15420. They continue to use one of the 7 MHz frequencies at times they are scheduled for 15420. They have a few other programs on the weekend; otherwise they air *Brother Stair*. It is a bit harder to hear, but WRNO hasn't been off recently. Heard almost every night in WY over the summer, albeit weak. Valko reported much stronger signals from PA (Hans Johnson, AZ, *Cumbre DX*) WRNO definitely heard on 7354.38 at 0123 with preaching, very weak, and only at threshold. A real DX catch! (Walter Salmaniw, Victoria, BC)

WMLK: we have been checking 9465, scheduled 1600-2100 (except Saturdays), and find a carrier there of poor strength, tending to be masked by super-power WWCW on 9475, but no modulation detectable, which would be in keeping with WMLK as was its offgoing at precisely 2100. At times can almost imagine hearing the intonations of Elder Meyer. If a station runs a transmitter for hours despite lack of modulation, are they competent to manage a 250 kW unit, as reported last month? FCC W-00 9465 listings with power and target zones:

0400-0900 WMLK 50 53 27,28,39
1200-1300 KTRW 100 345 45
1400-1900 KFBS 100 323 30-33,42-44
1600-2100 WMLK 50 53 27,28,39
2100-2200 KTRW 100 335 44 (gh)

In order to distance itself from the government and enhance the perception of objectivity, VOA opened new website <http://www.voanews.com> and E-mail addresses ending in .com rather than .gov such as newsnow@voanews.com and cw@voanews.com The <http://www.voa.gov> Web site continues to exist as an administrative site for the Voice of America (Kim Elliott, VOA *Communications World*, paraphrased by gh) Mark Hattam in the U.K. asks if VOA intends to use the 11 meter band. VOA has no plans to use 11 meters. VOA also has a shortage of transmitters and antennas that work on that band (Kim Elliott, VOA *Communications World* via John Norfolk, Kai Ludwig)

[non] The General Board of Global Ministries of the United Methodist Church conducted a week of test broadcasts to Africa in early December, via DTK in Germany. Emphasis is not on preaching, but on programs promoting health and social welfare. Reply from Donna Niemann, program producer at radio@gbgm-umc.org said regular service would start Jan 1 on same schedule, i.e. to East Africa 0400-0600 11775, 1700-1900 13810; Central/South Africa 0400-0600 13685, 1700-1900 15485 (via Paul Bailey, Tasmania; Paul Ormandy, New Zealand) 15485 was heard well off the back of the beam here in central NAM; fax 1-212-870-3748; 475 Riverside Drive, New York, NY 10115 (gh) They are looking for segment producers to fill the two hours daily (Martin Spinelli via Chet Copeland)

VATICAN [non] In the winter VR printed schedule RCC HQ are not exactly forthcoming and honest, as nothing whatsoever is said about certain of their transmissions being via relay sites. Indeed, the radial maps centered upon Rome certainly give the impression that all target areas are served directly from there! Yet we have info from the HFCC and Russia showing Khabarovsk, Chita, Petropavlovsk-Kamchatskiy used for certain transmissions on 6205, 5940. The VR sked shows these in Chinese, Vietnamese, and Japanese are "non-directional" since there is no letter-suffix indicating a target area, but this is certainly untrue as the relays have azimuths aimed at the appropriate countries. There is also one relay via Philippines on 6020, and some via Uzbekistan on 9865, 6205. Their website is no more candid: <http://www.vaticanradio.org/CoorPro/palinsasioce.htm> (gh)

VENEZUELA On 3059.78, Radio San Felipe, (2 x 1530 harmonic), 1016-1042 sign-on with anthem followed by canned ID, into live announcer. Fair signal (Mark Mohrmann, VT, *DX Listening Digest*)

...Until the next, Best of DX and 73 de Glenn!

0005 UTC on 7415

USA: WBCQ. Johnny Lightning's Radio New York program, calling himself the "Real Voice of America" from his, "bootiful Brooklyn facility." Trashed Matt Drudge referring to him as "Matt Sludge broadcasting with half his brain tied behind his back." Makes me think ole' Johnny is trying to be the left-wing Rush Limbaugh. **WHRI** 2300, 7580; **WWFV** (ex **WGTV**) 9320 USB, 2303 with Power Hour segment on lady who professes to be the bastard child of the Duke and Duchess of Windsor. (Sue Wilden, Noblesville, IN; William McGuire, Cheverly, MD)

0005 UTC on 15180

NORTH KOREA: Radio Pyongyang. Korean news with fading, // 13760, 11710. (Jim Boynton, Newton, MA) 0007-0018+, 13760.1 English news on Kim Jong Il. ID 0016 with rousing military music // 151179.9, nothing on // 11460. Station audible *0000-0005* 11460 with ID and news; 11710; //137600 SIO=544; //15180 SIO=544 (Harold Frodge, Midland, MI)

0017 UTC on 9400

BULGARIA: Radio Bulgaria. Bulgaria marks the 11th anniversary of the collapse of communism, //9400. (Bob Fraser, Cohasset, MA) 0345, 9400 Radio Bulgaria Calling; 2200-2245, 7200. (Jim Boynton, Newton, MA) 0330, 7400 Time Out For Music. (David Weronka, Benson, NC) 2145-2153+, 11700 feature on commercial radio SIO=4+33+; 2005-2012, 7500. East European news coverage to ID and Behind the News program. SIO=3+53. (Frodge, MI; McGuire, MD)

0400 UTC on 7180

RUSSIA: Voice of World newscast. (Boynton, MA) *1300, 15460 station ID to newscast. Moscow Mailbag 2115 on 5940, featuring diamonds, Olympics, Lenin and WWII. (Fraser, MA)

0426 UTC on 15320

CLANDESTINE: Voice of Hope. Open carrier 0426 to instrumental music 0427. Sign-on announcement with freqs and schedules, and purpose of broadcast. Lively high-life style music. Male's 0430 talk segment in unid language, mentions of Sudan. English greetings to friends in Sudan and mentions of "Voice of Hope." Fair and clear signal quality. (Dave Valko, PA/Cumbre DX) **Voice of Jammu & Kashmir Freedom** 1415; 5101 kHz anti-Indian government programming. Signal quite satisfactory, 1437*. Address: P.O. Box 102, Muzaffarabad, Azad Kashmir via Pakistan. (Jouko Huuskonen, Turku, Finland/HCDX)

0552 UTC on 4960

DOMINICAN REP.: Radio Villa. Spanish. Fair signal for SIO 222, music program and station identification. (Daniele Canonica, Muggio, Switzerland)

0600 UTC on 9745

ECUADOR: HCJB. Saludos Amigos to station ID. (Boynton, MA) Ham Radio Today 1930 on 17660. (Fraser, MA)

1343 UTC on 13650

CANADA: Radio Canada Int'l. Interview with classical singer and her musical inspiration. (Wilden, IN) Maple Leaf Mailbag, 2125, 13650 (Fraser, MA); 0225, 9755 (Boynton, MA)

1350 UTC on 18960

SWEDEN: Radio Sweden. Report and interview on communities for the mentally handicapped. (Fraser, MA; McGuire, MD)

1410 UTC on 4850

INDIA: All India Radio-Kohima. Heavy interference from Tashkent. ID, "This is All India Radio, Kohima." AIR services noted as; 1720, 4940 **Guwahati** //4920 **Chennai**; //4910 **Jaipur**; //4880 **Lucknow**; //4800 **Hyderabad**; //4775 **Imphal**. Station **Radio Kashmir** 4950 to 1738*. (Huuskonen, FIN/HCDX)

1413 UTC on 21745

CZECH REP.: Radio Prague. Sports report into Spotlight show. (Boynton, MA) 2245, 7345 //9435 A Day of Poetry in Public Places. (Fraser, MA)

1459 UTC on 11734.09

ZANZIBAR: Radio Tanzania. After hearing this frequency in Hawaii, decided to sit on this freq and see if audible on the east coast. Signal did indeed pop on with highlife instrumental music.

Very brief children's vocals and male's extended newscast. Signal improved by 1505, fading by 1520. Never seemed to have an "official" sign-on, abruptly fades up with programming in progress. Signal very nice by 2000 recheck. (Valko, PA/Cumbre DX) 1655-1700, 11734 very good signal including music, ID and signal tone to 1700*. (Canonica, SU1)

1600 UTC on 17680

JORDAN: Radio Jordan. Jordan Ancient Cultures program, featuring Desert Castles # 7, to classical music segments. Announcements to news broadcast and 1730*. (Martin Gallas, Jacksonville, IL) Station spur 6985 at 2033 //7155 with Arabic discussion. (Zacharias Liangas, Thessaloniki, Greece/HCDX)

1620 UTC on 7530 USB

SOMALIA: Radio Hargeisa. (Tentative) Very weak signal in local language, possibly Somalian. Recitations to Arabic style music at 1645. Utility interference commencing abruptly at 1645. Subsequent daily rechecks; 1644-1703, 7530 (Canonica, SU1)

1945 UTC on 6973.1

ISRAEL: Galei Zahal. Signal noted early, although audio level weak but readable by 2005 with choral music and unid language. (Valko, PA/Cumbre DX) **Kcl Israel** 2020; 9435 Week in Review (Boynton, MA; McGuire, MD)

1957 UTC on 11785

INDONESIA: Voice of Indonesia. Poor signal for ID, "this is the radio Voice of Indonesia" to anthem, ID repeat and schedule quote. **Deutsche Welle's Rwanda** relays' interference 2000. (Frodge, MI)

2055 UTC on 9965

ARMENIA: Voice of Interval signal at tune-in, followed for station identification and newscast. Mailbag program including music selections. (David Ross, Hamilton, Ontario, Canada)

2100 UTC on 5100

LIBERIA: Radio Liberia Int'l. English news including segment on Liberian first lady. (Chambers, NY/ODXA) 2130-2204, 5100 Highlife music program to commentary. Station identification to brief time check and Awareness program. Very nice signal at tune-in but choppy towards the top of the hour. (Valko, PA/Cumbre DX) 2240-2310+. Continuous African music with brief top-of-the hour English national news. SIO=332, improved after 2245. Best to monitor in USB, other modes impossible. (Frodge, MI)

2151 UTC on 6265

ZAMBIA: Radio Zambia. Vernaculars text with phone interviews. African highlife music to station identification. Choral national anthem to 2206*. Signal weak to poor. (Chambers, NY/ODXA)

2230 UTC on 13600

BELGIUM: Radio Vlaanderen Int'l. Station ID and music segment. (Mindy Scheer, Dunnellon, FL) 0420, 11985 (Weronka, NC) 0756, 5985 (Chambers, NY/ODXA; McGuire, MD)

2253 UTC on 7125

GUINEA: RTV Guineenne. French service of talk and music intervals. Flute interval signal 2323 to African highlife music and station ID. **Orchestral national anthem** to 0001*. Signal very strong initially, generally good to sign-off. (Chambers, NY/ODXA)

2310 UTC on 9655

TURKEY: Voice of Hues and Colors program on coal mining area on the Black Sea //6020. (Fraser, MA; Weronka, NC; McGuire, MD)

2314 UTC on 15280

ARGENTINA: Radio Rivadavia. Spanish. Sports roundup segment and mentions of stations' Radio Independencia and Radio Dobleve, plus phone calls. Commercial breaks to time pips to ID 2335 with mentions of "Argentina" and "Futbol Continental"; SIO=2+33) (Frodge, MI)

SIO = Signal strength, Interference, Overall merit

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

Latin Websites and More

ANGUILLA

Caribbean Beacon <<http://www.dgenescott.com/homepage.htm>>

ANTIGUA

BBC Relay <http://www.bbc.co.uk/worldservice/index_stat.html>
Deutsche Welle Relay <<http://www.dwelle.de/english/Welcome.html>>
Radio Vlaanderen Int'l Relay <<http://www.rvi.be/>>

COLOMBIA

Caracol Colombia <<http://www.caracol.com.co>>
RCN/Radio Cadena Nacional <<http://rcn.com.co>>
Radio Difusora Nacional <<http://inravision.com/ca/radiodifusora/onda>>
Caracol Estero <<http://www.caracolstereo.com/>>

COSTA RICA

Fara del Caribe <<http://www.cristo.net/fara/fara.html>>
Radio Exterior Espana Relay <<http://www.rtve.es/rne.rea/>>
Radio Fides <<http://www.radiofides.co.cr>>
Radio For Peace Int'l <<http://www.rfpi.org>>
Radio Reloj <<http://www.rpreloj.co.cr/>>
University Network <<http://www.dgenescott.com/homepage.htm>>

CUBA

China Radio Int'l Relay <<http://www.cri.com.cn/>>
Radio Havana Cuba <<http://www.radiohc.org>>
Radio Rebelde <<http://www3.cuba.cu/RRebelde/>>

DOMINICAN REPUBLIC

Radio Amanecer <<http://www.tricom.net/amanecer>>
Radio Cristal Int'l <<http://www.dominicon.com>>

ECUADOR

HCJB <<http://www.hcjb.org.ec>>

MEXICO

Radio Educacion <<http://www.cnca.gob.mx/cnca/buena/radio/index.html>>
Radio Huayacocotla <<http://www.sjsocial.org/Radio/huarad.html>>
Radio Mexico Int'l <<http://hello.ta/rmi>> <www.imer.gob.mx/estaciones/rmi.html>
Radio Mil <<http://www.nrm.com.mx/estaciones/radiomil>>

NETHERLANDS ANTILLES

Radio Netherlands Relay <<http://www.rnw.nl>>

PUERTO RICO

AFN/AFRTS <<http://www.mediocn.navy.mil/>> <<http://www.afrts.osd.mil>>

SURINAME

Radio Apintie <<http://www.opintie.sr>>

Two new Peruvians have been observed since last month's South American Directory:

Lo Voz de Alibonay
Avenida Noviembre Late 6
Urbanizacion Micaela Bastidas
Abancay, Apurimac, Peru

Radio Uripa
Avenida Tupac Amaru s/n
Uripa, Chincheros, Apurima, Peru

Additions and corrections are always welcomed. Thanks to Dave White for his website assistance and *Cumbre DX* for their Peruvian address update.

BRAZIL

Radiodifusion do Amazonas, 4805 kHz. Full data scenery card signed by Joaquim Marinho, plus personal note. Received in 56 days for a Portuguese report, two mint stamps and local AM bumper stickers. Station address: Caixa Postal 311, 69000-000 Manaus, Amazonas, Brasil. (Frank Hillton, Charleston, SC)

Radio Trans Mundial, 9530 kHz. Full data QSL card with illegible signature. Received in 93 days for a Portuguese report, one U.S. dollar and one mint stamp. Station address: Caixa Postal 18300, Aeroporto, 04699-970, São Paulo, São Paulo, Brasil. (Hillton, SC)

CUBA

Radio Havana Cuba, 13680 kHz. Full data color scenery card unsigned, plus program guide. Received in 148 days for an English report. Station address: P.O. Box 6240, Habana, Cuba 10600. (Brian Bagwell, St. Louis, MO)

Radio Rebelde, 9600 kHz. QSL Folder card signed by Daimelis Manzoni-Esp. Relaciones Publicas. Received in 12 weeks for a Spanish report and one U.S. dollar. Email address: <rebelde@cenial.inf.cu> (Richard Jary, Australia/*Cumbre DX*)

DIEGO GARCIA

AFN/AFRTS, 12579 kHz USB. Full data letter via email from Michael Fouch-Chief Broadcast Operations Specialist. Received in one day for an English email report. Email address: <qsl@mediocn.navy.mil>. (Micky Delmage, Sherwood Park, Alberta, Canada)

ECUADOR

La Voz del Nopo Full data station card signed by Ramiro Cabrera. Received in three months for a Spanish follow-up report and two mint stamps. Station address: Misión Josefina, Tena, Nopo, Ecuador. (Sam Wright, Biloxi, MS)

HCJB, 9745 kHz. Full data scenery card unsigned. Received in 25 days for an English report and one IRC. Station address: Casilla 17-17-691 Quito, Pichincha, Ecuador. (Wright, MS)

GUATEMALA

TGM Radio Buenas Nuevas, 4800 kHz. Full data station card un-

signed, plus brief note. Received in 35 days for a Spanish report, one U.S. dollar and one mint stamp. Station address: 13020 San Sebastian, Huehuetenango, Guatemala. (Tom Banks, Dallas, TX)

HAWAII

AFN/AFRTS 6350 kHz USB. Partial data letter on Naval Media Center letterhead signed by April K. Gorenflo-Broadcast Operations Specialist. Received in 27 days for an English email report. Email address: (see Diego Garcia) (Bill Wilkins, Springfield, MO)

HONDURAS

Radio Luz y Vida 3250 kHz. Full data prepared Spanish QSL card returned and verified by Ubaldo Zaldivar, plus personal note. Received in 50 days for a Spanish report, SASE (used for reply). Station address: Apartado 303, San Pedro Sula, Honduras. (Duone Hadley, Bristol, TN)

IRAQ

Radio Iraq International, 9684 kHz. Full data, Folder QSL card unsigned. Received in 63 days for an English report, no enclosures. Station address: P.O. Box 8145, CN, 12222, Baghdad, Iraq (or) P.O. Box 8125, Baghdad, Iraq. (Banks, TX)

MEDIUM WAVE

CBKN, 990 kHz AM, Shalath, BC, Canada. Full data QSL card signed by Dave Newberry-Chief Engineer. Received in 12 days via CBC Vancouver. Station address: P.O. Box 4600, Vancouver BC, V6B 4A2 Canada. (Patrick Martin, Rio Mirage, CA)

CKY, 580 kHz AM, Manitoba, Canada. Really nice full data QSL letter signed by George Buzonis-Chief Engineer, plus station history brochure. Received in 63 days for an English report. Station address: Rogers Broadcasting-Unit # 4, 166 Osborne St., Winnipeg MB R3L 1Y8 Canada. (Martin, CA)

KORG, 1190 kHz AM, Anaheim, CA. Full data verification letter signed by Miles Sexton-Manager. Received after nine years of trying! Station address: 1190 E. Boll Rd., Anaheim, CA 92805. (Martin, CA)

KSMH, 1620 kHz AM, Auburn, CA. Received second QSL via station form letter, signed by Tricia Lemmon-Development Manager Re-

ceived in 90 days for a taped report. Station address: P.O. Box 180, Tahona, CA 96142. (Martin, CA)

XENU, 1550 kHz AM, Nuevo Laredo, Tamaulipas, Mexico. Brief email verie text from Sergio Korlowsky-Head Engineer, Organizacion Radiorama, with promise of a future QSL on station letterhead. Received email response 30 months after posted report, three months after an email follow-up. Email address: <xo2xp@nld.bravo.net>. (Paul Ormandy, Oamaru, New Zealand/*HCDX*)

MEXICO

Radio Mil, 6010 kHz. Full data colorful logo card with illegible signature, plus personal letter, sticker, schedule and reception report form. Received in 547 days for a taped report. Station address: Apartado Postal 21-100, 04021 Mexico 21, DF Mexico. (Delmage, CAN)

MONGOLIA

Voice of Mongolia, 12085 kHz. No data card plus personal handwritten message signed as, "The Staff." Program schedule and Mongolian Airline folder included. Received in 40 days for an English report, a SASE and one U.S. dollar. Station address: P.O. Box 365, Ulaanbaatar 13, Mongolia. (Jim Boynton, Newton, MA)

NETHERLANDS ANTILLES

Radio Netherlands Bonaire Relay, 15315 kHz. Full data card signed by Jaime Boguena, plus station stickers. Received in 46 days for an English report and one IRC. Station address: P.O. Box 222, 1200 JG Hilversum, The Netherlands. (Hadley, TN)

PUERTO RICO

AFN/AFRTS, 6458.5 kHz USB. Partial data e-mail from Michael Fouch-Chief Broadcast Operations Specialist. Received in 27 days for an English email report. Email address: (see Diego Garcia). (Wilkins, MO)

SICILY

AFN/AFRTS 10940.5 kHz USB. Full data email from Michael Fouch-Chief Broadcast Operations Specialist. Received in one day for an English email report. Email address: (see Diego Garcia) (Delmage, CAN; Wilkins, MO)

It's Your VOA

If you've overlooked the Voice of America (VOA) – our publicly supported “official” international broadcaster – you're missing some interesting and informative programming. I would also gently suggest that you may be shirking an important responsibility that you – as both a seasoned radio listener and a taxpayer – should be shouldering. But more on that later.

◆ Governing Structure

The VOA operates as part of the International Broadcasting Bureau (IBB) which is under the jurisdiction of the Broadcasting Board of Governors (BBG). The BBG consists of eight members appointed by the President with the consent of the Senate. The Secretary of State is an ex-officio member. This construct is a recent one and is supposed to ensure the organizational independence of the VOA and protect it from political meddling. (A more complete explanation of the structure of U.S. international broadcasting is available on the Internet from <http://www.voa.gov>, <http://www.ibb.gov> and <http://www.ibb.gov/bbg>.)

◆ VOA Shortwave Services

There are three VOA English language shortwave services:

VOA Special English provides world news and feature programs using a slower speaking cadence and a limited 1500 word vocabulary.

VOA English to Africa was inaugurated in 1963 and functions as a regional broadcast service for Africa. For stateside listeners, the Africa service can be a good source for information about a continent that gets limited coverage from domestic media. Some notable programs are:

Straight Talk Africa, a weekday phone-in for Africa concentrating on African issues and concerns. (M-F 1830)

Daybreak Africa, Al James hosts a lively weekend breakfast show. (M-F 0300, 0430, 0600)

Africa World Tonight, an excellent nightly report on Africa and world events from an African perspective, in three live editions. (M-F 1630, 1800, 2000)

Nightline Africa, a somewhat more relaxed weekend evening news magazine, hosted by Ted Roberts. (A/S 1600, 2000)

World of Music, contemporary music with

African roots hosted by the incomparable Rita Rochelle (M-F 1930)

Music Time in Africa, Rita Rochelle highlights – in two editions – the best of traditional and modern African music, as selected by VOA's “Music Man.” Leo Sarkisian. (S 1730, 1930)

Voices of Africa, interviews with prominent Africans. (A 1910, S 1710)

VOA News Now is the largest and newest service which, as its name implies, primarily seeks to provide accurate, constantly updated news and analysis of current events for a global audience. Recently the service has made some tentative moves toward including additional half-hour feature programs into its schedule, mostly on the weekends. Some notable programs include:

Talk to America, a weekday global phone-in on topical issues, this has become the VOA's flagship program. (M-F 1705, with a weekend digest version, *Best of Talk to America*, A 0233, 1033, 1833; S 0633, 1433, 2233)

Communications World, a weekly report on telecommunications and international broadcasting presented by Kim Elliott. (A 0133, 0533, 0933, 1333, 1733, 2133)

Kaleidoscope, Susan Logue explores American culture from contemporary theatre to folk traditions. (1st, 3rd & 4th S 0333, 0733, 1133, 1533, 1933, 2333)

Our World, a weekly report on science, technology and agriculture with Rob Sivak. (A 0333, 0733, 1133, 1533, 1933, 2333)

[For frequencies and abbreviations, consult *MT's Shortwave Guide* section. For expanded information, use the Internet and go to <http://www.voa.gov> and <http://www.newsnow.com>.]

◆ Considering the Future

There has been talk over the past few years that reorganization of the Africa service was imminent. To date, though, changes that have taken place have been incremental or made largely to address transient crisis situations. Lately, internal discussions about *VOA News Now* have been a bit more dynamic.

VOA News Now grew, in significant part, out of a proposal tendered by Kim Elliott in 1993 when he was the VOA's audience research officer. The model suggested was the “all-news” approach popularized by many U.S. domestic AM radio stations and National Public Radio and which conformed better with the way radio was increasingly being used by the VOA's target audiences.

The service finally came into existence in 1998. Since then, two internal factions have apparently emerged. One argues largely for maintenance of a strictly all news service. The other is pressing for a partial resumption of music and the longer format block features the VOA used to have in abundance. In a recent memo to station management, Elliott himself weighed in with a moderate approach – urging maintenance of the 24/7 news presence while restoring a wider use of music and cautiously resuming some popular longer features. Doing so will add what he terms “radio's unique strength” – *personality* – back into the service, which he argues will be an important asset in encouraging needed audience participation via immediate feedback by phone, fax and e-mail.

To me, this resembles the NBC network weekend program *Monitor**, which ran nationally from 1955 to 1975. With some updating, this could be a suitable model. A more relaxed format would seem appropriate to the weekend and allow the service to more effectively build for listeners an accurate impression of the U.S. by stressing the vast, diverse and sometimes subtle facets of American everyday life, culture and values that make the U.S. unique in the world. This is not possible with *News Now*.

◆ It is your VOA

However, the point is not so much what Dr. Elliott thinks or what I think; but, what do you think? Not enough is known domestically about the VOA. The VOA is statutorily prohibited from communicating with a domestic U.S. audience, effectively imposing a know-nothing posture on the public. This is an unhealthy situation for both the VOA and the taxpayer. Several stations – Radio Canada International (RCI), Radio Australia and Deutsche Welle (DW) to name three – have learned the hard lesson that their futures rely as much on domestic public awareness and support as on any other factor.

So, the message here is listen to what the VOA is broadcasting in your name. Then, don't allow Congress or anyone else to shut you out of the process. Comment freely on what you hear – whether directly to the VOA or its governing bodies or to forums like this magazine or Internet discussion groups. You and I and the VOA will only be the better for it.

Until March, good listening! (*By the way, if you were a fan of NBC's *Monitor*, check out a great new web site about the program at <http://www.monitorbeacon.com>.)

HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af
 ① ② ⑤ ③ ④ ⑥ ⑦

Convert your time to UTC.

Broadcast **time on** ① and **time off** ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Standard Time) 5, 6, 7, or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all **dates**, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 7:30 pm Eastern, 6:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC **time on** ①, then alphabetically by **country** ③, followed by the **station name** ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the **days of broadcast** ⑤ will appear in the column following the time of broadcast, using the following codes:

Day Codes	
s/S	Sunday
m/M	Monday
t/T	Tuesday
w/W	Wednesday
h/H	Thursday
f/F	Friday
a/A	Saturday
D	Daily
mon/MON	monthly

In the same column ⑥, **irregular broadcasts** are indicated "tent" and programming which includes languages besides English are coded "vl" (**various languages**).

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

The **frequencies** ⑦ follow to the right of the station listing: all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

As a general rule, when listening in the daytime start with the highest frequencies listed for your desired station and work toward the lower ones until you find a strong signal. The lower frequencies will travel (propagate) better at night. Your best chance to hear very distant stations will be at nighttime, especially if darkness extends from your location to the signal source.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April

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

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

Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
au:	Australia
ca:	Central America
do:	domestic broadcast
eu:	Europe
irr:	irregular (Costa Rica RFPI)
me:	Middle East
na:	North America
om:	omnidirectional
pa:	Pacific
sa:	South America
va:	various

Choose a program or station you want to hear.

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

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

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

MT MONITORING TEAM

Gayle Van Horn Frequency Manager gayle@webworkz.com	John Figliozzi Program Manager jfiglio1@nycap.rr.com
---	--

Mark Fine, VA
mark.fine@fineware-swl.com

PROGRAM HIGHLIGHTS

JOHN FIGLIOZZI

New - Listings By Content

With this month, we inaugurate our second rotating format for *MT's Shortwave Guide* program listings. As you will see by perusing the pages, listed programs for each hour are grouped into twelve distinct categories.

As we said in January, these changes are designed to help you to locate the fine programs available on shortwave, many of which go unnoticed for one reason or another. Our objective is to make regular improvements to these listings. We appreciate your comments, assistance and corrections, which you can send by postal and electronic mail to the addresses provided elsewhere in this magazine. The stations would also deeply appreciate your constructive comments on their programs.

New at Radio Sweden

Radio Sweden has added two programs to its regular rotation. The science program *Horizon* has been replaced by the new program *The S-Files*, which runs monthly on the fourth Thursday or Friday UT of each month (depending on location and transmission). The S-Files will offer listeners a closer "behind the scenes" look at Sweden. Also, *Studio 49*, which had been an occasional program, has been moved up to a regular monthly slot – that is, the fourth Saturday/Sunday of every month. *Studio 49* is a conversational program that focuses on ideas and long-term trends in Sweden and the Nordic region. In that regard, it is similar in tone to YLE Radio Finland's *Capital Cafe*, which airs every Sunday. (Thanks to Rich Cuff of The NASWA Journal for this information.)

RA's Summer of Cricket (cont'd.)

Radio Australia's hot summer of cricket coverage continues in February with full broadcasts of the closing series of one day internationals:

Feb. 2 - West Indies vs. Zimbabwe from Perth (0230-1030 UT).
 Feb. 7 - First Final from Sydney (0330-1130 UT).
 Feb. 9 - Second Final from Melbourne (0330-1130 UT).
 Feb. 11 - Third Final from Melbourne 0330-1130 UT.

On shortwave only: 0000-1358 on 21725 kHz/0000-0758 on 17580 kHz/ 0800-1358 on 11630 kHz.

FREQUENCIES

0000	0015	Cambodia, National Radio Of	11940as				
0000	0015	Japan, Radio	17810as	13650as			
0000	0030	Egypt, Radio Cairo	99000m				
0000	0030	Mexico, R Mexico International	97050m	11770al			
0000	0030	Thailand, Radio	9680va				
0000	0030	UK, BBC World Service	3915as	5965as	5975na	6175na	
			6195as	7105as	9410me	9590am	
			9915so	11945as	11955so	12075so	
			15280as	15360as	17615as	17790as	
0000	0045	India, All India Radio	9705as				
0000	0056	North Korea, R Pyongyang	4405va	11460na	11710na	13760na	
			15180na				
0000	0059	Canada, R Canada International	59600m	9755am			
0000	0100	Anguilla, Caribbean Beacon	60900m				
0000	0100	Australia, ABC/Alice Springs	4835do				
0000	0100	Australia, ABC/Katherine	5025do				
0000	0100	Australia, ABC/Tennant Creek	4910do				
0000	0100	Australia, Christian Voice	9875va	15165va	17645va	21620va	
0000	0100	Australia, Radio	9660pa	12080pa	15240as	17580va	
			17750as	17795va	21740va		
0000	0100	Bulgaria, Radio	7400na	9400na			
0000	0100	Canada, CBC Northern Service	9625do				
0000	0100	Canada, CFRX Toronto ON	6070do				
0000	0100	Canada, CFVP Calgary AB	6030do				
0000	0100	Canada, CHNX Halifax, NS	6130do				
0000	0100	Canada, CKZN St John's NF	6160do				
0000	0100	Canada, CKZU Vancouver BC	6160do				
0000	0100	Costa Rica, R for Peace Intl	7480va	15048va	15065va	21815usb	
0000	0100	Costa Rica, University Network	7490va	15048va	15065va	21815usb	
0000	0100	Ecuador, HCJB	9745na	11840na	21455usb		
0000	0100	a/monthly Finland, Scandv Weekend Radio	11690va				
0000	0100	Guyana, Voice of	3289do	5949do			
0000	0100	Japan, Radio	6145na				
0000	0100	Liberia, Voice of Hope	6280af				
0000	0100	Malaysia, Radio	7295do				
0000	0100	Malaysia, RTM Kota Kinabalu	5980do				
0000	0100	Malaysia, RTM Sarawak	7160do				
0000	0100	Namibia, Namibian BC Corp	3270af	3289af			
0000	0100	Netherlands, Radio	6165na	9845na			
0000	0100	New Zealand, R New Zealand Int	17675pa				
0000	0100	New Zealand, ZLXA	3935do	7290do			
0000	0100	Papua New Guinea, NBC	9675do	11880do			
0000	0100	Singapore, R Corp of Singapore	6150do				
0000	0100	Solomon Islands, SIBC	5020do				
0000	0100	Solomon Islands, SIBC	9545do				
0000	0100	Spain, R Exterior Espana	6055na				

0000	0100	as	UK, Global Kitchen/Merlin	3955eu	6180eu	7165eu	
0000	0100	f	UK, Global Kitchen/Merlin	6170eu			
0000	0100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13362va
				16847va			
0000	0100		USA, KAU Dallas TX	5755va			
0000	0100		USA, KTBN Salt Lake City UT	7510na			
0000	0100		USA, KWHR Naalehu HI	17510as			
0000	0100	tw/ta	USA, Voice of America	59950m	6130ca	7405am	9455ca
				97750m	11695ca	13740am	
0000	0100		USA, WBCQ Monticello ME	7415na	9335na		
0000	0100		USA, WEWN Birmingham AL	5825va	7425na	9355na	
0000	0100		USA, WHRA Greenbush ME	7580na			
0000	0100		USA, WHR Nablesville IN	7315sa			
0000	0100		USA, WINE Red Lion PA	12160am			
0000	0100		USA, WJCK Upton KY	7490va	13595as		
0000	0100		USA, WRMB Miami FL	9955am			
0000	0100		USA, WSHB Cypress Crk SC	9430am			
0000	0100		USA, WTJC Newport NC	9370na			
0000	0100	sm	USA, WWBS Macon GA	11900eu			
0000	0100		USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0000	0100		USA, WWFV McCaysville GA	9320va	12172am		
0000	0100		USA, WYFR Okeechabee FL	6085na	9505na	15060as	
0000	0100	vi	Vanuatu, Radio	3945do	4960do	7260do	
0000	0100		Zambia, Christian Voice	4965do			
0030	0100		Iran, VOIRI	6065am	6135na	6150na	9022na
0030	0100		Kirgizia, Kirgizia Radio	4010eu			
0030	0100		Lithuania, Radio Vilnius	6000na	9735na		
0030	0100		Sri Lanka, Sri Lanka BC Corp	4940do	9770eu		
0030	0100		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
				15425as			
				13695na			
0030	0100		Thailand, Radio	5965as	5975na	6175na	6195as
0030	0100		UK, BBC World Service	7105as	9410me	9590am	9915sa
				11955as	12095sa	15280as	15360as
				17790as			
0030	0100		USA, VOA Special English	7215as	9890as	11760as	15185as
				15290as	17740as	17820as	
0030	0100		USA, Voice of America	7215as	9890as	11760as	15185as
				15290as	17740as	17820as	
0045	0100	vi	Pakistan, Radio	9780as	11650as	15455as	
0050	0100		Italy, RAI International	6010na	9675na	11800na	
0050	0100		UK, International BC Tamil	11570as			

SELECTED PROGRAMS

Newscasts (*extended)

0000	BBCWS(am)	S	News Summary
		M	World Briefing*
		T-A	News
	R. Australia	D	World News
	R. Canada Int.	D	News
	R. Japan	D	World News
	R. New Zealand Int.	D	News
	Spanish Foreign R.	T-A	Ibero-American News*
	VOA News Now	T-A	World News
0010	VOA News Now	T-A	Regional News
0014	VOA News Now	T-A	USA News
0030	BBCWS(am)	M	The World Today*
	VOA News Now	T-A	World News

Current Affairs Magazines/Features

0005	BBCWS(am)	T-A	Outlook
	R. Canada Int.	T-A	As It Happens (from 2330)
0010	R. Australia	S/M	Correspondents' Report
		T-A	Asia Pacific
0015	R. Japan	T-A	44 Minutes
0032	Spanish Foreign R.	T-A	Press Review
0033	VOA News Now	A	Press Conference USA

Business/Economics

0000	R. Netherlands	A	A Good Life (development issues)
0028	HCJB	T-A	Money Minute
0030	R. Netherlands	W	A Good Life (development issues)
0049	VOA News Now	T-F	Business News

Science/Technology

0000	R. Netherlands	T	The Research File
0005	R. Canada Int.	S	Quirks and Quarks
0030	R. Australia	M	The Health Report
	R. Netherlands	F	The Research File
0045	VOA News Now	T-F	Science News
	BBCWS(am)	A	Body and Mind

Arts & Culture

0006	R. New Zealand Int	S	Books at One
0030	R. Netherlands	S	Roughly Speaking (youth culture)
0035	Spanish Foreign R.	T	Entertainment in Spain
		F	Arts in Spain

Local Lives and Views

0000	R. Netherlands	M	Dutch Horizons
	Spanish Foreign R.	S	Visitors' Book
		M	Window on Spain
0010	R. Japan	M	Weekend Square
0015	Spanish Foreign R.	M	Entreemesas (food and tourism)
0030	R. Netherlands	T	Euroquest (Europe in context)
		H	Dutch Horizons
0035	Spanish Foreign R.	W	Kaleidoscope (life in Spain)

Informational Features

0000	R. Netherlands	M	Sound Fountain (soundscapes)
		H	Documentary
		F	Encore (the best of RN)
0015	Spanish Foreign R.	S	American Chronicles
0022	VOA News Now	T-A	Feature story
0030	R. Australia	S	Educational series
		T	The Law Report
		W	The Religion Report
	R. Netherlands	M	Sound Fountain
		F	Documentary
	R. New Zealand Int.	S	Future Indicative (magazine for disabled)
0032	Spanish Foreign R.	S	Spain in the American West
0035	Spanish Foreign R.	H	As Others See Us
0045	BBCWS(am)	T	Patterns of Faith
		W	Plain English (on language)
		H	Heart and Soul (religion)
0047	Spanish Foreign R.	T-A	Spanish Language Course

Music

0000	R. Netherlands	W	Music 52-15 (world/folk)
	WBCQ	F	Scream of the Butterfly (pop/rock)

0005	R. Canada Int.	M	Global Village (world/folk)
	R. New Zealand Int.	M-F	Cadenza (light classics)
		A	Home Grown (NZ music)
0028	Spanish Foreign R.	M	Flamenco
		T-A	Spanish Pop Music
0030	R. New Zealand Int.	A	Musical Chairs (featured artist)
0053	VCA News Now	T-F	Music feature

Entertainment/Variety, Magazine Shows

0000	WBCQ	M	Lo Show
0001	BBCWS(am)	S	Play of the Week (radio theatre)
0030	WYCR(3215 kHz)	M	Old Record Shop
0045	BBCWS(am)	F	Best of "The Edge" (youth culture)

SWL, Media and Communications

0000	WBCQ	S	The Real Amateur Radio Show
	WYCR(5745 kHz)	A	DXing with Cumbre
0030	WYCR(5745 kHz)	S	DXing with Cumbre
	R. Australia	H	The Media Report
	WBCQ	H	World a0047 Spanish Foreign R. Radio Waves

Listener Contact/Interactive

0010	R. Japan	S	Hello from Tokyo
0030	H. JB	S	Saludos Amigos
	R. Australia	A	Feedback
0035	Spanish Foreign R.	A	Radio Club
0047	Spanish Foreign R.	M	Radio Club (rpt.)

Sport

0018	VMA News Now	T-A	Sports
0020	BBCWS(am)	M	Sports Roundup
0030	R. Australia	F	The Sports Factor

GRUNDIG Best in Technology



Yacht Boy 400 Professional Edition (YB 400PE)

The most powerful compact Radio AM/FM Shortwave Receiver.

"The Best compact shortwave portable we have tested" Lawrence Magne.-Editor in Chief, *Passport to World Band Radio*.

The Big Breakthrough! Power, performance, and design have reached new heights! The Grundig 400 Professional Edition with its sleek titanium look is packed with features like no other compact radio in the world.

Pinpoint Accuracy! The Grundig 400PE does it all: pulls in AM, FM, FM-Stereo, every shortwave band (even aviation and ship-to-shore)-all with lock-on digital precision.

Ultimate Features! Auto tuning! The Grundig 400PE has auto tuning on shortwave and stops at every signal and lets you listen. With the exceptional sensitivity of the 400PE, you can use the auto tune to catch even the weakest of signals.

Incredible timing features! The Grundig 400PE can send you to sleep listening to your favorite music.

You can set the alarm to wake up to music or the morning traffic report, then switch to BBC shortwave for the world news. The choice is yours!

Powerful Memory! Described as a smart radio with 40 memory positions, the Grundig 400PE remembers your favorites-even if you don't!

Never Before Value! Includes deluxe travel pouch, stereo earphones, owner's manual, external antenna and a 9 volt Grundig AC adapter. Uses 6 AA batteries (not included)

Style • Titanium look

Shortwave, AM and FM • Continuous shortwave from 1.6 - 30 MHz, covering all existing shortwave bands plus FM-stereo, AM and Longwave. • Single sideband (SSB) circuitry allows for reception of two-way communication such as amateur radio, military, commercial air-to-ground, and ship-to-shore.

Memory Positions • 40 randomly programmable memory positions allow for quick access to favorite stations.

Multi-function Liquid Crystal Display • The LCD simultaneously displays the time, frequency, band, alarm and sleep timer.

Clock, Alarm and Timer • Two alarm modes: Beeper and radio.

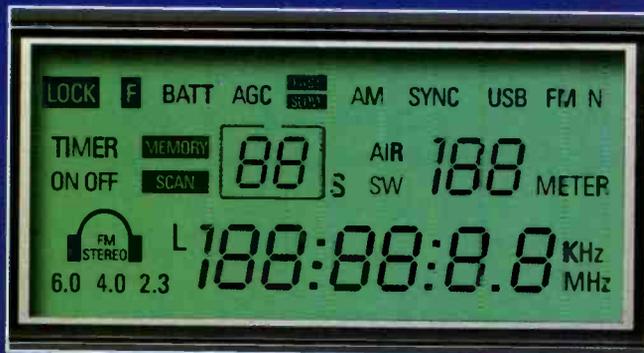
- Dual clocks show time in 24 hour format.
- Sleep timer programmable in 15 minute increments.

Dimensions: 7.75" L x 4.5" H x 1.5" W

Weight: 1 lb. 5 oz.

by **GRUNDIG**

GRUNDIG The Ultimate in



The LCD

Big! Bold! Brightly Illuminated 6" by 3 1/2". Liquid Crystal Display shows all important data: Frequency, Meter band, Memory position, Time, LSB/USB, Synchronous Detector and more.

The Signal Strength Meter

Elegant in its traditional Analog design, like the gauges in the world's finest sports cars. Large. Well Lit. Easy to read.



The Frequency Coverage

Longwave, AM and shortwave: continuous 100-30,000 KHz. FM: 87-108 MHz VHF Aircraft Band: 118-137 MHz.

The Tuning Controls

- For the traditionalist: a smooth, precise tuning knob, produces no audio muting during use.



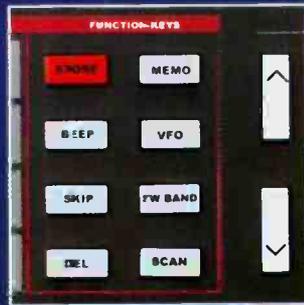
Ultra fine-tuning of 50Hz on LSB/USB, 100Hz in SW, AM and Aircraft Band and 20 KHz in FM.

- For Fixed-step Tuning: Big, responsive Up/Down tuning buttons.
- For direct frequency entry: a responsive, intuitive numeric keypad.



THESE ARE THE SATELLIT 800 MILLENNIUM'S MAJOR FEATURES. FOR A DETAILED SPECIFICATION SHEET, CONTACT GRUNDIG.

Digital Technology



The Operational Controls

Knobs where you want them; Buttons where they make sense. The best combination of traditional and high-tech controls.

The Sound

Legendary Grundig Audio Fidelity with separate bass and treble controls, big sound from its powerful speaker and FM-stereo with the included high quality headphones.



The Technology

Today's latest engineering

- Dual conversion superheterodyne circuitry.
- PLL synthesized tuner.

The Many Features

- 70 user-programmable memories.
- Two, 24 hour format clocks.
- Two ON/OFF sleep timers.
- Massive, built-in telescopic antenna.
- Connectors for external antennas - SW, AM, FM and VHF Aircraft Band.
- Line-out, headphone and external speaker jacks.

The Power Supply

A 110V AC adapter is included for North America (a 220V AC adapter is available upon request). Also operates on 6 size D batteries. (not included)



Dimensions: 20.5" L X 9" H X 8" W

Weight: 14.50 lbs.

by **GRUNDIG**

GRUNDIG Best in Technology



Yacht Boy 300 Professional Edition (YB 300PE)

Power and Performance with the Affordable Yacht Boy 300 Professional.

Designed for the traveller, the titanium look digital radio provides incredible power and performance for an incredibly low price! Packed with features, this radio is an excellent value, accompanied with 3 AA batteries, AC adapter, earphones, supplementary Antenna and carrying case!

State of-the-art features include:

- Digital tuning with 24 user-programmable memory presets
- 13 SW Bands (2.30-7.80 MHz; 9.10-26.10 MHz)
- Illuminated multifunction LCD display screen
- AM/FM stereo via earphones
- Clock, alarm and 10 to 90 minute sleep timer
- Digital tuning display
- Direct frequency entry
- DX/ local selector
- Titanium look finish
- External antenna jack
- Dynamic micro speaker
- Earphone jack
- Telescopic antenna

Dimensions: 5.75" L x 3.5" H x 1.25" W

Weight: 9.92 oz

by **GRUNDIG**



FREQUENCIES

1200 1205	New Zealand, R New Zealand Int	15175as	1200 1300 vl	Nigeria, Radio/Ibadan	6050da			
1200 1215	Somalia, Radio Galkayo	6985va	1200 1300 vl	Nigeria, Radio/Kaduna	4770da	6090do	7275do	9570da
1200 1220 fa	Kazakhstan, Radio Almaty	11840eu	1200 1300 vl	Nigeria, Radio/Lagos	4990da	7285do		
1200 1220 as	UK, BBC World Service	6190af	1200 1300	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as
1200 1227	Iran, VOIRI	15185as	1200 1300 vl	Papua New Guinea, NBC	4890da	9675do		
		21730as	1200 1300	Sierra Leone, Sierra Leone BS	5980da			
1200 1230	Philippines, FEBC	15110as	1200 1300	Singapore, R Singapore Intl	6150as	9600as		
1200 1230	Sri Lanka, Sri Lanka BC Corp	4940da	1200 1300	Taiwan, R Taiwan International	7130as	9610au		
1200 1230	Uzbekistan, Radio Tashkent	5060as	1200 1300	Uganda, Radio	5026da	7110do	7196do	
1200 1245	USA, WYFR Okeechobee FL	5950na	1200 1300	UK, BBC World Service	5965na	6195va	9515na	9580as
1200 1256	China China Radio International	9705as	1200 1300		9740as	11760me	11955as	12095eu
		11980as			15280as	15310as	15485eu	15565eu
		15415as			17640eu	17700as	17830af	17885af
1200 1256	North Korea, R Pyongyang	3560va	1200 1300 a	UK, Flat Earth Radio/Merlin	9430na	21515af		
		11335va	1200 1300 a	UK, Vrg n Radio/Merlin	21455me	21515af		
1200 1259	Canada, R Canada International	6150as	1200 1300	Ukraine, R Ukraine International	15520eu			
1200 1300	Anguilla, Caribbean Beacon	11775am	1200 1300	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1200 1300 vl	Australia, ABC/Alice Springs	2310do	1200 1300		6458va	6847va	10320va	10940va
1200 1300 vl	Australia, ABC/Katherine	2485do			12579va	12689va	13362va	16847va
1200 1300 vl	Australia, ABC/Tennant Creek	2325do	1200 1300	USA, KAJJ Dallas TX	5755va			
1200 1300	Australia, Radio	5995pa	1200 1300	USA, KTNB Salt Lake City UT	7510na			
		21820va	1200 1300	USA, KWHR Naalehu HI	9930as	11565pa		
1200 1300 vl	Botswana, Radio	7255do	1200 1300	USA, Voice of America	6110as	9645as	9760as	11705as
1200 1300	Brazil, Radio Nacional Bras	15445am			11715as	15250as	15425as	
1200 1300	Bulgaria, Radio	15700eu	1200 1300	USA, WEWN Birmingham AL	5825na	7425na	15745na	
1200 1300 vl	Cameroun, RTV/Yaounde	4850da	1200 1300	USA, WHRI Noblesville IN	6040na	9495na		
1200 1300	Canada, CBC Northern Service	9625do	1200 1300	USA, WJCR Upton KY	7490va	13595as		
1200 1300	Canada, CFRX Toronto ON	6070do	1200 1300	USA, WRMI Miami FL	9955am			
1200 1300	Canada, CFPV Calgary AB	6030do	1200 1300	USA, WSHB Cypress Crk SC	6095am	11660va		
1200 1300	Canada, CHNX Halifax, NS	6130do	1200 1300	USA, WTJC Newport NC	9370na			
1200 1300	Canada, CKZN St John's NF	6160do	1200 1300	USA, WWCN Nashville TN	5070am	5935am	7435am	15685am
1200 1300	Canada, CKZU Vancouver BC	6160do	1200 1300 vl/s	Vanuatu, Radio	3945do	4960do	7260do	
1200 1300	Costa Rica, R for Peace Intl	15048irr	1200 1300	Zambia, Christian Voice	9865do			
1200 1300	Costa Rica, University Network	15048irr	1200 1300 vl	Zambia, National BC Corp	6165do	6265do		
1200 1300	Ecuador, HCJB	12005am	1200 1300 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
		15115va	1204 1220 mtwhf	UK, BBC Caribbean Report	6195ca	15220ca		
1200 1300 as/vl	Eqt. Guinea, Radio East Africa	15185af						
1200 1300 a/monthly	Finland, Scandy Weekend Radio	11690va	1205 1300 occsnl	New Zealand, R New Zealand Int	6095pa			
1200 1300	France, R France International	11670af	1215 1300	Egypt, Radio Cairo	17595as			
1200 1300	Germany, Deutsche Welle	6140eu	1220 1240 w	Kazakhstan, Radio Almaty	9620eu	11840eu		
1200 1300	Germany, Voice of Hope	15715me	1220 1300 as	UK, BBC World Service	6190af	11940af		
1200 1300 vl	Ghana, Ghana BC Corp	4915do	1230 1256	Belgium, Radio Vlaanderen Intl	9925eu			
1200 1300	Guyana, Voice of	5949do	1230 1257	Vietnam, Voice of	12019as			
1200 1300 vl/as	Italy, IRRS	7120va	1230 1300 mtwhfa	Austria, R Austria International	6155eu	13730eu		
1200 1300	Jordan, Radio	11690eu	1230 1300	Bangladesh, Bangla Betar	7184as	9558as		
1200 1300	Kenya, Kenya BC Corp	4935do	1230 1300	Sri Lanka, Sri Lanka BC Corp	17820eu	6005as	6075as	9770as
1200 1300 vl	Lesotho, Radio	4800do	1230 1300		15425as			
1200 1300 vl	Liberia, ELWA	4760do	1230 1300	Sweden, Radio	18960na			
1200 1300 vl	Liberia, R Liberia International	6100do	1230 1300	Thailand Radio	9810as			
1200 1300	Liberia, Voice of Hope	11530af	1240 1300 t	Kazakhstan, Radio Almaty	9620eu	11840eu		
1200 1300	Malaysia, Radio	7295do	1245 1300 a	Seychelles, FEBA Radio	15535me			
1200 1300	N Marianas, KHBI Saipan	5915as	1255 1300 mtwhfa	Taiwan, CBS	6180as	7250as	9630as	11725as
1200 1300	Namibia, Namibian BC Corp	7165af			11775as			
1200 1300	Netherlands, Radio	6045eu						
1200 1300	New Zealand, ZLXA	3935da						
1200 1300 vl	Nigeria, Radio/Enugu	6025do						

SELECTED PROGRAMS

Newscasts (*extended)

1200 BBCWS(am)	O	NewsHour*
HCJB	M-F	Latin American & World News
R. Australia	D	News
1210 BBCWS(am)	M-F	Caribbean Report*
1230 HCJB	M-F	Latin American & World News

Current Events Magazines/Features

1230 R. Sweden	M-F	60 Degrees North
----------------	-----	------------------

Business/Economics

1205 BBCWS(am)	M-F	Caribbean Business (special to Caribbean on 6195, 15220 kHz only)
1245 R. Sweden	W	Money Matters

Science/Technology

1215 WWCR(15685kHz)	A	Eco Watch
1245 R. Sweden	H	Greenscan (ecology-2nd wk.) Heartbeat (3rd wk.)

Arts and Culture

1230 R. Sweden	A	Spectrum (3rd wk.)
----------------	---	--------------------

Local Lives and Views

1205 R. Australia	M-H	Late Night Live (discussion)
1230 R. Sweden	A	Weekend (Europe magazine-1st wk.) Sweden Today (2nd) Studio 49 discussion-3rd)
1245 R. Sweden	H	Nordic Report (1st) The S-Files (things Swedish-4th)
	F	Review of the Newsweek

Informational Features

1205 R. Australia	A	The Spirit of Things (spiritual matters)
WWCR(5070 kHz)	A	This Week in Americana (collectibles)
1224 HCJB	M-F	Mission Network News

1230 HCJB	A	Adventures in Odyssey (stories)
-----------	---	---------------------------------

Music

1200 WWCR(15685kHz)	F	The Big Backyard (Australian country)
1205 R. Australia	S	Country Club
	F	Sound Quality (innovative)
1230 R. Sweden	S	Sounds Nordic (rock-acc. 1st wk.)

Entertainment/Variety, Magazine Shows

1200 HCJB	M-F	Morning in the Mountains (from 1130)
-----------	-----	--------------------------------------

SWL, Media and Communications

1200 WWCR(15685kHz)	T	World of Radio
	W	Communications World
1230 R. Sweden	T	Mediascan (1st/3rd wk.)
WHRI(9495 kHz)	A	DXing with Lumbre
WWCR(15685kHz)	A	World of Radio

Listener Contact/Interactive

1215 WWCR(15685 kHz)	S/M	Ask WWCR
1230 R. Sweden	S	In Touch with Stockholm (1st wk.)

Sport

1205 HCJB	M-F	Sports News
1245 R. Sweden	M	Sportscan

0232	Voice of Russia	T	Folk Box
------	-----------------	---	----------

Continued from 0200

		W	Jazz Show
		H	Russian Musical Highlights (history)
		F	Yours for the Asking
0240	Swiss R. Int.	S	Sounds Good (Swiss music-3rd/5th wk.)

0246	Voice of Russia	F	Music At Your Request
0250	Voice of Vietnam	S	Music (Vietnamese)

Entertainment/Variety, Magazine Shows

0200	HCJB	M	Sunday Nit
		H	Adventures in Odyssey (children's stories)
		S	Marion's Attic (vintage recordings)
0205	R. New Zealand Int.	S	Playhouse (radio theatre)
0232	Voice of Russia	M	Timelines
0240	Voice of Vietnam	M	Sunday Show

SWL, Media and Communications

0200	HCJB	S	Ham Radio Today
0205	R. Canada Int.	M	CIOX Report (biweekly)
0210	R. Budapest	S	DX Blockbuster
0230	R. Korea Int.	M	Multiview Feedback
0245	R. Sweden	W	Media Scan (1st/3rd wk.)

Listener Contact/Interactive

0205	R. Canada Int.	M	Maple Leaf Mailbox
0210	R. Budapest	M	And the Gatepost (monthly)
0215	R. Prague	A	Mailbox
0230	R. Korea Int.	S	From Us to You
	R. Sweden	M	In Touch with Stockholm (1st wk.)
0240	Swiss R. Int.	S	Capital Letters (2nd/4th wk.)
0245	R. Taipei Int.	S	Mailbox Time
	Voice of Vietnam	H	Letterbox
	WWCR(5070 kHz)	S	Ask WWCR

Sport

0200	R. New Zealand Int.	S/A	Live Sport (in season)
0205	BBCWS(am)	H	Sports International (magazine)
	R. Australia	S/A	Grandstand (live sports action - special on 9660, 12080, 17580, 17715, 17750, 21725 kHz only)
0245	R. Sweden	T	Sportscan



FREQUENCIES

1400 1405	Vatican City, Vatican Radio	15235au	17515vu	1400 1500 vl	Nigeria, Radio/Enugu	6025do			
1400 1429	Czech Rep, Radio Prague Intl	21745va		1400 1500 vl	Nigeria, Radio/Ibadan	6050do			
1400 1430	Thailand, Radio	9530as		1400 1500 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1400 1430	Turkey, Voice of	17690as	17815ev	1400 1500 vl	Nigeria, Radio/Lagos	4990do	7285do		
1400 1430 s	USA, Voice of America	18275va		1400 1500	Oman, Radio Sultanate of	15140va			
1400 1455 as	S Africa, Channel Africa	11720af	17780af	1400 1500	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as
1400 1456	China, China Radio International	7180as	7405na	1400 1500	Sierra Leone, Sierra Leone BS	5980do			
		11765as	15125af	1400 1500	Singapore R Corp of Singapore	6150do			
				1400 1500	Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
1400 1500	Anguilla, Caribbean Beacon	11775am		1400 1500		15425as			
1400 1500 vl	Australia, ABC/Alice Springs	2310do		1400 1500	Switzerland, Swiss R International	12010as	15185as		
1400 1500 vl	Australia, ABC/Katherine	2485do		1400 1500	Taiwan, R Taiwan International	15125as			
1400 1500 vl	Australia, ABC/Tennant Creek	2325do		1400 1500	Uganda, Radio	4976do	5026do		
1400 1500	Australia, Radio	11660va	6080pa	1400 1500	UK, BBC World Service	5995as	6190af	6195as	9590na
						9740as	11940af	12095ev	15310as
1400 1500 vl	Botswana, Radio	7255do	9600da	1400 1500		15485ev	15565ev	15575me	17640ev
1400 1500 vl	Cameroon, RTV/Yaounde	4850do		1400 1500		17830af	17840am	21470af	21660af
1400 1500	Canada, CBC Northern Service	9625do		1400 1500	UK, Flat Earth Radio/Merlin	15665na	21455me	21515af	
1400 1500	Canada, CFRX Toronto ON	6070do		1400 1500	UK, Virgin Radio/Merlin	21455me	21515af		
1400 1500	Canada, CFVP Calgary AB	6030do		1400 1500	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1400 1500	Canada, CHNX Halifax, NS	6130do				6350va	6458va	6847va	10320va
1400 1500	Canada, CKZN St John's NF	6160do				12579va	12689va	13362va	16847va
1400 1500	Canada, CKZU Vancouver BC	6160do		1400 1500	USA, KAIJ Dallas TX	13815va			
1400 1500	Canada, R Canada International	9640na	13655na	1400 1500	USA, KJES Vado NM	11715na			
1400 1500	Costa Rica, R for Peace Intl	15048rr	21815usb	1400 1500	USA, KTVN Salt Lake City UT	7510na			
1400 1500	Costa Rica, University Network	15048rr	21815usb	1400 1500	USA, KWHR Naalehu HI	9930as	11565as		
1400 1500	Ecuador, HCJB	12005am	15115va	1400 1500	USA, Voice of America	6110as	7125as	9645as	9760as
1400 1500	Eq Guinea, Radio East Africa	15185af				11705as	15205as	15395as	15425as
1400 1500	Finland, Scandy Weekend Radio	11690va	11720va	1400 1500	USA, WEWN Birmingham AL	11875va	15375na	15475na	
1400 1500	France, R France International	11610as	17620as	1400 1500	USA, WHRI Noblesville IN	6040na	15105na		
1400 1500	Germany, Deutsche Welle	6140ev	17680af	1400 1500	USA, WJCR Upton KY	7490va	13595as		
1400 1500	Germany, Overcomer Ministries	6110ev		1400 1500	USA, WRMI Miami FL	15725am			
1400 1500	Germany, Voice of Hope	15715me	17550as	1400 1500	USA, WTJC Newport NC	9370na			
1400 1500 vl	Ghana, Ghana BC Corp	4915do	6130do	1400 1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400 1500	Guyana, Voice of	5949do		1400 1500	USA, WWFY McCaysville GA	9400am	12172am		
1400 1500	India, All India Radio	9690as	11620as	1400 1500	USA, WYFR Okeechobee FL	11550as	11740na	11830na	17760na
1400 1500 vl/as	Italy, IRRS	7120va		1400 1500	Zambia, Christian Voice	9865do			
1400 1500	Japan, Radio	7200as	9505as	1400 1500 vl	Zambia, National BC Corp	6165do	6265do		
1400 1500	Jordan, Radio	11690ev		1400 1500 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
1400 1500	Kenya, Kenya BC Corp	4935do		1415 1420	Nepal, Radio	5005as	7165as		
1400 1500 vl	Lesotho, Radio	4800do		1430 1500	Austria, R Austria International	6155ev	13730ev	17855ou	
1400 1500 vl	Liberia, ELWA	4760do		1430 1500	Guam, Adventist World Radio	15225as			
1400 1500 vl	Liberia, R Liberia International	6100do		1430 1500	Guam, Trans World Radio	15330as			
1400 1500	Liberia, Voice of Hope	11530af		1430 1500	Malaysia, RTM Kota Kinabalu	5980do			
1400 1500	Malaysia, Radio	7295do		1430 1500	Myanmar, Radio	5985do			
1400 1500	Malaysia, RTM Sarawak	7160do		1430 1500	Netherlands, Radio	12070as	12090as	15595as	
1400 1500	Nomibia, Namibian BC Corp	7165af	7215af	1430 1500	Sweden, Radio	17505va	18960na		
1400 1500 occsnal	New Zealand, R New Zealand Int	6095pa							
1400 1500	New Zealand, ZLXA	3935do							

SELECTED PROGRAMS

Newscasts

1400	BBCWS(am)	D	News
	China R. Int.	D	News
	R. Australia	D	News
	R. Canada Int.	D	News
	R. Japan	D	News
	R. Prague	D	News

Current Affairs Magazines/Features

1405	R. Canada Int.	S	The Sunday Edition (from 1310)
		M-F	This Morning (from 1310)
1410	China R. Int.	S	Report on Developing Countries
		M-F	Current Affairs
		A	Global Review
	R. Japan	S	Roundup Asia
1415	R. Japan	M-F	44 Minutes
1430	R. Sweden	M-F	60 Degrees North

Business/Economics

1420	China R. Int.	W	China Horizons
	R. Prague	H	Economic Report
1445	R. Sweden	W	Money Matters

Science/Technology

1445	R. Sweden	H	Greenscan (ecology-2nd wk.) Heartbeat (health-3rd wk.)
------	-----------	---	--

Arts and Culture

1405	BBCWS(am)	T	Meridian-Screen (film)
		H	Meridian-Writing (books)
	R. Australia	S	Books and Writing
	R. Prague	A	The Arts
1415	R. Prague	S	Readings from Czech Literature
1420	China R. Int.	S	In the Spotlight
1430	R. Sweden	S	Spectrum (3rd wk.)

Local Lives and Views

1405	R. Prague	S	Letter from Prague
		M-F	Current Affairs
1410	R. Japan	S	Weekend Square
	R. Prague	S	From the Weeklies
1415	R. Prague	M	Spotlight (Czech events) or One on One (interview)
		W	Czechs in History or Central Europe Today
1420	R. Prague	T	Talking Point
1430	China R. Int.	M	People in the Know
		F	Life in China
	R. Sweden	A	Weekend (Europe magazine-1st wk.) Sweden Today (2nd wk.) Studio 49 (discussion-4th wk.)
1445	R. Sweden	H	Nordic Report (1st wk.) The S-Files (things Swedish-4th wk.)
		F	Review of the Newsweek

Informational Features

1405	BBCWS(am)	M	Meridian-Ideas
	R. Australia	A	New Dimensions ("progressive" ideas)
1420	China R. Int.	H	Voices from Other Lands

Music

1400	R. Sweden	S	Sounds Nordic (rock/pop-exc. 1st wk.)
1405	BBCWS(am)	W	Meridian-Music
		F	Meridian-Masterpiece
	R. Australia	M-F	The Planet (from 1315)
1410	R. Prague	A	Saturday Music (classical/folk/jazz)
1430	BBCWS(am)	M	Music Mix
		T	UK Top 20
		W	World of Music
1445	BBCWS(am)	W	UK Album Chart
		F	Music X-Press

Entertainment/Variety, Magazine Shows

1400	Channel Africa	S/A	Channel Africa Extra (from 1300)
------	----------------	-----	----------------------------------

1405	R. Canada Int.	A	Basic Black (humor)
1430	BBCWS(am)	W/F	Wayway (drama serial)
	HCJB	A	Alive! (Christian lifestyles)

SWL, Media and Communications

1445	R. Sweden	T	Mediascan (1st/3rd wk.)
------	-----------	---	-------------------------

Listener Contact/Interactive

1405	BBCWS(am)	S	Talking Point (current events call-in)
1415	R. Prague	F	Mailbox
	WWCR (15685kHz)	A	Ask WWCR
1420	China R. Int.	A	Listeners' Garden
1430	R. Sweden	S	In Touch with Stockholm (1st wk.)

Sport

1405	BBCWS(am)	A	Sportsworld (live action)
1430	China R. Int.	T	Sports World
1445	R. Sweden	M	Sportscan

FREQUENCIES

1500 1530	Ecuador, HCJB	21455	usb	1500 1600	vl	Nigeria, Radio/Lagos	4990do	7285do			
1500 1530	Germany, Voice of Hope	15715me	17550as	1500 1600	vl	Nigeria, Voice of	7255af	15120af			
1500 1530	Jordan, Radio	11690eu		1500 1600		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as	
1500 1530	Mexico, R Mexico International	9705am	11770am	1500 1600		Russia, Voice of Russia WS	7180na	7315as	9800as	9875as	
1500 1530	Mongolia, Voice of	12015as	12085as				11500as				
1500 1530	S Africa, Channel Africa	17770af		1500 1600		S Africa, World Beacon	6145af				
1500 1556	China China Radio International	7160as	7405na	9785as	13685af	Seychelles, FEBA Radio	11600as				
		15125af				Sierra Leone, Sierra Leone BS	5980do				
1500 1559	North Korea, R Pyongyang	4405va	6574na	9335na	11710na	Singapore R Corp of Singapore	6150do				
1500 1600	Canada, R Canada International	9640na	13655na	17710na		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as	
1500 1600	Anguilla, Caribbean Beacon	11775am					15425as				
1500 1600	Australia, ABC/Alice Springs	2310do				Uganda, Radio	4976do	5026do			
1500 1600	Australia, ABC/Katherine	2485do				UK, BBC World Service	5975as	5995as	6190af	6195as	
1500 1600	Australia, ABC/Tennant Creek	2325do					9515na	9590na	9740as	11860af	
							11940af	12095eu	15220na	15310as	15400af
1500 1600							15420af	15485eu	15565eu	17700as	17830af
							17840am	21470af	21490af	21660af	
1500 1600	Australia, Radio	5995va	6080pa	9580as	11650pa	UK, Flat Earth Radio/Merlin	15665na	21455me	21515af		
		11660va				UK, Virgin Radio/Merlin	21455me				
1500 1600	Botswana, Radio	7255do	9600do	7255do		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
1500 1600	Cameroon, RTV/Yaounde	4850do					6350va	6847va	10320va	10940va	
1500 1600	Canada, CBC Northern Service	9625do					12579va	12689va	13362va	16847va	
1500 1600	Canada, CFRX Toronto ON	6070do									
1500 1600	Canada, CFVP Calgary AB	6030do									
1500 1600	Canada, CHNX Halifax, NS	6130do									
1500 1600	Canada, CKZN St John's NF	6160do									
1500 1600	Canada, CKZU Vancouver BC	6160do									
1500 1600	Costa Rica, R for Peace Intl	15048va	21815usb								
1500 1600	Costa Rica, University Network	15048va	21815usb								
1500 1600	Ecuador, HCJB	12005am	15115va								
1500 1600	Eat. Guinea, Radio East Africa	15185af									
1500 1600	Finland, Scandv Weekend Radio	11690va	11720va								
1500 1600	Germany, Deutsche Welle	6140eu									
1500 1600	Germany, Overcomer Ministries	6110eu	13810af								
1500 1600	Ghana, Ghana BC Corp	4915do	6130do								
1500 1600	Guam, Trans World Radio	15330as									
1500 1600	Guyana, Voice of	5949do									
1500 1600	Italy, IRRS	7120va									
1500 1600	Japan, Radio	7200as	9750as	9845as							
1500 1600	Kenya, Kenya BC Corp	4935do									
1500 1600	Lesotho, Radio	4800do									
1500 1600	Liberia, ELWA	4760do									
1500 1600	Liberia, R Liberia International	6100do									
1500 1600	Liberia, Voice of Hope	11530af									
1500 1600	Malaysia, Radio	7295do									
1500 1600	Malaysia, RTM Kota Kinabalu	5980do									
1500 1600	Malaysia, RTM Sarawak	7160do									
1500 1600	Myanmar, Radio	5985do									
1500 1600	Namibia, Namibian BC Corp	7165af	7215af								
1500 1600	Netherlands, Radio	12070as	12095as	15595as							
1500 1600	New Zealand, R New Zealand Int	6095pa									
1500 1600	New Zealand, ZLXA	3935do									
1500 1600	Nigeria, Radio/Enugu	6025do									
1500 1600	Nigeria, Radio/Ibadan	6050do									
1500 1600	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do						

SELECTED PROGRAMS

Newscasts

1500	BBCWS(am)	D	News
	China R. Int.	D	News
	R. Australia	D	News
	R. Canada Int.	D	News
	Voice of Russia	D	News
1530	Voice of Russia	D	News in Brief

Current Events Magazines/Features

1505	BBCWS(am)	S	From Our Own Correspondent
	R. Australia	M-F	Asia Pacific
	R. Canada Int.	S	The Sunday Edition (from 1310)
		M-F	This Morning (from 1310)
1510	China R. Int.	S	Report on Developing Countries
		M-F	Current Affairs
		A	Global Review
1511	Voice of Russia	S	Sunday Panorama
		M-A	News and Views

Business/Finance

1530	China R. Int.	W	China Horizons
------	---------------	---	----------------

Science/Technology

1505	BBCWS(am)	M	One Planet (ecology)
		T	Discovery (research)
		W	Health Matters
		H	Science View
1530	R. Australia	M	The Health Report

Arts and Culture

1520	China R. Int.	S	In the Spotlight
------	---------------	---	------------------

Local Lives and Views

1530	BBCWS(am)	S	People and Politics (Parliament)
	China R. Int.	M	People in the Know
		F	Life in China

R. Australia	T	The Law Report	
	W	The Religion Report	
R. Canada Int.	F	C'est La Vie (life in Quebec)	
1532	Voice of Russia	S	Kaleidoscope (Russian events)
		F	Moscow Yesterday and Today
1545	R. Canada Int.	M-H	Out Front (experimental radio)

Informational Features

1505	R. Australia	S	Encounter (spiritual beliefs)
1520	China R. Int.	H	Voices from Other Lands
1530	BBCWS(am)	M	People and Places
		T	The Essential Guide
		W	Everywoman
		H	Focus on Faith
		F	Pick of the World (best of the BBC)

Music

1505	R. Australia	A	Melisma (innovative)
1532	Voice of Russia	M	Folk Box
		T/H	Yours for the Asking
		W	Jazz Show
1546	Voice of Russia	T/H	Music at Your Request

Entertainment/Variety, Magazine Shows

1500	HCJB	A	Alive! (from 1430)
1505	R. Canada Int.	A	Basic Black (from 1405)
1530	HCJB	A	Weekend Magazine
1532	Voice of Russia	A	Timelines

SWL, Media and Communications

1530	R. Australia	H	The Media Report
	WHRI(6040 kHz)	S/A	DXing with Cumbeo

Listener Contact/Interactive

1520	China R. Int.	A	Listeners' Garden
------	---------------	---	-------------------

Sport

1505	BBCWS(am)	F	Sports International
		A	Sportsworld (from 1405)
1530	China R. Int.	T	Sports World
		F	The Sports Factor

Continued from 0500

Entertainment/Variety, Magazine Shows

0500	HCJB	M	Sunday Nite
		H	Adventures in Odyssey (stories)
	WBCQ(7315 kHz)	M-A	Arms 'n Andy (classic comedy)
0505	R. New Zealand Int.	S	Storytime
0532	Voice of Russia	F	Audio Book Club
		A	Timelines

SWL, Media and Communications

0530	WHRI(5745 kHz)	S	DXing with Cumbeo
0540	R. Habana Cuba	S/W	DXers Unlimited
0547	Spanish Foreign R.	S	Radio Waves

IT'S BACK AND BETTER THAN EVER

The Worldwide Shortwave Listening Guide

Edited by John Figliozzi

A "must" reference for every shortwave program listener!





FREQUENCIES

1600 1610	Vatican City, Vatican Radio	9865au	13765au	15235au		1600 1700	New Zealand, ZLXA	3935da			
1600 1615	Pakistan, Radio	11570va	15100va	15725va	17720va	1600 1700 vl	Nigeria, Radio/Enugu	6025do			
1600 1625	Netherlands, Radio	12070as	12095as	15595as		1600 1700 vl	Nigeria, Radio/Ibadan	6050do			
1600 1627	Iran, VOIRI	7115as	9635as	11775na		1600 1700 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1600 1627	Vietnam, Voice of	7145eu	9730eu			1600 1700 vl	Nigeria, Radio/Lagos	3326do	4990do		
1600 1630	Ecuador, HCJB	12005am	15115va			1600 1700 vl	Nigeria, Voice of	7255af	15120af		
1600 1630 s	Germany, Universal Life	15105af				1600 1700	Palau, KHBN/Voice of Hope	9955as	9965as	13840as	
1600 1630	Guam, Trans World Radio	15330as				1600 1700	Russia, Voice of Russia WS	4940me	4965me	4975me	6005me
1600 1630	Mexico, R Mexico International	9705am	11770am					7305as	9830me		
1600 1630	S Africa, Channel Africa	9525af				1600 1700	S Africa, World Beacon	6145af			
1600 1630 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			1600 1700	Sierra Leone, Sierra Leone BS	5980do			
1600 1640	UAE, Radio Dubai	13675eu	15395eu	21605eu		1600 1700	South Korea, R Korea Intl	5975am	9515va	9870va	
1600 1645	Germany, Deutsche Welle	6170as	7225as	9735af	15380as	1600 1700	Sri Lanka, Sri Lanka BC Corp	4940do			
		15455af	17810as	21780af		1600 1700	Uganda, Radio	4976do	5026do		
1600 1650 occsnal	New Zealand, R New Zealand Int	6095va				1600 1700	UK, BBC World Service	3915as	5975as	6190af	6195as
1600 1656	China China Radio International	7190af	13650af					7160as	9410eu	9740eu	11940af
1600 1656	North Korea, R Pyongyang	3560va	6520va	9600va	9975va			15310as	15400af	15420af	15565eu
1600 1700	Algeria, R Algiers International	11715va	15160va					17830af	16740am	21470af	21660af
1600 1700	Anguilla, Caribbean Beacon	11775am				1600 1700 mtwhfo	UK, BBC World Service	9515na			
1600 1700 vl	Australia, ABC/Alice Springs	2310do				1600 1700 a	UK, Flat Earth Radio/Merlin	15525eu	15665na	21515af	
1600 1700 vl	Australia, ABC/Katherine	2485do				1600 1700	UK, World Beacon	15455eu			
1600 1700 vl	Australia, ABC/Tennant Creek	2325do				1600 1700	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1600 1700	Australia, Radio	5995va	6080pa	9580va	9655va			6458va	6847va	10320va	10940va
		11650pa	11660va					12579va	12689va	13362va	16847va
1600 1700 vl	Botswana, Radio	3356do	4820do	7255do		1600 1700	USA, KALJ Dallas TX	13815va			
						1600 1700	USA, KJES Vado NM	11715na			
1600 1700 vl	Cameroon, RTV/Yaounde	4850do				1600 1700	USA, KTBN Salt Lake City UT	15590na			
1600 1700	Canada, CBC Northern Service	9625do				1600 1700	USA, KWHR Naalehu HI	9930as			
1600 1700	Canada, CFRX Toronto ON	6070do				1600 1700	USA, VOA Special English	13600af	15445af	17895af	
1600 1700	Canada, CFVP Calgary AB	6030do									
1600 1700	Canada, CHNX Halifax, NS	6130do				1600 1700	USA, Voice of America	6035af	6110as	7125as	9575as
1600 1700	Canada, CKZN St John's NF	6160do						9645as	9760as	11920af	12040af
1600 1700	Canada, CKZU Vancouver BC	6160do						15205as	15225af	15240af	15395as
1600 1700	Costa Rica, R for Peace Intl	15048va	21815usb			1600 1700	USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na
1600 1700	Costa Rica, University Network	15048va	21815usb			1600 1700	USA, WHRA Greenbush ME	17650af			
1600 1700	Ethiopia, Radio	7165af	9560af			1600 1700	USA, WHRI Noblesville IN	13760na	15105na		
1600 1700 a/monthly	Finland, Scandy Weekend Radio	11690va	11720va			1600 1700	USA, WRB Red Lion PA	13570eu			
1600 1700	France, R France International	11615af	11995af	12015af	15210af	1600 1700	USA, WJCR Upton KY	7490va	13595as		
		17850af				1600 1700	USA, WRMI Miami FL	15725am			
1600 1700	Germany, Deutsche Welle	6140eu				1600 1700	USA, WSHB Cypress Crk SC	18910af			
1600 1700 a	Germany, Good News World R	15105af				1600 1700	USA, WTJC Newport NC	9370na			
1600 1700	Germany, Overcomer Ministr es	6110eu	13810af			1600 1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600 1700 vl	Ghana, Ghana BC Corp	4915do	6130do			1600 1700	USA, WWFV McCaysville GA	9400am	12172am		
1600 1700	Guam, Adventist World Radio	11980as				1600 1700	USA, WYFR Okeechobee FL	11830na	15215na	17760na	18980eu
1600 1700	Guyana, Voice of	5949do						21455eu	21525af		
1600 1700 vl/os	Italy, IRRS	7120va				1600 1700	Zambia, Christian Voice	4965do			
1600 1700	Jordan, Radio	17680na				1600 1700 vl	Zambia, National BC Corp	6165do	6265do		
1600 1700	Kenya, Kenya BC Corp	4935do				1615 1630 as	UK, BBC World Service	11860af	21490af		
1600 1700 vl	Lesotho, Radio	4800do				1630 1700	Egypt, Radio Cairo	15255af			
1600 1700 vl	Liberia, ELWA	4760do				1630 1700 s	Seychelles, FEBA Radio	11605as			
1600 1700 vl	Liberia, R Liberia International	6100do				1630 1700	Somalia, Radio Galkayo	6985va			
1600 1700	Libero, Voice of Hope	11530af				1630 1700 mtwhf	UK, Merlin Network One	12065as			
1600 1700 vl	Malawi, Malawi BC Corp	3380do				1630 1700 vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
1600 1700	Malaysia, Radio	7295do				1645 1700	Bangladesh, Bangla Betar	7184eu	7462eu	9550eu	15520eu
1600 1700	Nambia, Nambian BC Corp	7165af	7215af			1650 1700 mtwhf	New Zealand, R New Zealand Int	15120as			

SELECTED PROGRAMS

Newscasts (*extended)

1600	BBCWS(am)	S	News Summary
		M-F	World Briefing*
		A	News
	R. Australia	D	News

Current Events Magazines/Features

1630	BBCWS(am)	M/T/W/F	News Analysis
		W	From Our Own Correspondent
	R. Austria Int.	D	Report from Austria

Local Lives and Views

1605	R. Australia	S	The National Interest
		T	The Comfort Zone (homes/gardens/food)
		W	Verbatim (oral histories)
		H	Hindsight (history)
		F	Away! (Aboriginal culture)
1630	R. Australia	W	Earshot (Australian voices)
1640	R. Austria Int.	S	Profile of Austria
		A	Radio E (on Europe)

Music

1601	BBCWS(am)	S	Concert Hall (classical)
1602	WHRI(15105 kHz)	A	20: The Countdown Magazine (Christian rock)
1605	R. Australia	M	Music Deli
		A	Melisma (from 1505)

SWL, Media and Communications

1600	WHRI(15105 kHz)	S	Düing with Cumbro
------	-----------------	---	-------------------

Sport

1605	BBCWS(am)	A	Sportsworld (from 1405)
1645	BBCWS(am)	M-F	Sports Roundup

Continued from 0100

Music

0100	WBCQ(7415 kHz)	A	A Different Kind of Oldies Show
	WWCR(5070 kHz)	M	Big Band Classics
0105	BBCWS(am)	H	Meridian-Music
		A	Meridian-Masterpiece
	R. Australia	A	Oz Sounds
	R. New Zealand Int.	A	Home Grown (from 0005)
0110	R. Prague	S	Saturday Music (classical/folk/jazz)
	Swiss R. Int.	S	Sounds Good (Swiss music)*
0120	Voica of Vietnam	S	Music
0128	Spanish Foreign R.	M	Flamenco
		T-A	Spanish Pop Music
0130	BBCWS(am)	T	Music Mix
		W	UK Top 20
		F	World of Music
	HCJB	A	Musica del Ecuador
0140	Swiss R. Int.	S	Sounds Good (Swiss music)*
0145	BBCWS(am)	H	UK Album Chart
		A	Music X-Press (*3rd/5th wks.)

Entertainment/Variety, Magazine Shows

0100	WBCQ(7415 kHz)	M	Radio NY International
		H	Idio-Audio
		A	Allan Weiner Worldwide

0110	Voica of Vietnam	S	Sunday Show
0130	BBCWS(am)	H/A	Westway (drama serial)

SWL, Media and Communications

0100	WBCQ(7415 kHz)	F	Radio Detective (antique radio)
	WWCR(3215 kHz)	M	World of Radio
0109	HCJB	S	DX Partyline
0130	HCJB	H	Ham Radio Today
	WWCR(3215 kHz)	A	World of Radio
0133	VOA News Now	S	Communications World
0140	R. Habana Cuba	S/W	Dixers Unlimited
0147	Spanish Foreign R.	S	Radio Waves

Listener Contact/Interactive

0110	HCJB	M	Musical Mailbag
	R. Prague	A	Mailbox
	Swiss R. Int.	S	Capital Letters (2nd/4th wk.)
	Swiss R. Int.	A	Letterbox
0115	Voica of Vietnam	H	Listeners' Garden
0120	China R. Int.	A	Mailbag Show
0130	R. Habana Cuba	M	Radio Club
0135	Spanish Foreign R.	A	Mailbag Show
0140	R. Habana Cuba	H	Mailbag Show
	Swiss R. Int.	S	Capital Letters (2nd/4th wk.)
0147	Spanish Foreign R.	M	Radio Club

Sport

0115	Deutsche Welle	F	Spotlight on Sport
0118	VOA News Now	T-A	Sports Report
0130	China R. Int.	T	Sports News
	RTE Ireland	S/M	Sportsnews
0135	R. Habana Cuba	T-A	Time Out
0135	R. New Zealand Int.	S/A	Live Sport (in season)

Satellite Service Guide



All Frequencies MHz

Robert Smathers
roberts@nmia.com

Panamsat Galaxy 1R - C-Band

133 degrees West longitude

1(H) 3720	Comedy Central - West	VC2 +
2(V) 3740	Univision	Digital
3(H) 3760	STARZ/Encore	Digital
4(V) 3780	Do It Yourself Network/Food Network	Digital
5(H) 3800	Classic Arts Showcase	ITC
6(V) 3820	The National Network (TNN) - West	VC2 +
7(H) 3840	Disney Channel - West	VC2 +
8(V) 3860	Cartoon Network	VC2 +
9(H) 3880	ESPN-2 Alternate feed (occasional)	VC2 +
	Shop at Home (occasional)	ITC
	ESPN test	Digital
10(V) 3900	MSNBC	VC2 +
11(H) 3920	Eternal Word Television Network	ITC
	WEWN Worldwide Catholic Radio	5.40 (English)
		7.38 (English)
		5.58 (Spanish)
		5.80
	EWTN Spanish SAP	ITC
12(V) 3940	ValueVision TV	Digital
13(H) 3960	STARZ/Encore	ITC
14(V) 3980	Shop at Home (occasional)	VC2 +
	ESPN Alternate feed (occasional)	Digital
15(H) 4000	Time Warner services	Digital
16(V) 4020	Time Warner services/Turner South	Digital
17(H) 4040	Inspirational Life Television Network	ITC
	Genesis Communications Radio Network	5.58
	WNMX-FM 106.1 Waxhaw, NC "Mix 106"	7.92
	Inspirational Life Television Network-Spanish	Digital
18(V) 4060	Home Box Office (HBO)	Digital
19(H) 4080	Cinemax - West	VC2 +
20(V) 4100	Home and Garden TV	VC2 +
21(H) 4120	USA Network - West	VC2 +
22(V) 4140	Good Life TV Network	VC2 +
23(H) 4160	Home Box Office (HBO)	Digital
24(V) 4180	Home Box Office (HBO)	Digital

GE Americom Satcom C4 - C-Band

135 degrees West longitude

1(V) 3720	American Movie Classics	VC2 +
2(H) 3740	(none)	
3(V) 3760	Nickelodeon - East	VC2 +
4(H) 3780	Lifetime - East	VC2 +
5(V) 3800	STARZ/Encore	Digital
	California Channel	Digital
6(H) 3820	History Channel - West	VC2 +
7(V) 3840	Bravo	VC2 +
8(H) 3860	(none)	
9(V) 3880	QVC Network	ITC
10(H) 3900	Home Shopping Network	ITC
11(V) 3920	Speedvision	VC2 +
12(H) 3940	tech tv	ITC
13(V) 3960	Travel Channel	VC2 +
14(H) 3980	TV Games Network	Digital
15(V) 4000	Animal Planet	VC2 +
16(H) 4020	HITS - Canales N	Digital
17(V) 4040	MTV - East	VC2 +
18(H) 4060	InDemand PPV	Digital
19(V) 4080	CSPAN-2	ITC
	CSPAN Extra	Digital
20(H) 4100	Sundance Channel	VC2 +
21(V) 4120	Discovery Channel - East	VC2 +
22(H) 4140	Flix	VC2 +
23(V) 4160	VH-1	VC2 +
24(H) 4180	Country Music TV	VC2 +

GE Americom GE-7 - C-Band

137 degrees West longitude

1(H) 3720	(none)	
2(V) 3740	KMGH-TV ABC, Denver	VC2 +
	Talk America Radio Network	7.50
3(H) 3760	C-band Central	ITC
4(V) 3780	Data Transmissions	
5(H) 3800	KDVR-TV FOX, Denver	VC2 +
	Colorado Talking Book Network	5.58
6(V) 3820	KCNC-TV CBS, Denver	VC2 +
	LDS Radio Network	5.58
7(H) 3840	FX - East	VC2 +
	Cable Radio Network	8.00
8(V) 3860	NBC	Digital
9(H) 3880	(none)	
10(V) 3900	(none)	
11(H) 3920	NHK Tokyo secondary feeds circuit	ITC
12(V) 3940	(none)	
13(H) 3960	(none)	
14(V) 3980	KUSA-TV NBC, Denver	VC2 +
	Talk Radio Network	5.80
15(H) 4000	(none)	
16(V) 4020	(none)	
17(H) 4040	(none)	
18(V) 4060	Data Transmissions	
19(H) 4080	Fox Net	VC2 +
20(V) 4100	(none)	
21(H) 4120	(none)	
22(V) 4140	(none)	
23(H) 4160	KWGN-TV WB, Denver	VC2 +
24(V) 4180	(none)	

GE Americom GE-8 - C-Band

139 degrees West longitude

1(V) 3720	Data Transmissions	
2(H) 3740	Data Transmissions	
3(V) 3760	Data/SCPC Services	
3745.40 1404.60 55.40	Wyoming News Network/Northern Ag Network/Univ. of Wyoming sports	
3749.40 1400.60 59.40	Leaffield Communications/Univ. Indiana sports	

3749.60 1400.40 59.60	Missourinet/Leaffield Communications	
3749.80 1400.20 59.80	Occasional Audio	
3750.00 1400.00 60.00	Leaffield Communications/Purdue sports	
3753.40 1396.60 63.40	Kansas Info. Network/Kansas AgNet	
3753.60 1396.40 63.60	Liberty Works Radio Network - talk	
3753.80 1396.20 63.80	Missourinet/Univ. Illinois football	
3754.10 1395.90 64.10	Western Montana Radio Network/Red River Farm Network/Univ. Montana sports	
3754.30 1395.70 64.30	Missourinet/Kansas State sports	
3763.60 1386.40 73.60	Leaffield Communications/Blues hockey	
3763.80 1386.20 73.80	Occasional Audio	
3766.00 1384.00 76.00	Brownfield Network/Univ. Missouri sports	
3766.20 1383.80 76.20	Genesis Communications Radio Network	
3766.60 1383.40 76.60	Capital Radio Networks	
3767.10 1382.90 77.10	MissouriNet/Leaffield Communications/Univ. Illinois sports	
3767.90 1382.10 77.90	Missourinet/Leaffield Communications/Blues hockey	
4(H) 3780	Data Transmissions	
5(V) 3800	Data Transmissions	
6(H) 3820	Data Transmissions	
7(V) 3840	Data Transmissions	
8(H) 3860	Data Transmissions	
9(V) 3880	Data Transmissions	
10(H) 3900	Data Transmissions	
11(V) 3920	Data Transmissions	
12(H) 3940	Data Transmissions	
13(V) 3960	Data Transmissions	
14(H) 3980	Data Transmissions	
15(V) 4000	OART Audio	Digital
16(H) 4020	Data Transmissions	
17(V) 4040	ABC/Premiere Radio Networks	Digital

18(H) 4060	Data Transmissions	
19(V) 4080	DART Audio	Digital
20(H) 4100	Data Transmissions	
21(V) 4120	Various radio networks	Digital
22(H) 4140	Data Transmissions	
23(V) 4160	SEDAT Audio	Digital
24(H) 4180	Alaskan Rural Communications Service	Digital

INTRODUCING

DIRECT FREQUENCY READOUT SCPC AUDIO RECEIVER

FULL COMMERCIAL FEATURES



UNIVERSAL SCPC-200 AUDIO RECEIVER

- EASY DIRECT FREQUENCY TUNING - 50 TO 90 MHz (LCD)
- DIRECT TRANSPONDER TUNING (LCD DISPLAY)
- LARGE MEMORY BANK- 50 CHANNELS
- C AND KU BAND AGILE - 950 - 1450 MHz
- AUTOMATIC LNB DRIFT COMPENSATION (ADC)
- COMPANDING, 1:1, 2:1, 3:1 (AUTOMATIC)
- BANDWIDTH, WIDE / NARROW
- AUTOMATIC TUNING INDICATORS
- DIGITAL FREQUENCY LOCK-ON (DFL)
- SERVICE NAME ON LCD DISPLAY
- MICROPROCESSOR FREQUENCY DISPLAY
- SPEAKER AND LINE OUTPUTS, HIGH QUALITY AUDIO
- COMMERCIAL DIGITAL SYNTHESIZER
- 6 BUTTON KEY PAD FOR FAST TUNING
- BASEBAND 70 MHz OUTPUT
- BUILT IN U.S.A. BY THE LEADING SCPC MANUFACTURER
- FULL 16 CHARACTER LCD DISPLAY
- DOES NOT DISABLE VIDEO WHEN IN USE

INTRODUCTORY PRICE \$399.00 plus S & H — CALL: 1 - 828 - 293-2222

UNIVERSAL ELECTRONICS, INC.
Communications Specialists

4515 LITTLE SAVANNAH RD., CULLOWHEE, NC 28723
(828) 293-2222 FAX (828) 293-2221



The Risky Business of Satellites

Last autumn was not the best of seasons for NOAA (National Oceanographic and Atmospheric Administration) weather satellite (WXSAT) users. The failure of NOAA-15's imaging system has been followed by a problem with NOAA-16's APT, yet to make a re-appearance. Fortunately, its AVHRR (the advanced imager) appears to be in perfect condition, and I am amongst those who have continued to receive high quality HRPT (high resolution picture telemetry).

As usual, our NOAA contact, Wayne Winston, has provided the latest information about the background work being undertaken to identify and fix the problem:

"I wouldn't even speculate whether the N-16 APT will be revived again. The fault has to be isolated, and then that component tested/cycled by ground commands, if possible. To analyze these problems remotely can be a frustrating and tedious process, but we've had a surprising number of successes with similar problems.

"There are generally no penalties for in-orbit failure. The satellite is built from subsystems supplied by many manufacturers. This is, inherently, a somewhat risky business. Penalties can be assessed for delayed delivery, or parts and components not meeting specification. Basically, one tries to address any potential problems before a satellite is launched, while there is a better chance of a suitable remedy.

"It is possible to buy commercial insurance for satellites – this is sometimes done for the launch and possible launch failure for commercial communications satellites. But it is very expensive, as it is recognized there are inherent hazards in launching and operating satellites. NOAA does not do this, as there is not a favorable cost-to-benefit ratio.

"You just try to build them to be as reliable as possible, and put in redundant systems where possible, or where failure of a system would mean failure of the entire mission. Obviously, you cannot build with duplicate 'everything' as the satellite would be too expensive and too heavy to launch. In this particular case (N-16), if the fault is found with the RF switch, it is one of those 'one-in-a-million' failures. This is a highly reliable, mechanical switch, used in the NOAA series for years without failure.

"NOAA-16 is still a success even if there are no further APT transmissions, as the APT system is not critical. All the scientific sensors are working and sending back data via the HRPT and beacon transmissions."

◆ Resurs

Resurs 01-N4 has provided some good imagery: figure 1 shows that (sun-synchronous) Resurs is activated before reaching sunlit ground. It has come from the north polar regions and is passing across a cloud-covered Britain. The image was remarkably interference-free during this pass; the noise at the end occurred at low elevation.

Resurs images have a black column on the right side of the image, inside the grey scale. On Meteor satellites (such as Meteor 3-5) this section comprises six separate columns that can be interpreted as a binary number indicating the aperture opening – the number depending on the ground illumination below.



Fig 1: Resurs 01-N4 1205 UTC December 6, 2000, over UK

◆ NOAA-9 remains active

Although no longer transmitting any imagery or even house-keeping data from its beacon, reports continue to note periodic transmissions from the de-activated satellite. Dale Ireland logged transmissions on 137.50 MHz and comments, "It was transmitting a 2292 Hz tone for about 8 seconds every 45 seconds or so."

◆ NOAA-15 lives!

Tom Gwilym KA7VIK kindly sent me figure 2, a storm off the Washington coast as imaged at 1659 UTC on October 27. Tom comments that this was supposed to be the first big storm of the season, and "like most storms we get around here, the TV news media goes crazy! Live reporters on TV standing in the rain on the ocean beaches or on top of buildings, telling us to tie things down since it's going to get windy and nasty." Tom reported that the storm fizzled out, leaving a dead story.

The image was received from NOAA-15, recorded using a small QFH antenna in his attic and a R139 Hamtronics receiver. Tom's reception station can be seen on his web site: <http://www.geocities.com/tegwilym>



Fig 2: NOAA-15 1659 UTC October 27 from Tom Gwilym

Several readers have kindly sent in one or two images for the column. My apologies for not being able to show more, but my graphics allocation is limited!

Frequencies

NOAA-14 transmits APT on 137.62 MHz
NOAA-12 transmits APT on 137.50 MHz
NOAA-15 and 16 – see article
Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
Resurs 1-4 transmits APT on 137.85 MHz
Okean-O, Okean-4 and Sich-1 sometimes transmit APT briefly on 137.40 MHz
GOES-8 and GOES-10 use 1691 MHz for WEFAX

Weather on Your Scanner

One of the most popular topics in *Monitoring Times* is weather and reception of weather related transmissions. Just about every *MT* reader survey we have ever done shows a strong interest in listening to weather transmissions. So, in this month's *Fed File* we will take a look at two of the major radio services offered by the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS).

◆ The Voice of the National Weather Service

One of the first radio related services that new scanner listeners monitor is the NOAA Weather Radio (NWR) service in the 162 MHz band. These weather radio transmitters form a nationwide network of radio stations broadcasting continuous weather information direct from National Weather Service offices. NOAA Weather Radio broadcasts NWS warnings, watches, forecasts and other hazard information 24 hours a day.

The NOAA weather radio service has been combined with the Federal Communications Commission's (FCC) Emergency Alert System (EAS), and is now considered an "all hazards" radio network. Weather radio is the single most comprehensive source for weather and emergency information available to the public. The network now broadcasts warning and post-event information for all types of hazards – both natural (such as earthquakes and volcano activity) and technological (such as chemical releases or oil spills).

In the early days of this system, users became frustrated with the alarm portion of this service. One transmitter might cover a large area and many different counties. Listeners were forced to listen to each and every alarm carried on a particular transmitter even though it might not directly affect them.

With new digital technology called Specific Area Message Encoding (SAME), life-saving messages broadcast on NOAA Weather Radio is targeted to a specific area, like a county or portion of a state, to bring

more hazard-specific information to the listening area. Additional digital technology will provide automated broadcast capability for more timely service. Digital technology also allows these messages to be automatically received by all the communications industries of the information super-highway, broadcast, cable, satellites and other media through the Emergency Alert System.

When an NWS office broadcasts an urgent audio message (warning, watch, or non-weather emergency) it also creates and broadcasts a digital SAME code that may be heard as a very brief static burst, depending on the characteristics of the receiver. This SAME code contains the type of message, county(s) affected, and expiration time of the message.

An appropriately programmed NWR SAME receiver will then turn on for that message, with the listener hearing the 1050 Hz warning alarm tone as an attention signal, followed by the broadcast message.

At the end of the broadcast message, listeners will hear a brief digital end-of-message static burst followed by a resumption of the NWR broadcast cycle.

Known as the "Voice of the National Weather Service," the network has more than 550 transmitters, covering the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories.

NOAA Weather Radio broadcasts are found in the 162-174 MHz government land mobile band on one of the following seven frequencies: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525 and 162.550 MHz. You will find a complete list of stations in the network at: <http://www.nws.noaa.gov/nwr/nwrbro.htm#nwrstations>

Canadian readers also have a voice VHF weather radio service using the same frequencies as its U.S. counterpart. "Weatheradio" is a service of Environment Canada and transmitters are located all across Canada. You can find more information about this service at: <http://www.msc-smc.ec.gc.ca/cd/wxradio/>

index_e.cfm

In this month's *Service Search* column you will find a complete list of these Canadian Weatheradio stations.

◆ EMWIN

One part of the National Weather Service mission is the need to provide the emergency management community with access to NWS warnings, watches, forecasts, and other products at no recurring cost. To that end, the Emergency Managers Weather Information Network (EMWIN) system was developed. In partnership with the Federal Emergency Management Agency (FEMA) and other public and private organizations, EMWIN has now evolved into a fully operational and supported NWS service.

EMWIN is a suite of data access methods which make available a live stream of weather and other critical emergency information. Each method has unique advantages. EMWIN's present methods, in use or under development, for disseminating the basic data stream includes radio, internet and satellite transmissions.

The radio broadcast is one method used by the NWS and others for disseminating the EMWIN data stream using digital weather information transmitted using inexpensive radio broadcast and personal computer (PC) technologies.

The NWS (and other public and private agencies) transmits selected text, graphics, and imagery products as an audio signal on a dedicated VHF or UHF radio frequency. This information can be received by anyone within the 40-50 mile broadcast area, using an inexpensive radio receiver, a demodulator, and a personal computer. EMWIN software on your PC, running under Windows, receives the signal through a serial port, stores the received weather products onto disk, and simultaneously allows you to display this information.

The EMWIN data stream is intercepted from satellite by many emergency management groups, municipalities, and others, and retransmitted on local and NWS owned radio frequencies. The retransmission is, in turn, intercepted by anyone within range of

the signal (generally a 40-50 mile radius from the transmitter) and displayed on their computer.

Using free retransmission software from Xenocode, Inc. at (301) 725-4009, retransmitting agencies can tailor the data to their area by eliminating products that do not apply to that area and adding locally generated data. Many retransmission sites include local road conditions, school closings, and other data that is useful to their clients. EMWIN data stream is being disseminated via National Weather Service

VHF assigned frequencies. These frequencies are specifically 163.300 MHz, 163.325 MHz, 163.350 MHz, 168.7125 MHz, and 168.8125 MHz. It is planned to propagate the 163.325 MHz frequency first.

There are other frequencies in other bands sending EMWIN data streams. Table One is the most current list of frequencies and locations on-the-air sending EMWIN data.

You can find more information about EMWIN at URL: <http://iwin.nws.noaa.gov/emwin/index.htm>

Antenna Designer

New Version 2.1 for Microsoft Windows 95 and 98

Computer program helps you design and build 17 different antennas from common materials. Based on Antenna Handbook by W. Clem Small.

Only \$39.95 Send check or money order to:

\$5 S/H on all orders
CA residents add 8.5%
Shipped on CD ROM

Small Planet Systems
623 Mangel's Avenue
San Francisco, CA 94127

www.smallplanetsystems.com 415-337-9394

Table One: EMWIN Radio Broadcast Areas

The *only* NWS-supported VHF broadcast is in the Norman, Oklahoma, area. The National Weather Service does not plan to implement NWS radio transmitters nationwide. All other ground-based transmitters are (and will be) the result of cooperative efforts by *other* public and private agencies, downlinking from various satellites or the Internet and rebroadcasting the data stream. Unless otherwise indicated, the broadcasts are receivable (once demodulated) as normal async 9600, N, 8, 1 or 1200, N, 8, 1.

Arkansas

Fayetteville Unknown 148.050 MHz 1200 baud

Florida

Seminole County 60 watts 156.105 MHz 1200 baud
St. Petersburg 100 watts 139.2125 MHz 1200 baud

Illinois

Germantown Hills 100 watts 148.6375 MHz 1200 baud
Wheaton (DuPage County) 150 watts 148.6375 MHz 1200 baud

Iowa

Des Moines 125 watts 152.180 MHz 1200 baud

Maryland

Laurel 100 watts 142.925 MHz 2400 Baud (Xenocode, Inc)
Notice: The Laurel, Maryland, broadcast is off the air until further notice.
Brunswick 50 watts 142.925 MHz 1200 baud
Silver Spring 300 watts 400.175 MHz 1200 baud
Notice: The Silver Spring, Maryland, broadcast is off the air until further notice.

Michigan

Battle Creek 50 watts 150.500 MHz 1200 baud

Mississippi

Pascagoula 100 watts 148.375 MHz 1200 baud

Missouri

Buffalo 30 watts 139.2125 MHz 1200 baud
Kansas City 300 watts 139.2125 MHz 9600 baud
Nevada Unknown 139.2125 MHz 1200 baud

Nebraska

Wilber 45 watts 156.105 MHz 1200 baud

North Dakota

Bismarck 40 watts 143.150 MHz 1200 baud
Grand Forks 35 watts 143.150 MHz 1200 baud

Oklahoma

Atoka 25 watts 153.950 MHz 1200 baud
Broken Arrow 25 watts 142.950 MHz 9600 baud
Clintan 35 watts 148.775 MHz 1200 baud

Durant 25 watts 150.750 MHz 1200 baud
Enid 45 watts 142.950 MHz 9600 baud
Guyman 60 watts 150.750 MHz 1200 baud
Kiamichi Mountain 75 watts 142.950 MHz 1200 baud
McAlester 100 watts 148.775 MHz 1200 baud
Miami 100 watts 150.750 MHz 1200 baud
Norman 50 watts 169.025 MHz 1200 baud
Oklahoma City 200 watts 150.750 MHz 1200 baud
Panca City 80 watts 150.750 MHz 1200 baud
Poteau 60 watts 150.750 MHz 1200 baud
Stillwater 100 watts 148.775 MHz 1200 baud
Tulsa 650 watts 165.0125 MHz 1200 baud
Woodward 100 watts 150.750 MHz 1200 baud

South Carolina

Moncks Corner 45 watts 141.500 MHz 1200 baud

Tennessee

Memphis 100 watts 150.750 MHz 2400 Baud
Memphis 500 watts 150.890 MHz 9600 Baud
Memphis WYPL 89.3 FM / 67-kHz subcarrier 1200 baud

Texas

Austin 50 watts 150.435 MHz 1200 baud
Burkburnett 50 watts 150.435 MHz 1200 baud
College Station KEOS 89.1 FM / 67-kHz subcarrier 1200 baud
Crockett 25 watts (soon 100 watts) 150.435 MHz 9600 Baud
Dallas 60 watts 150.435 MHz 1200 baud
Houston 200 watts 150.435 MHz 1200 baud
Longview 150 watts 150.435 MHz 1200 baud
McAllen (City of) 75 watts 150.435 MHz 1200 baud
Nursery 375 watts 150.435 MHz 1200 baud
Port Lavaca 100 watts 150.435 MHz 9600 baud
Temple 100 watts 150.435 MHz 1200 baud

Virginia

Atlantic 250 watts 154.515 MHz 1200 baud
Roanoke 100 watts 148.775 MHz 1200 baud

Wyoming

Cheyenne 30 watts 453.4875 MHz 1200 baud (Cheyenne)
100 watts 141.300 MHz 1200 baud (Laramie and Albany Counties)

Seeking Frequencies

One of the first challenges facing a scanner user trying to track a trunked system is finding the right frequencies. Short of standing next to a police cruiser or fire truck with a frequency counter, how can you find the frequencies they use?

Web Resources

One of the easiest ways is to see if someone else has already figured it out, and the World Wide Web is a great place to look. A number of dedicated hobbyists maintain detailed listings of frequencies and talkgroups.

One such site is the Southeast US Trunked Radio Information Homepage run by Lindsay Blanton at <http://www.trunkedradio.net/> The site contains specific county and city listings for Alabama, the District of Columbia, Florida, Georgia, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia. You can also find general information about Motorola and EDACS systems, decoding schematics and software, and even some tidbits about the APCO 25 standard.

In the April 2000 *Tracking the Trunks* column I reported on the Ocean City, Maryland, EDACS system. Lindsay's web site recently reported that: In coming months Ocean City, Md and Worcester County will consolidate their EDACS systems for enhanced coverage. It will be necessary to change/re-program all radios with this new talkgroup IDs and system information."

The site goes on to list the frequencies and talkgroups for the combined system.

Orange County Transportation

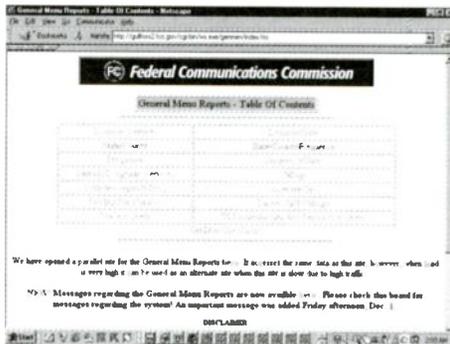
From the mailbag I received this question: Sir, in your November 2000 column on page 79 you found information on the Galveston County trunked system for Dale M. I have the same problem with the Orange County Transit Authority in California. I know the frequencies of 856 to 860.4875 MHz. On my Pro 90, 92, and 94 scanners Motorola Type 2 systems go right in but not this system. Any help will be a great help to me, are there any web sites on public transit that you have found? Clarence B.

The Orange County Transportation Authority (OCTA) is the primary public transportation provider in Orange County, California, with about 1,500 employees and an annual budget of more than \$500 million.

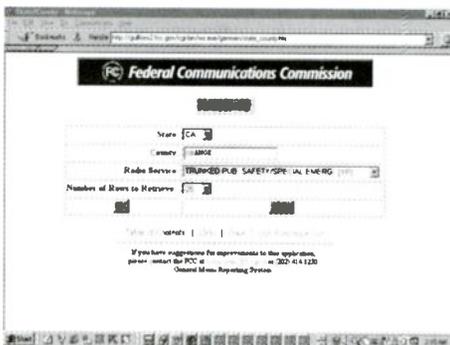
The ultimate source for frequency informa-

tion is the Federal Communications Commission (FCC), which operates a license database that can be accessed from the web. Let's walk through an example to find the assigned frequencies for the Orange County Transportation Authority.

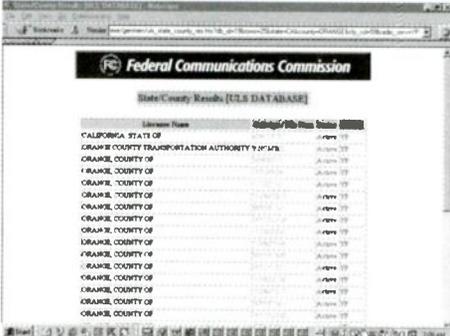
First, go to the FCC database website at <http://gullfoss2.fcc.gov/cgi-bin/ws.exe/genmen/index.htm> and select State/County from the left side of the Table of Contents.



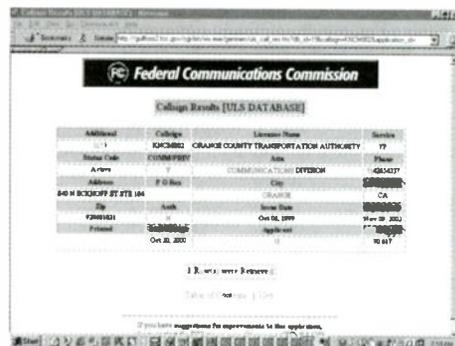
Select CA for the State, enter ORANGE for the County, and use YP (Trunked Public Safety/Special Emergency) for the Radio Service. Click on the "OK" button.



When the search completes, click on "ULS DATABASE" hyperlink and you should see a screen like this:



Click on the callsign assigned to the Orange County Transportation Authority, KNCM802. This should retrieve one record that looks something like this:

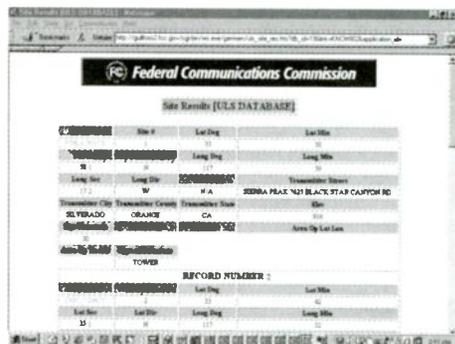


Click on "SITE" in the upper left-hand corner of the record. You'll see a set of site records.

Click on "FREQUENCY" in the upper-left hand corner of the record.

The frequency drill-down results show a total of six unique frequencies licensed at the first site (Sierra Peak): 856.4875, 857.4875, 858.4875, 859.4875, 860.4875 and 858.4125 MHz. Record number 2 (for Santiago Peak) shows the same frequencies.

Record number 3 shows the corresponding mobile frequencies (45 MHz lower than the repeater frequencies): 811.4875, 812.4875, 813.4875, 814.4875, 815.4875, and 813.4125 MHz.



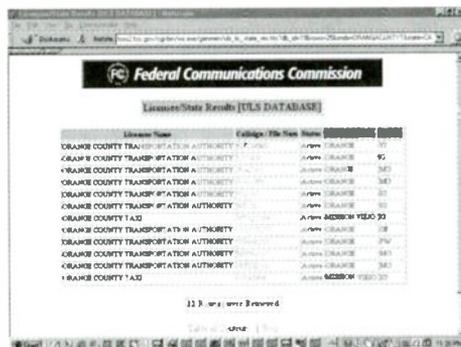
With these frequencies, Clarence can listen in conventional mode to find the control and voice channels for this trunked system.

A number of other types of FCC database searches are available from the Table of Contents. For instance, if you know the name of the licensee you're interested in, you can use the "Licensee/State" search.

Entering "orange county transportation au-



thority" results in the following table:



Selecting the callsign for each entry will pull out the relevant records.

◆ Galveston, Texas

As a follow-up to Dale M.'s request in the November 2000 column, a reader who wishes to remain anonymous sent me the following talkgroup information for the Galveston County, Texas, trunked radio network. It's a Motorola Type II system with voice channel frequencies of 866.0625, 866.1625, 866.4125, 866.4375, 866.5875, 866.8125, 866.8375, 866.9625, 867.0875, 867.3125, 867.3375, 867.5625, 867.7125, 867.8375, 868.0625, 868.2125, 868.3375, and 868.4625 MHz. Control channels are running on 868.5875, 868.6625, 868.8000, and 868.9125 MHz.

Fire

Bacliff/San Leon Fire Department	59312E7B
Bolivo/High Island Fire Department	53424D0B
Dickinson Fire Department (Channel #1)	49936C31
Dickinson Fire Department (Tactical #1)	49968C33
Dickinson Fire Department (Tactical #2)	50000C35
Galveston Fire Department	52656CDB
Galveston County (Countywide Fire)	55920DA7
Galveston County (DVP Operations)	55888DA5
Hitchcock Fire Department	60720E03
Jamaica Beach Fire Department	60848EDB
Kemah Fire Department	53680D1B
LaMarque Fire Department	53904029
Rodcliff/San Leon Fire Departments	59312E7B
Santa Fe Fire Department	54576D53
Texas City Fire Department (Channel #1)	55184D79
Texas City Fire Department (Channel #2)	55216D7B
Texas City Fire Department (Channel #3)	5524807D
Tiki Island Fire Department	61552F07

Emergency Medical Services

Galveston City	51504C93
Galveston City (Dispatch)	51472C91
Galveston County (Countywide)	55984DAB
Galveston County (Countywide)	55952DA9
Rural Metro Galveston County	54512D4F
Rural Metro Galveston County (Primary)	54480D4D
Rural Metro Galveston County (Channel #1)	54384D47
Rural Metro Galveston County (Channel #2)	54416D49

Santa Fe EMS

Police

Texas Department of Public Safety	55472D8B
Galveston County Constable (Channel A)	51120C7B
Galveston County Constable (Channel B)	51152C7D
Clear Lake Shores Police	49616C1D
Dickinson Police (Channel 1)	49712C23
Dickinson Police (Channel 2)	49744C25
Dickinson Police (Channel 3)	49776C27
Dickinson Police (Channel 4)	49808C29
Dickinson Police (Channel 5)	49840C2B
Dickinson Police (Special Events)	49872C2D
Galveston Police (Channel 1) Primary	52208CBF
Galveston Police (Channel 2) Information	52240CC1
Galveston Police (Channel 3)	52272CC3
Galveston Police (Channel 4)	52304CC5
Galveston Police (Channel 5)	52336CC7
Galveston Police (Channel 6)	52368CC9
Galveston Police (Channel 7 - SWAT)	52464CCF
Galveston Police (Dive Team)	52496CD1
Galveston Police (Motorcycles)	52560CD5
Galveston Police (Narcotics)	52624CD9
Gilchrist Police Department	54352D45
Hitchcock Police Department	53456D0D
Jamaica Beach Police Department	60816ED9
Kemah Police Department	53648D19
Kemah Police Department (Channel 1)	53616D17
Kemah Police Department (Channel 2)	53584D15
Kemah Police Department (Tactical)	62928F5D
LaMarque Police Department	53808D23
Santa Fe Police Department (Channel 1)	54704D5B
Santa Fe Police Department (Channel 2)	54736D5D
Texas City Police Department (Channel 1)	54896D67
Texas City Police Department (Channel 2)	54928D69
Texas City Police Department (Channel 3)	54960D68
Texas City Police Department (Channel 4)	55088D73
Galveston County Sheriff (Administration)	50832C69
Galveston County Sheriff (Beach Patrol Channel 1)	50960C71
Galveston County Sheriff (Beach Patrol Channel 2)	50992C73
Galveston County Sheriff (Beach Patrol Supervisor)	51024C75
Galveston County Sheriff (Channel 1 - Island)	50032C37
Galveston County Sheriff (Channel 2 - Mainland)	50064C39
Galveston County Sheriff (Channel 3 - Information)	50096C3B
Galveston County Sheriff (Channel 4 - Intercity)	50128C3D
Galveston County Sheriff (Communications)	50416C4F
Galveston County Sheriff (Countywide)	55888DA5
Galveston County Sheriff (Countywide Police)	55856DA3
Galveston County Sheriff (Dive Team)	50928C6F
Galveston County Sheriff (Jail)	50448C51
Galveston County Sheriff (Marine - Channel 1)	50864C6B
Galveston County Sheriff (Marine - Channel 2)	50896C6D
Galveston County Sheriff (Patrol 1)	50160C3F
Galveston County Sheriff (Patrol Supervisor)	50192C41
Galveston County Sheriff (Warrants - Channel 1)	50768C65
Galveston County Sheriff (Warrants - Channel 2)	50800C67

Other

Galveston County (Countywide - All Agencies)	55952DA9
Galveston County Disaster (Channel 1)	51728CA1
Galveston County Disaster (Channel 2)	51760CA3
Dickinson Office of Emergency Measures	49904C2F
Galveston County Emergency Management (Channel 1)	51664C9D
Galveston County Emergency Management (Channel 2)	51696C9F
Galveston County Emergency Measures (Channel 1)	51888CAB
Galveston County Emergency Measures (Channel 2)	51920CA0
Galveston City Emergency Operations Center	52880CE9
Galveston School District	52944CE0
Santa Fe School District	57008DEB
Texas City Independent School District	56912DE5
LaMarque Utilities	58000E29
Texas City Utilities Department	61200EF1

Our reader also recommends the website <http://www.clarc.org/~kg5ai> for further information.

◆ Scanning over the Web

If you're interested in listening to public safety radio traffic in distant areas of the country, you may be in luck if you have a relatively fast connection to the Internet. Many cities now pipe their po-

lice and fire dispatch frequencies to interested web surfers. Here's a sample of some of what's out there:

<http://www.policescanner.com> has police departments from Los Angeles, Dallas, Miami, New York and San Diego as well as the Dallas Fire Department. You'll need either the Windows Media Player or the Real Audio Player (both are free) and at least a 28.8 kbps (kilobits per second) connection to the Internet.

Cleveland, Ohio, may be the first city to have their trunked radio traffic available on the Internet. You can check it out at <http://www.cleveland.com/policescanner>

Montgomery County, Maryland has two channels of Real Audio, Fire Ground Operations and Emergency Dispatches, available at <http://www.co.mo.md.us/mcfrs/ecc/radio.html>

Phoenix police and fire frequencies can be heard at <http://www.azcentral.com/news/scanner.html>

Cincinnati, Ohio police transmissions are available in Real Audio at <http://www.cincinow.com/mmgallery/scanner/index.shtml>

That's all for this month. Further information and links can be found on my website at <http://www.signalharbor.com>, and I welcome your electronic mail at dan@signalharbor.com. Until next month, happy monitoring!

GORDON WEST
HAM TEST PREP TAPES
BOOKS SOFTWARE VIDEOS

Prepare for your ham test with "Gordo" WB6NOA as your personal instructor.

- **THE NEW THEORY** on audio cassettes
 No-Code Technician (4 tapes)..... \$19.95
 General Class (4 tapes) \$19.95
 Amateur Extra Class (4 tapes)..... \$19.95
- **THE CODE** on audio cassettes
 Learning CW (0-7wpm 6 tapes)..... \$29.95
 Speed Builder(5-16wpm 6 tapes)... \$29.95
 Speed Builder(10-28wpm 6 tapes)... \$29.95
- **NEW STUDY MANUALS** by "Gordo"
 No-Code Technician (Element 2)..... \$11.95
 General Class (Element 3)..... \$12.95
 Extra Class (Element 4)..... \$14.95
- **PC SOFTWARE** with study manuals
 No-Code Technician (Element 2) \$34.95
 Tech/Tech+/Gen. (+ Code, Windows) \$49.95
 General Class (+Code, Windows)... \$34.95
 Extra Class (+ Code Windows)..... \$34.95
 Ham Operator (Tech-Extra +Code)..... \$59.95
 Morse Software Only..... \$12.95
- **VIDEO** VHS with study manual
 No-Code Tech Video Course..... \$31.95

Add \$4.00 for shipping 1st item, \$1.50 each additional
 Priority Mail 2-3 day service available
 VISA, MasterCard, Discover & AMEX Accepted

WSYI Group
 P. O. Box 565101 • Dallas, TX 75356
 Call Toll Free **1-800-669-9594**

Something for Everyone

Welcome aboard, everyone and fasten your seatbelts. We have places to go and frequencies to examine today; let's get started!

Last year, we reviewed a book called *Five Miles and a Thousand Feet*, by Bob Tatosian, a working Air Traffic Controller from ZMP (Minneapolis ARTCC). This was the first in a series of books, each featuring 5 novelettes, concerning ATC within different ARTCCs across the country.

Mr. Tatosian's second book in the series contains stories about ZDC (Washington Center), ZMA (Miami Center), ZHU (Houston Center), ZKC (Kansas City Center), and ZAU (Chicago Center). If possible, it is even better than the first book! This is a really great "read" for anyone who is interested in ATC, whether they are also a controller, or just fascinated by the subject. The book sells for \$11.95 plus shipping and handling. Check out Bob Tatosian's website at <http://www.fivemiles.com> or write to him at P.O. Box 231, Farmington, MN 55024 for more details. You'll be glad you did – and tell him you saw it in "Plane Talk"!

◆ Flightradio.com

Here is a relatively new and very good website for us aero comms monitors. Michael Dell, N7LMJ, Webmaster and chief bottle washer, has come up with a real winner. He has areas on the website for just about every area of aero comms monitoring available today. While Michael has space available and frequencies for HF & UHF Military aero communications – and is looking for editors for those areas – his main thrust is the VHF aero communications band. Visit this really interesting website at <http://www.flightradio.com> – say you read about it in *Monitoring Times*!

◆ Airline Company Frequencies

Ted Moran of CARMA (Chicago Area Radio Monitors Association) gave us permission to use the following O'Hare airline company frequencies. He says they came to him as an anonymous contribution. Some we have published previously, but most are new to the column:

American Airlines:

129.225 - Air-ground Technisonic
129.325 - Cargo Bldg.

129.675 - Park Air Radio
129.875 - Cargo Bldg Technisonic
130.250 - Ramp
130.650 - Operations Maintenance
130.750 - Cargo Bldg
131.875 - K12 (gate)

Other airlines

128.825 - Japan Airlines
129.025 - Air France, Terminal 5
129.050 - International Terminal Tower (Ops type)
129.100 - TWA Maintenance Office
129.325 - Mexicana
129.625 - All Nippon Airways, Terminal 5
129.725 - NACA, Terminal 5
129.725 - Korean Air
129.725 - Iberia
129.725 - TAESA
129.825 - Evergreen International
129.900 - Alitalia
130.125 - Lufthansa
130.200 - Air Wisconsin
130.400 - Air Wisconsin
130.550 - DHL Air Cargo
130.700 - China Eastern Cargo
131.150 - Royal Jordanian
131.200 - Air Wisconsin
131.525 - American Trans Air (*they seem to use this freq at many locations, jb*)
131.525 - Swiss Air and Swiss Air Cargo – shared with ATA (above)
131.600 - American Eagle
131.625 - American Eagle
130.725 - TWA Operations
460.775 - Air Wisconsin (ramp rats, etc.)

San Francisco ARINC

129.350, 129.400, 129.450

Thanks, Ted!

◆ Andrews AFB

Mike Agner compiled these frequencies from many contributions for Andrews Air Force Base:

113.100 - Aircraft Info
118.400 - Control Tower //289.600
119.300 - GCA
121.800 - Ground Control
122.850 - Pilot to Dispatch
123.400 - DC Air National Guard/113th Fighter Wing Air-Air
124.000 - GCA (Washington Center)
125.350 - GCA
125.650 - Washington Class B Departure

127.550 - Clearance Delivery
128.350 - Washington Class B Approach
129.525 - 89th Airlift Wing SAM Liaison
236.600 - Tower Alternate
251.050 - ATIS
252.100 - DC Air National Guard/113th Fighter Wing Ground Support
254.250 - Washington Class B Departure
257.200 - GCA
269.000 - GCA (Washington Center)
269.500 - Washington Class B Departure
269.900 - ATIS
275.800 - Ground Control
286.600 - GCA
289.600 - Tower
292.200 - 89th Airlift Wing 'Muscle Control'
294.500 - Washington Class B Approach
301.500 - GCA
314.250 - DC Air National Guard/113th Fighter Wing 'Boxer'
316.700 - GCA
335.500 - GCA
344.600 - Base Weather (PMSV Metro)
351.200 - AFRES Dispatch ('Cody') 459th Airlift Wing
360.800 - GCA
371.800 - Dispatch
372.200 - Pilot to Dispatch
378.100 - Andrews Command Post 89th Airlift Wing SAM
379.200 - GCA
386.800 - Pilot to Dispatch
389.800 - GCA
393.100 - Clearance Delivery

◆ Out of the Routine

From our Australian Correspondent Bob Bell, who writes "On The Airbands" for *Australian Aviation* comes the following:

A BAe 146 aircraft made a taxi call, specifying the airplane as a jet.

FLIGHT SERVICE: "Alpha Bravo Charlie, copied that, no IFR traffic, are they still referring to your aircraft as a JET, are they Sir?"

Bae 146 jet: "Now, now, Perth!"

FLIGHT SERVICE: "In here, the letters "BAe" stand for "Bring another engine!"

Bob says he's sure that last remark went down well with the BAe crew.

And also from Bob: Holly Hegman from the USA wrote that she was flying from Providence, Rhode Island, on board United flight UAL 1595, bound for a business conference in Seattle, Washington. She was expecting to be there well in time to have dinner and go over her notes for her speech she was to give the next day to members of the Puget Sound

Business Travel Association. She was expecting to arrive Seattle at 8:50 local, and her speech was at 1pm the next day.

As Holly puts it, "Mother Nature threw a temper tantrum" – a temper tantrum she heard all about by monitoring the inflight audio channel devoted to the aircraft's air traffic control communications, which all or most of United's domestic services have available to passengers on the inflight entertainment system. Holly thinks she is a self-confessed techno-nerd, but doesn't care what people think.

Holly was inbound to Chicago, where she was to board a connecting flight to Seattle. Severe weather began to plague ORD (O'Hare International Airport) about forty five minutes before the intended landing time, and Holly became aware that her captain was in a holding pattern. He came on the intercom and told passengers that they were in a hold due to severe weather. Holly then tuned up Channel 9 on the inflight entertainment audio, which is an air traffic control split from the aircraft main comms radio. Now, United captains can pull the pin on the inflight ATC channel at any time, but this one left it on, bless his heart, for the entire time.

Holly was particularly pleased she could get regular weather and delay updates on the ATC channel without having to wait for the fairly irregular cockpit intercom announcements to passengers. Holly's captain eventually advised ATC that he was quite low on fuel, and either Chicago O'Hare was going to have to let him make his approach, or he was going to have to consider going to an alternate (airport) immediately. ATC took their time. The captain of UAL 1595 suddenly became quite terse and blunt. He wanted an answer "now," not "later," as he had a full plane load of passengers, was now low on fuel.

He discussed diverting to Indianapolis, but, no, he was told he couldn't, as too many other aircraft had diverted there. The delays for Indianapolis were too long for him. ATC suggested St. Louis. No, sorry, UAL 159 didn't have enough fuel for St. Louis.

Suddenly, the O'Hare controller seemed to realize how critical the situation really was, and immediately took UAL 1595 out of the stack and allowed it to fly a descent and approach for immediate landing. Holly was one of the few on board perhaps who knew that if

they were again delayed for any reason, her aircraft was in a really tight spot.

But she says she preferred to know the real story, rather than the sanitized ones that passengers often get over the intercom.

Here's one more: About 11:30am one morning during the Olympic fever period, a Lockheed L-1011 Tristar operated by American Trans Air (callsign AMTRAN) arrived in Sydney with a full load of Olympic passengers on a special charter, and was scheduled to turn around some ninety minutes later for Los Angeles via Pago Pago.

The departing AMTRAN captain duly called on the radio for and received permission to "push back" and "engine start," and after being cleared to taxi, announced he would have to return to the bay (gate).

Ground: "Amtran one-zero-three-two, why?" AMT 1032: "Because we've left the crew behind!"

Thanks for these gems, Bob! That's all for this month. See you in April for more aero freqs, news, and views. Until then, 73 and out.

◆ Major World Air Routes

Here's the rest of the MWARA frequencies contributed by Ron Perron from the list started last December. Keep in mind that not all of the frequencies listed are in use at any one time; some are rarely used at all:

EUR-A (EUR-Europe)			
2910	4689	8826	10084
3411	5519	8875	11390
4672	5661	9024	

INO-1 (INO-Indian Ocean)				
2872	5517	6586	8909	13306
2878	5601	6655	8948	
3467	5634	8870	10018	
3476	5658	8873	11300	
5493	6559	8879	13288	

MID-1 (MID-Mid East)			
2992	5658	7595	10018
3404	5667	8091	13288
5100	5856	8847	13306
5603	6925	8918	17961

MID-2				
2872	5580	6583	8906	13288
2923	5601	6624	8918	13312
2992	5658	6925	8948	13336
3312	5667	8091	10009	
3446	5856	8861	10018	
3467	6556	8879	10066	

MID-3				
2926	4095	4728	8145	10018
3440	4669	5487	8918	11333
3467	4672	5586	8951	11390
3476	4712	5658	9955	

AFI-1 (AFI-Africa)				
3452	6535	8861	13294	17955
5554	6638	8882	13315	
5565	6673	11291	13357	

AFI-2				
3411	5519	8826	13304	13294
3419	5652	8894	13273	

AFI-3				
2872	5658	8879	8948	13306
3467	6559	8888	10018	13336
5517	6574	8903	11300	17961
5601	6655	8909	13288	
5634	8870	8913	13294	

AFI-4				
2851	5565	8873	13273	21926
2878	6559	8879	13294	
3411	6586	8888	13304	
5493	8826	8903	13315	
5519	8861	10018	17955	

NAT-A (NAT-North Atlantic)				
2887	5440	6628	10096	13306
2910	5526	6730.5	11291	17946
2962	5540	8825	11309	
3016	5598	8855	11387	
3023	6577	8906	13297	

NAT-B				
2899	5616	8864	11279	13291
17946				

NAT-C				
2872	5649	8879	11336	13306
17946				

NAT-D				
2971	4675	8891	11279	13291
17946				

NAT-E				
2962	6628	8825	11309	13354
17946				

NAT-F				
3476	6622	8831	13291	17946

Station Identification

Broadcast DXers are, of course, fond of hearing distant stations. Many of us are fans of radio in general. If we see a broadcast tower, we won't rest until we know whose it is!

Telling the difference between an AM station and an FM or TV station tower is relatively simple. At AM stations, the tower is the antenna. The entire tower is responsible for radiating signals. If you see a tower with nothing on it, it's almost certainly AM. See the center photo; this is WKIN-1320 Kingsport, Tennessee.

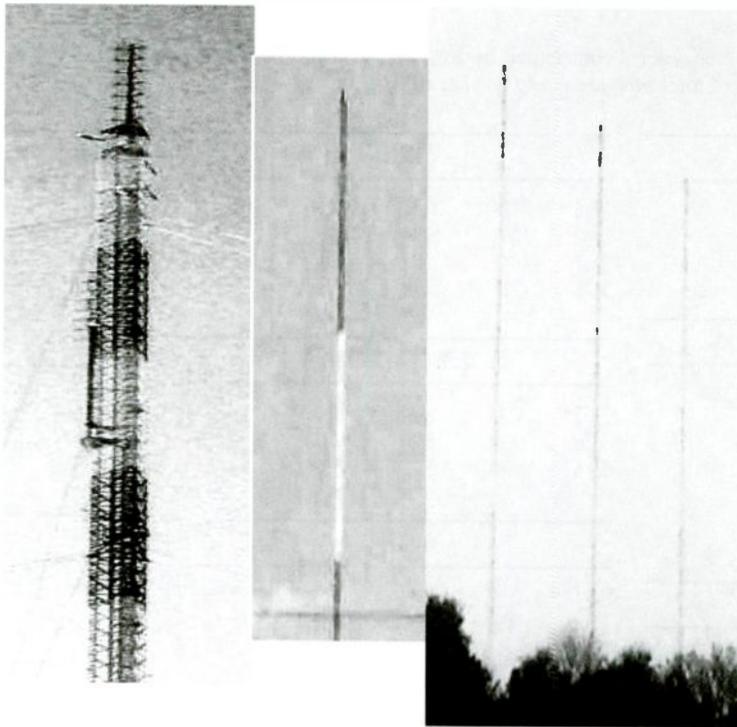
Small antennas partway down the tower (not on top) are occasionally seen; these are usually studio-transmitter links, or antennas for internal two-way communications. A large antenna at or near the top isn't necessarily a sign that a station isn't AM, though. Smaller FM stations often share the towers of an AM station.

Another dead giveaway of an AM tower are insulators in the supporting guy wires. Using single pieces of wire to support the tower is less expensive and less likely to fail, but it also "grounds out" the tower, making it much less effective as an antenna. AM stations "break up" the guy wires by inserting ceramic or glass insulators at regular intervals. If a tower's guy wires have lots of little "bulges" (as viewed at a distance), it's AM.

A single AM tower radiates equally well in all directions. To avoid interference, many AM stations are required to radiate less signal in the direction of older stations. This is done by erecting multiple towers. (Basically, the station intentionally interferes with itself!) Several similar towers at the same site and evenly-spaced are a clear sign of a directional AM station. Towers at a directional station aren't necessarily identical; don't rule out a directional AM site just because the towers are different. The right-hand photo is of WCTZ-1550 Clarksville,

Tennessee, which is directional at night.

FM and TV stations are different. Most of the tower does not radiate signals; it exists only to hold the radiating antenna as high in the air as possible. FM and TV towers will have large antennas either protruding from the top or hanging from the sides. Or both; it is not unusual for a single tower to host more than one station. The actual transmitting antennas may be 100 feet tall, though it's usually hard to tell because the antennas are so high in the air!



FM and TV towers are also often substantially taller than AM towers. FM/TV towers of 1,000 ft. in height are not unusual, while AM towers taller than 300 ft. are rare. Because the tower itself doesn't radiate signals, the guy wires in a FM/TV tower are not insulated; you'll see single wires going all the way to the ground. The first photo shows the WSMV-TV tower in Nashville; you can also see the WZTV-TV antenna hanging off the side. Four FM stations also share this tower.

◆ Expanded-band news

Two brief items this month. While looking at TV items, I discovered that KALT-1610 Atlanta, Texas, has applied for an operating license. The station has been testing, and expected to begin their regular talk format shortly after Thanksgiving. Here's hoping you can hear it through the mess of travelers' information stations on that frequency!

The other new one is north of the border. Canada's first expanded-band station, CHEV-1630 Toronto, hasn't seen much activity. Now, a second station is planned, also on 1630. This one will also use 99 watts, and will be a travelers' information outlet at the Ottawa airport.

◆ Bits & Pieces

Bryan Turner, W8LN of Athens, Alabama (and several others) have noted WSM-650 is no longer stereo. Bryan contacted the station and was told they are going to experiment with IBOC digital. Stereo is permanently gone from WSM. Bryan also mentions <http://www.egroups.com/group/amstereo>, a mailing list about AM stereo.

Would you like to try DXing FM in Europe? I'm sure a lot of us would, but our spouses would never let us drag a radio along! Now, you can do it without actually travelling. Kelly Lindman SM0NHC has put an Icom PCR100 online in Malmo, Sweden. The receiver is connected to four stacked 8-element FM Yagis. (That's one serious antenna system!) Check out <http://www.javaradio.com>, which also has links to other Internet-controllable receivers in other parts of the world.

What's making it to *your* antenna? Let us know. Write: w9wi@w9wi.com or Box 98, Brasstown NC 28902-0098. Note the change in e-mail address; the Bellsouth.net address was receiving too much spam. It will still work for another few months though. Good DX!

Variety and Quantity Return

We have so many different pirate loggings this month that we have to jump right into the broadcast news sent in by *MT* readers.

◆ Condolences

Monitoring Times sends its sincere sympathy to John T. Arthur, whose mother passed away shortly after Thanksgiving. John, the interim publisher of *The ACE*, is a longtime major force in the pirate radio scene. His mother was a longtime *ACE* member, and a strong supporter of our hobby.

◆ What We Are Hearing

The new year is off to a good start in pirate radio. *MT* readers logged over two dozen North American shortwave pirate stations, all on 6950 or 6955 kHz. Your best bet is to tune these frequencies on weekends, two to four hours before or after local sunset.

Eat It Radio- Oldies rock music and pirate radio advocacy, a common format, holds forth here. (None)

Fight for Free Radio- So far the main purpose of this station has been to create fights within free radio through complaints about the Free Radio Network web site. (None, accepts reports on the Free Radio Network web site; go figure)

Ground Zero Radio- Lately they have mixed seasonal music with their rock programming. (Blue Ridge Summit and Elkhorn)

Indira Calling- Vijay Nehru's All India Radio parody station features "sitar" music by the Beach Boys. Don't be fooled by the announced Calcutta address. (Providence)

Jean Chretien Station- The Canadian election stimulated this operation, but surprisingly there were almost no pirates or clandestines who targeted the lengthy disputes in the United States election. (None)

NOEL- From the call letters, it is obvious that this one features holiday music. But, Santa apparently is not delivering QSLs down the chimney. (None)

Old Turkey Radio- Their comedy about American eating habits at Thanksgiving is a good example of a seasonal holiday station. (uses oldturkeyradio@hotmail.com e-mail)

Radio Azteca- Bram Stoker still comes up with hilarious original comedy bits about DXers and DXing. He's produced about 40 of these content-packed broadcasts. (Belfast)

Radio Bingo- The bingo game on shortwave radio still pops up occasionally. It's more rigged than a chad-filled election, since John T. Arthur

wins every time. (now uses radiobingo@chek.com)

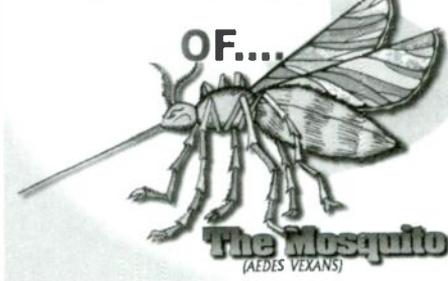
Radio Free Speech- Bill O. Rights is back, sometimes with a very powerful AM transmitter. His advocacy for individual freedom is now supplemented by relays of other pirates. (Belfast)

Radio Neptune- Their "universal service," hosted by Joe Mack, formerly was heard only in Europe. (Blue Ridge Summit)

RBCN- Radio Bob retains a prominent position in pirate radio with his down-home southern style, including interviews with Colonel Hounddog. (Lula)

Scream of the Mosquito- As we see here this month, Ben Loveless got a fine QSL for a bulletin logging. (None, verifies logs in *The ACE*)

THE SCREAM



Sycko Radio- Their fare has evolved into a mix of rock music and drama programming. (None)

URGZ- The elaborate programming about human instincts on this classic pirate station has returned lately. They used to QSL, but no current address is known. (None)

Voice of Bizarro World- Xhem's classic backwards parody station resurfaced last month after a long absence. The station begins with a sign-off, but doses with a sign-on. (Huntsville)

Voice of Captain Ron Shortwave- Captain Ron is now mixing his rock music with commentary on the pirate radio scene. (uses captainronsw@yahoo.com)

Voice of the Runaway Maharishi- The Maharishi Hashishi Ganja produces lengthy commercials for drug use, in a pretty clever fashion. (Providence)

Voice of Shortwave Radio- Their ancient rock oldies are a backdrop for comedy and novelty bits. (Blue Ridge Summit)

WHYP- James Brownyard claims to be the most underrated pirate on the air today, and he may be right. (uses why1530@yahoo.com e-mail)

WLIQ- This one often surfaces around holidays with seasonal music from Lake Superior. (None)

WLS- The old top 40 rock format from Chicago on WLS has spawned a number of pirate memorials over the years. (None)

WMFQ- No shortwave station, pirate or otherwise, has ever done more to promote QSLing than this one. Lately they have criticized other stations who do not verify reports. (Providence)

WPAT- This new one has had some equipment problems, but when it's heard, novelty music predominates. (None)

WPN- The World Parody Network has returned after a long layoff. Miscellaneous comedy is their stock in trade. (Huntsville)

Z-100- A brand new operation, this one is distinctive as a clone of a commercial FM rock oldies station. (uses bigz100fm@yahoo.com)

◆ Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. This finances postage for a souvenir QSL to your mailbox. Your letters go to these addresses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 69, Elkhorn, NE; 68022; PO Box 24, Lula, GA 30554; and PO Box 11522, Huntsville, AL 35814. A few pirates, as listed, prefer e-mail, bulletin logs or internet web site reports instead. Reports to the Free Radio Network go to <http://www.fm.net/> on the web. *Free Radio Weekly* loggings go via niel@ican.net e-mail. Sample copies of *The ACE* are \$2 via the Belfast maildrop.

◆ Thanks

Your input is extremely welcome via PO Box 98, Brasstown, NC 28902, or via my e-mail address atop the column. This month we heard from John T. Arthur, Belfast, NY; Cachito, Santiago, Chile; Ross Comeau, Andover, MA; Tim Cooper, UK; Rich D'Angelo, Wyomissing, PA; Joe Filipkowski, Providence, RI; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; William T. Hassig, Mt. Prospect, IL; Hans Johnson, AZ; Jim Keeling, St. Charles, MO; Chris Lobdell, Stoneham, MA; Ben Loveless, Bloomfield, MI; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Cachito Marnani, Santiago, Chile; Adrian Peterson, Indianapolis, IN; Mike Prindle, New Suffolk, NY; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany; Doug Smith, Pleasant View, TN; Bud Stacey, Setsuma, AL; DJ Stevie, Basel, Switzerland; Mike Striatus, CT; Gary Thorburn, Boston, MA; Niel Wolfish, Toronto, Ontario; and Andrew Yoder, Blue Ridge Summit, PA.

The Band is Hot!

Although slow in getting started, I'm happy to report that longwave conditions this winter seem to be doing extremely well. This is evidenced by a long list of loggings this month from three contributors—plus a few of my own thrown in for good measure (see Table 1).

I am happy to welcome Dave Tomasko as a contributor this month. He submitted a fine list of logs from his location near Chicago, IL. Dave has gained notoriety in LF circles for his knack of identifying "difficult" beacons for listeners on many occasions. If you've heard a beacon that you can't find listed in beacon guides, past loggings, on the Internet, etc., you can contact Dave at Kdtomasko@aol.com for expert assistance.

Jim Renfrew of Byron, NY, also checks in with an impressive list of logs this month. He uses a Drake R8 with a 500-ft (152 meter) wire antenna oriented in an East/West direction. Some of Jim's loggings are from a DXpedition he took to Cappahayden, NF, back in October 2000.

Finally, we have a nice selection of intercepts from Jacques d'Avignon, many of which were heard while attending a DXpedition at Brantingham, NY, just south of his home location near Ottawa, Ontario. Jacques used an AOR AR-7030 receiver and a Wellbrook ALA 1530 large aperture loop for his loggings.

◆ Web Updates

Alex Wiecek's longwave site has changed its URL to <http://members.home.com/wiecek6010>. Alex (VE3GOP) runs this site from his location in Ontario, Canada. It features pictures of beacons and antennas, Canadian beacon listings, sound clips and LW DXing news. The site also contains an interesting story by Dave Tomasko (see above) about how beacons get their names. This is clearly one of the most interesting longwave sites on the web right now. Got a favorite LW site that you'd like to see plugged in *MT*? Just send the details to me at lowband@gateway.net.

Alan Gale (<http://www.alan.gale.clara.net/beaconworld.htm>) sends a special QSL from historical station SAQ, 17.2 kHz in Grimeton, Sweden. The QSL (Figure 1) was issued for SAQ's commemorative broadcast of July 2, 2000.

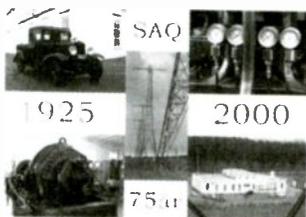


Figure 1. QSL card from station SAQ (17.2 kHz), Grimeton, Sweden (Courtesy of Alan Gale—UK).

This station has been on the air since 1924 and uses one of the last remaining Alexanderson Alternator transmitters. The Alternator is a mechani-

TABLE 1. SELECTED LF LOGGINGS

FREQ	ID	LOCATION	BY	FREQ	ID	LOCATION	BY
153	—	Bechar, Algeria*	J.R. (NY)	364	TZ	Winchester, VA	K.C. (NY)
162	—	Allouis, France*	J.R./K.C. (NY)	365	PBC	Columbia, TN	D.T. (IL)
183	—	Saarouis, Germany*	J.R. (NY)	369	OXU	Carmilla, GA	D.T. (IL)
189	—	Iceland*	K.C. (NY)*	382	POS	Port of Spain, TTO	D.T. (IL)
198	—	BBC-Droitwich, ENG*	J.R. (NY)	382	LQ	Boston, MA	J.D. (ON)
203	T	Thompson, MB	D.T. (IL)	391	DDP	San Juan, PR	J.R., K.C. (NY), J.D. (ON)
204	YFY	Iqaluit, NT	D.T. (IL)	395	XEN	Xenia, OH	J.D. (ON)
205	YRQ	Trois Rivières, QC	D.T. (IL)	395	SL	Saranac Lake, NY	J.D. (ON)
206	GLS	Galveston, TX	J.R. (NY)	400	PIE	Pieducuestra, COL	D.T. (IL)
208	YSK	Sanikiluaq, NT	J.R., K.C. (NY), J.D. (ON)	400	CI	Sioux St. Marie, MI	J.D. (ON)
209	GDW	Gladwyn, MI	J.D. (ON)	402	C	Camaguay, Cuba	D.T. (IL)
213	YRC	St. Honoré, QC	D.T. (IL)	404	ZR	Sarnia, ON	J.R. (NY)
214	KB	Nemiscau, QC	D.T. (IL)	404	IUB	Baltimore, MD	J.D. (ON)
216	ME	Matane, QC	D.T. (IL)	407	AQ	Appleton, WI	J.D. (ON)
221	DYO	Rutland, VT	J.D. (ON)	410	EGQ	Emmetsburg, IA	J.D. (ON)
224	VWD	West Dover, VT	J.D. (ON)	411	VFU	Van Wert, OH	J.R. (NY)
239	TCU	Tecumseh, MI	J.R. (NY)	412	CMY	Sparta, WI	J.D. (ON)
242	EFK	Newport, VT	J.D. (ON)	414	IEB	Lebanon, MO	J.R. (NY)
251	ZQA	Nassau, QC	D.T. (IL)	414	JUE	Lebanon, TN	J.R. (NY)
263	BGF	Winchester, TN	D.T. (IL)	417	IY	Charles City, IA	J.R. (NY)
263	DEQ	Greeneville, TN	D.T. (IL)	417	EK	Worcester, MA	J.D. (ON)
266	BR	Atlanta, GA	J.D. (ON)	418	HHG	Huntington, IN	J.D. (ON)
269	OSX	Kosciusko, MS	D.T. (IL)	419	RYS	Detroit, MI	J.D. (ON)
270	SAL	Cape Verde Islands	J.R. (NY) †	420	CEK	Crete, NE	J.R. (NY)
278	ADG	Adrian, MI	J.R. (NY)	423	CKP	Cherokee, IA	J.R. (NY)
281	HXX	Berlin, NH	J.D. (ON)	423	DXE	Dexter, MO	J.R. (NY)
290	TVK	Centerville, IA	J.R. (NY)	426	EN	Omaha, NE	J.R. (NY)
305	YQ	Churchill, MB	J.R. (NY)	426	FTP	Fort Payne, AL	J.R. (NY)
327	POR	Porto, Portugal	J.R. (NY) †	429	IKY	Springville, KY	J.R. (NY)
329	YEK	Eskima Point, NT	J.R. (NY)	430	AYB	Auburn, NE	J.R. (NY)
332	PH	Port Huron, MI	J.R. (NY)	434	SLB	Unidentified	J.R. (NY)
333	HQU	Thomson, GA	D.T. (IL)	450	PPA	Puerto Plata, Dom. R.	K.C. (NY), J.D. (ON)
335	RWN	Winimac, IN	J.R. (NY)	509	OF	Unidentified	J.R. (NY)
335	PST	Madeira, Ponta Santo	J.R. (NY) †	512	SSB	Unidentified	J.R. (NY)
338	DE	Detroit, MI	J.R. (NY)	515	RRQ	Rock Rapids, IA	J.D. (ON)
347	ANQ	Angola, IN	J.R. (NY)	518	BHZ	Belo Horizonte, Brazil	J.R. (NY) †
353	HOT	Higuerote, VEN.	J.R., K.C. (NY)	518	GCT	Guthrie Center, IA	J.D. (ON)
356	PB	W. Palm Beach, FL	K.C. (NY)	521	TVX	Greencastle, IN	J.D. (ON)
359	TPX	Tepeapan, MEX	D.T. (IL)	526	ZLS	Stello Maris, BAH	K.C. (NY), J.D. (ON)
362	OX	Oxford, CT	J.D. (ON)	1610	OXZ	Denmark	J.R. (NY) †
362	LYL	Lima, OH	J.D. (ON)				

* LW broadcast station
† Heard at Newfoundland DXpedition

cally-driven device that spins fast enough to generate low frequency RF energy directly. You can learn more about SAQ at: <http://www.telemuseum.se/Grimeton/>.

◆ New LF Catalog

Some of you may recall the Q-Stick antenna that was popular a few years ago among LF DXers using portable receivers. This tuned, passive antenna produced greatly improved signal strengths when placed atop a portable receiver. I still use one today with a Sony 2010.

After a long hiatus with no announcements, Gerry Thomas (KB4JFM), proprietor of RadioPlus+ Electronics, has recently released a new catalog of LW/MW DXing tools. His lineup includes the venerable Q-Stick, the Quantum Loop QX, the QX Pro and other antennas which are designed for high per-

formance desktop reception.

He's considering the launch of a web site (pending evaluation of his production capabilities), but you can request a no-frills catalog right away by e-mailing Gerry at radioplus@pcola.gulf.net. The catalog I received contained six pages of products along with photos of several key items. The catalog is available as a Word file, or in a basic .TXT format.

◆ End Notes

February is an excellent time to try for experimental "Lowfers" operating at 160-190 kHz. CW is the traditional mode for Lowerfer operation, but you are likely to hear some data signals on the band as well. If you are in the Northeast, you may want to try for my beacon, "KC" operating at 185.000 kHz. For more information on Lowfers, check out the LWCA web site at <http://www.lwca.org>.

Big Savings on Radio Scanners

Uniden® NEW!

SCANNERS

AOR

Bearcat® 245XLT Trunk Tracker II

Mfg. suggested list price \$429.95/CEI price \$194.95
 300 Channels • 10 banks • Trunk Scan and Scan Lists
 Trunk Lockout • Trunk Delay • Cloning Capability
 10 Priority Channels • Programmed Service Search
 Size: 2 1/2" Wide x 1 3/4" Deep x 6" High
Frequency Coverage:
 29,000-54,000 MHz., 108-174 MHz., 406-512 MHz., 806-823.995
 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

Our Bearcat TrunkTracker BC245XLT, is the world's first scanner designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS and EDACS® analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. Our scanner offers many new benefits such as Multi-Track - Track more than one trunking system at a time and scan conventional and trunked systems at the same time. 300 Channels - Program one frequency into each channel. 12 Bands, 10 Banks - Includes 12 bands, with Aircraft and 800 MHz. 10 banks with 30 channels each are useful for storing similar frequencies to maintain faster scanning cycles or for storing all the frequencies of a trunked system. Smart Scanner - Automatically program your BC245XLT with all the frequencies and trunking talk groups for your local area by accessing the Bearcat national database with your PC. If you do not have a PC simply use an external modem. Turbo Search - Increases the search speed to 300 steps per second when monitoring frequency bands with 5 KHz. steps. 10 Priority Channels - You can assign one priority channel in each bank. Assigning a priority channel allows you to keep track of activity on your most important channels while monitoring other channels for transmissions. Preprogrammed Service (SVC) Search - Allows you to toggle through preprogrammed police, fire/emergency, railroad, aircraft, marine, and weather frequencies. Unique Data Skip - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. Memory Backup - If the battery completely discharges or if power is disconnected, the frequencies programmed in your scanner are retained in memory. Manual Channel Access - Go directly to any channel. LCD Back Light - An LCD light remains on for 15 seconds when the back light key is pressed. Autolight - Automatically turns the backlight on when your scanner stops on a transmission. Battery Save - In manual mode, the BC245XLT automatically reduces its power requirements to extend the battery's charge. Attenuator - Reduces the signal strength to help prevent signal overload. The BC245XLT also works as a conventional scanner. Now it's easy to continuously monitor many radio conversations even though the message is switching frequencies. The BC245XLT comes with AC adapter, one rechargeable long life ni-cad battery pack, belt clip, flexible rubber antenna, earphone, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, ESAS or LTR systems. Hear more action on your radio scanner today. Order on-line at www.usascan.com for quick delivery.



Bearcat® 780XLT Trunk Tracker III

Mfg. suggested list price \$699.95
 Less CEI Introductory Instant Rebate -\$320.00
Introductory price \$379.95
 500 Channels • 10 banks • CTCSS/DCS • S Meter
 Size: 7 5/8" Wide x 6 15/16" Deep x 2 3/16" High

Frequency Coverage: 25,000-512,000 MHz., 806,000-823,9875MHz., 849.0125-868.9875 MHz., 894.0125-1300.000 MHz.
 Due to the high demand for this new product, allow 30-60 days for delivery.
 The Bearcat 780XLT has 500 channels and the widest frequency coverage of any Bearcat scanner ever. Packed with features such as TrunkTracker III to cover EDACS, Motorola and EF Johnson systems, control channel only mode to allow you to automatically trunk certain systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display & backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control with RS232 port, Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for \$29.95; The BC780XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. For fastest delivery, order on-line at www.usascan.com

Bearcat® 895XLT Trunk Tracker

Mfg. suggested list price \$729.95/Special \$194.95
 300 Channels • 10 banks • Built-in CTCSS • S Meter
 Size: 10 1/2" Wide x 7 1/2" Deep x 3 3/8" High
Frequency Coverage: 29,000-54,000 MHz., 108,000-174 MHz., 216,000-512,000 MHz., 806,000-823.995 MHz., 849.0125-868.995 MHz., 894.0125-956.000 MHz.

The Bearcat 895XLT is superb for intercepting trunked communications transmissions with features like TurboScan™ to search VHF channels at 100 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a Signal Strength Meter, RS232C Port to allow computer-control of your scanner via optional hardware and 30 trunking channel indicator annunciators to show you real-time trunking activity for an entire trunking system. Other features include Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - Lets you record channel activity from the scanner onto a tape recorder. CTCSS Tone Board (Continuous Tone Control Squelch System) 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; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC895XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS or LTR systems.



AOR® AR8200 Mark IIB Radio Scanner

AOR820H Mark IIB-A wideband handheld scanner/SPECIAL \$559.95
 1,000 Channels • 20 banks • 50 Select Scan Channels
 PASS channels: 50 per search bank + 50 for VFO search
 Frequency step programmable in multiples of 50 Hz.
 Size: 2 1/2" Wide x 1 3/8" Deep x 6 1/8" High
Frequency Coverage:
 500 KHz to 823.995 MHz, 849.0125-868.995 MHz, 894.0125-2,040,000 MHz
 (Full coverage receivers available for export and FCC approved users.)

The AOR AR8200 Mark IIB is the ideal handheld radio scanner for communications professionals. It features all mode receive: WFM, NFM, SFM (Super Narrow FM), WAM, AM, NAM (wide, standard, narrow AM), USB, LSB & CW. Super narrow FM plus Wide and Narrow AM in addition to the standard modes. The AR8200 also has a versatile multi-function band scope with save trace facility, twin frequency readout with bar signal meter, battery save feature with battery low legend, separate controls for volume and squelch, arrow four way side rocker with separate main tuning dial, configurable keypad beep/illumination and LCD contrast, write protect and keypad lock, programmable scan and search including LINK, FREE, DELAY, AUDIO, LEVEL, MODE, computer socket fitted for control, clone and record, Flash-ROM no battery required memory, true carrier re-insertion in SSB modes, RF preselection of mid VHF bands, Detachable MW bar aerial. Tuning steps are programmable in multiples of 50 Hz in all modes. 8.33 KHz airband step correctly supported, Step-adjust, frequency offset, AFC, Noise limited & attenuator, Wide and Narrow AM in addition to the standard modes. For maximum scanning pleasure, you can add one of the following optional slot cards to this scanner: CT8200 CTCSS squelch & search decoder \$89.95; EM8200 External 4,000 channel backup memory, 160 search banks. \$69.95; RU8200 about 20 seconds chip based recording and playback \$69.95; TE8200 256 step tone eliminator \$59.95. In addition, two leads are available for use with the option socket. CC8200 PC control lead with CD Rom programming software \$109.95; CR8200 tape recording lead \$59.95. Includes 4 1,000 mAh AA ni-cad batteries, charger, cigar lead, whip aerial, MW bar antenna, belt hook, strap and one year limited AOR warranty. Enter your order now at <http://www.usascan.com>.



Buy with Confidence

Order on-line and get big savings

For over 31 years, millions of communications specialists and enthusiasts worldwide have trusted Communications Electronics for their mission critical communications needs. It's easy to order. For fastest delivery, order on-line at www.usascan.com. Mail orders to: Communications Electronics Inc., P.O. Box 1045, Ann Arbor, Michigan 48106 USA. Add \$20.00 per radio transceiver for UPS ground shipping, handling and insurance to the continental USA. Add \$13.00 shipping for all accessories and publications. 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 sales tax. No COD's. Your satisfaction is 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, MasterCard, IMPAC or Eurocard. Call anytime 1-800-USA-SCAN or 800-872-7226 to order toll-free. Call 734-996-8888 if outside Canada or the USA. FAX anytime, dial 734-663-8888. Dealer and international inquiries invited. Order your radio scanners from Communications Electronics Inc. today at www.usascan.com and save.

More Radio Products

Save even more on radio scanners when purchased directly from CEI. Your CEI price after instant rebate is listed below:
 Bearcat 895XLT 300 ch. TrunkTracker I base/mobile scanner.....\$194.95
 Bearcat 780XLT 500 ch. TrunkTracker III base/mobile scanner.....\$379.95
 Bearcat 278CLT 100 ch. AM/FM/SAME WX alert scanner.....\$159.95
 Bearcat 245XLT 300 ch. TrunkTracker II handheld scanner.....\$194.95
 Bearcat 248CLT 50 ch. base AM/FM/weather alert scanner.....\$89.95
 Bearcat Sportcat 200 alpha handheld sports scanner.....\$169.95
 Bearcat Sportcat 180B handheld sports scanner.....\$149.95
 Bearcat 80XLT 50 channel handheld scanner.....\$99.95
 Bearcat 60XLT 30 channel handheld scanner.....\$74.95
 Bearcat BCT7 information mobile scanner.....\$139.95
 AOR AR8200 Mark II Wide Band handheld scanner.....\$539.95
 AOR AR16BQ Wide Band scanner with quick charger.....\$209.95
 ICOM ICR8500 wideband communications receiver.....\$1,469.95
 ICOM PCR1000 computer communications receiver.....\$379.95
 ICOM R10 handheld wideband communications receiver.....\$279.95
 Uniden WX100 Weather Alert with S.A.M.E. feature.....\$49.95

For credit card orders call 1-800-USA-SCAN

e-mail: cei@usascan.com

www.usascan.com

PO Box 1045, Ann Arbor, Michigan 48106-1045 USA
 For Information call 734-996-8888 or FAX 734-663-8888
 Price schedule effective January 1, 2001 AD #D10101MT © 2001 Communications Electronics Inc.

**COMMUNICATIONS
ELECTRONICS INC.**
 Emergency Operations Center

Visit WWW.USASCAN.COM • 1-800-USA-SCAN

Books to Grow By

Whenever I teach a new ham class, I am always pleased to find that a number of the students express a real desire to go beyond simply passing the test and getting on the air. More than a few folks seek resources that will allow them to get a better understanding of the electronics of amateur radio. Likewise, I often get letters and e-mail on the very same subject.

There are a number of excellent books that can go a long way in improving upon the basic knowledge licensing tests expect. As a service to those who are looking to expand their horizons, allow Old Uncle Skip to share with you an annotated bibliography of the books that can help you out. This book list also has a great deal to offer the advanced ham.

THE ARRL HANDBOOK FOR RADIO AMATEURS 2001

78th Edition

Editor: Chuck Hutchinson K8CH et al
1216 Pages

\$32 Paperback, \$49.95 hardbound,
\$39.95 CD ROM version

ISBN 0-87259-186-7

The American Radio Relay League

225 Main Street

Newington, CT 06111

1 (888) 277-5289

<http://www.arrl.org/>

Let me tell you a little story. Many years ago when I first became interested in amateur radio, I went to my local library and looked at a copy of the then current edition of "The Handbook." (I won't tell you exactly how long ago that was, but I will say that there were a heck of a lot more vacuum tubes in the circuits back then.) I could barely understand the table of contents much less all of the information in the following pages.

Well, as is my nature, I kept at it. Over the years, in each successive edition, I grew to understand more and more. Now I feel I can turn to any page and get a quick handle on the topic that is troubling my mind. This ongoing growth of understanding is really what ham radio is all about. The *Handbook* is the single volume that has historically done this best. For most of us with a number of years under our belts, *The Handbook* is a companion and friend.

The *Handbook* has taken different approaches to presenting its information over the years. This latest edition starts with a basic in-

roduction to the amateur radio experience. This is followed by a series of chapters on fundamental electronic theory. These particular chapters are most in keeping with the theme of this article. You could easily use these chapters on Mathematics, DC and AC Theory, as well as Digital and Analog Theory, as the best path to move a bit beyond the basics that were needed to pass your first license exam. Further, the information would serve well as a guide to the theory portions of the more advanced amateur tests.

The next section of the book is probably the most popular – Practical Design and Projects. This is where you move beyond the theory and get a few things built and on the air. Designs for stages of receivers, transmitters, powers supplies and antennas serve to get the reader to try things out and make improvements on their existing station. This is the essence of the amateur radio art. If you're a bit afraid of rolling up your sleeves, the following section on Construction Techniques will show you how it's done.

The book finishes up with a comprehensive guide to Operating Practices, including extensive reference material.

For the last few years, the ARRL has begun to also offer *The Handbook* in CD ROM format. This version is particularly useful over the more traditional bound version in that it allows the user to conduct searches for specific material. The CD version also includes a number of programs to aid in such things as filter design and transmission line analysis.

So as far as Old Uncle Skip is concerned, this is the first radio electronics book you need and for many it will also be the last. Its depth of practical knowledge is that great!

UNDERSTANDING BASIC ELECTRONICS

BY Larry D. Wolfgang WR1B

314 pages

\$20.00

ISBN 0-87259-398-3

The American Radio Relay League

This is a book that has been needed by the hobby for a long time. *Understanding Basic Electronics* is a great starting point for anyone who has little or no knowledge of radio electronics. It gives clear and concise explanations of the main electronics concepts behind

everything we do when we participate in amateur radio. Most importantly, if you were like me and didn't pay close attention in math classes, it provides a complete guide through all the basic mathematics needed to really move on in discovering advanced electronics concepts.

The book is laid out very much like a good text book. It has four units covering mathematics, DC electronics, AC electronics, and a catch-all unit covering semiconductors, integrated circuits and vacuum tubes. Further, the book has an appendix and glossary providing support to the main units.

Each chapter covers a main concept, usually by providing a number of "real world" analogies to help lock down the main idea. Most chapters also provide an opportunity to test what has been learned, usually by working through the associated mathematics but the reader can also conduct a few simple practical experiments using common devices.

THE ELECTRONICS OF RADIO

by David B. Rutledge KN6EK

431 pages

\$44.95 paperback, \$100.00 Hardbound

ISBN 0-521-64136-5

Cambridge University Press

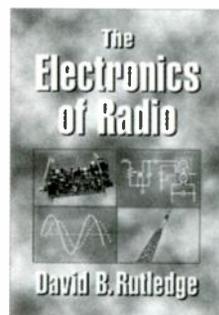
New York, NY

<http://www.cup.org>

Mr. Rutledge's book has been causing quite a stir in the amateur radio community. He is a professor of Electrical Engineering at the California Institute of Technology. The technique he chose to use in his book is to walk the reader through a complete study of basic radio design by encouraging the reader to build a popular CW transceiver kit, the NorCal 40A, currently available from Wilderness Radio <http://www.fix.net/jparker/wild.html> Once

you've worked your way through the book you would then not only have a fine working radio but a great deal of knowledge and information about how it works. What a great idea for both a text book and a course of self-study!

Rutledge begins with a great basic



study of electronic components. From there essentially the reader works his or her way through the stages of the NorCal 40A, looking at oscillators, mixers, filters, amplifiers and how these stages come together to produce a useful transceiver. One of the things I really appreciated in this book was its examination of audio circuits and acoustics. Many books give these topics short shrift in favor of the RF design aspects. However, once you've heard CW through a tuned speaker, you'll never go back to anything else.

Let me remind you that this book was written as a practical college text and as such the math can get a bit hefty. This should not discourage the reader because in between the advanced mathematic is a great deal of useful information that can be grasped by any radio amateur.

The book also includes a disk containing the program PUFF, a basic circuit simulator that has many uses, but, in the scope of this book, concentrates on filter and transformer analysis.

PRACTICAL RF DESIGN MANUAL

by Doug DeMaw W1FB

246 pages

\$19.95

MFJ Publishing

Starkville, MS 39759

ISBN # 1-891237-00-4

<http://mfjenterprises.com>

Most of us came to know Doug's work through his articles in *QST* and *Monitoring Times*. This book shows a bit more of Doug's scholarly side. It gives the reader a one stop study of basic radio design. Making extensive use of practical circuits (many of which can be built right out of the book) Doug led the reader through Transmitter and Receiver Fundamentals including detailed analysis of Mixers, Balanced Modulators, Detectors, IF Amplifiers, Filters, AGC Systems, Frequency-Control Systems, Small and Large Signal RF Amplifiers, and Frequency Multipliers.

Anyone familiar with some of Doug's *QST* transmitter or receiver designs will see the fundamentals in the circuits shown in this book. You can quite literally read each section and build the circuit as a way of furthering your understanding. Doug had a way of making even the most complex topics easy to understand. Over the years I've learned a great deal from his writings and this book taught me even more. I hope that it does the same for every reader.

SOLID STATE DESIGN FOR THE RADIO AMATEUR

By Wes Hayward W7ZOI & Doug DeMaw W1FB

256 pages

\$15.00

ISBN 0-87259-040-2

The American Radio Relay League

Since its publication, *Solid State Design for the Radio Amateur* has sold well over

50,000 copies, and for good reason. Wes Hayward and the late Doug DeMaw created one of the greatest single volumes on the subject of basic radio theory ever printed. This book is written for the person with more than a passing interest in what is going on behind the dials of their receiver or transmitter. You can quite literally take this book and construct any number of receiver or transmitter circuits and accessories. But, far beyond any basic construction project book that may give the reader a few lines about how the circuit works, Wes and Doug teach you the theory and then take you through the circuit to illustrate the various topics they cover.

One of the great secrets that Hayward and DeMaw share with the reader is that it is very possible to build receiver and transmitter circuits that can rival and even outperform much of the commercial gear on the market. Even if melting solder is not your cup of tea, reading this book and studying the circuits will allow you to make much more informed decisions when you go shopping for radio equipment.

The book begins with a study of general semiconductor theory as it relates to RF design. This is followed by chapters covering transmitters, amplifiers and matching networks, receivers, and modulation methods. Also included are sections on test equipment and accessories. The more advanced mathematical theories are covered in detail in the appendices. This is truly a book that belongs on every serious radio hobbyist's shelf.

INTRODUCTION TO RADIO FREQUENCY DESIGN

by Wes Hayward W7ZOI

383 pages + software disk

\$30

ISBN: 0-87259-492-0

The American Radio Relay League

Let me warn you in advance that *Introduction to Radio Frequency Design* assumes that the reader knows a bit more than Ohm's Law. It was originally published as a supplemental text for working engineers. Still, a dedicated hobbyist with a solid foundation in basic electronics can muddle through and gain a lot of knowledge about RF concepts.

The text covers, in detail, eight major aspects of radio theory and practice including: Low Frequency Transistor Models, Filter Basics, Coupled Resonator Filters, Transmission Lines, Two Port Networks, Practical Amplifiers and Mixers, Oscillators and Frequency Synthesizers and the Receiver: AM RF System. The book makes use of illustrations and extended mathematical analysis to fully examine each concept. "Real world" circuits are used to demonstrate the applications discussed, many of which can actually be pressed into service should you desire to take up a soldering iron.

The book includes a disk of useful programs to aid the reader with testing the various design concepts discussed in the book including programs covering filter design, feedback

amplifiers, RF system dynamic range and phase-locked loops.

If you are ready to design the next great receiver, this book will put you on the right track.

So, as you can see, armed with a couple of good books, it is possible to begin to advance your understanding of how this whole radio thing works. Have fun. Learning something new is the greatest thrill I know.

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

Full 800 MHz Scanners



AOR AR-8200 (unblocked)
Wideband Portable receiver
- 0.5 to 2040 MHz continuous.
- NFM, WFM, NAM, WAM, USB, LSB & CW
- Alphanumeric memory identification
- Spectrum scan
- Computer control
- Flexible dynamic memory bank layout
- Optional CTCSS & Extra memory boards
\$699 US



ALINCO DJ-X10 (unblocked)
Wideband Portable receiver
- 0.1 to 2000 MHz continuous.
- NFM, WFM, AM, USB, LSB & CW
- Alphanumeric memory identification
- Channel scope
- 1200 memory channels
- Superb sensitivity, Clear sound
- Various scanning modes - Menu system
\$499 US



ICOM PCR-100-08
Wideband receiver for PC
- PCR-100 can be used with your Desktop or Portable PC
- 0.1 to 1300 MHz continuous.
- Modes AM, FM & WFM
- Built-in tone squelch
- Multiple screens: multi-function control panel
\$229 US

+ OPTOELECTRONICS & YUPITERU
Guaranteed Delivery to USA.

Radioworld

Phone: (416) 667-1000

FAX (416) 667-9995 Website Address: sales@radioworld.ca http://www.radioworld.ca
4335 Steeles Ave. W, Toronto, ON Canada M3N 1V7

Kiwa Pocket Loop™

TM

The Kiwa Pocket Loop is a 12.5 inch diameter Air Core Loop Antenna that collapses to fit in your pocket! This antenna is designed for portable receivers to enhance MW and SW reception. Tuning is from 530 kHz to 23 MHz using a battery powered low noise amplifier. No direct connection to the receiver is required. The special coupler is simply slipped over the whip antenna for improved reception.

The Kiwa Pocket Loop is the ideal travel companion for those who require a loop antenna for on the go!

Kiwa Electronics

612 South 14th Ave., Yakima WA 98902
☎ 509-453-5492 or 1-800-398-1146 (orders)
✉ kiwa@wolfe.net (Internet/full catalog)
🌐 www.kiwa.com

Rehabbing an R.F. Generator

In last month's column, we successfully tested the little Philco *Transitone* a.c.-d.c. set that we'd been working on for a few issues. Normally, after a receiver comes back to life on the workbench, my next step is to check its alignment. Quite often, a dramatic increase in performance can be realized by tweaking alignment adjustments – particularly the i.f. transformer trimmers. However, part of my mission in this column is to help newcomers to the restoration hobby get a good start. So I'll postpone the alignment, and instead discuss the acquisition and rehabbing of that essential alignment instrument: the r.f. signal generator.

◆ Characteristics of an R.F. Generator

What is an r.f. signal generator? Well, not surprisingly, the purpose of this instrument is to generate a radio signal for use in adjusting radio receivers. Why do you need a special generator when there are always plenty of radio stations broadcasting signals? There are several good reasons.

Not to put too fine a point on it right now, the radio serviceman requires a stable signal he can adjust to specific frequencies and to specific signal strengths. Radio stations, of course, have fixed frequencies and strengths. Not only that, but the frequency of the a.m. superheterodyne's i.f. (intermediate frequency) amplifier, a "must-do" adjustment, is well below the frequency of any radio station in the broadcast band.

The r.f. generators intended as radio test instruments are equipped to cover i.f. frequencies as well as standard and shortwave broadcast frequencies. They are continuously adjustable over the entire frequency range and are generally equipped to modulate the signal with an audio tone if desired. Controls

are provided to attenuate (reduce) the signal output to the desired level. Well-designed, high-quality instruments offer a stable signal, a well-calibrated vernier tuning dial, and a wide tuning range divided into several bands.

You'll most likely be acquiring a used signal generator at a hamfest or a radio flea market. As you can imagine, signal generators for radio service aren't made new anymore! Some models (particularly higher-end industrial or military units) are available through surplus sources, and you will find these by browsing through magazine ads and the internet.

◆ What to Look for at the Flea Market

With its big round calibrated dial and lineup of control knobs, even an inexpensive hobby-grade unit might look impressive on a flea-market vendor's table. But you might want to consider looking for something better than those built-from-a-kit units made by Heathkit, Paco, Eico and the like.

It's not that they won't do a job for you, but the same ten to 20 bucks you might spend on such gear would also buy you a radio-service grade instrument – one that was wired in a factory and not in a home workshop. Look for instruments by firms like RCA, Hickock, Triplett and Simpson.

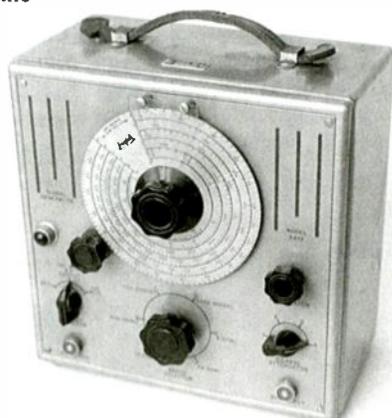
Flea market economics don't seem to assign a higher value to the service instruments than to the hobby instruments, and the former beat the latter hands-down in the sophistication of their circuitry and the solidity of their construction. Even laboratory-grade equipment can sometimes be purchased for similar prices, and I know people who stick up their noses at anything less. I'm not one of them.

The lab stuff is generally heavy and bulky, and it gives off the wrong vibes. It may seem silly, but I'd like my workbench to look like a radio repair shop, not a Lucent Technologies laboratory.

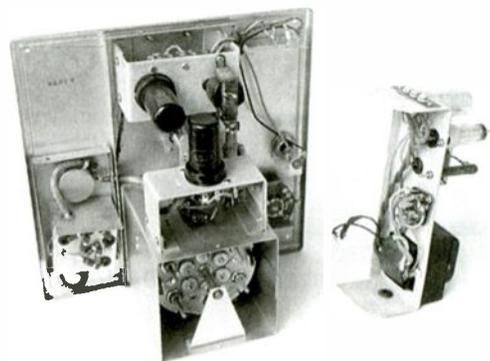
In all honesty I do have to add that – if your flea market find doesn't come with documentation – it will be easier for you to locate manuals for the hobby kit instruments than for the professional service-oriented instruments. And the kit instructions will give you beginner-oriented detail on trouble-shooting and adjustment procedures that you won't find in the professional manuals. So there are good arguments for both approaches.

Anyway, look for a unit that tunes down to at least 100 kHz (i.f.s in the older superhet receivers may be tuned this low), and up to at least 30 MHz (so as to cover the standard shortwave bands). It should have a switch that will allow you to apply modulation at a fixed audio frequency (usually in the 400 Hz range) to the r.f. signal as well as a control or controls (may be marked "attenuator") for adjusting the signal's output level. The tuning range should be divided into several bands, so that the scale for each band is long and easy to read.

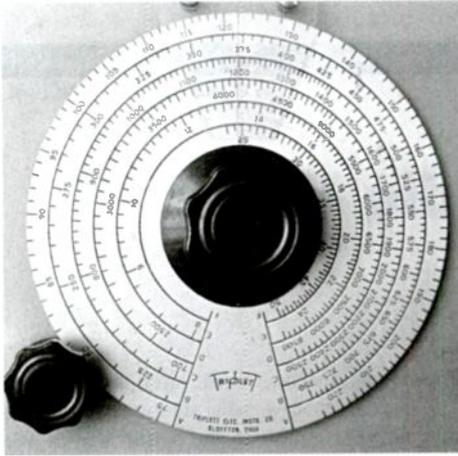
Actually, most r.f. generators will have these features, and you need to look beyond them for solidity of construction. Weight isn't a bad standard – indicating the presence of a heavy-gauge steel chassis that will prevent



Here's the Triplett 2432 as found at the 2000 Rochester Conference flea market. I was won over at once by its hefty feel (over 15 pounds), excellent cosmetic condition, and low \$10.00 price.



Rear view with power supply subchassis (right) and shield covers removed. Top subchassis (with the tube pointing at us) is the audio oscillator. Upright, below it, is the r.f. oscillator tube. The shield can containing the tuned circuit turret is below that.



The nicely engraved main tuning dial has concentric scales representing each of the six tuning ranges.

instability due to vibration and good internal shielding. Shielding is important because you want the only signal leaving the box to be squirting out of the test lead – not leaking out prior to the attenuation control(s). Also check for a nicely calibrated, smooth-acting and clearly marked dial with a good vernier control. If the frequency range is broken into several bands, than the dial markings for each band can be more spread out and easier to read and set accurately.

◆ My Own Flea-Market Find

Knowing that I would be writing this column in a few months, I shopped for a good signal generator at last September's Antique Wireless Association Convention (you can find out more about AWA and its convention at our web site: <http://www.antiquewireless.org>). Of course I already own a good signal generator, but it is just a little too sophisticated to discuss right now. I was looking for a unit that I would feel comfortable recommending in this column.

I didn't begin my search until about halfway through the meet, when the flea market was definitely beginning to thin out. Nevertheless, after only a short walk, I quickly spotted a nice-looking Triplett unit sitting forlornly on an otherwise almost empty shelf. It was marked \$20.00, but the vendor quickly accepted my \$10.00 bid.

The unit is a Model 2432 and tunes from 75 kHz to 50 MHz in six bands. It has main and vernier tuning controls, modulated output, and both coarse and fine attenuators. In addition to the r.f. output jack, there is a jack for direct access to the a.f. modulating signal. This is very useful for signal tracing in audio stages.

General cosmetic condition is very nice – with hardly a scratch on the brown hammertone paint. And the unit has a very satisfying heft (weighing in at over 15 pounds). In fact, I've had to avoid carrying the unit by its leather handle. The handle's

dried-out and fragile condition is the only defect I've noted so far.

After I got the Triplett home, I tried looking through old radio catalogues to see if I could find a description of this unit, as well as its original price – and also pin-point its age. The best I could do was a 1951 Allied Radio catalogue that showed what is clearly a later generation of the same instrument: the model 3432. The front panel was similar, but widened out for a different control arrangement. I have no catalogue that shows my own model – but its construction clearly pegs it as postwar, vintage somewhere between 1946 and 1950.

◆ Taking a Preliminary Look

Of course you are not necessarily going to acquire a Triplett 2432, but as we go through the instrument together I think you will see that you can apply similar techniques to your own flea-market prize.

After removing the four screws at the corners of the front panel, I was quickly able to slide the back off the front panel/chassis assembly. The only visible circuitry was on the power supply subchassis, which contains the power transformer, a 6X5 rectifier tube and an 0A2 gaseous regulator tube. (By the way, the regulated power supply is a feature that might well be absent in the inexpensive kit units). Everything else was hidden within a group of copper shield boxes. The view was rather daunting!

I usually check the condition of the power source before undertaking any radio restoration, and this one was no exception. I had to remove the power supply subchassis to access its circuitry, but that was an easy job. Backing out the four mounting screws, removing three spade lugs from a terminal strip, and unsoldering the power cord wires did the trick.

Removing the rectifier tube to prevent high voltage from reaching the filter capacitor, I connected a temporary power cord and tested the plate transformer. Its high-voltage winding and two low-voltage windings were fine. Setting the subchassis aside, I removed all the shields and took a look at the rest of the circuitry.

Behind the tuning dial is a small receiver-type 2-section tuning capacitor, and behind that a subchassis including a 6SJ7 tube – obviously the r.f. oscillator. It might well be that the two sections of the capacitor are switched to a parallel connection to reach the lower-frequency r.f. ranges and that just one is used for the higher ranges. However, I don't yet have a schematic diagram for the 2432. Above the tuning capacitor is another subchassis on which is mounted a 6J5 tube and a small audio transformer. Obviously, this is the audio oscillator circuitry.

In an enclosure below the tuning capacitor is the heart of the instrument, a rotating

turret on which are mounted a slug-tuned coil, as well as what looks like trimmer capacitor, for each band. These adjustments are lettered to match the positions on the bandswitch. As the turret is rotated, each coil/trimmer in turn is cut into the circuit via two sets of sliding contactors mounted inside the enclosure.

The construction of this unit is wonderfully simple and sturdy, and the quality approaches that seen in military units. Each subchassis is made of very heavy gauge metal and screw-attached to spot-welded right-angle brackets that are drilled and tapped for the mounting screws. With the exception of the power supply, every bit of circuitry that *can* be shielded is enclosed in a sturdy copper shield.

Just as I would with on a receiver restoration job, I plan to replace all of the paper and electrolytic capacitors before powering the unit up. Hopefully, I'll be in a position to report the results in next month's column. See you then!

Longwave Resources

✓ **Sounds of Longwave** 60-minute Audio Cassette featuring WWVB, Omega, Whistlers, Beacons, European Broadcasters, and more!
\$11.95 postpaid

✓ **The BeaconFinder** A 65-page guide listing Frequency, ID and Location for hundreds of LF beacons and utility stations. Covers 0-530 kHz.
\$11.95 postpaid

Kevin Carey

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

- * 5.3ft solid 6-panel C/Ku dish, polar mount, add Hq18 and scan 120 azimuth. \$150 + \$80SH (Ku holder \$25 extra)
 - * 4.5ft solid 6-panel C/Ku dish, patio mount, fixed satellite. \$130 + \$60SH (Ku LNB 23mm holder \$25 extra)
 - * Digital C-LNB 20 deg NF + scalar ring, \$69 + \$10SH
 - * Superjack 18" actuator for 5.3ft HQ18, \$59 + \$20SH
 - * AP3000 Positioner, memory, remote, \$89 + \$15SH
- Email: support@smalltear.com or fax 888-7311834



FREE SAMPLE COPY!

ANTIQUE RADIO CLASSIFIED

Antique Radio's Largest-Circulation Monthly Magazine

Articles - Classifieds - Ads for Parts & Services
Also: Early TV, Ham Equip., Books, Telegraph, 40's & 50's Radios & more...

Free 20-word ad each month. Don't miss out!

1-Year: \$39.49 (\$57.95 by 1st Class)
6-Month Trial - \$19.95. Foreign - Write.

A.R.C., P.O. Box 802-P14, Carlisle, MA 01741

Phone: (978) 371-0512; Fax: (978) 371-7129

Web: www.antiqueradio.com

Interesting Aspects of Radio Wave Propagation

Most of us have been introduced to the basic ideas of radio-wave propagation. We have a good grasp of the ideas such as HF signals hopping between earth and ionosphere to cover great distances, and VHF and higher-frequency signals traveling in relatively straight, line-of-sight paths. But as we utilize radio for communication in a variety of situations we soon start to question whether these basic concepts are enough to always explain to us how a signal gets from a transmitting antenna to a receiving antenna.

◆ Diffraction and Knife-Edge Phenomenon

When I started listening to VHF signals one of the confusing things about radio waves for me was that, although they were supposed to travel in straight lines, I could receive signals when totally surrounded by hills, or in a deep gorge. Of course HF signals could bounce off the ionosphere to enter such

places, but VHF and higher-frequency signals don't usually propagate by ionospheric skip. To confuse the situation further, AM broadcast-band signals found me practically anywhere I went with a portable receiver. Even in places where the VHF signals couldn't make it through.

My confusion diminished when I learned of signal diffraction. Have you noticed how you can hear the siren of an emergency vehicle long before there is a clear line-of-sight path to that vehicle? Obviously then the sound is not traveling a straight path from the siren to your ears. Sound can reflect from surface to surface when following the path from its source to your ears. But usually the surfaces along that path (which is usually in traffic) don't support the amount of reflection that would be needed to get the level of sound you hear from the siren. Sound from the siren is actually dispersing (diffracting) around objects in its path as it spreads out from its source. Thus sound doesn't follow a strictly

line-of-sight path from the siren to your ears.

Signals from a radio antenna can behave in a fashion similar to the sound waves just discussed. Radio waves can disperse around objects in their path as they travel (fig. 1). This is known as "diffraction." So what happened to the idea of line-of-sight propagation for radio waves? Well, radio waves do tend to travel in straight lines, especially when there is no impediment to their travel. But there are exceptions to this, such as when waves follow a path that grazes the edge of an object that would otherwise prevent their passage. In such cases they diffract, just as the sound waves from the siren do.

If this grazing happens to be at the top of a mountain ridge, then diffraction may put a signal of usable strength into the valley below. This valley would otherwise be shielded from the signal by the mountains. That's probably why I could hear signals from antennas which were shielded from my antenna by the mountains.

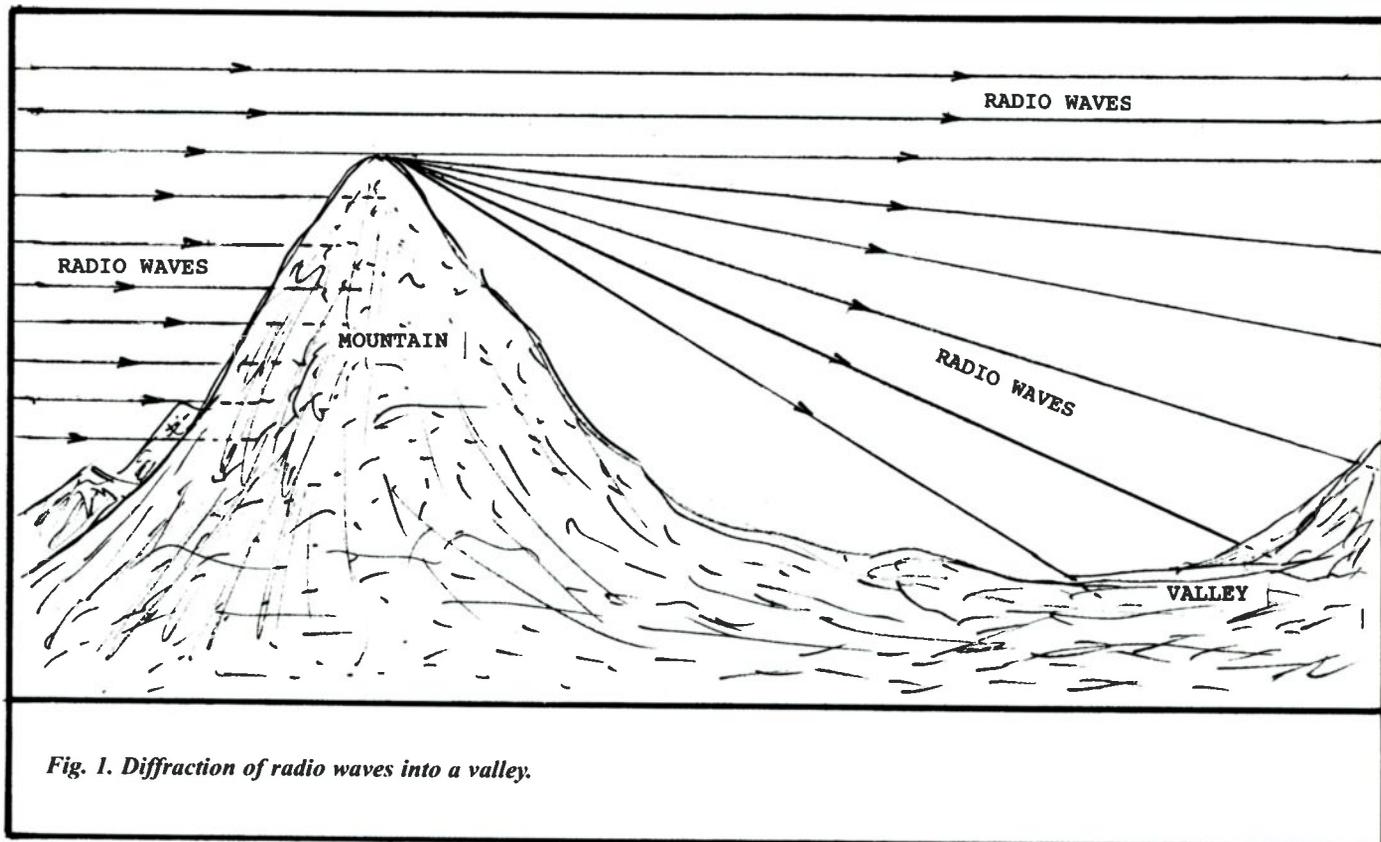


Fig. 1. Diffraction of radio waves into a valley.

This Month's Interesting Antenna-Related

Web site:

If you'd like to check out some free antenna programs look at:

<http://www.btinternet.com/~g4fqg.reggp/>

Don't forget to send in your suggestions for inclusion here as an interesting antenna-related web site to: clemsmall@hotmail.com.

Have you heard a marching band coming down a side street where the band is blocked from your vision, and even somewhat from your hearing, by intervening buildings? You may have noticed that you heard the bass drum long before you could hear the higher-pitched horns. This occurs because there is more diffraction of lower frequencies (the drum) than of higher frequencies (the horns).

A similar situation exists with radio waves. There is more diffraction of lower-frequency waves than of higher frequency ones. Thus higher-frequency signals follow the "line-of-sight path" rule more closely than do lower-frequency signals. Knowing this cleared up my confusion concerning being able to receive relatively lower-frequency, AM broadcast signals essentially anywhere I went.

The greater diffraction at lower frequencies is also the reason why the U.S. Navy uses such very low frequencies for its worldwide communication network. When diffraction occurs on the VHF and higher band around a relatively-sharp object such as a mountain ridge, it is sometimes called "knife-edge" diffraction. In the very-low frequency and lower bands, wavelengths reach hundreds and thousands of meters in length, whereas at VHF and higher they are measured in meters, and fractions of meters. To those longer waves, the bulge or bend of the earth's curvature is, comparatively speaking, a relatively "sharp edge." Thus ground waves of these lower frequency signals can continually diffract as they travel around the globe. If very-high transmitted power is utilized this diffraction makes reliable world-wide communication possible.

◆ Another Way to Put a Signal into a Valley

Despite the help our radio coverage gets from diffraction it is sometimes difficult to cover mountainous terrain completely with readable signal levels. Fortunately, there is a useful mode of propagation which comes to our aid in such situations. Fiedler and Farmer in their excellent book, *Near Vertical Skywave Communication*, cover both the basic theory and the practical application of this mode. All the following information on this mode is covered in their book (available at \$14.00 plus shipping from: Worldradio Books, P. O. Box 189490, Sacramento, CA 95818; phone 1-800-366-9192).

Near vertical incidence skywave communication (NVIS), can often be employed with standard radio equipment through merely a change in antenna placement! Although some antennas have been specially designed to support NVIS, most horizontal antennas can be adapted to this mode by simply placing them closer to the ground (.1 to .25 wavelengths high). Sometimes they are placed on the ground, or even under the ground! Vertical antennas, such as mobile whips, can be adapted by bending them to become more horizontal. Both changes cause the antenna's radiation and reception pattern to emphasize higher vertical angles.

NVIS depends on ionospheric refraction of its upward-directed signals. These signals are transmitted at vertical or near vertical angles, and when they encounter the ionosphere they are returned back to earth to an area surrounding the transmitting antenna for a radius of perhaps 300 -400 miles. Although upwards of 400 watts of transmitter power is advisable for NVIS, low-power backpack-type radios with only 20 watts of power can be utilized when received-noise levels are modest, and antennas are well matched to the transceiver. Frequencies employed vary from 2 MHz to 12 MHz, and, since this mode depends on ionospheric refraction, the frequency of these signals must be below the maximum usable frequency at the time of communication. When employed by knowledgeable operators, NVIS is a highly reliable mode of communications in mountainous terrain.

◆ Antenna Contest Coming Up!

Watch this column in upcoming issues of *Monitoring Times* for announcements of a contest held to find the most unusual antennas in existence! Keep your eyes peeled and your brain alert for antennas that are quite different from the ordinary ones we see everyday in the cities and countryside. We'll have rules and information on entering this contest with your choice for the world's most unusual antenna. We'll report the winner and runner-ups in a future column, and there will be a prize for the winning entry!

RADIO RIDDLES

Last Month:

I said: "OK, so we've talked about radio horizon, radio ground, radiovision, and radionics. Now what does "radiotrician" mean? Well "radiotrician" is another of those terms whose day is past. Although we seldom, if ever, hear this term nowadays it has been used in the past as an acronym for "radio electrician." Over time this term was replaced by "radio serviceman." Now we are more likely to hear the term "radio technician" than either of the two earlier terms.

This Month:

OK, so we've worried about radio horizon, radio ground, radiovision, radionics, and radiotrician. Now just what is "radio" anyhow? The answer may not be as simple as you think!

You'll find an answer for this month's riddle, another interesting, antenna-related web site, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.

New books and CDs for worldwide radio!

2001 SUPER FREQUENCY LIST CD-ROM

all broadcast and utility radio stations worldwide!

10,200 entries with latest schedules of all clandestine, domestic and International broadcasters on shortwave. 10,900 frequencies from our 2001 Utility Radio Guide. 17,800 formerly active frequencies. All on one CD-ROM for PCs with Windows*. You can search for specific frequencies, countries, stations, languages, call signs, and times, and browse through all that data within milliseconds. It can't get faster and easier than this! • \$ 23 (worldwide seamall Included)



2001 SHORTWAVE FREQUENCY GUIDE

Simply the most up-to-date worldwide radio handbook available today. Really user-friendly and clearly arranged! Contains more than 20,000 entries with all broadcast and utility radio stations worldwide from our 2001 Super Frequency List on CD-ROM, and a unique alphabetical list of broadcast stations. **Two handbooks in one** - at a sensational low price! 556 pages • \$ 32 (worldwide seamall Included)

2001 GUIDE TO UTILITY RADIO STATIONS

Now Includes many HF e-mail Pactor-2 radionets that we cracked! Here are the **really fascinating radio services** on shortwave: aero, diplo, maritime, meteo, military, police, press, and telecom. 10,900 up-to-date frequencies from 0 to 30 MHz are listed, plus hundreds of new decoding screenshots, abbreviations, call signs, codes, explanations, meteo / NAVTEX / press schedules, modulation types, all Q and Z codes, and much more! 612 pages • \$ 36 (worldwide seamall Included)



Special package price: CD-ROM + Shortwave Frequency Guide = \$ 45. More package deals available on request. **Plus:** 2001/2002 Worldwide Weather Services = \$ 27. Double CD Recording of Modulation Types = \$ 45. Radio Data Code Manual = \$ 36. Radiotelex Messages = \$ 14. WAVECOM Digital Data Analyzers and Decoders = the # 1 worldwide: ask for details. Sample pages and colour screenshots can be viewed on our comprehensive Internet site (see below). Payment can be made by credit card: Mastercard, Visa, and Eurocard. No cheques! Please ask for our free catalogue with recommendations from all over the world. We've been leading in this business for 32 years! ©

Klingenfuss Publications • Hagenloher Str. 14 • D-72070 Tuebingen • Germany
Internet <http://ourworld.compuserve.com/homepages/Klingenfuss>
Fax +49 7071 600849 • Phone +49 7071 62830 • E-Mail klingenfuss@compuserve.com

AOR's Pocket ACARS Decoder

This month we are going to look at AOR's almost-pocket-size, battery-operated, standalone ACARS (Aircraft Communications Addressing and Reporting System) and NAVTEX decoder and display unit – the ARD-2.

ACARS is a very interesting air-to-ground digital mode used by commercial and biz jets to report aircraft operations on VHF. We'll compare its performance to a laptop computer running WACARS, a freeware ACARS decoder program. We're cleared for immediate departure, so let's go.

◆ Where and What is ACARS?

ACARS has been a topic of many columns in *MT* over past years. In this age of signal encryption, ACARS is a digital mode of communication which is transmitted in the clear by airliners. In the USA and Canada ACARS can be monitored as an "eeking" 1 second pulse on 131.550, 131.475, 130.450, 130.025 MHz and 129.125. In Europe, ACARS signals can be found on 131.725, 131.525 and 136.900 MHz.

The airliner's aircraft registration number (which is printed on the fuselage), aircraft type, airline company and sometimes its location, can be easily decoded and displayed using a personal computer.

◆ AOR's Product Concept

With the current trend of shrinking communication receivers to the size of a pack of cigarettes (witness the ICOM R2 and Yaesu's VR-500), AOR has produced an ACARS decoder and display product that is battery-operated and not much bigger than these new receivers. The ARD-2 only requires a connection to a receiver's speaker/headphone jack. Then the ARD-2's two-line dot matrix liquid crystal display shows ACARS data. Decoded data can be scrolled on the display using two scroll buttons.

The ARD-2 is about the size of a thick calculator and uses four AA batteries. A jack for a 12 volt external AC power supply is provided on the back of the ARD. Turning on the unit puts the unit into the ACARS-1 mode.

The ARD-2 is very simple to operate. First connect the audio output of a receiver,

tuned to an active ACARS frequency, to the ARD-2. Then adjust the level control so that the red Decode LED on the ARD-2 panel lights when an ACARS signal is present. Data will begin to appear on the display.

In the ACARS-1 mode, valid ACARS signals will be displayed as six data fields: Mode Number, Aircraft Registration Number, Message Label Number, Message Block Number, Message Sequence Number and Flight ID including a Message Content. Lots of interesting data appear in this last field. This includes position information, estimated arrival times, fuel on board, equipment malfunctions and special instructions.

◆ Nice Additions

AOR has added some thoughtful features to the ARD-2. Once you connect to a receiver's speaker output, this disconnects the radio speaker. The result is that you can no longer hear what you are monitoring. The ARD has an internal speaker and volume control, so you still can hear the output of your receiver. The ARD-2 also has extra audio jacks for connecting other decoders and equipment. In a minute we'll make use of this capability to see how the ARD-2 and a PC ACARS decoder compare.

On the back of the ARD-2 I found a 9 pin connector; AOR designers have thoughtfully included a serial interface so data can be transferred and displayed on a computer. All it takes is a serial port cable and a PC running Windows Hyper-Terminal. In order to take advantage of the ARD-2's unique standalone capabilities we did use it attached to a PC in the serial data output mode.

◆ How Does It Work?

Now that we have the ARD-2 set up let's run WACARS, available free on the internet, on a Pentium I, 120 MHz laptop, running under Windows 98. The Line-In jack of the computer's sound card is connected to the

ARD-2's Ext Sp connector. Then we wait for a solid ACARS signal.

The ARD-2's red light blinks and its display shows "Mode 2." Pressing the scroll button results in the sequential display of the two lines (top and bottom) shown in Figure 1.

The WACARS decoder computer screen of the same signal is shown in Figure 2. You can see that both have decoded the same basic data. However, WACARS's databases have added more details such as the fact that flight N418UA is an Airbus A 320-232 aircraft. Also, in the Message we see that WACARS has translated BOS into BOSTON and IAD into Washington. These "translations" make the message much easier to understand. But, both decoded the same raw data.

I found that in most cases, the ARD-2 and the laptop running WACARS were comparable in their decoding capabilities. That's pretty good for a little battery-operated, standalone decode and display unit.

◆ A Rough Landing?

As we have seen the ARD-2 performed well. But using the ARD-2 has its difficulties. For one thing, you cannot read previously received decoded messages while you decode new messages. Once you press a scroll button the decoding function is suspended until you hit the Decode Start button. This method of operation is not very convenient and caused me to stare at a non-moving display wondering what was wrong, while missing decodes.

Reading data using two limited-length lines at a time is not easy. Sometimes it gets in the way of understanding the message. The ARD-2's internal memory limits the recallable decodes to two or three. After three or so decodes have been received and stored, they are overwritten by new incoming decodes.

Since operating current requirements is

ACARS Decode From ARD-2

Press 1	Press 2	Press 3	Press 4	Press 5	Press 6 & 7
Aircraft Reg:	Message Label:	Block id:	Msg. No:	Flight ID:	Message Content:
.N418UA	5Z	9M19A	UA1981	/R3 BOSIAD	1981-30 BOS

Figure 1 - ARD-2's Line-By-Line Decode of an ACARS Signal

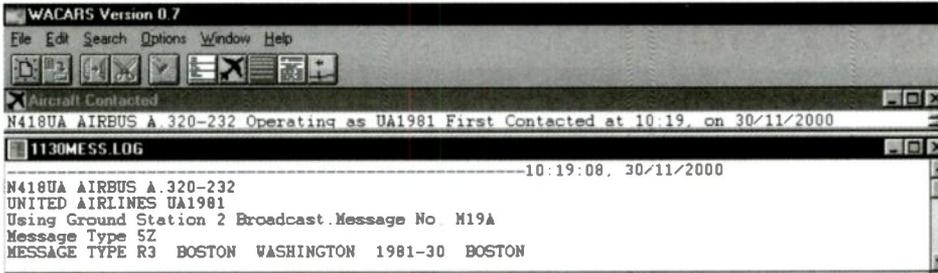


Figure 2 - WACARS Screen Shot of the Decode of the Same ACARS Signal as in Figure 1

high, 180ma, the battery life is limited to about 6 to 7 hours. With very little use of the display's backlight I could only get about 6 hours from a set of batteries before the unit started flashing uncontrollably. This flashing also occurred with a second set of fresh alkaline batteries after 6 hours of continuous use. I believe this indicates that a peak current requirement of the ARD-2 can no longer be met by the used batteries.

The first set of batteries tested very low under a standard load. But the second set of batteries tested in the low end of the acceptable range, thus confirming the peak current theory. Although I had about thirty "wall wart" power adapters in the workshop, I could not find one that fit the power connector on the ARD-2.

Finally, compare the costs. The ARD-2 weighs in at a hefty \$250, close to the cost of

a used Pentium I laptop. WACARS, an excellent program, with features we have not discussed, is freeware, costing little to nothing.

◆ Small + Standalone = ARD-2

For many of us the price comparison will be the deciding factor. However, if you must have a pocket size ACARS/Navtex decoder, then the ARD-2 does a great job and is the only game in town. The AOR ARD-2 is available from Grove at <http://www.grove-ent.com>. Also check AOR's website at <http://www.aorusa.com/main.html> and <http://www.aoruk.com/Default.htm> for updates and product specifications. The excellent WACARS program, whose modest minimum requirements are a Pentium I 100 MHz, Windows 3.1 and 8 MEG of RAM, is available at

<http://www.geocities.com/CapeCanaveral/Cockpit/9870/acars.html>

Also check out these sites for more ACARS info, decoder, support programs and ACARS links:

<http://patriot.net/~acars/>

<http://www.tardis.ed.ac.uk/~kr/kracars/index.html>

◆ One Final Thought

Does anyone know of an ACARS decoding program for Palm Pilot, Windows CE or the Pocket PC? That would be sweet! Email me if you know of any such decoder applications for these PDA/handheld computers and I'll pass them along to everyone.

◆ What's Next?

As a very active pilot at the time, I remember when ACARS was born. It has been around since 1978 when it was first introduced into commercial aviation. In the electronics industry nothing lasts forever. So what will replace ACARS? When will it be introduced? You may be surprised by some of the answers. Next time we'll compare the proposed new system to our old friend ACARS and share some readers' letters. Remember, when the snow flies so do the ACARS messages.



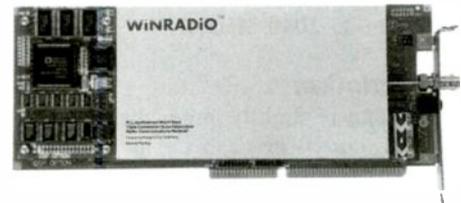
WINRADIO WR-1550

New WR-1550, with improved dynamic range! Continuous 150 kHz - 1500 MHz frequency coverage (less cellular), multimode detection (AM, NFM, WFM, USB, LSB, CW), IF shift (+/-2 kHz), sharp selectivity (2.5, 6, 17, 230 kHz), high sensitivity (0.3 uV SSB and NFM), built-in spectrum display, and triple superheterodyne conversion. This is the receiver that sets the standards!

Choose from two models: the WR1550i plugs into an unused ISA port in your desktop computer - \$499.95 plus shipping; or the WR1550e external module for convenient use with a portable computer - \$549.95 plus shipping.

RCV47-E - WinRADIO 1550 External: \$549.95 plus \$11.95 shipping in the U.S.

RCV47-I - WinRADIO 1550 Internal: \$499.95 plus \$11.95 shipping in the U.S.



Grove Enterprises, Inc.

800-438-8155

7540 Highway 64 West

Brasstown, NC 28902

828-837-9200 828-837-2216 (fax)

order@grove-ent.com

GROVE
WWW.GROVE-ENT.COM

The only authorized WinRADIO repair center in North America.

AOR AR8600: Part 1

The arrival a few years ago of the AOR AR8000XLT was a much-heralded event; it was arguably the best hand-held scanning receiver on the market. With wide frequency coverage from below the AM broadcast band to above 1000 MHz, sporting multimode reception including single sideband, and with good strong-signal-overload resistance, it stood at the top of the thin rank of super scanners.

The subsequent upgrade to the AR8200XLT, and most recently the AR8200XLT Mark II, gave it even more respect among experienced scanner listeners. But AOR wasn't finished yet; they still didn't have a desktop/mobile unit.

Now being delivered to dealers, the new AR8600 is essentially an AR8200 in a bigger box. It has a wide choice of functions, but some of the compromises of a small, price-competitive radio as well. The 143-page manual is comprehensive, well written, and informative. Unlike many Asian-written manuals, this one is in readable English!

This month we will take a look at the 8200's 100 kHz-30 MHz performance; in our next installment, Bob Parnass will concentrate on 30-2040 MHz.

◆ Description

The unit is slightly larger than a conventional, under-the-dash CB or scanner (see specifications below for measurements). A front tilt bail allows the unit to face up toward the operator for desktop applications. Frequency entry is by a multi-function numeric keypad; a detent-type tuning knob allows manual slewing across the spectrum, and may be fast/slow commanded by touching adjacent tuning-speed keys. Power may be derived from a mobile or portable 12 VDC source, an optional BP6000 internal battery pack, or from the

AC adaptor (included).

A temperature-compensated crystal oscillator (TCXO) assures excellent frequency stability. The receiver is factory-preprogrammed for automatic selection of mode for any frequency; this default is defeatable by a manual mode selection.



Front panel controls include volume (with on/off switch), squelch, and tuning. The LCD and all function keys are brilliantly lit (defeatable for battery conservation); signal strengths are displayed on a horizontal bar graph.

Rear panel jacks are provided for antenna (BNC, 50 ohms), IF output for optional SDU5500 (BNC, 50 ohms), 12 VDC power (standard coaxial plug), plug-in ferrite antenna for medium wave broadcast (included), optional speaker (1/8-in. mini jack), and a standard 9-pin RS232 for elective computer control.

A DIN socket provides several modes of audio for recording, as well as unfiltered detector output for data decoding. A tape-recorder activation control line is there, as well as +5VDC @ 30 mA for powering an optional digital device.

And there are five slot-card ports to accommodate options like: 20-second digi-

tal record/playback, 4000 channel external memory, voice inversion decoding (available only to government users), CTCSS, and audio tone eliminator.

While an admirable selection of reception modes and filters is provided, there is no synchronous detection. Collins mechanical replacement filters for SSB and AM are available on special order.

The rugged diecast cabinet is well fabricated and provides an extra measure of shielding. A single BNC antenna connector is used for the entire frequency range; a telescoping whip is included for near-field monitoring. The two-inch, top-mounted speaker provides remarkable audio quality and volume for its size.

Favorite frequencies and modes may be stored in up to 1000 memory channels in 20 banks, with a search/scan rate of 37 channels per second. The radio comes with factory-memorized frequencies of interest and band plans for the U.S. market. On-screen menus are readily navigated for custom programming.

In our next (final) installment, Bob Parnass will discuss the VHF/UHF performance, including the flexible scanning features which are more applicable to that portion of the spectrum.

◆ Sensitivity

The ability of a receiver to detect weak signals is of paramount interest to most listeners. The AOR will actually tune down as low as 100 kHz, but below the AM broadcast band (530-1700 kHz) it is profoundly lacking in sensitivity. At 100 kHz, LORAN-C was only faintly audible, while strongly heard on a comparison receiver, and a local 335 kHz aircraft beacon could

be barely heard in the background hiss, also strong on the comparison receiver.

At medium wave, local broadcasters came in loud and clear with the external antenna connected, but when we attempted to use the plug-in ferrite bar antenna alone, signal strengths dropped dramatically. When the receiver is tuned above 1.9 MHz, the BNC antenna connector is automatically selected, and the ferrite bar is deselected.

◆ Selectivity

In the crowded spectrum, a receiver must be able to discriminate between the desired signal and the adjacent-frequency signals often interfering with it. Communications receivers thus employ filters with steep "skirts," i.e., sharp attenuation of signals just above and below the frequency of the tuned signal.

Such filters are relatively expensive, and they are unnecessary in VHF/UHF scanners where signals are reasonably spaced by a regular channelization plan. But at shortwave, signals are found wherever they happen to be, and sharper selectivity is the norm.

Unlike some other manufacturers who choose to use the same wide filters at shortwave that they use on their VHF/UHF radios, AOR wisely provides wide, medium and narrow filters to allow the user to optimize his receiver selectivity for band conditions.

Specifications

Display: Large, edge-lighted LCD with 12-character alphanumeric capability.

Frequency range: 530 kHz-2040 MHz (tunable down to 100 kHz with reduced sensitivity)

Modes: AM, WAM, NAM, USB, LSB, CW, WFM, NFM, SFM

Tuning steps: 50, 100, 200, 500 Hz; 1, 2, 5, 6.25, 8.33, 9, 10, 12.5, 20, 25, 30, 50, 100 kHz

Sensitivity: 1.5 μ V SSB, 2.5 μ V AM (3.5 μ V 530 kHz – 2 MHz)

Selectivity: 3, 9, 12 kHz AM; 3 kHz SSB

Antenna connector: BNC; telescoping whip provided

Power requirement: 12 VDC nom. (10.8-16 VDC max.) @ 350 mA, AC adaptor included

Computer control: RS232 port

Size: 6"W x 2-1/4"H x 7-3/4"D

Weight: 3.3 lbs.

◆ Spurs

The presence of "wandering birdies" is quite pronounced on the medium wave broadcast band. When first turned on, the ascending and descending whistles are heard at approximately 50 kHz intervals. They don't go away, but merely stabilize somewhat after warm-up. These internally-generated spurious signals were widely reported in earlier AOR scanners like the AR1000. Fortunately, they are absent above 2 MHz.

The shortwave spectrum is quite clean of self-generated signals – one or two minor artifacts heard here and there – but unusually clean for a moderate-cost, broad-spectrum receiver.

◆ Dynamic range

For top performance, a receiver must be able to handle equally well weak and strong signals. It's a design juggling act, since high-sensitivity receivers often overload easily with strong signals, producing desensitization as well as intermodulation; both are highly undesirable characteristics. Conversely, circuits which withstand the onslaught of strong signals often have poor sensitivity.

With an outdoor antenna connected, and being tuned for shortwave reception, the AR8600 exhibits considerable intermod, evidenced as a constant background din of mixed signals which aren't really on those frequencies. The overload is most prominent at night when signals are strongest.

Selecting the attenuator reduces the interference considerably, but it is still there. An external attenuator or smaller antenna would bring the signal levels down to an acceptable level.

◆ Single sideband

With the singular exception of 27 MHz CB, the vast majority of shortwave voice communications are in the single-sideband (SSB) mode, with upper sideband (USB) dominating. The 8600 offers a selection between upper and lower sideband (LSB), offering true carrier re-insertion. Fine tuning is in 50 Hz steps, marginally adequate for resolving voices to natural-sounding intelligibility, but not music.

If a user wants to use a sharp-filtered digital decoder for reception of packet, RTTY, etc., it may require a much tighter adjustment of mark/space tones than the 8600 is capable of providing.

◆ Band scope

The ability to display signals visually on a screen is a desirable feature, usually accomplished by an accessory spectrum display unit. The multifunction band scope

in the 8600 shows signals throughout a 10 MHz span, operates in a peak-hold condition, and even stores the trace for later recall.

Because of the slow sweep time – nearly a minute for a 10 MHz span at 5 kHz intervals (faster for smaller spans and larger steps) – the feature is not as reliable as a real-time CRT for catching on-off keying by two-way radio users, but it does show the presence of constant carriers from AM/FM/TV broadcasters and other longer-term signals.

A 10.7 MHz IF output is provided for an external spectrum display unit like the SDU5500. It is internally set to operate only in the WFM mode in order to minimize spurious signals that may be heard on narrower filters. If all-mode SDU display is desired, an internal jumper may be moved (from R500 to R501).

When used with a standard SDU like the AVCOM SDM42A, the maximum span is 4 MHz. The 8600 must handshake with the companion AOR SDU5500 for full function.

◆ The bottom line

While not satisfactory as a primary receiver in a serious, analytical environment, the AOR AR8600 is a worthy contender as a wide-frequency coverage receiver where compact size, self-powered portability, and modest cost are the prime considerations. It does a very good job with a small, all-band antenna, and it is feature-packed.

Universal Video Descrambler



For Free Information Package and Pricing:
www.rcdistributing.com

R.C. Distributing Co. Phone (219) 233-3053 Fax (219) 289-1566

KEEP YOUR C-BAND SYSTEM RUNNING STRONG!

Free Buyer's Guide

BEST VALUES ON...

- Receivers, including 4DTV
- Dish Movers & LNBs, all kinds
- Tune-up Kits, Tools & Parts
- Skypac® Programming
- Toll Free Technical Help

1010 Frontier Dr.
Fergus Falls, MN 56537
Fax: 218-739-4879
Int'l: 218-739-5231

800-543-3025
www.skyvision.com

Skyvision

SCANNER EQUIPMENT

EQUIPMENT AND ACCESSORIES FOR YOUR MONITORING POST

Bob Parnass

parnass@megsinet.com

http://www.megsinet.com/parnass

RT Systems Software for the Yaesu VR-500

We reviewed the Yaesu VR-500 portable, wide coverage scanner in February 2000 *MT* (fig. 1). Its tiny size, 1000 channel memory capacity, and alpha labeling make the VR-500 attractive. The VR-500's full numeric keypad makes it easier to enter frequencies than its ICOM IC-R2 competitor (April 1999 *MT*). Despite the improved keypad, it's easier to program the VR-500 using a personal computer.

There are compelling reasons to use a personal computer for scanner programming. Programming more than a couple of dozen frequencies is time consuming, especially if you program alpha labels along with the frequencies. It's easier to type them on a full size computer keyboard than a small radio keypad. Programming via a PC saves wear and tear on the radio keypad, which is more expensive to replace than a \$15 PC keyboard, a commodity item these days.

In theory, the radio should retain its memory contents for a long time even when batteries are removed. But, some of us have accidentally "wiped out" memory contents when experimenting with undocumented keystroke sequences or zapped them with static electricity on a dry day.

◆ RT Systems VR-500 Programmer

RT Systems is an American firm best known for developing Yaesu programming software. We've used their ADMS-IC software for years to program a FT-50R dual band walkie-talkie. RT Systems now offers ICOM, Alinco, and Kenwood programming software, too.

The ADMS-3 package includes both ADMS-3U Windows software on floppy disk and a CT-29A radio to PC cable. While the software is designed specifically for the VR-500, the CT-29A cable is usable with several different radios.

The CT-29A cable is well constructed. It

is fitted with a 9 pin serial port connector on one end and a 3-conductor 1/8" plug on the other, which plugs into the VR-500. It comes with a 3 to 4 pin plug adapter for use with other radios. We use the CT-29A with the VR-500, FT-50R, and an ICOM IC-R2.

The ADMS-3 package sells for \$39, but RT Systems sells the software and cable separately for \$20 and \$25 respectively.

We installed software version 2.01 for this review, running under Microsoft Windows 98 SE on a 266 MHz Pentium II processor. Installation is straightforward.

Unlike other software, e.g., the SONY ICF-SC1PC, ADMS-3 lets you choose any COM port. You select or change the COM port setting from within

the program after installation.

◆ Main Window

ADMS-3's main window (fig. 2) is visible at all times. Major sections are represented as tabbed pages: memory channel programming, VFO scan (search limits), Dual Watch memories, Auto Band (band plan), global settings and Preset Mode.

File, Radio, and Help pulldown menus are listed in a row along the top. Oddly, there is no Edit menu. The cut, copy and paste icons are always grayed out and are not functional. Experimentation shows that CTL-X, CTL-C and CTL-V keystroke combinations perform cut, copy, and paste operations after clicking on a frequency in the Memory View page. They are not documented in the Help file.

◆ Memory View Page

The Memory View page contains a single grid or table of 1000 memory channels. The VR-500 sup-



Figure 1. Yaesu VR-500 wide coverage receiver

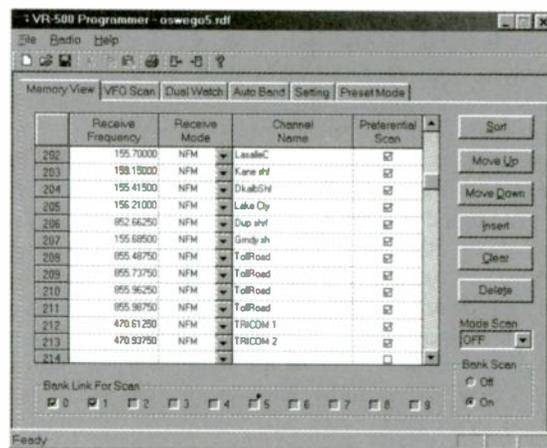


Figure 2. ADMS-3 main window and Memory View page

ports 10 memory banks but the ADMS-3 grid shows the entire memory as single table. Only 13 channels are visible at a time and you cannot resize the window to see more. You must use the vertical scroll bar at the right margin to bring other channels into view.

Buttons down the right side are useful for sorting and moving data within the table. You can sort some or all of the channels by one or two criteria: by frequency, label, mode, and preferential scan.

The Memory View page contains scanning parameters as well, including checkboxes representing the banks to be scanned.

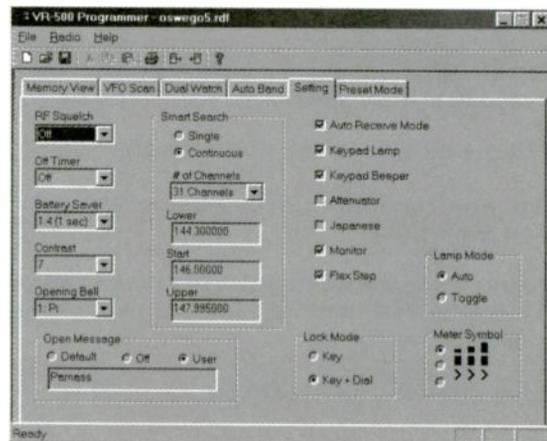


Figure 3. The Settings page controls global parameters

Channel	Receive Frequency	Receive Mode	Step Size
38	161 50000	NFM	25 kHz
39	182 90000	NFM	12.5 kHz
40	174 00000	NFM	50 kHz
41	218 00000	NFM	5 kHz
42	225 00000	AM	100 kHz
43	262 00000	NFM	12.5 kHz
44	270 00000	AM	100 kHz
45	271 00000	NFM	12.5 kHz
46	275 00000	AM	100 kHz
47	338 00000	NFM	12.5 kHz
48	420 00000	NFM	25 kHz
49	450 00000	NFM	12.5 kHz
50	512 00000	WFM	50 kHz
51	770 00000	NFM	25 kHz
52	1240 00000	NFM	25 kHz
53	1300 00000		

Figure 4. Auto Band page

❖ Setting Page

The Setting page (fig. 3) allows access to the parameters which "personalize" the VR-500, e.g., the keypad confirmation tone, S-meter symbol, initial display greeting message, display contrast, etc.

Timer, battery saver, and Smart Search (auto store) limits are set here, too.

❖ Importing and Exporting Data

Higher quality radio software provides the ability to exchange data with other programs. ADMS-3 software lets you export the frequency, label, and preferential scan flag fields to either a tab (.tab) or comma (.csv) separated values file for further processing by other programs. We wish it could export the channel number, too, so you could read them into Microsoft Excel and print custom formatted frequency listings.

Frequencies and mode data may be imported from tab or comma separated values files.

❖ Other Features

Search limits, search parameters, and skip frequencies are established using the VFO Scan page Band scope and priority channel information are programmed here, as well.

Mode and step size defaults are determined by frequency and alterable on the Auto Band page (fig. 4).

A print facility allows you to create a paper report of all memory channels. An options window offers control of several print formatting parameters, but ADMS-3 ignores them and prints an entire frequency list using its own settings instead! We con-

firmed the defect with another ADMS-3 user and reported the problem to RT Systems.

❖ Overall

There are several free and commercial programs available for programming the ICOM IC-R2, and this makes the IC-R2 attractive. By contrast, VR-500 owners are currently limited to ADMS-3.

Fortunately, ADMS-3 does most of what it's supposed to do and is simple to use. The version 2.01 software has a few defects and omissions.

ADMS-3's single memory table is counter to the way we visualize memory banks. We prefer the paradigm employed by Butel's ARC2 software for the ICOM IC-R2, which uses a separate tabbed page for each memory bank.

The CT-29A cable is an excellent product due to its construction and adaptability to different scanners.

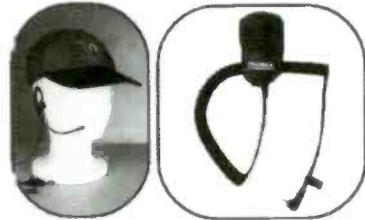
For more information, contact: RT Systems, P.O. Box 12188, Huntsville, AL 35815, telephone 1-800-750-9689 or visit their web page at <http://www.rtsars.com>.

Accessorize Your Portable!

Whatever your interest in hobby radio, **PRYME Radio Products** has an accessory item for you! We manufacture a full line of aftermarket products for all types of portable radios, from microminiature Family Radios, to scanning receivers, to amateur or commercial handheld radios. Our accessories are reliable, innovative, and affordably priced. We provide accessories for all major bands of radio including Motorola, Kenwood, Icom, Vertex, Uniden, and many, many more!

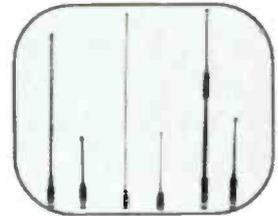
Audio Accessories

Our innovative audio products have made us famous. From the comfort of our SPM-400 mini-boom microphone to the low-profile of our EH-1 "invisible" ear phone and SPM-700 surveillance mic, we have the right accessory for the job!



Antennas for Handhelds

Most stock antennas for scanners or portable radios are extremely poor. Upgrading to a better antenna can make a huge difference in performance. Our antenna products are specifically designed for maximum performance and durability.



Batteries / Portable Power

We offer many models of rechargeable battery pack for today's most popular handheld radios, as well as a number of portable "power stations" for those who need "power to go."



Order on-line from our entire line of high quality, accessories. Visit our on-line store on the web at:

<http://www.prymebattery.com>

PRYME
Radio Products

by **PREMER Communications Corp.**
480 Apollo St. #E • Brea, CA 92821
Phone: 714-257-0300 • Fax: 714-257-0600
Web: <http://www.adi-radio.com>

Radiomap™

Transmitter sites in your area are researched and marked on a beautiful 11 x 17 full color plot. See FCC licensed sites from VLF through microwave plus selected FAA transmitter sites. Call signs, frequencies, and names provided. Ham radio stations excluded.

You choose the map center location - anywhere within the United States. We adjust map coverage for best readability. Deluxe report includes additional index by frequency and local spectrum occupancy chart.

Used by radio professionals and hobbyists since 1994 for identifying towers, sources of radio signals, interference, etc. Send nearest street intersection for map center and check for \$29.95 or \$39.95 (Deluxe report) payable to Robert Parnass.

Robert S. Parnass, M.S.

Radio electronics consulting
2350 Douglas Rd. Oswego, IL 60543-9794
www.megsnet.com/parnass



Not much interference on this page? That's what this filter does for your scanner. Call today. 1-800-438-8155.

Order FTR-100 today for only \$49.95 plus \$5.95 shipping direct from Grove at www.grove-ent.com or call 800-438-8155/
828-837-9200 or send check or money order to Grove Enterprises, Inc., 7540 Highway 64 West, Brasstown, NC

MT

REVIEW

Emerson Universal Multi-System Video Converter

By Ken Reitz KS4ZR

History is filled with weird anecdotes of engineering oddities. And, while we may be inclined to believe that in our modern computer dominated world we are all in agreement as to engineering standards, we don't have to look far to find proof of the opposite. Even the precise world of computer engineering struggles with Mac and PC standard deviations. Two decades ago it was VHS versus Beta, and thirty years ago it was eight track cartridge versus cassette. A reasonable person might expect that the best engineered system wins, but, a reasonable person is always shocked to find that isn't true.

Consider the world of color television. In the U.S., as television progressed in the 1940s, there were so many incompatible standards for television broadcasting that an industry-wide organization was formed in 1948 to set, once and for all, a television broadcast standard. The organization was the National Television System Committee and the American standard would be forever known by the Committee's acronym: NTSC. Nearly a decade later the French had improved upon the NTSC standard with its own Sequential Color A Memoire or SECAM. Four years after that the British had a go at improving things and developed its system known as Phase Alternating Line or PAL. Now, these "improvements" were not exactly earth shaking in their differences, but the differences made it so that none were compatible with any other.

Following a confusing pattern of adoption, all countries around the world have opted for one of the three systems. As a result PAL is used in Britain as well as much of Africa; France uses SECAM; many eastern European countries including Russia also use SECAM; Latin America uses a patchwork quilt of all three including three variations on PAL; the U.S., Canada and

Mexico use NTSC as do Nicaragua, Cuba and the Philippines.

◆ Emerson's Video Converter in Action

Before the introduction of Emerson's Universal Multi-System Video Converter the only ways to convert PAL to NTSC or vice versa was to use a multi-standard video monitor/TV set or a multi-standard VCR. Both are traditionally more expensive than their less talented counterparts and force the user to lug around another big piece of electronic gear. The Emerson converter really helps in that department because it's barely bigger than a video cassette, weighs in at just one pound, and the design couldn't be simpler.

The back panel has an RCA video input jack, into which the source video is plugged, and an RCA video output jack which takes the converted signal to your PAL or NTSC TV set. The unit is set up to automatically detect the type of video received, but you can manually change the input with an Auto/Manual switch. An LED on the front panel indicates which input you chose. Another LED lights on the front to indicate the type of video received.

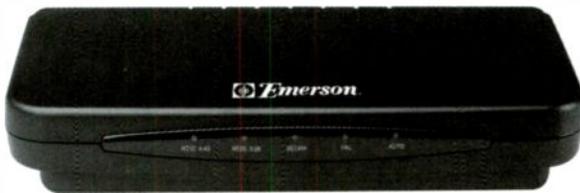
For the unit to work properly you must take the video from any source (satellite receiver, camcorder, laser disc or VCR) via the familiar yellow, white and red RCA jacks. The yellow jack is video out and the other two are for left and right audio. There are no coax connections. For proper reception and to get both video and audio you must use a VCR or TV set equipped with the three RCA jacks.

The Emerson converter is most useful for people on overseas assignment who don't want to have to buy new TVs or VCRs and for satellite hobbyists who want to be able to watch international transmis-

sions. These transmissions are occasionally found in both C and Ku-band and most frequently are sporting events being back-hauled to England. The Emerson converter will work with both analog and digital satellite receivers.

What this product won't do is allow you to play a PAL recorded video tape in an NTSC VCR; the conversion is done with the output signal of the video device. If you want to watch PAL format videos you'll have to use a PAL VCR.

The Emerson Universal Multi-System Video Converter (model #EVC1575) retails for \$219.95 and is available from Skyvision at 800-500-9275 or visit their web site at <http://www.skyvision.com>.



New! Your own weather forecaster!

Our new Vantage Pro weather stations let you monitor temperature, wind, rain, barometric pressure, UV, humidity, and more. Quick-view icons show the forecast at a glance while a moving ticker tape display gives more details. Mostly clear with little temperature change? Increasing clouds and cooler? Whatever the forecast, Vantage Pro will let you know. Wireless or cabled, starting at just \$495!

Order now, or ask for your FREE catalog.

Davis Instruments

3465 Diablo Ave, Hayward, CA 94545
800-678-3669 • www.davisnet.com

MOT0102

What's NEW

Tell them you saw it in *Monitoring Times*

AR8600 Receiver

AOR's AR8600 is an extremely versatile receiver with all-band (from 530 kHz to 2040 MHz, less cellular) and all-mode capability (WFM, NFM, SFM, WAM, AM, NAM, USB, LSB, CW). It can be used virtually anywhere – mobile, base or portable – since it can be powered from an external 12V d.c. power supply, optional d.c. lead from a 12V vehicle, or from an optional internal NiCad battery pack. Its double-walled metal case and die-cast front panel add to its shielding and durability. An RS232 port further extends the capabilities with free control software available from the AOR web sites.

Although many features were



adopted from the sophisticated AR8200 Series-2 hand held receiver, the AR8600 RF front-end is an all new design with preselection around VHF to ensure the highest levels of adjacent channel rejection.

In addition to a hinged telescopic whip aerial, the AR8600 is supplied with a detachable medium wave bar aerial for localized medium wave monitoring. An additional BNC socket is mounted on the rear chassis so that 10.7 MHz i.f. output may be extracted for use with an external spectrum display such as the AOR SDU5500.

The frequency display is a multi-section back-lit LCD with alpha-numeric text. Controls include numeric keypad, navigation keys, rotary tuning control and separate controls for volume and squelch control.

Channel steps are provided in a menu and may be programmed. Step may be programmed by the operator in any receive mode using multiples of 50 Hz in any mode (i.e. 5 kHz, 12.5 kHz or even 1.25 kHz). The all important 8.33 kHz air band channel step is correctly implemented (eight-and-one-third, 33, 66, 00). Extensive step-adjust and fre-

quency offset facilities are also provided to ensure tracking of the most obscure band plans.

The AR8600 contains 1,000 memory channels in 20 banks; can accommodate 50 select scan channels and 1 priority channel; and has a maximum scan/search speed of 37 steps per second. The AR8600 is now available for \$899.95 from Grove Enterprises (1-800-438-8155) and other leading dealers.

See Bob Grove's review of the HF portion of the AR8600 in this issue on page 82; watch for Bob Parnass' take on the 8600 as a scanner in a later issue.

Also watch *MT* for announcement of AOR's JT2000 cutting edge, computer-host receiver, rumored to have a February release date.

New Shortwave Receiver from Patcomm

Patcomm Corporation came into being as recently as 1993, but one look at the design of their amateur radio transceivers and the RX-16000A HF receiver tells you these folks know their business. According to the literature, the 16000 is a multi-mode receiver that covers 100 kHz to 30 MHz on CW, SSB, RTTY/ASCII and AM. A built-in modem decodes CW and RTTY/ASCII text on the large, easy-to-read display, and a keyboard interface to the included AT style keyboard is also built-in.

The RX-16000 uses 2.4 kHz and 500 Hz Collins mechanical filters for IF selectivity in CW and SSB modes; a 6 kHz ceramic filter is used on AM. Digital signal processing filters help clean up the audio even further, aided by noise fighting features like IF shift, manual notch filter, fast/slow AGC selection, and noise blanker.

Frequency selection and the 90 memory channels are accessed from the keyboard or the front panel.

The chassis is aluminum and measures 14.5 inches wide, 15



inches deep, and 4.25 inches high.

This high end receiver has a price to match the high quality of its components: list price is \$1,295. For more information on this advanced receiver, visit <http://www.patcommradio.com> or write or call Patcomm Corporation, 7 Flowerfield Suite M100, St James, NY 11780; 631-862-6511, patcomm1@aol.com. A computer-hosted version of the 16000 may also be available.

Talk to the Satellites

ICOM has announced a new amateur radio transceiver with enough power to work the satellites without requiring an external power amplifier. The IC-910H is a VHF/UHF all mode transceiver with 100 watts of power – although preamplifiers for each band are still an option for an extra boost and optional digital signal processors (DSP) can provide better signal-to-noise ratio.

Two data sockets provide easy packet connection for simultaneous operation on two bands. A limiter prevents modulation whenever the input level to the radio is exceeded.

The display is a generous 3.5-inch screen, even though the receiver is small and easily transportable for



field day or other portable operations. Control is via a 10-key entry pad, direct entry or memory channels.

The DC power cable and HM-12 hand microphone are included. The 910H is still awaiting FCC type acceptance, so check out availability and pricing on the 910H at your ICOM dealer or visit <http://www.icomamerica.com>

DX Edge for the Wrist?

DXers might have special reason to be interested in a new watch collection introduced by Wild Seed Inc. in San Francisco, California.

Through an innovative use of a colored LCD, a microcomputer and a one handed quartz movement you can see at a glance how much daylight and nighttime is in the 24-hour cycle, when sunrise and sunset is and what phase the moon is in.

DXers know that best reception is often during those hours or minutes when a path of darkness lies between their location and the station they are trying to hear. The YES watch shows not only the remaining darkness for your own location, but keeps time for up to three locations simultaneously.

The user chooses between 12 hour and 24 hour digital time display; it automatically adjusts for DST. YES watch shows accurate sunrise and sunset times, month, date and day.



Other features are a sunrise and a regular alarm, 24 hour stopwatch with lap time, water-resistance, and nighttime illumination.

With Swiss parts movement and state-of-the-art electronics, the YES watch ranges in price from \$199 to \$399; the stainless steel design is mid-range at \$299. For more information, visit <http://www.yeswatch.com>, or write or call YES, 2269 Chestnut Street #618, San Francisco, CA 94123; 1-877-YESWATCH.

Snoop Out Snoops and Snitches

As miniature wireless cameras become smaller, cheaper and easier to hide, the general public is growing wary of being watched by hidden cameras planted in hotel/motel rooms, public restrooms, rental units, dorm rooms, dressing rooms, etc..



Now there's a personal protection device known as the Plus Guard. This little device, designed to fit on a key chain, is made to discreetly locate hidden transmitters. Fitting in the palm of your hand, the Plus Guard is convenient, inexpensive and easy-to-use. Simply press the side button and it looks for radio waves being emitted by hidden transmitters. A yellow light means no transmitter has been detected; orange means radio waves have been detected in the general area; a red light appears as you home in on the transmitter. The red light then blinks with a low audio alarm within inches of a transmitter!

To their credit, the website does post a cautionary note regarding false alarms, listing TVs, Cell/PCS Phones, 2-way pagers, 2-way radios, computers, etc. as other possible sources of RF.

Included are an optional antenna for extended range and batteries. Plus Guard is available for \$42.95 from many Ham Radio Outlet stores, counter surveillance shops, or online from KK6YO's Ham Shop (follow the links from <http://www.theplusguard.com>, or contact 4455 Torrance Blvd. #294, Torrance, CA 90503, 1-888-630-6666, Fax: (310) 533-0779; Email: sales@kk6yo.com)

Police Call Radio Guide

Southern California Edition
by Gene Hughes

Hughes' new 2001 guide to scanner monitoring focuses on federal government, military, law enforcement, radio/TV news teams, amateur repeaters, conservation, entertainment, and security frequencies. Even though Southern California is the emphasis, many agencies (like military and federal government) utilize nationwide allocations, making this a good reference guide across the country for spectrum exploring.

An introductory chapter on scanner technology, repeater architecture, and signal propagation is an excellent tutorial for all listening hobbyists. Cross-listed by frequency and agency, listings also include location, channel ID, unit designators, call signs, and CTCSS tones.

\$14.99 plus \$3 shipping from U.S. Radio Data, 11 Deer Hill Rd., Lebanon, NH 08833.

Short-Range Wireless Communication

by Alan Bensky

The gradual reduction in wired electronics has created a whole new field for short-range radio systems. Computers, phones, control systems, signaling, security, and more all require transmitters, receivers, antennas, programming, and many other hardware/software considerations.

Bensky's text is designed for RF engineers who don't mind the math. Block diagrams showing signal paths, along with supportive schematics illustrate the text. A CD-ROM containing Mathcad worksheets and a PDF file of the book is included.

\$49.95 plus \$5 shipping from LLH Technology Publishing, 3578 Old Rail Road, Eagle Rock, VA 24085; phone (540) 567-2000, fax (540) 567-2539, or visit <http://www.llh-publishing.com> on their web site

HAMCALC 48

"Aversion to mathematics is not an acquired distaste - it comes naturally," reads the motto on the menu. Now in its 48th version since the disk was first offered in 1993, HAMCALC is a compilation by Canadian amateur George Murphy, VE3ERP, of around 250 "Painless Math and Design Programs for Radio Amateurs and Professionals." It contains so many programs that the disk is now a CD. HAMCALC requires a WINDOWS operating system, and Murphy recommends the program be installed on your hard drive for best operation.

Contents and programs are organized alphabetically into six sections: 555 Timer to Code; Coil to Impedance; Inductance to Potentiometers; Power to Stubs; Sunrise to Yagi; and Yagi to Zepp. An index provides a helpful cross-reference if you can't find the tool you're looking for.

For learning or designing radio projects this CD-ROM makes a wonderful reference tool, and best of all, it's available for the cost of shipping and materials. Send US\$7 check or money order to George Murphy VE3ERG, 77 Mackenzie Street, Orillia ON L3V 6A6, Canada (e-mail ve3erp@encode.com)

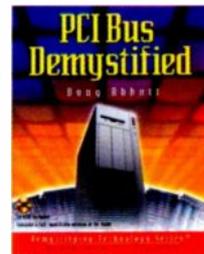
PCI Bus Demystified

by Doug Abbott

Computer hardware and software designers will appreciate this update on peripheral component interconnect (PCI), the dominant data exchange mechanism for modern computer systems. With high resolution graphics, wide-bandwidth video and networking, the last two decades have seen enormous changes in data handling requirements.

Chapters discuss how multiple masters share the bus, data transfer protocols, advanced and optional PCI features, plug and play, error detection and reporting, PCI bridging to increase capacity, PCI BIOS, and the new Compact PCI. Extensive charts and tables are provided to make the system designer's task easier, and a PDF CD-ROM of the book is included.

\$49.95 plus \$5 shipping from LLH Technology Publishing, 3578 Old Rail Road, Eagle Rock, VA 24085; phone (540) 567-2000, fax (540) 567-2539, or visit <http://www.llh-publishing.com> on their web site.

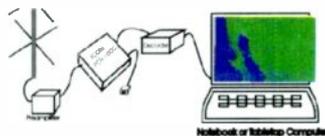


Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to mteditor@grove-ent.com.

Swagur
ENTERPRISES



TIMESTEP



If you own an ICOM PCR1000, all you need for Weather pictures is an antenna, a preamplifier and a TIMESTEP interface for your computer.

If you would like to see colored weather images as they move across the United States and Europe, call or email us. It is easier than you may think. With a dish looking out a South facing window, a Feed, an LNA, a Timestep Receiver and Timestep Interface, your computer and you are ready to receive these kinds of images.



U.S. GOES/WEFAX IMAGE



Dish in window



Timestep GOES RECEIVER



Timestep interface



European WEFAX Image

We have all you will need for INMARSAT except the Receiver

SWAGUR - TIMESTEP
email: swagur@swagur.com

Box 620035 - Middleton, WI 53562
Phone/Fax 608-592-7409
Web site www.swagur.com

HERE'S WHAT OUR READERS ARE SAYING ABOUT MT EXPRESS:

"No doubt about it, the future is here! Sure nice to get the magazine so early, this has got to be the way! Thanks for a great job!"

- Charles (Chuck) Boehnke
Keaau, Hawaii

"You and the MT staff that put this project together have done a FANTASTIC job. You would seem to be the leaders in the field presenting material in this manner so it can be archived so easily. This is the way to receive a magazine."

- Don Nauer

Clip and mail this ad along with your payment or call us to subscribe or renew to Monitoring Times!

Subscribe to MT for as little as \$14.00 (U.S. Second Class Mail)



7540 Hwy. 64 W.; Brasstown, NC 28902
1-800-438-8155 US and Can.; 828-837-9200; Fax 828- 837-2216
e-mail order@grove-ent.com

	6 months	One Year	Two Years	Three Years
US Rates	<input type="checkbox"/> \$14.00	<input type="checkbox"/> \$25.95	<input type="checkbox"/> \$49.95	<input type="checkbox"/> \$73.95
US 1st Class	<input type="checkbox"/> \$29.50	<input type="checkbox"/> \$56.95	<input type="checkbox"/> \$111.95	<input type="checkbox"/> \$166.95
Canada Surface*	<input type="checkbox"/> \$21.00*	<input type="checkbox"/> \$38.50*	<input type="checkbox"/> \$73.95*	<input type="checkbox"/> \$109.95*
Foreign International*	<input type="checkbox"/> \$30.00*	<input type="checkbox"/> \$57.50*	<input type="checkbox"/> \$112.95*	<input type="checkbox"/> \$168.50*
Electronic Subscription		<input type="checkbox"/> \$19.95	<input type="checkbox"/> \$38.90	<input type="checkbox"/> \$57.85

*All payments must be in U.S. Funds drawn on a U.S. Bank!

Name _____ Address _____
City _____ State _____ Zip _____ Country _____
CC# _____ Exp. Date _____
Signature _____

If you are currently a subscriber to *Monitoring Times*, please check your label to determine the expiration date of your subscription. MasterCard, Visa, and Discover Card accepted!

INDEX OF ADVERTISERS

Alinco	17
Antique Radio Classified	77
AOR	Cover III
Austin Antenna	19
Bruce & Associates	7
Communications Electronics	73
Computer Aided Technologies	7
Computer International	9
Davis Instruments	87
Grove Enterprises	13,25,31,81,86
Grundig	Center Section
ICOM	Cover IV
John Figliozzi	56
Kevin Carey	77
KIWA Electronics	75
Klingenfuss	79
Monitoring Times	21,90,91
OptoElectronics	Cover II
Popular Communications	23
Premier Communications	85
Radiomap	85
Radioworld Inc.	75
RC Distributing	83
Scanner Master	29
Skyvision	83
Small Ear	77
Small Planet Systems	65
Swagur Enterprises	63,89
Universal Electronics	62
Universal Radio	17
Viking	9
W5YI	67
WINRADIO	1
World Radio TV Handbook (WRTH) ..	3

EDITORIAL STAFF

Correspondence to columnists may be mailed c/o Monitoring Times; any request for a reply should include an SASE.

Frequency Manager	Gayle Van Horn	gayle@webworkz.com
Frequency Monitors	Mark J. Fine	mark.fine@fineware-swl.com
Program Manager	John Figliozzi, KC2BPU	jfiglio1@nycap.rr.com
American Bandscan	Doug Smith, W9WI	w9wi@w9wi.com
Antenna Topics	W. Clem Small, KR6A	clemsmal@hotmail.com
Ask Bob	Bob Grove	bgrove@grove-ent.com
Beginner's Corner	Ken Reitz, KS4ZR	ks4zr@firstva.com
Below 500 kHz	Kevin Carey, WB2QMY	lowband@gateway.net
Bright Ideas	Gary Webbenhurst	ab7ni@arrl.net
Closing Comments	Bob Grove	bgrove@grove-ent.com
Communications	Rachel Baughn	mteditor@grove-ent.com
Computers and Radio	John Catalano	j_catalano@conknet.com
Digital Digest	Stan Scalsky	sscalsk@mail.ameritel.net
	Mike Chace	mike.chace@mindspring.com
Easy Access Radio	Jock Elliott KB2GOM	lightkeeper@sprintmail.com
Federal File	Larry Van Horn, N5FPW	larry@grove-ent.com
Letters to the Editor	Rachel Baughn	mteditor@grove-ent.com
Milcom	Larry Van Horn, N5FPW	larry@grove-ent.com
On the Ham Bands	T.J. Arey, N2EI	tjarey@home.com
Outer Limits	George Zeller	georgez@nacs.net
Plane Talk	Jean Baker, KIN9DD	jeanieandbob@earthlink.net
Programming Spotlight	John Figliozzi, KC2BPU	jfiglio1@nycap.rr.com
Propagation	Jacques d'Avignon	monitor@rac.ca
QSL Corner	Gayle Van Horn	gayle@webworkz.com
Radio Restorations	Marc Ellis	mfellis@enteract.com
Satellite Radio Guide	Robert Smathers	roberts@nmia.com
Scanning Equipment	Bob Parnass, AJ9S	parnass@megsnet.net
Scanning Logs	Larry Van Horn, N5FPW	larry@grove-ent.com
Scanning Report	Richard Barnett	ScanMaster@aol.com
SW Broadcasting	Glenn Hauser	wghauser@yahoo.com
SW Broadcast Logs	Gayle Van Horn	gayle@webworkz.com
The Fed Files	Larry Van Horn, N5FPW	larry@grove-ent.com
The Launching Pad	Ken Reitz, KS4ZR	ks4zr@firstva.com
Tracking the Trunks	Dan Veeneman	dan@signalharbor.com
Utility World	Hugh Stegman, NV6H	utilityworld@ominous-valve.com
View from Above	Lawrence Harris	Lawrence@itchycoo-park.freeserve.co.uk
Washington Whispers	Fred Maia, W5YI	fmaia@texas.net
What's New	Rachel Baughn	mteditor@grove-ent.com

Ads for Stock Exchange must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*. Ad copy must be typed for legibility.

1-3/4" SQUARE DISPLAY AD: \$50 per issue if camera-ready copy or, \$85 if copy to be typeset. Photo-reduction \$5 additional charge. For more information on commercial ads, contact Beth Leinbach, 828-389-4007.

STOCK EXCHANGE

Monitoring Times assumes no responsibility for misrepresented merchandise.

LINE ADS

NON-COMMERCIAL SUBSCRIBER RATES: \$.25 per word — *Subscribers only!* All merchandise must be personal and radio-related.

COMMERCIAL, NON-SUBSCRIBER, AND MULTIPLE SALES RATES: \$1.00 per word. Commercial line ads printed in bold type.

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

TEKTRONICS 7704A 200 MHz dual-trace oscilloscope with probes and manual, very good condition; \$395 includes shipping. Contact Bob at 828-837-9200 or bgrove@grove-ent.com.

WANTED: Any auto shortwave radio. Philips 777, Becker, Hallicrafters SX88, etc. any condition. (516) 223-4638. Ask for Earl.

SALE: Sony 2010. New in box. \$300.00. Call Mark at (410) 339-9716.

WANTED TO BUY - Simple plans for earthsound radio - preferably plans from *Monitoring Times* - Send dollar amount wanted for plans to - P. Nelson, P.O. Box 18123, Lansing, MI 48901.

Join the Club!

Open to hobbyists worldwide, the CANADIAN INTERNATIONAL DX CLUB is Canada's national, general coverage radio club serving members since 1962.

The Messenger features columns on AM/FM, shortwave, utilities, scanning, QSLing, pirates, ham radio and more. Send \$2 for a sample copy to:

CIDX

P.O. Box 67063-Lemoyne
St. Lambert, Quebec, Canada J4R 2T8
email: cidxclub@yahoo.com
web: www.onarc.org/cidx/

CUMBRE DX

is the world's best DX publication. Every issue features news and loggings that you just won't find elsewhere.

But the best part about Cumbre DX is that it is absolutely

FREE!

FOR YOUR FREE SAMPLE COPY,
SEND AN EMAIL TO:

cumbredx@yahoo.com

Visit us online at: www.cumbredx.org

Listening In

That's what we do and who we are!

For over 25 years we have published one of the world's leading radio magazines, *Listening In*. Now available in PDF files, in print or on tape for the sight-impaired. Mention M* and get a free sample.

Ontario DX Association
Box 161 Willowdale Station A,
Toronto, Ontario M2N 5S8 Canada
odxa@compuserve.com
www.odxa.on.ca

R F P I THERMO MUGS

16-oz \$10 each, ppd



P.O. Box 20728 - M
PORTLAND, OR 97220

Guide To SURVIVAL COMMUNICATIONS

How to build complete communications systems. Covers shortwave radio, amateur radio, citizens band, scanners, federal, weather, alternate news, satellite radio, equipment sources. How to build alternate emergency power sources, solar, generators, backup batteries. 200 pages. \$24.00 Priority Mail. MC or Visa. Call Universal Electronics 800-241-8171.

HUGE 100 PAGE CATALOG

- Shortwave & Ham Gear
- Scanners & RTTY/FAX
- Antennas & Accessories
- Radio Books & CDs.

Send \$1 to
Universal Radio
6830 Americana Pkwy.
Reynoldsburg, OH 43068
Tel. 800 431-3939
www.universal-radio.com

Think of what you could do
with this space...

It's painless, we promise. Contact
our advertising manager, Beth
Leinbach, at 828-389-4007.

MT ANTHOLOGY 2000 EDITION

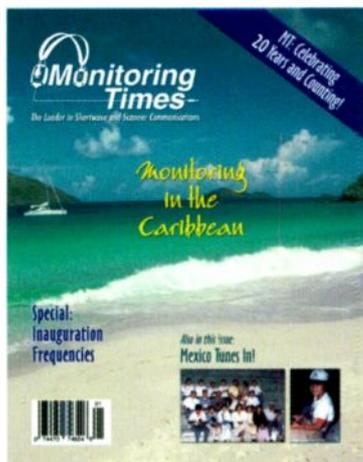
A Whole Year of MT on ONE CD!

That's right, an entire year of *Monitoring Times*, complete with full articles, reviews, and even advertisers, all on one CD. Completely searchable and user-friendly, this CD is the perfect companion when you're wondering "what issue was that review in" or "I remember I saw how to build that antenna in ONE of these!" Imagine being able to search for just what you need in a matter of seconds! It's the radio-room reference you've been looking for! **Order yours today!**

Order SFT27-00 today for only \$19.95
(\$14.95 for current MT subscribers)

Grove Enterprises, Inc. 800-438-8155
www.grove-ent.com

7540 Highway 64 West Brasstown, NC 28902





By Bob Grove,
Publisher

Dialogue on Out-of-Band Broadcasting

A Letter from Stanley Leinwoll:

Reference is made to your November 2000 *Closing Comments* observations in *MT*. Although the first part of your editorial is factual and appears to be trying to making a straightforward case, the second half, an assault on private U.S. shortwave broadcasters and their frequency management practices, is unfounded and, I am afraid, based on misconceptions as well as erroneous assumptions.

Let me first assure you that private U.S. broadcasters operate strictly within the Radio Regulations of the International Telecommunication Union, [ITU], as well as the FCC's Rules and Regulations. Although U.S. broadcasters "seem [to you] to move about the spectrum at random," nothing could be further from the truth. U.S. broadcasters operate in accordance with authorizations which the FCC provides in writing... Furthermore, out-of-band operation strictly follows ITU Regulations, and is sanctioned by the FCC on a non-interference basis.

The relevant Radio Regulation permits the use of any frequency in any band for virtually any purpose provided "they avoid causing harmful interference to services rendered by stations using frequencies assigned in accordance with the table of frequency allocations." U.S. broadcasters use out-of-band frequencies ONLY after they have been authorized by the FCC. Such prior authorizations are given after detailed scrutiny, with the expectation that they will not cause harmful interference. A classified list of U. S. government frequency use is carefully reviewed, in order to avoid conflicting assignments.

On a world-wide basis, a study of any recent HFCC coordinated schedule will indicate to you that approximately 25% of the more than 25,000 daily shortwave broadcasting frequency hours are out-of-band.

Increasing congestion and interference is not an excuse for such use – it is the reason it occurs. Furthermore, the advent of satellite and other sophisticated methods of communication have resulted in a mass exodus of Fixed [point-to-point, mobile, etc.] users from the bands allocated to these services, leaving significant portions of the HF bands underused. The movement of shortwave broadcasters into these bands represents an efficient and effective way of utilizing a scarce and finite natural resource.

As a point of information, the HFCC has significantly expanded its base. It now includes the Arab States Broadcasting Union [ASBU], and a recent meeting in Kuala Lumpur also included the Asian Broadcasting Union. [ABU]. Approximately 90% of the world's HF broadcasting was coordinated at the KL meeting.

I will remind you that a number of HF broadcasters, including Russia's Radio Rossii, continue to operate domestic services openly in the bands above 6 MHz. Although your piece started promisingly, it quickly digressed into an apparent effort to stir up a controversy, where, in fact, none is warranted.

A Response from Rachel Baughn, editor

Thank you, Stan, for writing to state the situation from the perspective of a person involved in frequency coordination for many years. (For the benefit of our readers, we note that Stanley Leinwoll attends HFCC conferences on behalf of his clients, WYFR and WEWN.) You are correct in detecting a critical tone to much of our editorial, though we did not at all intend to imply the broadcasters operate without approval or coordination. As "outsiders" to the process we had three primary questions:

1. When US and international regulations clearly prohibit most domestic shortwave broadcasting outside of the tropical zone, why is there no attempt to enforce this regulation?
2. How can the bands be crowded when alternative, proven bandwidth-reducing methods like SSB are available, propagation changes with the sun, shortwave broadcasters are dropping like flies as many are moving to satellites, and shortwave receiver selectivity is the best it's ever been?
3. Is there any other service (other than the government) that is allowed to operate out of band under the guidance of using "any frequency in any band for virtually any purpose?" Amateur radio, maritime, air, fixed point-to-point, and virtually every other utility service would quickly be taken to task if they did.

Our interest is especially aroused when the out-of-band frequencies that are commonly requested by "international" broadcasters are at the short-range, bottom end of the allocations, frequencies that are intended for domestic broadcasting. Wouldn't a higher fre-

quency propagate better to "Greenland" than WWCR's choice of 2390 kHz, a government/military allocation?

Jacques d'Avignon, *MT*'s Propagation columnist for years, had the same observation: "I fully agree with your comments, these broadcasts are specifically targeted to the US public! I did ask the National Shortwave Broadcasters Association to explain this phenomenon to me. My letter was never answered!"

"The tropical bands have specifically been set aside by the ITU mostly for NVIS propagation service in those area of the globe where the vegetation would play havoc with the normal broadcast frequencies due to the immense attenuation, and the programs more often than not are not relayed from other sites but produced to be delivered on these specific frequencies."

At the end of the November *Closing Comments* we asked if anyone cares about this issue. Since Mr. Leinwoll says we're stirring up a dispute where none exists, I guess he would say that no one does care. In one sense, we agree: we are neither for nor against the idea of domestic broadcasting. It's the inconsistency between international agreements, US regulations, and actual practice that is bothersome.

Mr. Leinwoll also made the following observation: "Incidentally, my contacts in the FCC know nothing about your alleged case of NASA interference which required NASA to move from 5810 kHz. ... In fact, 5810 kHz was, and continues to be, duly authorized by the FCC."

Perhaps the assignment was an oversight on the part of the FCC, but Bob Grove says it is not "alleged": "I personally listened to it happen and discussed it with a NASA, communications officer. As a utilities buff, I extensively monitored 5810 kHz USB, the heavily-used, registered, nighttime frequency for NASA launch support. The uninvited intrusion of WYFR on that frequency forced them to move to 5812 to avoid the interference caused to this worldwide network."

If readers would like to see an article on the process of HF frequency coordination, let us know your interest, and we will invite someone on the "inside" to explain the process more thoroughly. We certainly recognize that the field is complicated enough that many persons, including Mr. Leinwoll, have made it a lifelong career.

The State of the Art Just Took a Giant Step Forward

AOR™

Introduces the AR 8600

AOR has just raised your expectations of what a wide-range receiver should do. From the ultra-stable TCXO to the availability of Collins® Mechanical Filters and three optional card slots, the AR 8600 blends precision, performance and technical achievement in an attractive, functional package. The AR 8600 is so revolutionary, its design has been awarded US Patent No. 6,002,924!

- Temperature Compensated Crystal Oscillator (TCXO) stable frequency reference
- Covers 530 KHz ~ 2040 MHz*
- Receive Modes: WFM, NFM, SFM, WAM, NAM, USB, LSB, CW
- New front end and RF stages for superior sensitivity
- 2 VFOs (A/B)
- 1000 memory channels (20 banks X 50 memories/bank)
- 40 search banks
- Up to 37 channels/second search rate
- Add up to 3 optional slot cards. Available cards include: Tone Eliminator, CTCSS, Voice Inversion, Recording, External Memory
- Accommodation for Collins® Mechanical Filters
- FS-232C port
- 10.7 MHz IF output (WFM mode only) can be used with SDU 5500 Spectrum Display Unit
- 12 VDC operation
- BNC antenna connection

AOR™

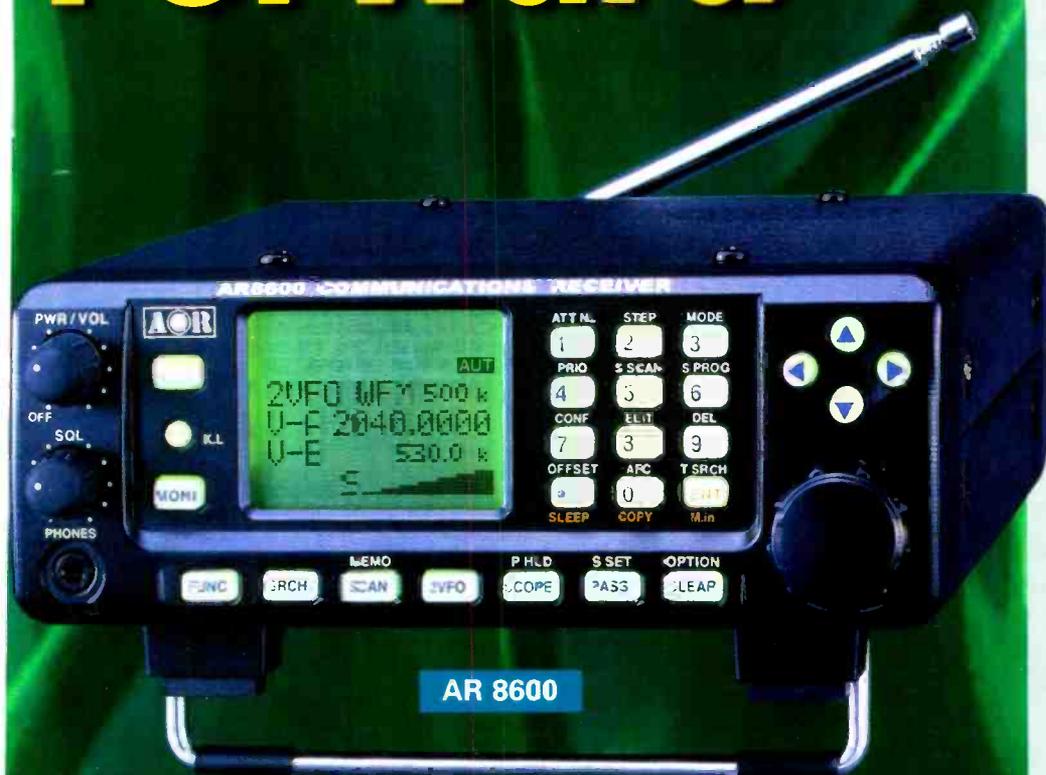
AOR U.S.A., Inc.

20655 S. Western Ave.

Suite 112 Torrance, CA 90501

310-787-8615 Phone • 310-787-8619 Fax

www.aorusa.com



AR 8600

From monitoring aircraft to public safety, broadcast, shortwave and beyond, the AR 8600 sets new standards in performance. It's no wonder that many monitoring professionals, including government, newsrooms, laboratories, military users and more rely upon AOR.

*Cellular Blocked. Unblocked version available to authorized users, documentation required. Specifications subject to change without notice or obligation. All trademarks remain the property of their respective owners.



IC-R75 SAVE \$200

Pull out the weak signals

30 kHz - 60.0 MHz¹

Commercial grade • synchronous AM detection (S-AM) • optional DSP with auto notch filter • all mode • triple conversion • twin passband tuning (PBT) • large front mounted speaker • large display • well spaced keys and dials • 1000 memory channels • up to two optional filters • PC remote control with ICOM software for Windows®.

"A versatile HF/6-meter receiver that offers a good measure of performance in a compact package. All mode capability for the ham and utility listeners and synchronous AM for the SWLs should make the IC-R75 a popular choice for a wide variety of radio enthusiasts." —QST, 1/00

Want the latest specials? See your authorized ICOM dealer or go to www.icomamerica.com for the most up to date savings!

download frequencies
right from the web
www.icomreceivers.com

log on > download > listen in

ICOM makes it easy to get the frequencies you want. Our database searches your area. You download the frequencies to your computer and easily load them into your ICOM radio. Optional software and PC connection cable required.



IC-PCR1000 SAVE \$50

The original "black box" is still best

100 kHz - 1.3 GHz¹

AM, FM, WFM, USB, LSB, CW • unlimited memory channels • real time band scope • IF shift • noise blanker • digital AFC • "VSC" voice scan control (when activated, stops only on modulated signals) • attenuator • tunable bandpass filters • AGC function • S meter squelch • CTCSS tone squelch • large selection of tuning steps and scans • external speaker level control • DSP optional • download and demo the latest software for free at www.icomamerica.com

"The PCR1000 has something to intrigue and satisfy everyone. This is a fun product." —QST, 7/98



IC-PCR100 SAVE \$50

Much like its big brother, but for less

100 kHz - 1.3 GHz¹

AM, FM, WFM • many of the same features and performance as the IC-PCR1000 • designed for Windows® 95 or 98 • download and demo the latest free, full version software today: www.icomamerica.com



IC-R10 SAVE \$50 & FREE SOFTWARE & CABLE

Advanced performance and features

500 kHz - 1.3 GHz¹

All mode • alphanumeric backlit display • attenuator • 7 different scan modes • beginner mode • 1000 memory channels; band scope • includes AA Ni-Cds and charger.

IC-R2 FREE SOFTWARE & CABLE

Excellent audio, tiny package

500 kHz - 1.3 GHz¹

AM, FM, WFM • easy band switching • CTCSS decode • 400 memory channels • priority watch • MIL SPEC 810C/D/E • weather resistant • includes 2 AA Ni-Cds and charger.

IC-R3 VIDEO SCANNER

See and Hear all the action. NOW AVAILABLE!

500 kHz - 2.45 GHz¹

450 Memory Channels with Alphanumeric Names • CTCSS with Tone Scan • 4 Level Attenuator • Telescoping Antenna with BNC Connector • Four Way Action Joystick • Lithium Ion Power • 2" Color TFT Display with Video/Audio Output.

"Wide tuning range allows you to see and hear the excitement behind the scenes. Large easy to read color display for frequency settings and video reception. All in a compact easy to carry package. Perfect for sporting events and commercial uses."

DOWNLOAD FREQUENCIES RIGHT FROM THE WEB



IC-R8500

The experts choice

100 kHz - 2.0 GHz¹

Commercial grade • all mode • IF shift • noise blanker • audio peak filter (APF) • selectable AGC time constant • digital direct synthesis (DDS) • 1000 memory channels • RS-232C port for PC remote control with ICOM software for Windows®.

"If you want a receiver that is both a superior world band radio and a solid scanner, the new ICOM IC-R8500 is the best choice."

—Passport to World Band Radio, 1998

Get the latest specials

www.icomamerica.com



¹Limited time offer. See dealer for details.

²Cellular frequencies blocked; unblocked versions available to FCC approved users ©2000 ICOM America, Inc. 2380 116th Ave NE, Bellevue, WA 425-454-8155. The ICOM logo is a registered trademark of ICOM, Inc. All specifications are subject to change without notice or obligation. RCVRFAMMT1200