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Volume 20, No. 4

April 2001

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Monitoring Times

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Antennamania

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Optoelectronics R11, Optocom

Connect this to your scanner...



...and be amazed!

The AX-31B antenna is a compact VHF/UHF directional antenna with a built-in amplifier, which provides a low-cost alternative to conventional VHF/UHF antennas, especially for indoor use.

This log-periodic antenna is constructed on a high-quality fibreglass substrate, with a 20dB amplifier directly mounted on the substrate, together with other surface-mount circuitry and a standard 9V PP3 type battery holder. A power switch is provided directly on the antenna.

The antenna is ideally suited for reception of VHF/UHF point-to-point communication, where its directional characteristics can significantly improve reception, and rejection of interfering signals.

The antenna covers a frequency range of 230 to 1400 MHz (a much wider frequency range can be received with reduced gain) and is ideally suited for surveillance and monitoring, EMC pre-testing and other professional and amateur applications.

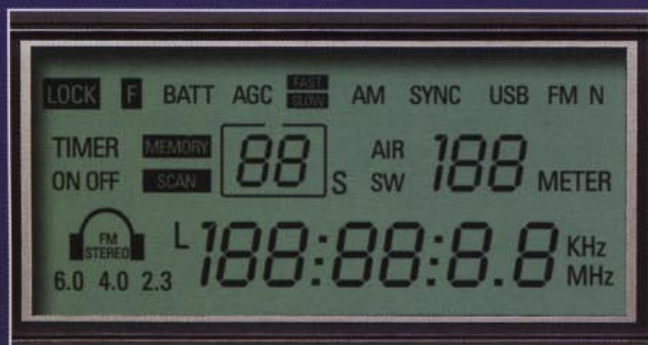
The antenna is designed for indoor reception. Its small footprint, (the size of a 11.5" by 8.5" sheet of paper) conserves space and makes concealed installation possible.

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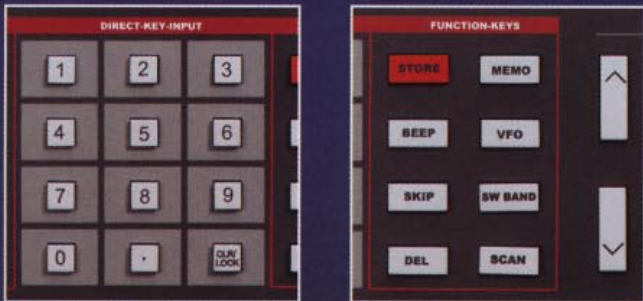
• For Fixed-step Tuning: Big, responsive Up/Down tuning buttons.

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by **GRUNDIG**



Monitoring Times

Vol. 20, No. 4

April 2001



On our Cover

My Most Enjoyable Channels: MilCom!

By Robert Wyman

From early childhood memories of the Cuban Missile Crisis, the annual open house at Homestead Air Force Base, to the advent of the Bearcat 210 scanner which opened up new monitoring possibilities, military communications have always fascinated the author. They still do.

The main obstacles to this hobby are the same now as before: the availability of proper receiving equipment and discovering active frequencies. There is no publicly available government resource for military or government assignments as there is for civilian allocations. But the challenge is half the fun!

There's plenty to hear if you live in the vicinity of an Air Force Base or other military facility. Units such as law enforcement, fire-rescue, base hospitals/ambulances, civil engineering, various maintenance activities, schools, conference centers and recreational areas each utilize VHF and UHF land-mobile radio communications. Monitoring aircraft around Homestead AFB is still one of the author's favorite activities: you'll find a selection of active frequencies in the story starting on page 10.

MF Spectrum Loopstick Receiving Antenna 14

By Richard Q Marris G2BZQ

MT readers have enjoyed previous loops designed by the author. This time he's designed a *loopstick* – a 36-in. long ferrite loop antenna designed to give maximum nulling in the medium wave spectrum. This takes in the AM broadcast band, U.S. MEDFER experimental band, amateur radio bands, various navigational beacons, and more – something for everyone.

This highly directional loop can be of benefit in eliminating the interference from which all MF signals suffer.

A Linear Loaded Quad for 15 MHz..... 17

By Douglas A. Blakeslee

Of the various antenna choices available to the monitor looking for improved performance, the quad (also known as the quad loop) has some distinct advantages. The primary three are low noise pickup because the loop is a closed system, higher gain than a dipole cut for the same frequency, plus a lower angle radiation pattern for good long distance (DX) performance. Here's one design for performance on the 15 MHz and higher bands, that is not only inexpensive, lightweight, and constructed of easily available components, but it's rotatable!

You Can Take it with you! 20

By Arthur R. Lee

Not too many folks try going mobile with an HF rig – partly because a vertical HF antenna for the range is too long. Add to that the problem of modern-day plastic bumpers and sleek new car design, and the options narrow even further. However, here's one solution, using a standard trailer hitch, fold-over Hustler antenna, and the roof rack.

Scanning Florida's Space Coast 21

By John Mayson

In the March issue, *MT* readers took a trip down I-4 and across central Florida. But we barely bypassed some of the most popular beaches and sights just to the south of our starting point at Daytona Beach. Here we pick up public safety scanning in Brevard and Osceola counties.

Cover photo by Bob Wyman. Below photo courtesy DoD.





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Reviews:

Bob Grove reviews the HF por-
tion of the *Yaesu VR5000* and de-
cides it offers a great deal for the
money (p.82).

Bob Parnass finds the VHF and
UHF portion of the *AR8600* is on a
par with other scanners, and, while
it doesn't perform well on HF, it sim-
ply oozes with features and options
(p.84).

If you're looking for a
handitalkie for communications
over better-than-FRS ranges and the

ability to receive weather informa-
tion as well, Jock Elliott says he can
wholeheartedly recommend the *Co-
bra Professional 2000WX* (p.86).

The *AX-31B* active VHF/UHF
antenna from WinRADiO is a sur-
prisingly flexible antenna which
works well on any scanner.

Always on the prowl for better
radio control solutions, John
Catalano pits *Game Commander 2*
against Microsoft's new *Game
Voice* (p.80).

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Stand by for change at the Republican-led FCC

There are major changes underway at the Federal Communications Commission. Commissioner Michael Powell, the son of Secretary of State Colin Powell, is the new FCC Chairman. He will oversee the administration's direction on telecommunications, broadcast and cable matters. Powell takes over at a crucial time when regulators are trying to ensure competition as the Internet, telecommunications and cable industries all converge.

Like his father, Mike Powell wanted to make the military his life's career. But it was cut short by a devastating automobile accident in 1987. After a long rehabilitation, Mike Powell graduated from Georgetown University Law School and became a telecommunications lawyer. He joined the Clinton administration in the U.S. Justice Department's antitrust division. The 37-year-old Michael Powell, a Republican, was appointed to the FCC in November 1997.

He replaces outgoing Chairman Bill Kennard, a Democrat who resigned from the FCC on Jan. 19 – the day before Republican President George W. Bush took office. Powell does not need to be confirmed by the Senate. The president can designate the chairman from a sitting commissioner without any Senate action. Kennard has already accepted a position as a senior fellow at the Aspen Institute's Washington-based Communications and Society Program.

A Powell-led commission is expected to bring a more business-oriented approach to the agency, compared to Kennard's regulatory-oriented approach. He has already voiced apprehension about the wide array of regulations facing broadcasters, telephone companies, cable operators and Internet Service Providers.

The Clinton administration unleashed the *Telecommunications Act of 1996* which sought to bring competition to the industry. So far it hasn't worked and has only resulted in large companies getting larger as they merged among themselves.

The new FCC is expected to be a "hands off" Commission. Instead of shaping markets, the Powell-led FCC is expected to let the marketplace determine its own direction. Powell also is in favor of restructuring the Commission along functional rather than industry lines.

Before leaving, Kennard expressed his concern about a more business-friendly FCC under the new Administration. He feels that a more business oriented approach will translate into policies that will benefit incumbents rather than innovation among new entrants.

Kennard's concerns are well founded. Powell's record at the FCC shows he is more restrained about regulating industries that, like technology, constantly change. He would rather let the

marketplace decide.

He is on record as opposing regulation of the Internet since restraining computer-related information services would undermine innovation. One of Powell's first initiatives is to push for the expansion of high speed broadband Internet access to homes and small businesses.

Powell enjoys cordial relations with House and Senate leaders. The Powell appointment drew high praise from key lawmakers especially from Rep. Billy Tauzin (R-La.), chairman of the U.S. House Commerce Committee which oversees over the agency. Tauzin often criticized Kennard's policies and direction and believes Powell "...understands the benefits to consumers of aggressive competition in the marketplace and ...will work with Congress to complete the task of deregulating the telecommunications industry."

About a week after Powell became FCC Chairman, Commissioner Harold Furchtgott-Roth, a Republican, announced he would not be seeking reappointment to a second term. His first term expired June 30, 2000. Saying he wants to return to the private sector, Furchtgott-Roth will continue to serve on the Commission until a departure date is worked out with the Administration. He said Powell "...will make a great chairman."

The FCC consists of five Commissioners which is typically split three to two in favor of the ruling political party. The Furchtgott-Roth announcement now leaves President George W. Bush with two slots to fill on the FCC. Both are expected to be Republicans since two Democrats already serve on the panel, Gloria Tristani and Susan Ness. With a new Republican Chairman and two more rookie Republican Commissioners on the way, the Bush administration indeed has the potential to totally change the direction of U.S. telecommunications policy.

The Justice Dept has released an independent report on Carnivore, the e-mail sniffing software, which is similar to a wiretap. The FBI says it uses the program to monitor suspected criminals by installing the system at Internet providers to monitor their e-mail activity. The study was ordered by Congress after civil-liberty groups raised concerns about unreasonable search and seizure.

The use of the surveillance software came to light when ISP EarthLink resisted having the program installed on its network. The FBI and DOJ maintain the surveillance system is only deployed to monitor specific criminal activity under a court order. But privacy advocates question the allegation and point out that the software can be configured to capture all Internet traffic and track users.

The report completed by a group of researchers at the Illinois Institute of Technology concluded that the controversial FBI electronic wiretap tool was appropriate for law-enforcement use but recommended the DOJ maintain tighter control of the e-mail monitoring system. They also said all Carnivore searches should require specific Justice Department approval and that the software should be modified to document all of its activities to prevent abuse.

The FCC has socked Madison, Wisconsin, radio station WZEE with a \$7,000 fine for playing an indecent, unedited recording by Grammy-nominated rapper Eminem. (Real name: Marshall Mathers.) WZEE is owned by radio giant Clear Channel Communications which has about 1,000 stations. A listener sent in a tape recording of the broadcast to the FCC. The FCC's decency standards are enforced from 6 a.m. to 10 p.m.

Last-Minute Report:

House Cleaning at the FCC

On Friday, (February 16th) FCC Commissioner Gloria Tristani made it unanimous. She too will leave the agency to seek some sort of elected office in her native state of New Mexico. That means all four incumbents under newly appointed FCC Chairman Mike Powell are leaving the Commission. He gets a brand new crew ...and probably input as to who they will be. In unprecedented fashion, President Bush will have to appoint four new Commissioners almost immediately! You can bet that the FCC will be seeking new "business-friendly" directions.

This certainly looks like a year of major changes at the FCC. Don't look for too much to happen this year as staffers for the Commissioners and various bureau and division chiefs start the shuffle to find new jobs. A year from now you won't recognize the agency. The previous FCC fought Congress. The new one will follow their directions.

The Dow Jones Newswire said FCC Commissioner Gloria Tristani will leave the agency by year's end to pursue either a congressional spot or the governor's mansion. New names surfacing as potential Commissioner candidates include Michael Copps, chief of staff to Sen. Fritz Hollings (D-SC); Andy Levin, aide to Rep. John Dingell (D-Mich.); Kathleen Abernathy, a telecom attorney; and Intel Corp. lobbyist Peter Pitsch, a former FCC chief of staff.

We'll report in future columns on what's behind these developments and what we may be in for. Stand by for change!



LETTERS TO THE EDITOR

Interesting and Unusual Websites

Brian Rogers (the one from England) reprints a 1985 *MT* article on the Russian "Woodpecker" article on his web site at <http://dSPACE.dial.pipex.com/brogers/wpecker.htm>. He says it "forms one of four articles (and a poster) relating to the Russian Woodpecker signal. I have had a lot of interest shown in the articles, which I hope form a useful resource for those interested in this 'mother of all signals.'" – Brian Rogers, West Sussex, South-East England

http://www.nsa.gov/wwii/papers/start_of_digital_revolution.htm
"Someone sent this to me and I thought you might want to share it with the *MT* readers. Pretty amazing stuff for the time. Yes, it's on the NSA site-which if you haven't poked around on, there's some cool stuff to be found :-)"
– Michael Graham

<http://www.nara.gov/iwg/report/ossrecs.html>
"I was looking up some information at the National Archives & Records Agency (NARA) website and came across the historical radio related piece of information. Having an interest in military history and the Holocaust I took the time to investigate. Amazing what can be pieced together and learned from just listening to a conversation."
– René. B. Valladares, KB3CGA

Emerson Video Converter

"I read with great interest the article on page 87 of the February issue about Multi-System Video Converter because I have the same problems not being able to watch videos from my friends in Germany. Now at least I have sources for a converter.
"By the way, PAL was invented by Walter Bruch of Telefunken in Germany, and not by the British."
– Cord Schuette, Computer International, computer-int@mintcity.com

"By the way, PAL was invented by Walter Bruch of Telefunken in Germany, and not by the British."
– Cord Schuette, Computer International, computer-int@mintcity.com

Prop Charts Gone for Good?

Edward Stroh and Richard Hansen asked if Jacques d'Avignon's propagation page was a temporary or permanent cut, and asked for other sources of propagation information.

The charts were a casualty of the page reduction that made it possible to continue mailing the magazine in a plastic wrapper, but there are a number of web sites where you can keep up with propagation conditions. Of course you can listen to WWV for the current sun spot count, and there are several free or inexpensive computer programs to help interpret these numbers. You can also find all kinds of resources for HF propagation off the Amateur Radio Relay League's website at <http://www.arrl.org> and

the Radio Amateurs of Canada web site at <http://www.rac.ca> However, nearly all print publications have discontinued their propagation charts, so I can be of little help there.

Education by Remote

Bob Gehle, who provided the news clipping referenced in this month's "Communications" item *Telecoms vs Educational Institutions vs Pentagon*, has these comments to add:

"My wife gave me a short wave receiver for Christmas and I have been enjoying DXing and *Monitoring Times* ever since. I appreciate that your publication has valuable information for beginners and advanced individuals. I will enjoy reading your magazine for many years to come.

"The 'Washington Whispers' column of the January 2001 issue had a piece headed 'The good news is that the Internet is going wireless.' The 3G issue discussed in the column may have a significant impact on the Instructional Television Fixed Service licenses (2.5 GHz – 2.686 GHz) held by many educational institutions (K-12 through university).

"The FCC in its Two-Way Rule and Order (Parts 1, 21, and 74 of Title 47 Code of Federal Regulations) opened the door for educational institutions to work with wireless service providers (Sprint, Digital Broadcast Corp., Bell South, and others). These companies want to lease the spectrum to provide internet access to citizens. Schools, colleges, and universities would receive access to the technology resources provided by these companies.

"Those of us who provide instruction through the ITFS spectrum are concerned about the potential loss to our students as a result of a poor decision on 3G."
– Bob Gehle, Program Administrator, Manatee County School Board

Canadian Correspondence

"I wanted to pass on a few comments regarding your magazine. I have been reading *MT* for quite a few years. I look forward to it every month as it's always packed with great information. I find *MT* fits what I want to read and use as a reference.

"My listening is quite reduced these days (with 2 young kids, etc.) but I am trying to find more time for it... I really like the plastic cover on the magazine. It would sometimes arrive up pretty beat up, but problem solved: every issue that has arrived since you started using the plastic is perfect!

"Attached is a photo of my shack. I don't think I've purchased any new equipment in about 8 years but this works great for me. Included are
* Kenwood TS-440S HF. Great ham rig and general coverage receiver. I'd love to get my hands on the R-5000.
* Yaesu FT-2400H 2 meter. Excellent and tough.



- * Realistic PRO-2005. Modified of course. (Thanks Bill Cheek, I'll miss you)
- * Realistic PRO-2020. Old, but I could never part with it. It was my first real scanner.
- * Alinco DJ-580. Also modified (of course)
- * Innova Power Pack for the HT. Great unit, I can run the Alinco for almost 5 days continuous.
- * Realistic TRC-480 CB. A reminder of my teenage years
- * Yaesu FRG-7. I bought that new and what a joy it was for me at the time.

"I run the Kenwood through two Realistic Minimus 7 hi-fi speakers which provide great sound. The scanners and 2M rig all have their own Realistic communication speakers (Cat# 21-549). Again, much improved sound. The old radio is a Sylvania model no. 1101 AM receiver. It has the original tubes and even the serial number sticker on the back.

"Antennas include your scanner beam, a Radio Shack discone and a few specialized antennas. For HF I just use dipoles and long wires off a small tower."

– Cliff Fournier, VE7CGF, Canadian west coast

"Really enjoyed Larry Van Horn's article on finding Canadian frequencies (January 2001 'Service Search'). Living near Canada, above line A, how do I find their Public Safety channels? It would surely be handy to be able to determine co-channel and adjacent channel user."
– Ron Gilson

Larry says that unfortunately Canada lists very little public safety information on the internet and we are aware of no definitive Canada-wide radio hobby frequency guide. *Monitoring Times* would be happy to publish more Canadian frequencies or promote frequency guides if our Canadian scanner listeners will share the information. With enough input, a Canadian column could become viable... Anyone want to take on the challenge?!

Your letters, opinions, comments, and corrections are welcome at mteditor@grove-ent.com or to Rachel Baughn, P.O. Box 98, Brasstown, NC 28902.

Radio Honor Roll

Long-distance Search and Rescue

A ship floundering in heavy seas off Indonesia was rescued after a British tourist, Rebecca Fyfe, sent an SOS mobile phone text message to her boyfriend. Nick Hodgson was halfway around the world in an English pub when he received the text message: "Call Falmouth Coastguard, we need help, SOS."

The boat's engines were flooded in the Lombok Strait, leaving 12 passengers and six crew adrift without a radio or flares. Falmouth Coastguard contacted the girl on her mobile phone, but she was unable to give her precise location. The coastguard asked the Australian Coastguard to relay the message to the Indonesian Search and Rescue Authority. They were located when the boat finally washed up in North Lombok. All on board were fine.

Indian Hams

Hams assisted with relief operations in the Indian State of Gujarat following the January 26 earthquake which took over 60,000 lives and left more than 600,000 homeless. Bangalore-based Guru Rao, VU2GUR, and Sandeep Shah, VU3SXE, a Gujarati Bangalorean engaged in relief work in Gujarat, took advantage of the UO-14 amateur FM satellite to provide communications to the stricken region.

Another Bangalore amateur, Chandru Ramachandra, VU2RCR – a former UNESCO official – drove his SUV to Bhuj, 1700 km distant. Carrying a medical team and supplies, he set up a station to establish a link between Bhuj and Bangalore. 18 amateurs from the State of Karnataka handled communication regarding placement of doctors and medical supplies as well as health-and-welfare inquiries into areas where the telephone system was out.

"This has become a practical exam showing our capability and preparedness in disaster management," said Bangalore Amateur Radio Club President Lion Ajoy, VU2JHM.

Most of the earthquake-related traffic was handled via HF on 40 and 20-meter SSB, although some VHF FM links were established for local work.

Spectrum Turf Wars Intensify

Public Safety vs Television

Since 1997 a plan has been in the works to create 32 radio channels for interagency communication between public safety officials from local, state, and federal agencies nationwide so that, for example, federal disaster relief workers could coordinate by radio with local police authorities when on the scene of a major preplanned event or unexpected emergency.

The Federal Communications Commission already has designated the frequencies – located in the 700 MHz band – for the communications network, and near the end of January the Commission adopted Project 25 Phase I as the voice standard for communications on these channels. The Commission also adopted the Project 25 data standard which will allow public safety entities to send status messages or short E-mails to one another.

The Commission also filed a Notice of Pro-

posed Rulemaking regarding the migration to an efficiency standard of one voice path per 6.25 kHz on the General Use channels. The Commission believes that eventual adoption of such an efficiency standard would be in the public interest, suggesting that the earliest date the Commission would require 6.25 kHz technology in new equipment would be December 31, 2005.

The fly in the ointment is the fact that before the 32 channels can be used nationwide they must be relinquished by broadcasters operating analog TV stations between channels 60 to 69. Broadcasters are supposed to return their analog channels by 2006 or when digital television reaches 85 percent of the market – whichever is later. Until this happens, the radio safety channels will only be available in parts of the country where broadcasters are not already occupying the frequencies.

Television vs Telecoms

The FCC was set to begin auctioning the frequencies not set aside for public safety (747-762 and 777-792 MHz) March 6, 2001. However, Verizon Wireless – the largest bidder in a recently-completely PCS auction – requested the auction be postponed. The uncertainty whether broadcasters will vacate the channels by the 2006 deadline was used as an argument both for and against the postponement – one questioning whether the spectrum will bring in as much revenue as it should if bidders are uncertain the channels will become available on schedule, and the other side deploring the hold-up in roll-out of new technologies. The FCC chose to reschedule the auction for September 12, 2001.

The 700 megahertz airwaves are highly coveted by wireless and other phone companies as a new avenue for delivering advanced telecommunications services.

Telecoms vs Educational Institutions vs Pentagon

In the flurry of activity in the last few months of the Clinton administration, pressure was put on federal agencies to cooperate in identifying available spectrum for the expansion of telecommunications technologies, particularly third-generation (3G) technology which combines multiple functions into one wireless unit. Private industry is most interested in the frequencies in the 1755 to 1850 megahertz band now controlled by the military, which are adjacent to those used by existing domestic wireless phone services and include frequencies that the World Radio Conference earmarked for next-generation wireless phones.

However, the military counters by saying this spectrum includes airwaves reserved for Air Force communications, intelligence-gathering and the global positioning satellite navigational system. It could cost millions of dollars and take as much as 30 years to locate and move these services to a different part of the spectrum.

If the Pentagon is not won over, the next place the industry is likely to look is at the 2500-2686 MHz band, licensed to Multichannel Multipoint Distribution Service ("MDS") and Instructional Television Fixed Service ("ITFS"). In her article in *Information Technology*, Goldie Blumenstyk said, "Colleges and other education broadcasters are at the vortex of some powerful political forces: cellular-telephone manufacturers and service pro-

viders, like Motorola and Verizon, eager for frequencies that will help them develop globally compatible 3G services; wireless-communications companies, anxious to deploy their new Internet services after investing more than \$2-billion to buy out companies that had previously leased bandwidth in the spectrum from educational broadcasters; and the federal government, which would welcome the chance to pocket the billions of dollars that could potentially be raised through a 3G-spectrum auction."

Media reports on the new FCC chairman, Michael Powell, indicate he is inclined to allow the marketplace to determine direction, rather than government regulation steering technology. Who will win in a scuffle between broadcasting, public safety agencies, the telecommunications industry, the Pentagon, and educational institutions? Stock-market investors, place your bets now. If the FCC doesn't represent the public interest, at least we get to vote with our pocketbook when the latest gadgets come on the market. To go to bat for education, visit the Wireless Education Broadband NOW web site at <http://www.ifs.org/webnow/>

FCC Begins WRC-2003 Preparations

In preparation for the next World Radiocommunication Conference in 2003, the FCC's WRC-03 Advisory Committee met January 30 for the first time. The Advisory Committee provides an opportunity for interests outside the federal government to develop and debate US draft proposals for possible adoption.

WRC-03 will deal with wide-ranging telecommunications issues, including IMT-2000 or so-called "third-generation" or "3G" cellular telephone devices, fixed services, mobile and fixed-satellite issues, HF broadcasting, satellite broadcasting, and regulatory matters.

Amateur Radio-related issues on the WRC-03 agenda include the basic rules for the Amateur



April 8: Stoughton, WS

Madison Swapfest sponsored by Madison Area Repeater Assoc at the Mandt Community Center, Stoughton Junior Fair Grounds, Mandt Park; talk-in 147.150. Adm \$5, 8a.m. For more info call 608-245-8890 or visit <http://www.qsl.net/mara/>

April 28: Windsor, SC

Salkehatchie ARS Tailgate party at Community Center, 0900-1600; Talk-in 147.030(-), CB Chan 22. Adm free; \$5 tailgate. BBQ chicken, raffle to win flight in vintage WWII SNJ trainer. For more info call Bill Wetzel W40XA, 803-245-5522, W40XA@oburg.net

May 5: Cedarburg, WI

Ozaukee Radio Club 23rd annual Cedarburg Swapfest at the Circle-B Recreation Center (Hwy 60 and Co I); talk-in 146.37/.97 and 146.52; 8a.m.-1p.m.; adm \$4. Food, license exams. SASE to Gene Szudrowicz KB9VJP, W55 N865 Cedar Ridge Drive, Cedarburg, WI 53012; 262-377-6792.

and Amateur-Satellite services, including the requirement for Morse code proficiency for access to HF bands.

WRC-03 will consider realignment of amateur and broadcasting bands around 7 MHz in search of a "harmonized" worldwide 300-kHz allocation. An examination of HF broadcasting allocations from approximately 4 to 10 MHz also is on the agenda. Conference participants also will consider abandoning an earlier commitment for HF broadcasters to shift from double to single-sideband AM modulation in favor of digital modulation.

WRC-03 will consider allocations for non-geostationary, non-voice mobile satellites (the so-called "Little LEOS") below 1 GHz, as well as spectrum above 1 GHz for feeder links. In addition, the conference will consider Earth Exploration-Satellite Service in the 420 to 470-MHz band.

A WRC-03 Web site has been set up at <http://www.fcc.gov/wrc-03> along with a mailbox for the committee, wrc03@fcc.gov. WRC-03 is scheduled to begin June 9, 2003.

BoatU.S. Provides Free DSC Radio Registration

Since 1999, the FCC has required marine radio manufacturers to include a Digital Selective Calling (DSC) capability in new radios sold in the U.S. DSC radios are fundamentally different from conventional marine radios in that (1) a maritime mobile service identity (MMSI) must be programmed into the radio to serve as a kind of "phone

number," (2) DSC automatically maintains a watch on marine VHF channel 70, rather than the operator listening to channel 16, (3) the operator can call other DSC radios or coast stations directly using their MMSI, and (4) can communicate with commercial vessels that are required to carry DSC radios.

In December 2001, the FCC and the U.S. Coast Guard named BoatU.S. as the first non-governmental organization to issue boaters the identification numbers for marine radios with Digital Selective Calling (DSC). Before BoatU.S. volunteered, boaters wanting identification numbers had to pay \$120 for an FCC license, and neither the FCC nor the Coast Guard had the budget or staff to begin registering DSC radios that in the future could number in the hundreds of thousands.

BoatU.S. chose to underwrite the service because - although recreational boaters are not required to carry a marine radio - DSC radios have the potential to save many lives, and they wished to protect boaters from what could have been a steep fee, had the government simply turned the function over to a commercial provider.

DSC is part of the global transition in maritime distress communications from voice calls (on channel 16) to digital communication. DSC's major advantage lies in its ability to send an automatic mayday which not only identifies the vessel (by the MMSI) but also gives its location when the radio is connected to a Loran or GPS.

"It's important for boaters to understand that the Coast Guard is not yet monitoring Channel 70

for DSC maydays, and may not be until 2005-6," said Elaine Dickinson, BoatU.S. assistant vice president for government affairs. "However, there have already been instances where commercial ships required to monitor the DSC-reserved channel for distress calls have relayed DSC maydays to the Coast Guard," she said.

To register, Dickinson said, boaters may go online to BoatUS.com and click on "MMSI." Once the registration form is accepted, their MMSI numbers will be issued electronically. Boaters may also e-mail BoatU.S. at MMSI@BoatUS.com. To ask questions or get a registration form by phone, call 800-563-1536; completed forms may be faxed to BoatU.S. at 703-461-2840 or mailed to the BoatU.S. MMSI Program at 880 S. Pickett St., Alexandria, VA 22304.

Communications is compiled by Rachel Baughn, editor, from clippings submitted by our readers. Thanks to this month's reporters: Anonymous, Mobile, AL; Anonymous, Ballston Spa, NY; David Carberry, Gales Ferry, CT; Raymond Delaforce, Sterling Hts, MI; RD Hanson, Braintree, MA; Norman Hill, Arlington, VA; Ken Hydeman, Xenia, OH; Sterling Marcher, La Mirada, CA; Clive Ridpath, Soquel, CA; Doug Robertson, Oxnard, CA; Brian Rogers, Melvindale, MI; Mike Roth, Chicago, IL; Bob Schultz, St Louis Park, MN; Richard Sklar, Seattle, WA; W.O. Tribble, Macon, GA. Thanks for "e-clippings" from Chanel Cordell, Ed Mayberry, Eddie Muro, Ken Reitz, Larry Van Hom, Dan Veeneman. Special thanks to the ARRL Bulletin.

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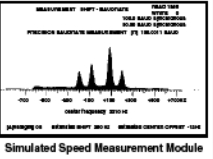
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The Most Enjoyable Channels in My Radio: *MilCom!*

By Robert Wyman
photos courtesy of the D.O.D.

It's the trains that I remember the most. The constant, mechanical, metal-on-metal rumble that went on all day and all night. In the early 1960s, we slept with our windows open. Our home had not yet evolved into the air conditioned fortress of later years, and the sound of military trains heading for Homestead Air Force Base kept me up all night. It would later be called the "Cuban Missile Crisis" and it's my first memory of anything "military."

As a child, I was used to the normal sounds of darkness...but this was different. Combined with news reports that I vaguely remember, it became ominous. Trains on the Florida East Coast Railroad and convoys of trucks and equipment and even missiles on U.S. Highway 1 through Miami. The military buildup had never been seen before, and it was the topic of

discussion at home and in school. "What is happening? How will it end?"

My childhood memories also include visits to Homestead's annual Open House to see the Thunderbirds and "all the jets." Homestead never disappointed us, the residents of southern Dade County. I remember the base as something special; something to be highly respected. It was a Strategic Air Command base back then, and SAC held a magical place in the eye of the public, including the children. These people were protecting Miami. They made sure we didn't have to be afraid of Castro...or even Kruschev. We were all proud to be an Air Force community. We were especially proud to be a SAC community.

I obtained my first scanner while in Junior High School. That's grades 7 through 9 for those who only know the term "Middle School." Crystals allowed it to scan up to four

channels sequentially, all in the VHF High band. I loaded it with the local police dispatch channel, the records channel and the adjacent district's dispatch channel. I used the fourth channel to swap out crystals of other agencies or districts...and it was always great sport to visit a Radio Shack in another part of Miami just to get a new crystal to play with.

My friends and I quickly collected all the crystals for all the police agencies in our area. The fire department was on UHF, so we couldn't listen to them. Homestead Air Force Base, near enough to hear the jet engine runups on the flightline each morning, was still an unattainable dream...except for monitoring an occasional mutual aid call about a rowdy Airman or something, since Homestead's Security Police desk also had a base station on the county's district police channel.

◆ Equipment was Key

The first MilCom breakthrough came in the form of the Bearcat 210. This was the world's first keyboard-programmable scanner, with 10 VHF/UHF channels plus the ability to search out new channels. Included with the scanner was a teasingly brief list of frequency allocations, including military and government bands. It was a miracle. I could finally listen to the fire department, as well as anything else at any time, all without crystals. Sleeping at night immediately became optional. Since I was now in High School, I was probably heading for the up-all-night lifestyle anyway, but this gadget made a great excuse to do so. We were even allowed to legally listen to mobile telephone calls!

By the time the Bearcat 220 came out about a year or so later, adding the VHF Aircraft Band to the monitoring mix, I had already started my "frequency list" and had mapped out almost all of the active channels in my area. Homestead Air Force Base was by then a Tactical Air Command base, and it



encompassed dozens of channels with a multitude of interesting communications.

Aircraft maintenance, security and law enforcement, fire and crash rescue, various component repair shops, command nets, fueling nets, "Follow Me" trucks, the Air Force Sea Survival School at nearby Turkey Point (using Marine Band channels), and the all-important Control Tower frequency of 126.2 continued to increase my awareness and reduce my sleep.

And you'll love this recollection: after hearing all the names and abbreviations of the various "nets," I called the base and asked who was in charge of the radios. I was eventually forwarded to an on-site Motorola technician who happily answered (almost) every question and provided the real names of (almost) every channel I inquired about! Try that today and see who shows up at your door!

Now armed with an impressive frequency list, including channel names such as "Maintenance Net A - Gold Flight" and "Transient Alert" and "Ground Controlled Approach," I entered my 20s with a greater respect for the military and Homestead Air Force Base, although I had also determined that I was not personally destined to join the ranks.

Instead, I entered local government service and integrated the radio scanning hobby through both volunteer and assigned work with the county's Civil Defense agency... later called Emergency Management... as well as through my other government assignments within the Department of Traffic and Transportation.

MilCom from Homestead remained a big part of my scanning day, with Military aviation frequencies being the most enjoyable since I could hear them (the aircraft) many miles away from the base itself. I continued to amass volumes of allocation information and frequency books, and I participated regularly in the Radio Communications Monitoring Association (RCMA) along with [long-time MT contributors and subscribers] Mark Cobbeldick, Jan Fine, Bob Sherman and others. When Bob Grove moved from South Florida to North Carolina and started his company and this magazine, the entire group of South Florida monitors applauded the effort and sought to contribute as much as possible.

By the time scanners appeared on the market with the (predominantly military) UHF Aircraft Band, I was ready. Bob Grove's *Federal Frequency Directory* (now long out of print), along with the other books I researched, opened up a new avenue of monitoring on a portion of the radio spectrum previously unavailable to all but the most die-hard hobbyist.

◆ Milcom Today

This band continues to be the most enjoyable and surprising part of all the channels I currently listen to. And finally, after

several years' drought, an authoritative frequency resource has been completely updated. Larry Van Horn has completely revised *Monitoring the Military* state by state, and the entire work will soon be available on CD from Grove Enterprises.

Now that we're speaking of the present, I highly recommend that everyone at least sample this segment of you have a scanner capable of doing so. In fact, some scanner-related websites even include audio links with MilCom VHF and UHF channels, so a new scanner isn't necessary for such a sample.

- Remember "Top Gun?" You'll hear the military combat range communications, air-to-air and air-to-ground, just like in the movie. It's even more exciting in real time and real life, even without Tom Cruise.
- Remember "M*A*S*H?" You'll hear the helicopter missions and ground support communications, with all of the drama and none of the comedy.
- Remember any of the hundreds of other war movies? If they used communications, you'll hear the real troops training for real missions: air combat, aerial refueling, bombing runs, forward air control, recon, rescue, ground support, base operations, and many other special assignments.
- With a good antenna system (including high-grade cable), you'll even hear satellites and the Space Shuttle (see this month's *Fed Files*), as well as flight tests and a wide assortment of mystery channels and callsigns. "Black Projects" and secret aircraft? Perhaps.

Air Force Bases and other military facilities are almost cities unto themselves. Units such as Law Enforcement, Fire-Rescue, Base Hospitals/Ambulances, Civil Engineering, various maintenance activities, schools,

conference centers and recreational areas each utilize VHF and UHF land-mobile radio communications.

Unlike cities, however, many base units will coordinate their activities and support each other during exercises and emergencies. Monitoring these radio systems, both airborne VHF/UHF and land-mobile VHF/UHF, will provide a great deal of information and enjoyment...and restore the pride we used to feel for our military.

Prove it to yourself: listen in to MilCom and hear the dedication, discipline and precision in their communications, then compare that to the local dispatch channels you normally listen to. You'll find that MilCom will soon become your most enjoyable channels, too!

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UHF Aircraft Frequency Sampler for Southeast Florida

Military Aircraft use these channels to communicate at local airports, for cross-country navigation, and during training missions. All freqs AM mode. For more detailed information, contact the author at wymenant@bellsouth.net

235.100	Aerial Refueling	285.500	Miami Air Route Traffic Control Center	338.000	Key West Naval Air Station
238.900	Aerial Refueling	285.600	Miami International Airport	340.200	Key West Naval Air Station
239.300	Airport Control Towers (various locations)	289.400	Key West Naval Air Station	342.500	Weather reports
243.000	Emergency Channel	290.325	Miami International Airport	342.600	Air Combat Training
250.600	Air Combat Training	290.500	Aerial Refueling	343.000	Aerial Refueling
251.000	NORAD	291.600	Miami Air Route Traffic Control Center	343.600	Palm Beach International Airport
251.100	Miami International Airport	292.200	Air Combat Training	343.700	Miami Air Route Traffic Control Center
251.900	Air Force Rescue use	295.700	Homestead Air Reserve Station	344.200	Air Combat Training
252.200	Air Mobility Command	298.900	Miami Air Route Traffic Control Center	344.600	Weather reports
255.400	FAA Flight Service Stations (various locations)	301.500	Miami International Airport	346.300	Aerial Refueling
255.600	Miami International Airport	303.150	Homestead Air Reserve Station	348.600	Miami International Airport
256.700	Miami Air Route Traffic Control Center	304.800	USAF, NOAA and NASA use during Hurricane Season	348.700	Miami Air Route Traffic Control Center
256.900	Miami International Airport	305.200	Key West Naval Air Station	348.900	Aerial Refueling
257.700	Miami Air Route Traffic Control Center	306.300	Miami International Airport	349.000	Miami Air Route Traffic Control Center
257.800	Airport Control Towers (various locations)	306.400	NORAD	349.400	Air Mobility Command
263.100	Miami Air Route Traffic Control Center	306.900	Miami Air Route Traffic Control Center	352.000	Aerial Refueling
263.200	NORAD	306.975	Miami International Airport	353.600	Miami Air Route Traffic Control Center
264.600	Air Combat Training	307.100	Miami Air Route Traffic Control Center	353.900	Miami Air Route Traffic Control Center
264.625	Air Combat Training	307.200	Miami Air Route Traffic Control Center	354.100	Miami International Airport
265.000	Air Combat Training	307.300	Miami Air Route Traffic Control Center	355.600	Key West Naval Air Station
266.500	Aerial Refueling	307.800	Aerial Refueling	360.200	Key West Naval Air Station
269.050	Miami Air Route Traffic Control Center	307.900	Miami Air Route Traffic Control Center	360.800	Opa-Locka Airport
269.300	Miami Air Route Traffic Control Center	313.200	Key West Naval Air Station	363.050	Miami Air Route Traffic Control Center
269.575	Miami International Airport	317.400	Palm Beach International Airport	363.100	Aerial Refueling
269.900	Homestead Air Reserve Station	317.700	Miami International Airport	363.200	Miami Air Route Traffic Control Center
270.600	Air Combat Training	318.500	Air Combat Training	364.200	NORAD
275.400	Air Combat Training	319.000	Miami Air Route Traffic Control Center	370.900	Miami Air Route Traffic Control Center
275.800	Airport Ground Control (various locations)	319.100	Miami Air Route Traffic Control Center	372.200	Pilot-to-Dispatcher
276.500	Aerial Refueling	319.700	Aerial Refueling	377.100	Miami Air Route Traffic Control Center
277.200	Key West Naval Air Station	319.900	Miami International Airport	379.200	Aerial Refueling
278.500	Miami Air Route Traffic Control Center	322.300	Miami International Airport	379.250	Miami Air Route Traffic Control Center
280.200	Air Combat Training	322.450	Miami Air Route Traffic Control Center	379.900	Miami International Airport
281.500	Miami Air Route Traffic Control Center	322.500	Miami Air Route Traffic Control Center	380.200	Miami International Airport
282.800	Search and Rescue use	322.550	Miami Air Route Traffic Control Center	381.300	USAF Command Post (various locations)
283.900	Aerial Refueling	323.000	Miami Air Route Traffic Control Center	381.450	Miami Air Route Traffic Control Center
284.600	Palm Beach International Airport	323.100	Miami Air Route Traffic Control Center	381.700	Coast Guard
		323.200	Miami Air Route Traffic Control Center	381.800	Coast Guard
		324.600	Aerial Refueling	384.600	Palm Beach International Airport
		327.600	Aerial Refueling	387.100	Palm Beach International Airport
		335.500	Miami Air Route Traffic Control Center	391.000	Aerial Refueling
		335.600	Key West Naval Air Station	397.900	Palm Beach International Airport
		336.400	Airport Ground Control (various locations)	398.900	Miami Air Route Traffic Control Center

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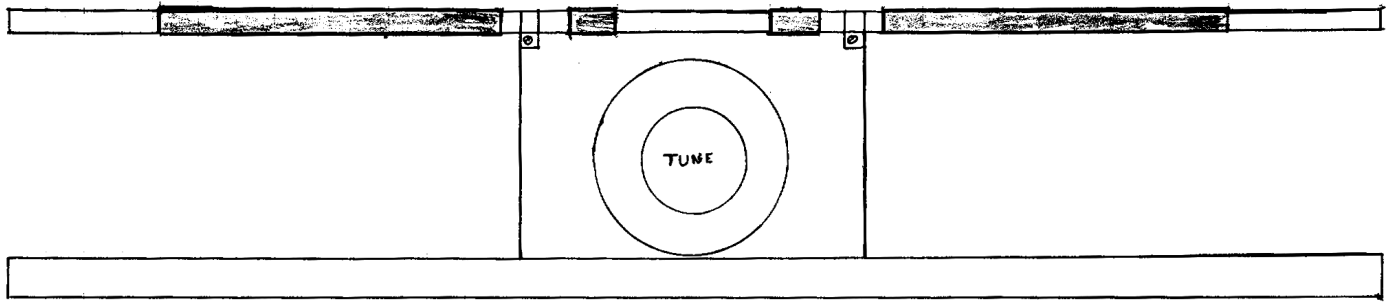
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A 36-inch MF Spectrum Loopstick Receiving Antenna

By Richard Q Marris G2BZQ

The Medium Frequency Spectrum covers from 300 to 3000 kHz (or 1000 meters to 100 meters). It thus takes in the medium wave AM broadcast band, the U.S. MEDFER experimental band, plus the amateur transmitting "Top Band" (1800 to 2000 kHz). In between, there are various navigational beacons, and other beacons. To which must be added commercial and other CW stations, etc. So, it will be seen that there is something for everyone—DX listeners, transmitting amateurs, and experimental enthusiasts.

All the above activities in the MF spectrum suffer greatly from interference from other stations (QRM), and from man-made and atmospheric noise (QRN). To eliminate this it is usually necessary to employ a highly directional antenna for receiving, such as a tuned loop, especially for those who live in heavily populated areas.

Tuned loops come in a variety of forms and sizes. For example, among the smallish loops are box loops, up to maybe 48-in. x 48-in.; spiral loops; and ferrite loops which are sometimes called loopsticks. Small versions of loopsticks will be found in your small portable radio, for use in the medium and long wave bands. These small ferrite loops consist of coils wound over a nickel zinc ferrite rod. Rotate your portable radio, and interfering stations and noise can often be eliminated or greatly reduced.

It is a function of ferrite rods that the larger the diameter of the rod, then the greater the sensitivity and also the directivity. However, if you lengthen the rod then the greater the directivity (nulling) achieved, accompanied by greatly increased sensitivity. In fact zero nulling can be achieved, except where the user lives adjacent to a high power transmitter.

So this 36-in. long loopstick antenna for the MF spectrum gives maximum nulling. It uses a 36-in. long x 3/8-in. diameter nickel zinc ferrite rod, which has to be fabricated by the constructor from shorter readily available rods (see later).

The Circuit is shown in Figure 1. It consists of coils L1 & L2 wound on the rod and tuned in a balanced circuit by variable capacitor C1A, which is half of a 2-gang variable capacitor. The other half (C1B) can be switched, with switch SW, to lower the frequency range.

The resulting frequency range is 400 to 3350 kHz on the prototype, achieved as follows;

C1A only = 3350 to 620 kHz

C1A + C1B = 3350 to 400 kHz

The range can be extended to 300 kHz if required (see later). Coils L3 & L4, via the coaxial socket, are used to couple the loopstick to the receiver input.

The Unit Assembly is shown in

Figure 2. It is built onto a base 36-in. long x 5-in. wide x 1-in. deep. On the prototype, an inverted plastic plant pot tray was used, giving a lightweight, easy to use device. An alternative would be a lightweight timber frame, surfaced with thin plywood or plastic sheet. A piece of solid timber would be far too heavy and unwieldy.

At the front will be seen the 2 gang variable capacitor C1A/C1B. A 410 + 410 pf solid metal framed variable capacitor was used, with inbuilt slow-motion. A 500 + 500 pf would be advantageous, as it would extend the frequency range at the LF end. An external slow-motion drive could be fitted. A large diameter knob should be used.

At the center rear of the base, is mounted a 4-1/2-in. high x 7-in. wide insulated rigid plastic board. It is mounted vertically, as shown, using small metal brackets. The coaxial socket is fitted near the center bottom of this board. The 36-in. long x 3/8-in. diameter loopstick, encased in a 1/2-in. o/d rigid plastic tube (see Figure 3), is fitted along the top edge of the vertical board, with two PVC "P" clips secured with two screws, nuts and washers. The outer edge of the "P" clips would line up with the vertical edge of the vertical board. A small switch, SW, is fitted alongside C1B on the base.

◆ Fabricating the 36-in. long ferrite rod

The rod material used is nickel zinc type 61 mixture. The prime supplier is Amidon Associates*, and such rods are also advertised in the current catalogue of Antique Electronic Supply*. The suggested rod size is 7-1/2-in. long x 3/8-in. diameter. (Note: dimensions are quoted in inches - not metric).

Ferrite rods can be adhered together, end to end to produce longer rods. Also they can be cut with a small hacksaw, though the blades do not seem to appreciate this operation! Thus, for the 36-in. long rod, it is necessary to use 5-in. x 7-1/2-in. long x 3/8-in. diameter 61

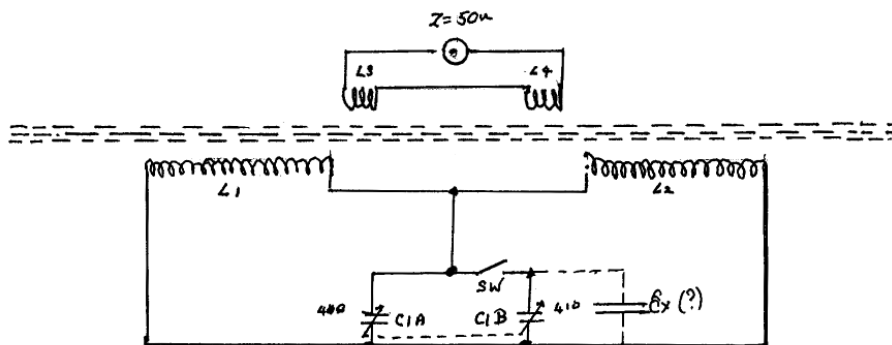


Figure 1 - Schematic

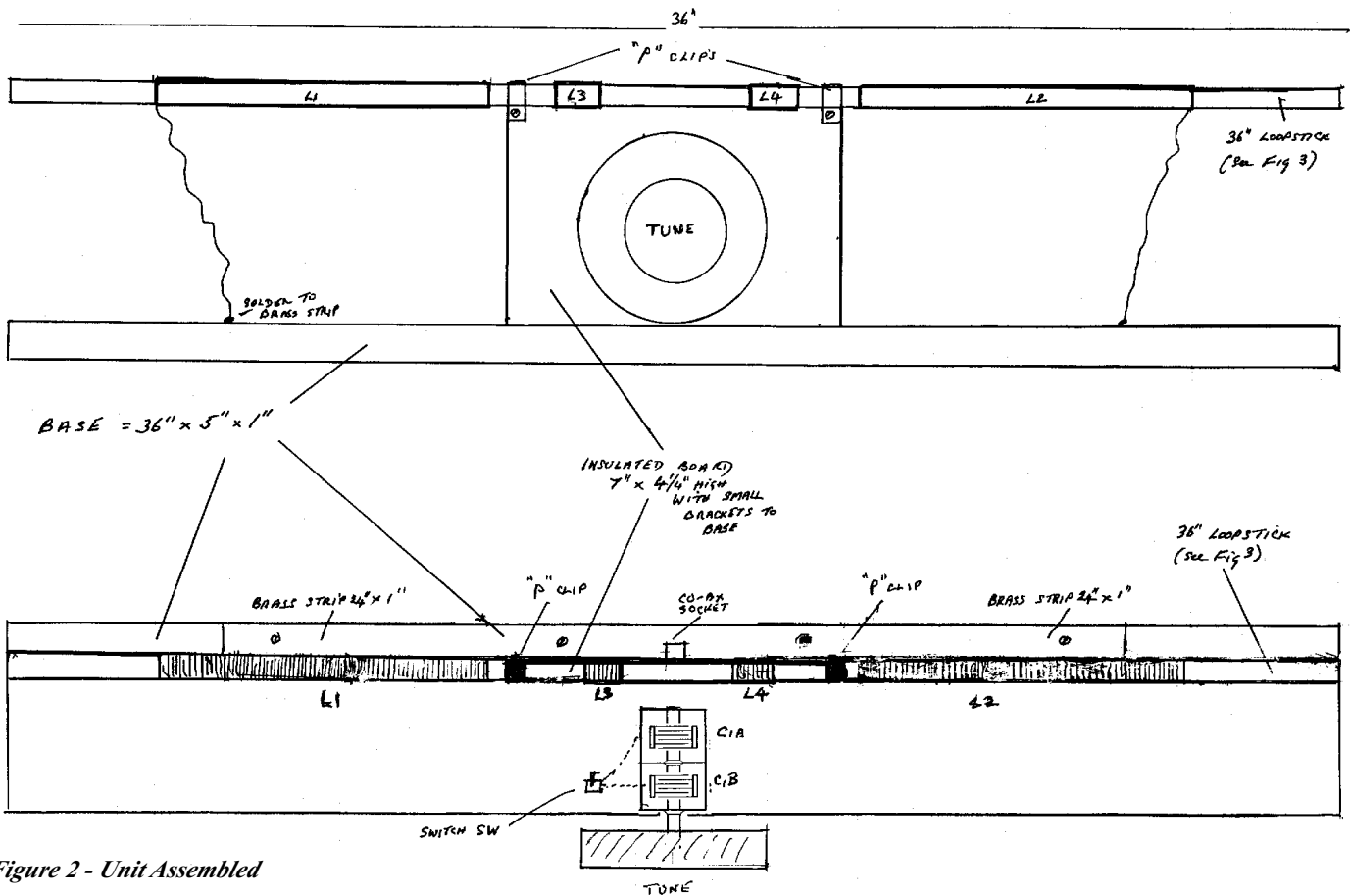


Figure 2 - Unit Assembled

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rods, with the surplus 1-1/2-in. cut off one of the rods before adhesion.

Each rod should be lightly cleaned by carefully rubbing down the ends on a sheet of abrasive paper laid on a flat surface. A Cyanoacrylene adhesive (e.g., Superglue) should be used. It gives a near unbreakable joint with rapid adhesion. Great care must be taken to line up the rod ends, as you do not get a second chance. Also keep the Superglue off the fingers. The best idea is to first stick the rods together in pairs, which are then stuck together to form the 36-in. long rod.

The rod is then inserted into a 1/2-in. o/d plastic tube, which becomes the coil former. Any 1/2-in. o/d rigid plastic tubing will do. The thicker the wall thickness the better, providing the inside diameter exceeds 3/8-in., so that the rod can be inserted. On the prototype, polycarbonate clear rigid tubing was used. This was obtained from a store specializing in supplies for tropical fish keepers.

The tube should be cut to 36-in. long. The ferrite rod on the prototype was wound with a few turns of masking tape, to make the ferrite rod a snug fit in the plastic tube. The ends of the tube (and rod) are then sealed by a few drops of hot candle wax.

(Notes: The ferrite rod should not be secured in the plastic tube until the coils L1 to L4 have been wound and the system fully tested. An alternative suggestion for ferrite rod source supply is to find a supply of the older 8-in. long x 3/8-in. diameter ferrite rods which were popular some years ago. These can sometimes be found on the surplus market, complete with a medium wave (and long wave?) winding. These will probably be of a nickel zinc mixture of unknown grade. Providing they were intended for medium wave usage, they are well worth a try, as they come out cheap on the surplus market from time to time. However, the performance at the HF end of the loopstick may be below that obtained with the 61 mixture rods.

◆ Winding L1 - L4

The wire used, in all cases, is PVC cov-

ered hookup wire (24/0.2) 2.06 mm outside diameter. This type of wire makes coilwinding easy, as, when closewound, it automatically spaces the wire turns. Winding turns are therefore closewound, as laid out in Figure 3.

L1 is wound *anticlockwise*, starting one wire width, to the left of the lefthand "P" clip. L1 consists of 84 turns.

In a similar manner L2 is *clockwise*, wound with 84 turns, starting one wire diameter width from the right hand "P" clip.

Coupling coils L3 and L4 are next wound *clockwise* as shown in Figure 3. Each consists of 11-1/2 turns exactly 3-in. apart. The two inner ends are connected together, as shown, and the outer ends will drop down to the coaxial socket.

All coil ends should be anchored with a spot of adhesive or tape.

◆ The Final Assembly

(see Figure 2)

Before fitting the 36-in. long loopstick, a 24-in. x 1-in. thin strip of brass should be screwed to the base, behind the vertical board. A narrow strip of the same brass should be cut and run from the main body frame of the variable capacitor and soldered at both ends.

Next fit the loopstick, along the top edge of the vertical board, by using two PVC 1/2-in. "P" clips.

Drop the ends of L1/L2 down, and solder to the brass strip. The inner ends of L1/L2 should be taken to C1A and soldered (see circuit). The inner ends of L3/L4 are soldered together. The outer ends of L3/L4 are taken to the inner and outer connections of the coaxial socket, and soldered.

A small switch (SW on circuit) is fitted near C1A/C1B and connected as shown in circuit. As an alternative a short alligator clip lead could be used.

◆ Testing

Connect the loop to the receiver antenna input socket, using maybe 4 feet of RG58 feedline. With C1A (only) in circuit, locate the actual frequency range of the loop by us-

ing the receiver calibrations. The loop should be brought to resonance on a convenient signal. Resonance is indicated by a increased signal strength. Rotate the loop, until the signal increases dramatically, as the flat side of the loop points towards the station being received. Rotate the loop through 90 degrees. The signal should now be no longer audible. Continue this operation until the loop has been thoroughly tested over the whole frequency range; at the same time recording the range by means of the receiver calibrations.

If C1B is switched in, then this will drop the LF bottom frequency to about 400 kHz. The actual frequency will depend on the capacity of C1A/C1B. On the prototype a 410 + 410 pf two-gang variable capacitor was used. A 500 + 500 pf is likely to be more readily available, and the extra capacity will lower the LF frequency end of the loop range.

A further drop down to 300 kHz may be achieved by adding additional capacity "CX" across C1B. This can be a ceramic or silver mica capacitor of 200 pf (CX).

In operation, it will be found that the nulling can be quite dramatic, thus eliminating (or very greatly reducing) both QRM & QRN. Whether an RF preamplifier should be used will depend on the performance of the individual receiver. Such preamplifiers can be purchased at relatively low cost, or a wide-band preamplifier can be made up using one of the many published circuits.

Remember: All connections should be securely soldered. Do not use mechanical connections.

Suppliers of 61 mixture Nickel-Zinc Ferrite Rods	
1.	Amidon Associates Inc., P.O. Box 25867, Santa Anna, California 92799, U.S.A.
2.	Antique Electronic Supply, 6221 S. Maple Avenue, Tempe, AZ 85283 USA.
<i>Remember :- The ferrite rods required are 61 mixture 7-1/2-in. long x 3/8-in. diameter. Quantity - 5.</i>	

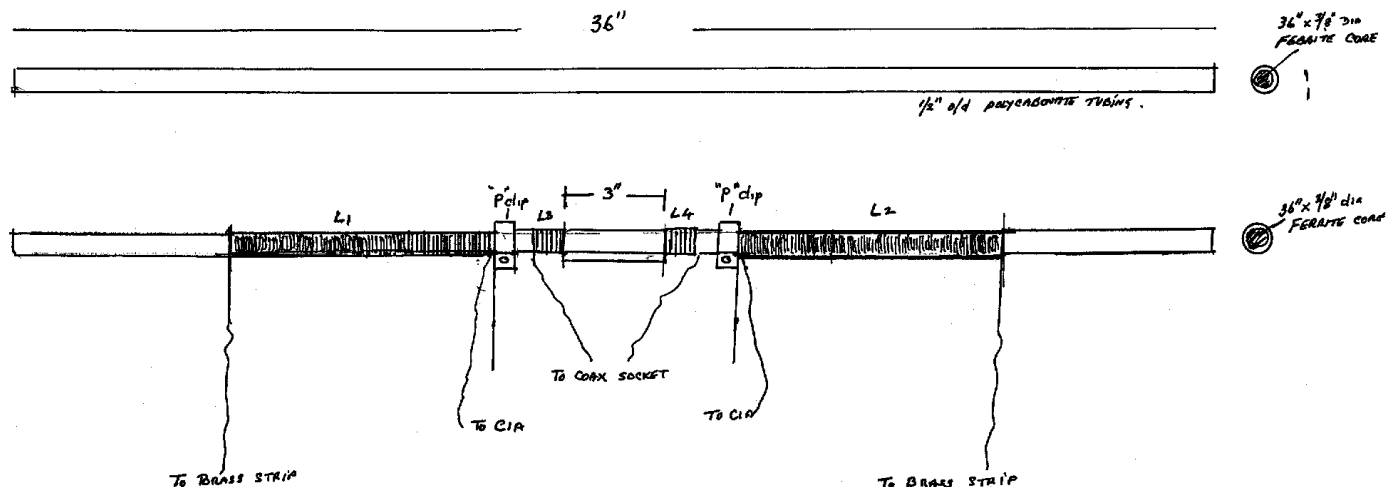


Figure 3 - Ferrite Rod/Coil Assembly

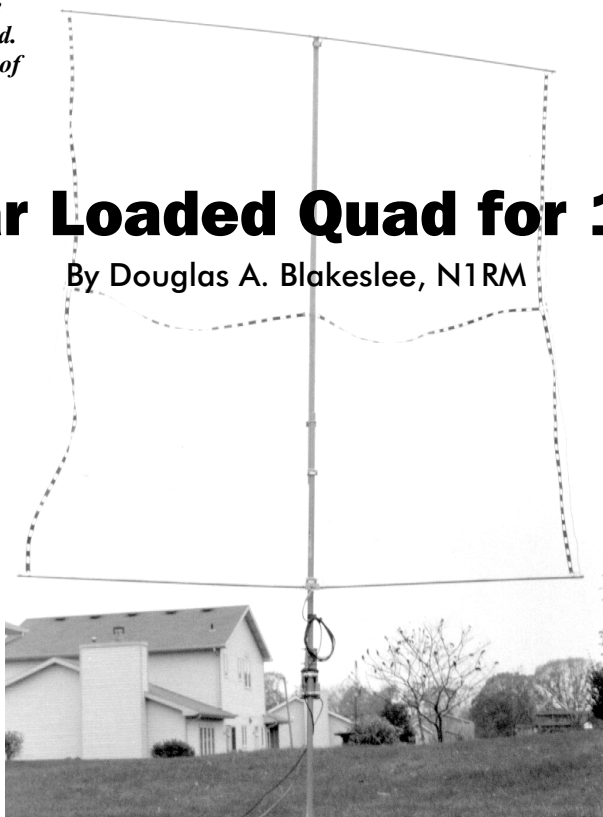
The linear loaded quad is set up in the side yard only a few feet off the ground. Operational tests show the advantage of this design, as described in the text.

A Linear Loaded Quad for 15 MHz

By Douglas A. Blakeslee, N1RM

Of the various antenna choices available to the monitor looking for improved performance, the quad (also known as the quad loop) has some distinct advantages. The primary three are low noise pickup because the loop is a closed system, higher gain than a dipole cut for the same frequency, plus a lower angle radiation pattern for good long distance (DX) performance.

The quad antenna was pioneered for shortwave service at HCJB in Ecuador, the religious broadcaster that has been the "Voice of the Andes" for over 50 years. Their transmitting site above Quito was so high, yet moist, that static discharge from linear elements such as dipoles was a major problem. The quad loop was the answer for this broadcaster.



(G3FPQ), designed a 7-MHz (40 meter) 2-element quad beam antenna which was described in *QST*² and several editions of *The ARRL Handbook*. Mark Twain wrote, "thunder? thunder is impressive but it is the lightning that does the work." To apply Twain to antennas is a bit of a stretch, but the high current portion of the antenna is the lightning and the high voltage portions are the thunder. G3FPQ kept the high current portions intact

while folding back the high voltage sections back on themselves, creating "linear loading," reducing the size of the quad by approximately 40 percent.

Anyone who has tall trees or who can put up tall masts can build a quad. However, once installed, it is only bidirectional. For performance on the 15 MHz and higher bands, a quad that is rotatable can be made from inexpensive, lightweight, available components. The first model built by this writer was for 15 MHz as this was the largest size considered possible for a lightweight quad. It was the best test for mechanical stability of a very light weight antenna.

A full sized quad for 15 MHz would be over 18 feet on a side, difficult to build and to handle. With linear loading, the quad comes down to approximately 10 x 12 feet, an antenna much easier to construct and to rotate.

A full sized quad for 15 MHz would be over 18 feet on a side, difficult to build and to handle. With linear loading, the quad comes down to approximately 10 x 12 feet, an antenna much easier to construct and to rotate.

◆ Antenna Construction

The linear-loaded quad is built from two pieces of electrical conduit as the main elements at the top and bottom of the antenna. The general design of the antenna is shown in Fig. 1. The supporting mast is made from a 1-1/4-inch piece of wood dowel, 10-feet long. The center support needs to be nonconductive to prevent detuning the antenna. A 5-foot piece of antenna mast (RS 15-842) and two U bolts (RS 15-826) finish the mast for insertion into the mount or rotator.

A number of small plastic rectangles are employed to provide mounting of the connecting wires and to provide insulation. Diagram of these pieces are shown in Fig. 2. A visit to a local plastic supply and a good smile can produce the material needed, as it usually goes into the scrap bin. Or a piece of acrylic or polycarbonate sheet can be purchased and cut up with a small saw. Acrylic should be at least 3/8-inch thick, while polycarbonate 1/8-inch thick or more is appropriate. Next, the holes shown in Fig. 2 are drilled.

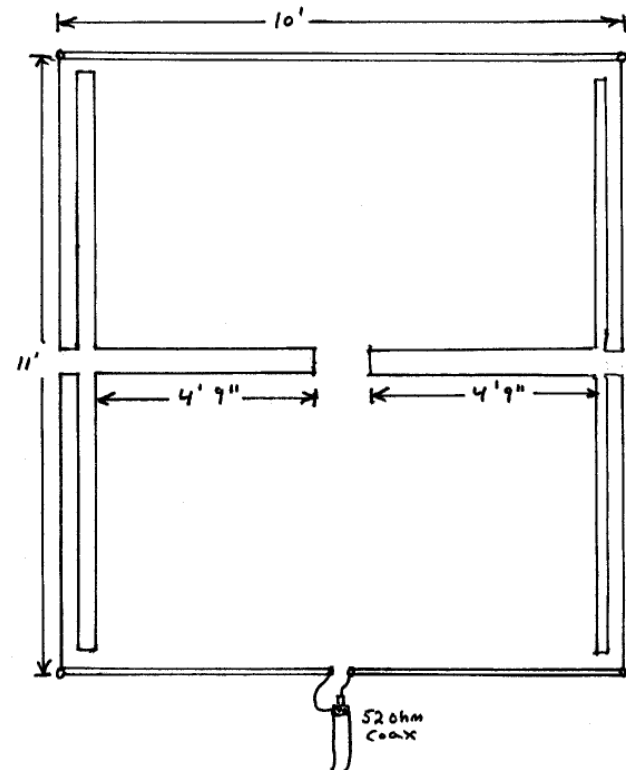


Fig. 1 — The generalized drawing of the linear loaded quad shows the configuration.

According to *The ARRL Antenna Book*,¹ the quad has additional advantages because "it introduces very little loss, does not degrade directivity patterns, and has a low Q to allow reasonable bandwidth." That is high praise! (The Q of an antenna is a measure of its bandwidth, which generally doesn't need to be high. The higher the Q, the narrower the bandwidth over which the antenna can be utilized.)

◆ The Linear-Loaded Quad

A long-time friend, David Courtier-Dutton

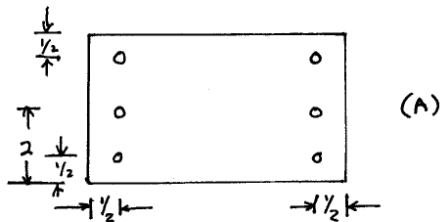
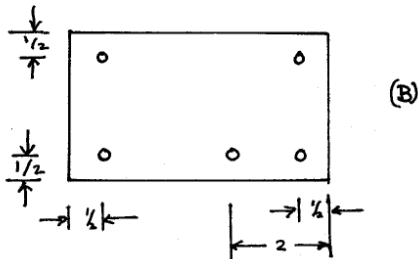


Fig. 2 — Spacers are cut from Lexan or acrylic sheet stock. All holes are 3/16 inch diameter. Connection hardware are no. 6, with brass types utilized for all points carrying radio frequency (RF) energy.



Any connection that must carry part of the antenna electrical circuit should be made with brass hardware, available at most hardware stores. Bolts used for mounting only do not need to be brass. Wire connections should be soldered at each point; the best approach is to use solder lugs where each wire terminates at a brass bolt.

The main loaded elements are made with 450-ohm, open wire line.³ The other two side elements are insulated wire, no. 18 to 22 gauge. A thicker gauge wire (no. 12) was first tried, and it was found to be so heavy that it tended to break in high winds.

◆ Impedance Matching

To extract or input the maximum energy to or from an antenna, the impedance of the connecting cable needs to be matched to the antenna's impedance. A full size quad has a natural impedance of 90 ohms. Calculations indicate that the linear-loaded quad should be approximately 40 ohms in free space. Close to the ground, these numbers can change. Direct connection eliminates the complexity of matching circuits.

The quad loop is a balanced antenna while the coax feed is unbalanced. A simple solution to protect the balance of the loop is to wind the feedline into a five-turn loop approximately 8 inches in diameter. The coax forms a simple balun transformer. Of course, a purchased unit can also be used, but a simple coil of feedline cable is tough to beat in cost.

◆ Antenna Results

The linear-loaded quad was set up in the side yard on a 5-foot piece of TV mast driven approximately 2 feet into the ground. A TV quality rotator (RS-15-1225) was added so that the position of the antenna relative to the signal source could be evaluated. A reference antenna was a 100-foot-long wire antenna some 30 feet high, fed through a transmatch, with some 20 ground radials. A coaxial switch allowed quick changeover between the two antennas for fast comparison.

HF antenna measurements are very difficult even under the most controlled conditions, as noted by Bob Grove in *MT* a couple of years ago. Even fully instrumented antenna ranges don't always yield consistent results. The following notes should be taken as observations only, repeated often enough to lend

some credibility.

1. The quad has lower noise pickup as advertised. Tests using a receiver S meter calibrated with a signal generator indicated the quad was approximately 10 decibels (dB), almost two S units, lower in local noise pickup vs. the reference long wire antenna.

2. The quad antenna seems to have better response to long distance (DX) signals. The quad antenna was located only 3 feet off the ground, which indicates how a closed loop is less affected by its surroundings than linear antennas.

3. Because the antenna is fed directly via 50-ohm coaxial cable, it can also be used on other bands. It was tried on 7 and 21 MHz for ham radio contacts. Utilizing a transmatch (also called an antenna tuner) to match impedances, some 20 countries were worked on 21 MHz in one day.

In monitoring the 9 and 11 MHz bands, the antenna's general ability to produce a null of signals off the sides of the antenna were noticeable, even though the quad was built for 15 MHz. In the end, the ability of a rotatable antenna to reduce the level of interfering signals may well be its most important characteristic.

Footnotes

¹ Rashed and Tai, "A New Class of Wire Antennas," 1982, *International Symposium Digest on Antennas and Propagation*, Vol.2, IEEE. Also, R. Dean Straw et al, *The ARRL Antenna Book*, "linear loading," pgs. 6-19 to 20, 1997, ARRL.

² David Courtier-Dutton, G3FPQ, "Some Notes on a 7-MHz Linear Loaded Quad," pgs. 14 and 15, *QST*, February 1972.

³ Cable X-Perts, Inc, 416 Diens Drive, Wheeling, IL 60090. Tel. 847-520-3003.

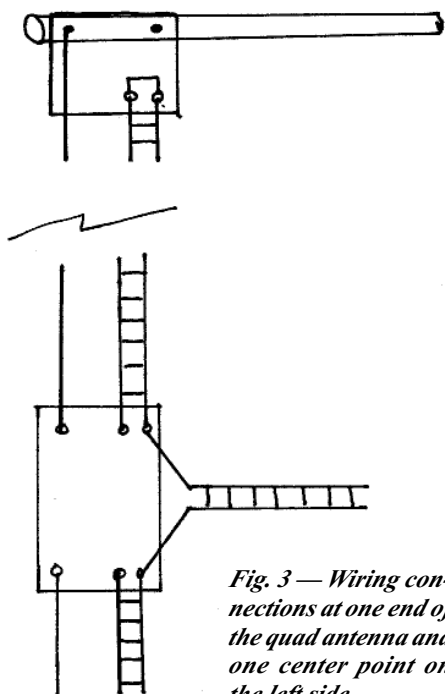


Fig. 3 — Wiring connections at one end of the quad antenna and one center point on the left side.



B. The lower section of the antenna is split into two parts to form a feed point for 52-ohm cable. A coil of coax cable provides a balun transformer to make an unbalanced feedline work with a balanced loop, as described in the text.

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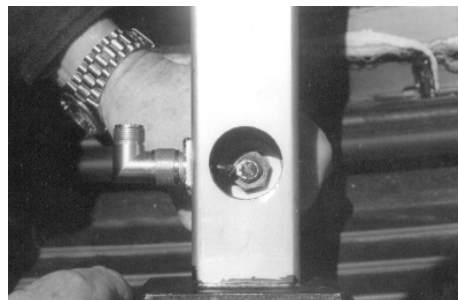
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Who says you can't take it with you!

By Arthur R. Lee WF6P

When my ham radio buddy Don Moore, WA6BJJ, bought a new model Sports Utility Vehicle, there was no possible place to mount his High Frequency (HF) antenna. He easily set up a through-the-window mounted antenna for his two-meter/440 antenna, but his Hustler vertical HF antenna was too big for that approach. Modern-day plastic covered bumpers and the sweeping lines to his SUV had him stymied. Wanting to continue with his on-the-air contacts while operating mobile, he came up with a handy solution that most of us can adopt when faced with the same situation.

He obtained a twelve-inch section of hollow, two-inch square, stainless steel stock from a metal shop to fit his standard trailer hitch. Don cut two one-inch access



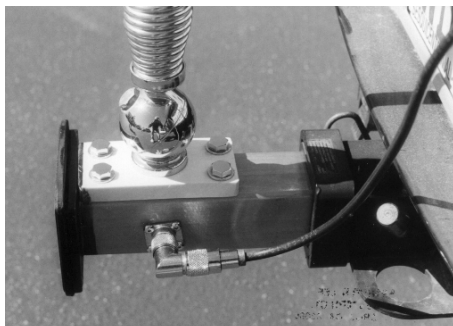
1. Access holes are cut into the mount to allow for soldering and attaching the antenna base and coax connectors.

holes in the stock. The first hole was for the mounting of the antenna spring base connection (Photo 1).

A durable piece of flat plastic was used to insulate the antenna mount from the stainless stock. A panel receptacle (SO-239) was attached at a third hole, with the center connector soldered to the antenna feed point (Photo 2). For mild steel stock, the mounting bolt or screw holes could be drilled and tapped. For this stainless steel



2. The coax connector centerpost is soldered to the antenna terminal spade connector.



3. The completed trailer hitch antenna.

piece, however, the holes were drilled through and nuts and lock washers attached to the bolts. An additional hole in the square stock was drilled for a lock pin to hold it securely in the trailer hitch.

Drilling of holes through stainless steel requires cutting oil and a drillpress operated at slow speed. Drilling through mild steel is easier and only requires the use of a light oil coolant to reduce heat on the drill bit.



4. The assembled antenna after a very dusty (and successful) road test.

preventing the antenna from bending rearward from wind loads while driving was necessary. This antenna was tethered to the roof rack with a short length of nylon cord (Photo 4).

On bumper mounted antennas I have used in the past, I preferred to use two lengths of 20 pound test monofilament fishing line tied in a vee fashion to either a roof rack or my trunk lid edges. With the breakaway monofilament fish-

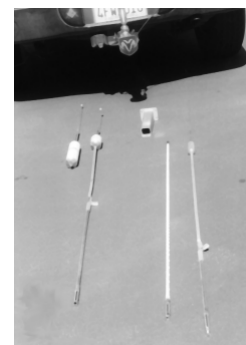


5. The RG-8U coax is fed to the antenna through the seal in the rear cargo door.

ing line, an unplanned-for snag from a tree or low lying bridge or parking garage will not damage the antenna too badly. When the monofilament fishing line breaks, the antenna can bend back against the natural action of the vertical spring support.

For easy operating access, the HF rig was mounted on the transmission console between the driver and front seat passenger. The RG8U coax connecting the HF transceiver to the antenna was led back under the carpeting through the passenger compartment to the rear-loading door. To prevent drilling a hole in the body of the vehicle, the coax passed out through the soft rubber seal at the lower part of the door (Photo 5).

The antenna elements and traps for different bands are stowed inside the vehicle when not in use (Photo 6). The trailer hitch antenna mount is easily removed for storage or when replaced by the actual trailer hitch and ball for towing (Photo 7).



6. Coils and the fold-over antenna elements are stowed in the vehicle for use on various frequencies.

Although Don is an excellent CW operator, his wife will not let him pursue that part of his ham radio hobby by operating his straight key while driving down the freeway. She makes him use his microphone on voice frequencies only! Of course, when she is not with him ... ?



7. By pulling out the lock pin, the unit can be easily removed when not in use.

Scanning Florida's Space Coast

By John Mayson
photos by Harry Baughn

In the March issue, *MT* readers took a trip down I-4 and across central Florida. But we barely bypassed some of the most popular beaches and sights just to the south of our starting point at Daytona Beach. We also neglected to warn motorists that in Florida, unless you are a licensed ham, it is illegal to mount a scanner in your car.

For everything connected to monitoring NASA launches, consult the newly-updated and comprehensive *Monitoring Times* website <http://www.grove-ent.com/nasa.html> compiled by Assistant Editor Larry Van Horn.

Brevard County

Florida's Space Coast is home to the Kennedy Space Center, one of the largest sea turtle nesting grounds, and about eighty miles of Atlantic Ocean coastline. The closest beaches to Orlando are in Brevard County. Viera is now the county seat and Palm Bay is the largest city. Along with miles of desolate, beautiful beach, the Brevard Zoo in Viera and Kennedy Space Center Visitor's Center attract many visitors.

Brevard operates an EDACS TRS used by all county and city agencies. Brevard is about 80 miles north-to-south and only about 15 to 20 miles east to west. In order to cover such a vast area, three repeaters were built: Titusville (north), Rockledge (central), and Palm Bay (south).

North Site Frequencies

- 1=866.2125
- 2=866.8250
- 3=868.1625
- 4=868.7375
- 5=866.2625
- 6=866.5500
- 7=868.4125
- 8=868.6875
- 9=866.7625
- 10=867.2625

- 11=867.7625
- 12=868.5125

Central Site Frequencies

- 1=866.0750
- 2=866.3250
- 3=866.6250
- 4=868.5375
- 5=868.7875
- 6=866.1875
- 7=868.6000
- 8=868.8500
- 9=867.1250
- 10=867.3750
- 11=867.6250
- 12=867.8750

South Site Frequencies

- 1=866.1250
- 2=866.5875
- 3=867.0375
- 4=868.0750
- 5=866.2500
- 6=868.3750
- 7=868.5625
- 8=868.8125
- 9=866.3000
- 10=866.3750
- 11=866.6750
- 12=866.9000
- 13=867.5375
- 14=866.5625
- 15=868.6250
- 16=856.7625
- 17=857.7625
- 18=858.7625
- 19=859.7625
- 20=860.7625

Brevard County Sheriff's Office Talkgroups

AFS	Chan	Description
01-000		Agency Call
01-010		Patrol Fleet Call
01-011	1	North Dispatch
01-012	2	Central Dispatch
01-013	3	South Dispatch
01-014		Teletype
01-015		Tac
01-016		Supervisor
01-020		Agent Fleet Call
01-021		CID
01-022		Homicide
01-023		SID
01-024		GEE TOO
01-026		Drug Task Force

01-027	M A N
01-030	Tac Fleet Call
01-031	North Tac
01-032	Central Tac
01-033	South Tac
01-034	M A N
01-037	M/A ERT
01-040	AOA Fleet Call
01-041	Countywide
01-042	M/A ERT
01-044	EOC
01-045	ERT 1
01-046	ERT 2
01-047	Vice
01-050	Sheriff Fleet Call
01-051	Command
01-052	Court W/A
01-053	Training Tac
01-054	FARM Ops
01-055	SWAT 1
01-056	SWAT 2
01-060	Tac Fleet Call
01-064	State Attorney's Office
01-080	EOC Fleet Call
01-081	EOC A
01-082	EOC B
01-083	EOC C
01-084	EOC D
01-085	EOC E
01-090	Alert Fleet Call
01-091	Alert 1
01-092	Alert 2
01-093	Alert 3
01-094	Alert 4
01-095	Civil
01-096	Warrants
01-097	AG Marine
01-140	Police 1 Fleet Call
01-147	Police North
01-150	Police 2 Fleet Call
01-156	Police Central
01-157	Police South

Brevard County Fire-Rescue Talkgroups

AFS	Description
03-000	Fire Agency Call
03-010	Fire Fleet Call
03-011	North Fire Dispatch
03-012	Central Fire Dispatch
03-013	South Fire Dispatch
03-014	North Emergency Management
03-015	Central Emergency Management
03-016	South Emergency Management
03-017	Paging



03-020 EMS Fleet Call
 03-021 North EMS Dispatch
 03-022 Central EMS Dispatch
 03-023 South EMS Dispatch
 03-030 Ops
 03-031 Tac 31
 03-032 Tac 32
 03-033 Tac 33
 03-024 North Lifeguards
 03-034 Central Lifeguards
 03-025 South Lifeguards
 03-040 Fire Tac Fleet Call
 03-041 Tac 41
 03-042 Tac 42
 03-043 Tac 43
 03-044
 03-050 EMS Tac
 03-051 Tac 51
 03-052 Tac 52
 03-053 Tac 53
 03-054 EMS Wide Area
 03-060 Admin Wide Area
 03-061 Agency Wide Area
 03-062 B/U Wide Area 1
 03-063 B/U Wide Area 2
 03-064 B/U Wide Area 3
 03-070 Training & Prevention Fleet Call
 03-071 North Training
 03-072 Central Training
 03-073 South Training
 03-074 North Prevention
 03-075 Central Prevention
 03-076 South Prevention
 03-077 Comm 1
 03-080 Mutual Aid Fleet Call
 03-081 North Mutual Aid
 03-082 Central Mutual Aid
 03-083 South Mutual Aid
 03-100 Car-to-Car Fleet Call
 03-101 North Car-to-Car
 03-102 Central Car-to-Car
 03-103 South Car-to-Car

Beachside Talkgroups

AFS	Chan	Description
10-000		Beaches Agency Call
10-010		City Beach 1 Fleet Call
10-011	1	Indian Harbour Beach Police Dispatch
10-012	2	Satellite Beach Police Dispatch
10-013	3	Indianalantic Police Dispatch
10-014	4	Beaches Police
10-020		City Beach 2 Fleet Call
10-021	5	Beaches Police
10-022	6	Beaches Police
10-023	7	Beaches Police
10-030		City Beach 3 Fleet Call
10-031	1	Indian Harbour Beach Fire Dispatch
10-032	2	Satellite Beach Fire Dispatch
10-033	3	Indianalantic Fire Dispatch

Cape Canaveral Talkgroups

AFS	Description
03-035	CCVFD Tac

Cocoa Police Talkgroups

AFS	Description
11-020	Patrol Fleet Call
11-021	Ops
11-022	Teletype
11-023	Tac 1
11-024	Tac 2

11-025	Wide Area
11-026	Cocoa/Rockledge Mutual Aid
11-027	Dispatch
11-030	CIS Fleet Call
11-031	CID
11-032	SID
11-040	Admin Fleet Call
11-041	Admin
11-042	Supervisor
11-043	SRT-L
11-044	SRT-W

Cocoa Fire Talkgroups

AFS	Description
11-050	Fire Fleet Call
11-051	Dispatch
11-052	Tac 1
11-053	Tac 2
11-054	Backup
11-060	Command Fleet Call
11-061	Mutual Aid
11-062	Admin

Cocoa Beach Police Talkgroups

AFS	Description
12-030	Police 1 Fleet Call
12-031	Dispatch
12-032	Tac 1
12-033	Tac 2
12-034	Supervisor
12-035	Teletype
12-040	Police 2 Fleet Call
12-041	Events
12-022	Wide Area
12-023	Wide Area
12-024	EOC

Cocoa Beach Fire Talkgroups

AFS	Description
12-010	Fire 1 Fleet Call
12-011	Dispatch
12-012	Tac 2
12-013	Tac 3
12-014	Supervisors
12-020	Fire 2 Fleet Call

Malabar Fire Talkgroups

AFS	Description
04-101	Dispatch
04-102	Tac 1
04-103	Tac 2

Melbourne Police Talkgroups

AFS	Description
08-010	Fleet Call
08-011	Teletype
08-012	Primary
08-013	Talkaround
08-014	Tac
08-015	Investigations
08-016	Narcotics
08-017	TRSO
08-020	SPC
08-021	Command
08-022	Wide Area
08-023	Vice
08-024	Investigation
08-025	Vice
08-026	Narcotics
08-027	SWAT
08-031	MDT

08-054 Fire/Police Shared

Melbourne Fire Talkgroups

AFS	Description
08-050	Fleet Call
08-051	Primary
08-052	North
08-053	South
08-054	Fire/Police Shared
08-055	Training
08-056	Admin
08-057	Wide Area

Melbourne Airport Talkgroups

AFS	Chan	Description
08-063	1	Police
08-065	2	Police
08-066		Airport Authority

Palm Bay Police Talkgroups

AFS	Chan	Description
09-010		Patrol Fleet Call
09-011	1	Patrol
09-012	2	Patrol
09-013	3	Patrol
09-014		Teletype
09-015		Command
09-017		ERT 2
09-020		Investigations Fleet Call
09-021		Special
09-022		Log In/Out
09-023		Training 1
09-024		Training 2
09-025		CID
09-026	1	SID
09-027		Investigations
09-031		Fire/Police Shared
09-032	1	Citywide
09-033	2	Citywide
09-037		V-COPS
09-040		Supervisors
09-041		Staff
09-042		Supervisors
09-043	2	SID
09-044		SRO S
09-050		Special
09-051		Palm Bay 1

Palm Bay Fire Talkgroups

AFS	Description
09-060	Fire 1 Fleet Call
09-061	Fire Primary
09-062	Tac 2
09-063	Tac 3
09-064	Tac 4
09-065	Tac 5
09-066	Tac 6
09-067	Tac 7
09-070	Fire 2 Fleet Call



09-071	Tac 8
09-072	Tac 9
09-073	Tac 10
09-074	Tac 11
09-075	Training 1
09-076	Training 2
09-077	Maintenance
09-080	Fire 3 Fleet Call
09-081	Maintenance 2
09-082	Chief
09-083	Citywide
09-031	Fire/Police Shared

Rockledge Police Talkgroups

AFS	Description
06-010	Patrol Fleet Call
06-011	Patrol
06-012	Alt 1
06-013	Alt 2
06-014	Supervisor
06-016	Court
06-020	Special Crimes Fleet Call
06-021	CID
06-022	CID Private
06-023	Tac 1
06-024	Training
06-025	Admin
06-026	Emergency

Rockledge Fire Talkgroups

AFS	Description
06-015	Primary
06-060	Fire Fleet Call
06-061	
06-063	Fire Tac 1
06-064	Fire Tac 2
06-065	Fire Tac 3
06-066	Special Ops
06-067	Admin

Titusville Police Talkgroups

AFS	Chan	Description
07-040		Fleet Call
07-041	1	
07-042	2	
07-043		Teletype
07-044		ER
07-045		Tac 3
07-046		Admin
07-051		CIS
07-052		SIS
07-053		Tac 4
07-054		Tac 5
07-055		Tac 6
07-056		Voice Guard
07-057		Admin

Titusville Fire Talkgroups

AFS	Description
07-010	Tac Fleet Call
07-011	Tac A
07-012	Tac B
07-013	Tac C
07-014	Tac D
07-015	Tac E
07-016	Tac F
07-017	Tac G
07-020	Admin Fleet Call
07-021	Admin
07-022	Prevention
07-023	Training

07-024	Car-to-Car
07-030	Station All
07-031	Station 10
07-032	Station 11
07-033	Station 12
07-034	Station 14
07-035	Headquarters

West Melbourne Police Talkgroups

AFS	Description
01-025	SID
01-043	City Tac
01-065	SID

MEDCOM

AFS	Description
04-140	Hospital 1 Fleet Call
04-141	Holmes Regional Medical Center
04-142	Cape Canaveral Hospital
04-143	Titusville Medical Center
04-144	Wuesthoff Hospital
04-145	Palm Bay Hospital
04-146	Wide Area
04-147	Patrick AFB Medical
04-150	Hospital 2 Fleet Call
04-151	Kennedy Space Center Medical
04-152	Holmes Regional Medical Center Security

Osceola County

Osceola lies south of the city of Orlando. Kissimmee and St. Cloud are the gateway to the Orlando theme parks, offering affordable lodging near Disney World, Sea World, and Universal Studios Florida. Most of the county is rural and consists of citrus groves.

Osceola County operates a Motorola TRS that all city and county agencies use.

Osceola County Trunked Radio System

Motorola Type II Analog

Frequencies
856.2125
856.7125
856.7375
856.9375
857.2125
857.7125
857.7375
857.9375
858.2125
858.7125
858.7375
858.9375
859.2125
859.7125
859.7375
859.9375
860.2125
860.7125
860.7375
860.9375

Osceola County Sheriff's Office Talkgroups

Talkgroup	Description
272	West Patrol
784	East Patrol
528	Teletype

1040	Support
1296	Tactical 1
2064	Tactical 2
2928	Law Enforcement Net
1552	Comm Channel
1744	Civil Division
1776	Courthouse Security
2576	County Jail

Kissimmee Police Talkgroups

Talkgroup	Description
3216	Patrol
3248	Teletype
3280	Tac 1
3312	Tac 2
3344	

Kissimmee Fire Talkgroups

Talkgroup	Description
3600	Dispatch
3632	Tac 1
3664	Tac 2
3696	Tac 3
3728	Tac 4

St. Cloud Police Talkgroups

Talkgroup	Description
4880	Patrol
4944	Tac 1
4912	Admin
5072	City Net

St. Cloud Fire Talkgroups

Talkgroup	Chan	Description
5104	Tac 1	Dispatch
5136	Tac 2	EMS Response
5168	Tac 3	Fire Response

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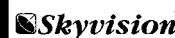


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Satellite TV Update: CBC Woes, Scheduled Launches, MPEGII Report

As most of you are aware, the satellite TV column in *MT* is no longer produced. Instead, I'll be updating the satellite TV industry every four months or so in this column. And, since it's been four months since the last edition of "The Launching Pad," here's the latest info on satellite TV monitoring.

◆ CBC Continues Plummet

Canada's domestic television service continues its steep downward spiral as budget cut-backs year after year take their toll. Once the very model of a national domestic TV network, the CBC has finally ceased all broadcasts via C-band satellite television on Anik E2. Canadian viewers must now rely on their local TV channels (if they can get them), or small dish satellite and cable service (if they can afford them).

Gone in particular are the Atlantic, Eastern and Pacific feeds of the CBC domestic service including a half dozen radio stations from Toronto and Montreal. Affected by this loss are tens of thousands of North Americans who have spent the better part of the last 20 years enjoying the Canadian alternative to the all-too-predictable American networks. Outstanding shows such as "This Hour Has 22 Minutes," "Venture," "Marketplace," and "Royal Canadian Air Farce" follow in the wake of the acclaimed "Midday" which left the network last year in what was, in fact, a glimpse of the CBC's gloomy future.

Still available via MPEGII on E2 are CTV programs, CBC Newsworld International, The Weather Network and three radio stations CITE,

CKAC and RFI. Also available on the Ku-band side of Anik E2, in DigiCipherII mode, is StarChoice channel 299, which is an info channel for the StarChoice system. Sports scores, weather and news items are found here.

◆ Satellite Launch Update

Launch activity in the satellite TV world has been very active over the last several months. *Anik F1*, launched in late November of last year (36 C-band and 48 Ku transponders), takes its place at 107.3 ° W. *GE8* was launched at the end of December last year and replaces *Satcom C5* at 139°W with just 24 C-band transponders. By the time you read this *PASIR* will have replaced *PAS1* at 45°W with 36 C and 36 Ku-band transponders. Look for additional MPEGII Free-To-Air transmissions aimed at North America when this satellite goes into service.

Scheduled launches as of publication date include *GE9* which will be used as an in-orbit spare for *GE7* and *GE8*. *Telstar 9* will be a C/Ku satellite located at 69°W and should launch the first week of this month. *Galaxy 3C* will launch in June and carry 24 C and 48 Ku-band transponders. It will replace *Galaxy 3R* at 95°W.

In other launches of interest *DirectTV 5* will launch next month and be located at 119°W. XM Radio's first two satellites, *XM Rock* (115°W) and *XM Roll* (85°W) will be up and in testing mode by the time you read this. XM Radio is one of two FCC licensed DARS (satellite radio to car) services expected to be blitzing your senses with ad campaigns this summer. We'll all experience a level of hype not seen since the early days of small dish satellite TV.

Looking down the long launch road there are other items of note. *Intelsat 903* (24.5°W), *Intelsat 904* (34.5°W) and *Intelsat 905* (27.5°W) are all slated to be launched at the end of this year. Each will carry 44 C-band and 12 Ku-band transponders which represents a huge increase in transponder availability for the year 2002. Also in 2002 watch for Ka-band satellites in North American skies at 73°W, 85°W, 105°W and 77°W.



Multiple feeds allow one dish to "see" several satellites at the same time without moving the dish. (Courtesy: Global Communications)

One intriguing satellite, *Anik F2* (111.1°W) will carry 52 Ka-band, 32 Ku-band and 24 C-band transponders. *GE1i* will launch in early 2003 to be placed at 47°W and carry a whopping 72 C-band transponders. That same year Inmarsat will see new satellites at 54°W and 64°E.

◆ More MPEGII Info

MPEGII Free-To-Air (FTA) signals continue to dominate the action on both the C and Ku-bands on virtually all satellites which can be seen in North America. Of note recently has been the switch from analog to MPEGII back haul transmissions for U.S. broadcasting giant CBS on the Ku-band side of its main satellite *Telstar 6*. CBS joins NBC which has used MPEGII technology for several years to do its news and sports back hauls. NBC's single NTSC feed on *Satcom F1* has been replaced by several MPEGII time zone feeds which are encrypted.

PAS9 (formerly *PAS5*) at 58°W continues to be the place for international programming. Numerous feeds from NHK Tokyo, CCTV Beijing, and BBC London, are found here in addition to single full time feeds from RTP Portugal, DWTV Germany, Arirang TV Korea, and a part time feed from Cuba. Full time radio broadcasts from China Radio International (including transmissions in Russian), DW1, DW2, DW7, RDP Antena 1, RAI International as well as EWTN Catholic Radio and WACC-AM Miami are also found here.

The mother lode of foreign FTA MPEGII transmissions are found on NSS806 at 40.5°W including Solo Tango, Red Latina, NITV (Iran), Iraq Satellite Channel, Syria Satellite Channel, TV 5 France/Belgique/Suisse, Kuwait Space Channel, WorldNet Europe and WorldNet Latin



Satellite TV enthusiast's dream dish farm belongs to Mike Kohl of Global Communications. (Courtesy: Global Communications)

America & Africa. Other channels include MCM Europe, Fashion TV, and Video Italia. Radio services on NSS806 include Voice of America, VoA News Now, VoA Music Mix, Radio Italia, Syrian Radio, Radio Monte Carlo, five feeds of RFI including English, Afrique, Antilles, Musique, Diverse, RCN Radio, Met Opera (U.S. Naval Observatory Master Clock), Radio Capital 104.5, Radio Popular, Radio Nacional de Venezuela, Circuito CNB 102.3, Radio Capital AM, Radio Panamericana, Radio Cadena Nacional, La Voz de Bolivia, Radio Fides, and Radio Sol.

The only difficulty for most North American viewers is that you'll need at least a 10-ft. dish with a circularly polarized C-band feed and a very clear view to the Southeastern horizon. Don't expect to see NSS806 beyond the Mississippi River. To try tuning it in, set your receiver to channel 23, Canal 7 Argentina. Programming will be in the PAL format. If you have a clear picture and good audio you will be able to receive the MPEGII channels. It's really worth a try!

◆ MPEGII Receivers

Throughout the last couple of years I've reviewed many MPEGII FTA satellite receivers. In the future I'll do a round-up of FTA receivers and include a general discussion on the subject. Meanwhile, there are two excellent sources for current information on these receivers and other aspects of MPEGII reception. The first is <http://www.smaller.com> which is well known to MT

readers. This is where you'll find information about analog reception in addition to MPEGII. They have a number of excellent links to other web sites of interest and they sell an extensive array of MPEGII as well as analog satellite reception equipment.

The other site is owned by Mike Kohl of Global Communications and can be found at <http://www.global-cm.net>. Mike sells MPEGII equipment as well as analog gear and also has many links to other sites of interest to satellite TV enthusiasts. Among the points of interest are his FTA MPEGII Signals North America chart. Of particular interest are the MPEGII tuning parameters for tuning in audio services on Nimiq 1 (91°W).

His home page featuring his world class dish farm is alone worth the visit. There are also some great pictures of how to do multiple feeds with one dish (strictly for the advanced TVRO hobbyist) and a number of text articles on top-

ics of interest to the satellite TV hobbyist (particularly his views on a "Canadian solution").

Once you have an MPEGII receiver you can simply hook it up to your LNB and loop it through to your analog receiver. In this configuration the analog receiver controls the dish and you may point it to whichever satellite you wish to watch. Once the dish has arrived at the proper satellite, switch the output from your analog to the MPEGII and watch on your TV. It's really that simple.

You can also use an old Primestar dish with an MPEGII receiver for a stand-alone system turned to Telstar 5, for example. As cheap as MPEGII receivers are and since Primestar dishes, complete with feed horn and LNB, are being given away, there's no reason for you not to be starting your own "Adventures in the Clarke Belt."

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A couple of oversights.

One of my colleagues pointed out two errors in my February column. Such corrections are always appreciated.

(1) The shortwave broadcast jammers haven't been heard from the Communist Bloc in years; the bubbles and sweepers we hear now come, for the most part, from the Midwest and Cuba.

(2) Not all voice comms heard in the 108-118 MHz range are necessarily VOR/transcribed weather broadcasts or out-of-band images of land mobile communications. Some air towers do respond below 118 MHz to aircraft transmitting in the 118-137 MHz band.

An excellent site that has audio samples and updates on jamming: <http://america.his.com/jamming/>

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. I had a 1961 Chevrolet Impala with a tube-type radio; at two locations on its tuning dial were little white circles with triangles. What did they indicate? (Mark Burns, Terre Haute, IN)

A. They indicated the frequencies 640 and 1240 kHz of the old CONELRAD system, the old nationwide public alert system during the height of the cold war. The acronym stood for Control of Electronic Radiation.

In this system, all AM broadcast stations would go off the air except those formally appointed by the government. This was to prevent Soviet aircraft from beaming in on known radio station locations to direction-find their targets. The system was replaced by the Emergency Broadcasting System and was obsolete by the 1960s.

Q. Is the receiver part of a transceiver better, equal to, or worse than a table top receiver? (Manikant, VU2JRO)

A. Current transceivers use virtually the same receiver section as in their independent receivers; there is little difference in performance. The difference comes when a manufacturer continues to put out new receivers, but carries the same older model transceiver; then the newest receiver would be best. Similarly, if the manufacturer keeps an older receiver in the line, but continues to improve his transceiver line; the transceiver receiver section of the newest product would most likely be best, assuming the newest product is not a low-end radio.

Q. What is independent sideband? (email inquiry)

A. A conventional AM signal, such as that used by medium and shortwave broadcasters, has the same modulation information on both the upper and lower sidebands, which is a waste of spectrum. It is more spectrally efficient to use only upper or lower sideband (USB or LSB) than the entire AM bandwidth.

If a transmitter utilizes this technique, it is possible to send different information on the two sidebands simultaneously; this is independent sideband (ISB). Specialized receivers are made for commercial users which simultaneously detect the upper and lower sideband, feeding the extracted information into two separate channels. Conventional shortwave receivers, however, can only detect one sideband at a time, lower or upper.

Q. I have several receiving antennas on my property, but no transmitters. Nevertheless, my DirectTV satellite picture flickers up and down occasionally, but not when I'm watching DVDs, and it didn't jump when I had Prime Star. The service man doesn't know what causes it, but says it might be due to all my antennas. Is this likely? (James Johnson, Detroit, MI)

A. No, it's probably not even possible. The dish is very directional, and the offending antennas would have to be very close and virtually in line with the satellite beam to affect your reception.

The TV is losing vertical synchronization, causing it to go into a partial roll. This could be due to weak signal, poor synch on the signal, poorly adjusted AGC, or a defective TV set.

Did the service man adjust the dish for proper alignment, and was the signal grade (strength) good? Did he adjust the vertical hold or AGC on your TV?

Borrow another TV and see if it stops; that should tell you whether it's the set or the signal.

Q. My portable shortwave seems to eat batteries, so I generally operate it from its AC adaptor. Can I leave the batteries in place while I'm using the adaptor without damaging the batteries? (Derick Ovenall, Wilmington, DE)

A. Yes; battery-operated shortwave portables are not intended to use rechargeable batteries, so their internal power supplies are isolated from the battery compartment. If you switched to high-current-capacity NiCds, you would have to recharge them in an optional accessory charger.

Q. Are there any anti-scanner laws in Canada affecting the monitoring of digitally-encrypted transmissions? (T.R., Greenburgh, NY)

A. While there has been on-again, off-again discussion about restrictive scanner legislation in Canada, I am not aware that any has ever been effected into law.

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

Well, I'm no April fool! Here are some bright ideas for getting better reception on your handheld radio. Did you lose the standard rubber duck antenna that came with your radio? Do you wish you *had* lost it? Here are some alternatives.

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You can add a "counter poise" or ground plane for your handheld (or desktop radio.) These are simple and cheap. You can make several, a different one for each radio or any band configuration you want – just understand the concept. Rubber ducks, and telescoping antennas, are usually half (or a quarter) of a dipole antenna. Although the design of the radio attempts to use the radio frame itself as the ground wave, it is a poor effort.

To determine the correct length, the formula is 468 divided by the operating frequency in MHz, with the answer in feet for a halfwave dipole. For example: 460.425 MHz divided into 468 is approximately one foot for a half dipole length. For a quarter wave, we need half of that, or about 6 inches. For an agency on VHF 155.595, the answer is about three feet, the quarter wave being about 1.5 feet, or 18 inches. Now you see the correlation between the antenna on top of the cop car and the frequency they use.

To make a counterpoise, you simply take a small wire (not shielded), cut it to length, and wrap it around the outside of the BNC antenna connection to your radio. If you wish, you can solder the wire to a battery connector RS# 64-3040. This can be slipped over the BNC. It is best if the wire can remain relatively straight, and not in contact with other metal. Do NOT strip the outside cover on the wire!

How do you find free copper wire? Stop by any commercial building project that is in the indoor phase. Find the electrician, and ask if you can have the *telephone wire scraps* from his trash dumpster. The guy I found said, "sure, take all you want." Let me tell you, it was all I could carry back to the car with two hands. I have a lifetime supply! All brand new copper wire with vinyl covering in a rainbow of different colors with lengths ranging from 18 inches to 8 feet. These are also useful for many other small projects. The best part is the cost – free!

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Have you ever noticed how most rubber duck antennas of police handheld radios are tweaked beyond belief? The an-

tenna is bent to distortion because the officers wear so much gear and the antenna does not have a chance. Happens to some of us, too. Now you know why everybody moved off lowband! The solution is to use two 90-degree BNC connectors. This keeps the antenna pointed down. (Also helpful if it rubs your love handles.)

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For your scanner antenna, there are several options: Telescoping antennas are a big improvement over the stock rubber duck. They work well on your desktop. However, these antennas are awkward, if not dangerous, to deploy in public.



"Radio, scanner, siren, lights – action!"

If you carry your scanner about town, you can use a frequency specific antenna. I find that "rubber duck" antennas cut for a specific range are the best answer. If most of your local agencies are on VHF-HI, then look for a rubber duck cut to 155 MHz. If most of your local frequencies are UHF 460, then a duck cut for 462 MHz is the answer.

You can find rubber ducks cut for 27 MHz, 124, 146, 151, 155, 168, 222, 430, 450, 462, 488, 504, 845, and 936 MHz. Try a new specialized rubber duck, you will notice a difference! Also remember that sometimes you need to move your HT just a few inches or tilted a particular way to find the "sweet spot" where reception is best.

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So where do you find a frequency specific antenna? Rubber duck antennas are available from a variety of sources: If you can't find one at your ham/scanner dealer, watch for the next local hamswap. I have literally bought old rubber ducks by the hand full. You would also be amazed at what I find at garage sales.

There was an excellent article in the March 1998 issue of *QST* on making your own custom ducks.

I have a large assortment of rubber ducks including one for the aero 108-136 MHz range. That was the hardest to find. (Try Sporty's Pilot Shop at 1-800 543-8643 or <http://www.sportys-catalog.com>.) I simply purchased a \$20.00 replacement antenna (part# 8665A) for an aircraft transceiver. You can also try Icom America at 425-454-7619. Ask for a BNC replacement for their "A" series.

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Obsessed with 800 MHz trunking? Cell phone antennas work great. There are mobile models as well as rubber ducks. You can use one from an old "bag phone." It might need an adapter to fit your BNC. You can also salvage the battery, cigarette lighter plug, etc. from old cellular bag phone. If you don't have one in your closet, I bet your friends, relatives, or neighbors do. (Reader Dave Foster submitted this idea.)

I had promised some bright ideas for the *Police Call 2001* CD-ROM. Not enough space in the column this month, but I will tackle that one in the May issue.

Software for the Shortwave Listener...

SWBC Schedules - Broadcast frequencies and programs, updated weekly+	\$35/year
Smart R8 Control - Smart control for the Drake R8/R8A/R8B	\$25.00/\$40.00/\$60.00
Smart Icom Control 32 - for IC-R75	\$60.00
Smart NRD Control 32 - for NRD-535/545	\$60.00
Smart Kenwood Control 32 - for R-5000	\$60.00
Smart Lowe Control 32 - for HF-150	\$60.00
Smart Audio Control - Audio scope and spectrum analyzer for your PC	\$25.00/\$35.00
SWBC Interval Signals - Turn your PC into a virtual shortwave receiver	\$5.00/\$30.00

FineWare

11252 Cardinal Drive • Remington, VA 22734-2032
fineware@fineware-sw.com • www.fineware-sw.com

The Future of Scanners and Consumer Electronics

Each year we report on the annual Consumer Electronics Show (CES) held in January in the sprawling Las Vegas Convention Center. This year the show was busier than ever, with an estimated 110,000 attendees.

With the economy in a downturn, why was it so busy at CES? A very interesting factoid was printed in one of the show's trade magazines: More new consumer electronics products will be developed in the next 5 years than have been produced since the beginning of the industry! This is startling and exciting information, but it is, at the same time, disconcerting. There are so many new players in consumer electronics, with so many new products, that to develop a hit new device will be extremely difficult in such a crowded marketplace.

For scanner manufacturers this is even more troubling. As consumers now play with their 500 channel TVs, DVD players, the Web, and an ever-increasing number of toys and tools, a relatively old pastime, communications monitoring, is going to be ever harder to sell. This brings us back to one of the first topics I covered in *Monitoring Times*: How does the industry grow the scanner business?

The manufacturers (Uniden, GRE, and the smaller players such as AOR, ICOM and the others), as well as the major national distributor (Radio Shack), at least have their core scanner customers: serious radio hobbyists, the news media, as well as public safety agencies. As long as the manufacturers continue to develop product that keeps up with the two way transmission technology – as they have done with trunking and as they hopefully will do with digital – these core customers will continue to buy the product.

But will it be possible for Uniden and Radio Shack to increase interest in the hobby, or even maintain it, among novices and other potential customers? As they continue to serve their base, will they, out of necessity, complicate the radios to the point where they are no longer accessible to the first timer? It's a real Catch-22. Clearly, though, if the manufacturers don't keep up with the various transmission schemes, most first-timers will find nothing to hear. It's critical that features such as PC-interfaces and SmartScanner downloads – techniques to make the programming of scanners easier – be promoted and improved upon whenever possible.

I've said it before and, in my second to last article for *MT*, I'll repeat it again: We must ap-

plaud and continue to support the manufacturers and retailers who have done so much for our hobby, particularly in the last five years. New products from Uniden, GRE, and others have really helped the entire monitoring community, from scanner buffs to the news media, and on to state, local, and federal officials who use scanners in their work.

Now it's our turn to help them grow the business. If you have ideas on how to get more people interested in scanning, let me know by sending e-mail to scanmaster@aol.com or writing me care of *Monitoring Times*. In the meantime, everyone can help out by getting the word out to family, friends and colleagues, and particularly youngsters, about the merits, and the fun, of the hobby.

◆ Air Radio News & Notes

Recently an avionics engineer with Honeywell told me that ACARS, the data transmission system for airliners, was going to switch to a digitally encrypted system within a few years. One of the reasons for this apparently is that information on the English Royal Family was sent via ACARS in the clear, and was somehow misused. There are ACARS decoders and software currently available which we hope will not one day become fodder for the trash heap....

Speaking of airliner radio, during the first week of January a report by Robert Hager of *NBC Nightly News* described how the nation's air traffic control system was in desperate need of additional AM radio channels. The report spoke of how the system currently uses channels spaced at 25 kHz intervals and that there were proposals on the table for both 12.5 kHz channels and/or a switch to digital transmissions, all of which would require new equipment costing billions. In Europe 8.33 kHz spacing is used, so none of this would seem too far-fetched. In the meantime, new routes that passenger airlines wish to fly are put on hold due to a lack of available frequencies.....

Speaking of Europe, why is it that aircraft monitoring took off (excuse the pun) across the Atlantic while it never really caught on here in the U.S.? What is the great appeal of aircraft monitoring anyway?.....

Do any of the airlines still offer one of the headphone channels as a patch to the air traffic control frequencies?....

Fun monitoring challenge: Take a scanner and any other inconspicuous monitoring tools you might have to the airport (you can sit in the

parking lot rather than going inside a terminal where security issues may cause airport police concern). Take an hour and see how many different frequencies you can identify in use at the airport, from the AM VHF and UHF air frequencies, to the airport police, fire and maintenance departments, ground crews, data bursts from weather monitoring stations, rental car companies, hotel buses, limo services, taxis, and so much more. Take it a step further and try to nab the subaudible tones for the stations, then try to find all the frequencies used in trunked system at the airport, as well as talkgroups. Pretty soon you'll find you've killed an afternoon!

◆ Mississippi Monitoring

In a recent article (Nov 2000) we commented that Mississippi was the one state from which we never seemed to receive frequency contributions. John Mayson was quick to respond to our assertion with the following e-mail:

"I presume you're trying to rekindle the Civil War by comparing the Magnolia State to the Bay State? :-)" ("I'm from Georgia and my wife from New Hampshire, so I'm allowed to poke fun at New England.)

"You're right. Mississippi scanner information is hard to come by. I find myself on I-10 and I-20 in Mississippi enough that I've collected some information about radio systems there."

FORREST COUNTY

Hattiesburg TRS

Motorola Type II Analog
856.2375, 857.2375, 858.2375, 859.2375, 859.7625, 859.8875,
860.2375,
860.7625 MHz

Forrest County Sheriff's Office

3248 Law Channel

Forrest County VFD

1360 Dispatch
1424 Operations

EMS

1008 AAA Ambulance

Hattiesburg Police

176 1A Dispatch
208 B NCIC
336 1C Emergency
144 1D Car-to-Car
240 1E Supervisors

304 1H STAR
400 1I NET
48A TG All Talk Group
800 Law Common channel

Hattiesburg Fire

1264 1A Dispatch
1328 1B Operations

Petal Fire

4912 Dispatch

University of Southern Mississippi

6412 Police Dispatch

HINDS COUNTY

Jackson TRS covered in November column

Mississippi Highway Patrol District 1

KKA929
42.12 Jackson
42.02 Statewide Intersystem

Mississippi State Tax Commission

154.665

LAMAR COUNTY

Lamar County TRS

Motorola Type II Analog
856.4875, 857.4875, 858.4875, 859.4875,
860.4875 MHz

Lamar County Sheriff's Office

16 Primary

Lamar County VFD

320 Dispatch
336 Tac 1
352 Tac 2

Lamar County EMS

368 Dispatch
176

Purvis Police

1120 Dispatch

LAUDERDALE COUNTY

Mississippi Highway Patrol District 6

KKB238
42.08 Meridian
42.02 Statewide Intersystem

LEE COUNTY

Lee County TRS

Motorola Type II Analog

Tupelo: 856.2625, 857.2625, 858.2625,
859.2625, 860.2625 MHz
Saltillo: 856.9875, 857.9875, 858.9875,
859.9875, 860.9875 MHz

Lee County Sheriff's Office

528 Dispatch

Lee County EMS

624 Dispatch
688 HEAR (155.340 MHz link)

Beldon Police

1040 Dispatch

Richmond Police

1392 Dispatch

Saltillo Police

1232 Dispatch

Tupelo Police

144 Dispatch
176 Car-to-Car

Tupelo Fire

432 Dispatch

Verona Police

816 Dispatch

RANKIN COUNTY

Rankin County TRS

Motorola Type II Analog

Rankin County Sheriff's Office

304 Dispatch
336 Car-to-Car

Countywide Law Enforcement

208

Florence Police

1232 Dispatch

Flowood Police

1552 Dispatch
1584 Car-to-Car
2032 Car-to-Car

Pearl Police

880 Dispatch
912 Car-to-Car
1712 Car-to-Car

Pelahatchie Police

1168 Dispatch

Puckett Fire

2960 Dispatch

Richland Police

1744 Dispatch

Richland Fire

1904 Dispatch

Ross Barnett Reservoir Patrol

2256 Dispatch

State Mental Hospital

784

Mississippi Highway Patrol District 1

42.02 Statewide Intersystem

◆ **Trunking Updates**

Wayne Batten was kind enough to send in the following report:

CLARK COUNTY WASHINGTON

STATE

Known Frequencies (Motorola Type II)

855.9875
856.7625
856.9625
856.9375
856.9875
857.7625

857.9375
857.9625
857.9875
858.7625
858.9375
858.9625
858.9875
859.7625
859.9375
859.9625
859.9875
860.7625
860.9375
860.9625
860.9875
866.1625
866.4125
866.9625
867.2375
867.4875

Known IDs in use (Other than CTRAN)

POLICE (LAW)
040112 VPD
040144 VPD/VFD
040176 CODE ENFORCEMENT
040204 UNKNOWN
040240 RESERVED VPD
040272 RESERVED VPD
040304 RESERVED VPD
040912 COWLITZ COUNTY
040944 SKAMANIA COUNTY
041008 VPD PATROL
041040 VPD PATROL
041072 CLARK COUNTY SO COMMON
041104 SHERIFF CUSTODY 1
041136 SHERIFF CUSTODY 2
041168 SHERIFF CUSTODY 3
041200 SHERIFF CUSTODY 4
041232 SHERIFF CUSTODY 5
041264 SHERIFF CUSTODY 6
041296 WORK CREW
041328 COUNTY
041360 CLARK COUNTY SHERIFF TRNG
041456 BATTLEGROUNND PD
041520 REBEL 1
041616 CAMAS PD
041680 WASHOUGAL PD
041776 RIDGEFIELD PD
041840 REBEL 2
042000 REBEL 3
044656 CONTROL 1
044688 CONTROL 2
044720 CONTROL 3
044752 CONTROL 4
044784 CONTROL 5
044816 TAC 1
044848 TAC 2
044880 TAC 3
044912 TAC 4
044944 TAC 5 (ALSO USED FOR TRNG)
? TAC 6
044976 EAGLE 1
045008 EAGLE 2
045040 EAGLE 3
045072 EAGLE 4
045104 EAGLE 5
045136 LERN
045168 UNKNOWN
045200 RECORDS
045296 CCSO DET
045328 CCSO TRNG
045360 CCSO DET
045392 CCSO (SERT)
045424 WSP MONITOR
046487 MULTI-SELECT (DISPATCHER SIMUL-CAST)
046928 VANCOUVER WATER DEPT.
048016 VANCOUVER ECC

048048 VANCOUVER ECC
048080 VANCOUVER ECC
048112 VANCOUVER ECC
048144 VANCOUVER ECC
048176 VANCOUVER ECC
048208 VANCOUVER ECC
048240 VANCOUVER ECC
048272 CCSO A
048304 CCSO B
048336 CCSO C
048560 ANIMAL CONTROL
047696 STATE CONTROL 1
047728 STATE CONTROL 2
047760 STATE CONTROL 3
047792 STATE CONTROL 4
047824 STATE RECORDS
047856 STATE TAC 1
047888 STATE CONTROL 7
047920 STATE CONTROL 9
047952 STATE OPS 3

FIRE/EMERGENCY MVI

043216 CONTROL 9 VFD
043248 CONTROL 7 CC FIRE DISPATCH
043280 CLARK COUNTY FIRE OPS 2
043312 CLARK COUNTY FIRE OPS 3
043344 CONTROL 8 CC FIRE
043408 CLARK COUNTY FIRE OPS 4
043440 CLARK COUNTY FIRE OPS 5
043472 CLARK COUNTY FIRE OPS 6
043504 CLARK COUNTY FIRE OPS 7
043536 CLARK COUNTY FIRE OPS 8
043568 CLARK COUNTY FIRE OPS 9
043600 CLARK COUNTY FIRE OPS 10
043632 CLARK COUNTY FIRE OPS 11
043664 CLARK COUNTY FIRE OPS COMMAND
12
043696 CLARK COUNTY FIRE OPS COMMAND
13
043728 CLARK COUNTY FIRE OPS COMMAND
14
043760 CLARK COUNTY FIRE MARSHALLS
043792 CLARK COUNTY FIRE MARSHALLS
043856 LIFE FLIGHT
043888 FT JAMES PAPERMILL FJ-1
043920 FT JAMES PAPERMILL FJ-2
043952 FT JAMES PAPERMILL ?
043984 CLARK COUNTY FIRE (TRNG)
044016 CLARK COUNTY FIRE PREVENTION
044048 CLARK COUNTY FIRE LOG LOGISTICS
044080 CLARK COUNTY FIRE PLAN.
044112 HAZMAT
044336 CC EMS SWMC
044496 CC EMS DISPATCH
044528 CC EMS
043376 CLARK COUNTY FIRE
043824 WDOT
044144 CLARK COUNTY FIRE ?
044176 VANCOUVER OPS
044592 UNKNOWN
045168 UNKNOWN
16 RADIO SHOP/TESTING
002698 EMERGENCY DES
030916 EMERGENCY PATCH

LEGEND:

CCSO = CLARK COUNTY SHERIFF OFFICE
ECC = EMERGENCY COMMAND CENTER
WDOT = WASHINGTON DEPARTMENT OF TRANSPORTATION
LERN = LAW ENFORCEMENT RADIO NETWORK
VPD = VANCOUVER POLICE DEPARTMENT
VFD = VANCOUVER FIRE DEPARTMENT
SWMC = SOUTHWEST WASHINGTON MEDICAL CENTER
CC = CLARK COUNTY

U.S. NOAA Weather Radio Stations and Frequencies

Courtesy of the National Weather Service

Continued from the March 2001 issue of *Monitoring Times* magazine. Information courtesy of the National Weather Service.

HAWAII

Hawaii (Kulani Cone)	WWG76	162.550	1000	Honolulu
Hawaii (South Point)	WWG27	162.550	150	Honolulu
Kaneohe	WWH21	162.400	1000	Honolulu
Kauai (Kokee)	WWG74	162.400	1000	Honolulu
Maui (Mt. Haleakala)	WWG75	162.400	1000	Honolulu
Oahu (Mt. Kaala)	KBA99	162.550	1000	Honolulu/Oahu Kai
(Hawaii Kai)	WWF39	162.400	10	Honolulu

IOWA

Burlington	WXN83	162.525	300	Quad Cities
Cedar Rapids	WXL61	162.475	1000	Quad Cities
Des Moines	WXL57	162.550	1000	Des Moines
Dubuque	WXL64	162.400	1000	Quad Cities
Fairfield	WXN85	162.400	300	Quad Cities
Fort Dodge	WXK84	162.400	300	Des Moines
Sioux City	WXL62	162.475	1000	Sioux Falls (SD)
Waterloo	WXL94	162.550	1000	Des Moines

IDAHO

Boise	WXK68	162.550	100	Boise
Bonnets Ferry	WWG99	162.500	100	Spokane
Grangeville	KX182	162.450	25	Missoula
Lewiston	WXK98	162.550	100	Spokane
McCall	WWF58	162.475	100	Boise
Payette	WXK88	162.400	100	Boise
Pocatello	WXL33	162.550	100	Pocatello
Twin Falls	WXL35	162.400	100	Boise

ILLINOIS

Champaign	WXJ76	162.550	1000	Central
Chicago	KW039	162.550	500	Chicago
Jacksonville	WXM90	162.525	300	Central
Marion	WXM49	162.425	1000	Paducah
Macomb	WXJ92	162.500	1000	Quad Cities
Newton	KX148	162.450	1000	Central
Odell	WXK24	162.450	1000	Chicago
Paris	KX147	162.525	300	Central
Peoria	WXJ71	162.475	1000	Central
Princeton	WXL22	162.425	300	Quad Cities
Rock Island/Moline	WXJ73	162.550	1000	Quad Cities
Rockford	WXJ74	162.475	1000	Chicago
Springfield	WXJ75	162.400	1000	Central

INDIANA

Bloomington	WXM78	162.450	1000	Indianapolis
Edwardsport	WWG83	162.425	1000	Indianapolis
Evansville	KIG76	162.550	1000	Paducah
Fort Wayne	WXJ58	162.550	1000	Northern
Georgia	WWG72	162.500	1000	Indianapolis
Indianapolis	KEC74	162.550	1000	Indianapolis
Lafayette (Yeoman)	WXK74	162.475	1000	Indianapolis
Marion	WXM98	162.450	400	Northern
North Webster	WWG45	162.425	300	Northern
Putnamville	WXK72	162.400	1000	Indianapolis
Seymour	WWG73	162.525	1000	Indianapolis
South Bend	WXJ57	162.400	1000	Northern

KANSAS

Abilene	WXL71	162.525	1000	Topeka
Beaumont	WWH22	162.500	300	Wichita
Chanute	WXK95	162.400	1000	Wichita
Colby/Goodland	WXK96	162.400	600	Goodland
Concordia	WXK94	162.550	1000	Topeka
Dodge City	WXK93	162.475	1000	Dodge City
Ellsworth	WXK92	162.400	1000	Wichita
Lenora	WWF87	162.425	100	Goodland
Topeka	WXK91	162.475	1000	Topeka
Tribune	WWG22	162.550	150	Dodge City
Wichita	KEC59	162.550	1000	Wichita

KENTUCKY

Ashland	KIH39	162.550	1000	Charleston
Beattyville	WWG67	162.500	100	Jackson
Bowling Green	KIH45	162.400	1000	Louisville
Covington	KIH42	162.550	1000	Cincinnati
Elizabethtown	KIH43A	162.550	100	Louisville
Frenchburg	WWG63	162.475	100	Jackson
Harlan	WWG68	162.450	100	Jackson
Hazard	KIH40	162.475	1000	Jackson
Hopkinsville	KX126	162.450	300	Paducah
Jackson	WWG26	162.425	100	Jackson
Lexington	KIH41	162.400	1000	Louisville
London	WWG65	162.475	100	Jackson
Louisville	KIH43	162.475	1000	Louisville
McKee	WWG64	162.425	100	Jackson
Madisonville	WXJ91	162.525	1000	Paducah
Manchester	WWG66	162.400	100	Jackson
Mayfield	KIH46	162.475	1000	Paducah
Monticello	WWG80	162.425	100	Jackson
Morehead	WWG71	162.425	100	Jackson
Mount Vernon	WWG70	162.425	100	Jackson
Paintsville	WWG28	162.525	100	Jackson
Phelps	WWG81	162.500	100	Jackson
Pikeville	WWG69	162.400	300	Jackson
Pineville	WWG62	162.525	100	Jackson
Richmond	WWF82	162.525	100	Louisville
Somerseset	KIH44	162.550	1000	Jackson
Stanton	WWG61	162.550	100	Jackson
West Liberty	WWG79	162.450	100	Jackson
Williamsburg	WWG78	162.500	100	Jackson

LOUISIANA

Alexandria	WXK78	162.475	1000	Lake Charles
Baton Rouge	KHB46	162.400	700	New Orleans/Baton Rouge
Buras	WXL41	162.475	1000	New Orleans/Baton Rouge
Lafayette	WXK80	162.550	1000	Lake Charles
Lake Charles	KHB42	162.400	500	Lake Charles
Monroe	WXJ96	162.550	1000	Shreveport
Morgan City	KIH23	162.475	1000	New Orleans/Baton Rouge
New Orleans	KHB43	162.550	1000	New Orleans/Baton Rouge
Shreveport	WXJ97	162.400	1000	Shreveport

MAINE

Caribou	WXM77	162.525	500	Caribou
Dresden	WXM60	162.475	100	Portland
Ellsworth	KEC93	162.400	1000	Portland
Falmouth	KD095	162.550	500	Portland

MARYLAND

Baltimore	KEC83	162.400	1000	Baltimore/Washington
Hagerstown	WXM42	162.475	1000	Baltimore/Washington
Salisbury	KEC92	162.475	1000	Wakefield

MASSACHUSETTS

Boston	KHB35	162.475	500	Boston/Hyannis
(Camp Edwards)	KEC73	162.550	1000	Boston
Mt. Greylock	WWF48	162.525	100	Albany
Worcester	WXL93	162.550	500	Boston

MICHIGAN

Alpena	KIG83	162.550	500	North Central Lower
Detroit	KEC63	162.550	330	Detroit
Flint	KIH29	162.475	1000	Detroit
Gaylord	WWF70	162.500	100	North Central Lower
Grand Rapids	KIG63	162.550	1000	Grand Rapids
Hesperia	WWF36	162.475	150	Grand Rapids
Houghton	WXK73	162.400	1000	Marquette
Marquette	KIG66	162.550	300	Marquette
Onondaga	WXK81	162.400	500	Grand Rapids
Oshtemo	WWF34	162.475	500	Grand Rapids
Sault Ste Marie	KIG74	162.550	1000	North Central Lower
Traverse City	KIH22	162.400	330	North Central Lower

MINNESOTA

Bemidji	WXM99	162.425	110	Eastern
Bogus Lake	KX143	162.400	300	Duluth
Detroit Lakes	WXM64	162.400	100	Eastern
Duluth	KIG64	162.550	1000	Duluth
Ely	KX144	162.500	300	Duluth
International Falls	WXK45	162.550	1000	Duluth
Mankato	WXK40	162.400	1000	Minneapolis
Minneapolis/St. Paul	KEC65	162.550	1000	Minneapolis
Park Rapids	WWG98	162.475	300	Eastern
Rochester	WXK41	162.475	1000	La Crosse
Rosevelt	WWF45	162.450	190	Eastern
St. Cloud	WXL65	162.400	330	Minneapolis
Thief River Falls	WXK43	162.550	1000	Eastern
Willmar	WXK44	162.475	1000	Minneapolis

MISSOURI

Alton	KX135	162.500	300	Springfield
Bourbon	WWF75	162.525	1000	St. Louis
Camdenton	WXJ90	162.550	1000	Springfield
Columbia	WXL45	162.400	1000	St. Louis
Doniphan	WWG48	162.450	1000	Paducah
Fredricktown	WWG49	162.500	1000	St. Louis
Hannibal	WXK82	162.475	1000	St. Louis
Hermitage	WXM81	162.450	100	Springfield
Joplin	WXJ61	162.425	1000	Springfield
Kahoka	WXL99	162.450	300	Quad Cities
Kansas City	KID77	162.550	1000	Kansas City/Pleasant Hill
La Plata	WXM39	162.525	300	Kansas City/Pleasant Hill
Lancaster	WXM36	162.550	300	Kansas City/Pleasant Hill
Sikeston	WXL47	162.400	1000	Paducah
Springfield	WXL46	162.400	1000	Springfield
St. Joseph	KEC77	162.400	1000	Kansas City/Pleasant Hill
St. Louis	KD089	162.550	1000	St. Louis
Summersville	WWF76	162.475	1000	Springfield
Wardell	WWG47	162.525	1000	Memphis
West Plains	KX138	162.525	300	Springfield

(Continued Next Month)

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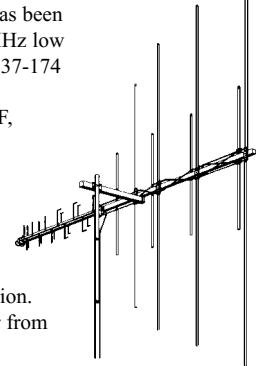
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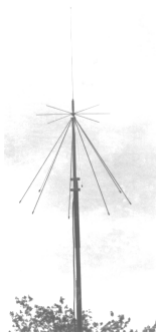
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Hugh's Favorite Frequencies

A letter writer asked to see some of my own picks for best utility frequencies. This does seem like a good idea. Here, then, are some personal favorites.

◆ US Air Force

As compared to Europe and the north-eastern United States, California is not exactly Radio Action Central. Around here, the USAF Global High Frequency System is probably the best listening on high frequency ("short wave"). We covered the Global pretty thoroughly last month, so let's just review the frequencies. They are 4724, 6712, 6739, 8992, 9025, 11175, 11181, 13200, 13212, 15016, and 20390 kilohertz, all upper-sideband voice (USB).

An interesting net, which is considered a GHFS backup, is the Air Force's Eastern Test Range activity, primarily Cape Radio at Cape Canaveral, FL, on 10780 USB. This is also a good channel to monitor any time there is a launch countdown on this range, especially a space shuttle launch. Downrange operations are heard on many other frequencies. Recent USB hits include 3041, 3365, 4521.5, 5190, 5717, 6937, 7461, 7676, 7833, 9043, 13237, 15021, and 20390.

◆ Coast Guard

The US Coast Guard probably has a hundred worthwhile frequencies all by itself. Most interesting is the Safety Of Flight (SOF) network, where aircraft pass positions and operation status at set intervals. In searches and rescues, this becomes a catch-all net for participating units on surface, shore, and air.

USCG SOF frequencies are 3053, 3056, 4730, 4733, 4739, 5694, 5696, 5699, 8980, 8983, 13218, 13221, 15082, 15085, 15088, 17988, and 17991 kHz USB. 4733, 5696, 8993, and 15088 are primary, and by far the busiest. Some of the others will be dead for months at a time, coming suddenly alive in major incidents.

The US Coast Guard – which after all started out looking for smugglers as the Revenue Cutter Service – still plays a major part in border interdiction, including the well-pub-

licized "war on drugs." The Greater Antilles Section (GANTSEC) is active on 3396, 5399 and 6815.6 kHz USB. Callups tend to be in the clear but most traffic is scrambled. The odd "whale songs" that follow these nets around are almost certainly due to some unknown device seeking lock, plus a lot of over-compressed circuit noise.

2182, an old calling and distress frequency, still has some good activity in the US and Canada. The Canadian Coast Guard also runs a lot of phone patches on 6964 USB to its Rescue Coordination Center in Halifax. 4125 kHz, a calling frequency which used to be popular with fishing fleets, is still monitored and used for weather broadcasts by Canada and several other countries.

◆ Other "War On Drugs"

The US Navy uses its remaining HF mostly for tactical data link coordination and anti-submarine warfare. Both capabilities, of course, are also relevant to joint drug activities. A good frequency is 8971 kHz, the Blue Star net out of Puerto Rico. Other nets for exercises or occasionally the real thing come up on unpredictable frequencies above and below the 6 MHz maritime band.

The Royal Dutch Navy, out of Curacao in the Caribbean, uses 11178 USB. Various American and international task force units come up there, too, making something of a language soup at times.

The US Drug Enforcement Agency's "Atlas" communication center in Iowa is often heard working "Flint" aircraft on 5277, 5841, 7657, 9497, 11076, 14686, and 19131 USB. US Customs continues to maintain its old COTHEN (Customs Over-The-Horizon Enforcement Network), using one of the first HF autoscans systems. Stations exchange data bursts and occasional USB voice on 5732, 7527, 8912, 10242, 11494, 13907, 15867, 18594, 20890, 23214, 25350, and perhaps a couple of others. This net is not as active as it once was.

◆ Fax and Teleprinting

I'm a huge fan of weather faxes. When signals are strong and not smeared up by

multipath, buzzy old HF can produce astonishingly clear results.

Pacific weather pictures and charts are sent out by the Coast guard from Point Reyes, California, on 4346, 8682, 12730, 17151.2, and 22527 kHz. Settings for nearly all weather faxes are 120/576. Tune them in USB and 1.9 kHz lower.

New Orleans transmits information for the Gulf on 4316, 8504 2790, and 17148. Boston has Atlantic products on 6340.5, 9110, and 12750. Finally, Honolulu has very interesting Central and West Pacific charts on 9982.5, 11090, 16135, and 23331.5, when I can receive them.

Japan has two stations, both out of Tokyo. JMJ is on 3365, 5405, 9438, 14692.5, and 18441.2. JMH uses 3622.5, 7305 (when broadcast splatter permits), 9970 (same problem), 13597, 18220, and 23522.9.

Kyodo News, which sends mostly scrambled newspapers from Japan and Singapore, also has some very odd fishing charts and general strangeness on 4316, 8467.5, 12745.5, 16035, 16971, 17069.5, 17430, and 22542, some at the lower speed of 60/576.

The Canadian Forces weather center in Halifax transmits similar faxes on 4271, 6496.4, 10536, and 13510. These are sent on the hour, and then the rest of the time is filled in by weather observations in radio teletype (RTTY), with an odd shift of 550 Hertz and a 75-baud speed.

RTTY itself is a good technical challenge, since most is uncopiable. There are a couple of "RTTY broadcasting stations" on the air now. Best is WA9XHN on 6994 and 13972, 850/75. Several RTTY amateur nets serve the military on such frequencies as 4000 and 7915, both 850/75.

Lately I've been shooting a lot of Pactor-I, an interesting HF mode combining computer networking with proven maritime teleprinting techniques. Try 6959.5, 7576, 7970, 10338.5, 14506.5, 15971, 18190.5, all of which are mail systems with hours of traffic lists at 200/100.

This ought to keep everyone listening for a month. Have fun with these.

ABBREVIATIONS USED IN THIS COLUMN

AFB	Air Force Base
ALE	Automatic Link Establishment
AM	Amplitude Modulation
AMVER	Automated Mutual-assistance Vessel Rescue
ARQ	Automatic Repeat Request teleprinting system
AWACS	Airborne Warning And Control System
CAMSLANT	Communication Area Master Station, Atlantic
CIA	US Central Intelligence Agency
CW	Continuous Wave (Morse telegraphy)
DEA	Drug Enforcement Agency
DX	Distant Transmitter
E3	UK English female "numbers" with folk tune
E5	CIA English female "numbers," counts 1-0
EAM	Emergency Action Message
FACSFAC	Fleet Area Control and Surveillance Facility
FAX	Radiofacsimile
FEC	Forward Error Correction teleprinting system
GMDSS	Global Marine Distress and Safety System
HQ	Headquarters
M22	Israeli intelligence or military, callsign 4XZ
M8	Cuban CW "numbers," ANDUWRIGMT for 1-0
M8a	Specific version of above with 3 messages
MARS	Military Affiliate Radio System
MFA	Ministry of Foreign Affairs
M/v	Motor vessel
NAS	Naval Air Station
NHQARC	National Headquarters, American Red Cross
Pactor	Packet Teleprinting Over Radio
PR	Puerto Rico
RSA	Republic of South Africa
RTTY	Radioteletype
SAM	Special Air Mission
SHARES	Shared Resources
Sitor-B	Simplex Telex Over Radio, FEC mode
UK	United Kingdom
Unid	Unidentified
US	United States
V13	New Star, Taiwanese Chinese language numbers
V2	Cuban "numbers" starting with "Atencion!"
V2a	Specific version of above with 3 messages
VOLMET	Flight Weather broadcasts

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 brackets with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association (see MT 3/01).

- 60.0 Unid-Probably WWVB, CO, standard time station with continuous carrier lowered once per second, closely matching standard WWV ticks on another band, at 0052. (Hugh Stegman-CA)
- 338.0 POB-Nondirectional beacon at Pope AFB, NC, in AM at 0555. (Duke Rumley-NC)
- 2390.0 PCKH-Motor Vessel Alert, calling m/v Triton, at 0122. PDQE-m/v Diamant, calling m/v Balticborg, at 0124. (Ary Boender-Netherlands)
- 2486.0 OST-Oostende Radio, Belgium, working unid vessel with engine problems, at 2252. (Boender-Netherlands)
- 2582.0 VBA- Canadian Coast Guard, Thunder Bay, with Marine Information Bulletins at 0039. (Ron Perron-MD)
- 2687.0 JWT-Norwegian navy, Stavanger, in radio checks with "C-7-S" and "W-1-W," at 2344. (Boender-Netherlands)
- 2749.0 VCO-Canadian Coast Guard, Sydney, NS, with info bulletins at 0041. (Perron-MD)
- 3594.8 P-Russian navy single-letter CW "cluster" marker, Kaliningrad, at 2357. (Boender-Netherlands)
- 3594.9 S-Russian navy single-letter CW "cluster" marker, Arkhangelsk, at 2357. (Boender-Netherlands)
- 3595.0 C-Russian navy single-letter CW "cluster" marker, Moscow, at 2357. (Boender-Netherlands)
- 4026.0 Cuban CW "cut" numbers (M8), in progress, at 0202. Cuban "Atencion" AM numbers (V2), different day at 0303. (Camillo Castillo-Panama)
- 4271.0 CFH-Canadian Forces, Halifax, NS, with weather codes at 0242. (Tom Severt-KS)
- 4372.0 "D-3-Y"-US Navy, calling Giant Killer (FACSFAC, VA), no joy, and working six other stations in some kind of exercise, followed by "5-B-Q" with a real-world medical emergency, at 0050. (Perron-MD)
- 4570.5 HZN46-Jeddah Meteorological, Saudi Arabia, with weather in RTTY (500/100) at 0336. (Bob Hall-RSA)
- 4700.0 1Kzsdkaca-Polish United Nations troops in Kosovo, calling 1Kzdzankovic in ALE, also on 7599, at 2035. (Day Watson-UK)
- 4718.0 Rescue 51-Royal Air Force Nimrod, working Kinloss Rescue at 0740. Kinloss calling Rescue 193, at 0744. (Middle Atlantic DXer-MD)
- 4724.0 Andrews-US Air Force, Andrews AFB, MD, with EAM at 0635. (Severt-KS)
- 5105.0 BVM-Probable UK military, sounding in ALE at 1535. BVA, sounding at 1539. FCD, sounding at 1557. BLE, sounding at 1627. DKL, sounding at 1732. (Watson-UK)
- 5418.0 Cuban CW "cut" numbers (M8a), two Saturdays at 0200, two Thursdays at 0300. Cuban "Atencion AM numbers (V2), Friday at 0200, Saturday at 0300. (Castillo-Panama)
- 5786.0 Batz-French Ile de Batz, with ALE call to Houat, Ile de Houat, in a network also including Glenan and Galva, and also on 7512 and 8165 kHz, at 0845. (Watson-UK) Molene, Ile de Molene, calling Groix, Ile de Groix, at 1043. Molene calling Batz at 1052. (MADX-MD)
- 5810.0 US CIA "Counting" numbers station (E5), English female voice, two Saturdays at 0200, three Wednesdays at 0300. (Castillo-Panama)
- 5860.0 FAAACA-Federal Aviation Administration, Washington, DC, calling FAAASO, College Park, MD, in ALE, at 0035. T42N-FAA, working T12N in ALE, at 2259. FAANY, New York, sounding at 2314. FAAZID, Indianapolis, sounding at 2314. FAAZBW, Boston, sounding at 2317. DEFAULT, presumably an FAA station which forgot to set its address, sounding at 2318. (Watson-UK)
- 6378.5 4XZ-Israeli intelligence (M22), with marker at 0041 and 0051. (Dom Mallozzi-MA)
- 6415.5 7TF-Boufarik Radio, Algeria, with traffic list at 0228. (Mallozzi-MA)
- 6481.6 CLA-Havana Radio, Cuba, with traffic list at 0101. (Mallozzi-MA)
- 6513.0 Unid-coast station working Russian motor vessels, including m/v's Olympiad, Kapitan, and Metrochkin, in Russian, at 0621. (MADX-MD) [This frequency gets really busy in winter. -Hugh]
- 6712.0 Cotam 1024-French Air Force transport leaving Guyana with 136 passengers, working Circus Vert (Headquarters, Villacoublay), at 0512. Croughton-US Air Force Global High-Frequency System, with two EAMs at 2338. (Perron-MD) [Despite Croughton's well-publicized stand-down, the call is still heard. -Hugh]
- 6768.0 Cuban CW "cut" numbers (M8a), two Thursdays at 1300. (Castillo-Panama)
- 6796.0 Cuban CW "cut" numbers (M8a), daily at 1200, and nearly every day at 1300. (Castillo-Panama)
- 6845.0 HSP-Probable UK military, sounding in ALE at 0314. (MADX-MD)
- 6855.0 Cuban "Atencion" station (V2a), with 3 messages in AM to 00642, 95612, and 01022, at 0300, ending at 0343 with 3 "Final." (Gary Cohen, MA)
- 6933.0 Cuban CW "cut" numbers (M8a), Thursday and Saturday at 1200, and Tuesday and Saturday at 1300. (Castillo-Panama)
- 7535.0 Ramage-US Navy ship USS Ramage in radio check with Norfolk at 1452. Red Thunder, probably US Navy, also using trigraph call "V-3-E," working Norfolk at 1506. (MADX-MD)
- 7635.0 Fighting Tiger 202-US Navy, working High Voltage at 2030. Lancer 03, working High Voltage at 2036. (Rumley-NC)

- 7685.5 NNN0MDC-US Navy/Marine Corps MARS, Washington, DC, calling many US Coast Guard vessels and passing short messages in Pactor-II, at 1815. (MADX-MD)
- 7708.0 CC13-Gabon Railways, ALE sounding at 1528. Mboundou, sounding at 2025. Moanda, sounding at 2046. Milole, sounding at 2057. Pcowendo, sounding, then calling CC16 at 2113. (Watson-UK)
- 7755.0 Lincolnshire Poacher-British Intelligence, Cyprus (E3), in progress at 1521. (Boender-Netherlands)
- 7889.0 Cuban "Atencion" AM numbers (V2), Sunday at 0200. Cuban CW "cut" numbers (M8a), Tuesday and Saturday at 1300. (Castillo-Panama)
- 8045.0 BVA-UK military, probably Cyprus, sounding in ALE at 1524, FCD, calling BVM in ALE at 1539. FKF, calling BVM at 1547. DKL, sounding at 1548. BVM, calling FCD at 1551. (Boender-Netherlands)
- 8070.0 UTS27-Possible Ukrainian military, with short, time-stamped, CW messages at 1630. (Boender-Netherlands)
- 8120.0 ROBLE-Mexican military, calling TAURO in ALE, at 0112. (MADX-MD)
- 8300.0 New Star Radio Station (V13), Taiwan, with Chinese 4-figure AM "numbers" and tinkly music, at 1338. (Sevart-KS)
- 8638.0 VNG-Standard Time Station, Sydney, Australia, with AM beeps at 0916. (MADX-MD)
- 8646.0 FUJ-French Navy, Noumea, New Caledonia, testing in RTTY (800/75) at 0920. (MADX-MD)
- 8687.0 IRM-Italian International Medical Center (CIRM), Rome, with markers offering free medical and AMVER traffic, at 0231. (Castillo-Panama)
- 8764.0 NMN-US Coast Guard Camslant Chesapeake, with marine information at 0931. (MADX-MD)
- 8861.0 Unknown-Possibly Russian VOLMET, Kirensk, at 0234. Reach JHL 4-US Air Mobility Command contract aircraft, giving position to Recife, Brazil, at 0254. (Perron-MD)
- 8965.0 E30138-US Air Force AWACS, attempting an ALE-originated direct patch via Offutt to Tinker AFB, at 2009. PLA-Lajes Air Field, ALE and voice checks with JNR, Salinas, PR, at 2011. (MADX-MD)
- 8971.0 Trident 725-US Navy, working Goldenhawk, NAS Brunswick, at 1527. Goldenhawk working Joshua 56 at 1530, and Fighting Tiger 725 at 1604. (MADX-MD) Fighting Tiger 721-US Navy, working Goldenhawk (NAS Brunswick), and High Voltage (also Brunswick), returning from mission at 1650. (Perron-MD)
- 8992.0 Reach 9062-US Air Mobility Command transport, in a patch to Hilda West via McClellan Global, interrupted by Andrews with a priority EAM, at 0541. (MADX-MD) PACAF 01-Commander, US Pacific Air Force, calling Mainsail (any station) with no joy, at 1949. (Haverlah-TX)
- 9025.0 Andrews-US Air Force, Andrews AFB, MD, with EAM at 0255. (Rumley-NC)
- 9090.0 Unid-U.S. CIA English-speaking female (E5), with "numbers" callup of "634" and test count, at 2205. (Perron-MD)
- 9258.0 Hotel-US military, in link coordination ("Gator" and "Timber"), with Foxtrot, Mike, Echo, Tango, and Romeo, at 0353. (Perron-MD)
- 10536.0 CFH-Canadian Forces, Halifax, NS, with RTTY (850/75) weather at 1353, and a FAX chart at 1500. (Sevart-KS)
- 11122.7 Unid-US military signal-intelligence training station, simulating a contact between fictitious "Sector Command" and "37th Brigade HQ," in voice, RTTY (170/75), and Sitor-B, at 1612. (Sevart-KS)
- 11175.0 Jambo 65-US Air Force, working McClellan Global, mentioned Barksdale AFB, at 1650. (Haverlah-TX) Titan 18-Unknown military in radio checks with Croughton, UK, at 2051. (Perron-MD)
- 11178.0 Condor-French navy unit in joint Caribbean drug interdiction, coordinating tracking links with Dutch navy "Q-9-Y," a P-3C out of Curacao, at 0105. NRN 348-Dutch Navy P-3C, working PJK, Curacao, at 2159. (Perron-MD)
- 11214.0 Dagnet Tango-US Air Force AWACS, patching Northern Lights (Tyndall AFB) via Canadian Forces Trenton, then another patch to self-identified Nightwatch 01, who gave him frequencies Z150 (5800) and Z175 (9016), at 1530. Dark Star Papa-US Air Force AWACS, in a patch via Trenton to Melrose, self-identified as Cannon AFB, at 2145. (Perron-MD)
- 11220.0 SAM 202-US Air Force Distinguished Visitor flight, attempting a patch with Andrews AFB, MD, at 1441. (Perron-MD)
- 11244.0 Salinas- US Air Force Salinas Global, PR, with 3 EAMs, simulcast on 15016, at 1620. Puerto Rico-Salinas alternate call, with EAMs at 1920 and 2020. (Haverlah-TX) Andrews-Andrews AFB, MD, with EAM at 1931. (MADX-MD) Offutt-US Air Force, Offutt AFB, NE, with EAM at 2329. (Sevart-KS)
- 12577.0 GMDSS alert channel, with following Digital Selective Calling loggings: Lyngby, 0654; Tokyo, 0718; Madrid, 0851; Chilung, 0950; Perth, 1042; Miami, 1205; New Orleans, 1307; Boston, 1356; Point Reyes (CA), 1647; Capetown, 1712. (Watson-UK)
- 13257.0 Canforce 3580-Canadian Forces, calling Trenton Military on the "Foxtrot" frequency, at 2008. (Perron-MD)
- 13291.0 Gander-Gander Aeradio, Canada, working Northwest 41, at 1418. (Perron-MD)
- 13528.0 "S"-Russian single-letter marker, repeating in CW at 1954. (Sevart-KS)
- 13827.5 Unid-coastal station working NNOCXS (typical shortened call sign for Navy/Marine Corps MARS digital), in Pactor-II, alternate frequency is 7685.5, at 2037. (MADX-MD)
- 13876.7 Unid-Probably Egyptian Embassy, Belgrade, calling Cairo in FEC, then switching to ARQ for traffic, at 1548. (Watson-UK)
- 13977.0 HBD20-Swiss MFA, Bern, with encrypted ARQ traffic for the Tripoli embassy, at 0737. (MADX-MD) HBD20, with encrypted ARQ for Tripoli, at 0944. (Watson-UK)
- 13980.3 RFFA-French Ministry of Defense, with weather in ARQ, at 1801. (MADX-MD)
- 14441.7 Unid-Egyptian MFA, relaying an ARQ message from Rabat to many recipients, at 1940. (MADX-MD)
- 14636.7 RFLI-French Forces, Fort de France, with ARQ traffic for Cayenne, at 2019. (MADX-MD)
- 17215.7 LOR-Argentine Navy, Buenos Aires, with RTTY (170/75) grid references at 1256. (Hall-RSA)
- 17487.0 DLA303-US Defense Logistics Agency, CA, coordination station in SHARES Presidential Inauguration activation, exchanging link-quality data with AAT3BFMARS, US Army MARS gateway, DE, at 2213. AAT3BF, link data with NHQARC, American Red Cross National Headquarters, Arlington, VA, at 2215. (Stegman-CA)
- 17916.0 SDJ-Stockholm Radio, working Reach 123, US Air Mobility Command enroute to Skopje, at 0917. (Patrice Privat-France)
- 18560.0 BMF-Taipei Meteorological, Taiwan, with a fuzzy weather FAX (120/576), at 0730. (Hall-RSA)
- 19131.0 Flint 411-US Drug Enforcement Agency aircraft, patching Flint 500 via Atlas (DEA comm, IA), then in a radio check with aircraft Coast Guard 6003, at 1837. (Perron-MD)
- 19242.0 9SG15-Probably "Goldmine," Katanga, Congo, with mining information in French, then military news in German, in 200/200 Pactor, at 1557. (Hall-RSA)
- 19724.7 Unid-Russian vessel with RTTY (170/50) traffic to Kaliningrad, then receiving a personal message from another ship, at 1533. (Hall-RSA)
- 20631.0 Chalice Bravo-US Air Force AWACS, working Elmendorf in ALE and voice, at 1912. (MADX-MD)
- 21865.0 Unid-MFA, Warsaw, Poland, with Polish-language messages and news for Brasilia, in ARQ at 1256. (Hall-RSA)
- 22376.0 NRV-US Coast Guard, Guam, with an FEC cyclone warning for the US Embassy in Mauritius, at 1505. (Hall-RSA)
- 22857.7 RFVI-French Navy, Le Port, Reunion Island, idling in ARQ at 1612. (Hall-RSA)
- 22912.7 RFHI-French Forces, Noumea, New Caledonia, idling in ARQ at 1616. (Hall-RSA)
- 23053.9 Unid-New station, probably the Turkish Embassy, Kinshasa, Congo, with FEC traffic in Turkish, possibly related to the Kabila assassination, at 0821. (Hall-RSA)
- 24268.0 KUV-UK military (might be the Army-LVH), probably Kuwait, calling CYP, probably Cyprus, in ALE at 1425. PRI, sounding at 1440. (Watson-UK)
- 26241.7 RFVIT-French Navy, St Denis, Reunion Island, with French military traffic in ARQ, at 1023. (Hall-RSA)

High Speed Modem Decoder Finally Here!

This month we follow up on February's "International ALE Networks" feature and detail preliminary beta-test results of some new modules for the Hoka Code30 and 300 series of decoders.

◆ ALE Networks Update

No sooner had we gone to press with the February 2001 "International ALE Networks" feature, than more facts about the various networks detailed there came to light. Some "unidentified" and "tentative" networks may be moved into the "identified" category. We will be adding a new section to the Utility Monitoring Central website to track and maintain details of the various networks. Go to <http://www.mindspring.com/~mike.chace> and follow the "HF" link to ALE Networks.

◆ The "BB1" Network

A number of monitors have independently reported Hebrew-speaking operator chatter from aircraft following ALE calls. It is therefore very likely that this network is operated by the Israeli Air Force.

◆ The "X7, A5" Network

A few atypical ALE calls were spotted on this network – ETATMAJOR and RELJADIDA. The latter of these calls probably denotes the Moroccan town of El Jadida. Other snippets of information point to this network being operated by the Moroccan Army.

◆ The "UK Military or Diplo" Network

This network has been confirmed as being operated by the British Army's Royal Signals Corps. This branch of the Army is responsible for the deployment of communications infrastructure for both permanent bases and missions, for example to Bosnia. The British Army web pages (see resources) mention a large number of operational locations which provide the tie-in to the ALE identifiers active on this network.

Over recent weeks, the new identifiers "BVM" and "BVA" have come to light (as yet unidentified) regularly communicating with "DKL" (the Sovereign Base at Dekhelia, Cyprus) on the new frequency of 16321 kHz (USB).

◆ The Canadian Military Network

There has been some question as to whether Network 2 is part of the Canadian Forces set-up. Some monitors have reported the calls in the CGE, CRC-series to be Chilean in origin. More monitoring will be required to verify this information.

◆ The "2222, 3333, 5555" Network

A number of reports indicate that this network is run by the Moroccan Air Force.

◆ The "AFO, KAI, CH" Network

Some great detective work by LDO finally identified this network as belonging to the bases of the Swiss Headquarters Support Unit (SHQSU) of the OSCE (Organization for Cooperation and Security in Europe). The SHQSU was sponsored by the Swiss government as part of ongoing relief operations in Bosnia-Herzegovina.

After closing their regional offices in Tuzla, Mostar and Banja Luka in late 2000, they brought their 46 soldiers back to Switzerland at the end of 2000 and closed the main office in Sarajevo. The "down-building" will be finished as this column goes to press.

◆ New Modules from Hoka

Although still in the beta-testing stage and not yet commercially available, we're excited to report that the latest versions of the Hoka Code30 and Code300 decoder software have several new modules added. These are:

- ARINC HF Datalink
- MIL-188-141A ALE
- MIL-188-110A 2400bd PSK HF modem
- STANAG4285 2400bd PSK HF modem
- STANAG4529 2400bd PSK HF modem

We've been wondering when the decoder manufacturers would catch up with the latest on-air systems, and Hoka's efforts represent a real step forward. We've been lucky enough to have had these offerings on test, and thanks to permission from Horst at Hoka, we can report our initial findings here.

◆ HF Datalink

As reported in the previous issues of *MT*, ARINC are continuing to build their global HF aircraft data system and now have over a dozen transmit sites in operation. The signal is an adaptation of the MIL-188-110A waveform and is used to provide a number of functions analogous to the well-known VHF ACARS system.

◆ MIL-188-141A ALE

This module performs decoding of the standard ALE protocol. In our tests, the Hoka implementation appears to be somewhat more sensitive than that of the PC-ALE software. This is almost certainly due to the hardware involved (dedicated DSP vs general purpose soundcard) rather than the software itself. Reliable decoding from our

Code30 is obtained with signals barely above the noise-floor of our WJ8715 receiver.

◆ MIL-188-110A 2400bd Modem

This module decodes the 2400bd HF modem signals now very common on HF. It automatically senses the data rate (most signals appear to use 600 or 1200bd) and interleaver in use (short or long) – the longer interleaving of data helping increase protection in noisy conditions. So far, this module has revealed a very active Spanish Navy network, MS Exchange email between ships of the Royal Swedish Navy, and a very active network carrying Ethernet traffic (demonstrating why these modems are so popular now) and believed to be run by the US Coast Guard. As is the case with many modes, 110A traffic often carries addresses or other identifiers which indicate the user. Here are some frequencies carrying 110A traffic:

Swedish Navy 17254 kHz USB

Spanish Navy 12266, 13089, 16408, 17266, and 17290 kHz USB
US Coast Guard 5105.5, 5193.5, 6961, 6996.5, 10294, 10343, and 12372 kHz USB

Any of the Swedish Diplomatic channels noted in our recent International ALE Networks feature will also carry 110A traffic, although these are encrypted X.25 messages.

◆ STANAG4285 2400bd Modem

Again, a very common system these days, STANAG4285 is in use by a large number of NATO countries. The Code 30's module decodes these signals, but unlike the 110A standard, STANAG4285 does not provide for so-called autobauding where the receiving modem can sense the data rate of the incoming signal. In practice this means that one must try various combinations of data rate (75, 150, 300, 600, 1200, & 2400bps) and interleaving (short, long and uncoded). Disappointingly, so far, with over 100 signals analyzed, all appear to be encrypted.

◆ STANAG4529 1200bd Modem

Rather less common than either the 110A or STANAG4285 standard, we have yet to catch one of these burst modems long enough to verify the operation of the Hoka module.

All in all, this is exactly what we've been waiting for. The implementations are faithful to the original specifications and produce reliable results. Hopefully we'll soon be able to announce the final version. Now, where's that PacTOR-II modem....?

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Is Radio Austria International a Sinking Ship?

Roland Machatschke, director, posted this essay (in part) on the station's website:

In its 20 January, 2001 issue, the daily newspaper *Die Presse* makes the above claim, without adding a question mark. In the year 2000, funding was reduced by almost 30 percent compared to 1999. In 2001, the Republic of Austria is only providing roughly half of the funding it paid for its international broadcaster in 1999. For the year 2002 no further funding is planned. Radio Austria International was forced to let go half of its roughly 100 regular staff and freelancers within the space of six months.

Programming itself had to be changed to concentrate on the core responsibilities of an international broadcaster, namely news and current affairs. Thus all music programmes were discontinued, a decision not easily made by Austria's voice to the world, considering the fact Austria is regarded as the "land of music." All told, 26 of the 36 magazine programmes were cancelled along with all ROI produced news broadcasts and current affairs programmes with the exception of the *Österreich Journal*, which is broadcast Monday thru Friday.

The other language services have remained by and large un-

changed, because with their 13 percent share of the entire programming it would have been difficult to make further cuts without endangering their very existence. Instead of being on the air to overseas target areas for several hours a day, ROI can usually only be heard there for one hour daily. This was a very painful spending cut for us. Radio Austria International has more listeners than some of the critics here at home would want to lead us to believe.

Radio Austria International is prepared for the challenges of the future. It is not a "sinking ship in the short-wave ocean" as *Die Presse* wrote. Even though it has considerably less money to spend than the governments of neighbouring countries such as the Czech Republic, Slovakia or Hungary allocate to their international radio programming, Radio Austria International is able to fulfill its core responsibilities. But there a great danger that the "ROI ship" will be sunk by outside forces. When half the crew is forced to leave the ship and when the engines are only permitted to run at half speed then there are limits even to our manoeuvrability. (From http://roi.orf.at/frameall.asp?url=/english/en_intern_thema.html) (c) 2001 Radio Österreich International via John Norfolk)

AUSTRALIA [non] In late January, R. Australia began some relays via IBB on Tinian, and, dropped after only one day, Saipan (Dan Ferguson and Bob Padula) Probably changed by now for A-01, effective March 25, schedules for this and many other stations not yet available to us at presstime (gh)

BRAZIL R. Nacional da Amazônia is back on 6180. Programming is a bit different from the old RNA, a lot of links with R. Nacional do Rio on 1130 (Rudolf W. Grimm, SP, *radioescutas*) 6180, strong around 0901-0928 (Phil Ireland and Craig Seager, NSW, *Australian DX News*)

R. Cultura's audio link is for great Brazilian music is <http://www.tvcultura.com.br/radioam/radioam.asx> as heard on 17815, or <http://www.tvcultura.com.br/radiofm/radiofm.asx> for their FM side, classical (gh)

CAMBODIA [non] Since it was denied a transmitter in Cambodia, the Sam Rainsy opposition party started weekly shortwave broadcasts Feb 17 from an unidentified Asian country, Saturdays 1000-1100 on 15455, known as Voice of Justice, or phonetically in Cambodian, "Samheng Yutethoa." May increase to daily. See <http://www.samrainsyparty.org/> (AFP and Nick Grace C., *Clandestine Radio Watch*)

CANADA Scott Snaillham - Production Assistant/Evening Producer, CHNX/CHNS/CHFX Halifax tells me the current contact for QSL response is CE Mark Olsen; Rp is appreciated. CHNX 6130 kHz was off the air in Feb due to difficulties with the transmitter. It is uncertain if the SW outlet will return as "the transmitter is not suited for shortwave" (Joe Talbot, Alberta, *hard-core-dx*)

CHECHNYA [non] U.S.-funded Radio Liberty said it would go ahead with plans to broadcast in the Chechen language despite objections by a Russian minister. Congress had mandated the Prague, Czech Republic-based station to start transmissions in the languages of Russia's turbulent North Caucasus region (Andrei Shuksin, Reuters via Brock Whaley)

CHILE Transmitter site announced for Voz Cristiana is "Calera de Tango" (Horacio Nigro, Uruguay, DXLD) [non] 1700 in Miami Springs is running parallel to Radio Voz Cristiana - Santiago (still IDs as WAFN) and mentions an FM outlet in Panama City (Keith T. Willis, FL)

CHINA China National Radio 5th programme (CNR5). ID in Mandarin: "Zhongyang Renmin Guangbo Diantai Xianzai Kaishi Dui Taiwan Guangbo" ("This is the Central People's Broadcasting Station. We now begin our broadcast to Taiwan"). First Programme: "Di Yi Tao Jiemu" ("This is the First Programme"). Some programmes in Amoy, Hakka. Address: 2 Fuxingmenwai Dajie, Beijing 100866, China. Tel: +86 10 6851 5522. Schedule daily: 0055-0615 on 549 765 11100 11935 15710; 0955-0005 549 765 5090 7567 7620 9380 11160 (BBC Monitoring)

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; A-01=summer season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated

[non] In late Jan I found new CRI English broadcasts on 17720 at 1400 and 1500; wide, strong, steady signal, but degraded modulation, typical of Cuban relays. Not the same transmitter as 9570 which overlapped it before 1400 (gh) Same kind of skip-over flutter WYFR has here, indicating a nearby site. If from Cuba, would strongly suggest it is from the new Chinese-built (two years old) transmitting and monitoring facility, Dfed by the FCC at 22.56.00 N, 82.23.00 W (near Bejucal), as opposed to the Bauta site for most RHC SW transmitters (Terry Krueger, FL, *hard-core-dx*)

COLOMBIA Radiodifusora Nacional on 9634.97 is now audible almost all night in Denmark with a surprisingly good signal from 2230 to 0500 - except for 0100-0200 when 9635 also used by Radio Sweden (Stig Hartvig Nielsen, *hard-core-dx*)

On 5956.44, Caracol Villavicencio at 0856 Talk, Caracol net IDs and time checks. Very good signal (Mark Mohrmann, VT)

6233.0v is new frequency for clandestine Voz de la Resistencia, Bloque Oriental, until 1235* with good quality, s/off with usual *Compañeros de la FARC*. Also at 2140 with *Notifoaque Voz de la Resistencia* (news) (Yimber Gaviria, Colombia, *DX Listening Digest*) La Voz de Resistencia - not exactly loud and clear - but with a perfectly readable signal and lots of nice danceable music from tune in at 2220. By 2230 a couple IDs, revolutionary march and sign off at 2233 on 6233.72 or 6233.73 (Stig Hartvig Nielsen, Denmark, *hard-core-dx*)

On 2620.26, at 1100 after Mexican music ID "Desde Palermo, la república de Colombia, transmite para Ustedes su emisora Micrófono Cívico, la emisora del Pueblo, HJWD 1310 kHz..." Harmonic from MW 2 x 1310.13 (Björn Malm, Quito, Ecuador, *SW Bulletin* via Thomas Nilsson)

COSTA RICA To avoid interference, RFPI moved from 7480 to 7450, and expanded to 0000-0800 (gh) RFPI carried a pilot for *Live Wire Independent News* in Feb, Mon-Thu 1730, companion to the weekly *Freespeech Radio News* Fri 1730, all repeated 6 and 12 hours later. LWIN is created by the National Radio Project (NRP), producers of *Making Contact*, and live specials, such as *UnConventional Coverage* and *World Trade Watch*; featuring fresh, lively, newsworthy stories not often heard in mass media (RFPI) Also via public radio stations and website <http://www.radioproject.org/lwmoreinfo.html> (Richard Cuff, swprograms)

On 5953.90, Radio Casino, Limón, reactivated, excellent signal every morning at 1130, always with Mexican music (Björn Malm, *SW Bulletin* via Thomas Nilsson)

DOMINICAN REPUBLIC Santo Domingo, 5008.85, 2328-2340 ID first as "La Voz de la Esperanza" and then "Radio Cristal Internacional", news, mx, SIO 343 (Daniele Canonica, Switzerland) R. Cristal frequency 5009.78, *1101-1141 relaying some other AM

station in the morning; music always clear, but voice always distorted, a very different format from Cristal's all-bachata canned style (Terry Krueger, FL, *hard-core-dx*)

6025.05, R Amanecer Internacional, Santo Domingo, 2345-0005, Christian songs, sermon, ID in Spanish, reactivated (Michael Schnitzer, Germany, *Conexión Digital*)

ECUADOR HCJB, 21455, heard with much stronger signal than before and not just USB. I know they were a test site for DRM on 21455 earlier. Would it have anything to do with that? (Ricky Leong, QC) Beware of WYFR which was also using 21455 at 1545-1945, HCJB 2000-1530 (Wolfgang Büschel) DRM tests in January from Pifo used 30 kW PEP linear transmitter (Hans Linkels, Chairman of DRM System Evaluation Group, <http://www.21MHz.com>) And we kept using it for analog instead of 1 kW (Doug Weber, Frequency Manager HCJB, via Allen Graham, CA) HCJB tested live streaming three days in February, planning to begin continuous streaming in March; <http://www.hcjb.org/streamindex.php> (Yvonne Kennedy, HCJB via Richard Cuff, *swprograms*) We would prefer to have on demand audio to listen to favorite programs at our convenience (Larry Nebron, Bill Whitacre and gh)

On 4840.00, Radio Interoceánica, 0208-0342+, apparently reactivated with new program format. No traditional Andean music heard. Pop ballads and "música romántica". Highly produced canned IDs for "Interoceánica FM...103.5...", still going at 0342, very good signal, much stronger than in the past (Mark Mohrmann, VT, *DX Listening Digest*)

ERITREA UNMEE, UN Mission in Eritrea and Ethiopia, started broadcasts in English, Tigrinya, Tigre Arabic via national channels here, Tue 1030-1130 on 7100; 1400-1500 on 7175; repeated Wed 0700-0800 on both (BBC Monitoring, *Media Network*) Frequencies are all Eritrean state radio, Voice of the Broad Masses of Eritrea (Chris Greenway, BDXC-UK) Radio UNMEE has Real Media files of their programs at <http://www.un.org/Depts/dpko/unmee/radio.htm> (Hans Johnson, *Cumbre DX*)

ESTONIA Radio Tallinn is operated by Estonian Radio, aimed at Estonian and foreign nationals in the Tallinn area. As well as its own programmes in English, it carries relays of BBC World Service, Radio France Internationale, Radio Sweden and Deutsche Welle. The former Radio Estonia external service aimed at listeners abroad ended with the closure of Estonian Radio's shortwave transmitter on 5925 kHz on March 1st 1998. Programmes are NOT subject to Summer/Winter time changes. English news is Tue-Fri 0400-0415; *News and Estonia Today* Mon 0400-0500, repeated 0900-1000, and available on demand from <http://www.er.ee/eng/uudis/> (© BBC Monitoring)

GABON You can now listen to Africa Number One via <http://www.africa1.com> but we can also be heard perfectly well on SW in North America, Japan, Australia, and even in Siberia (Georges Courreges, ANO via Mike Terry, *hard-core-dx*) Finally found the link, <http://www.comfm.com/live/radio/africa/playerw.html> (gh)

GEORGIA Radio Khara is on 4875 from Dusheti at 1700-1730 on Monday and Thursdays with a repeat of the previous day's broadcasts at 0500-0530 on Tuesdays and Fridays. Radio Khara is sponsored by the Georgian-Abkhazian Relations Institute in Tbilisi. "Khara" means "We" in Abkhazian. The accent of Radio Khara is on Georgian-Abkhaz reconciliation, and the history of these two people who have lived together for centuries. The Institute does not have a website (Goulnar Pataridze, Kai Ludwig, Hans Johnson, *Cumbre DX*)

GREECE ERT news. I had telephone talkings with the technical persons of the ERT 3. Indeed the Continental transmitters from IBB RFE donated by the VOA have been received and they are still in their packs, for Thessaloniki at least. The facility of Perea/Thessaloniki has received two 250 kW with their antennas. However in order for these systems to be installed, a management approval is required (bureaucracy ...). (Zacharias Liangas, Greece, BC-DX)

GUYANA On 5948.9, Voice of Guyana, at 0928-0947: Hindu devotional music, 0930 promo for National Unity Rally, ID "Voice of Guyana". Ad for on air funeral announcements. Good S9 signal with moderate fading. ID again at 0940, then reading of verses from the Bhagavad Gita. Not more than a half second after the host ended with "Hari Om Shanti Shanti Hari Om", a huge carrier from WYFR on 5950, buried the signal. How ironic! (David Hodgson, TN, *DXLD*)

INDONESIA Radio Republik Indonesia now has web site under construction at: <http://www.rrionline.com/> RRI Overseas Service home page is at: http://www.rrionline.com/rriframe_overseas_main.html (TDP via Pentti Lintujärvi, *Hard-Core-DX*)

IRAQ Get set for an exciting year for the airwaves over Iraq. The Worker-Communist Party of Iraq maintains a separate webpage for their station: <http://www.wpiraq.org/english/radio.htm> (Nick Grace C., *hard-core-dx*) see also KURDISTAN

ISRAEL IBA began in Feb a good new frequency for English at 0500, 7500. Summer timing 0400 and frequency may change (gh)

JAPAN Timesignal station JYJ is to be decommissioned as of March 31, 2001. Hurry to hear it on 8000 or other frequencies (<http://www.iprimus.ca/~hepburnw/dx/time.htm> via Carlos Felipe, *radioescutas*)

KOREA NORTH The Frontline Soldiers station seems to be active on an irregular basis on all three frequencies (1614v, 2624v, 3025v), approx. 1400-2000. Purpose is (probably) entertainment for North Korean soldiers stationed along the DMZ (hence the frontline). Contents are mainly radio dramas with occasional music and political talk. Programs are not parallel when two or three are on at the same time. They may all be feeders for local

rebroadcasting. "Chonyon Chobyong durul wihan Bangsong" (lit. "Radio for Soldiers on the Frontline") ID can be heard at s/on and a few minutes after the half-hour (Sonny Ashimori, Japan, *Cumbre DX*)

Found by chance in a search is this website about R. P'yongyang by someone who seems to have visited the country: <http://www.simonbone.com/pyongyang.html> (Ken Halpert, *DX Listening Digest*)

KOREA SOUTH KBS Radio One is 24 hours on 3930 (BBC Monitoring)
KURDISTAN One issue of the Kurdish DX Summary Chart or "Kurdistan SW Target List" can be found at: <http://www.clandestineradio.com/martin/crw-kurd.html> (*Clandestine Radio Watch*)

Voice of the People of Kurdistan. (Kurdish: "aira dangi gelli kurdistana", Arabic: "sawt sha'b kurdistan") is the official radio station of the Patriotic Union of Kurdistan (PUK) led by Jalal Talabani. It broadcasts from Al-Sulaymaniyah in Iraqi Kurdistan. According to the radio's website, it was established in 1979 under the name "Voice of the Iraqi Revolution" and adopted the current name in 1983. Languages: Arabic, Multilingual, Sorani Kurdish, Hawrami dialect. Address: PUK, Postfach 210231, 10502 Berlin, Germany. E-mail: puk@puk.org Web Site: <http://www.puk.org> Daily 0300-0700, 1345-2100 on 4060, 6995 (© BBC Monitoring)

[non] WCPI, the Worker-Communist Party of Iraq, launched R. Bopeshawa Mon, Wed, Fri in Arabic and Thu in Kurdish at 1500-1600 on 9450 from undisclosed location. "Bopeshawa," meaning "Forward" in Kurdish, is also the name of the party's newspaper. Listeners are invited to contact the station via e-mail at radio@wpiraq.org Also spelt Bopishawa, Bopishawa (Martin Schöch and Nick Grace C., *Clandestine Radio Watch*) ID in Arabic is *Itha'at ela Al-Amam Radio Forward, ela (to) al (the) Amam (front)*. PO Box 22266, London SE5, UK (Hans Johnson, AZ, *Cumbre DX*) Transmitter location revealed itself by leakthrough of interval signal of R Bulgaria (Olle Alm, Sweden, *SW Bulletin* via Thomas Nilsson, and Noël Green, BC-DX)

MALAYSIA RTM is absent from 4845, which carried their Radio 6 service in Tamil 24 hrs. SE Asia tropical bands are now sounding decidedly empty. The number of active tropical band stations in the region, excluding Indonesia, is now down to single figures, most of which operate for only a few hours a day. Only channel with really good reception is 7295, in English 24h (Alan Davies, Hat Yai, Thailand, *Electronic DX Press*)

MÉXICO Starting Feb 1, the new management of R. Educación has reduced its SW-only broadcasts on 6185 to six hours a day, 0000-0600 UT, then simulcasting MW for the rest of the night until 1200 [one hour earlier during DST]. This is a step backwards, less programming for an international audience, following a doubling of the power in 1999. Listeners' opinions about this are divided to Radio Educación, onda corta, A.P. 21 940, C.P. 04021, México D.F. (Deyanira Morán, yanimoran@hotmail.com via *Noticias DX*)

XEQM, 6105, Mérida, Yucatán, reactivated since Jan 31, weekdays opening at 1200 with newscast called Radio Noticias, from XEUL, Foro 930; on Sat it relayed XEMH 970, Candela Tropicaliente instead. Promo says the new name for this is "RASA Onda Corta", slogan "Lo Mejor de nuestras estaciones para el Mundo" (Hector Garcia Bojorge, México DF, *MUNDO RADIAL*)

NETHERLANDS [et al.] Digital Radio Mondiale now publishes advance details of future field test transmissions on shortwave. These should be available on the DRM Website at <http://www.drmm.org> but will also be available on our Media Network site <http://www.rnw.nl/realradio/html/medianews.html> (Andy Senniit Radio Netherlands, *hard-core-dx*)

PAPUA NEW GUINEA R. Sandaun on 3205 returned to the air Jan 3, 2001. Noted at a Graylands DXpedition, and since (Don Nelson, Oregon, *DXLD*) Radio Western Highlands, Mt Hagen, 3375: This one has been active again since November. Heard at 0925 with current affairs program, relayed from Port Moresby & also on the Karai Service from PM on 4890 (Craig Seager, Australia, *DXLD*)

PERÚ 4580-4610v ex 5421v/x5609v, Radio San Juan de "Saïque"? with comunicados for Jaén department; starts around 2345 and closes between 0300 and 0330. (Björn Malm, Quito, Ecuador, *SW Bulletin*) It is "distrito de Sallique", and the station then probably "R San Juan, de Sallique". (Henrik Klemetz, *DXLD*) Over four nights in less than a week, R. San Juan was heard as early as 2340, as late as 0310 on 4582.1, 4584.9, 4588.4, 4577.8. On a visit to Chiclayo I was able to visit R. Imperio, and was shown around the offices and studios. They said the schedule was 0845-0500. But R. Horizonte is in a dangerous neighborhood, surrounded by high walls and a big metal door. They reluctantly gave me some info about the station through a small window (Pedro F. Arrunátegui, Lima, *Chasqui DX*)

The Celendin station on 4655.0 previously known as R. Celendin; R. La Voz del Campesino; and R. Ecos del Edén, by mid-Feb was IDing as R. Nuevo Amanecer, as early as 2340-0305* to return at 1000, with Andean music, comunicados (Pedro F. Arrunátegui, Lima, *Chasqui DX*)

Around 6270, varying 6225 to 6297, is new Radio El Libertador, provincia de Utcubamba, departamento Amazonas at 0050 announced as testing; then religion after 0100 and no IDs (Björn Malm, Quito, Ecuador, *SW Bulletin*)

RUSSIA The 12th of April this year marks 40 years since humanity penetrated outer space and the world's first cosmonaut was Yuri Gagarin of Russia.

Voice of Russia offers a special quiz, broadcasts the questions and terms on a regular basis. Or visit <http://www.vor.ru> Winners will be awarded special prizes, best works put on display, deadline April 12. Winners will be given June 15. Write "For space quiz" on envelope to: "Voice of Russia", 25, Pyatnitskaya St., 113326 Moscow, RUSSIA. Or fax 095 950-56-48 (VOR via Sergei Sosedkin)

Radio Miks-Master in Yakutsk, 4940, is frequently misinterpreted as a private radio station. This is not the case. It is a channel of NVK "Sakha" which is the national state broadcasting company of the Republic of Sakha (Yakutiya), financed by the republic's administration and included in the structure of VGTRK (All-Russian state radio & TV broadcasting company) as the regional broadcasting company for Yakutiya (Bernd Trutenau, Lithuania, BC-DX) Goes off at 0930 (Olle Alm, Sweden, BC-DX)

SICILY Received a full data, typewritten and signed, verification letter direct from "Naval Radio Transmitter Facility, Niscemi, Sicily" indicating the AFN broadcast on 6847.5 kHz on August 13, 2000 was from that station but they did not verify another report for 16847.5. I originally sent reports to Naval Media Center Washington but received letters back stating neither was a published / authorized frequency for AFN. So I sent reports to NAVCOMTELSTA Sigonella. My full data typewritten QSL has a return address of PSC812, Box 3290, NRTF Niscemi, FPO AE 09627-3290. In part it states, "This signal originated from Naval Radio Transmitter Facility Niscemi, Sicily". (Lee Silvi, OH, DX *Listening Digest*) Perhaps in Niscemi is only the antenna or radio relay. Airport, base and command are in Sigonella (Salvo Miccichè, Sicily, *hard-core-dx*)

SWEDEN [non] There's a new relay swap, between RCI and Radio Sweden. Radio Sweden is going out via Sackville on 9560 kHz at 0230-0259 UT in English (Bill Westenhaver, RCI) Very good on 9560 at *0230 crash-start. Direct 9495 still on, barely audible here, runs as much as 16 seconds behind Sackville; one or both must be playing back pre-recorded tape, not simultaneous feed, so gap is unpredictable. Kim Elliott determined that a WRN feed was being used. Magnus Nilsson of Terakom admitted on MediaScan that Swedish language broadcasts were first priority for Sackville relays, but a convenient way to feed them had not yet been established (gh)

TAIWAN CBS on new 15060 has also been putting a very good signal into here mornings roughly 1200-1500 (gh, OK)

TAJIKISTAN Harmonic 13905 at 1554 from Tadjik R, Dushanbe, 3 x 4635, fair at peaks (Tim Bucknall, UK, harmonics@yahoo.com)

THAILAND R Thailand external outlets on 9655 and 11905 via Pathumthanee site are inactive. Only IBB Udorn Thanees is in use (Uwe and Suree Volk, Chiang Rai and Bangkok, BC-DX)

TURKEY Hunting around the Voice of Turkey website for their current English feature program schedule, PROGRAMMES is a dead link, but under REVIEWS we get a list of programs, and days, but no exact times, which may or may not be up-to-date. See <http://www.tsr.gov.tr/en/reviews/ingiliz.shtml> (gh)

UK Starting in February and lasting six months is a monumental series on BBC WS, *The Story of Africa*, on the African streams only, Fri 0930, Sun 0430 (when Ascension 7160 and 11765 should be best for us) and 0730, Tue 1630, a history of the last bimillennium. See <http://www.bbc.co.uk/worldservice/africa/features/storyofafrica/index.shtml> (gh)

USA Check out <http://www.wiseclean.org> - I was alerted to this story by a letter to the editor in *Radio World*, 1/17/2001, pg 62. I know Mike Dorrrough. He is a nice fellow, and an advocate for getting information to the blind. He wanted to start a SW radio station to provide info to the blind. His efforts have been halted (Fred Vobbe, NRC DX *Audio Service*) There is a lot more to this than the SW angle. Apparently he has been done a great injustice by a number of public officials, including Gov. Tommy Thompson, named to alleged Pres. Bush's cabinet. Here's an excerpt we found referring to the SW project:

"Judge Steven D. Ebert has illegally taken Mike Dorrrough's land, rendering a near-fatal blow to 'Project Beacon', Dorrrough's shortwave station and archiving project, by and for people without sight, but blessed with an inner vision for a new and better kind of radio. Tragically, this inner vision may never be realized." (gh)

On the last day of the Clinton Administration, VOA announced more services to be closed: Thai, Uzbek, Portuguese to Brazil. Reduced: Bulgarian, Romanian, Slovak, Turkish. Merged: Armenian, Azerbaijani, Georgian. 36 jobs to be eliminated by August. Savings will allow improvement of: Arabic, Indonesian, Hindi, Macedonian, Russian, Spanish to Andes. VOA Director Sandy Ungar did not resign like other political appointees, maintaining his position did not require this (Kim Elliott, VOA *Communications World*) *Noncitizen Employees Could Bear Brunt of VOA's Latest Round of Layoffs*: <http://www.washingtonpost.com/wp-dyn/articles/A27547-2001Jan21.html> (via Bill Westenhaver, Mike Cooper) *Cutbacks at VOA prompt critical chorus*: <http://www.csmonitor.com/durable/2001/02/08/fp18sl-csm.shtml> (via Jim Moats, OH)

Radio Free Europe/Radio Liberty started publishing every Friday *Media Matters* based on reports by RFE/RL broadcasts and other sources. To subscribe e-mail mm-request@list.rferl.org with the word subscribe as subject. Or you can access this at: <http://www.rferl.org/mm/> (Krzysztof Rybus, Poland, via Wolfgang Büschel) Like *BBC Monitoring* but freely accessible and concerning only the countries RFE/RL serves, eastern Europe, CIS and vicinity. Not much relevant to SW or clandestines but there could be (gh)

See *WWCR's Specialty Program Guide*, a quick way to find DX, musical, entertainment and info programs other than preachers and far-right

talkshows: http://www.wwcr.com/cr_specialty_pgms.html (gh) WWCR runs a promo that they are "targeting Japan and the Far East at 1000-1100 [DST timing] on 7435". This seems odd, since all WWCR's rhombics are aimed from NE to E, this one registered at 46 degrees, nowhere near Japan's direction. So I asked George McClintock how he justifies this; his reply in summary:

The international broadcasting community dislikes rhombics because they have sidelobes, but that is exactly why we like them. This happens to have a good sidelobe toward Japan, and we have been getting reports from there. As a matter of fact, our sidelobes have more power than many US stations have on their main lobes from other antenna designs! Another good thing about rhombics is their low vertical takeoff angle, which favors propagation to greater distances. Ours have been modified to be as low as possible, all below 10 degrees. This is a disadvantage for close-in coverage, but we make up with sheer power, gain and sidelobes. The window to Japan is two hours maximum, when 7435 is near the FOT [optimum frequency] and at that time of day there has not been much demand from programmers in North America, so we are trying promoting it as a service to Japan and the Far East.

Although such a low frequency as 2390 was necessary previous seasons for close-in coverage at night in sunspot lows, we have found that it is subject to ducting, and there are few receivers capable of receiving it, so we plan to reduce usage of it from A-01 season; the Brother Stair service gets better results from 7435 which will be expanded; previously it suffered from a 1500-mile skip zone overnight (George McClintock, WWCR)

WWFV says it plans to use frequencies around 14.900 and 3.290 MHz (rec.radio.shortwave via John Norfolk)

WBCQ-3, The Planet, started new Saturday afternoon musical/entertainment series on 17495-CUSB from *Complex Variable Studios* and *Marion's Attic* at 1800-0100 UT. We also plan to add another nighttime service, most likely in the 5 MHz band that we will diplex into our 709 foot rhombic. Most likely in the spring or as soon as we can line up clients (Allan Weiner, WBCQ Central)

Paul Harvey's noon news can be heard on SW at its first feed-time, 1640 UT [DST: 1540] as noted on WFLA 25870 NBFM. This is to allow Eastern Zone stations time to pre-tape it and insert local commercials in noon+ airings, but a number of stations, even in western timezones broadcast it at this first opportunity and get it over with (gh)

Received full-data letter confirming WLW-700's cue-link on 26450, after follow-up. Says it is omni 5/8 wave antenna with 70 watts; V/S Gary Barnett, 1111 St Gregory, Cincinnati OH 45202 (Dinan Rogério Honório de Oliveira, Brazil, DXCB @-TIVIDADE DX via radioescutas)

[non] WYFR Family Radio tested via Jülich, Germany for two weeks in Feb, 1600-1800 and 1900-2200 13855, 1800-2100 15775 (Kai Ludwig, Germany, *World Of Radio*)

BGBM of UMC, 15485 via Germany, at 1700 with wonderful reception. Very regionally sensitive programming, emphasizing the sad occurrence in Congo with the death of Kabila. This day was dedicated to mostly music, both inspirational and secular, all sounding appropriate for Africa. This program is in stark contrast to the "Americentric" programming of other religious groups. Worth listening to. Parallel 13810 was good, with some splash from 13815 (Walt Salmaniwi, BC, *DX Listening Digest*)

OUR CURRENT AUDIO - Finally have put together all our audio links on one convenient page, as well as to summaries/scripts, for *World Of Radio*, *Continent Of Media*, *Mundo Radial*, *Shortwave Year In Review*: <http://www.angelfire.com/ok/worldofradio/Audiomid.html> From April 1, all WOR times on WWCR and WBCQ shift one UT hour earlier for DST (gh)

VATICAN The pope named 37 new cardinals, one of whom is Rev. Roberto Tucci, 79, Italian, president of Vatican Radio and main organizer of the pope's foreign trips (Reuters via NY Times via Bill Westenhaver) Cardinal Tucci and two other Vatican officials face possible jail time, charged with violating Italy's very strict standards on electromagnetic fields emitted by radio transmitters, i.e. Vatican's Santa Maria di Galeria. They were to go on trial March 12. Vatican maintains even if true, Italy has no jurisdiction (RN *Media Network*)

VENEZUELA [non] Tnx to a tip from Henrik Klemetz, checked out Sunday morning program *Aló Presidente* via Cuba. First hour at 1400 one week promoted tourism to Mérida, then Pres. Hugo Chávez came on at 1500 for more than three hours until 1818*. Cuban announcer gave 6140, 9505, 9820-USB, 11705 and 11875. Until 1459, 6140 was best; then 11705 after NHK/Canada closed. The others confirmed but blocked or distorted. At <http://www.unionradio.com.ve> this show is listed only for 1300-1500 UT (gh)

YEMEN Republic of Yemen Radio, English Service is at 1800-1900 daily, repeated at 0600-0700 next day on 9780v; at other times in Arabic. Address: PO Box 2371, Sanaa, Yemen. Tel: +967-1-231181. Fax: +967-1-230761 (© BBC Monitoring)

During a recent stay in the country, I found, during local day-time, 5950, 6135 & 9780 are often on the air simultaneously with the Sana'a National Programme. Certain publications still list 6135 as being located at Al-Hiswa (Aden), but SW facilities there were bombed and destroyed during the 1994 War of Unity. R. Sana'a has a beautiful QSL card and more DXers would receive it if they would care to report the programmes in English and write to: English Service, Radio Sana'a, P O Box 2371, Sana'a, Rep. of Yemen (Maarten van Delft, Holland, *DSWC World News*)

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

0005 UTC on 6797.6

PERU: Ondas del Rio Mayo. Spanish. Andean music and advertisement, "loteroa de Cajamarca", station ID, SINPO=24322. Additional Peruvians monitored: **Radiodifusion Huancabamba** 6535.8, 0015; **La Voz del Campesino** 6956.5, 0020; **Radio Madre de Dios** 4950.1, 2300; **Radio Imperio** (presumed) 4389, 2310; **Radio Cultural Amauta** 4995.6, 2325; **Radio Ancash** 4992.5, 2335; **Radio Horizonte** 4992.5, 2335; **Radio Horizonte** 5019.9, 2340; **Radio La Oroya** 4904.7, 2345; **Radio Cultural** 4955, 2350; **Radio Chota** 4890.2, 2350-2355. (Michael Schnitzer, Hassfurt, Germany)

0124 UTC on 4845

GUATEMALA: Radio Kekchi. Nice Latin vocals and text in Kekchi language. Background music during station IDs to regional promos and commercials. Amazing signal! (Mark Veldhuis, Borne, Netherlands/HCDX)

0230 UTC on 7325

AUSTRIA: Radio Austria Int'l. Vienna waltz tune to ID and report on continuing Mad Cow disease research, to story on northern Italy. (William McGuire, Cheverly, MD) Monitored 1630, on 17865 with report on demonstrations and strikes aimed at government budget cuts. (Bob Fraser, Cohasset, MA)

0400 UTC on 6020

TURKEY: Voice of Turkey. Review of Turkish Press. (Jim Boynton, Newton, MA) Impressions of Turkey-interview with a foreign woman living in the country, 2312 on 9655. (Fraser, MA)

0537 UTC on 4845

MAURITANIA: Radio Mauritanie. Male hosts Arabic music program, best noted on 60 meters. Slight heterodyne noted, monitored at 0545. (Harold Frodge, Midland, HI)

0600 UTC on 11840

ECUADOR: HCJB. *Saludos Amigos*, // 9745. Religious program, *Renewing Your Mind* 0800, 11755. (Boynton, MA) *Adventures in Odyssey 2000* on 17760 // 21455. (Fraser, MA)

0715 UTC on 7265

GERMANY: SWR, Baden. Usual pop music program hosted by woman, including "canned" announcements. Three time ticks with newscast 0800-0804, canned ID into music program. Good and clear signal, best at tune-in. Germany's **Deutschlandfunk** 6190, 0726-0733 in German. Station ID to time tips, notable slop from Mexico 6185. **Deutschland Radio** 6005, 0738-0748, German programming of children's educational segments. Station ID at 0743 with program continued to bridge. Hosts talk with several IDs into German rock music. (Dave Valko, PA/HCDX/Cumbre) **Deutsche Welle** 15135 at 1937 (Dean Burgess, Manchester, MA) Report on Yasir Arafat 2300 on 9815. (McGuire, MD)

0727 UTC on 7260

VANUATU: Radio Vanuatu. Local languages to English news and ID at 0730. Island music past 0800, fair signal quality. (Roger Chambers, Utica, NY/ODXA)

0752 UTC on 9870

MONACO: Trans World Radio. Program sign-on with music box interval signal. English religious programming to 0920. Parallel 12007 mentioned. (Chambers, NY/ODXA)

0847 UTC on 4915

BRAZIL: Radio Difusora Macapa. Accordion music to local time check. Female announcer's station ID at 0902. Brazil's **Radio Anhanguera** audible 11830, 0910 with Portuguese music and station ID. Weak signal, fair and clear. **Radio Cruzeiro** 4765, 0943 with pop music, time check with pips at 1000. (Chambers, NY/ODXA)

0912 UTC on 4388.97

PERU: Radio Estereo. Soft campo music, finally got two official IDs during canned promo by announcer at 0913. *La Voz Salvacion* program at 0930. Signal fairly weak. Peruvians noted: **Radio Cora** 0939-1000 with light instrumental Latin music. ID and freq quote at 0955. Occasional time checks. **Radio Difusion San Francisco Solano** 4750.14, 0945-1030. Fast paced DJ with several IDs, and almost impossible to hear! (Dave Valko, PA/Cumbre)

1025 UTC on 6115

COLOMBIA: LV del Llano. Very strong, signal splattering all the way to 6095 up to 6190. (Valko, PA/Cumbre)

1124 UTC on 6233.70

CLANDESTINE: LV de la Resistencia. Tune-in with Latin music, possible vocal march music at 1130. Audio was very weak during canned ID to live announcer's segment. Musical bridge to announcer's talk and instrumental music. Strong signal but modulation low with slight drift. Still audible at tune-out. (Valko, PA/HCDX/Cumbre)

1758 UTC on 11402

ICELAND: Rikisvarpid. Icelandic talk and text from two announcers. Music voice-overs presuming this was an upcoming newscast promotional. Newscast noted with S2-S5 on USB, audio was fair. (Liangas, GRC/ODXA)

1815 UTC on 13640

MADAGASCAR: Radio Canada Int'l. *Canada Today*-Quebec premier Lucien Bouchard steps down. Radio Netherlands **Madagascar relay** 11655 at 1815. *Things Mechanical* featuring clock and watch makers. (Fraser, MA)

1823 UTC on 4949.99

ANGOLA: Radio Nacional de Angola. Station ID into Portuguese programming. Musical bridge followed by announcer's chat and mentions of Luanda. SINPO=24333. (Veldhuis, NLD/HCDX)

1830 UTC on 13640

ASCENSION ISLANDS: RTE. Report and interview on a controversy over destroyed medical records, // 21630. (Fraser, MA)

1900 UTC on 11990

KUWAIT: Radio Kuwait. Program feature on Ramadan and its concepts, followed by segment of social programs that give medical services to patients with chronic illnesses. (Burgess, MA)

2007 UTC on 2310

AUSTRALIA: VL8A Alice Springs. Weather reports followed by Aussie country & western music. Morning greetings from announcer. SINPO=24333. (Veldhuis, NLD/HCDX) Aussie **VNG Llandilo** 16000, 0723-0731. Time pips and voice segments each minute. Complete voice ID at 0730. (Daniel Canonica, Muggio, Switzerland) **Radio Australia** 9580, 1100. Fair audio for Asia-Pacific segment. (Boynton, MA)

2046 UTC on 4976

UGANDA: Radio Uganda. Pop music and talk in indigenous language. National anthem at 2059, prompt 2100*. Signal poor with deep fading. (Chamber, NY/ODXA)

2048 UTC on 4770

NIGERIA: Voice of Nigeria. Announcer's talk to English newscast at 2100. Station ID with mentions of "Kaduna", followed by a science and technology program. (Chambers, NY/ODXA)

2231 UTC on 4785

BRAZIL: Radio Caiari. Tentative logging for Portuguese religious programming. Phone number quote, no ID, signal very low with SIO=121. Tentative logging on Brazil's **Radio Aquidauna** 4795, 2340-0010. Very poor signal quality, too low to discern ID. (Canonica, SU1)

2310 UTC on 9575

MOROCCO: Radio Medi Un. Arabic news covering Middle Eastern topics. Fanfare briefs into martial and regional popular music. Signal strong but noisy, fair quality to good. (Chambers, NY/ODXA) **RTV Marocaine** 15345, 1636-1700+, Arabic music to mentions of "Maroc". French ID at 1700. (Frodge, MI)

2348 UTC on 7120

ITALY: IRRS. Announcer's address and FAX quote, into live version of *Somebody to Love* by Queen. Full ID announcement by man at 2356 including mention of use of omnidirectional north beam with reduced carrier SSB at 10kW PEP. Address, FAX and phone number repeated, signal fair but heavy CW interference from 7125 Guinea. (Valko, PA/HCDX/Cumbre)

SI(NP)O = strength, interference, (noise, propagation), overall

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.

Veri Signers: are they worth the trouble ?

Let's face it; every QSL collector has his own method of achieving the ultimate goal, nabbing a verification from a radio station. Most collectors will gladly boast of their results in the hobby clubs and magazines, and rightly so; while others consider their windfall a *trade secret*, one to be shared only with the elite.

During a recent phone call with a well known DXer and friend, I was queried on my opinion of the use of addressing reception reports to a specified individual, in particular veri signers. Considering his hobby status, I was perplexed at his question, as well as the revelation that he considers their use, "not worth the trouble."

A *veri signer* is the person that signs the verification on the card or letter. Usually a specific person is designated to answer reception reports, or sometimes the signer may be nonadministrative staff who answer the mail.

Generally, I recommend addressing letters to a veri signer, especially if it is one that has been reported regularly within the hobby.

However, if the veri signer's response has taken over a year, or if it was addressed to an announcer or secretary, I would agree with my DX friend. He's absolutely right. Staff personnel change, and unless you're dealing with the QSL Manager or the Chief Engineer of an AM station, a follow up report may be in your future.

My friend continued, "In several known instances, the secretary or announcer would not answer mail unless instructed by the manager, who incidentally was conspicuously absent most of the time." He might have a point; I suggested that in such cases an alternative could be to address your letter to a particular program or language service. Obviously, broadcasters are interested in their listener's opinions on programming, and addressing a report to a particular one should interest them.

Whether you opt to address your report to a veri signer is a DXer's prerogative. What's your opinion...is it worth the trouble?

CHINA

Radio China Int'l, 9690 kHz. Full data *Great Wall* scenery card in signed. Received in 30 days for an English report. Station address: 16A Shijingshan Street, Beijing 10040, China. (David Weronka, Benson, NC)

INDONESIA

RRI-Biak, 6154 kHz. Partial data letter signed by Butje Latuperissa-Kepala Seksi Siaran. Received in 19 days for an Indonesian report and one U.S. dollar. Station address: Kotak Pos. 505, Biak, Irian Jaya, Indonesia. (Yamada, Japan/Cumbre DX)

RRI-Jayapura, 6069.8 kHz. No data English letter signed by Hartono-Bidang Teknik. Received in 184 days for an Indonesian report and one U.S. dollar. Station address: Kotak Pos 1077, Jayapura 99222, Irian Jaya, Indonesia. (Yamada, Japan/Cumbre DX)

RRI-Sorong, 4874.5 kHz. No data English letter signed by Muchtar Yushaputra-SH.BA, Head of Station. Received in two months for an Indonesian report and one IRC. Station address: Kotak Pos 146, Sorong 98414, Irian Jaya, Indonesia. (Richard Lam, Singapore/Cumbe DX)

MEDIUM WAVE

88 Country, 1593 kHz AM. Full data letter signed by Honest John Peterson-Chief Engineer/General manager. Received in 17 days for a cassette taped program. Station address: P.O. Box 1603, Christchurch, New Zealand. QSL # 104 for New Zealand! (Patrick Martin, Seaside, OR)

KEX, 1190 kHz AM. Date/frequency verification letter signed by Brooks Burford-Newscaster, plus four souvenir key chains.

Received in 15 days for an AM report and US mint stamp (returned with reply). Station address: 4949 S.W. Macadam Ave., Portland, OR 97201 (Mickey Delmage, Sherwood Park, Alberta, Canada)

KIFO, 1380 kHz AM. Full data QSL letter unsigned, plus program schedule. Received in 45 days for an English AM report. Station address: 738 Kahwka St., Honolulu, HI 96814-3726. (Martin, OR)

KUYL, 1280 kHz AM. Full data verification on station letterhead, signed by Marty Lanser-Assst. Program Director. Received in 47 days for an AM report. Station address: Clear Channel Comm., 3600 Sisk Rd., Modesto, CA 95356 USA. (Martin, OR)

NEW ZEALAND

Radio New Zealand Int'l, 15175 kHz. Full data scenery card verified by Director, plus program schedule. Received in 35 days for an English report. Station address: P.O. Box 123, Wellington, New Zealand. (Weronka, NC)

PAPUA NEW GUINEA

Radio Bougainville, 3325 kHz. Full data prepared QSL card stamped and signed with illegible signature. Received in two months for an English report and one U.S. dollar. Transmitter power listed as 5kW on card. Station address: P.O. Box 35, Buku, North Solomon Province, Papua New Guinea. (George Maroti, NY/Cumbre DX)

Radio Madang, 3260 kHz. Partial data letter signed by George Gedabing-Prov. Program Manager. Received in three months for a cassette tape of programming and an SASE (returned). Station address: P.O. 2138, Madang, Papua New Guinea. (Greg Myers, VA/Cumbre DX)

PIRATE

Ground Zero Radio, 6955 kHz USB. Full data atomic bomb explosion/mushroom cloud photo, signed by Texas Pete, plus advertising for *Hobby Broadcasting* magazine. Received in 105 days for an English email pirate report. Email address: <gzrsw@usa.net>. Response received from pirate maildrop; P.O. Box 109, Blue Ridge Summit, PA 17214 (Bill Wilkins, Springfield, MO)

Indira Calling, 6955 kHz USB. Full data *Indian Musical Instruments* sheet signed by Vijay Nehru, plus map of Rhode Island showing Indian city names. Received in 103 days for an English pirate report and three U.S. mint stamps. Pirate maildrop: P.O. Box 28413, Providence, RI 02908. (Wilkins, MO)

KIPM-Illuminati Prima Materia, 6950 kHz USB. Full data 8 x 11 QSL, plus a three page history/description of KIPM with previous show titles. Received in 29 days for an English pirate report and three U.S. mint stamps. Pirate maildrop: P.O. Box 24, Lula, GA 30554. (Kraig Krist, Annandale, VA)

SINGAPORE

RTE/Radio Telefis Eireann relay, 11740 kHz. Full data QSL card unsigned. Received in ten days for an email report to Julie Hayde <haydej@rte.ie>. Station address: Dublin 4, Ireland. (Krist, VA)

UNITED STATES

USAF Reserve 403rd Air Force Reserve Wing, 53rd Weather Reconnaissance Squadron, 8846, 11342 kHz USB. Partial data USAFAFRES picture postcard, signed by Maj. Fitz (TEAL 66). Received in 37 days for an English report. Station address: USAFRES 53rd WRS, 403rd Wing, 701 Fisher St., Keesler AFB, MS 39534-2572 USA. (Scott Medlin, Cleveland, TN)

AFTERNOON DELIGHTS

Back in January, we suggested that break-fast time listening represented a sort of second prime time for the shortwave bands. Since then, a few readers have pointed out (and correctly so) that the afternoons “ain’t too shabby” either!

When it’s afternoon in North America, it’s evening prime time on the other side of the Atlantic. Several stations targeting western Europe also put excellent signals into North America at that time. In fact, some stations – such as *Radio Tirana* and *Radio Romania International* – actually are easier to hear via their broadcasts to Europe, than during our evenings when they are ostensibly *trying* to broadcast to us. Other stations – like *Radio Polonia* and *All India Radio* – which have no transmissions directed specifically to North America, can be heard best during our afternoons as well.

All India Radio

Given the number of Indian expatriates living in the USA and Canada, and the fact that India owns some of the most powerful shortwave transmitters on earth, it’s hard to understand why *All India Radio (AIR)* does not broadcast to North America. Nonetheless, those 500 kW transmitters often put a *hefty* signal into at least the eastern half of this continent from 1745-2230, even though *AIR’s General Overseas Service* is targeting the UK and Western Europe. 7410 kHz and 11620 kHz have been good performers over the past few months, especially as it gets later. However, since April begins the A01 (spring) seasonal frequency turnover period, you may need to consult *MT’s Shortwave Guide* for an update.

For North Americans, the programming can only be described as exotic. The music, the subcontinental English accent and the focus on south Asia are largely unfamiliar to us. While the AIR schedule is dominated by music – everything from film tunes, which are wildly popular (Indians are some of the most avid cinema-goers in the world) to Karnatak instrumental – there are also ample newscasts, commentaries and magazine shows on topics like development, culture, science, literature and film.

The audio can be “muddy” at times due to poor modulation. However, this problem does not mar the entire schedule, as can be the case with *Radio Cairo*. So sticking with the station does yield a pleasant and interesting listening experience for the most part.

AIR Program Schedule (1745-2230)

1745 M Light Music, T Karnatak Instrumental Music, W Folk Songs, H-S Devotional Music; 1800 D News; 1810 D Commentary; 1815 W Instrumental Music–Old Masters, H-T Hindustani

Classical Vocal Music; 1830 S Sports Round-up(1st)/Features(2nd)/Film Story(3rd)/Discussion(4th), M Faithfully Yours, T Cultural Talk, W Book Review(1st)/Window on Science(2nd/4th)/Times and Lives(3rd), H General Talk, F Focus(1st)/Horizon (2nd/4th)/Music (3rd), A For Youth(1st)/Indian Classics(2nd)/Archives(3rd)/Quiz Time(4th); 1840 M DXers’ Corner(2nd/4th), T Film Songs of Yesteryears, W Hits from Films, H Light Karnatak Music, A Light Instrumental Music; 1850 M Film Songs, F Light Music; 1900 D News; 1905 D Indian Press Review; 1910 S Women’s World, MWF Radio Newsreel, T Of Persons, Places & Things(1st/3rd)/Our Guest(2nd/4th), H Panorama of Progress, A Mainly for Tourists(1st/3rd)/Indian Cinema(2nd)/On the Export Front(4th); 1920 SMWF Film Songs, T Light Classical Music, H Light Instrumental Music, A Karnatak Classical Music; 1930 D Commentary; 1935 SHF Indian Film Songs, M Karnatak Vocal Music, T Folk Songs, WA Light Music; 1945 D Talk and Music Programs in Hindi; 2045 D Indian Press Review; 2050 ST Instrumental Music, MF Folk Songs, W Light Music, H Classical Vocal Music, A Regional Devotional Music; 2100 D News; 2105 D Commentary; 2111 S Regional Film Songs, MA Classical Vocal Music, T Karnatak Vocal Music, WH Instrumental Music, F Orchestral Music; 2120 S Sports Round-up(1st)/Features(2nd)/Film Story(3rd)/Discussion(4th), M Faithfully Yours, T Cultural Talk, W Radio Newsreel, H Panorama of Progress, F Focus(1st)/Horizon(2nd/4th)/Music (3rd), A For Youth(1st)/Indian Classics(2nd)/Archives(3rd)/Quiz Time(4th); 2130 M DXers’ Corner(2nd/4th), TW Film Songs, H Classical Half Hour, A Old Film Songs; 2140 F Film Songs; 2145 M Film Songs; 2150 S Karnatak Vocal Music; 2200 D News; 2210 D Commentary; 2215 S Women’s World, MF Radio Newsreel, T Of Persons, Places & Things(1st/3rd)/Our Guest(2nd/4th), W B o o k Review(1st)/Window on Science(2nd/4th)/Times & Lives(3rd), H General Talk, A Mainly for Tourists(1st/3rd)/Indian Cinema(2nd)/On the Export Front(4th); 2225 D Film Tune.

Radio Polonia

Poland, though closer to us geographically, is much harder to hear on shortwave than *AIR*. That’s too bad because the “External Service of Polish Radio Warsaw” (*PRW*) is one of the better international services. Here, again, it seems curious that Poland does not make more of an effort toward this side of the Atlantic given the large Polish community residing here.

It is worth your effort to try and tune in. Now that we are in the A01 season, the afternoon broadcast (evening to western Europe) runs one hour and starts at 1930. Higher frequencies propagate better this time of year, so 9525 kHz is probably your only chance.

Too frustrating an experience? *Radio Polonia*

also netcasts on-demand from <<http://www.wrn.org/on-demand>> and uses *WRN North America* to broadcast via satellite and over the Internet at 0300-0330 and 2030-2100. (Further details also from <<http://www.radio.com.pl/polonia/>>.)

Radio Polonia

Program Schedule (1930-2030)

1930 S News, M-F News from Poland, A Europe East; 1935 S Panorama; 1950 M Cookery Corner, T Letter from Poland, W Day in the Life, H Focus, F Business Week; 2000 S Request Concert, M Best of Polish Radio, T Multimedia Show, W Discovering Chopin, H Soundcheck, F Postbag, A The Weeklies; 2005 A Chart Show.

The West Africans

Many who wax rhapsodic about late afternoon North American listening do so because of the Africans. Since it’s after dark in west Africa, several of that continent’s tropical band (60 meters – 4700 to 5100 kHz) domestic stations sometimes propagate to North America, especially to eastern portions and especially during our winter. Vibrant music is sought from places like Nigeria (4770 – also 7255 kHz), Mali (4783 and 4835 kHz), Senegal (4890 kHz), Ghana (4915 kHz) and Togo (5047 kHz).

A very popular station heard year-round because of its rare (for Africa) 250 kW transmitters is *Afrique Numero Un*, which broadcasts from Gabon. The reason for its popularity rests with the cornucopia of African popular music it broadcasts daily. The lively DJ introductions and banter in French (some English slips in now and then) enhance the presentation. *Kilimandjaro*, a weekday hit parade program now almost legendary in some quarters, goes out daily for two hours. But there are many other fine music programs, such as *Jazz Anthologie*, *Academie de la Musique Africaine*, *Reggafrica* and *Africa Dance*.

Afrique Numero Un broadcasts during our afternoons on 9580 kHz and from 1700 to 2100 on 15475 kHz. It is also streamed live over the Internet, details from <<http://www.africa1.com/>>.

Afrique Numero Un Selected Programs

1610 M-F Kilimandjaro, A Academie de la Musique Africaine; 1810 M-F Africa Song (1 hr.); 1910 A Reggafrica; 2010 A Africa Dance (part 1); 2130 M-F Jazz Anthologie (90 min.), A Africa Dance (part 2).

Remember, times are in UTC, day abbreviations are as used in *MT’s Shortwave Guide*, and programs are always subject to change. Next month, by popular demand, a DX programs list. Until May, good listening!



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 Daylight Savings) 4, 5, 6, or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

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

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on 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 ⑥ 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.

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.

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PROGRAM HIGHLIGHTS

JOHN FIGLIOZZI

Time Change

By the first weekend in April, all local seasonal time changes will have been implemented. This bi-annual event effects changes to many, but not all, international broadcasting schedules. Since few stations give advance indications as to whether and how their schedules will change, we are forced – also due to the exigencies of magazine deadlines – to guess station intentions based on their past behavior. This we have done and hope what is rendered in these pages is an accurate rendition of the results of this spring's exercise in time travel.

No more Waveguide?

Richard Lambley, the host of what has been the BBC World Service's monthly report on international broadcasting, announced at the close of the February installment that March's program was to be the last in the series. As of the deadline date of this month's magazine, there is no other indication of this; nor has there been any announcement of a replacement. March 24 at 0430 was your last chance to hear this program on the Americas stream, although it may be archived as an Internet audio file for a time after that air date.

Dispatches

The *CBC*, seeking to recapture some of the spirit its reporting once had, introduced this program in January hosted by its most experienced foreign correspondent, Rick Mac Inness-Rae. *Dispatches* is also intended to provide a Canadian perspective to international affairs and events. It airs on *Radio Canada International (RCI)* each Wednesday at 2330 UT.

Schedule Changes at Radio Australia

RA, in conjunction with its introduction of new frequencies for Asia from off-shore transmitters, has adjusted its English Service program schedule to provide its flagship programs to its newly shortwave-accessible Asian audience. Most of these changes are centered in the 0000 to 0500 UT period and are fully reflected in this month's listings.

New VOR Programs

The *Voice of Russia* has introduced some new programs, notably *The 20th Century: Footprints in History*, *Musical Portraits of the 20th Century* and *Music Around Us*. Check the listings for air times.



FREQUENCIES

0500	0505	USA, WWCR Nashville TN	2390am	5070am	5935am	0500	0600	vl	Nigeria, Radio/Ibadan	6050do					
0500	0505	sm	USA, WWCR Nashville TN	3210am		0500	0600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
0500	0505	twhfa	USA, WWCR Nashville TN	3215am		0500	0600	vl	Nigeria, Radio/Lagos	3326do	4990do				
0500	0530		Australia, Christian Voice	9865va	15185va	17645va	21680va	0500	0600	vl	Nigeria, Voice of	7255af	15120af		
0500	0530		Netherlands, Radio	6165na	9590na			0500	0600	vl	Papua New Guinea, NBC	9675do	11880do		
0500	0530		S Africa, Adventist World Radio	5960af	6015af			0500	0600	vl	Russia, Voice of Russia WS	15460au	15470au	15525au	17570au
0500	0530		S Africa, Channel Africa	15215af				0500	0600	mtwhfs	S Africa, Trans World Radio	17655au	21790au		
0500	0530		Switzerland, Swiss R International	9655eu				0500	0600	vl	Singapore R Corp of Singapore	7200as			
0500	0530		Uganda, Radio	4976do	5026do			0500	0600	vl	Solomon Islands, SIBC	6150do	9545do		
0500	0530		Vatican City, Vatican Radio	9660af	11625af	15570af		0500	0600	vl	Spain, R Exterior Espana	5020do			
0500	0530	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			0500	0600	vl	Sri Lanka, Sri Lanka BC Corp	6055na			
0500	0545		Germany, Deutsche Welle	5960na	6120na	9670na	11795na	0500	0600	vl	Swaziland, Trans World Radio	6130do			
0500	0556		China China Radio International	9560na				0500	0600	vl	UK, BBC World Service	6035af	7200af	9500af	
0500	0559		Canada, R Canada International	9760af	11850af	11905me		0500	0600	vl		5975na	6005af	6175am	6190af
0500	0600		Anguilla, Caribbean Beacon	6090am							6195eu	7160af	9410eu	9740as	
0500	0600	vl	Australia, ABC/Alice Springs	4835do							11760me	11765af	11940af	11955pa	
0500	0600	vl	Australia, ABC/Katherine	5025do							12095eu	15280as	15360as	15420as	
0500	0600	vl	Australia, ABC/Tennant Creek	4910do							15575me	17640af	17760as	17790as	
0500	0600		Australia, Radio	9660pa	12080pa	15240as	15515va	0500	0600		USA, Armed Forces Radio	21660as			
				17580va	21725va						4278va	4319va	4993va	5765va	
				17750as							6350va	6458va	6847va	10320va	
0500	0600	as	Australia, Radio	3356do	4820do	7255do					10940va	12579va	12689va	13362va	
0500	0600	vl	Botswana, Radio	4850do							16847va				
0500	0600	vl	Cameroon, RTV/Yaounde	9625do							5755va				
0500	0600		Canada, CBC Northern Service	6070do							0500	0600	USA, KAJI Dallas TX	7510na	
0500	0600		Canada, CFRX Toronto ON	6030do							0500	0600	USA, KTVN Salt Lake City UT	9975am	
0500	0600		Canada, CFVP Calgary AB	6130do							0500	0600	USA, KVOH Los Angeles CA	11565pa	
0500	0600		Canada, CHNX Halifax, NS	6160do							0500	0600	USA, KWHR Naalehu HI	5970af	
0500	0600		Canada, CKZN St John's NF	6160do							0500	0600	USA, Voice of America	6035af	
0500	0600		Canada, CKZU Vancouver BC	6160do							0500	0600		6080af	
0500	0600		Costa Rica, R for Peace Intl	7450va	15048va						0500	0600		6035af	
0500	0600		Costa Rica, University Network	5920af	6970va	7480va	15048va				0500	0600		9700af	
0500	0600		Cuba, Radio Havana	9550na	9820na	9830na					0500	0600		9775af	
0500	0600		Ecuador, HCJB	9745na	11840na	21455usb					0500	0600		12080af	
0500	0600	a/monthly	Finland, Scandv Weekend Radio	11690va	11720va						0500	0600		15205as	
0500	0600		Germany, Deutsche Welle	6140eu	13685af						0500	0600		15205as	
0500	0600		Germany, Unt Methodist Church	3289do	5949do						0500	0600		9330na	
0500	0600		Guyana, Voice of	5975eu	6110na	7230eu	11715as				0500	0600		7425na	
0500	0600		Japan, Radio	11760as	15150as						0500	0600		7435af	
				4935do							0500	0600		7315sa	
0500	0600		Kuwait, Radio	15110va							0500	0600		7490va	
0500	0600	vl	Lesotho, Radio	4800do							0500	0600		7555va	
0500	0600	vl	Liberia, R Liberia International	5100do							0500	0600		7385am	
0500	0600	vl	Liberia, Voice of Hope	6280af							0500	0600		7353eu	
0500	0600	vl	Malawi, Malawi BC Corp	3380do	5995do						0500	0600		9370na	
0500	0600		Malaysia, Radio	7295do							0500	0600		3270va	
0500	0600		Malaysia, RTM Sarawak	7160do							0500	0600		5085am	
0500	0600		Malaysia, Voice of Islam	6175as	9750as	15295as					0500	0600		5985na	
0500	0600		Myanmar, Radio	9730do							0500	0600		9355eu	
0500	0600		Namibia, Namibian BC Corp	3270af	3289af						0500	0600		4960do	
0500	0600		New Zealand, R New Zealand Int	17675pa							0500	0600		7260do	
0500	0600		New Zealand, ZLXA	3935do	7290do						0500	0600		6065do	
0500	0600	vl	Nigeria, Radio/Enugu	6025do							0500	0600		6165do	
											0502	0600		9500af	
											0505	0600		2390am	
											0515	0525		6055do	
											0525	0600	vl	3366do	
											0530	0600	vl	4915do	
											0530	0600	vl	3985va	
											0530	0600	vl	12015eu	
											0530	0600	vl	13675au	
											0530	0600	smtwhf	15435au	
											0530	0600	vl	21700au	
											0530	0600	vl	17885af	
											0530	0600	vl	5975do	
														6045do	

SELECTED PROGRAMS

BBC World Service (am)

0500 M The World Today, T-S News; 0505 S Wright Around the World (musical variety), T Meridian-Masterpiece, W Meridian-Ideas, H Meridian-Screen, F Meridian-Music, A Meridian-Writing; 0530 M Play of the Week (radio theatre), T Panel game or Quiz, W Music Mix, H UK Top Twenty, F Omnibus (documentary), A World of Music.

Channel Africa

0500 S Network Africa (week in review), M-F Dateline Africa (news magazine), A Channel Africa Sport.

China Radio International

0500 D News; 0510 S Report on Developing Countries, M-F Current Affairs, A Global Review; 0520 S In the Spotlight (cultural magazine), A Listeners' Garden; 0530 M People in the Know (China's leading citizens), T Sports World, W China Horizons (business), H Voices from Other Lands, F Life in China.

Deutsche Welle

0500 D News; 0505 S Talking Point (journalists), M Religion & Society, T-A Newslink (European current affairs); 0515 S Marks & Markets, M COOL! (youth magazine); 0530 T Insight (international affairs), W Man & Environment, H Living in Germany, F Spotlight on Sport, A German by Radio.

HCJB, Ecuador

0500 S Ham Radio Today, M Sunday Nite, T Let My People Think, W The Book & the Spade (archaeology), H Adventures in Odyssey (Christian stories for children), F Inspirational Classics (liturgical music), A Walkin' in the Sunshine (country music); 0515 W Words for Women; 0530 S Inside HCJB, T-A A New Beginning; 0556 T-A A Slice of Infinity.

Radio Australia

0500 D News; 0505 S/A Pacific Focus (S business, A sport); 0510 M-F Pacific Beat (Pacific islands magazine with regional sports report @ 0530); 0530 S Fine Music Australia (classical), A Lingua Franca (about language); 0545 A Short Story. [Special service: 0505 S/A Grandstand (live sports action) on 9660, 12080, 17580, 17715, 17750, 21725 kHz. only.]

Radio Habana Cuba

0500 M Top Tens, T-S International News; 0510 T-S National News; 0515 T-S Viewpoint; 0530 M The Jazz Place, T-S News Bulletin; 0535 T-A Time Out (sports); 0540 S/W DXers Unlimited, M/F Caribbean Outlook, H Mailbag Show, A Weekly Review.

Radio Japan

0500 D News; 0510 S Roundup Asia (regional magazine), A Hello from Tokyo (listener contact); 0515 M-F 44 Minutes (feature magazine).

Radio Netherlands

0500 S Sound Fountain (soundscapes), M Dutch Horizons, T Research File (science), W Music 52-15 (international music), H Documentary, F Encore (best of RN), A A Good Life (global development).

Radio New Zealand International

0500 D RNZ News; 0505 S Whenua! (Maori culture), M-F Checkpoint (comprehensive news), A Tagata o te Moana (Pacific culture).

Spanish Foreign Radio

0500 S Visitors' Book, M Window on Spain, T-A News; 0515 S American Chronicles, M Entreemes (food/tourism); 0529 M Music series; T-A Spanish Pop Music; 0532 S Spain in the American West; T-A Press Review; 0535 T Entertainment in Spain, W Kaleidoscope (life in Spain), H As Others See Us, F Africa Today, A Radio Club (letters); 0547 S Radio Waves, M Radio Club (repeat), T-A Spanish Language Course.

Voice of Nigeria

0500 S Reflections, M-F Wave Train (music), A African Safari (music); 0505 S Link-Up (music requests); 0530 S/A News, M-F VON Scope (news magazine).

WBCQ, Maine

0500 S Radio Timtron Worldwide.

WHRI, Indiana

5745 kHz.: 0500 A DXing with Cumbre; 0530 A World Harvest Country Style. 7315 kHz.: 0500 M-F Music (Christian contemporary and gospel), A DXing with Cumbre. 7435 kHz.: 0500 A Joe 2 K.

WWCR, Tennessee

3210 kHz.: 0500 M World of Radio; 0505 A Rock the Universe (Christian rock music); 0530 M Communications World. 5070 kHz.: 0500 T Ask WWCR (letters).



FREQUENCIES

1400 1405	Vatican City, Vatican Radio	15235au	17515au	1400 1500 vl	Nigeria, Radio/Lagos	4990do	7285do		
1400 1429	Czech Rep, Radio Prague Intl	21745va		1400 1500	Oman, Radio Sultanate of	15140va			
1400 1430	Jordan, Radio	11690ue		1400 1500	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as
1400 1430	Mexico, R Mexico International	9705am	11770am	1400 1500	Russia, Voice of Russia WS	7180na	7315as	9800as	9875as
1400 1430	Thailand, Radio	9530as				11500as			
1400 1430 s	USA, Voice of America	18275va		1400 1500	Sierra Leone, Sierra Leone BS	5980do			
1400 1455 as	S Africa, Channel Africa	11720af	17780af	1400 1500	Singapore R Corp of Singapore	6150do			
1400 1456	China China Radio International	7180as	7405na	1400 1500	Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
		11765as	13685af			15425as			
1400 1500	Anguilla, Caribbean Beacon	11775am		1400 1500	Switzerland, Swiss R International	12010as	15185as		
1400 1500 vl	Australia, ABC/Alice Springs	2310do		1400 1500	Taiwan, R Taiwan International	15125as			
1400 1500 vl	Australia, ABC/Katherine	2485do		1400 1500	Uganda, Radio	4976do	5026do		
1400 1500 vl	Australia, ABC/Tennant Creek	2325do		1400 1500	UK, BBC World Service	5995as	6190af	6195as	9590na
1400 1500	Australia, Radio	5995as	6080pa			9740as	11940af	12095eu	15220na
		11660va				15310as	15485eu	15565eu	15575me
1400 1500 vl	Botswana, Radio	7255do	9600do			17640eu	17700as	17830af	17840am
1400 1500 vl	Cameroon, RTV/Yaounde	4850do	7255do			21470af	21660af		
1400 1500	Canada, CBC Northern Service	9625do		1400 1500 a	UK, Flat Earth Radio/Merlin	15665na	21455me	21515af	
1400 1500	Canada, CFRX Toronto ON	6070do		1400 1500 a	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				10940va	12579va	12689va	13362va
1400 1500	Canada, CKZU Vancouver BC	6160do				16847va			
1400 1500	Canada, R Canada International	9640na	13655na	1400 1500	USA, KAJI Dallas TX	13815va			
1400 1500	Costa Rica, R for Peace Intl	15048va	21815usb	1400 1500	USA, KJES Vado NM	11715na			
1400 1500	Costa Rica, University Network	15048irr	21815usb	1400 1500	USA, KTBN Salt Lake City UT	7510na			
1400 1500	Ecuador, HCJB	12005am	15115va	1400 1500	USA, KWHR Naalehu HI	9930as	11565as		
1400 1500 as/vl	Egt. Guinea, Radio East Africa	15185af		1400 1500	USA, Voice of America	6110as	7125as	9645as	9760as
1400 1500 a/monthly	Finland, Scandy Weekend Radio	11690va	11720va			11705as	15205as	15395as	15425as
1400 1500	France, R France International	11610as	17620as	1400 1500	USA, WEWN Birmingham AL	11875va	15375na	15745na	
1400 1500	Germany, Deutsche Welle	6140eu	17680af	1400 1500	USA, WHRI Noblesville IN	6040na	15105na		
1400 1500	Germany, Overcomer Ministries	6110eu	13810af	1400 1500	USA, WJCR Upton KY	7490va	13595as		
1400 1500	Germany, Voice of Hope	15715me	17550as	1400 1500	USA, WRMI Miami FL	15725am			
1400 1500 vl	Ghana, Ghana BC Corp	4915do	6130do	1400 1500	USA, WTJC Newport NC	9370na			
1400 1500	Guyana, Voice of	5949do		1400 1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400 1500	India, All India Radio	9690as	11620as	1400 1500	USA, WWFV McCaysville GA	12172am			
1400 1500 vl/as	Italy, IRRS	7120va		1400 1500 mtwhf	USA, WWFV McCaysville GA	9400va			
1400 1500	Japan, Radio	7200as	9505as	1400 1500	USA, WYFR Okeechobee FL	11550as	11740na	11830na	17760na
1400 1500	Kenya, Kenya BC Corp	4935do	9845as	1400 1500	Zambia, Christian Voice	9865do			
1400 1500 vl	Lesotho, Radio	4800do		1400 1500 vl	Zambia, National BC Corp	6165do	6265do		
1400 1500 vl	Liberia, ELWA	4760do		1400 1500 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
1400 1500 vl	Liberia, R Liberia International	6100do		1415 1420	Nepal, Radio	5005as	7165as		
1400 1500	Liberia, Voice of Hope	11530af		1430 1500	Austria, R Austria International	6155eu	13730eu	17855au	
1400 1500	Malaysia, Radio	7295do		1430 1500	Guam, Adventist World Radio	15225as			
1400 1500	Malaysia, RTM Sarawak	7160do		1430 1500	Guam, Trans World Radio	15330as			
1400 1500	Namibia, Namibian BC Corp	7165af	7215af	1430 1500	Jordan, Radio	17680na			
1400 1500 occsnal	New Zealand, R New Zealand Int	6095pa		1430 1500	Malaysia, RTM Kota Kinabalu	5980do			
1400 1500	New Zealand, ZLXA	3935do		1430 1500	Myanmar, Radio	5985do			
1400 1500 vl	Nigeria, Radio/Enugu	6025do		1430 1500	Netherlands, Radio	12070as	12090as	15595as	
1400 1500 vl	Nigeria, Radio/Ibadan	6050do		1430 1500	Sweden, Radio	17505va	18960na		
1400 1500 vl	Nigeria, Radio/Kaduna	4770do	6090do	1445 1500 f	Seychelles, FEBA Radio	11600as			
			7275do						
			9570do						

SELECTED PROGRAMS

BBC World Service (am)

1400 D News; 1405 S Talking Point (global phone-in), M Meridian-Ideas, T Meridian-Screen, W Meridian-Music, H Meridian-Writing, F Meridian-Masterpiece, A Sportsworld (live action); 1430 M Music Mix, T UK Top Twenty, W/F Westway (drama serial), H World of Music; 1445 W UK Album Chart, F Music X-Press.

Channel Africa

1300 S/A Channel Africa Extra (cont'd from 1200).

China Radio Intenational

1400 D News; 1410 S Report on Developing Countries, M-F Current Affairs, A Global Review; 1420 S In the Spotlight (cultural magazine), A Listeners' Garden; 1430 M People in the Know (China's leading citizens), T Sports World, W China Horizons (business), H Voices from Other Lands, F Life in China.

HCJB, Ecuador

1400 S Back to God Hour, M-F Turning Point, A Kid's Corner; 1430 S Moody Presents, M-F The Living Way, A Rock Solid; 1456 M-F Beyond the Call.

Radio Australia

1400 D News; 1405 S Books and Writing, M-F The Planet (cont'd from 1315), A New Dimensions ("progressive" ideas).

Radio Canada International

1400 D News; 1405 S The Sunday Edition (cont'd from 1210), M-F This Morning (cont'd from 1210), A Basic Black (humor); 1430 F C'est La Vie (life in French Canada); 1445 M-H Out Front (experimental radio).

Radio Japan

1400 D News; 1410 S Roundup Asia (regional magazine), A Weekend Square (Japanese life); 1415 M-F 44 Minutes (feature magazine).

Voice of Russia

1400 D News; 1411 S Sunday Panorama, M-A News & Views; 1424 S Russia: People and Events; 1430 D News in Brief; 1432 S Kaleidoscope (Russian events), M Folk Box, T/H Music Around Us, W Jazz Show, F Moscow Yesterday & Today, A Timelines; 1446 T/H Music At Your Request.

WHRI, Indiana

6040 kHz.: 1400 M-F World Harvest Live; 1430 S/A D'xing with Cumbre. 15105 kHz.: 1405 M-F Music (Christian contemporary and gospel); 1430 S Music (Christian contemporary and gospel).





FREQUENCIES

1600 1610	Vatican City, Vatican Radio	9865au	13765au	15235au		1600 1700 vl	Nigeria, Radio/Lagos	3326do	4990do		
1600 1615	Pakistan, Radio	11570va	15100va	15725va	17720va	1600 1700 vl	Nigeria, Voice of	7255af	15120af		
1600 1625	Netherlands, Radio	12070as	12095as	15595as		1600 1700	Palau, KHBN/Voice of Hope	9955as	9965as	13840as	
1600 1627	Iran, VOIRI	7115as	9635as	11775na		1600 1700	Russia, Voice of Russia WS	7180me	9830me		
1600 1627	Vietnam, Voice of	7145eu	9730eu			1600 1700	S Africa, World Beacon	6145af			
1600 1630	Ecuador, HCJB	12005am	15115va	21455usb		1600 1700	Sierra Leone, Sierra Leone BS	5980do			
1600 1630 s	Germany, Universal Life	15105af				1600 1700	South Korea, R Korea Intl	5975	om	9515va	9870va
1600 1630	Guam, Trans World Radio	15330as				1600 1700	Sri Lanka, Sri Lanka BC Corp	4940do			
1600 1630	Jordan, Radio	17860na				1600 1700	Uganda, Radio	4976do	5026do		
1600 1630	S Africa, Channel Africa	9525af				1600 1700	UK, BBC World Service	3915as	5975as	6190af	6195as
1600 1630 vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			1600 1700	USA, KJES Vado NM	7160as	9410eu	9740eu	11940af
1600 1640	UAE, Radio Dubai	13675eu	15395eu	21605eu		1600 1700	USA, KTBN Salt Lake City UT	12095eu	15210af	15310as	15420af
1600 1645	Germany, Deutsche Welle	6170as	7225as	9735af	15380as	1600 1700	USA, VOA Special English	15565eu	17700as	17830af	16740am
		15455af	17810as	21780af		1600 1700	USA, Voice of America	21470af	21660af		
1600 1650 occsnal	New Zealand, R New Zealand Int	6095pa				1600 1700 mtwhfa	UK, BBC World Service	9515na			
1600 1656	China China Radio International	7190af	13650af			1600 1700 a	UK, Flat Earth Radio/Merlin	15525eu	15665na	21515af	
1600 1656	North Korea, Voice of Korea	3560va	6520va	9660va	9975va	1600 1700	UK, World Beacon	15455eu			
1600 1700	Algeria, R Algiers International	11715va	15160va			1600 1700	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1600 1700	Anguilla, Caribbean Beacon	11775am						6350va	6458va	6847va	10320va
1600 1700 vl	Australia, ABC/Alice Springs	2310do						10940va	12579va	12689va	13362va
1600 1700 vl	Australia, ABC/Katherine	2485do						16847va			
1600 1700 vl	Australia, ABC/Tennant Creek	2325do				1600 1700	USA, KAIJ Dallas TX	13815va			
1600 1700	Australia, Radio	5995va	6080pa	9580va	9655va	1600 1700	USA, KJES Vado NM	11715na			
		11650pa	11660va			1600 1700	USA, KTBN Salt Lake City UT	15590na			
1600 1700 vl	Botswana, Radio	3356do	4820do	7255do		1600 1700	USA, KWHR Naalehu HI	9930as			
1600 1700 vl	Cameroon, RTV/Yaounde	4850do				1600 1700	USA, VOA Special English	13600af	15445af	17895af	
1600 1700	Canada, CBC Northern Service	9625do				1600 1700	USA, Voice of America	6035af	6110as	7125as	9575as
1600 1700	Canada, CFRX Toronto ON	6070do						9645as	9760as	11920af	12040af
1600 1700	Canada, CFVP Calgary AB	6030do						13710af	15205as	15225af	15240af
1600 1700	Canada, CHNX Halifax, NS	6130do						15395as			
1600 1700	Canada, CKZN St John's NF	6160do				1600 1700	USA, WEWN Birmingham AL	11875na	13615na	15375na	15745na
1600 1700	Canada, CKZU Vancouver BC	6160do				1600 1700	USA, WHRA Greenbush ME	17650af			
1600 1700	Costa Rica, R for Peace Intl	15048va	21815usb			1600 1700	USA, WHRI Noblesville IN	13760na	15105na		
1600 1700	Costa Rica, University Network	15048va	21815usb			1600 1700	USA, WINB Red Lion PA	13570eu			
1600 1700	Ethiopia, Radio	7165af	9560af			1600 1700	USA, WJCR Upton KY	7490va	13595as		
1600 1700 a/monthly	Finland, Scandv Weekend Radio	11690va	11720va			1600 1700	USA, WRMI Miami FL	15725am			
1600 1700	France, R France International	11615af	11995af	12015af	15210af	1600 1700	USA, WSHB Cypress Crk SC	18910af			
		17850af				1600 1700	USA, WTJC Newport NC	9370na			
1600 1700	Germany, Deutsche Welle	6140eu				1600 1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600 1700 a	Germany, Good News World R	15105af				1600 1700	USA, WWFV McCaysville GA	12172am			
1600 1700	Germany, Overcomer Ministries	6110eu	13810af			1600 1700 mtwhf	USA, WWFV McCaysville GA	9400va			
1600 1700 vl	Ghana, Ghana BC Corp	4915do	6130do			1600 1700	USA, WYFR Okeechobee FL	11830na	15215na	17760na	18980eu
1600 1700	Guam, Adventist World Radio	11980as						21455eu	21525af		
1600 1700	Guyana, Voice of	5949do				1600 1700	Zambia, Christian Voice	4965do			
1600 1700	Israel, Kol Israel	11605va	17545va			1600 1700 vl	Zambia, National BC Corp	6165do	6265do		
1600 1700 vl/as	Italy, IRRS	7120va				1615 1630 as	UK, BBC World Service	11860af	21490af		
1600 1700	Kenya, Kenya BC Corp	4935do				1615 1630	Vatican City, Vatican Radio	4005eu	5883eu	7250eu	9645eu
1600 1700 vl	Lesotho, Radio	4800do						15595eu			
1600 1700 vl	Liberia, ELWA	4760do				1625 1640	Monaco, Trans World Radio	6145me			
1600 1700 vl	Liberia, R Liberia International	6100do				1630 1700	Egypt, Radio Cairo	15255af			
1600 1700	Liberia, Voice of Hope	11530af				1630 1700 s	Seychelles, FEBA Radio	11605as			
1600 1700 vl	Malawi, Malawi BC Corp	3380do				1630 1700	Slovakia, R Slovakia International	5915eu	6055eu	7345eu	
1600 1700	Malaysia, Radio	7295do				1630 1700	Somalia, Radio Galkayo	6985va			
1600 1700	Namibia, Namibian BC Corp	7165af	7215af			1630 1700 mtwhf	UK, Merlin Network One	12065as			
1600 1700	New Zealand, ZLXA	3935do				1630 1700 vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
1600 1700 vl	Nigeria, Radio/Enugu	6025do				1645 1700	Bangladesh, Bangla Betar	7184eu	7462eu	9550eu	15520eu
1600 1700 vl	Nigeria, Radio/Ibadan	6050do				1650 1700	New Zealand, R New Zealand Int	15120pa			
1600 1700 vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do						

SELECTED PROGRAMS

BBC World Service (am)

1600 S/A News, M-F Europe Today; 1605 S/A Sportsworld (live action); 1630 M-F World Business Report; 1645 M-F Sports Roundup.

HCJB, Ecuador

1600 S Message of Truth, M-F Renewing Your Mind, A Words of Hope.

Radio Australia

1600 D News; 1605 S The National Interest (Australian politics), M Margaret Throsby (interview and music), T The Comfort Zone (Australian homes/gardens/food), W Verbatim (oral histories), H Hindsight (Australian history), F AWAYE! (Aboriginal culture), A Melisma (cont'd. from 1505); 1630 W Earshot (Australian voices).

WHRI, Indiana

13760 kHz.: 1615 S Music (Christian contemporary and gospel).
15105 kHz.: 1600 A 20 The Countdown Magazine (Christian rock music charts); 1605 S-F Music (Christian contemporary and gospel).
17650 kHz.: 1600 A Music (Christian contemporary and gospel).

WWCR, Tennessee

12060 kHz.: 1630 A Keen on Jazz.
15685 kHz.: 1600 M-F World Wide Country Radio (country music).



YLE Radio Finland 1999



FREQUENCIES

2100	2110		Kenya, Kenya BC Corp	4935do					
2100	2127		Czech Rep, Radio Prague Intl	5930va	9430va				
2100	2130	vl	Australia, ABC/Alice Springs	2310do					
2100	2130	vl	Australia, ABC/Katherine	2485do					
2100	2130	vl	Australia, ABC/Tennant Creek	2325do					
2100	2130		Australia, Radio	7240pa	9500as	9580va	9660pa		
				11880va	12080pa	17715va	21740va		
2100	2130		China China Radio International	5965eu	9840eu	11735af	13640af		
2100	2130		Cuba, Radio Havana	13660eu					
2100	2130		Hungary, Radio Budapest	6025eu					
2100	2130		Mexico, R. Mexico International	9705am	11770am				
2100	2130		Turkey, Voice of	9525sa					
2100	2130	sa	UK, BBC World Service	5975ca	9690af	9765va	15135va		
2100	2145		Germany, Deutsche Welle	9615af	17560va	17835af			
				15410va	6574va	9335va			
2100	2156		North Korea, Voice of Korea	5955eu	7195eu	7215eu	9690eu		
2100	2156		Romania, R. Romania International	5995eu	7235eu	9770eu	9805eu		
2100	2159		Canada, R. Canada International	13650eu					
2100	2200		Angola, R. Nacional de Angola	3374va	4950va	7245va			
2100	2200		Anguilla, Caribbean Beacon	11775am					
2100	2200	vl	Botswana, Radio	3356do	4820do				
2100	2200		Bulgaria, Radio	7200eu	7500eu				
2100	2200	vl	Cameroon, RTV/Yaounde	4850do					
2100	2200		Canada, CBC Northern Service	9625do					
2100	2200		Canada, CFRX Toronto ON	6070do					
2100	2200		Canada, CFPV Calgary AB	6030do					
2100	2200		Canada, CHNX Halifax, NS	6130do					
2100	2200		Canada, CKZN St John's NF	6160do					
2100	2200		Canada, CKZU Vancouver BC	6160do					
2100	2200		Costa Rica, R. for Peace Intl	15048va	21815va				
2100	2200		Costa Rica, University Network	15048va	15065va	21815usb			
2100	2200		Ecuador, HCJB	17660eu					
2100	2200		Egypt, Radio Cairo	15375af					
2100	2200	mtwhf	Eqt Guinea, Radio Africa	15185af					
2100	2200	f/monthly	Finland, Scandv Weekend Radio	11690va	11720va				
2100	2200	vl	Ghana, Ghana BC Corp	3366do	4915do				
2100	2200		Hungary, Radio Budapest	3975eu					
2100	2200		India, All India Radio	7150au	7410eu	9650eu	9910au		
				9950eu	11620au	11715au			
2100	2200	vl	Italy, IRRS	3985va					
2100	2200		Japan, Radio	6115eu	6180eu	11830eu	11855af		
				17825na	21670pa				
2100	2200	vl	Lesotho, Radio	4800do					
2100	2200	vl	Liberia, ELWA	4760do					
2100	2200	vl	Liberia, R. Liberia International	5100do					
2100	2200	vl	Malawi, Malawi BC Corp	3380do					
2100	2200		Malaysia, Radio	7295do					
2100	2200		Namibia, Namibian BC Corp	3270af	3289af				
2100	2200		New Zealand, R. New Zealand Int	17675pa					
2100	2200		New Zealand, ZLXA	3935do					
2100	2200	vl	Nigeria, Radio/Enugu	6025do					
2100	2200	vl	Nigeria, Radio/Ibadan	6050do					
2100	2200	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
2100	2200	vl	Nigeria, Radio/Lagos	3326do	4990do				
2100	2200		Palau, KHBN/Voice of Hope	9985sa					
2100	2200	vl	Papua New Guinea, NBC	4890do					
2100	2200		Russia, World Beacon	7360eu					
2100	2200		S. Africa, World Beacon	3230af	11640af				
2100	2200		Sierra Leone, Sierra Leone BS	3316do					
2100	2200	vl	Solomon Islands, SIBC	5020do	9545do				
2100	2200		South Korea, R. Korea Intl	15575eu					
2100	2200	irreg	Sri Lanka, Sri Lanka BC Corp	4940do					
2100	2200	vl	Syria, Radio Damascus	12085eu	13610eu				
2100	2200		UK, BBC World Service	3255af	3915as	5965as	5975pa		
				6110as	6190af	6195va	9410eu		
				11835af	12095sa	15400af			
				9675af					
2100	2200		UK, World Beacon	5905va	9560va	11770va			
2100	2200		Ukraine, R. Ukraine International	4278va	4319va	4993va	5765va		
2100	2200		USA, Armed Forces Radio	6350va	6458va	6847va	10320va	10940va	
				12579va	12689va	13362va	16847va		
2100	2200		USA, KAU Dallas TX	13815va					
2100	2200		USA, KTBN Salt Lake City UT	15590na					
2100	2200		USA, KWHR Naalehu HI	17510as					
2100	2200		USA, Voice of America	6035af	6040me	6095as	7415af		
				9595as	9670as	9760me	11775pa	11870pa	
				11975af	13710af	15185pa	15240af	15580af	
				17725af	17735as	17820as			
				7415na					
2100	2200	a	USA, WBCQ Monticello ME	17495na					
2100	2200		USA, WBCQ Monticello ME	9975na	11875na	13615na	15375na		
2100	2200		USA, WEWN Birmingham AL	17650af					
2100	2200		USA, WHRA Greenbush ME	5745na	9495sa	13760na			
2100	2200		USA, WHRI Noblesville IN	13570eu					
2100	2200		USA, WJCR Upton KY	7490va	13595as				
2100	2200		USA, WMLK Bethel PA	15265eu					
2100	2200		USA, WRMI Miami FL	15725am					
2100	2200		USA, WSHB Cypress Crk SC	11550eu	15665af				
2100	2200		USA, WTJC Newport NC	9370na					
2100	2200		USA, WWCN Nashville TN	7435am	9475am	12160am	13845am		
2100	2200		USA, WWFV McCaysville GA	12172va					
2100	2200	mtwhf	USA, WWFV McCaysville GA	9320va					
2100	2200		USA, WYFR Okeechobee FL	7355eu	15565af	21525af			
2100	2200	vl	Vanuatu, Radio	3945do	4960do	7260do			
2100	2200		Zambia, Christian Voice	4965do					
2100	2200	vl	Zambia, National BC Corp	6165do	6265do				
2100	2200	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do				
2115	2130	mtwhf	UK, BBC Caribbean Report	5975ca	11675ca	15390ca			
2115	2200		Egypt, Radio Cairo	9990eu					
2120	2200	s	Greece, Voice of	9420au	15650au				
2130	200	f	UK, Wales Radio Intl/Merlin	6010eu					
2130	2145	hf	UK, BBC Calling Falklands	11680sa					

2130	2156		China, China Radio International	5965eu	9840eu				
2130	2200	vl	Australia, ABC/Alice Springs	4835do					
2130	2200	vl	Australia, ABC/Katherine	5025do					
2130	2200	vl	Australia, ABC/Tennant Creek	4910do					
2130	2200		Australia, Radio	7240pa	9660pa	11880va	12080pa		
				17715va	21740va				
2130	2200		Belgium, Radio Vlaanderen Intl	13660am					
2130	2200		Guam, Adventist World Radio	11960as	11980as				
2130	2200		Iran, VOIRI	9780va	11740va				
2130	2200		Uzbekistan, Radio Tashkent	9540eu					

2200

2200	2210	vl	Malawi, Malawi BC Corp	3380do					
2200	2210	vl	Zambia, National BC Corp	6165do	6265do				
2200	2220	s	Greece, Voice of	9420au	15650au				
2200	2225		Italy, RAI International	9675as	11900as	15240as			
2200	2227		Iran, VOIRI	9780va	11740va				
2200	2230		India, All India Radio	7150au	7410eu	9650eu	9910au		
				9950eu	11620au	11715au			
2200	2230	mtwhf	Mexico, R. Mexico International	9705am					
2200	2230	vl	Papua New Guinea, NBC	4890do					
2200	2230	mtwhf	South Korea, R. Korea Intl	3975eu					
			USA, Voice of America	6035af	7415af	11655af	11975af		
				13710af					
2200	2245		Egypt, Radio Cairo	9990eu					
2200	2245		USA, WYFR Okeechobee FL	7580eu	11740na	15565af	21525af		
2200	2256		China China Radio International	7170eu					
2200	2259		Canada, R. Canada International	11705as					
2200	2300		Anguilla, Caribbean Beacon	6090am					
2200	2300	vl	Australia, ABC/Alice Springs	4835do					
2200	2300	vl	Australia, ABC/Katherine	5025do					
2200	2300	vl	Australia, ABC/Tennant Creek	4910do					
2200	2300		Australia, Radio	7150au	7410eu	9650eu	9910au		
2200	2300	vl	Cameroon, RTV/Yaounde	4850do					
2200	2300		Canada, CBC Northern Service	9625do					
2200	2300		Canada, CFRX Toronto ON	6070do					
2200	2300		Canada, CFPV Calgary AB	6030do					
2200	2300		Canada, CHNX Halifax, NS	6130do					
2200	2300		Canada, CKZN St John's NF	6160do					
2200	2300		Canada, CKZU Vancouver BC	6160do					
2200	2300		Costa Rica, R. for Peace Intl	15048va	15065va	21815usb			
2200	2300		Costa Rica, University Network	15048va	15065va	21815usb			
2200	2300	mtwhf	Eqt Guinea, Radio Africa	15185af					
2200	2300	f/monthly	Finland, Scandv Weekend Radio	11690va	11720va				
2200	2300	vl	Ghana, Ghana BC Corp	3366do	4915do				
2200	2300	vl	Italy, IRRS	3985va					
2200	2300	vl	Liberia, R. Liberia International	5100do					
2200	2300		Malaysia, Radio	7295do					
2200	2300		Namibia, Namibian BC Corp	3270af	3289af				
2200	2300		New Zealand, R. New Zealand Int	17675pa					
2200	2300		New Zealand, ZLXA	3935do					
2200	2300	vl	Nigeria, Radio/Enugu	6025do					
2200	2300	vl	Nigeria, Radio/Ibadan	6050do					
2200	2300	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
2200	2300	vl	Nigeria, Radio/Lagos	3326do	4990do				
2200	2300	vl	Palau, KHBN/Voice of Hope	9955as	9960as	9985as			
2200	2300	vl	Sierra Leone, Sierra Leone BS	3316do					
2200	2300	vl	Solomon Islands, SIBC	5020do	9545do				
2200	2300	as	Spain, R. Exterior Espana	9595af	9680eu				
2200	2300	irreg	Sri Lanka, Sri Lanka BC Corp	4940do					
2200	2300		Taiwan, R. Taiwan International	5810eu	9355eu				
2200	2300		Turkey, Voice of	6020eu	9655na				

Satellite Service Guide



Robert Smathers
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All Frequencies MHz

GE Americom GE-2 - C-Band

85 degrees West longitude

1(V)	3720	Horse Racing (occ)
2(H)	3740	Occasional Video
3(V)	3760	RAI International (occ)/ Occasional Video
4(H)	3780	La Cadena de Milagro
5(V)	3800	NASA feeds (occ)
6(H)	3820	Occasional Video
7(V)	3840	Occasional Video
8(H)	3860	Data Transmissions
9(V)	3880	NASA TV
10(H)	3900	Data Transmissions
11(V)	3920	Occasional Video
12(H)	3940	Data Transmissions
13(V)	3960	Data Transmissions
3971.30	1178.70	81.30 NASA Space Shuttle Transmissions (missions only)
14(H)	3980	USIA Worldnet (digital)/Data Transmissions
15(V)	4000	Data Transmissions
16(H)	4020	Data Transmissions
17(V)	4040	Data Transmissions
18(H)	4060	Data Transmissions
19(V)	4080	Data Transmissions
20(H)	4100	Data Transmissions
21(V)	4120	Horse Racing (occ)
22(H)	4140	Horse Racing (occ)
23(V)	4160	Horse Racing (occ)
24(H)	4180	Horse Racing (occ)

GE Americom GE-2 - Ku-band

85 degrees West

1(V)	11720	Occasional Video
2(H)	11740	Occasional Video
3(V)	11760	Occasional Video
4(H)	11780	Occasional Video
5(V)	11800	Occasional Video
6(H)	11820	Occasional Video
7(V)	11840	Occasional Video
8(H)	11860	Occasional Video
9(V)	11880	Occasional Video
10(H)	11900	Occasional Video
11(V)	11920	CONUS Communications
12(H)	11940	Occasional Video
13(V)	11960	Occasional Video
14(H)	11980	Occasional Video
15(V)	12000	Occasional Video
16(H)	12020	Occasional Video
17(V)	12040	Occasional Video
18(H)	12060	Occasional Video
19(V)	12080	Occasional Video
20(H)	12100	Occasional Video
21(V)	12120	Occasional Video
22(H)	12140	Occasional Video
23(V)	12160	Occasional Video
24(H)	12180	Occasional Video

GE Americom GE-3 - C-band

87 degrees West longitude

1(H)	3720	Associated Press TV (digital)/Michigan Government TV (digital)
2(V)	3740	Data Transmissions
3(H)	3760	Data Transmissions
4(V)	3780	Data Transmissions
5(H)	3800	Univision (VC2+)
6(V)	3820	MSC/MSC Wisconsin (digital)/HTS(digital)
7(H)	3840	(none)
8(V)	3860	Data Transmissions
9(H)	3880	WPIX-TV - WB New York (VC2+)

10(V)	3900	(none)
11(H)	3920	CNN SI
12(V)	3940	Occasional Video
13(H)	3960	Occasional Video
14(V)	3980	Turner Classic Movies (VC2+)
15(H)	4000	KTLA-TV - WB Los Angeles (VC2+)
16(V)	4020	CNN fn (VC2+)
17(H)	4040	Christian Radio (digital)/Data Transmissions
18(V)	4060	Fox Movie Channel (VC2+)
19(H)	4080	Fox Sports Net
20(V)	4100	University Network - Dr. Gene Scott
21(H)	4120	CNN feeds (occ)
22(V)	4140	Data Transmissions
23(H)	4160	Data Transmissions
24(V)	4180	America One

GE Americom GE-3 - Ku-Band

87 degrees West longitude

1(H)	11720	Bloomberg TV (digital)/STARS of Faith (digital)/Data Transmissions
2(V)	11740	Data Transmissions
3(H)	11760	Data Transmissions
4(V)	11780	Data Transmissions
5(H)	11800	Data Transmissions
6(V)	11820	Occasional Video
7(H)	11840	Occasional Video
8(V)	11860	Data Transmissions
9(H)	11880	CNN Newsource (LEITCH)
10(V)	11900	National Technology University (digital)
11(H)	11920	Data Transmissions
12(V)	11940	Occasional Video
13(H)	11960	Occasional Video
14(V)	11980	Occasional Video
15(H)	12000	Occasional Video
16(V)	12020	Occasional Video
17(H)	12040	Occasional Video
18(V)	12060	Data Transmissions
19(H)	12080	PBS leased analog services (occ)
20(V)	12100	PBS (DC2)
21(H)	12120	PBS HDTV (digital)/PBS (digital)
22(V)	12140	Indiana Higher Education Telecommunication Service (digital)
23(H)	12160	PBS (DC2)/Annenberg-CPB Channel (DC2)
24(V)	12180	PBS (DC2)

Loral Orion Telstar 4 - C-Band

89 degrees West longitude

1(V)	3720	Gonzo X (VC2+)/ETC (DC2)
2(H)	3740	Data Transmissions
3(V)	3760	XXcite (VC2+)
4(H)	3780	Extasy (VC2+)
5(V)	3800	True Blue (VC2+)/TEN (DC2)/Pleasure (DC2)
6(H)	3820	Occasional Video
7(V)	3840	The Erotic Networks Promotional Channel
8(H)	3860	ABC feeds (occ)
9(V)	3880	Occasional Video
10(H)	3900	Occasional Video
11(V)	3920	Occasional Video
12(H)	3940	ABC feeds (occ)
13(V)	3960	CBS (DC2)
14(H)	3980	ABC HDTV (digital)/ABC feeds (occ)
15(V)	4000	SXTV Promotional Channel/

16(H)	4020	Bloomberg TV (digital) Eurotica (VC2+)/Cornerstone TV (digital)
17(V)	4040	Occasional Video
18(H)	4060	PBS C-band Schedule X
19(V)	4080	Occasional Video
20(H)	4100	Occasional Video
21(V)	4120	ABC - West (LEITCH)
22(H)	4140	ABC - East (LEITCH)
23(V)	4160	Occasional Video
24(H)	4180	Occasional Video

Loral Orion Telstar 4 - Ku-Band

89 degrees West longitude

T01(V)	11730	South Carolina Educational TV (DC2)
T02(H)	11743	Data Transmissions
T03(V)	11790	Microspace (digital)
T04(H)	11803	Data Transmissions
T05(V)	11850	Data Transmissions
T06(H)	11863	Georgia Public Television (DC2)
T07(V)	11910	Data Transmissions
T08(H)	11923	Data Transmissions
T09(V)	11971	Occasional Video
T10(H)	11984	Occasional Video
T11(V)	12033	ABC SNG (occ)
T12(H)	12046	Data Transmissions
T13(V)	12095	Data Transmissions
T14(H)	12108	Data Transmissions
T15(V)	12157	Muslim TV Ahmadiyya (digital)/DNX (digital)
T16(H)	12170	Occasional Video

The satellite arc listings will continue in sequence next month. Now, here is the loading report for a new satellite in the North American domestic arc:

Telesat Canada Anik F1 - C-Band

107.3 degrees West longitude

Transponders with an "S" have South American beams		
1A(H)	3720	(none)
S1A(H)	3720	
1B(V)	3740	Data Transmissions
2A(H)	3760	CBC (digital)
S2A(H)	3760	
2B(V)	3780	Telesat (digital)
3A(H)	3800	Data Transmissions
S3A(H)	3800	
3B(V)	3820	Occasional Video
4A(H)	3840	Occasional Video
S4A(H)	3840	
4B(V)	3860	Cancom (digital)
5A(H)	3880	Occasional Video
S5A(H)	3880	
5B(V)	3900	Cancom (digital)
6A(H)	3920	CBC French (digital)
S6A(H)	3920	
6B(V)	3940	Cancom (digital)
7A(H)	3960	CBC feeds (occ)
	3944.00	1206.00 54.00
		CBC Radio - Occasional feeds
	3944.50	1205.50 54.50
		CBC Radio - North
S7A(H)	3960	
7B(V)	3980	Cancom (digital)
8A(H)	4000	Data Transmissions
S8A(H)	4000	
8B(V)	4020	Occasional Video
9A(H)	4040	CBC feeds (occ)
	4024.00	1126.00 54.00

		CBC Radio - North
	4024.50	1125.50 54.50
		CBC Radio - North
S9A(H)	4040	
9B(V)	4060	Telesat (digital)
10A(H)	4080	Data Transmissions
S10A(H)	4080	
10B(V)	4100	CTV (digital)
11A(H)	4120	Occasional Video
S11A(H)	4120	
11B(V)	4140	Occasional Video
12A(H)	4160	CBC feeds (occ)
	4144.00	1005.50 54.50
		CBC Radio - CBC Radio One
S12A(H)	4160	
12B(V)	4180	Occasional Video

Telesat Canada Anik F1 - Ku-Band

107.3 degrees West

Transponders with an "S" have South American beams		
T1(V)	11714	Star Choice DBS
T2(V)	11744	Star Choice DBS
T3(V)	11775	Star Choice DBS
T4(V)	11807	Star Choice DBS
T5(V)	11836	Star Choice DBS
T6(V)	11867	Star Choice DBS
T7(V)	11880	Star Choice DBS
T8(V)	11897	Star Choice DBS
T9(V)	11928	Star Choice DBS
T10(V)	11959	Star Choice DBS
T11(V)	11990	Star Choice DBS
T12(V)	12020	Star Choice DBS
T13(V)	12051	Star Choice DBS
T14(V)	12080	Star Choice DBS
T15(V)	12140	Occasional Video
T16(V)	12172	Star Choice DBS
T17(H)	11725	Star Choice DBS
T17S(H)	11725	
T18(H)	11756	Star Choice DBS
T18S(H)	11756	
T19(H)	11786	Star Choice DBS
T19S(H)	11786	
T20(H)	11817	Star Choice DBS
T20S(H)	11817	
T21(H)	11850	Star Choice DBS
T21S(H)	11850	
T22(H)	11880	Star Choice DBS
T22S(H)	11880	
T23(H)	11910	CBC feeds (occ)
T23S(H)	11910	
T24(H)	11940	Star Choice DBS
T24S(H)	11940	
T25(H)	11971	Star Choice DBS
T25S(H)	11971	
T26(H)	12002	Star Choice DBS
T26S(H)	12002	
T27(H)	12033	Star Choice DBS
T27S(H)	12033	
T28(H)	12063	Star Choice DBS
T28S(H)	12063	
T29(H)	12094	Star Choice DBS
T29S(H)	12094	
T30(H)	12124	Occasional video
T30S(H)	12124	
T31(H)	12155	Star Choice DBS
T31S(H)	12155	
T32(H)	12180	Star Choice DBS
T32S(H)	12180	

See Universal Electronics ad on page 43 for satellite equipment.

No Pictures, Snowy Pictures & Gulf Pictures

January's weather satellite monitoring operations were a columnist's nightmare! Resurs unexpectedly stopped transmitting, then Meteor 2-21 stopped as well... only to resume some days later. I wanted to find someone at operational level in the Russian Control Centers who could explain what was going on, so I contacted Vitaly Ippolitov, an engineer at ScanEx, a private Russian firm that manufactures Russian satellite systems. I have previously exchanged e-mails with Vitaly, and he was happy to explain.

Resurs had indeed developed a fault. Many days later, transmissions resumed – finally breaking the streak of misfortune! The problems with APT from NOAA-15 and NOAA-16 were being actively investigated, but it coincided with periods of overlapping footprints – resulting in more satellites having automatic picture transmissions (APT) terminated. For several days, only NOAA-12 and NOAA-14 were transmitting APT!

How fortunate that despite problems with all APT constellations, the geostationary WXSATS – GOES-8 and GOES-10 for continental USA – remained in full operation.

A positive side to snowy pictures

I spent some time looking at the amounts of snow revealed in HRPT images from the operational NOAAs. One snowfall, and the television media was full of pictures of traffic at a stand-still! Al-

though we expect snowfalls to occur during winter, particularly in more northern latitudes, it seems to take very little to nearly paralyze neighborhoods.

A NASA satellite confirmed that this winter was snowier than usual. "Composite data from NASA's Terra satellite show that this winter brought more snow-cover in the early part of the season than average," said Dorothy Hall of NASA's Goddard Space Flight Center. Results from the Moderate Resolution Imaging Spectro-radiometer (MODIS) aboard Terra clearly observed more snow-cover in the Midwestern and Western United States in November and December. Complementing the snowfall were record cold temperatures for November and December 2000 throughout the United States, according to the National Oceanic and Atmospheric Administration (NOAA).

NOAA/NESDIS has been producing weekly snow maps of Northern Hemisphere land surfaces since 1966 using visible-band satellite imagery. Snow has such a high reflectivity compared to other surfaces on Earth, that snow-covered areas appear much brighter in satellite imagery than most other surface types. More than 40 percent of the Earth's land surface in the Northern Hemisphere can be covered with snow during the winter months.

The highly reflective nature of snow combined with its large surface cover make it an important factor in the Earth's radiation balance, which includes incoming solar energy and energy reflected back into space. NOAA satellites measure radiation in six bands that help to accurately determine snow coverage. According to the National Snow and Ice Data Center, snow may reflect up to 80 and 90 percent of incoming solar energy, whereas a surface without snow would only reflect 10-20 percent.

Many areas of the world rely on the snowmelt for irrigation and drinking water. In the western U.S, mountain snowpacks contribute up to 75 percent of all year-round surface water supplies. Therefore, it is necessary to monitor snowpacks closely throughout the winter and spring for assessment of water supply and flooding potential, and MODIS data will prove useful in this capacity.

Sample MODIS imagery is available at: <http://nsidc.org/NASA/MODIS/>

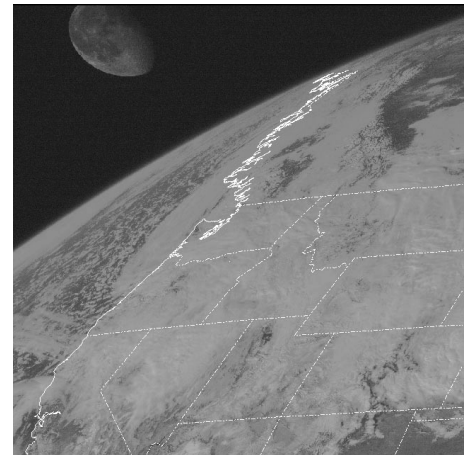


Fig 2: GOES-8 imaging the Moon January 13, 2001, 2032 UTC from Joseph Gresham. During its monthly passage around the earth, the Moon is occasionally imaged by GOES. Such an event is seen in figure 2.

Ten years ago

I vividly recall the events of the Persian Gulf War back in 1991, so NOAA's recent decision to release some high resolution images taken by NOAA-11 – see figure 1 - was of great interest. At that time, I had wondered whether wxsat images were likely to be of military significance – and pointed out wefax and APT resolution levels to a reporter friend.

A few hours later, I regretted doing that! There was considerable interest from the local media, and my humble desk and computer, together with my homebrew wefax dish out in the yard, were photographed until there was no unexplored angle remaining. I did explain that many hobbyists around the country – not to mention the world – had wefax reception stations. However, it left the news headlines after a week or two.

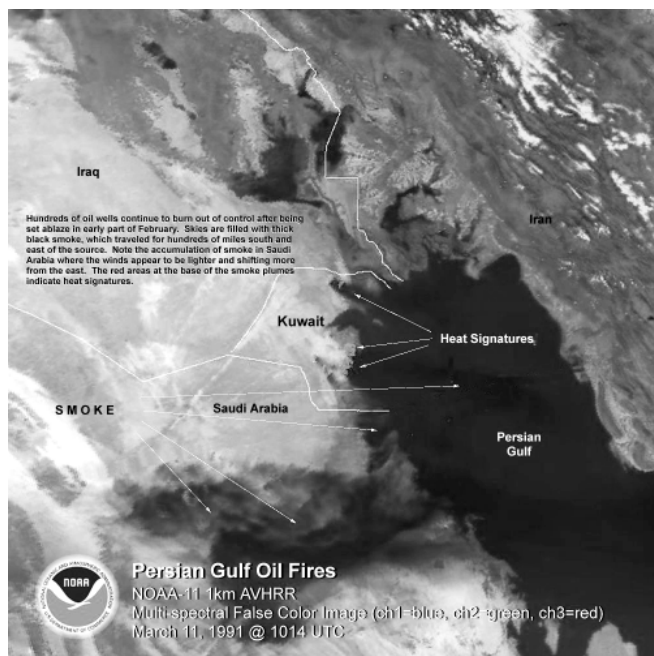


Fig 1: Burning oil fires in Kuwait on March 11, 1991, HRPT by NOAA-11 courtesy NOAA.

Frequencies

NOAA-15 and NOAA-16 has unresolved APT faults.
 NOAA-14 transmits APT on 137.62 MHz
 NOAA-12 transmits APT on 137.50 MHz
 Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
 Resurs 1-4 transmits APT on 137.85 Hz
 Okean-0, Okean-4 and Sich-1 sometimes transmit APT on 137.40MHz
 GOES-8 and GOES-10 use 1691 MHz for WEFAX

See Swagur's ad on page 89 for weather satellite equipment.

Monitoring a Space Outpost

As the tempo of operations aboard the International Space Station (ISS) Alpha continues to increase, so does the number of communications systems used by expedition crew members aboard the space outpost. These systems are primarily managed by the United States and Russia. Some of the ISS downlink frequencies fall within federal frequency bands.

As of press time the bulk of the communications systems transmitting from the ISS are of Russian origin and a couple of these systems are easily monitored on public safety scanner radios. In fact, one of the VHF downlinks is easily heard on a handheld scanner or ham transceiver with a rubber duck antenna.

I have also included some other support networks including a completely revised profile of the space shuttle communications systems. The shuttle is the main space truck used to haul equipment and space modules to this space outpost.

If you want more information on NASA field sites and other space related communications systems, you can find the most comprehensive list of NASA and space shuttle communications frequencies and systems in the *Monitoring Times* section on the Grove Enterprises website (<http://www.grove-ent.com>). I update this information frequently so check back often for new information and frequencies.

International Space Station Communication and Tracking Systems (C&TS)

US On-Orbit Segment (USOS)

ISS Alpha/TDRSS S-band frequencies — 2265.0/2085.680 MHz
(Note: Any additional information on the frequencies used by the USOS would be most welcome. Contact the author at larry@grove-ent.com.)

Russian Orbital Segment (ROS)

Zarya ISS Control Module
Zarya BITS Telemetry System — 632/634 MHz (PCM/FM)
TORU Rendezvous Control System (Zarya/Progress) — 130.167/121.750 MHz

Complete information on the TORU rendezvous control system can be found at Sven Grahn's Space website at: <http://www.users.wineasy.se/svengrahn/trackind/TORU/Toru.html>

Zvezda ISS Service Module

EVA Data System — 247.0/231.0 MHz
EVA Voice System (Simplex/Duplex) — 121.750 MHz (EVA-1)/130.167 MHz (EVA-2)
Internal Wireless System — 463/420 MHz (Video)

The ROS Television subsystem collects video during EVA activities and aids in the control of approach/docking vehicles both manned and unmanned. It receives TV video from various modules and displays TV pictures on monitors throughout the ROS. This system does *not* use the US NTSC video standard.

Kurs Rendezvous Docking Radar — 3294/3300 MHz
This radar system has a 20 MHz bandwidth and the Zvezda module uses a passive reflector

Lira System — 13511-13545 MHz LHCP/15130-15180 MHz RHCP (Data)

Lira provides two-way, high speed radio communications with ground stations through the Luch Relay satellite system.

Luch Relay Satellite System — 900/700 MHz, 13511-13545 MHz LHCP/15130-15180 MHz RHCP Data, 10810-10860 MHz RHCP/14591-14625 MHz LHCP

Regul (Kvant) System — 922.760/768.975 MHz

Regul is designed for two-way voice communications, digital command/program info, as well as telemetry transmission to Russian ground stations or the Luch satellite.

TORU Rendezvous Control System (Zvezda/Progress) — 130.167/121.750 MHz

Tracking System — 2860 MHz/2725 MHz (Pulse Modulation)

Voice Downlink Primary (VHF-1) — 143.625/139.208 MHz (FM)

Voice Downlink Backup (VHF-2) — 121.750/130.167 MHz (FM)

VHF-2 is part of the telemetry, tracking and control subsystem and is used primarily for space-to-space communication. Communications with EVA astronauts is via VHF-2. This is the equivalent system to the Space Shuttle UHF EVA military system.

Zvezda BITS Telemetry System — 628/630 MHz (PCM/FM 256 kbps)

Amateur Radio International Space Station

(ARISS) Information

Callsigns in use on the ISS Alpha:

United States Callsign — NA1SS
Russian Callsign — RZ3DZR
Packet station mailbox callsign — RZ3DZR-1
Packet station keyboard callsign — RZ2DZR
Astronaut William Shepherd — KD5GSL
Sergei Krikalev — U5MIR

Worldwide downlink — 145.800 MHz (NFM/Packet)

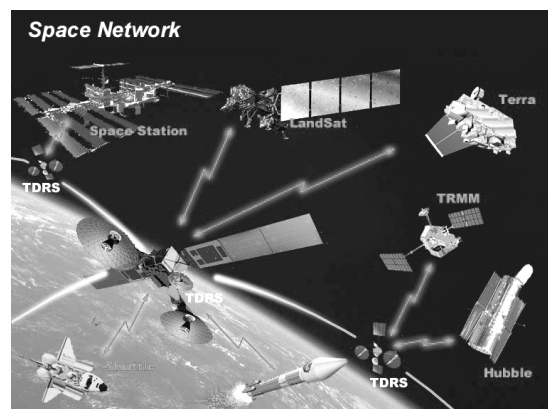
Worldwide uplink — 145.990 MHz (Packet)

Region 1 voice uplink — 145.200 MHz (NFM)

Region 2/3 voice uplink — 144.490 MHz (NFM)

Space Shuttle Communications Systems

Amateur SAREX downlink — 145.840 MHz (FM)



Ku-band System — 15.0034 GHz (Orbiter to TDRS)/13.755 GHz (TDRS-to-Orbiter)

S-band DoD Phase Modulation (PM) forward link (uplink) — 1831.787 MHz (Primary SGLS channel 18)/1775.732 MHz (Secondary SGLS channel 4)

S-band Frequency Modulation (FM) return link (downlink) — 2250.0 MHz (Voice, Data, Video)

S-band Phase Modulation (PM) forward link (uplink) — 2106.4 MHz (Primary)/2041.9 MHz (Secondary)

S-band Phase Modulation (PM) return link (downlink) — 2287.5 MHz (Primary SGLS channel 18)/2217.5 MHz (Secondary SGLS channel 4)

UHF Air-to-Ground voice downlink (AM) — 259.700 MHz (Primary)/296.800 MHz (Secondary)

UHF Emergency only (AM) — 243.000 MHz

UHF EVA downlink (new system) — sources indicate several unknown discrete frequencies within the 410.000-420.000 MHz range.
UHF EVA voice orbiter only, no ground link (AM) — 279.000 MHz

NASA/ESA General Frequencies

Emergency Nets — 3385 3395 4604.5 6982.5 14455 (kHz and USB)

ESA Satellite TV Broadcast

Eutelsat 2 F4 (10° E.) 11.134 GHz (H) MPEG-2 (4:2:0), 5.632 Msymb/sec, FEC 3/4

NSS-K Satellite (21°W) 11.465 GHz (V) 5632 Msymb/sec, FEC 3/4

HF Ar-to-Ground — 3089.5 6743.5 9003.5 11192.5 15062.5 (All kHz and USB)

NASA Air-to-Air — 123.050 123.125 (T-38 Interplane) 123.350 230.650 235.400 (T-38 Interplane) (All MHz and AM)

NASA NCS HF net — 2360 3379 3388 5403.5 5821 5961 6106 6108 6809 9462 11801 12129 12219 13633 13744 13780 14836 14989 14908 15464 16201 16430 18744 20063 22983 23390 (All kHz and USB)

NASA Nationwide Assignments — 162.1125 162.9875 163.100 166.525 166.8375 167.0125 167.350 167.400 167.775 168.350 168.4125 168.9375 169.2125 171.5125 171.6375 172.0375 172.3375 172.9625 173.425 173.900 (All MHz and NFM)

NASA Satellite TV Broadcast
 GE-2 (85°W) 3880 MHz (V) transponder 9C, 6.8 MHz mono audio,
 NTSC video

NASA/USAF Space Ground Link Subsystem (SGLS):

Uplink (MHz) Channel Downlink (MHz)

1763.7210 Channel 01 2202.5

1767.7250 Channel 02 2207.5

1771.7290 Channel 03 2212.5

1775.7320 Channel 04 2217.5

1779.7360 Channel 05 2222.5

1783.7400 Channel 06 2227.5

1787.7440 Channel 07 2232.5

1791.7480 Channel 08 2237.5

1795.7520 Channel 09 2242.4

1799.7560 Channel 10 2247.5

1803.7600 Channel 11 2252.5

1807.7640 Channel 12 2257.5

1811.7680 Channel 13 2262.5

1815.7710 Channel 14 2267.5

1819.7750 Channel 15 2272.5

1823.7790 Channel 16 2277.5

1827.7830 Channel 17 2282.5

1831.7870 Channel 18 2287.5

1835.7910 Channel 19 2292.5

1839.7950 Channel 20 2297.5

Search and Rescue Operations: 282.8 MHz (AM)

Solid Rocket Booster (SRB) Recovery Beacons: 240.0 242.0 MHz (Data)

Shuttle Emergency Landing Site Net: 408.150 408.800 MHz (NFM)

Shuttle Launch Support INMARSAT Nets (Reported frequencies from

the 15.5 deg west Atlantic satellite): 1535.250 1535.500

1535.700 1535.975 1537.175 1537.975 1538.325 1538.750

(KSC Audio) 1540.375 1540.425 (KSC Audio) 1540.7750

1541.075 MHz (All NFM) Note: You can learn more about monitoring

INMARSAT satellites at the URL http://www.time-step.com/reviews/mt_inmar1.htm

Shuttle Launch Support Net (UHF military satellites): 261.750

261.800 261.950 263.625 MHz (All NFM) The most frequently

reported UHF satellite frequencies are listed above.

Table One: Federal UHF Land Mobile Service

Frequency	Ch/Paired Freq*	Agencies	Frequency	Ch/Mode	Agencies
412.0000	472/Simplex	Drug Enforcement Agency, Energy Department, Geologic Survey (Nationwide), Interior Department (Nationwide), NASA, Post Office, TVA (No reported activity)	412.4875	511/Simplex	(No reported activity)
412.0125	473/Simplex	Bureau of Land Management, Bureau of Reclamation, Interior Department (Nationwide), Post Office, TVA, US Information Agency (No reported activity)	412.5000	512/Simplex	FBI (Nationwide)
412.0250	474/Simplex	Bureau of Land Management, Energy Department, Interior Department (Nationwide), International Boundary and Water Commission, NASA, Navy (No reported activity)	412.5125	513/Simplex	(No reported activity)
412.0375	475/Simplex	Bureau of Land Management, Energy Department, Interior Department (Nationwide), International Boundary and Water Commission, National Park Service, TVA (No reported activity)	412.5250	514/Simplex	Drug Enforcement Agency, FBI (Nationwide)
412.0500	476/Simplex	Bureau of Land Management, Energy Department, Interior Department (Nationwide), International Boundary and Water Commission, National Park Service, TVA (No reported activity)	412.5375	515/Simplex	(No reported activity)
412.0625	477/Simplex	Bureau of Land Management, Bureau of Reclamation, Geologic Survey, Interior Department (Nationwide), National Park Service, TVA (No reported activity)	412.5500	516/Simplex	FBI (Nationwide)
412.0750	478/Simplex	Bureau of Land Management, Bureau of Reclamation, Geologic Survey, Interior Department (Nationwide), National Park Service (No reported activity)	412.5625	517/Simplex	(No reported activity)
412.0875	479/Simplex	Bureau of Land Management, Interior Department (Nationwide), National Park Service (No reported activity)	412.5750	518/Simplex	FBI (Nationwide), Navy
412.1000	480/Simplex	Bureau of Land Management, Interior Department (Nationwide), National Park Service (No reported activity)	412.5875	519/Simplex	(No reported activity)
412.1125	481/Simplex	Bureau of Land Management, Drug Enforcement Agency, Energy Department, Interior Department (Nationwide), International Boundary and Water Commission, National Park Service, TVA, Veterans Administration (No reported activity)	412.6000	520/Simplex	Agriculture Department (Nationwide), Agriculture Research Service, Forest Service (Nationwide)
412.1250	482/Simplex	Bureau of Land Management, Drug Enforcement Agency, Energy Department, Interior Department (Nationwide), International Boundary and Water Commission, National Park Service, TVA, Veterans Administration (No reported activity)	412.6125	521/Simplex	(No reported activity)
412.1375	483/Simplex	Bureau of Land Management (Nationwide), Interior Department (Nationwide)	412.6250	522/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (12.5 kHz or greater simplex only) [authorized for use until December 31, 2007]
412.1500	484/Simplex	Bureau of Land Management (Nationwide), Interior Department (Nationwide)	412.6375	523/Simplex	(No reported activity)
412.1625	485/Simplex	Bureau of Indian Affairs, Bureau of Mines (Nationwide), Interior Department (Nationwide), International Boundary and Water Commission (No reported activity)	412.6500	524/Simplex	Energy Department (Nationwide), FBI, Marshal Service (Nationwide)
412.1750	486/Simplex	Bureau of Indian Affairs, Bureau of Mines (Nationwide), Interior Department (Nationwide), International Boundary and Water Commission (No reported activity)	412.6625	525/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.1875	487/Simplex	Bureau of Land Management (Nationwide), Interior Department (Nationwide)	412.6750	526/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.2000	488/Simplex	Bureau of Land Management (Nationwide), Interior Department (Nationwide)	412.6875	527/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.2125	489/Simplex	Bureau of Land Management, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), IRS (No reported activity)	412.7000	528/Simplex	Energy Department (Nationwide), Marshal Service (Nationwide)
412.2250	490/Simplex	Bureau of Land Management, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), IRS (No reported activity)	412.7125	529/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.2375	491/Simplex	Bureau of Land Management, Bureau of Reclamation, Interior Department (Nationwide), NASA, TVA (No reported activity)	412.7250	530/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.2500	492/Simplex	Bureau of Land Management, Bureau of Reclamation, Interior Department (Nationwide), NASA, TVA (No reported activity)	412.7375	531/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.2625	493/Simplex	Army, Bureau of Indian Affairs, Geologic Survey (Nationwide), Interior Department (Nationwide), Post Office (No reported activity)	412.7500	532/Simplex	Energy Department (Nationwide), Navy, Post Office
412.2750	494/Simplex	Army, Bureau of Indian Affairs, Geologic Survey (Nationwide), Interior Department (Nationwide), Post Office (No reported activity)	412.7625	533/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.2875	495/Simplex	Bureau of Land Management, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), Navy, TVA (No reported activity)	412.7750	534/Simplex	Hydrologic Channel (center frequency): US Government/Non-Government Agencies (simplex only)
412.3000	496/Simplex	Bureau of Land Management, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), Navy, TVA (No reported activity)	412.7875	535/Simplex	(No reported activity)
412.3125	497/Simplex	NOAA (Nationwide), National Bureau of Standards (Nationwide)	412.8000	536/Simplex	Agriculture Department (Nationwide), Army, Federal Grain Inspection Service (Nationwide), Food Safety and Inspection Service, Forest Service, Veterans Administration
412.3250	498/Simplex	NOAA (Nationwide), National Bureau of Standards (Nationwide)	412.8125	537/Simplex	(No reported activity)
412.3375	499/Simplex	Bureau of Reclamation, Energy Department, Federal Reserve System, FEMA, Interior Department (Nationwide), National Park Service, Post Office, TVA (No reported activity)	412.8250	538/Simplex	Government Itinerant: wide area, common use simplex (Nationwide)
412.3500	500/Simplex	Bureau of Reclamation, Energy Department, Federal Reserve System, FEMA, Interior Department (Nationwide), National Park Service, Post Office, TVA (No reported activity)	412.8375	539/Simplex	Government Itinerant: wide area, common use simplex (Nationwide)
412.3625	501/Simplex	Bureau of Indian Affairs, Bureau of Land Management, Bureau of Mines, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), National Park Service, TVA, US Information Agency (No reported activity)	412.8500	540/Simplex	Government Itinerant: wide area, common use simplex (Nationwide)
412.3750	502/Simplex	Bureau of Indian Affairs, Bureau of Land Management, Bureau of Mines, Bureau of Reclamation, Energy Department, Interior Department (Nationwide), National Park Service, TVA, US Information Agency (No reported activity)	412.8625	541/Simplex	Government Itinerant: wide area, common use simplex (Nationwide)
412.3875	503/Simplex	Agriculture Department (Nationwide), Agriculture Research Service, Animal and Plant Health Inspection Service, FBI (Nationwide), Federal Grain Inspection Service, Food Service and Inspection Service, Forest Service, Navy (No reported activity)	412.8750	542/Simplex	Government Itinerant: local area, common use simplex (Nationwide)
412.4000	504/Simplex	Agriculture Department (Nationwide), Agriculture Research Service, Animal and Plant Health Inspection Service, FBI (Nationwide), Federal Grain Inspection Service, Food Service and Inspection Service, Forest Service, Navy (No reported activity)	412.8875	543/Simplex	Government Itinerant: local area, common use simplex (Nationwide)
412.4125	505/Simplex	Bureau of Prisons, Energy Department, FBI (Nationwide)	412.9000	544/Simplex	Government Itinerant: local area, common use simplex (Nationwide)
412.4250	506/Simplex	Bureau of Prisons, Energy Department, FBI (Nationwide)	412.9125	545/Simplex	Government Itinerant: local area, common use simplex (Nationwide)
412.4375	507/Simplex	Drug Enforcement Agency, FBI (Nationwide)	412.9250	546/Simplex	Air Force (Nationwide), Army (Nationwide), Corps of Engineers, Customs Service
412.4500	508/Simplex	Drug Enforcement Agency, FBI (Nationwide)	412.9375	547/Simplex	(No reported activity)
412.4625	509/Simplex	Bureau of Prisons, Drug Enforcement Agency, Energy Department, FBI (Nationwide), Post Office (No reported activity)	412.9500	548/Simplex	Air Force (Nationwide), Army (Nationwide), Corps of Engineers, Navy
412.4750	510/Simplex	Bureau of Prisons, Drug Enforcement Agency, Energy Department, FBI (Nationwide), Post Office (No reported activity)	412.9625	549/Simplex	(No reported activity)
			412.9750	550/Simplex	Air Force (Nationwide), Army (Nationwide), Navy
			412.9875	551/Simplex	(No reported activity)

Space Flight Tracking and Data Network

The primary network for operating, maintaining and controlling the Space Shuttle is the Space Flight Tracking and Data Network (STDN). Goddard Space Flight Center runs the STDN and the ground tracking stations that support this network are located throughout the world.

Ascension Island (ACN) — S-band and UHF air-to-ground.

Bermuda (BDA) — S-band, C-band and UHF air-to-ground.

Canberra, Australia (CAN) — S-band

Dakar, Senegal — UHF air-to-ground

Guam (GWM) — S-band and UHF air-to-ground

Kauai, Hawaii (HAW) — S-band and UHF air-to-ground

Merritt Island, Fla. (MIL) — S-band and UHF air-to-ground

Ponce de Leon, Fla. (PDL) — S-band

Santiago, Chile (AGO) — S-band

Wallops, Va. (WFF) — C-band

And that is it for this month's edition of *The Fed Files*. Now it is time to look at this month's federal spectrum scan in Table One. In this issue we continue our detailed look at the reorganized 406-420 MHz UHF federal land mobile service. 73 and good hunting.

Motorola Type II Trunking

With all of the various trunk-tracking scanners and software out there it is sometimes difficult to make sense of talkgroup numbers and understand why they occasionally change during a conversation. This month we'll take a look at Motorola Type II talkgroups and the different ways they can be displayed. We'll also report on a new radio system being built by Motorola for the state of Illinois.

Type II Talkgroups

Since your site seems to be becoming something of a collection point for tiny bits of the trunked jigsaw, if you are interested, the codes showing up on my 780 for Palm Springs Police Department in California are:

- 32784 - main channel
- 32816 - secondary
- 32912 - surveillance

There are batches of other things ranging from the Airport to the dogcatcher but I haven't logged them down. The reason I note the above numbers is that they are distinctly different from those shown in the Uniden/Bearcat booklet which are in the format 200-13, 400-04, etc.

Regards, David

David, congratulations on your purchase of a Uniden 780XLT scanner. Although the manual for the scanner is pretty good, there is often confusion about the way a talkgroup may be displayed.

The City of Palm Springs, California, is listed as having a Motorola hybrid system, which means it carries both Type I and Type II traffic. Apparently the Police Department uses Type II radios and the other city services use Type I. Five frequencies are licensed to the city, namely 857.4875, 858.4875, 858.9625, 859.4875 and 860.7125 MHz.

Type I and Type II transmissions both use sixteen binary digits, or *bits*, to represent a

talkgroup. These bits are sent out with every repeater transmission and are interpreted by your scanner.

A Type I system divides up those 16 bits into blocks, fleets, subfleets, and users. Talkgroups in Type I systems are usually displayed as FFF-SS, where FFF is a Fleet ID and SS is a subfleet ID. The trick with Type I systems is determining exactly how a particular system divides up those 16 bits. That information is represented by a fleet map, which I described in detail in the August 2000 *Tracking the Trunks* column. (Back issues of *Monitoring Times* are \$4.50 from Grove Enterprises 800-438-8155 and previous *Tracking the Trunks* columns are on my website at <http://www.signalharbor.com>.)

Status Bits

A Type II system divides the 16 bits differently than a Type I system. The 16 bits in a Type II system are split into 12 bits of talkgroup identifier and 4 status bits. The status bits identify special situations and are usually all zeroes.

Right-most Status Bits	Decimal	Meaning
000	0	Normal transmission
001	1	Fleet-wide (A talkgroup for all radios)
010	2	Emergency
011	3	Crosspatch between talkgroups
100	4	Emergency crosspatch
101	5	Emergency multi-select
110	6	Unknown
111	7	Multi-select (initiated by the dispatcher)

The three right-most status bits indicate if the message is an emergency and whether the talkgroup is interconnected in some way. The left-most status bit indicates whether or not the transmission is encrypted using the Data Encryption Standard (DES). A zero bit means the message is not encrypted and a one bit means it is encrypted. For example, a normal message has status bits of 0000 (0 in decimal). If that transmission was encrypted, it would have status bits of 1000 (8 in decimal). An emergency message that is not encrypted has status bits of 0010 (2 in decimal), while an encrypted emergency message would have status bits of 1010 (10 in decimal). Note that an encrypted message implies that it is in digital format and that it will come out of your scanner as a harsh buzzing sound instead of the radio user's voice.

The complete set of sixteen bits that make

up a talkgroup can be displayed a number of ways. They can be shown as a decimal number, like 32784 or 59216. They may also appear as hexadecimal numbers, such as 801 or E75.

The conversion between decimal and hexadecimal is straightforward. The easiest way is to use a scientific calculator, and it just so happens that one comes with Microsoft Windows. In Windows, Press the Start button, select Programs and then Accessories. Click on the Calculator selection to start the Windows calculator program. Once the calculator program is running, you'll need to switch from Standard to Scientific mode, which you can do by clicking on "View" in the menu bar and choosing "Scientific."

The scientific calculator has quite a few buttons, but we're only interested in the selections in the upper left-hand side just below the display. The program starts out with "Dec" (decimal) option selected, meaning the display will show numbers in the usual decimal format.

In David's example, the main channel has a decimal talkgroup of 32784. So, in the calculator we enter 32784 and then select the "Hex" (hexadecimal) option. The display changes to show 8010. Each hexadecimal digit represents four bits of the talkgroup number, with the last digit representing the status bits. Because the last four bits are zero for a normal talkgroup, many listings drop the last digit of the hexadecimal number. In David's example the talkgroup would be represented in hex as 801.

We can also view the same number in binary by choosing the "Bin" option. 32784 is equivalent to 1000 0000 0001 0000. These are the sixteen bits that make up the Type II talkgroup. The last four bits are all zero, meaning the status bits are indicating this ID is a normal talkgroup.

In fact, the status bits in each of the three talkgroups David mentions are all zero:

Decimal	Hexadecimal	Binary
32784	8010	1000 0000 0001 0000
32816	8030	1000 0000 0011 0000
32912	8090	1000 0000 1001 0000

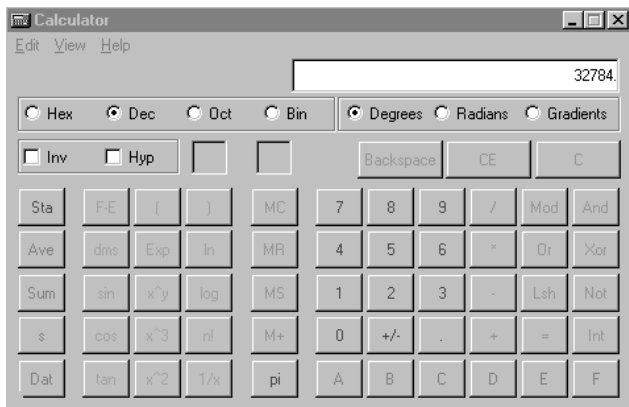
Interesting things happen when the status bits are something other than zero. If, for example, the Palm Beach surveillance talkgroup of 32912 had an emergency message, the status bits would change from 0000 to 0010, so the sixteen bits of the talkgroup then become 1000 0000 1001 0010. If we put this binary number into the calculator and convert it to decimal, we

Type I

Block	Fleet	Subfleet	Unit ID
16			

Type II

Talkgroup ID	Status Bits
12	4



find the new decimal number to be 32914.

Some scanners may be preset to ignore status bits in a Motorola system and always report the same talkgroup no matter what happens. This feature may have to be disabled in order to figure out Type I fleet maps, but is handy for following Type II conversations.

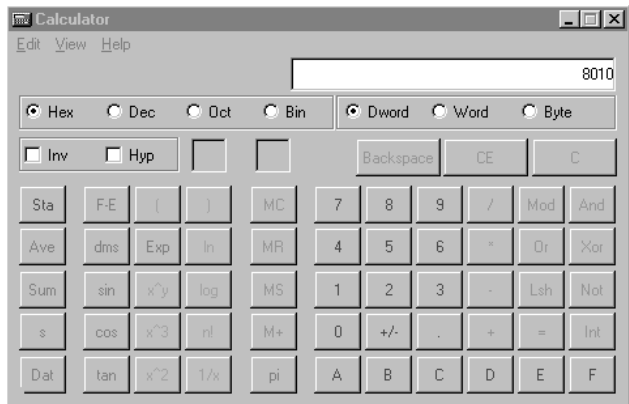
Other scanners will always display the full talkgroup number, which may change during a conversation depending on the status bits. This can cause the scanner to miss conversations if each of the possible talkgroups are not programmed into the scan list.

To sum up for David, the numbers he's reporting are valid Type II talkgroups from the Palm Springs Police Department. The other numbers in the format FFF-SS are talkgroups from the other Type I radios that share the hybrid system.

Illinois Starcom 21

Dan, I read your pages in *Monitoring Times* January 2001 and decided to drop you a line. I got this information from a local newspaper just last week. Illinois Governor Ryan announced a \$25 million grant for a new radio system phased in over the next 3 years. The state will lease time on the new Starcom 21 network from Motorola. It will be made available to other federal, state, and local public safety agencies if they want to update their own outmoded systems.

Reading between the lines, I would say the state police are going to phase out their low band radio system statewide. Also I would assume the Illinois Department of Transportation 47 MHz system will follow also. The VHF 155 MHz state police frequency will have to stay in place for use with other police departments (ISPERN, IREACH etc.) As we already know the state



police districts in the Chicago area are already using 800 MHz.

I don't know anything about Starcom21-is there a scanner yet that will work with this system? Or is this digital? Maybe a competitive brand two-way radio down the road properly programmed will be around. At the rate everyone is going, no one will be left on lowband. I've always said give 29.7 - 54 MHz to us hams (we like skip conditions) and trade part of the 440 MHz and also

1.2 GHz for commercial use (they don't like skip).

Daryl

Thanks for the information, Daryl. Funding for the Starcom 21 network comes out of the Venture TECH fund from the Illinois Technology Office. This fund promises to provide research and development dollars for a number of law enforcement initiatives, including expansion of the Illinois State Police Wireless Information Network, wireless access to photographic images and fingerprints, more rapid access to warrants and warrants databases, and an automated voice dispatch system. The new Starcom 21 network is one of those initiatives.

Motorola, headquartered in the Chicago suburb of Schaumburg, was selected to build Starcom 21 after a competitive bid process. The Illinois State Police will purchase new radios and lease airtime on the network, as will other federal, state, and local public safety agencies. Rather than spending a lot of money to establish their own independent systems, county and local agencies will have the option of joining the state network.

The plan is to phase in the network over three years, starting with coverage in the southern part of the state and moving northward. The state hopes that by having one common radio system, problems of interoperability – the ability of agencies to communicate directly with each other – will be a thing of the past.

As Daryl noted, the Chicago District of the Illinois State Police is currently using a trunked radio system. It's actually two EDACS networks, one covering a northern patrol area and the other a southern patrol. Frequencies in LCN (Logical Channel Number) order are:

North: 866.8875, 866.4625, 867.3875, 866.9625, 867.4625, 867.8875, 868.3875, 868.4625, 868.8875 and 868.9625 MHz.

South: 866.4125, 866.4375, 866.9375, 867.4125, 867.9375, 867.9125, 868.4375, 868.4125, 868.9375 and 868.9125 MHz.

Unfortunately, I don't have any technical details about the Starcom 21 system. I expect that it will be a trunked digital system, but I don't know if it will be compatible with other

Motorola products or with the APCO 25 standards, or something altogether new. If readers have any further information about the system, please send it along!

NPSPAC

Starcom 21 will almost certainly have the capability of operating on the National Public Safety Planning Advisory Committee (NPSPAC) 800 MHz frequencies. The NPSPAC was formed more than ten years ago to provide guidance in the use and coordination of public safety radio frequencies, and their recommendations included the establishment of common inter-agency frequencies.

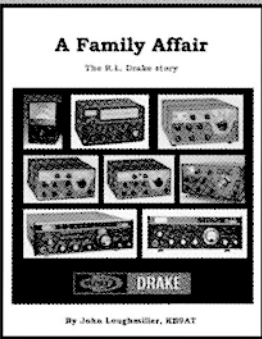
Five channels in the 800 MHz band are set aside for mutual aid across the country. One frequency, 866.0125 MHz, is designated a calling channel. The other four, at 866.5125, 867.0125, 867.5125 and 868.0125 MHz, are tactical channels. Each of these channels is 25 kHz wide and operates conventionally (that is, not trunked) with a tone coded squelch frequency of 156.7.

So, as you're scanning the 800 MHz band, be sure to include these five non-trunked frequencies in one of your scan banks.

That's all for this month. More information is available on my website at <http://www.signalharbor.com>, and I welcome your e-mail at dan@signalharbor.com. Happy monitoring!

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Richmond to Sacramento

Welcome aboard everyone! Today we are going to look at frequencies for Richmond (Virginia) International Airport and visit Sacramento (California) International Airport ATC Tower.

Richmond International Airport

These frequencies were contributed by Richard Rowland

Tower and related operations:

40.200 (FM) — Army National Guard
118.2/371.100 — Final Approach
119.150/266.600 — ATIS
121.100/257.800 — Tower
121.500/243.000 — Emergency/Distress
121.900/348.600 — Ground
121.100/255.400 — FSS Leesburg Radio (FSS-Flight Service Station)
122.200/255.400 — FSS Leesburg Radio
122.400/255.400 — FSS Leesburg Radio
122.950 — UNICOM
126.400/319.800 — Approach/Departure 360 — 170 degrees
126.800/398.200 — Approach/Departure 171 — 263 degrees
127.550/348.600 — Clearance Delivery
132.850/257.750 — Approach (+50 miles out)
134.700/307.200 — Approach/Departure 264-359 degrees
141.600/289.300 (AM) — 192FW Air National Guard Operations (Doghouse/Fury Ops)

Airline Frequencies

129.300 — United
129.325 — American
129.575 — Northwest
129.750 — US Airways
129.800 — US Airways/US Air Express
129.925 — Continental
130.800 — TWA/Trans States
130.950 — American Eagle
131.100 — US Airways/US Air Express
131.200 — Continental
131.450 — Delta/ComAir
131.775 — United Express
136.500 — United Express

ACARS Frequencies

129.125
130.025
131.550
136.850
136.900
136.975

FBOs (Fixed Base Operation)

122.950 — Aero Industries (FBO) RIC UNICOM
129.950 — Phillip Morris "Papa Mike"
130.275 — James River Corporation
130.300 — Million Air (FBO)
130.775 — CSX
131.425 — Richmond Jet Center (FBO)

Cargo Airlines

128.850 — Airborne Express (callsign ABEX)
129.425 — UPS/Ryan/Emory/Airborne Express
131.925 — Federal Express (callsign FEDEX)

Airline and FBO Ground Ops

151.925 — Million Air (FBO)
165.237 — U.S. Customs
172.850 — FAA
460.650 — Continental
460.675 — Northwest
460.725 — United
460.775 — American
460.800 — USAirways
460.850 — Delta
452.025 — Aero Industries

Law Enforcement

122.925 — Metro Police ("Metro")

Thanks, Richard!

Sacramento International Airport

Many thanks to Bill Silaghi of Sacramento ATC Tower for permission to use the following information. Visit the tower website at <http://hometown.aol.com/smfntatca1/smfpage1.htm>

Sacramento International Tower

121.100 — Clearance (frequently combined with ground)
121.700 — Ground Control
125.700/128.600 — Tower (128.600 - Intermittent use)
126.750 — ATIS
UHF — 256.700

Company and Other Aviation Frequencies

SMF UNICOM — 122.950: General Aviation and Ramp Services
Citation — 123.375: Cessna Citation Service Center
129.500 — United Airlines (Also used by United Express; also uses Data Link)
129.600 — Northwest (Also uses Data Link)
130.100 — Delta (Also uses Data Link)
130.150 — American (Also used by TWA; also uses Data Link)
130.175 — America West (Also used by Continental)
131.625 — DHL
131.700 — Southwest
131.925 — FedEx (Also uses Data Link)
132.000 — Alaska (Also used by Horizon)
135.850 — FAA Flight Inspection Area Office

Sacramento Mather Tower

ATIS — 118.325
Tower — 120.650/282.250
Ground — 121.850/307.900

Sacramento Executive Tower

Tower — 119.500/381.600
Ground — 125.000
ATIS — 125.500

Beale AFB Tower

Tower — 119.400/276.150
Ground — 121.6/228.400
ATIS — 273.5

Sacramento Approach Control (TRACON)

Northeast — 119.100/269.0
Southwest — 125.250/257.900
South — 125.600/360.800 (Used when SMF is on 34, above 4000')
Southeast — 127.400/317.500
Northwest — 134.800/271.300
Beale — 125.400/327.500
Mather — 123.700/259.100 (Used when MHR traffic warrants)

Travis Approach Control

South — 126.600/291.000
North — 119.900/371.200
Arrival — 128.400/294.700

Stockton Approach Control

South Low — 120.950/269.450 (6000' and below, south of Modesto)
West Low — 123.850/278.300 (6000' and below, west of Manteca VOR)
East Low — 125.100/363.200 (6000' and below, east of Manteca VOR)
High — 127.750/288.300 (Above 6000')

Oakland Center

Southwest — 119.475/380.300
West High — 125.850/323.000 (Above 7000')
Southeast — 126.850/319.900
West Low — 127.800/353.500 (7000' and below)
Northeast — 127.950/316.100
Northwest — 132.200/350.300

Sacramento International Airport Tower

What We Do: The controllers at SMF ATCT provide air traffic services to aircraft operating with the Class C Surface Area and on the airport's movement area. To provide these services the controllers use radar, visual observation and position reports. Classified by the Federal Aviation Administration (FAA) as a *Tower with Radar*, the tower controllers are authorized to provide radar separation between:

Arrivals and Departures
Successive Departures
Departures and Overflights

All other aspects of radar separation are provided by controllers at Sacramento Terminal Radar Approach Control (TRACON) located at McClellan AFB approximately 10 miles east of Sacramento International.

Local Control: The Local Controller (Tower) is responsible for airborne aircraft within the tower's airspace and for aircraft on the airport's runways. It is the Local Controller's responsibility to ensure that the appropriate separation of arriving and departing aircraft exists.

Ground Control: The Ground Controller is responsible for aircraft operating on the airport's surface or movement areas. It is the Ground

Controller that issues taxi instructions to arriving and departing aircraft. In addition, here at SMF, because of limited terminal apron space, the Ground Controller also provides advisory and traffic information to aircraft on the airport's two terminal aprons.

Clearance Delivery: The Clearance Delivery Controller is responsible for issuing IFR departure clearances and Class C VFR departure information to departing aircraft. This is done by radio or by computer data link. The Clearance Delivery controller does not provide control instructions. At SMF, the Clearance Delivery function is combined with the Ground Control position. *The ATIS will specify whether to use the Clearance Delivery or Ground Control frequency.*

As of October 2000, Sacramento International Airport was staffed with one Air Traffic Control Manager, one Operations Supervisor, and fourteen full-performance level controllers.

The Tower is presently an ATC-6 facility; formerly they were designated as a Level 2 VFR Tower. They are responsible only for successive departure separation, arrival/departure separation, overflight/departure separation and separation of VFR traffic within their traffic pattern. Sacramento Approach Control (TRACON) is responsible for arrival/arrival or approach separation.

It creates an interesting operation in that International is only one of two so-called VFR Towers in the entire US that are at the primary airport within Class C airspace.

◆ Other Interesting Information about Sacramento International Airport:

Scheduled Passenger Airlines as of 3/10/2000 – Alaska Airlines, American Airlines, America West Airlines, Continental Airlines, Delta Air Lines, Horizon Airlines, Northwest Airlines, SkyWest Airlines (United Express), Southwest Airlines, Trans World Airlines.

Cargo Airlines: DHL Airlines, Federal Express Airlines, Pac Valley Airlines (FEDEX Feeder) and Skyways Airlines (DHL Feeder).

Terminal A: There are twelve gate locations. America West occupies Gates 2 and 4; Delta occupies Gates 1 and 3; Continental operates from either the America West or Delta Gates and Southwest occupies Gates 10 through 17.

Terminal B1 presently has eight gate positions. These are occupied by American (Gate 33), Trans World (Gate 32) and United/United Express (Gates 31, 34, 35, 36, 37 and 38).

Terminal B2 presently has eight gate positions, however only four jetways. These are occupied by Alaska (Gate 23), Northwest (Gate 22), and Horizon (Gate 27). The jetway at Gate 21 is used for overflow. Gate positions 24, 25, 26, and 28 are not used.

Commuter Terminal has three ramp positions; these are presently unoccupied.

Off Terminal Parking Positions: There are several off terminal parking locations on the North Ramp, they are used for overnight parking, charter flights, or delay holding. There are two off terminal parking locations on the South Ramp. Spot 1 is leased to FEDEX for its cargo operations, the remaining spot is used for overnight parking.

General Aviation Facilities: The General Aviation Ramp is located southeast of the approach end of Runway 34L. It is accessed by taxiways G1 and G2. The General Aviation Ramp and taxiways G1 and G2 are restricted to aircraft with maximum gross weights of less than 60,000 pounds. Taxiway G1 is generally used in a southerly directions (inbound) and Taxiway G2 is generally used in a northerly direction (outbound).

Other General Aviation Facilities: There are two corporate hangars located off Taxiway P. In addition, there is a Cessna Citation Service Center and an FAA Flight Inspection Area Office also located off Taxiway P.

Department of Airports UNICOM: The Sacramento County Department of Airports operates and manages the General Aviation Ramp Facility. They operate UNICOM service on 122.950 MHz. They will, depending on workload, provide transportation from the General Aviation Ramp to the Terminals or to the Rental Car Facility.

Thanks again, Bill.

That's it for this month, folks. See you all in June with more aero news, views, and frequencies for all! Until then, 73 and out.

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Stakeout!

When I DX, I usually just spin the dial until I hear something interesting. I stick with the frequency only until I either hear an ID or decide the station isn't going to identify anytime soon. But a few weeks ago, I tried something different.

Several DXers had reported on the Internet hearing a signal under WLAC-1510 with gospel music. I live only 20 miles from the WLAC towers, but have heard other stations under WLAC myself. I decided to stake out 1510 kHz and see what surfaced.

I did *not* hear the gospel station reported by others. But there *were* other signals in there. One station was carrying Christian contemporary music; another nostalgia music from the 1940s and 1950s; a third with talk. All of them were fading over and under each other – and audible only during the pauses in WLAC's programming.

Luckily, WLAC was carrying a sports call-in show with plenty of long pauses. From one station, I heard bits and pieces of weather forecasts – a public-service announcement for the Black Canyon Wildlife Management Area – and the slogan "The Voice." A few minutes later, the nostalgia-music station faded up just long enough to sneak in "AM 1510 KMND." I checked the calls and format with the *NRC Log*: they match. This 2,400 watt station from Midland, Texas, is now in my log.

I considered calling it a night. But my curiosity took control, and I stayed at the dials. Along came another "The Voice" slogan – this time followed by call letters. It sounded like WDCY. I looked them up – they're on 1520. Guess I got it wrong. Here comes the weather again – and a sponsorship announcement – "American National Bank forecast" – and the calls again. This time, they sounded like they might be KVCY. That's a FM station in South Dakota, but maybe the bank ad will help track this one down.

I brought up my Internet connection and typed "American National Bank" into a search engine. The first hit is for a bank in Wichita Falls, Texas. There are no 1510 stations anywhere near Wichita Falls, but the bank's page suggests it has other locations. The next hit shows several locations in northeast Texas. Hmm, I wonder if it might be "KVCI"? I typed those call letters in to the search engine, and the first hit is KVCI's own website.

It shows the slogan "The Voice" and a list of records played, including the ones I heard. Going back to the American National Bank site, I found a branch in nearby Terrell, Texas. Mystery solved: a second new station, this one from Canton, Texas, went into my log.



Back in the 1920s when AM DXing first became a popular hobby, people used radios like this 1926 RCA.

I've since staked out 680 and 1070 kHz in (successful) hopes of relogging California; and 1060 kHz in (vain) hope of figuring out who besides KYW is carrying CNN Radio News. Give it a try; you never know what you might catch!

◆ Mailbag

• Charlie Manning in western New York State and Keith Stein near Washington, DC, have both heard the new CHWO-740 Toronto. See last month's column for more information on this station. The Ontario DX Association is handling QSLing for this station; if you log enough details for a report, it can be sent via P.O. Box 161, Station A,

Willowdale, Ontario M2N 5S8, Canada

- Jim, WO3Z near Pittsburgh wrote: "I have a TS-940 and 80 meter dipole. Is there any chance of hearing something Trans-Atlantic with that arrangement, or is a Beverage a must for TA?"

From that far west, it will be tough but possible. I should first warn that I don't have much experience with European DX; it's tough from anywhere west of the Appalachians. But I *have* heard European signals on my 160-meter dipole, using the same receiver Jim has. Keep an ear on the longwave broadcast band between 150 and 300 kHz; if there are good signals on this band, it's time to check out 530-1700 kHz.

- After 44 years of playing the hits – first, as Canada's first Top 40 station, and then playing them again as Toronto's oldies outlet – CHUM-1050's days as a music station are over. The station has switched to an all-sports format. Several co-owned stations in other Canadian cities are following suit.
- There is only one new expanded-band station to report this month. KAVT-1680 Fresno, California, has appeared on the air. They're carrying Radio Disney.

Spring storms are coming, but there's still plenty of DX to be had. What are you hearing? Write me at Box 98, Brasstown NC 28902-0098, or by email to w9wi@w9wi.com. Good DX!

Eddi Gorham of Chattanooga has been busy on the dials. Some of her more exotic loggings:

WIOD-610	Miami, FL
KMTL-760	Sherwood, AR
WTCW-920	Whitesburg, KY
KCTA-1030	Corpus Christi, TX
WBAL-1090	Baltimore
KCHR-1350	Charleston, MO
WIGG-1420	Wiggins, MS
WAIK-1590	Galesburg, IL

WBAL is a particularly good catch as it's very directional in the wrong direction, protecting KAAY in Little Rock.

Tenth Anniversary of Zeller's Outer Limits

This month marks my tenth anniversary as *Outer Limits* columnist in *MT*. We have now seen a full decade of pirate broadcasts, clandestine transmissions, and other odd stuff on the shortwave bands. I've had a lot of fun searching through the unusual, the bizarre, and the weird material that's constantly generated by unlicensed broadcasting all over the world.

Of course, this column has been around for much longer than ten years. But, I want to thank literally hundreds of *MT* readers who have helped me along the way. Without your great support, we would not be able to profile the unlicensed broadcasting scene every month. My thanks go out to every one of you; it's been a great ride!

◆ What We Are Hearing

MT readers heard nearly two dozen pirate stations again this month, all between 6940 and 6955 kHz. Your best bet is to tune these frequencies on weekends, two to four hours before or after local sunset. Europirates usually operate on 49 meters using frequencies noted below, also normally on weekends. Most Europirates use AM modulation, while about 75% of North American shortwave pirate broadcasters use sideband modes, usually upper sideband.

Alpha Lima International- One of the best heard Europirates in North America, this one snuck through both on 62190 at 0600 UTC and on 21890 at 1700 UTC. (Hoogeveen)

Blind Faith Radio- Dr. Napalm and classic rock music remain closely associated on the pirate bands. (Uses blindfaithradio@yahoo.com e-mail)

Crunch Radio- This is a brand new operation with big band music, old radio ads, and a slogan of, "Crunch Radio, Full Range Fidelity." Their random talk is offbeat in the pirate radio tradition. (None yet)

East Coast Beer Drinker- This guy has returned after an extended absence from the pirate bands. You never have any doubts about his favorite beverage. (Blue Ridge Summit)

Friday Radio- Another veteran pirate, this one broadcasts only on Fridays to celebrate the weekend. (Providence)

KIPM- Alan Maxwell's elaborate but weird dramas have been heard all across North America, and even overseas. His content is depressing but his signal is a whopper! (Elkhorn)

Melvin Malfunction Radio- Melvin, with a voice sounding like a computer, plays oldies rock on this new one. (Uses

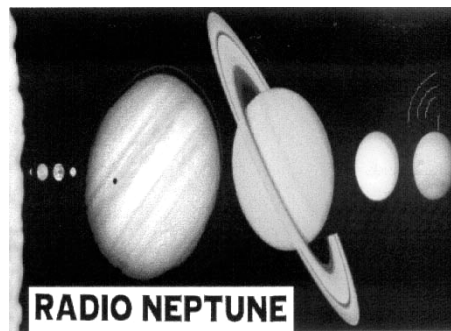
melvinmalfunction@yahoo.com e-mail.

Laser Hot Hits- Another good Europirate target is this one on 6220 kHz, with best reception around European sunrise. (Merlin)

Pirate Radio Central- This newcomer has featured hard rock music with offbeat commentary, but we don't know much about them yet. (None)

Radio Free Speech- Bill O. Rights is back with programs supporting freedom, but he also has been relaying several classic pirate stations. (Belfast)

Radio Neptune- Joe Mack's "Universal Service" has now produced seven different shows, and as we see here, QSLs are arriving. (Blue Ridge Summit)



Radio Three- Sal Amoniac is a parody of licensed broadcasters, other pirates, and himself, all at the same time. (None, QSLs logs in *The ACE*)

Radio Toronto- Their announcer, Brody, interviews local Toronto personalities and generally discusses Toronto issues. (Merlin)

Scream of the Mosquito- Their name is a parody of "Scream of the Butterfly," a former pirate now gone legit. Rock music and ID's make up the programming fare. (None, verifies logs in *The ACE*)

Sycko Radio- Pronounced "Psycho," this one is a frequent broadcaster but is a non-existent QSLer. (None)

Take It Easy Radio- The soft rock content on this one takes its name from the Eagles' rock tune, and the playlist often includes the Eagles. (Belfast)

Voice of Captain Ron SW- Captain Ron has returned with live broadcasts in 2001. (Uses captainronswr@yahoo.com e-mail)

Voice of the Angry Bastard- When not venting his anger, this fellow relays other pirate stations. (None)

WHYP- James Brownyard parodies other pirates, parodies the original WHYP weather

in North East, PA, and generally sets a high standard for pirate radio. (Uses whyp1530@yahoo.com e-mail)

WMFQ- Their IDs are unmistakable, always with a sarcastic and profane plea to send QSLs. They do send them! (Providence)

WMNM- Also giving identifications as "Slim Shady Radio," this new one is dominated by Eminem music and techno rock. (Uses slimshadyradio@yahoo.com e-mail)

◆ 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. Send your letters 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 293, Merlin, Ontario N0P 1W0; and PO Box 663 7900ar Hoogeveen, Netherlands. A few pirates, as listed, prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. Reports to the *Free Radio Network* go to <http://www.frn.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 always welcome via PO Box 98, Brasstown, NC 28902, or via my e-mail address atop the column. This month we heard from another great turnout of unlicensed broadcasting enthusiasts including John T. Arthur, Belfast, NY; Ranier Brandt, Hoefar, Germany; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; The Dude, Wellsville, NY; Sheldon Dunhan, Rochdale, CT; Joe Filipkowski, Providence, RI; Steve Foehner, Rochester, NY; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; Jorge Garcia, Santiago, Chile; William T. Hassig, Mt. Prospect, IL; Darrell Hewitt, Salt Lake City, UT; Jim Keeling, St. Charles, MO; Dave Kirby, Wickliffe, OH; Chris Lobdell, Stoneham, MA; Dr. Love, Belfast, NY; Greg Majewski, Oakdale, CT; Alan P. Masyga, Winona, MN; Bill McClintock, Minneapolis, MN; Cachito Marnani, Santiago, Chile; Craig M. Pradarelli; Mike Prindle, New Suffolk, NY; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany; Lee Silvi, Mentor, OH; Bud Stacey, Setsuma, AL; Dan Weston, Standish, ME; DJ Stevie, Basel, Switzerland; Dan Weston, Standish, ME; Lee Witham, San Diego, CA; Niel Wolfish, Toronto, Ontario; and Dave Zacek, Lafayette, IN.

Pipeline Reception, Reader Mail

Sometimes it seems like a radio “pipeline” exists into certain parts of North America. Here in Western NY for example, I hear many beacons from the state of Iowa. At first, I thought perhaps these stations ran more power than the typical U.S. maximum of 50 watts, or that they enjoyed relatively “clear channel” status. Upon checking official records, however, I found that the majority ran only 25 watts, and shared frequencies with beacons from many other states.

Interestingly, I rarely hear New England beacons, except for TUK/194 and a few other big guns. The New England states are much closer than Iowa, so why such a marked difference in reception?

I don’t have a definitive answer, but I recently discovered that I am not alone in my observations. Jacques d’Avignon (Ottawa, ON) sent a list of Iowa stations he has heard consistently over the past year or so, mostly between the morning hours of 10:00 and 12:00 UTC. (See Table 1.) He too, is curious about why these rather distant stations come in with such regularity at his location.

Table 1. Iowa Loggings from Ottawa

FREQ.	ID	LOCATION
293	CJ	Cresco, IA
368	SOY	Sioux Center, IA
407	BNW	Boone, IA
410	EGQ	Emmetsburg, IA
411	SDA	Shenandoah, IA
417	IY	Charles City, IA
423	CKP	Cherokee, IA
428	POH	Pocahontas, IA
512	ORC	Orange City, IA
515	RRQ	Rock Rapids, IA
518	GCT	Guthrie Center, IA
524	UOC	Iowa City, IA

Can anyone offer clues to this mystery, or report on similar situations in other regions? Is it terrain? Most of the Iowa beacons are in lofty locations – well over 1000 feet. My receiving location is just below this level at about 950 feet. Could it be that the Iowa signals have a “clear shot” to me while the New England signals are blocked by the rather mountainous, rocky terrain that beacons about 200 miles to the east of me?

If the mountains are indeed acting as a “wall” to longwave signals, they might also serve to concentrate signals arriving from a westerly direction – similar to the effect of a reflector element on a beam antenna. This is strictly speculation, so I welcome ideas from anyone else.

Mail Call

Welcome to first-time contributor Rodney Johnson (FL) who wrote in with a fine list of loggings made with his Drake R8B receiver and an active antenna. He notes that he logged 99 stations in just four nights of monitoring. Nice work, Rodney; we look forward to hearing from you often. A sampling of Rodney’s logs are included in Table 2.

Gregory Morrow (ME) wrote in with a question relating to beacon locations. For the past few years, he’s been traveling across the Eastern U.S. and Canada mapping and listing “different things” with his GPS unit. Part of his list includes beacon sites he has found by trial and error. He wants information on how to locate these sites with more precision than just town names. Well, Gregory, the answer may be as close as your GPS unit. Fortunately, the exact latitude and longitude of most beacons is known and is available in various beacon guides.

The *North American BeaconFinder*, for example, (see ad in this issue) contains the coordinates for virtually all U.S. beacons and a majority of Canadian ones. You should be able to use your GPS unit to direct you to the published coordinates with little or no trouble. Alternatively, you could take a portable LW receiver with you and track these stations down. This can be time consuming, but it is also fun and rewarding when you find the target.

I am pleased to hear from Jim Labor (FL) who inquired about beacon EVB/417 kHz near New Smyrna Beach, FL. He’d like to know the exact location of the site and type of equipment it uses.

EVB is located 3 miles northwest of New Smyrna Beach and serves the New Smyrna Beach Municipal Airport. Its coordinates are 29.03.15N, and 80.56.27W. It is just 12 feet above sea level and runs 25 watts to a tophat vertical antenna. For complete information about

the airport that EVB serves, visit <http://www.airnav.com/airport/EVB>.

Web Resource

Ever wonder how far away that beacon is that you’re hearing, or what the compass heading would be for best reception on a directional antenna? Check out <http://www.indo.com/distance/> for a quick answer online. All you need to enter your location and the location of the beacon. It gives you the mileage between these two points, plus directional headings. You can also choose to see a map with both locations identified. This site is a very useful resource for serious DXers.

See you next month!

Table 2. Selected Beacon Loggings

FREQ	ID	LOCATION	BY
198	DIW	Dixon, NC	R.J. (FL)
200	HXF	Hartford, WI	J.R. (NY)
203	PVB	Plattesville, WI	A.R. (MI)
207	YNE	Norway House, MB	A.R. (MI)
216	CLB	Wilmington, NC	R.J. (FL)
216	LRG	Lincoln, ME	J.R. (NY)
221	RQM	Rangely, ME	J.R. (NY)
230	SH	Shreveport, LA	A.R. (MI)
230	VYS	Peru, IL	A.R. (MI)
230	QB	Quebec City, QC	A.R. (MI)
239	SAR	Sparta, IL	A.R. (MI)
248	WG	Winnipeg, MB	A.R. (MI)
257	SQT	Melbourne, FL	J.R. (NY)
266	BR	Atlanta, GA	J.R. (NY)
268	UBY	Bayamo, Cuba	J.R. (NY)
276	TWT	Sturgis, KY	A.R. (MI)
278	EOE	New Berry, MO	R.J. (FL)
284	PTB	Petersburg, VA	J.R. (NY)
290	EKQ	Monticello, KY	A.R. (MI)
317	CBE	Cumberland, MD	A.R. (MI)
326	PKZ	Pensacola, FL	A.R. (MI)
330	CZM	Cozumel, Mexico	J.R. (NY)
332	FIS	Key West, FL	J.R. (NY)
335	LUK	Cincinnati, OH	A.R. (MI)
344	ZIY	Georgetown, Cayman Is.	R.J. (FL)
350	LE	Raleigh, NC	A.R. (MI)
350	IUI	Blytheville, AR	A.R. (MI)
354	LI	Little Rock, AR	R.J. (FL)
368	RRJ	French Lick, IN	J.R. (NY)
391	DDP	San Juan, PR	A.R. (MI)
403	BPO	Oneida, TN	A.R. (MI)
412	UNG	Nueva Gerona, Cuba	R.J. (FL)
413	TAM	Tampico, Mexico	R.J. (FL)
420	CEK	Crete, NE	A.R. (MI)
513	RRQ	Rock Rapids, IA	J.R. (NY)
515	PN	Ponca City, OK	R.J. (FL)
520	IQS	Sallisaw, OK	J.R. (NY)
526	ZLS	Stella Maris, BAH	R.J. (FL)

CEK

420

<p style="text-align: center;">BEACON</p> <p>This will verify your</p> <p>Date: <u>March 5, 1996</u></p> <p>Freq: <u>420 kHz</u></p> <p>Time: <u>0910 UTC</u></p> <p>Elevation: <u>107 feet</u></p> <p>Power: <u>25 watts</u></p> <p>Location: <u>40 37 N 96 56 W</u></p> <p>Antenna Type: _____</p> <p><u>Crete</u></p>	<p style="text-align: center;">KHZ</p> <p>Reception of our beacon.</p> <p>Verified by: <u>Pat J. Lorenz</u></p> <p>Title: <u>Line manager</u></p> <p>Date: <u>March 22, 1996</u></p> <p>Remarks: <u>Nebraska</u></p>
--	--

CEK/420 kHz, Crete, NE (Courtesy of Allen Renner, PA)

Logging contributors: Jim Renfrew (NY), Andy Robins (MI), Rodney Johnson (FL)

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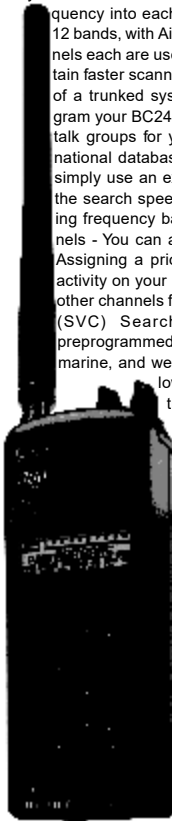


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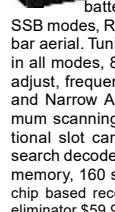
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Muscle Cars and Antenna Wire

I was working in my basement shop one evening. An amateur radio operator that recently upgraded to General Class stopped by for a visit. My work area has always represented a gathering spot for hams and folks who are looking to become hams. We were chatting while I was melting solder on some project or other.

The conversation turned to contesting and I asked this new General if he was planning on digging in and using the contests to fill his log with some neat stuff. After all, that's what the HF privileges that come with the General Class are usually about.

Well, this ham told me that he had purchased a nice used low band rig a few months back but hadn't gotten around to putting up an antenna. If found this kind of curious so I quizzed further as to the reason why. Initially I thought the guy was up against problems with neighborhood esthetics or a spouse that didn't have an appreciation for the natural beauty of a well-constructed antenna. Nope, none of these problems existed. This ham had free reign to put up any antenna he chose. So what was the problem?

I was further surprised when the ham picked up a copy of a popular ham magazine sitting on one of my bookshelves. On its cover was what looked like a very fine 120-foot tower sporting rotatable 20-meter monoband Yagis, one at 60 feet and the other at the top. Probably a picture of a major contest station's "Hot Setup."

My friend pointed to the picture and said, "I can't afford something like that. What's the point of getting on the air?" Well this was interesting. This was a clear case of antenna envy. I said that, while I could admire this remarkable antenna and perhaps even lust after it on some level, I noted that neither I nor most other hams had antennas of this caliber. I went on to say that I've been operating since the Seventies and I never used a tower or directional antennas. My modest means and various living situations have always kept me working with wire antennas.

In a recent survey of antennas used by members of one particular QRP radio society (folks who try to optimize antennas in lieu of high output power), dipoles and wires outnumbered beams by over seventy-five percent.

How had this friend of mine become paralyzed to all the fun ham radio has to offer? The ham had become caught up in what I call the Hot Car Magazine Syndrome. Allow me to explain.

If you go to any magazine rack in any convenience store in the land, you will see dozens of magazines devoted to high performance cars. You will find these magazines present page after page of the most perfect examples of the state of the automotive art. You will see vehicles that often sport tens of thousands of dollars in aftermarket modifications. Further, the owner will have spent countless hours to bring the car to the point of perfection. I remember reading of one man whose car won a major national award saying that he did nothing else but work on this car for over three years!

Do you see the point? How many of us have the freedom and resources to drop every other responsibility and just play amateur radio? But here, my poor friend had become convinced that he needed this multi-thousand dollar antenna system just to get on the air and work a few contacts. As with the car magazines, most of us can

admire a well designed hot rod but we drive around in our Fords and Mazdas. I can ooh and ah over the pictures of super contest stations in the pages of ham journals while still having tons of fun with my much more modest station set-up.

Turning to the advertising section of this ham magazine my friend was looking at, I pointed out that a "world class" transceiver goes for around four grand, a sturdy 2 kilowatt amplifier would add another couple of thousand dollars or so plus about \$500 to upgrade the house wiring to handle the power. A "tall enough" tower and installation would run another \$1500 and then you could mount a good \$450 or so beam at the top. We are not talking chump change when it comes to building a station to run with the big dogs!

I brought my friend up out of my workshop and into my shack. I showed him the various awards on my walls. I showed him the books full of QSL cards. I showed him the stack of cards waiting to get sent out through the bureau from the previous weekend's contest. Then I pointed to my station.



Uncle Skip's workshop is a gathering place for hams and soon to be hams

I told him I never spent more than \$400 on a transceiver until my recent building of the Elecraft K2. The cost of that rig was still well under a thousand dollars and I only purchased it because of my strong desire to build my own rig. Add to that about fifty dollars in accessories and a couple of antennas strung out of wire bought at my local hardware store. Over the twenty-five years I have been a ham I don't think all the money I have spent on radios and equipment ever came close to the cost of a single modern "top of the line" transceiver.

Still, I can't remember a day in all of those years that I didn't think ham radio was the most fun I ever had with my clothes on! In other words, I was getting by just fine driving my economy car with well over a hundred thousand miles on it. Yeah, a Ford Mustang with a 500 cubic inch "crate" motor running plumbed-in Nitrous Oxide through a re-worked transmission to a nine-inch custom rear and the biggest Mickey Thompson street slicks I could tub into the back end of the car would be nice if I ever hit the lottery, but I wasn't going to stop driving just because I couldn't afford one!

So this entire exercise served to help get my friend's mind right about the reasonable costs of amateur radio fun. With that, we returned to my basement to strategize a bit about his particular antenna predicament. There was no reason in the world why I couldn't have this guy on the air before the upcoming weekend.

I looked around the workshop and found a spool of about 100 ft. of 14 gauge hookup wire. I then rooted around some more and found a well-used but functioning MFJ-901B "Versa Tuner." (I think I have about four of these things now and I suspect they breed in the damper corners of my basement.) I handed the wire and tuner to my friend and said "Go for it!" He looked at me as if I had three heads. "How am I going to work anything with that?" he said.

◆ The End-Fed Random Wire

Now for the place in this article where Old Uncle Skip tries to "learn ya'll sumthin'." The End-Fed Random Wire antenna has probably been responsible for more amateur radio contacts than all of the other antenna designs combined! Of course it ain't perfect (I have the RF burns to prove it), but it will put a signal out on the air. You probably wouldn't want to go head to head with that double-stacked beam arrangement we talked about earlier, but you'll never want for contacts either.

If you're partial to older, tube type gear and know the fine points of adjusting same, you can often load a random length of wire directly off of the rig's internal pi-network. This is not for the weak-hearted and is defi-

nately not recommended for modern solid state gear. It is very easy to generate stray RF when using a random wire antenna. At the very least you will need to tame the wire with an "L-Network," the most basic of antenna tuning circuits. You can find the design for this in any *ARRL Handbook* or *ARRL Antenna Book* as well as on a dozen or so websites.

Now if you want to get a bit more fancy, cut the wire to either 135 feet or 67 feet, and you can use it with most modern antenna tuners without much trouble, including newer transceivers that have built-in automatic antenna tuners.

I recently built an automatic antenna tuner circuit. I use this when I head out in the field camping. I toss a 67 foot wire up into the trees and let the tuner do the rest.

I sent my friend home with instructions to find a tree and I'd meet him Saturday night on 40 meters. He's been on the air ever since. He has returned the MFJ box and graduated to a pair of dipoles, one cut for 40 meters (that he also loads up on 15) and one tuned for 20. He's having too much fun to think any more about that big gun tower setup he saw in the magazine. And isn't that what ham radio is really about? Have Fun!

◆ Uncle Skip's Software of the Month:

HAMCALC version 48

By George Murphy VE3ERP

\$7.00 U.S. funds directly to George at: 77 McKenzie St.

Orilla, ON L3V 6A6

Canada

e-mail: ve3erp@encode.com

I can't remember exactly when I first ran across HAMCALC, but to someone like myself who spent more time trying to figure out how to ask the girl next to me out on a date than paying attention in math class, this disk is an essential tool. HAMCALC is a collection of most of the math formulae needed to enjoy all but the most advanced aspects of amateur radio.

Now in its 48th version, the CD-ROM includes over 250 math and design programs. It's refreshing to see somebody still writing software in GWBASIC! As such, this disk of programs can probably be adapted to almost any computer you have in the house. I keep an older PC down near my workbench largely to run programs just like HAMCALC when I'm working on radios.

And the price is right! As "Murph" puts it himself, the program is free; the \$7.00 is simply to cover the cost of materials and air-mail shipping anywhere in the world. Unless you can do quadratic equations in your head, you can probably benefit from having HAMCALC around the shack.

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We Realign the Philco *Transitone*

Back in January, we completed work on the Philco *Transitone* Model TH-14, a really cute little Bakelite table model. It worked as soon as it was plugged in, and normally my next (and last) step prior to reinstalling the radio in its cabinet would have been to tweak the set's alignment adjustments. But since, right now, I'm in a phase of writing for readers who are new to the antique radio restoration hobby, I put the set temporarily aside in order to discuss that all-important alignment tool: the r.f. generator.

Waiting on my "to do" shelf was a Triplet 2432 r.f. generator that I had purchased earlier for discussion on these pages. We used the last two issues of the column to go through the Triplet as an example of the type of instrument you might want to purchase for your own test bench. Now that it's up and running, we can use it to do any necessary realignment on the *Transitone* so that we can finally put the radio back together again.

Realigning a radio receiver may sound like a formidable task, but the steps are simple and logical, very accessible to the beginner, and go very quickly if the right preparations are made. The Philco is quite a simple set and so is going to make an ideal first alignment project.

◆ Essential Alignment Tools

Besides a signal generator with audio modulation capability (see discussion in the two previous columns), we will need some kind of meter to indicate the strength of the

receiver's audio output. There are several types of meters and hookups you can use, and a common strategy is to connect a VTVM (vacuum tube voltmeter), set for a.c. volts, across the radio speaker voice coil.

Now a VTVM is indeed a very handy instrument to have on your test bench. There's usually a good choice available for sale at radio meets, and they are not expensive or difficult to rehab and calibrate. I'm sure we will do a VTVM restoration project one day in this column. Yet only the most advanced radio service projects really require the use of such a sensitive instrument. And radio alignment doesn't need to be one of them.

For this project, I'm going to assume you have a meter no more exotic than the Radio Shack 20,000 ohms-per-volt VOM recommended in an earlier column. If you connect such a meter across a speaker voice coil, it might not be sensitive enough to give a reliable reading except with a very strong signal from the r.f. generator. Later, we'll see why that signal needs to be kept as weak as possible.

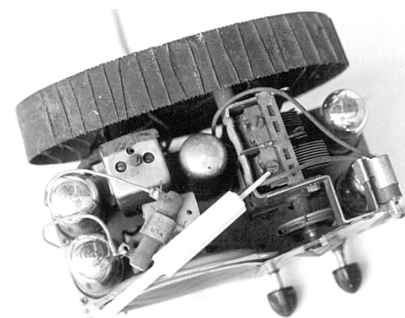
To get a decent indication from a conventional a.c. voltmeter, connect it from the plate of the last audio tube (in this case the 35A5) to ground, through a 0.1 mfd 600-volt capacitor (to block the d.c. also present in this circuit). In the Philco (see schematic published in an earlier issue), the metal chassis of the set is not used as d.c. ground. Instead, separate "ground bus" wiring is used to avoid connecting the chassis to one side of the a.c. line,

which is the usual safety hazard built into a.c.-d.c. sets. Instead of chassis ground, I connected directly to the negative side of one of the filter caps in the power supply.

For the alignment of the Philco, I deliberately used an even less sensitive volt-ohmmeter than the Radio Shack model – a vintage multitester having a sensitivity of only 1000 ohms

per volt. This, simply put, would make it 20 times less sensitive than the Radio Shack instrument. It was entirely satisfactory when connected as described.

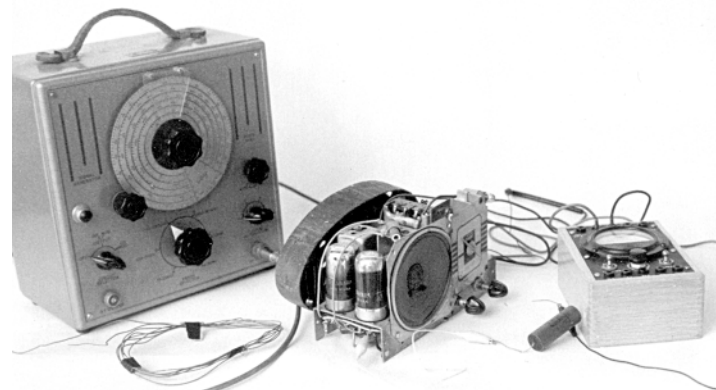
With the output indicator taken care of, I had to decide how to get a signal from the r.f. generator into the Philco. Since the radio was equipped with a loop antenna, I opted for the "inductive" method, which would avoid the necessity of making any direct connection to the set. All it took was a few feet of solid insulated hook-up wire bent into a several-turn loop about the same size as the set's own loop. This was taped to the back of the set's loop and its free ends connected to the output of the r.f. generator.



White alignment tool points to oscillator trimmer adjustment screw; r.f. adjustment screw is above it. Light colored can behind speaker holds first i.f. transformer; the larger holes in top give access to adjustment screws.

It's good practice to allow the radio and the generator to warm up and stabilize for about 15 minutes before making any adjustments. After that I was ready to begin the tweaking of the radio's i.f. (intermediate frequency) channel. To do this, one must set the r.f. generator to the frequency of the channel, which – in almost any radio built, say, after the mid 1930s – is 455 kHz. If you have a schematic for your radio, you'll almost always find the i.f. frequency listed somewhere on it. There are ways of determining an unknown i.f. frequency, but that's something to be discussed in a later column.

Try to get the service data for your set before attempting an alignment. Often there will be complete information about the loca-



The Philco as set up for alignment. R.F. generator at left, multitester at right. Wire loop in front of generator was taped to Philco's built-in loop to feed signal into set (see text).

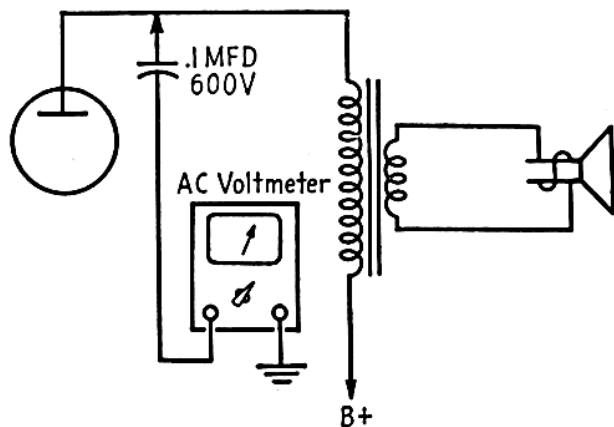
tion of all adjustment points, and a specific sequence of adjustment operations will be given. In the case of the Philco, the Rider's manual listing included little but the schematic and the i.f. frequency. However, generic procedures are more than adequate for this simple radio.

Finally, you'll need a non-metallic alignment tool as described in an earlier column where I discussed the outfitting of your workbench. Use of a metal screwdriver for alignment (1) is dangerous, because the i.f. transformer alignment screws often carry B-plus voltages and (2) impractical because the presence of the metal will affect the tuning of the circuit you are trying to adjust.

◆ Aligning the I.F. Channel

Setting my multimeter's a.c. volts range for 150 (to make sure that the meter wouldn't be pinned by a loud noise), I turned the Philco's volume control full on, switched on the r.f. generator's internal modulation, and set the instrument's r.f. output for a medium level. I was rewarded by hearing the modulated tone coming from the Philco's speaker and seeing a good deflection of the meter.

My next move was to reduce the output of the generator to the minimum amount that could be heard in the speaker and reliably deflect the meter. The reason that the signal must be kept small is to avoid engaging the set's automatic volume control circuitry. If that were to happen, any increase in gain obtained by adjusting the i.f. channel would be counteracted by the action of the avc – and therefore not be observable. In the end, I was able to change the meter setting to the 7.5-volt range – getting usable readings of just a few volts.



How to hook up a conventional VOM (set to an a.c. volts range) to serve as an alignment indicator. See text for details.

Now I was ready for the i.f. adjustments. Generally there are two i.f. transformers, each in a can with a pair of screwdriver-adjusted trimmer capacitors on top. The idea is to begin with the second i.f. transformer. This is the one situated closer to the set's detector/

first amplifier tube – in this case a 7C6. Readers who followed the earlier discussions of this Philco will remember that its second i.f. transformer is physically unusual, located in a small metal can under the radio chassis instead of the conventional tall can mounted “above decks.” It has only one adjustment trimmer, accessible from the top of the chassis near the tuning capacitor.

Most i.f. transformer adjustments have drifted seriously over the years, and it's very gratifying to see the significant increase in signal strength on the meter – multiplying itself manyfold as each succeeding adjustment is tweaked. I saw the expected major increase after adjusting the second-i.f. trimmer, and immediately had to reduce signal generator output to keep the meter at the desired minimum reading.

Subsequent adjustment of the first-i.f. trimmers resulted in an even greater increase in gain and prompted a further large reduction in signal generator output. After the first round of adjustments, one should repeat the procedure one or two more times to make sure the i.f. channel is delivering maximum gain.

◆ Oscillator and R.F. Adjustments

With the i.f. adjustments completed, the next move was to adjust the radio's oscillator circuit. This step properly sets the dial calibration. On simple radios like the Philco, the tuning capacitor will be a 2-section unit. If one of the sections has cut (slitted) plates (as in the Philco), it is the oscillator section. Mounted on top of that section will be a trimmer capacitor that controls calibration at the high end of the dial.

Before making this adjustment, turn the tuning capacitor so that the plates are fully engaged, then check to see if the dial pointer is at the lowest calibration mark on the scale. If not, move the pointer manually until it is.

Tuning the radio to a quiet spot between 1500 and 1700 kHz, I now set the signal generator to the frequency indicated on the radio dial. I was gratified to find that the signal came in at exactly that dial reading. If it hadn't, the adjustment trimmer would have brought it in. Be careful, though, the oscillator trimmer setting is very touchy and a tiny movement of the screw has a very large

effect! More complex sets may have a “padder” capacitor that is used to set the calibration at the other end of the dial (typically 600 kHz). We'll be demonstrating that type of adjustment in some future restoration project.

If in doubt about which of the sections of a tuning capacitor controls the oscillator, tune in a station and touch the stator (stationary part) of each section with your finger. But be sure you are powering the set through an isolation transformer – especially if is an a.c.-d.c. model! Your finger will detune the radio when you have touched the oscillator stator. But it will have little effect when you touch the other (r.f.) stator.

The final adjustment for this radio is the r.f. trimmer, which is mounted near the oscillator trimmer but over the other section of the tuning capacitor. This is also done at the high end of the dial. I adjusted the trimmer for maximum reading on my output meter, using the same r.f. oscillator and radio dial settings employed in the previous step. Some radios also have antenna trimmers (often found mounted on the antenna loop). This trimmer is also to be adjusted for maximum output.

See you next time, when we'll start another restoration project. I haven't made up my mind what it will be yet, but I have a couple of good ideas!

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Antennas Across the Spectrum: Part Two: The MF and HF Bands

◆ The Importance of Wave Propagation on Antenna Design

Just as on the lower bands, ground-wave propagation is the dominant mode of propagation on the MF band. However, the further we move toward the high-frequency end of the MF band, the more common sky-wave propagation becomes. Sky-wave propagation is when signals emitted from an antenna on earth travel to a layer of the ionosphere and refract back to earth one or more times.

In sky-wave propagation there is relatively little signal attenuation, so at times long-distance communication with very low power is possible. An advantage to this is that, using moderate power levels, fairly reliable communication paths can be established by considering the relatively predictable nature of sky-wave propagation conditions. Antennas which launch their signals at low vertical angles above the horizon support long-distance sky-wave com-

munication. On the other hand, high vertical angles (NVIS) can sometimes be used when ground waves are blocked by obstacles such as mountains. NVIS antennas must radiate signals at high vertical angles allowing the signals reflect back down to earth relatively near the transmitting antenna.

At the high MF frequencies and low HF frequencies sky waves sometimes return to earth close enough to the transmitting antenna to interfere with the antenna's ground wave signals. This can produce signal fading where these waves combine, and has led to the development of antifading antennas. These antennas produce radiation patterns which significantly reduce sky waves, and thus reduce interference to the station's ground wave from its own sky waves (see fig. 1).

As we move up in frequency in the HF band, ground wave communication becomes relatively unimportant, although it is still effective for increasingly shorter distances.

◆ Transmitting Antennas for the MF and HF Bands

The size of antenna elements is generally directly related to the wavelength for which the antenna is designed. And, the higher a signal's frequency the shorter its wavelength. Therefore many of the antennas we discuss this month could literally be dwarfed by those we discussed last month. Recall that at the VLF and LF wavelengths the length of some antennas' elements are measured in miles. This month we find element lengths shrinking to hundreds of feet on the MF band and even on down to tens of feet on the HF band.

Due to the smaller size of elements on these bands many antennas can be designed for the MF, and particularly the HF band, with greater gain than is possible on the lower bands. Good directivity is also relatively easy to achieve at the upper end of the MF band, and more so on the HF band.

As on the lower bands, ground-sited vertical antennas are very useful. The quarterwave vertical is perhaps the most

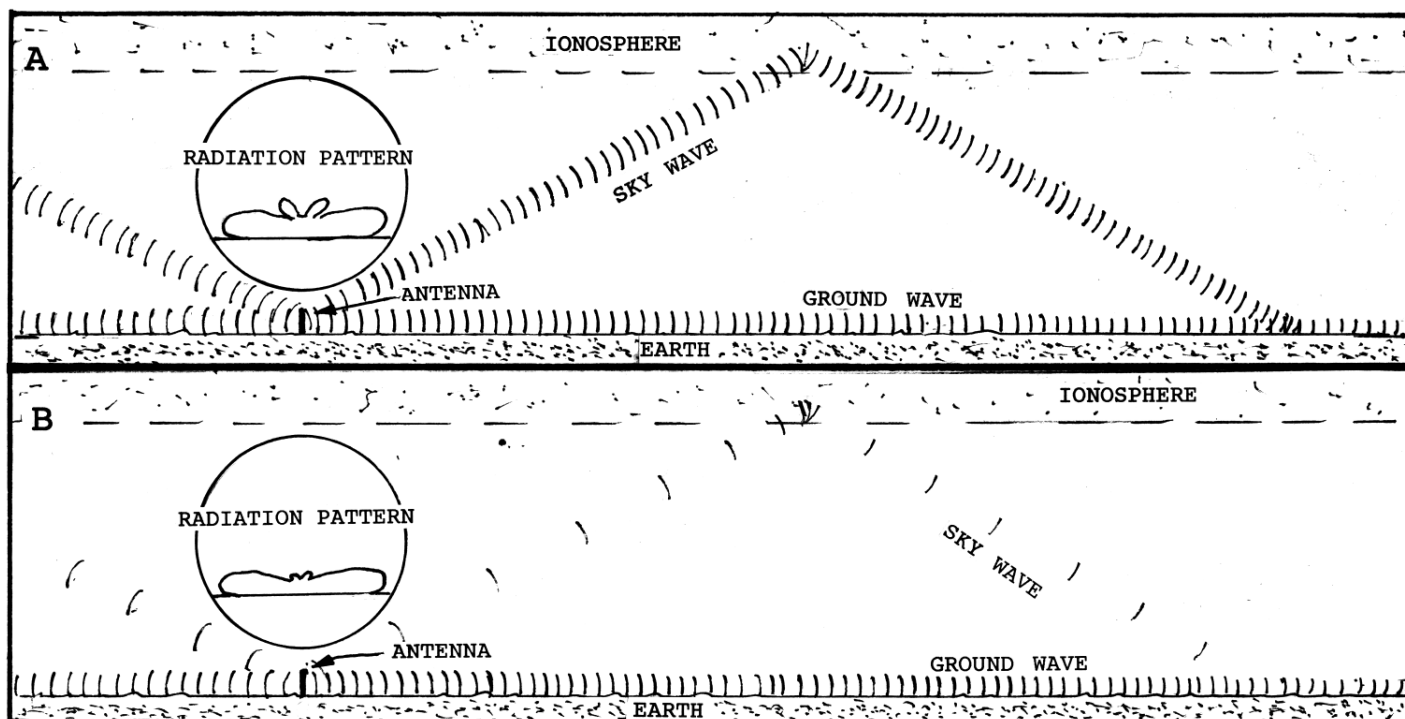


Fig. 1. A vertical antenna which produces sky waves that interfere with its ground waves thus causing fading. (A). An antifade antenna which produces an insignificant amount of sky waves, and thus reduces fading.

This Month's Interesting Antenna-Related

Web site:

Looking for an antenna Elmer? (Elmer is ham-talk for "friendly teacher.") Try <http://members.home.net/ac3l/antenna.htm>.

common; however, other electrical lengths such as the halfwave and $\frac{5}{8}$ wave verticals are useful. The longer elements generally give increases in useful signal-strength gain, with the in-line (collinear) multiple-element verticals offering the greatest useful gain. They also give low-angle vertical, nondirectional radiation. The ground-sited verticals require a good ground-radial system for efficient performance. The groundplane antenna, which utilizes non-grounded radials, is popular in the upper frequencies of the HF band.

Dipole antennas are quite common on these bands. Whereas the various halfwave dipole designs are typical, we also find application for dipoles both shorter and longer than a halfwave. Typically sited horizontally, these antennas provide decent gain levels along with relatively nondirectional coverage (at typical heights their nulls are not too deep).

The various beam-antenna designs offer both gain and directivity. The simplest are the wire beams which include the long-wire, the V, and the rhombic. Although these antennas are capable of good directivity and gain, they require a lot of space, particularly as they are mainly utilized at the low-frequency end of the HF band and lower.

Phased array beams utilize multiple elements which are all driven (connected to the source of transmitter power). Typically they give fair directivity and gain levels. Most phased designs can be made switchable in direction; however, on MF and lower frequencies they can require a lot of space.

The various curtain beams are capable of fairly high gain levels and relatively narrow beam widths. They are quite large, and their primary application comes in long-haul HF broadcasting.

Parasitic beams (some elements are not connected to the source of transmitter power), such as the Yagi-Uda and cubical quad, offer good gain and directivity on the upper half of the HF band. At considerable expense they can be had across the lower half also. Above 10 MHz they can be built small enough to mount on a modest size tower and to rotate by remote control to any compass direction.

Many of the antennas discussed here can be made multi-band by any of several means. Nevertheless such antennas are relatively narrow banded compared to frequency-independent antennas such as the

log periodic dipole array. An LPDA can provide good gain and directivity across a wide section of the spectrum.

◆ Receiving Antennas for the MF and HF Bands

We usually want a transmitting antenna to be efficient, and radiate a maximum of power. However, as we discussed for VLF and LF antennas last month, receiving antennas on MF, and usually also on HF, needn't be very efficient. This is because the quality of reception on these bands is determined not by the level of received signal, but by the ratio of received-signal strength to the relatively-high level of received noise on these bands. Antenna efficiency then becomes more important in situations where received-noise levels are very low. Typically these situations are in very rural areas, in latitudes toward the poles, or in the higher frequencies of the HF band when noise conditions are favorable.

Antennas tend to have the same gain, directional patterns, feedpoint impedance, and so forth whether utilized for transmitting or reception. Due to this "antenna reciprocity" we find that it is very common on the HF, and even on the MF band to utilize the same antenna for both transmission and reception. However, there are many exceptions to this practice.

As on the VLF and LF bands we find active antennas and small (desk-top) loops antennas useful and convenient in many reception applications. The Beverage (wave) antenna is very directional, and, although it can be used for transmitting it is quite inefficient. Its main employment is as a receiving antenna at the low end of the HF band and lower. It requires a lot of real estate to erect. Random-length wire antennas, usually the higher and longer the better, offer good performance for many HF and MF listeners with minimum expense.

There are many other antenna designs available besides the more common ones which we cover in this survey. We'll discuss many of them in upcoming columns.

◆ Unusual Antenna Contest!

Do you know of an antenna that is quite different in appearance or function from the ordinary antennas we see everyday in the cities and countryside? One highly unusual or even

weird? If you do, send me a photo or sketch of it, any information you have on the antenna, and your reasons for choosing this antenna for entry in our contest. We'll publish the entry I judge most appropriate in this column, and award an antenna book to the winner!

RADIO RIDDLES

Last Month:

I said "Enough of this play on the term 'radio,' OK? Now tell me who invented radio? Hint: This may be a trick question!"

The trick is that there is not one "who," but many. Among those variously credited with the honor are Tesla, Marconi, Poppov, Dolbear, and Loomis.

This Month:

Who first convincingly demonstrated to scientists the electromagnetic waves we now call "radio waves"?

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.

Longwave Resources

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

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The Kiwa Pocket Loop is a 12.5 inch diameter TM 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.

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I Command You To Scan!

Last time we looked at the Game Commander 2 voice command software (<http://www.gamecommander.com>) applied to the control of an ICOM R7000 via a program called RadioMax. We saw that voice command of a receiver, or for that matter any keyboard command-based program, can be fairly reliably controlled by an inexpensive software product. My past disappointing experiences with voice input were quickly, and firmly, reversed by Game Commander 2. Not to be left out of a technological breakthrough, Microsoft has introduced a product which is also capable of adding voice command to your computer. But does it work with our radios? Let's see.

SideWinder Game Voice is Microsoft's first foray into voice input. When I opened the box I was surprised by what I found, dare I say ithardware! Where the Game Command 2 is a software only product that utilizes the sound card in your computer, not so for the Game Voice.

At a minimum, to use Game Voice you will need a 233 MMX Pentium system, 64K of RAM, 45 MEG of hard drive space, a 4x CD ROM drive, full duplex sound card, 256 color SVGA display, Windows 98 and a USB port. Although by today's standards this is nothing special, it certainly blows away the idea of utilizing a cheap older computer. In addition, the computer must have Microsoft's DirectX version 8. This can easily be obtained free of charge from Microsoft's website, <http://www.microsoft.com/sidewinder/swupdate/>.

In comparison, Game Commander 2's hardware requirements are less, and do not require a USB port, 65K of RAM, Windows 98, nor the connection of a control box and its associated wiring.

◆ Software Installation

Make sure you install the software *before* you install the hardware. This is so the USB port device can be correctly detected. Version 1.0 Software for the Game Voice is quickly installed from the included CD ROM. After you install the software from the CD ROM, you should download the latest version (currently 1.2 beta) from the Microsoft website. Having tried both, I believe version 1.2 beta seems a bit quicker and has better recognition accuracy. Also, version 1.2 does not automatically start up

your internet connection, which is necessary for the internet chat function. For our voice-control-only applications we don't want, or need, to activate the modem. So, right now, version 1.2 is your best bet.

◆ Hardware Installation

Microsoft, the king of software, designed Game Voice around a control box which uses the computer's USB port and the sound card. The flying-saucer-shaped control box is the heart of Game Voice. See Figure 1. The supplied Plantronics boom microphone/stereo headphones are connected to it via two plugs. A three plug cable, hardwired to Game Voice, is then connected to the USB port of your computer and the sound card's microphone and speaker jacks. Finally, your computer's speakers are reconnected into a junction box on the Game Voice cable. (A surprisingly hardware intensive installation from the king of software...)

The control box does provide the user a speaker/headphone volume control. Also a switch to choose between the two is provided. Having these controls at hand is very convenient for many non-Game Voice applications.

Installing the software automatically takes you through level settings for the microphone and speakers. Make sure you pay particular attention to the microphone level. I found this a bit tricky with the original software, which set the level much too high. This resulted in performance so poor I almost gave up on Game Voice. I realized the microphone level was set too high when my wife called me from another room and the screen responded "Not Recognized."

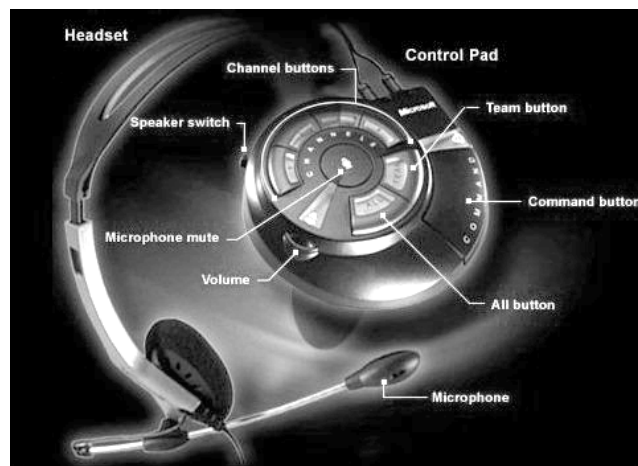


Figure 1 - Microsoft's Sidewinder Voice Control Hardware

◆ His Master's (Game) Voice

Figure 2 displays the Game Voice main display screen. Game Voice, like Game Commander 2, actuates keyboard keystrokes when it recognizes a voice command. Therefore, the user must define which associated keystrokes are to be "pressed" when a word or phrase is recognized. This is done by clicking Profile Options, then New. Once you enter the name of your new command file, you can type in commands and their corresponding keystrokes. Figure 2 shows the eight commands I have set up for controlling RadioMax with Game Voice.

Be sure to set the command function to Multiple Commands by clicking Game Voice Settings and then the Command tab. Then the voice command mode will be continuously active once the button is pressed on the control box, instead of being in a push-to-talk mode.

Once programmed, using Game Voice is as easy as clicking its icon, selecting the appropriate user-generated command file (JFC-RadioMax) and then starting RadioMax. Say the command and the computer will respond just as if your fingers were punching the keyboard. It's that easy. And it works very well. This again proves that voice input is real and here to stay.

◆ Game Voice vs Game Commander 2

The first difference is that Game Voice comes with quality stereo headphones with a boom microphone. The Game Commander 2 headset is a single earphone unit, and therefore mono only.

Game Commander 2 provides two different sounds when you speak to it; one is to acknowledge recognition of your voice command and a different sound to tell you it did not understand. The program also allows the user to record "wav" files for each command. These are then "spoken," in place of the simple sounds, when recognition takes place. Although I did not try the wav file feature, I found the audio acknowledgment feature of Game Commander 2 to operate erratically on two different computers.

Game Voice fared better with its audio acknowledge feature... well, almost. Game Voice provides synthesized voice (male or female) response which "reads" and repeats your command. No voice recording, or wav files required. Conceptually, the guys at Microsoft got this one right. But, for some reason, which I as-

sume is related to memory space usage and/or the sound card, the voices usually start out sounding like they are playing at much too slow a speed. I found that when I loaded Microsoft Flight Simulator 2000 after Game Voice, the voice became normal.

◆ Who's Got The Speed? Surprise!

For both the Game Voice and the Game Commander 2, speed of operation is not an issue for our relatively slow receiver applications. However, it seems to me that the additional hardware and use of the USB port does not make the Game Voice faster. In fact, I think that the Game Commander 2 has a speed advantage. This was most noticeable on my slower Pentium 233 machine where it made a real difference of about a 0.5 second. Game Voice's delay makes trying to pause a fast scan on a specific frequency a bit difficult.

◆ Try the Future - Get One!

I'll leave the choice to you. But if you

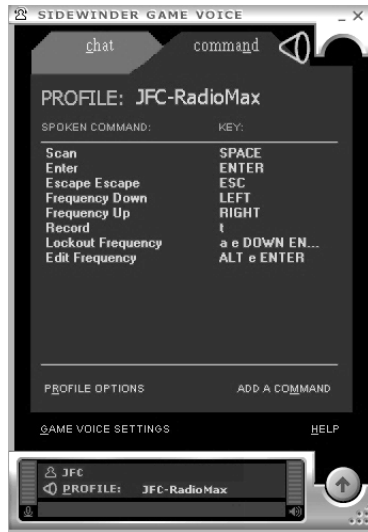


Figure 2 - Game Voice's Main Screen Setup for RadioMax

want to try the future, voice command technology is here and the price is right.

Microsoft's SideWinder Game Voice retails for around \$50. Also, check your local discount clubs, such as SAM's Club, where I purchased it for \$39.95. See <http://www.microsoft.com/sidewinder> for more.

Game Commander 2 is available for downloading at their website for \$29.95, obviously without microphone and headphone. For \$39.95 you can receive the software on CD ROM and the headphone and boom microphone. Check their website at <http://www.gamecommander.com> for details.

Keep in mind that neither of these products is aimed at the receiver control market, but at the computer and internet gaming markets. Therefore, we have not covered many of their gaming features such as voice communications over the internet to fellow gamers.

I have yet to find a receiver program that does function with these products. This includes RadioMax, ScanStar, Radio Manager and ScanCat. However, since these products simulate keystrokes, their usefulness

will depend on the control methodology of the receiver control program. Obviously, if the program uses cursor positions and mouse clicks, with no keyboard equivalents, these voice command programs will have limited use. Therefore, look for programs which are keyboard driven.

◆ Apologies from my Fingers

In a recent column on the AOR standalone ACARS decoder, I compared its price to that of a used Pentium laptop. Since I had just purchased this type of laptop for a family member I knew its price was around \$350. Problem is, my mind said 350 but my fingers typed 250. Sorry for any inconvenience that this honest mistake caused. Where is voice input when I really need it?!

◆ Next Time - I Promise

This new voice technology grabbed me by the throat and made me write about it. But as promised, next time we will go back to looking at what the future will bring to ACARS and aircraft data communications. I promise ...that is if I don't discover a major technology product breakthrough that we must share.

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Yaesu VR5000 Wide Coverage Receiver

Following quickly the release of AOR's AR8600, Yaesu has begun shipments of their VR5000 wide-frequency coverage (100 kHz-2600 MHz, less cellular) receiver. Intended for mobile or desktop operation, as is the AOR competitor, the VR5000 is also quite compact (7"W x 3"H x 8"D) and lightweight as well (4-1/2 lbs). Its front-lift legs tilt the viewing angle up to the user for desktop operation, revealing the bottom-mounted speaker which delivers its 1 watt of audio loud and clear.

This multi-mode receiver offers a selection of WAM, AM, NAM, WFM, NFM, FMN, USB, LSB, and CW. Depending upon the mode selected, a variety of tuning steps may be chosen, from as fine as 20 Hz to as coarse as 500 kHz.

An optional digital signal processor (DSP) module is available as an extra-cost option from your dealer. It is a very useful accessory, providing tunable notch filter, bandpass filter, CW peaking filter, noise reduction, and CW pitch change. Other cost options include an 8 second digital audio recorder and a digital voice annunciator for the current frequency setting.

A rear-panel connector accommodates one PL-259 coax antenna line for the entire frequency range; alternatively, an A/B switch selects a pair of spring terminals to attach either a balanced ("twin lead") or separate antenna and ground wires. If separate antennas are preferred for above and below 30 MHz, an external antenna switch or multicoupler will be necessary.

Also on the rear panel are RCA jacks for +8VDC @ 100 mA to power external accessories, a mute feature, and a 10.7 MHz IF output for an external spectrum display unit. A pair of 3.5 mm (1/8") audio jacks provide 4-16 ohms output for an external

speaker and 1000 ohm line output for a recorder or data demodulator.

A nine-pin sub-D connector invites computer control via the user's own RS232C cable; Yaesu does not produce software for this product.

◆ A Multitude of Functions

Yes, the front panel is quite busy. Keys are small, and nearly all of the 35 buttons and knobs have two functions. A key-lock-out command disables all front panel controls from accidental resets.

The backlit LCD is easy to read, with custom brightness and contrast user-selectable. Two volume controls are a clue that this rig allows dual reception; a second frequency may be selected within +/- 20 MHz of the primary receive frequency for instant

◆ Sensitivity

Tested alongside an ICOM R8500, we could detect little difference in weak signal reception between it and the VR5000. Published specifications show typical sensitivity in the HF range to be 0.3 microvolts for SSB, and 1 microvolt for AM; at VHF/UHF, 0.3-0.4 microvolts for SSB and NFM. These are quite respectable.

An "RF Tune" function allows a manual peaking of the desired signal, a sort of preselector. Its effectiveness in our test was marginal at best.

◆ Selectivity

As with virtually every hand-held and mobile wide-frequency-coverage receiver on the market, the IF filters are modicum. They do a fair job, but there are many instances where you wish the skirts were steeper and deeper to reject adjacent-frequency interference. The VR5000 is certainly no worse in this respect, and is actually a little better than some competitors, especially the hand-helds. Understandably, the manufacturer does not provide selectivity specifications.

An attenuator may be invoked for instances of strong-signal overload, and a noise blanker effectively reduces pulse (spark) interference.

◆ Dynamic Range

One common feature of all wide-frequency-coverage consumer receivers and scanners in the low- to mid-price class is their limited dynamic range, compromising their ability to handle strong signals without overloading. This produces unwanted products like intermodulation ("intermod") or desensitization.

The VR5000 is no exception. Connected to an efficient outdoor antenna, spurious signals will be heard on various parts

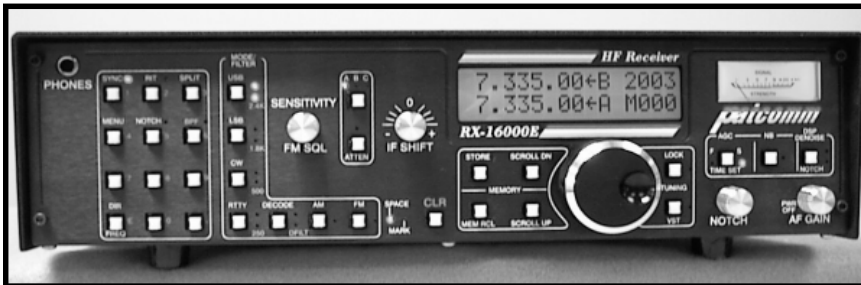


priority watch or simultaneous monitoring.

Both signals are activated by one squelch control; a separate tone control allows comfortable bass/treble adjustment.

The VR5000 memorizes the contents of up to 2000 channels in 100 banks, and allows up to 50 stop/start search ranges to be stored as well. One bank comes factory loaded with an erasable assortment of international broadcast frequencies. The scanning speed is approximately 16 steps per second, and channel identifications can be alphabetical or numeric.

A clock alarm sleep/timer also provides a world time clock function, displaying a global map with time zones.



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of the spectrum where they shouldn't be. While invoking the attenuator dramatically reduces the interference, it also reduces desired signal strengths.

◆ Spectrum Display

Small, wide-coverage receivers lend themselves particularly well to spectrum surveillance, and the VR5000 fits the task. Its built-in spectrum display unit presents a panorama up to 10 MHz wide, with simultaneous audio recovery in any mode appropriate for that step/range.

One apparent software glitch that is very irritating is that even though the user can enter his choice of sweep step, as soon as the tuning dial is turned to access a frequency, the step immediately reverts to its factory default.

As with all affordable LCD bandscoopes, sweeps are sluggish, not "real time," so on/off keying is likely to be missed, especially on wider sweep spans. But for finding continuous signals, or searching small spans, it is excellent and intuitive to use.

At first thought, an option for real-time display would seem to be the use of an external CRT-type spectrum display unit (SDU) like the popular AVCOM SDM-42A plugged into the 5000's 10.7 MHz IF output jack. But the bandwidth of the VR5000 filters is quite narrow, limiting the display to a few hundred kilohertz, too narrow for reasonable spectrum analysis.

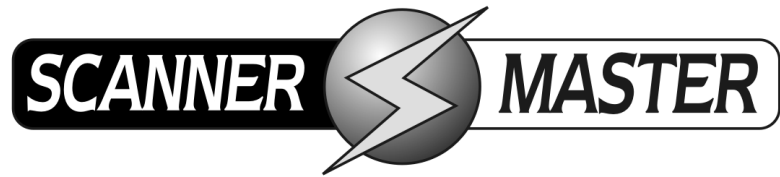
The dynamic range limitation is quite visible in the bandscope mode, filling the display with background noise when the receiver is connected to a good antenna. With the attenuator in place, the noise disappears, but so do spikes that would indicate the weaker signals.

◆ The Bottom Line

It's easy to be critical of any product, but the fact remains that the Yaesu VR5000 offers a great deal for the money. It is small, easy to operate, has wide frequency coverage, exhibits acceptable dynamic range and selec-

tivity, excellent sensitivity, and clear audio. The display is easy to read, the radio has direct frequency entry as well as a tuning knob, and an abundant variety of supportive features. An AC adaptor, DC cord, and full manual are included.

The VR5000 retails for around \$900 from MT advertisers including Grove Enterprises. Bob Parnass will be reviewing its performance on VHF/UHF in an upcoming column.



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AOR AR8600

The AOR AR8600 is a wide coverage, multimode receiver built in Japan. It replaces the AR3000 that we reviewed in November 2000 *MT*. The AR8600 is both a shortwave and VHF/UHF receiver, tuning AM, FM, and SSB signals in the .53 to 2040 MHz range. Three AM bandwidths, three FM bandwidths, CW, USB, and LSB are supported.

The AR8600 is powered by 12 - 14 VDC or from the AC mains using the provided wall wart power supply. A telescoping antenna and a tiny, removable AM broadcast antenna are included, but no mobile mounting bracket is supplied or mentioned in the user manual.

Extra cost options include a dealer-installed eight AA 700 mA/14 NiCd battery pack and five "slot" cards which can be plugged into edge connectors on the rear panel; TE8200 tone eliminator; CT8200 CTCSS squelch; VI8200 inversion descrambler; RU8200 20-second audio recorder, and EM8200 secondary memory. We tested AR8600 serial number 551028, but have none of the options to evaluate.

◆ VFOs, Memory, Scanning, and Searching

The AR8600 has two VFOs and displays the frequency of both simultaneously. The tuning step size is more flexible than found in most receivers. It is adjustable, regardless of emission mode, in 50 Hz increments up to 999.95 kHz, with an additional choice of an exact 8-1/3 kHz. The Yaesu VR-5000 restricts step sizes depending on mode which prevents tuning FM signals using a 1 kHz step, even though a 1 kHz step is available in SSB modes. You can offset the AR8600 tuning if you want to tune only the interstitial channels, e.g., use a 25 kHz step size to tune 470.0125, 470.0375, 470.0625, etc.

The VFOs are handy for general band tuning or searching, using both VFOs to designate upper and lower limits. Our AR8600 often stops a few kHz away from a signal's center frequency. Up to 50 frequencies may be skipped. The AR8600 will not stop on signals within 10 kHz of designated skip frequency.

In addition to searching between the VFO limits, there are 40 pairs of search limits available. They can be linked together, though the step, mode, and attenuator settings can differ for each one. Each search bank also supports up to 50 "pass" (skip) frequencies.

An Auto Store facility stores active frequencies into a memory bank. The AR8600 stops on the active frequency during an Auto Store and you can hear the audio. It will not resume searching until end of transmission, de-

pending on the search settings.

The 1000 memory channels are divided into 20 banks, designated A, a, B, b, etc. Initially, each bank has 50 channels, but you can re-portion 100 channels between bank pairs. For instance, bank A can contain 15 channels and bank a can hold the remaining 85 channels.

An alphanumeric label can be programmed



for each memory channel, memory bank, and search bank. Banks can be scanned individually or in combination.

◆ Physical

The AR8600 is ruggedly built in a clamshell metal cabinet with cast metal front and rear panels. It "feels" like an expensive radio and won't walk off the desk when keys are pressed. The tuning, volume, and squelch knobs are rubbery and easy to grasp. The green LCD display and keypad are brightly lit, and you can adjust the LCD contrast to suit.

A standard DB9 connector is fitted on the rear panel so a computer may control the AR8600. AOR thoughtfully documents the computer commands in the user manual.

A 10.7 MHz IF output jack is provided but is disabled, as verified by connecting HP spectrum analyzer. The user manual advises that enabling the IF output is an operation which "should be carried out in a workshop," but doesn't tell how. An odd, 8-pin jack on the rear provides unfiltered detector output, high

and low level audio outputs, and tape recorder switching. This is a \$900 radio, but AOR doesn't include the mating connector.

◆ Performance

Our AR8600 performs fairly well on VHF/UHF, though we confined testing to frequencies below 1300 MHz. The image rejection, audio, intermod immunity, squelch tail length, and sensitivity are on par with good scanners. We found several birdies (see table), some wide enough to interfere with reception on adjacent frequencies. At 13 channels/sec, our AR8600 cannot be declared a fast scanner.

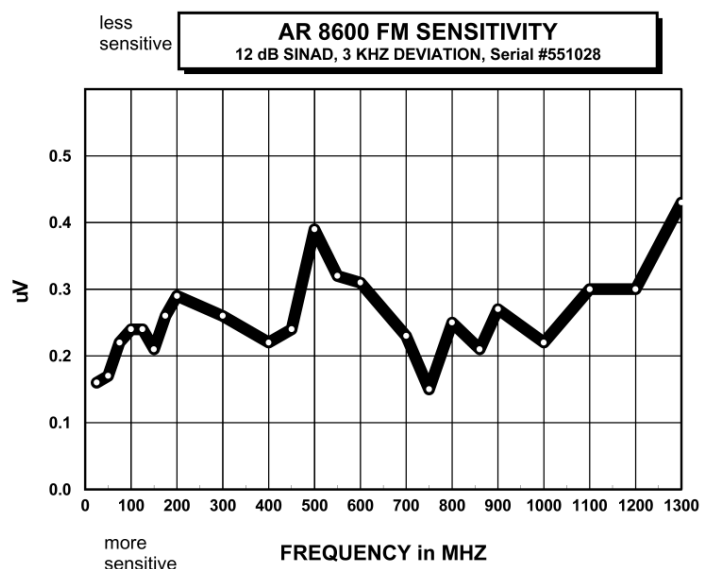
Bob Grove wrote about the AR8600's shortwave performance in February 2001 *MT*.

For this review, we compare shortwave reception of our AR8600 side by side with a Yaesu VR5000 (s/n 0L040004), Japan Radio NRD545 (s/n RG05179), and ICOM IC-R8500 (s/n 01075). They share the same 132-foot center-fed Zepp antenna through a Mini-Circuits ZFSC-4-1 passive splitter (6+ dB loss, see June 1999 *MT*).

Our AR8600 and VR5000 are overloaded below 30 MHz without attenuation and are severely stricken with AM broadcast intermod. Our AR8600's attenuator reduces, but does not eliminate the problem. The more expensive NRD545 and IC-R8500 are nearly intermod free and a pleasure to use under the same conditions.

◆ Wrapup

The AR8600 is solidly built. The wide spectrum coverage, front panel illumination, flexible



step sizes, and adjustable memory banks are as-sets we'd like to see in more receivers. It oozes with features and options, but the multiple key-pad sequences make the AR8600 maddening to use and program. Changing the mode and step size requires at least four key presses, for instance. The 143-page AR8600 manual is much more comprehensive than the Yaesu VR5000 manual, despite a few omissions.

Our AR8600 is a poor performer below 30 MHz, where it overloads too easily when using an outdoor antenna. VHF and UHF performance is on par with other scanners.

AOR AR-8600 Birdies (partial list)

33.27, 44.6, 49.15, 115.2, 117.96, 121.185, 122.88, 127.795, 143.655, 152.375, 157.285, 162.2, 167.115, 172.03, 222.97, 222.995, 240.85, 250.675, 260.5125, 267.5875, 267.6125, 275.25, 285.0875, 294.9125, 314.575, 324.4125, 329.325, 339.15, 348.9875, 353.9, 356.8125, 358.8125, 368.65, 378.475, 388.3125, 398.1376, 403.05, 412.8875, 413.125, 445.95, 490.95, 506.275, 820.85, 904.4125, 924.075, 926.4125, 933.9, 936.0, 943.7375, 950.4, 963.4, 964.8, 965.2, 971.475, 981.1375, 992.8875, 993.6

Measurements

AOR AR-8600 Receiver S/N 551028

Retail: about \$900
AOR U.S.A., INC.
20655 S. Western Ave., Suite 112
Torrance, CA 90501
Phone: 310-787-8615
Fax: 310-787-8619
http://www.aorusa.com

Frequency coverage (MHz):
0.1 - 2040

Steps: 0.05 kHz - 999.95 kHz
in 0.05 kHz increments

NFM modulation acceptance: 9 kHz

Attenuator:
12 dB @ 14 MHz
15 dB @ 40 MHz
14 dB @ 155 MHz
13 dB @ 460 MHz
9 dB @ 860 MHz

Intermediate Frequencies (MHz):
1) 243.85 or 754.85
2) 10.7 or 45.05
3) 0.455

Image rejection due to 1st IF:
59 dB @ 40 MHz
66 dB at 155 MHz
43 dB at 460 MHz

Audio output power, measured at speaker jack:
550 mW @ 10% distortion

Squelch tail near threshold (1 μ V @ 155 MHz): 30 ms.

Practical memory scan speed: 13 channels/sec.
Search speed: 33 steps/sec.

◆ Collectors' Corner

If you have crystals to sell or are looking to purchase used crystals, check out the Crystal Exchange web site at <http://senac.com/boards/880>.

The Fanon/Courier brand was popular back in the days of crystal controlled scanners. Fanon offered several portable, mobile, and desktop models.

The Fanon Scanfare M8-HLU (fig. 2) is an 8 channel mobile model covering 30 - 50, 146 - 174, and 450 - 475 MHz. It is small for a 3-band scanner, measuring only 5 inches wide. The double conversion circuitry employs 10.7 and 0.455 MHz IFs.



There are no cumbersome jumper wires for band programming like the Electra/Bearcat BC-12. Instead, you plug each crystal into a different position on a multi pin crystal socket depending on the band of operation.

The M8-HLU is powered by 12 VDC and requires an optional AC wall wart for base station use. Our M8-HLU was manufactured in 1986 and they sold for about \$100 until 1990.

More than just radios...

You probably know all about the great value of **ADI** brand transceivers, but **PRYME Radio Products** makes more than just radios. In fact, we manufacture a full line of aftermarket accessories for all kinds of radios, not just our own! Our line includes accessories for Kenwood, Icom, Yaesu, and many more! From Family Radios, to scanners, to amateur or commercial handheld radios, we have the right item for the job. Our accessories are reliable, innovative, and affordably priced.

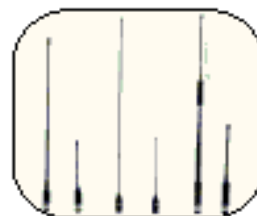
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Our innovative audio products have made us famous. From the comfort of our SPM-400 mini-boom microphone to the low-profile of our EH-1 "invisible" ear phone and SPM-700 surveillance mic, we have the right accessory for the job!



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Cobra's Snazzy microTALK Professional 2000WX

It seems like everywhere I look, people are adopting Family Radio Service (FRS) handtalkies. It also seems like the number and variety of places where you can buy FRS gear keeps expanding – office supply stores, discount houses, electronics stores, mail order catalogs, the Internet, and so on.

And it's little wonder: FRS radios just plain work great for very short range communications. Sure the manufacturers all claim "up to two miles," but the reliable distance that you can count on under virtually all conditions is something like a quarter to a half mile. (To be fair, there have been documented cases of FRS communications over much greater ranges, but when we're talking about reliable communications, it is better to underestimate.)

Still, these diminutive FRS handtalkies offer crystal clear communications with easy operation and no need for a license. People are using them in all kinds of outdoor activities, at public venues to keep members of a group in contact, for communications between cars caravanning on a trip, and even as inter- and intra-building intercoms. Once you start using FRS, there's almost no end to the applications that keep popping up.

I've heard only two consistent complaints about FRS radios. First, they are expensive. And, for a long time, they were. But prices have dropped, and now you can buy decent FRS units for a third what they cost not long ago.

Second, in many applications, a bit more range would be welcomed. Cobra Electronics was listening and has an answer. At the Consumer Electronics Show in January, Cobra announced the addition of two new professional models to its microTALK line of FRS products. According to Cobra, "The microTALK Professional series offers five-mile range of the Professional 1000 and Professional 2000WX and Emergency Weather Alert and 10-Channel NOAA weather capabilities on the Professional 2000WX."

MicroTALK Professional

The 2000WX is a handsome unit,

measuring about 5 inches high (excluding antenna) by 2.25 inches wide, by 1.375 inches deep (excluding belt clip). The case, lightly sculptured for easier gripping, is a metallic copper mist colored plastic.

On the top of the case, there is a sturdy flexible rubber antenna (which is removable) and a knob that controls power and receive volume. On the left side, there is a soft rubber button for push-to-talk and a Monitor button for defeating the auto-squelch.

On the right side are removable rubber covers that give access to jacks for an optional power cord and various optional speaker-microphones. On the back, there is a large plastic belt clip and a hatch for installing the six AA alkaline batteries that power the 2000WX.

On the face of the 2000WX, you'll find a backlit liquid crystal display that shows "what's up" with the 2000WX, Up/Down and Call buttons, a Function button, an Enter button, a Hi/Lo/Lock button, and speaker/microphone grill.

The 2000WX puts out 2.3 watts (high power) or .5 watts (low power) on 15 channels:

462.5625
462.5875
462.6125
462.6375
462.6625
462.6875
462.7125
462.7500
462.6250
462.6750
462.5500
462.6000
462.6500
462.7000
462.7250

Don't forget the license

The first seven channels are shared with the Family Radio Service, but the last eight channels are General Mobile Radio Service only. As a re-

sult, on the very first page of the manual, Cobra clearly states, "The PR 2000WX Professional radio operates on General Mobile Radio Services (GMRS) frequencies which require a Federal Communications Commission (FCC) license." The manual then goes on to give the phone numbers that are needed for obtaining the appropriate licensing forms or for contacting the FCC.

Cobra has done the right thing in pointing out that a license is needed. Nevertheless, because the first seven channels are shared by FRS, which needs no license, and GMRS, which requires a license, it wouldn't shock me to find people using these radios on the first seven channels, at least, without bothering about a license.

In addition to 15 channels, the 2000WX offers a bunch of goodies in an attractive package: 10 weather channels, weather alert, 38 continuous tone-coded squelch system (CTCSS) tones, roger beep, dual watch, 10 memory channels, memory scan, dual power, and a battery saver circuit. The 2000WX does not, however, offer GMRS repeater capability.

Even better, the performance sparkles. On high power, it offers easily double the range of the best FRS unit I have ever tested. Audio is crisp and clear, and the unit is easy to operate. In addition, the main weather channel in my area sounded absolutely terrific on the 2000WX. About the only quibble I have is that, if you have the volume cranked waaaaayyy up to hear someone who is very soft-spoken, the roger beep tones come through as absolutely thunderous! On balance, this is a teensy gripe compared to the otherwise stellar performance of this radio.

In short, if you want a handtalkie for communications over better-than-FRS ranges and the ability to receive weather information and alerts as well, I can wholeheartedly recommend the Cobra Professional 2000WX. But, don't forget about that license!

Suggested retail price of the 2000WX is \$179.99. For more information about Cobra Electronics and its products, visit <http://www.cobraelectronics.com> or call 1-773-889-3087.





WiNRADiO AX-31B Planar Antenna

by Bob Grove

WiNRADiO, an Australian company famous for innovative computer-hosted receiving products, has just released their AX-31B active VHF/UHF antenna. Although designed primarily for their own receiver line, the antenna works just as well on any VHF/UHF scanner or other receiver. It is not capable of transmitting.

The planar (flat plate design) enables the 8.5" x 11.5" board to be hung on a wall, or even on a window. A six-foot length of RG-58/U cable terminated with a BNC connector leads the signals to a nearby radio.

Architecturally, the layout incorporates a log-periodic dipole array (LPDA) antenna design etched on both sides of a fiberglass circuit board; an integral, solid-state preamp is part of the same board. The antenna is impedance-matched to the input of the amplifier by an RF transformer.

Powered by the 9-volt battery, the amplifier's 25 mA current drain assures continuous operation of many hours before replacement is necessary; a super-bright LED will remind you that it's still turned on! A simple modification, the addition of a resistor, enables the antenna to be powered remotely from an AC adaptor through the coaxial cable.

Claiming a 230-1400 MHz frequency range, we discovered that the unit actually works quite well over a much wider swath of spectrum. Gain is advertised as 20 dB, dropping off as the unit is utilized outside its advertised bandwidth. Technically inclined readers will be relieved to know that the third order intercept point is a healthy 25 dBm, protecting it from generating intermod under most signal receiving conditions.

While the specs show an antenna forward gain of 6 dBi, the small dimensions of the LPDA elements limit its directional response to the higher end of its bandwidth. At lower frequencies it is essentially omnidirectional.

Since the AX-31B is not intended for outdoor use, it's only fair to compare it with other indoor antennas. We selected a Uniden BC3000XLT hand-held scanner, its factory rubber duckie antenna, and a Condor whip for our test. A synopsis of observations at my indoor location, along with an indication of the best antenna at each sample frequency(*), can be found in Table 1.

The Bottom Line:

We are eternally in search of the perfect antenna: small, wideband, potent, and immune to interference. It doesn't exist. Signal capture

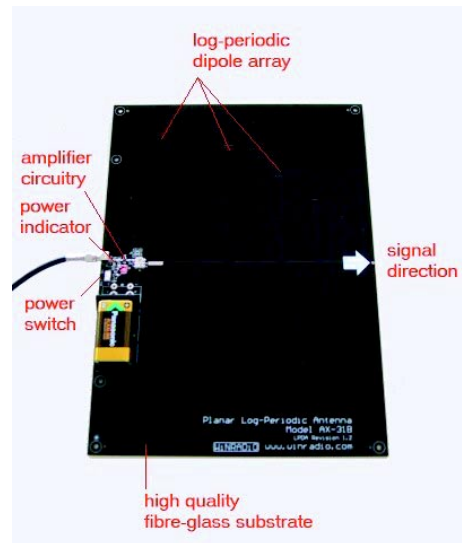
is a function of element size and placement, and active (amplified) antennas require power, generate noise, and are subject to overload problems like intermodulation and desensitization.

But the AX-31B has its niche. Exhibiting decent gain, acceptable noise figure, and high overload immunity, it works well in the upper VHF/UHF land mobile frequencies, and its low profile invites unobtrusive placement next to a wall or window.

It can even be used in a pinch for upper shortwave frequencies – as low as 15-20 MHz

an installation is impractical or even impossible. Given its few limitations, the AX-31B is a welcome addition to the cadre of listening tools.

The AX-31B planar antenna is available for \$129.95 plus shipping from most WiNRADiO dealers, including Grove Enterprises for \$109.95 (PO Box 98, Brasstown, NC 28902; 1-800-438-8155 or visit <http://www.grove-ent.com>)



or so – but doesn't work much better than a few feet of wire randomly run around the room, and it is just as vulnerable to interior electrical interference from appliances, electronic accessories, and power lines.

Nonetheless, for the new genre of wideband scanners which tune down into the shortwave frequencies, the AX-31B offers significant improvement over the factory-supplied whip, and since those scanners commonly have just one antenna port, the AX-31B can be that one antenna.

While a good rubber duckie like the Condor may work just as well on some frequencies, it is not always convenient to set the radio where the whip works best. By experimentation, the AX-31B can be located at an optimum spot for reception and the cable run to the monitoring position.

There is no substitute for an efficient outdoor antenna. But there are cases where such

Table 1: A Comparison of Indoor Antennas

FREQ. MHZ	ORIGINAL WHIP	CONDORAX-31B
27.185 (CB)	Undetectable	Some signals *Much stronger
49.845 (Baby monitor)	Undetectable	Good, some hiss *Full quieting
88.1 (FM broadcast)	Trace	Good, some hiss *Full quieting
88.5 (FM broadcast)	Undetectable	Undetectable *Receivable
109.8 (Airport VOR)	(Equal)	
151.550 (VHF hi)	*Good, some hiss	*Good, some hiss Weaker
162.400 (NOAA weather)	Readable, hiss	*Full quieting *Full quieting
171.025 (IFLOWS)	Very weak	*Full quieting *Full quieting
407.225 (Mil trunking)	Very weak	Undetectable *Moderately strong
411.550 (Hydrotelemetry)	Strong, some hiss	Strong, some hiss *Full quieting
453.075 (UHF mobile)	Weak	Weak *Full quieting
462.750 (UHF mobile)	(Equal)	
475.050 (UHF carrier)	Undetectable	Undetectable *Receivable
499.750 (UHF TV)	Noisy	Noisy *Full quieting
855.7375 (UHF trunking)	(Equal)	
864.7375 (UHF trunking)	(Equal)	
996.000 (VOR)	(Equal)	
1090.000 (Aircraft DME)	Weak, receivable	*Receivable Undetectable

NOTE: Results will vary with signal direction and propagation, placement and polarization of the antenna, and location of the installation. Directivity is present at the higher frequencies only, becoming omnidirectional (nondirectional) lower, and will be influenced by nearby metal masses.

What's NEW

Tell them you saw it in Monitoring Times

Alinco DJ-X2000T

The new Alinco DJ-X2000T, expected to be available in mid-March, is a triple-conversion, wide-coverage handheld scanning radio with a frequency range of 1 kHz to 2150 MHz (cellular frequencies blocked on U.S. "T" version). Receiving modes are NFM/WFM (mono, stereo)/AM/CW/USB/LSB. The user has a choice of 25 different channel steps, including automatic and user-programmable. Two thousand memory channels are divided into 50 banks, 40 channels in each.

The U.S. version comes with 4.8V 700mA Ni-Cd pack, multi-voltage switching quick charger, belt-clip, hand-strap, antenna, and instruction manual. Cigarette-plug DC cable, long-life Ni-Cd pack, earphone, soft-case for battery packs, and mobile bracket are available options.

List price on the Alinco is \$835 but street price on the DJ-X2000T from dealers such as Grove Enterprises (800-438-8155; <http://www.grove-ent.com>) is \$699 plus shipping. Watch for Bob Parnass' review of this full-featured handheld in an upcoming issue of MT.

Yaesu VR-120

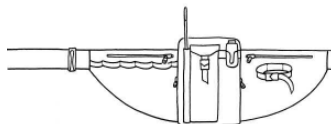
Yaesu has just released its new VR-120 pocket radio. Looking much like the popular ICOM R2, and covering 100 kHz-1300 MHz (less cellular)



in the AM and FM modes, the triple-conversion pocket scanner has 640 memory channels in 10 banks, 0.3 microvolt VHF/UHF sensitivity, and measures only 2.3"W x 3.3"H x 1"D. Street price should be in the \$230 range. Contact Grove Enterprises or your favorite dealer for price and availability.

Yaesu FT-817 Pouch

In response to numerous requests, Cutting Edge Enterprises is designing a carrying pouch for the new Yaesu FT-817 handheld transceiver. The package consists of a lightweight padded pouch with a strong belt clip, exterior pockets to hold extra antennae and an extra battery. A clip-on mike bracket can be attached wherever you need it.



For extra carrying capacity, a custom fanny pack will be available with zippered compartments, webbing loops and tie-downs. The pouch clips securely to the center of the fanny pack. An optional 2.3 amp 12V rechargeable battery with wiring harness for the FT-817 and a two-stage automatic charger can also fit into the assembly. Cutting Edge is calling this design the WorldPouch.

For pricing and availability on this product under development, contact Cutting Edge Enterprises, 1803 Mission Street, Suite PCM-546, Santa Cruz, CA 95060; 831-429-5384; <http://www.powerportstore.com>.

New Products from Garmin

We haven't covered GPS equipment often since it stopped being a novelty, but the industry certainly has not stood still. Here are some of the latest refinements from Garmin.

In *StreetPilot III*, Garmin has upgraded its popular navigation

GPS receiver to include turn-by-turn voice prompts. The dash-mounted unit is powered by your vehicle's battery or six AA batteries. Its built-in base-map includes all interstates, major highways, rivers and lakes for the North America, plus major streets in metropolitan areas. Detailed maps for specific cities and turn-by-turn guidance may be downloaded as needed from the MapSource City Navigator CD-ROM. Purchase includes the unit, mounting bracket, PC interface cable, 12V adapter cable with external speaker, 32MB data card, USB data card programmer, and the MapSource City Navigator CD-ROM. List price is \$1,273 though street price may be somewhat less.



For users who can't be tied to a vehicle, Garmin's eTrex series are among the smallest GPS handheld receivers on the market. New models in this line are the eTrex Venture, Legend, and Vista, all of which come with crisp, high resolution liquid crystal display, full-feature navigation capabilities, position information in latitude/longitude, MGRS and Loran TDs, plus a choice of English, French, German, Italian or Spanish interface. *Venture* offers a worldwide database and 1 MB internal memory at a list price of \$195. The *Legend's* base-map covers North, South, and Central America, 8 MB internal memory, and a stylish translucent blue case, at a list price of \$268. The eTrex *Vista* is similar to the Legend, but adds the features of a built-in barometric altimeter and electronic compass, providing bearing and altitude information while you're standing still. It contains 8 MB internal memory and comes in a silver colored case; list price \$375. These units will all accept MapSource data from an optional CD-ROM.

Garmin also carries a series of products especially designed for fishermen, including sounders, fish-finders, and MapSource databases of fishing hot spots and waterways. The maps provide detailed

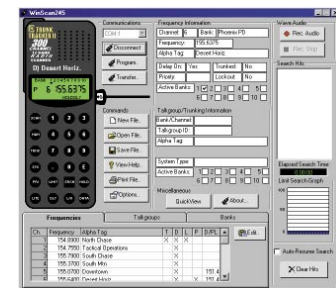
information by region of lake beds, ramps, hazards, mile markers and much more, as well as marked fishing areas, best times of year, types of fish, etc.



For more information on these products, see your local marine and recreational dealer or contact the company for a dealer near you: Garmin International, 1200 East 151st Street, Olathe, Kansas 66062 (ph. 913-397-8200; web <http://www.garmin.com>).

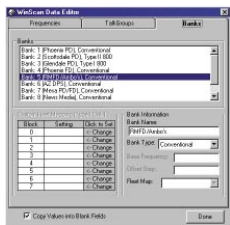
Computer Control the Uniden BC245xlt/BC895xlt

WinScan Version 2.1 is a software control program which works under Windows 95/98/NT 4.0 to control either the Uniden BC245xlt or BC895xlt scanner. On your screen the Virtual Scanner Interface(tm) looks and works just like the front of the scanner you are using.



There are the usual advantages of a computer control program – constructing custom scan lists, importing database info from other sources, programming the scanner, uploading scanner memory to the computer, adding alpha tagging to frequencies, etc. The enhanced search engine allows you to see what you are searching, how long you have been searching for and how many times a frequency has been hit.

WinScan enhances the trunk-tracking capabilities of these scanners by enabling the 895 to scan in



conventional and trunking mode simultaneously; allows you to program EDACS and Motorola talkgroups and frequencies for your 245; and allows you to program Motorola trunked systems without being in range of the system.

The program provides a new Bandscope for the BC895xlt, has a Speed Enhancer scan mode for the 245 Multi-Scan feature; and allows you to digitally record your favorite frequency with the click of a button!

System requirements include a Pentium 100 MHz computer; Windows 95/98/NT 4.0; 16 MB RAM; 2 MB Video Card; 10 MB free hard disk space minimum; free COM port; 3rd party interface cable if used with the Uniden BC895xlt; supplied interface cable with Uniden BC245xlt.



WinScan is \$59.95 from Grove Enterprises and other dealers. For technical questions, call Grove at 828-837-7081 or e-mail the software developer at products@pozillasoft.com

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.



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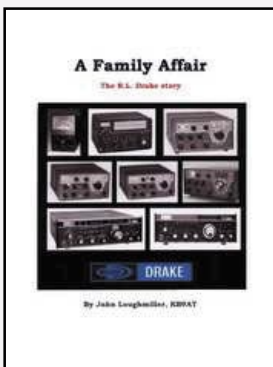
Web site www.swagur.com

A Family Affair: The R.L. Drake Story

By John Loughmiller, KB9AT

In recent years, retrospective books have appeared on radio giants such as Collins, Heathkit, Hallicrafters and the Zenith Company. It was only a matter of time before someone took up the noble task of documenting another radio great – the R.L. Drake Company. John Loughmiller, KB9AT, has assembled over 250 pages of material on the Ohio-based company and its products in his new book, *A Family Affair: The R.L. Drake Story*.

Right off the bat, Loughmiller sets the stage for what made the Drake Company different. Following conventional wisdom of the 1950s, bigger – and heavier – was better. For example, at 70 lbs., the Hallicrafters Company boldly proclaimed its SX-101 receiver to have the “heaviest chassis in the industry.” At this same time Bob Drake, the company’s founder, was developing a far different radio: the 1-A Receiver. It was only 7 inches wide and weighed less than 20 pounds. That was



small for its day, and it set a trend that would become a hallmark of the Drake amateur line – compactness.

The book not only records dates, places and names, but gives personal insight into the Drake company, much as you would expect to hear if you were sitting in the employee break room. You learn that Bob Drake was the company, and about the slump in morale that set in after his death. You learn about the conflicts and camaraderie between employees. In one hilarious anecdote, the author tells of an unsuspecting technician turning away from a receiver under test, while a co-worker placed a lit cigarette under the chassis of the radio. With smoke rising through the top of the case, he alerted his colleague to the situation. The technician frantically threw every switch in sight in an attempt to save the radio. When he discovered the cigarette, a mad chase began across the service floor.

Not all of the book is about history. Most of the second half is devoted to technical tips,

simple modifications and a grading standard for Drake equipment that is derived from the well-respected Collins standard. This section should be especially useful to anyone interested in collecting or restoring Drake gear. The back of the book shows catalog reprints and photos of several modern-day Drake stations.

Although the book is loaded with black & white photos, many are not as clear as they could be. In the copy I examined, the images on pages 19, 23, 107, 115 and 129 were especially poor. This is a shame, because many of these were close-up photos of Drake equipment, presumably in good to excellent condition. The pictures don’t do the equipment or the book justice. In contrast to the photos, the text of the book is unusually clear and easy to read.

A Family Affair: The R.L. Drake Story is published by the Technical Support Group, 15 Saddle Ridge Trail, Alexandria, KY 41001-9105; tel. 859-635-6487; www.home.fuse.net/tsg/. \$29.95 plus shipping and handling. It may also be ordered from Universal Radio, 6830 Americana Parkway, Reynoldsburg, Ohio 43068; tel. 800-431-3939; www.universal-radio.com.

– Review by Kevin Carey, WB2QMY

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By Bob Grove,
Publisher

The Silly Season – It’s All Year Long!

Now that the protracted Presidential election is finally over, the charges and countercharges have settled into history. People seem to have vivid imaginations, often confusing fact with imagination. Such creativity is rife in the political arena, but we see it daily all around us.

Occasionally something comes across my desk that makes me wonder if intelligent life still exists on Planet Earth. One of these epistles concerns a recent outbreak of contrail-itis. Contrails, as our air buffs know, are condensation clouds left behind high altitude aircraft, resulting from combustion products (mostly water vapor) hitting the frigid air at those elevations. The resulting ice crystals, admittedly contaminated with less benign chemical compounds, leave a spectacular white trail behind the aircraft’s jet engines.

Painted at those altitudes, the wispy white trails are real attention grabbers – apparently especially so if you’re paranoid! Yes, it seems that there are those who are sure that our government is spraying its citizens with (take your pick):

- a. Mind altering drugs
- b. Slow-acting poisons
- c. Crop-killing herbicides
- d. Sterility agents
- e. Carcinogens
- f. Hazardous wastes

Perhaps these “mysterious” malignant operations are being conducted either by members of the Trilateral Commission or the New World Order, two perennial favorites of the terminally twitchy. In spite of the decades that these concepts have been openly available to public scrutiny, there are those who are adamant in their belief that these represent an urgent threat to our national sovereignty. Often, these same impressionable folk will weave in suspicions about the U.N. or NATO just for good measure.

You can see a good profile of the Commission on their Web site at <http://www.trilateral.org>, and a delightful, skeptical treatment of the Order (and other conspiracy notions) at <http://www.skeptic.com/04.3.callahan-end.html>.

I can recall, as a child, looking upward, marveling at the vapor trails left from aircraft. During my scientifically-impressionable teens, I followed high altitude

experiments being conducted with dry ice, sodium iodide crystals, cesium vapor, aluminum foil (“chaff”), and any of a number of other comparatively benign substances during a period of considerably less suspicion.

These experiments were conducted to modify weather systems and radio signals, not human behavior. I don’t recall anyone dying, or even getting sick. So why the recent spate of hysteria over a common experimental program?

Is overexposure to violent video and computer games, movies, and TV taking its toll on the public’s rationale? Is growing disgust at politics for profit driving Americans to cynicism and suspicion? Or is it merely the fantasy of fundamentalists who will cite nearly anything as evidence of “prophetic fulfillment?”

Just a few years ago, well-meaning folks alerted me to trainloads of Russian-marked armored vehicles being conveyed to some unknown destinations, ostensibly to stage a takeover of America.

Think about it. If you wanted to take over America, would you send your equipment, marked clearly with your country of origin, during daylight, through heartland America? I don’t think so. Photos, please? Urban legend? Could be.

Then we have black-suited paratroopers dropping into a Texas town (have you seen “Red Dawn” lately?), and barbed-wire internment camps being set up in remote locations to impound U.S. citizens, and on and on.

Oddly enough, when availability of real news has never been more pervasive, many Americans would rather believe the much-altered predictions of Nostradamus as reported by historical revisionists, or the seriously-flawed prognostications of the late Jeanne Dixon who couldn’t even foretell her own death.

Just two years ago – May 1999 – a report was widely circulated that the citizens of Reston, Virginia, were sprayed with a brown, hepatitis-inducing agent by Soviet helicopters, and that thousands of residents would be expected to contract the disease. Oddly, there were no police reports of such an event, no scanner intercepts of related communications, no media coverage of such an extraordinary invasion.

I recently drove through Reston, and it was my impression that it looked pretty normal. How about it, Reston; are you still there?

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