



A Publication of
Grove Enterprises, Inc.

Monitoring Times

*Featuring MT's
Exclusive Shortwave
Guide and
Full-Spectrum
Coverage*

**Blue Ribbon Scanning
at the State Fair!**

**Back to School
Educational Radio in Costa Rica**

**Remnants of the Cold War
DXing the Two Koreas**

MT Reviews the BC2500XLT

**Target For
Terrorism**
*Monitoring the
New York Port Authority*

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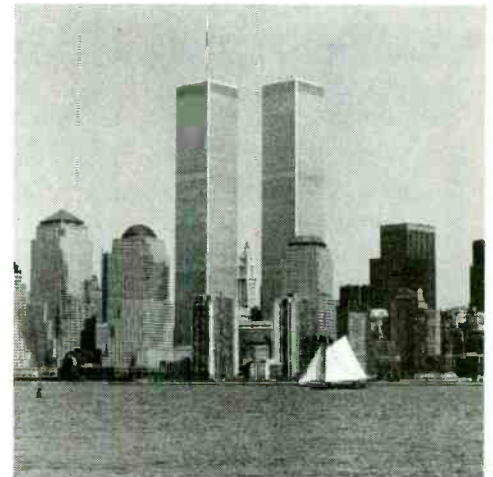
Target for Terrorism — New York's Port Authority

10

By Bob Kozlarek

In a 25 mile radius from the Statue of Liberty, the Port Authority of New York and New Jersey is in charge of all moving traffic—planes, trains, ships and automobiles. So what does that have to do with the bombing of the World Trade Center? The Port Authority owns the Twin Towers. Furthermore, the Authority's responsibility for the flow of traffic makes it a prime target for future terrorist attempts.

In this brief tour (complete with frequencies) of the agencies under the Authority's jurisdiction, the monitor gains an appreciation for the enormous amount of coordination and communications required to keep New York City on the move.



Remnants of the Cold War—DXing the Two Koreas

14

By Jeff Chanowitz

Both born of the Korean War, Radio Pyongyang and Radio Korea are still battling the cold war in an attempt to influence the Korean people. Outside of that, their styles have nothing in common. Recent showdowns between the US and North Korea have brought this area of the world back into the public eye. It's a good time to tune in these two voices of a divided people.



Blue Ribbon Scanning at the State Fair

18

By Allen Cole

In some places it's called the State Exhibition, and among the harvest of crops and livestock, there is also an exhibition dear to the heart of the scanner listener. Displayed in full view are all sorts of radio communications. The challenge is to find as many as possible within a week, because next year much of it will be new all over again.

COVER: *The Statue of Liberty is flanked by the twin towers of the World Trade Center in this view of the Lower Manhattan skyline, courtesy of the Port Authority of New York and New Jersey.*

A Farewell Visit to WCC

By Everett Slosman

22

Ship to shore communications stations such as WCC in Chatham, MA, are becoming irrelevant in today's modern technology. In fact, WCC's current traffic is already handled through a relay to KPH in Point Reyes, California. The first Marconi Wireless Telegraph station may be about to go off the air; be sure to log it before it does.

Back to School: Educational Radio in Costa Rica

By Glenn Thompson

26

Costa Rica is noted for its high literacy rate, but that has not always applied to indigenous peoples and rural workers located far from the population centers. Since 1973, a program has been in place to carry these people through the required basic education program—by radio.

And Much More ...

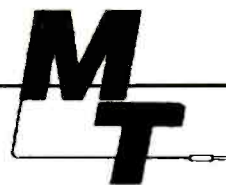
Bob Kay has some tricks up his sleeve for avoiding the prohibition against obtrusive antennas for apartment dwellers. Whether you erect an indoor or an outdoor antenna, "Scanning Report" will get you to look around your home site to see what configuration might work for you. Meanwhile, "Antenna Topics" will help you with the construction of two of the most popular and basic antennas, no matter whether you monitor shortwave broadcasting or public safety frequencies—the halfwave dipole and the groundplane.

If you'd like to pick up a new aspect of the hobby without a big investment, why not try the mediumwave AM/FM broadcast bands? As we move into autumn, the conditions are favorable to pick up signals from outside your local listening area. Check out "American Bandscan" to learn some tricks of the trade, and "DX Tests" for some specially scheduled opportunities for long distance loggings.

Reviews, listening tips, maritime monitoring, more broadcast schedule updates ... you'll find it all in this issue of *Monitoring Times*!

DEPARTMENTS

Letters	3	Shortwave Guide	60
Communications	6	Propagation Charts	88
Shortwave Broadcasting	28	What's New	90
Utility World	32	Scanner Equipment	94
The Scanning Report	36	Magne Tests	96
The Beginner's Corner	40	Computers & Radio	98
Federal File	42	Demaw's Workbench	100
High Seas	44	Experimenter's Workshop	102
Below 500 kHz	46	Antenna Topics	104
American Bandscan	48	Ask Bob	106
Satellite TV	50	Club Circuit	108
On the Ham Bands	52	Special Events Calendar	109
Outer Limits	54	Stock Exchange	110
Program Spotlight	56	Closing Comments	110
QSL Corner	58		



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LETTERS



We Don't Mean to Brag, but ...

Trying to pry advance program details out of international broadcasters is a tedious and frustrating job, but it's a challenge that was undertaken nonetheless by a young man used to pushing the limits. Kannon Shanmugam has tack-

led the job for *Monitoring Times* since June of 1988; few of us knew that he was 16 years of age at the time!

Reader Gene Carr of Lawrence, Kansas, sent us a clipping from the *Journal-World* newspaper "reporting on the extraordinary scholarship record of Kannon Shanmugam. If he is the same person listed on your staff as Program Manager (could there be more than one?!), how on earth has he found time to do all these things?"

We are proud to say he is one and the same, and it has not always been easy, especially during his senior year at Harvard. Kannon graduated summa cum laude, with a host of prizes under his belt for academic achievement and his work in Latin scholarship. Kannon goes on this fall to study for two years at Oxford University in the classics, and then returns to enter Harvard Law School.

As a last hurrah before he goes, Kannon has edited the third edition of his annual program guide, the *1994 Guide to Shortwave Programming*, but then we are losing Kannon as Program Manager. We have hopes he will find time to write an occasional feature article from his vantage point at Oxford.

Taking over for Kannon is a very experienced hand, who came on board at *MT* only a year later, Jim Frimmel. Jim is the author of the Shortwave Navigator software for the Macintosh, and if you haven't met him at previous *MT* Conventions, he'll be displaying there again next month as an exhibitor. I know he'd appreciate it if you'd not only drop by and say hello, but also send him copies of any hard-to-get shortwave program schedules that come your way.

Going Up?

A recent letter from Scott Blessing of Newport News, VA, is typical of letters we receive almost every day at *Monitoring Times* and Grove Enterprises as "thanks and encouragement." Scott compliments *MT* for the inclusion of new topics, for columns that are responsive both to readers and to current events, for quality advertisers and prepublication specials...! Scott has been a subscriber since 1989,

and he says, "so many issues stand out in my mind as special that I don't have the space to write them."

I agree that *MT* continues on an upward path. We keep reaching for higher quality and greater coverage; we aim to give our writers equitable payment for their work; and we are determined to provide reliable delivery to our subscribers. We have done well in addressing these goals, at the same time as absorbing increased printing, postage and overhead costs.

Beginning with the January 1994 issue, however, subscription rates will be going up, both to reflect the increase in expenses, and also to cover our decision to mail *Monitoring Times* in a poly bag. In a day in which the post office is becoming increasingly automated, the newsprint pages of *Monitoring Times* just don't stand up well to repeated sorting by machine. We already discovered in last year's experiment that adding a heavier paper cover provides very little protection.

Even with the increased subscription rate, *MT* is still the best bargain in the business. The price per page for a one-year subscription is currently .015 cent per page; it is increasing to a mere .016 cent per page! (\$21.95) Contrast this to any other magazine in the radio hobby and I think you'll agree: contents vs. advertising ratio and value for the money is unsurpassed.

You know, there is a way to avoid the increase for your personal subscription, however: renew today for up to three years at the old rate by December 31st. Then January will arrive and you won't feel a thing!

Let's Get Technical

Two readers wrote in to report experiences that varied from the introduction to improving receiver selectivity: July's "Experimenter's Workshop." One of them responded to Cheek's statement that one should not attempt to modify FM broadcast receivers, since the selectivity curve is specially designed. This reader says, "I have had the greatest success at improving selectivity on FM rather than AM. Even the simple procedure of putting in a more narrow ceramic filter can often produce a dramatic improvement. Stereo is more difficult, but it too can be improved considerably. I've logged close to 800 FM stations on my modified Panasonic RF-2200 and without the improved selectivity I imagine I would have missed at least a third of them."

Tom Jacks of Raleigh, NC, took issue with Cheek's explanation of bandwidth specification numbers. "Bill stated that for a receiver having a selectivity spec of -6 dB @ 9 kHz and -50 dB @ 15 kHz meant 'that signals in the center of the designated selectivity window are referenced to 0 dB [OK so far], and at 9 kHz

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Dear Mr. Malama,

Many thanks for your QSL card and kit. This is to confirm your reception on 5598 kHz. We are in the process of producing a new antenna and will be able to supply it for your next order. You are welcome to call and visit us at any time.

Best Regards,


Patrick O'Reilly
Patrick O'Reilly
Systems Manager
22 April 1993



Oifig Seirbhíse Aerloingseoireachta
Roinn Turasóireachta agus Iompar
Aeráid na Síona
Balle na Chathrúin
Cora Chaitlín
Co. an Chláir

By reading MT, I found the way to hear Air Traffic across the Atlantic, using my Sony 2010 on 5598 kHz. I wrote to Shannon and got this reply from Mr. Patrick O'Reilly, systems manager at Shannon Airadio.

I have seven shortwave sets, and it gives me the world. My antenna is copper wire I have fixed in the window. We are not allowed to have an outside antenna, but I work with the arrangement I have and it works just fine, mostly around 3-4 in the morning (and all night). Val Malama, Salem, Ohio.

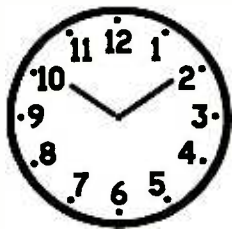


away from the center, signals will be attenuated or reduced by 6 dB...and at 15 kHz from the center of that window signals will be attenuated by 50 dB.'

"That last part is wrong, by a factor of two! When a selectivity spec is given per above, it means that the full bandwidth at the -6 dB points is 9 kHz, not plus and minus 9 kHz as Bill infers, and the full bandwidth at the -50 dB points is 15 kHz.

"By the way, the reference point (0 dB) may or may not be the exact center of the filter, depending on the ripple characteristics of the filter.

"Another point to be made concerns the availability now at reasonable cost of super steep-skirted filters at the audio frequencies, which can provide some additional selectivity without requiring modification of the receiver. Virtually all of these really good audio filters use Digital Signal Processing (DSP) to attain the very sharp skirt selectivity."



Making Time

Why spend money on someone else's customized 24-hour clock when you can build your own? asks John Nelson of Cleburne, TX. He enclosed a few

pages from one kit catalog, "Precision Movements," near Allentown, PA. Call 1-800-533-2024 for their address. The "innards" for a typical kit are \$10.75 for the movement, \$5.45 for the bezel/crystal, and peanuts for the dial if you don't want to make your own. Precision Movement also sells kits for weather instruments.

There are many other such hobby sources for clock works. Just think what you could do with the cabinet of a beloved old radio companion that you can't bear to throw away! John reports his home-built clock "keeps +/- 2 secs. per month, using one AA cell."

Long Life to Batteries!

Rob Cave of Princeton, TX, learned the value of "white glove areas" through having worked in a photo lab and also observing their use in other technologies as well. It's the oil in the hands that is the culprit. "An electrician friend told me not to touch fluorescent light bulbs with bare oily hands, because you will shorten their useful life. Also, a relative told me not to touch the small button cell watch and organizer batteries with oily hands because they will have a leakage path and run down sooner."

"I used to put a battery in my watch every six months or so until I started handling the batteries with plastic tweezers and/or white gloves. Now my button cell batteries last much longer, saving aggravation and money. Just a couple of hints passed on to me I wanted to share with staff and readers."

Garrett Stevens of Muscle Shoals, AL, tried out the new AA nickel metal hydride cells by Harding Energy Systems. He says, "Out of 12, I have had four go bad with internal shorts, which Harding replaced. Otherwise, I am very pleased with the cells. I normally was using 600 mAh NiCads in my AR1000XLT, and got an average of eight hours continuous run time from them. The first time I used the NiHy's, I got 11 hours continuous run time. Now I am getting around 14 hours per charge."

"According to the Harding tech people, the current AA NiHy's are rated at 1200 mAh. The defect rate is high, but they have been quick to replace them. I paid \$6.00 each for the cells, plus a \$5.00 s+h charge. In comparison, Radio Shack now has 850 mAh AA NiCads, for \$5.95 each. I personally think that the NiHy's are worth the money, because of the high capacity and no 'memory' effect."

Thanks for the feedback, Garrett. I want to remind readers, however, that when making any recommendation of a company, always provide an address and/or phone number for them. We got lucky this time and found Harding Energy Systems after some research: Grand Haven, MI 49417; phone 616-847-0989. Many other suppliers carry NiHy's as well, so ask around.

Closing Comments

A few readers were moved to respond to July's attempt to clarify the relationship between *Monitoring Times* and Grove Enterprises. Typical of the response was Greg Feis of Potomac, MD, who commented, "I have for years been amazed at how objective you are."

Steve Davis of Wadesville, IN, admitted, "When I first realized *Monitoring Times* was published by Grove Enterprises, I was very wary of their objectivity. I remained alert for self-serving articles and opinions. Despite my critical observing I have to wholeheartedly congratulate Bob Grove for his integrity. In *MT* I have seen Grove products compared with others and positive as well as negative things were pointed out. I haven't seen a Grove product totally run down as garbage, but I doubt they would offer garbage."

Continued on p. 111

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U.S. Listener Scoops U.S. Military Raid

A U.S. radio listener recently received the "intercept of the year." While monitoring his shortwave radio, Allen Hodge broke the story of the U.S. cruise missile bombing of Baghdad, Iraq.

Allen Hodge was able to listen in on conversations of aides for Secretary of State, Warren Christopher, aboard a Special Air Mission (SAM) aircraft. "As I searched past 6817 kHz (a USAF Mystic Star frequency), I stopped to tune in the upper side band only to find a woman talking on a phone patch about a United States military attack that had just happened," Hodge said.

Further conversations on the frequency ranged from trying to inform world leaders about the action, (before President Clinton's address to the nation on the bombing) to what the PLO might do and how to send them a firm message.

"There appeared to be considerable confusion on the part of the State Department Staff," said Hodge. "One call resulted in German Chancellor Helmut Kohl being awakened in the middle of the night only to find out that the President had called him hours earlier about the impending action."

According to Hodge, "It appeared that some members of the Secretaries staff seemed untrained in the use of the airphones and they would key over the person on the other end and were unable to understand what they were saying."

Hodge said, "After about an hour of great listening the plane was preparing to land at Andrews Air Force Base. The phone patches were terminated and the frequency fell silent. The President spoke to the nation about ten minutes later."

Hodge broke the story to several news agencies in this country, none of which knew about the bombing raid. Follow-up by different news agencies with the State Department resulted in a refusal to comment about what they characterized as "private conversations." One senior State Department official did say that the transcripts were "essentially accurate."

Radio Dealers Fined

Three Los Angeles, California, ham radio dealers got a surprise recently. In their mailboxes were Notices of Apparent Liability from the FCC in the amount of \$7,000. Henry Radio, Jun's Electronics and Ham Radio Outlet were investigated by engineers from the Commission's Cerritos, California, who charged them with marketing the Kenwood TS-50S HF Transceiver. The FCC claims that the radio can be "operated on frequencies not authorized for amateur radio use."

J.R. Zoulek, Engineer-in-Charge of the Los Angeles field office, said that several frequency bands were threatened by the TS-50S HF but that he was especially concerned about possible interference with public safety frequencies.

Scanner Victory

It looked pretty dark for radio hobbyists in Chicago, recently. Aldermen in the Windy City had proposed legislation that would have made it illegal to have a scanner in a vehicle. The bill seemed certain to pass. Then, Aldermen Michael Wojcik, citing the city's problem with drugs, proposed to outlaw the sale of scanners altogether, saying that the radios "hinder the efficiency and effectiveness of the Chicago Police Department."

Finally, however, common sense won out—but not before an undetermined number of *Monitoring Times* readers got in touch with their aldermen. In fact, Alderman Lawrence Bloom, who proposed the original piece of legislation, says he hasn't been besieged by this many angry constituents since Mayor Daley tried to raise property taxes. The result? It is now illegal to use a scanner to "aid or abet the performance" of a criminal act in Chicago.

Our thanks go to Mr. Bloom for his willingness to reconsider the anti-scanner legislation. We also congratulate the Chicago Area Monitoring Association (CARMA), Darren Leno of the Radio Hobby BBS, radio attorney Frank Terranella, and all of the many *Monitoring Times* readers who took the time to contact the aldermen.

But don't stop now. There's still something to be done. Make one more call—312-471-1414. Tell Mr. Bloom thank you.

900 MHz Personal Communications

The FCC has allocated 3 MHz of frequency space in the 900 MHz band for new narrowband

personal communications devices. Possible uses for the frequencies include advanced paging, electronic mail, two-way acknowledgment paging, data messaging, and wireless FAX. Look for activity from 901 to 902, 930 to 931 and 940 to 941 MHz. Up to 5,500 licenses will reportedly be granted including 11 nationwide and 13 regional.

Not So Personal Communications

A large community in the state of Virginia uses an 800 MHz trunked system for emergency communications. When they began experiencing interference which sounded like idle telephone chit-chat, they called the FCC.

The offending signal was a few blocks away from one of the emergency system receivers. A local resident who recently returned from Hong Kong had bought an 800 MHz cordless telephone which was intended for the Asian market. Unbeknownst to the customer, the foreign models use frequencies which are located within US cellular/repeater input frequencies.

The FCC decoded the touch tone dialing and was able to trace the caller with the assistance of the local telephone company. We were not told if the user, who was unaware of the confusion they had caused, was charged in the incident.

Railroad Radio Fined

For some reason, the Southern Railroad company refused to allow an FCC inspector access to their base radio station. The mistake cost them \$7,000.

Two-Meter Crime

Hams on the East Coast are reporting criminal communications on two meters, blaming the proliferation of ham equipment such as the new Radio Shack HTX-202 through mass merchandisers. Reportedly, 144.200 MHz is one of the frequencies most often linked to drive-by shootings and drug dealing in metropolitan New York City.

National Emergency

TV stations across Russia have been going off the air one after another. The problem is that in the tumultuous economy of the former Soviet Union, no one is paying the power

COMMUNICATIONS

companies. No one is paying the TV station employees, either.

The fact that this shutdown is being seen as nothing short of a national emergency shows the power of the blinking blue tube in homes around the world. One alarmed Russian commentator claimed the affected areas were in a "state of information siege." Another crestfallen comrade, obviously overwrought with emotion, lamented that "It is hard to imagine modern man's life without television." Try.

Your Show of Shows

Maybe you always wanted your own radio show. Perhaps you have a message that you feel must be heard. Now is your opportunity. Right now, All India Radio's (AIR) FM outlets in Delhi and Bombay are available. The charge is just 6,000 rupees. Say AIR officials, "First come, first served."

800 MHz Danger

Virginia State Farm Insurance is warning their customers that cellular car phones can cause accidents. According to the company, studies have shown that when dialing a car phone, your attentiveness drops 20 percent. An intense conversation can cut your concentration by a third. And the more intense your conversation gets, the more likely you are to make mistakes. Virginia State Farm ranks car phones the same as "putting on makeup" (presumably for women drivers) in terms of distraction.

Time to Change the Nappy

The BBC is trying to do some linguistic cleansing. Phrases like "shot in the arm" and "last-ditch bid" are out. Short words and sentences are in. Also out are Americanisms that jar the ear of the British — words like *diaper*, *drugstore* and *sidewalk* will be returning to British usage: *nappy*, *chemist* and *pavement*. Especially obnoxious, says the 50 page style guide, is the American habit of turning nouns into verbs, as in "to hospitalize."

The current effort is the BBC's most comprehensive effort to improve its own broadcasts and stimulate public debate about language usage.

BBC Somali Broadcasts Stir Commentary

The BBC's Somali Service broadcasts are regularly followed by commentary — but it's

not coming from the BBC. According to reports, the broadcasts, which close at 0915 UTC on the 15420 kHz Seychelles transmitter, ignite a cacophony of independent voices, most of which mock the BBC announcer's sign off of "nabad gelyo" ("Peace be with you"). "Hey," shouts another voice to the BBC So-



STREETER S. STUART

mali announcer, "who do you think you are." According to monitoring reports in the area, many of the voices are unintelligible.

Silent Voice

Streeter Stuart, true radio pioneer, has passed away at the age of 85. Mr. Stuart, got his start in 1940 on the staff of WBOS, an experimental shortwave station in Boston. Later, as part of the WBZ-AM news team, his voice was heard by generations of DXers. Mr. Stuart also made the first live FM broadcast in New England and became one of the region's first two TV anchormen. "If you grew up in the [Boston] area," says WBZ newsman Gary LaPierre, "you knew his name. It was a Walter Cronkite thing. He was a class act."

Communications is written by Larry Miller from a variety of sources including material sent in by the following readers and VIPs: Bill Battles; Doug Chandler, St. George, Utah; Arnal Cook, Clarksville, Tennessee; Bob Fraser, Cohasset, Massachusetts; Mr. Antonio Anonymous, Paris, France; Ginny Garza, Cincinnati, Ohio; Allen Hodge; Bob Kozlarek, New Jersey; Ken Mason, Washington, D.C.; Ted Moran, Chicago, Illinois; Jon Peterson, Chicago, Illinois; W. Smith, Blacksburg, Virginia; Larry Van Horn; Ray Zima, Tinley Park, Illinois; BBC Monitoring Service, and *W5YI Report*.

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Schedule

Friday, October 15

11:00 am to 5:00 pm
Registration Open
12:00 to 5:00 pm
Exhibits Open
7:00 to 9:15 pm
"Hobby Talk"

Saturday, October 16

8:00 to 11:30 am
Registration Open
9:00 am to 12:30 pm
Exhibits Open and
Morning Seminars
12:30 to 3:00 pm
Exhibits Open/Lunch Break
3:00 pm
Exhibits Close
3:00 to 5:15 pm
Afternoon Seminars
7:00 to 9:00 pm
Banquet--Served at table
9:00 pm
Transmitter Bug Hunt

Sunday, October 17

9:00 am to 12:30 pm
Morning Seminars

Convention Closes at 1:00

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Scan*Star
Shortwave Paradise
Sony Corporation
SPEEDX
Transtel Technologies
Universal Radio
WILLCO Electronics
Worldcom Technology

Friday evening starts off the weekend with a two hour "**Hobby Talk.**" Moderator Bob Grove will host this open forum of attendees, speakers, international broadcasters and specialists in the radio hobby field. Topics will include the new scanner laws, the future of shortwave broadcasting, new technology and much more. The balance of the weekend seminars will include these new topics for 1993:



SEMINARS

An Introduction to Computers
 Monitoring SW Military/HF and USB
 ELF--Are We Being Fried?
 Choosing a Scanner/SW Radio
 Monitoring the Feds!
 Beginner's Introduction to Electronics
 The Intermediate Listener:
 • Scanning--When to Accessorize
 • Shortwave--How to improve reception
 • Filters--When and How?
 LOWFERS--Earthquake Monitoring
 Monitoring Military/VHF/UHF
 Advanced Antennas--Design and Theory
 Shortwave Broadcasting: The Future
 A Beginner's Guide to TVRO

Communication Satellites
 An Introduction to Digital Communications
 Surveillance Techniques
 The Strange and Unusual:
 • Numbers stations, digital signals, etc.
 Advanced Digital Communications
 • How to decipher the "weird ones"
 • Troubleshooting
 Meet the International Broadcasters
 Pirate Radio Monitoring
 Public Safety Monitoring
 The Ideal Scanner Set-up
 Broadcast DXing: AM/FM/TV
 Aero Monitoring: VHF/UHF/HF
 Catch the Clandestines

Beginners:
 • Aero Monitoring
 • The Frequency Spectrum--Below 30 MHz
 • The Frequency Spectrum--30 MHz and Up
 • Get Started in Scanning
 • Utility Monitoring
 • Q&A for Beginners

• Saturday evening banquet with guest speaker Carole J. Perry, WB2MGP, noted author and promoter of amateur radio. In addition to her duties as founder of Media Mentors, Inc., a publishing and marketing company, Carole is the "Hams with Class" columnist for 73 magazine, contributor to *Radioscan* and *Radiofun* magazines, an ARRL Assistant Director in the Hudson Division and is Chairperson of the Hudson Division Educational Task Force. Carole is a member of "Radio Friends," an organization created to produce television programs that highlight exciting and informational aspects about radio to the public.

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Monitoring New York's Port Authority

By Bob Kozlarek, WA2SQQ

It was February 26. Snow flurries were falling and hundreds of people filled the observation deck atop New York's famous World Trade Center located on the southern tip of Manhattan. At 12:18 pm, without warning, a massive explosion occurred within the subterranean levels creating a 100 foot wide crater spanning the five lower levels. The parking garages, the PATH train station, and the Vista Hotel sustained major structural damage.

In an instant the seven million square foot complex went dark, trapping thousands of ten-



Steve Spak

ants and visitors, among them two kindergarten classes visiting on a school trip. Elevators came to an abrupt halt and the dimly lit emergency stairwells quickly filled with thick black smoke.

Radio and TV stations preempted regular programming with live reports which first cited the cause as a transformer explosion. Their reports were to be short-lived as Consolidated Edison cut all remaining power to the complex, much of which supplied power to the transmitters of many New York radio and TV stations located atop the Twin Towers. Acting quickly,

CBS reactivated transmitters located atop the Empire State building, former home to most metro area television transmitters. ABC negotiated and routed its programming to neighboring PBS channels in New Jersey, reaching a limited audience on UHF channels 50 and 58.

Disasters of this magnitude serve as an indicator for the media's emergency preparedness. Of the hundreds of active frequencies, fig.4 lists some of the NY citywide frequencies used during the emergency.

Of course, further investigations revealed that the explosion was the result of a 1200 pound terrorist bomb driven into the underground parking garage on level B2. In the days that followed, radio activity by federal, state, and city agencies reached a level seldom heard. Although the actual damage was confined to a one square block area, com-

muters throughout the NY metro area would feel the effects for weeks. Security at all of the major airports was increased, and many indoor parking garages at the airports were closed. Those that did remain open subjected vehicles to a search.

With threats of terrorism running rampant, hundreds of "copy cat" bomb threats would follow. Terrorism, a word most of us associated with foreign countries, was now a local issue. The bombing of the World Trade Center was by far the worst act of terrorism in US history. Officially, six people were killed, 1000 injured, and total property damage is now estimated at 300 million dollars.

The Twin Towers

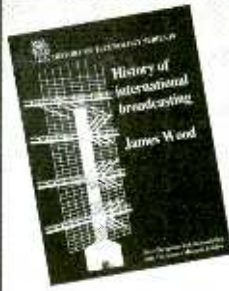
Built in the early 1970's, the 110 story "Twin Towers" rise 1,350 feet above the New York skyline, the tallest structures in New York and second tallest buildings in the world. The towers are owned and operated by The Port Authority of New York and New Jersey. This private agency was formed on April 30, 1921, and is responsible for much of New York's air, land, rail, and sea transportation. Port Authority's jurisdiction extends outward in a 25 mile radius from the Statue of Liberty in New York Harbor.

Monitoring the Port Authority and its associated agencies can provide hours of exciting listening, and that was the original intent behind this article. Two weeks into writing this article, the explosion occurred and all Port Authority offices were closed. But, persistence pays off! Contacting each agency independently and pleading my situation, I was able to find understanding people who were very willing to help. To those individuals, I would like to extend my sincere appreciation. Without their cooperation this article would have not been possible.

We'll begin our tour at the top, 1350 feet above the New York skyline. Atop the Twin Towers, hundreds of antennas share space with a small heliport and a 360 foot tower built in 1979 that supports 10 television stations, hundreds of auxiliary antennas, and a master FM



World Trade Center (circa 1973). Note that adjoining property wasn't developed yet. The top picture is of an evacuation helicopter after the explosion on February 26th.



History of International Broadcasting \$59.00

The origin and growth of information broadcasting (chiefly of propaganda) by radio – most renowned for its prominence in World War II and the Cold War – is outlined. The author chronicles the technological and engineering achievements that enabled long-range

broadcasting to develop, but keeps them in the context of the social and political environment of the day. The appeal of the book is by no means restricted to scientists and engineers and many will find much to stir their own memories of international radio broadcasts in wartime and peacetime alike. 264pp., casebound, ISBN 0 86341 282 5 - 1992

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broadcast antenna. To illustrate the potential RF field density which exists, EPA officials conducted some studies shortly after the site became radio active. Their studies concluded that RF levels within the upper floors of the adjacent tower were above accepted levels. Specially designed leaded glass windows provided the necessary attenuation to protect the buildings' tenants.

Incidentally, in the hours following the explosion hundreds of people that were stranded in the lifeless skyscrapers' upper floors were moved to the roof. Emergency service crews quickly cut down hundreds of non-essential antennas and effected efficient rooftop rescues using several helicopters.

As one might imagine, providing solid radio coverage throughout a seven million square foot complex required some careful planning. Motorola design engineers created a system by which a four foot corner reflector atop the roof of an adjacent building directs a signal at the twin towers. Using coaxial cable that is designed to leak the RF signal it carries, over 15,000 feet of "radiax" was routed throughout the complex, thus providing reliable communications using only 1/2 watt UHF radios! This somewhat passive system was highly instrumental in providing communications during evacuation.

World Trade operations use three frequencies designated channels X, Y, and Z (fig 1). Port Authority police who have jurisdiction throughout the New York and New Jersey area maintain headquarters here also. Designated as channel "W", constant activity can be heard on 453.375 MHz. In addition, most vehicles are equipped with New Jersey - Bergen County "F2" (477.1875) as well as the statewide inter-system channel "SPEN 1" (154.680).

While Port Authority was assigned several 800 MHz repeater channels about two years ago,

Port Authority Mobile Communications Vans can establish a link on virtually any band within minutes of an airport emergency.



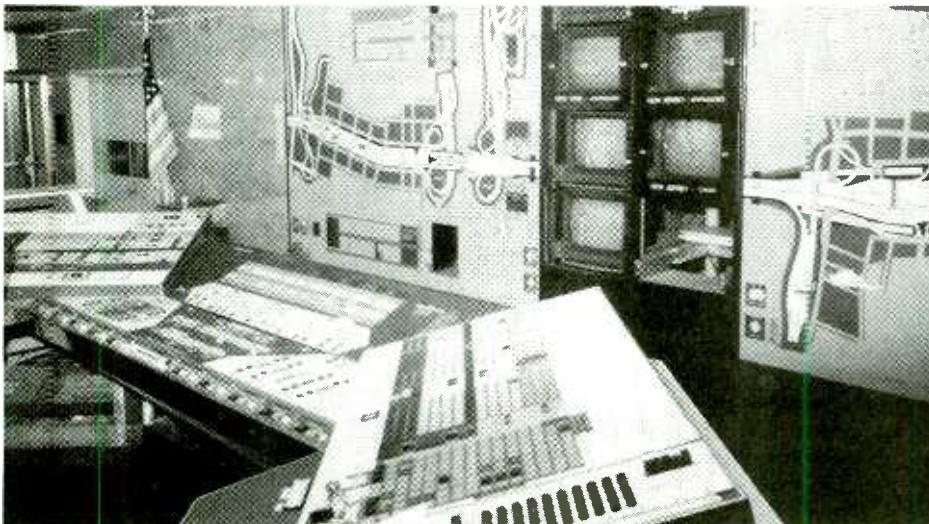
the change-over would have required extensive modification to their unique antenna system. This influenced the decision to give up the allocated frequencies. Most of these frequencies were transferred to the New Jersey Department of Transportation for future implementation. I did learn that there is serious consideration being given for a new 800 MHz trunked system which will complement the existing 450 MHz system.

Planes!

The Port Authority operates three major airports in the New York metro area; Newark International (NIA), JFK International (JFK), and LaGuardia (LGA). While writing this article, I had the pleasure of visiting Port Authority operations at Newark International Airport. My guides for the tour were Airport Duty Manager, Dan Harvey, and Deputy Chief Operations, Frank Loprano.

Dan explained that Newark International Airport currently ranks as the sixth busiest airport in the U.S., handling as many as 1300 flights daily. Since all New York air space is coordinated at a separate facility about 50 miles east of Newark, the FAA's control tower is often staffed by only four or five controllers, quieter than most would imagine it. Fig.2 lists the frequencies in use throughout the New York metro area.

Port Authority communications at Newark International Airport use three primary channels designated "B", "X", and "Z" (fig.2), with most of the related antennas and repeaters located atop the large heating complex building. Since Port Authority vehicles travel many of the same roads used by aircraft, each vehicle is equipped with aircraft radios tuned to Newark's ground



George Washington Bridge Control Center in Jersey City, NJ.



Newark, NJ, airport tower

frequency, 121.9MHz. Active runways are controlled by FAA personnel in the tower, while inactive runways are under Port Authority control. In fact, while crossing active FAA runways, our vehicle had to request permission from the tower on several occasions! With three major airports in the New York metro area, most FAA allocated frequencies are quite active. Readers may note local activity on many of those frequencies listed in fig.2.

In case of an emergency, communications can go mobile on demand from one of Port Authority's emergency communication vans located at each of the airports. Within minutes communications can be established on virtually any public service, marine, or aircraft frequency. Roof mounted surveillance cameras also provide radio operators with panoramic views of the situation outside. Add the cellular phones and fax machines, and we have an instant mobile communications center! Each airport also operates a traveler's information radio service at 530 kHz.

During my visit, maintenance workers were putting the finishing touches on a new antenna system that will use about 100 radials to complement a new antenna mounted 35 feet above ground along the perimeter of the airport — a system any 160 meter DXer would envy! This new system replaces the present system that is located atop the airport's North Terminal.

Trains!

Without any official ground breaking or fanfare a group of laborers began digging at a land fill site in Jersey City, NJ, on November 17, 1874. This began a major engineering achievement that would come to fruition 34 years later when the first rail system passing under the Hudson River would open. President Theodore Roosevelt sounded a bell on February 25, 1908, that signaled the activation of the system.

Opened as the Hudson & Manhattan Railroad, ownership was transferred in 1962 to the Port Authority which renamed the system, "PATH," Port Authority Trans Hudson. PATH is the primary rail link between Manhattan and several New Jersey urban communities and suburban commuter railroads. Carrying nearly 200,000 passengers daily, PATH is now celebrating its 30th anniversary.

Fig. 1: Port Authority Operations

World Trade Center

453.4000 "A" - Central Police Desk
 453.3750 "W" - Police Opr.
 470.5625 "X" - WTC Maint.
 470.5875 "Y" - Elevator Maintenance
 470.6125 "Z" - Operations
 123.05 - WTC Heliport
 130.50 - WTC Aero Traffic

Airport Support Frequencies

453.650 "B" - Newark, LaGuardia
 453.375 "W" - JFK

Bridge & Tunnels

453.800 "C" - Holland Tunnel,
 George Washington Bridge
 Staten Island Bridges
 150.995 "D" - Lincoln Tunnel
 151.115 "E" - P.A. Bus Terminals
 153.755 "F" - Lincoln Tunnel
 154.965 "S" - Passenger Ship Terminals

Hudson River Traffic

407.625 - U.S.C.G. Operations NY Harbor
 417.850
 417.925
 34.790 - Statue of Liberty /Governors Island
 123.050 - Hudson River Helo Traffic
 122.850 - Sky Writing Aircraft
 123.100 - NYC Police Helicopters

By railroad standards PATH is small: 342 cars using a total of 43 miles of track electrified by a 650 volt DC third rail system. Communications and operations is coordinated from The John F. Hoban Operation Control Center located at Journal Square in Jersey City, NJ.

Supervising and overseeing these operations is the Trainmaster who, from a central location, has a commanding view of all essential elements — the position of every train in service is displayed on an illuminated 200 square foot board. The status of traction power emanating from PATH's power substation is displayed on a 300 square foot display board, and passenger flow through each of PATH's 13 stations is displayed on 67 19" monitors! The Trainmaster maintains direct and immediate communications via radio (fig.3), intercom, and a backup "Centre x" phone system.

Twenty-four hour security is provided by a 105 member Port Authority police unit. Since PATH's station at World Trade sustained major damage, Port Authority police provided much of the rescue coordination within the lower levels of the complex and relayed the names of victims that were found.

And Automobiles!

The Port Authority is presently responsible for four of the major bridges in the New York metropolitan area; spanning the Kill Van Kull is the Bayonne Bridge, the Goethals Bridge, The Outerbridge Crossing and the world renowned

Fig. 2: Port Authority Operations at Newark Int'l Airport

453.6500 - Port Authority "B"
 473.5625 - Port Authority "X"
 470.6125 - Operations "Z"
 118.30 - Newark Tower
 119.20 - Newark Depart
 135.35 - Newark Depart
 126.70 - Approach Control
 126.80 - Approach Control
 128.55 - Approach Control
 118.85 - Clearance Control
 132.45 - ATIS
 127.85 - TCA Control
 121.90 - Newark Ground / Port Authority Police
 154.130 - Newark Fire Department
 477.1875 Bergen County Police
 154.680 - "SPEN 1"
 530 khz - Airport Info Radio

Airline Operation Freqs Press Disaster Freqs

129.30 - American Airlines	453.000 - Metro Traffic
130.65 - ZANTOP	173.325 - Assoc. Press
129.55 - United Airlines	173.225 - NY Times
131.85 - Delta Airlines	452.975 - UPI
129.975 - Northwest Airlines	450.350 - CBS / ABC
130.72 - TWA	450.0875 - CBS Helicopter
131.925 - Federal Express	181.730 - ABC / NBC / CBS
130.45 - SAS	35.375 - CBS TV
	41.275 - NBC TV
	170.160 - WWOR-TV
	450.150 - WPIX-TV

Active FAA Channels

135.850 - FAA Traffic
 135.950 - FAA Traffic
 172.900 - Channel A1 - "Rpt"
 170.200 - Channel A2 - "Rpt"
 172.925 - Channel F1
 172.950 - Channel F2
 172.975 - Channel F3
 172.850 - Channel F4
 172.875 - Channel F5
 172.900 - Channel F6 - "Rpt"
 172.825 - Channel F7 - "Rpt"
 172.125 - Channel F8 - "Rpt"
 172.150 - Channel F9/H2
 172.175 - Channel F10 - "Rpt"
 166.175 - Channel F11 - "Rpt"
 170.150 - Channel H1 - "Rpt"
 169.300 - VOR Control

Airport Emergency Codes

Condition 1: Major Accident or Fire
Condition 2: Aircraft Accident
Condition 3: Minor accident / Fire
Condition 4: Potential Aircraft Emergency
Condition 5: Bomb Threat
Condition 6: Hi-Jack (On Ground)
Condition 7: Sky-Jack (Airborne)

Fig. 3: PATH Train System

160.470 - "R1" Train Control
 161.040 - "R2" Police Operations
 161.460 - "R3" Maint / Emergency
 161.535 - "R4" Car Maintenance
 452.875 - Henderson Maint. Yard
 160.425 - Henderson Maint. Yard

George Washington Bridge, which was opened in 1931.

Connecting New York City with Ft. Lee, New Jersey, "The George" stretches 4760 feet providing a total of 14 lanes on its two levels.



George Washington Bridge viewed from Ft. Lee, NJ.

G.W. Bridge manager, Allegra Lockett, and Operations Supervisor, Ken Oliver, were gracious enough to provide me with a behind-the-scenes look at the bridge operations center which is undergoing major renovations. The impressive wall display and control position will be replaced with a much more efficient PC based system. Seven surveillance cameras equipped with powerful telephoto lenses mounted atop the 640 foot bridge towers provide operations with a spectacular view of the New York skyline.

Scanning bridge communications, Hudson River maritime traffic, and local Hudson River aeronautical traffic can in itself provide hours of uninterrupted listening pleasure. During the summer months, sightseeing helicopters circling "The Lady" (Statue of Liberty) can be monitored on 123.05 MHz, while sky writing aircraft can be heard on 122.85 MHz. coordinating their cumulus scripting! New York Harbor also plays home to Governors Island, The Statue of Liberty, and the home of the U.S. Coast Guard (fig.1), all of which interact with The Port Authority daily. Deep beneath the Hudson River, The Port Authority operates the Holland and Lincoln Tunnels. Though much of the communications is carried out on an internal wire system, some activity can be heard on the frequencies listed in fig.1.

Getting It All Together

As you can see, Port Authority operates each agency independently. Realizing some sort of coordination was needed, work began in 1984 towards this direction. In 1986, TRANSCOM, a consortium of fifteen transportation and public safety agencies in New York, New Jersey and Connecticut was created. Headquartered in Jer-

Fig. 4: NYC Citywide Communications

470.8375 - Citywide Special Operations
 476.7375 - "Citywide 1"
 476.6875 - "Citywide 2"
 470.8625 - "Citywide 3"
 477.8375 - Manhattan Emergency Med Services (EMS)
 478.0125 - EMS Citywide *
 856-860.9875 - EMS Citywide *
 *Many 470 & 800 MHz frequencies are simulcast

Fig. 5: New Jersey Transit

453.325 - Operations
 856-860.2375 - Trunked Sys
 856-860.3875 - Trunked Sys
 856-860.4125 - Trunked Sys
 856-860.4875 - Trunked Sys

sey City, NJ, TRANSCOM relays traffic and transportation related incidents through several inter-agency networks. These include digital paging, "HAR" highway advisory radio stations operated within the AM broadcast band, and "VMS" variable message displays located throughout the New York / New Jersey area.

During my research I spent an afternoon with TRANSCOM Operations manager, Bernie Wagenblast. Bernie, by the way, is the voice commuters hear on the various highway advisory radio stations under TRANSCOM control. Readers may also remember Bernie as the morning voice of New York's "Shadow Traffic." While visiting I had the pleasure to meet New York veteran traffic reporter, Fred Feldman, who reported from WOR radio's "helicopter 710" for many years.

Operating as a silent component of The Port Authority, TRANSCOM operates 24 hours a day coordinating transportation and informing the tri-state area. TRANSCOM is exploring the feasibility of tying incident information delivery directly into major employers in the affected area. Future plans also include more use of "IVHS," Intelligent Vehicle Highway Systems. In such a system, road sensors, remote cameras and other interactive technology will provide real time feedback to TRANSCOM operations. Visions of George Orwell's 1984 sprang to mind as real time video images of unsuspecting commuters were displayed on large wall mounted monitors.

Though TRANSCOM is not assigned any frequencies of their own, communications with New Jersey Transit occurs on an as-needed basis as listed in fig.5.

My sincere thanks go out to The Port Authority of New York and New Jersey. Amongst the confusion and turmoil which was occurring, their cooperation and assistance was outstanding. Readers having any specific questions are invited to contact me at 69 Memorial Place, Elmwood Park, NJ 07407 - SASE Please! Hams can drop me a message via packet to WA2SQQ @WB2GTX.NJ.USA.NA



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Remnants of the Cold War DXing the Two Koreas

By Jeff Chanowitz

The Democratic People's Republic of Korea

While the wall in Berlin has fallen and with it the Eastern bloc and the Soviet Union, the rivalry which marked the cold war era continues a world away on the Korean Peninsula. With United States and South Korean troops facing off against troops of the Democratic People's Republic of Korea across the 38th Parallel, both sides are involved in a war of words. In this battle of propaganda and ideologies, radio plays a key role, making shortwave listeners the real winners, as they tune in to the two Koreas.

Ironically, despite their political differences, Koreans are an extremely homogeneous people. With their ancient origins traced from the Koryo and Choson people, for thousands of years Koreans fought off invasions from the Chinese and Mongols to the north and the Japanese to the east. This siege mentality resulted in the country being cut off from the western world into a famed and mythic "hermit kingdom."

At the turn of the century, Korea was rudely awakened from its isolation; by 1910, the country was absorbed into the Japanese empire until liberation on August 15, 1945. After World War Two, Koreans were still united by their sense of national identity but divided ideologically and politically into two parts by American and Soviet forces. This division led to the founding of the Republic of Korea (also known as South Korea), and the Democratic People's Republic of Korea (also known as North Korea).

Increasingly, the rival Koreas faced off against each other verbally, and in 1950 war was unleashed by North Korean troops when they invaded South Korea with logistical help from the Soviet Union. The resulting conflict caused the deaths of over a million Korean, Chinese, American, and UN soldiers. It ended in stalemate three years later and left both countries devastated. During the Korean War, the two rival services asserted themselves and established shortwave as an integral part of broadcasting in both Koreas.

The service, called Radio Pyongyang, was born shortly before the outbreak of the Korean War. While initially only broadcasting in Korean, the service quickly expanded to Japanese and English, which was dropped after the war and then was subsequently added in 1960. Although also broadcasting in Russian, Spanish, and Arabic, Korean remains the service's principle language and Korean affairs its main preoccupation.

Radio Pyongyang, along with its associate "Voice of Revolutionary Reunification," broadcasts a stodgy style of propaganda reminiscent of Radio Tirana's broadcasts under communism. Dr. Ralph Klough, an Asian Studies specialist at Johns Hopkins University's school of International Studies who has traveled to North Korea, described it as "a totalitarian state developed on the personality cult centered around Kim Il Sung." North Korean politics has been characterized by the glorification of Kim Il Sung and his son Kim Chong-il. Kim Il Sung, along with his relatives, has ruled North Korea in a Stalinist-style dictatorship since the Korean war and has cut off North Korea from most of the outside world.

The broadcasts, which originate from transmitters in Kanggye, Kunjang, and Pyongyang (100/200/400 kW), have mostly consisted of revolutionary music with news read in a monoto-



Unlike Radio Korea's reliable response, reports to Radio Pyongyang rarely yield a QSL. The lily of the valley QSL above is the only one in MT's collection.

nous style that is oddly inflected in manner. The content, like most of the North Korean media, included intense propaganda relating to writings, sayings, and stories that center around Kim Il Sung. The word "warmongering" is invariably used to describe South Korea and the United States.

Lately, changes in the communist world, along with friendship treaties signed by North and South Korea, and China's recognition of South Korea, have caused North Korea to reach out more to the United States in its attempt to gain diplomatic recognition. According to Dr. Klough, "Its hard line has lessened over the years and the atmosphere seems to be milder than it used to be." He added, "The economy is in very bad shape...They need foreign investment."

The new opening in North Korea may be an advantage to listeners who are seeking to obtain QSLs from Radio Pyongyang, a station which has been known for its inconsistent QSLing policy. The *World Radio and Television Handbook* describes this policy as "not normally verifying." With North Korea's new opening toward the outside world, Radio Pyongyang may be more likely to respond to listeners.

Yet, for the time being, creativity and persistence remain paramount in obtaining QSLs. Ideas, such as enclosing communist newspapers with confirmation reports, have yielded a QSL for some shortwave listeners. Even Gayle Van Horn, *MT's* QSL Corner columnist, has no sure fire way of obtaining a Radio Pyongyang QSL. Van Horn admitted to doing nothing special to get her reception report confirmed and stated that she received a QSL "by a sheer stroke of luck."

Another obstacle to receiving a QSL is related to the propaganda war between the two Koreas, which extends to the reception of listener's mail. The 1993 edition of *Passport to Worldband Radio* reports that some listeners, who have written to Radio Pyongyang, have received what appears to be bogus "black propaganda" from alleged North Korean dissidents at the external service. This literature, mailed from Japan, seems to have originated from South Korea. From such reports, it seems that some letters are not getting to North Korea.

Yet, despite the obstacles involved, for DXers who are looking for a challenge in confirming reception reports, Radio Pyongyang offers a unique opportunity to obtain a rare QSL. However, because of its programming style, Radio Pyongyang may only be of interest for shortwave listeners who want to hear rarely found information about North Korea.

To obtain the service's publication *Radio Pyongyang*, a QSL, or any of its free souvenirs, such as pennants, calendars, pins, and artistic prints, the address to write to is: Radio Pyongyang, Ministry of Posts and Telecommunications, Pyongyang, People's Republic of Korea.

KBS Republic of Korea



Like Radio Pyongyang, Radio Korea evolved into its modern form during the Korean War period. Yet, the two services' similarities are few and their

differences are as wide as the ideological gulf that now divides the two countries.

Called Radio Korea, a name which was changed from the Voice of Free Korea in 1973, the service broadcasts in 12 different languages: Korean, English, Japanese, Chinese, French, Spanish, Russian, Indonesian, Arabic, German, Portuguese, and Italian. It delivers a total of 127 hours of programming on 20 shortwave and two mediumwave frequencies daily. From the Korean Broadcasting Service's studios in Seoul (the external service's parent company), Radio Korea produces a variety of programs, including news, commentary, and features that present international listeners with indepth information about life in South Korea.

In contrast to the problems in North Korea, South Korea is a relatively dynamic and prosperous country. Known as one of the "dragons" of Asia (a term describing newly industrialized countries such as Singapore and Taiwan), South Korea has recently emerged from over 40 years of authoritarian rule into what is now a budding democracy with a booming economy to match. This new awakening was symbolized by the 1988 Summer Olympic extravaganza and by the election of President Kim Young Sam, who is democratizing the government and changing many authoritarian laws—such as the law that banned ownership of shortwave radios in South Korea!

Radio Korea's English service is celebrating 40 years of existence and was the service's first non-Korean language broadcast. To keep track of the rapidly changing aspects of contemporary Korean society, the service strives to cover news from an objective point of view with indepth analysis of major current events. Its goal is to accurately and promptly convey to overseas listeners information on Korea's social, eco-



nomie, and cultural scene, as well as providing a view on the global developments affecting the nation.

Despite having only three full-time staff members, Chae Hong-Pyo, Kim Pyung-Ryul, and Koog Soon-Yup, the service offers a wide variety of features including *Seoul Calling*, which focuses on Korean culture and artistic activities, lifestyles, sports, and interviews. It is designed to provide listeners with an understanding of things uniquely Korean. *Tales from the Past* provides listeners information about Korea's 5,000 year-old history through anecdotal accounts. *Pulse of Korea* is a long-standing program that gives a comprehensive look at the major developments in Korea.

Like North Korea, South Korea still hopes for eventual reunification. In its program *Forward to Reunification*, listeners can hear South Korean perspectives on this issue. Radio Korea also offers two music programs including *Echoes of Korean Music* and *Let's Sing Together*, which deal with traditional and contemporary pop music.

The external service also puts a heavy emphasis on promoting international friendship and understanding. To accomplish this objective, programs such as *Listener's Forum*, *Pen Pal Corner*, *Quiz Show*, and *Writing Contest Special*, have been developed to encourage an international exchange of viewpoints and increase audience exposure to different cultures on a personal level.

Being a Korean service, Radio Korea also seeks to provide the millions of Korean expatriates with a link to their homeland. In the United States, Radio Korea's broadcasts are extremely popular among the Korean-American community. Maria Chang, Assistant Director of the Korean Cultural Center in Potomac, Maryland, commented that "almost everyone she knows

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The service has set a goal of "being the friendliest shortwave radio in the world."

has a shortwave radio in order to pick up the broadcasts." She added, "The broadcasts help many people keep in touch with the latest news in Korea...they also provide a cultural link by the many Korean songs they play."

With its programs *DX Report* and *Technical Report*, Radio Korea also provides a number of features of special interest to DXers. *DX Report* is the sole effort of William Mathews, who produces the weekly, eight minute program from Ohio. Presenting updated information on shortwave broadcasts and frequencies gathered from newspaper articles, shortwave publications, and listeners around the world, *DX Corner* is unique, because it is produced by a DXer to meet the information needs of radio hobbyists. For listeners who desire the frequency information mentioned on *DX Corner* in print, Radio Korea also provides a written synopsis for free.

If you're a novice DXer, *Technical Report* is a program that should not be missed. Containing information and inside tips on how to purchase and set up shortwave receivers, assemble antennas, prepare reception reports, and write correspondence to international broadcasters, *Technical Report* is designed to "fine-tune" the skills of new radio hobbyists.

Radio Korea also produces a number of programs that are designed to interact with its worldwide audience. Both *Listener Feedback*, co-hosted by Koog Soon-yup and Mitch Lazar, and *From Us to You* air on Saturdays and play musical requests.

Ironically, one of the biggest audiences for Radio Korea's English language programming is located *inside* South Korea. With over 40,000 American troops stationed throughout the country, Radio Korea's mediumwave broadcasts are very much in demand. One enthusiastic listener is Jim Smith of Baltimore, MD. While stationed at ROK Air Force Base in Kusun during the early 80's, Smith started listening to the broadcasts of Radio Korea. Recalling his experiences, Smith stated, "Their broadcasts enhanced my understanding of the people and culture of Korea and Asia in general...News and analysis about Asia was my favorite topic." The impact of Smith's experience was so great that today he is an enthusiastic shortwave listener who continues to listen to Radio Korea and is studying to receive his MA in Asian Studies.

To keep listeners like Jim Smith tuned to Radio Korea, the service has set a goal of "being the friendliest shortwave radio in the world." To accomplish this objective, Radio Korea has established an audience service, which provides listeners with materials ranging from program guides and stickers to publications about the country. In addition, for listeners who are interested in visiting the Radio Korea's headquarters, the audience service has established a special tour that informs Radio Korea's listeners about the step by step process of producing programming.

So far the investment in unique programming and listener interaction has increased Radio Korea's audience. This new popularity is reflected in the 12,000 letters it receives each month from over 120 countries. Additionally, the popularity of Radio Korea among shortwave listeners can also be measured by the 65 listener clubs that have spontaneously formed in over 24 different countries.

With bigger audiences, the demand for greater reception quality has also increased. In response, Radio Korea has added a daily relay from Radio Canada International's transmitters in Sackville and is in the process of negotiating with the BBC World Service for additional relays of its signal.

For DXers interested in confirming reception reports, Radio Korea offers ample incentive to listen often. In addition to offering four different QSLs each year, the service also issues three special verification cards. All reception reports should contain standard QSL information such as time, frequency, signal strength and program details. Mail these reports to: Radio Korea, 18 Yoido-dong, Youngpungpo-ku, 150-790 Seoul, Republic of Korea.

In addition to actively seeking relay agreements with other broadcasters, Radio Korea is now focusing its energies on broadcasts to Eastern Europe and other former socialist countries. At a time of cutbacks by many European broadcasters, Radio Korea's commitment in resources and programming to shortwave broadcasting stands out, as the service is quietly establishing a reputation as a growing international broadcaster.

Liberty Broadcast Service

In addition to Radio Korea, KBS also provides an additional Korean-language service. Called the Liberty Program Service, the broadcaster is unique in its goal of uniting divided families through programming aimed at Koreans living in the North, in China and throughout the former Soviet Union.

Typical examples of programming on the Liberty Program Service include segments containing the latest news about Korea and the broadcast of audience letters pleading for information about long lost relatives, who were separated during the Korean War or under Japanese occupation. Not unusual are heart-rending pleas, like one written by a South Korean resident, stating, "I still anxiously await news about my father, who has not been heard from since he left for China in 1938," or another who wrote, "I am searching for the whereabouts of my younger sister Kim Il-yong, from whom I was separated when she was four years old...I have not heard from her since, and do not know if she is still alive. Whoever has news of my sister, please contact me."

The service's programming is transmitted on 14 medium wave and shortwave frequencies; however, many of its broadcasts have been jammed by North Korea. We were unable to verify specific frequencies. It is probable that R. Liberty uses Radio Korea transmitters. Certainly, such a DX catch would present a unique QSLing opportunity.

Stay Tuned

Despite their Cold War division, the forces of change are being felt in the two Koreas. Major events, such as the Olympic Games in 1988, joint South Korean/U.S. military exercises, and the recent UN/North Korean stand off concerning inspection of nuclear facilities, periodically increase the tension between the two Koreas. Shortwave listeners can tune in to the latest news from two different perspectives, along with a common 5,000 year old culture from these divided yet dynamic countries on the Korean Peninsula.

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Blue Ribbon Scanning at the State Fair

Story and photos by Allen Cole

What is the real appeal of scanners? Are we really just a bunch of telephone busybodies or vicarious thrill-seekers? I think not. What many people don't understand about scanners is their capacity to bring things to life. If you like to scan while visiting your local airport or railroad yard, or while shopping at the mall, you know exactly what I'm talking about. Scanning brings the unseen to your attention, and helps clue you in to where the action really is.

Who's the largest user of radio spectrum in your area? Perhaps it's a military base, an airport or a large factory. Much of the fun of scanning is to find all the frequencies for such an entity and to learn what each one is used for. Better yet, being intimate with your subject is a lasting source of enjoyment long after the thrill of hunting frequencies and assembling the puzzle has passed.

Here in Richmond, I have a renewable challenge in the Virginia State Fair. For ten days each September, it provides me with an endless number of frequencies to capture and catalog. This is hunting at its finest. No books or microfiche, just me and my scanner. Each frequency has to be found and tagged on its own. Much of the usage changes from year to year, and the Fair's temporary nature adds a time limit to the challenge. With a

yearly attendance of half a million, there is no end to fascinating exhibits, events and people. Let's take a look at the 1992 Fair.

The presence of radios at the Fair is not a subtle thing. It is evident early on as state troopers direct us to the proper gate, where a radio-equipped parking attendant is there to point us towards the empty spaces. As we approach the ticket gate, a Burns security guard holsters her radio to take our tickets and stamp our hands. In the distance are two police officers patrolling on mountain bikes. Before we ride our first ride or smell our first goat, there are already four frequencies to look for. Better get a drink.

Monitoring the Midway

Might as well get a corn dog, too, while we're at it. Uh oh, radio number five. It's a high band Maxon, sitting silently on the shelf of the corn dog trailer. Looks like a single channel with no Private Line. The carnival worker or Icarriel who runs the neighboring "Funky Worm" ride has one just like it. Let's sit down for a minute and see if anybody talks on these things. (We'll be seeing a lot of high band radios today.)

The VHF high band carries almost all of the traffic for the traveling food stands,

shows, games and rides. Most of these are provided by Deggeller Attractions of Stuart, Florida, and most of the radios are sold and serviced by Audio Innovators of Riverview, Florida. AI's mobile shop visited the '92 Fair during its first four or five days and serviced radios in the Fairgrounds' trailer park, where most of the carnies stay. The Virginia Fair is probably good business for AI because most of the Deggeller inventory is present here.

Deggeller itself is a family owned business with about 40 permanent employees. In addition to their own rides, games, shows and food stands, they also appear to book the independent operators, providing the Fair with full service management for its midway. The proliferation of high band radios is largely a function of this.

Independent operators who get supplies through Deggeller will have one of Deggeller's frequencies in their radios. Many independents will also have a "private" channel for intercommunication between their different "joints." Deggeller's executive staff usually have 6-channel radios. 152.885 and 154.49 MHz are reliable from year to year, but others seem subject to change. One carnie told me that they have big jars of crystals on hand.



The nerve center of the Fairgrounds' public safety forces, during a busy day.



Golf carts, some with cellular phones permanently installed, were popular in 1991, but were absent in 1992.



The Red Cross appeared to be on a different frequency each year.

Midway frequencies are drawn from the *Business Radio Service* and the *Special Industrial Radio Service*. In *Police Call's* allocation tables, these frequencies are marked IB and IS respectively. The first step in Midway monitoring is to search these ranges. As an alternative to my search mode, I often program in all possible high band frequencies in memory channels. This allows me to lock out individual frequencies that I've already identified or which are subject to interference. It also lets me scan a number of small, disconnected bands as a single unit. (See notes 1 and 2.)

Radios on Exhibit!

Other temporary radio use is by exhibitors at the Fair. Most of this is in the form of wireless microphones, and the most interesting example is a robot police car operated by the Virginia State Police. A duplex setup in the 49 MHz band allows the trooper to converse with those who encounter the car. Also in the exhibitor category are the horse shows, which are run by the Virginia Equine Association. Judges use UHF radios to transmit instructions and scores to the announcer's booth. Look for exhibitor radios in all bands. Most non-government exhibitors will be found on business frequencies.

Having discussed all this while eating our corn dogs, our next puzzle arrives in the form of a speeding golf cart. Golf carts are the lifeblood of the Fair, keeping supplies and personnel on the move all the time. The folks who swept past us had what looked like a UHF radio with the letters ARE engraved on it. This stands for Atlantic Rural Expositions, the company that administrates the fair-

grounds. Don't be fooled by the six inch whip antenna on the handheld. It is an 800 MHz radio tied into a trunked commercial SMR. The fairgrounds moved here from the high band because of constant conflicts with their primary channel, 151.625 MHz.

The 800 MHz system has several subfleets for the Fairgrounds, but the most interesting one is a link between the Fairgrounds Office, Henrico Police, Burns Security, Old Dominion Parking, Hanover Towing, Harris Electric and other local contractors. Each of these agencies has a fairgrounds radio at its headquarters. Telephones are also available, but the radio link insures contact if the phones fail. Fortunately for us, this appears to be a 5-channel trunk. To avoid the SMR's many other users, we'll program in the repeater inputs and listen to the handhelds direct. Works like a charm.

Unlike many states, such as North Carolina, Virginia has no governmental frequencies permanently assigned to the

fairgrounds. The Henrico County Police dedicate one of their regular repeaters to the Fair, while Burns Security and Old Dominion Parking provide their own UHF radios. The Red Cross rented some UHF radios for this year, and Harris Electric used old VHF Fairgrounds radios. Hanover Towing was on 800 (probably another SMR) and was never found.

Other features at the Fairgrounds include the Richmond International Raceway (RIR) and the Classic Amphitheatre. The racetrack is closed for the Fair, but the amphitheatre is busy every night. They also have high band radios, but nothing shows up in our normal search ranges. At the suggestion of a friend, we try frequencies from the *Motion Picture Radio Service* and hit paydirt in the 173 MHz area. [See note 3]

Conversations can be very interesting. I worked as a security guard at the '92 Fair and identified one user by comments that she made about one of my coworkers, who flirted

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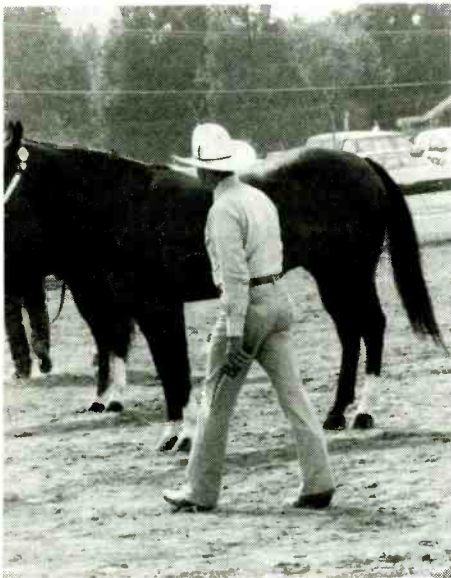
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Left: Horse judges use radios to relay instructions to contestants and to pass scores to the tabulators.



Right: This Standard VHF high band radio, equipped with speaker-mic, is the traditional rig for most carnies, but Maxon and Radius portables are quickly catching up.

a little too much. I found children contacting their parents on two different frequencies, and all of the concert communications were colorful. Many performers have contract riders specifying certain refreshments to be placed in their dressing rooms, and this can provoke some acerbic comments from the folks who are responsible for providing them.

The final leg of our tour will be through the Commonwealth Building. Here, we find exhibits from a wide variety of state agencies. Not much radio use here, but the research is great. After being handed new highway maps, we grab some commuter train schedules and a pamphlet on the state's forests. Across the aisle is the Air National Guard booth. They have new F-16Cs this year, and think that they may take on an air defense role in the near future. Meanwhile, they're still dropping practice bombs on Manteo, North Carolina.

Around the corner, the State Police have Canadian Mounties as their guests. The squad cars on display are equipped with the new GE integrated control heads which handle all radios, lights and noise makers on one panel. We also note that the new GE handheld radios (for use with vehicular repeaters) have LCD displays. There will be much to investigate in the coming year.

Having gathered all sorts of information, we return to the midway to enjoy the Fair and all its radio traffic. We quickly identify the busy frequencies and concentrate on the quiet ones while we watch the horse shows, tractor pulls, and carnival sideshows. The use of CTCSS, Digital Private Line, and UHF frequencies is on the rise this year. Maybe this will bring some relief to crowded frequencies like 151.625, 154.600 and 469.500 MHz.

At ten o'clock, the Midway closes, and we head for the car. We've had quite a scanner safari, and there's plenty more to do if we visit again. I hope that you had a good time, and learned something as well. Maybe I'll see you again in '93.

MT

STATE FAIR OF VIRGINIA — 1992

FAIRGROUNDS & SERVICES

151.6250	Fairgrounds (old F1 - CTCSS 71.9 Hz)
151.8050	Fairgrounds (old F2)
151.9550	Fairgrounds (old F3 - used by Harris Electric)
151.6850	Fairgrounds (old F4?)
816.7125	Fairgrounds Radio (trunked repeater input)
817.7125	Fairgrounds Radio (trunked repeater input)
818.7125	Fairgrounds Radio (trunked repeater input)
819.7125	Fairgrounds Radio (trunked repeater input)
820.7125	Fairgrounds Radio (trunked repeater input)
469.5000	Burns Security F1 (gates and supervisors)
464.5000	Burns Security F2 (building & site guards)
462.5625	Old Dominion Parking
173.3750	Classic Amphitheatre F1?
173.2750	Classic Amphitheatre F2?

EMERGENCY SERVICES

460.2750r	Henrico Police F3 (Fair primary)
460.1250m	Henrico Police F6 (simplex chat)
154.6650m	Virginia State Police "Tac" (traffic control)
464.5000m	Red Cross F1?
464.5500m	Red Cross F2?

MIDWAY - RIDES/SHOWS/GAMES

152.8850	Deggeller - primary
152.9450	Deggeller - games
154.4900	Deggeller - executive staff?
153.0050	Deggeller? - mention of cats for Crazy Ball
151.6250	joints - Mini-Ball, Lucky Duck
154.5700	joints - little girl calling Daddy & Grandma
154.6000	joints - Smile-A-While [PL 179.9 Hz]
154.6000	joints - food?
151.5500	joints - Clown Town, others unknown
154.5150	joints - Basketball games, 'big chair' photos
469.1375	joints - Bob's Space Racers
464.4750	joints - Picture This

NOTE 1: Business Radio Service: Primary allocations for VHF high band:
151.625-151.955
154.515, 154.540, 154.570, 154.600
Itinerant: 151.625

NOTE 2: Special Industrial Radio Service: Allocations for VHF high band:
151.490-151.610
152.870-153.005
158.325, 158.400
Itinerant: 151.505, 158.400

NOTE 3: Motion Picture Radio Service: Sometimes used for shows and concerts:
152.870-153.050 (30 kHz steps)
173.225-173.375 (50 kHz steps)

FOOD STANDS

151.865	Santillo's Italian sausage
151.715	O'Brien's Irish Cafeteria [PL 203.5 Hz]
151.655	Candy Apples/Cotton Candy (Deggeller Foods?)
151.925	Bill's Barbecue (in charge of Fairgrounds/Raceway concessions)
151.895	Used by Funnel Cake stand (Parnell Foods?)
154.570	French Fry stand?
153.035	Barbecue stand?
469.500	Rueger's Ice (local supplier)
469.550	unknown - asking about chili

MISCELLANEOUS

469.550	Horse judges (primary) [PL 210.7 Hz]
467.7875	Horse Judges (secondary) [PL 210.7 Hz]
469.500	Horse judges (old--used by accident?) [PL 210.7 Hz]
457.550	Unknown - PL tone
151.505	Only heard briefly - Deggeller?

WIRELESS MICROPHONES

49.83	"Super Peeler" display in Exhibition Bldg
49.83	State Police robot car - trooper-to-kids
49.86	Palm reader booth
49.875	State Police robot car - kids-to-trooper
169.445	Wireless guitar in Wolfstown Country Band
169.505	Whack-a-mole (Bob's Space Racers)
171.105	Sounded like a juggler
171.845	Intermittent, user unknown
171.905	Water Gun Fun (Bob's Space Racers)

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000461.4500	IB	YANKEE INDUSTRI	WN1M63	EPSOM	MERRIMACK	NH
000468.8750	IB	YANKEE INDUSTRI	WN1M63	EPSOM	MERRIMACK	NH
000468.8750	IB	YANKEE INDUSTRI	WN1M63	EPSOM	MERRIMACK	NH
000467.0000	IB	YANKEE INDUSTRI	WN1M63	EPSOM	MERRIMACK	NH
000465.4500	IB	YANKEE INDUSTRI	WN1M63	EPSOM	MERRIMACK	NH
000466.2500	IB	MARCUS CABLE O	WNF2949	BALLINGEP	RUNNELS	TX
000461.2500	IB	MARCUS CABLE O	WNF2949	BALLINGEP	RUNNELS	TX
001152.4800	IB	RICHTER, LEE	WNFY412	WINDER	BARROW	GA
001152.4800	IB	RICHTER, LEE	WNFY412	BETHELEM	BARROW	GA
000469.7250	IB	MARLER, HARRY	KN1C53	SPRINGFIE	GREENE	MO
000464.7250	IB	MARLER, HARRY	KN1C53	SPRINGFIE	GREENE	MO
000469.7250	IB	MARLER, HARRY	KN1C53	SPRINGFIE	GREENE	MO
000151.8350	IB	SOUTHERN STEV	WPBV444	GARDEN C	CHATHAM	GA
000151.8350	IB	SOUTHERN STEV	WPBV444	GARDEN C	CHATHAM	GA

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A Farewell Visit to WCC

By *Everett L. Slosman*

**Four
years
ago,**

MT ran "Old CC Calling" (Feb. 1989) detailing Marconi's first trans-Atlantic broadcast to England. CC, or as it was later known, WCC, was the first Marconi Wireless Telegraph Company of America operating station in New England.

WCC controlled a large portion of the ship-to-shore and trans-Atlantic point-to-point traffic, initiated an Americanized version of the famous fifty-cent-a-word Marconigram: a status symbol for wealthy and/or infamous ocean travelers throughout the 1920s.

Unfortunately, this historic station may have reached the end-of-the-line. Technology, which once made CW transmissions state-of-the-art, now makes it an almost irrelevant commercial communications form.

INMARSAT (International Maritime Satellite), ATOR (Automatic Telex Over Radio), and SITOR (Operator-Assisted Telex Over Radio) have taken the play away from radiotelegraphy.

The station's present owners, MCI Inc, may soon decide to shut down this venerable institution. In fact, management has taken the first steps by transferring all operations to KPH, Point Reyes, CA. So, if you call or listen to WCC, you are automatically linked to California.

However, WCC has a checkered history and is no stranger to adversity. Right after it was sited on the beach in South Wellfleet a raging Atlantic storm destroyed the original 200 foot antenna towers. This dealt Marconi's program a serious year-long setback.

The glaciers originally formed Cape Cod out of tailings and geological debris. This created a beautiful, wild, unstable land mass forever at odds with the North Atlantic. Wave action, tides, and ocean storms consistently erode the shoreline, whisking structures away to offshore burying grounds.

Yet, despite its soft composition, the Cape offers radio operators excellent saltwater sites 150 miles closer to Europe than other mainland locations.

In Marconi's time, land prices were relatively cheap. Few tourists or summer people owned seaside homes. People on Cape Cod

made their living by lobstering, fishing, salvaging, and occasionally by ship wrecking. They used false signal lights to lure cargo vessels onto the rocks and sandbars, then stripped the help-less boats clean.

Marconi's engineers relocated WCC to Chatham, MA, a seacoast village 30 miles southwest of the station's original site. This took several years because Marconi wanted to upgrade his equipment.

It made sense to replace obsolete spark gap generators and other South Wellfleet apparatus before switching locations. However, Marconi stubbornly refused to allow outside hardware in any of his stations and this meant WCC could not stay level with the emerging technologies.

While this move was underway, most of the corporation's energies focused on a series of legal hassles, patent infringement suits, stock manipulations, and industrial espionage. Between 1903 and World War One, the wireless business turned into a shell game looking to fleece the unwary and a full employment program for patent lawyers.

Although South Wellfleet no longer functioned after 1914, the station was not completely



"The Hotel," a two story brick building which was the officer's quarters during World War Two.



RCA built housing on the Ryder's Cove property for their employees. These homes were occupied by WCC personnel until the station was shut down.



The original site (Marconi Beach) of WCC. The area has been so eroded by nature that two of the original antenna bases are 65 yards offshore.

dismantled until 1920. Once the old station was shut down, WCC's receiving equipment and long wire antennas were installed on a hill overlooking North Chatham's Ryder's Cove on 30 acres fronting the Orleans Road (Route 28).

The transmitters went to Marion, MA, a community on the west shore of Buzzards Bay that offered excellent line-of-sight for Marconi-equipped ships sailing through Nantucket Sound. In effect this created two stations operating under one call sign.

Once the war started, the US Navy, no fans of Marconi, seized all radio communications facilities ostensibly to protect coastal communications. However, having seen the value of wireless, the brass wanted to control it forever.

Using an American multi-millionaire's yachting facility, the government cobbled together a spy-radio/intelligence network operating from Mt. Desert Island, ME, that may have been tangentially involved in a mysterious NH murder. (But, that's another story for another time.)

After WWI, Marconi Wireless wanted WCC back. However, government officials, led by Assistant Secretary of the Navy, Franklin D. Roosevelt, opposed the return believing it would give Great Britain a definitive edge in the forthcoming trans-Atlantic communications wars.

Roosevelt also convinced President Woodrow Wilson to cut off any sale of the new General Electric voice alternators to Marconi. Without them, Marconi was unable to compete with other wireless companies. Then, in an underhanded backroom deal, General Electric, Westinghouse Electric, and American Telephone & Telegraph formed Radio Corporation of America (RCA).

United Fruit sold RCA the rights they held to important radio patents for 4.1 percent of RCA's initial stock. With this technology, the fledgling company was off and running. Then, RCA paid Marconi \$2.2 million for all his stock in American Marconi, thereby acquiring WCC and KPH and laying the groundwork for RCA Global Communications. Investors shrewd enough to buy RCA in 1921 reaped small fortunes over the next four decades.

Chatham Radio originated point-to-point transmissions to Germany, Norway, and Sweden until P-T-P responsibilities shifted this phase to RCA's new "Radio Central" on Long Island.

Twelve years after RCA was created, the Justice Department sued to break up the firm's radio patents monopoly. United Fruit maintained their stock holdings and nothing else. AT&T pulled out of the combine immediately; Westinghouse and General Electric followed suit the next year. RCA's former partners were now rivals and would go at each other throats in almost every aspect of the broadcast business.

Table 1: WCC CW and ATOR

SHIP/ShORE: Calls to US, Possessions, Territories, and International points.
ShORE/SHIP: Calls from US, Possessions, Territories, and International points.

CW Traffic Lists at 0050 UTC and every two hours after on:

436 (500) kHz	12925.5 kHz
4331	13033.5
6376	16933.2
8586	16972
8630	22518
12847	

ATOR on NBDP (Narrow Band Direct Printing)

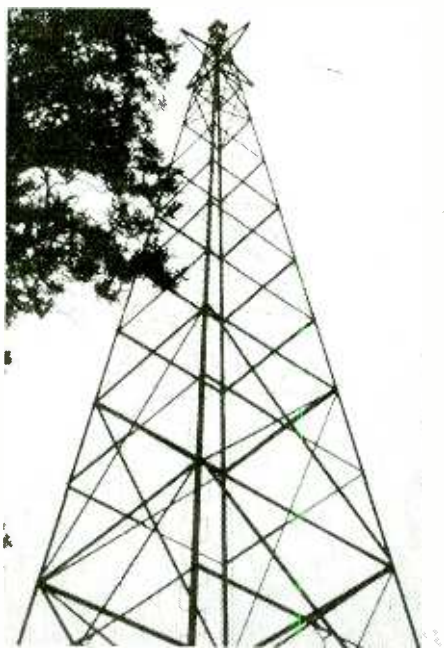
Traffic Lists at 0040 UTC and every two hours after on:

4216.5 kHz	1298 kHz
6324	16817
8424	16825
8426.5	22386.5
12589.5	

Table 2: WCC Weather for Atlantic, Gulf of Mexico, and Caribbean

CW at 1250 and 1650 UTC immediately following Traffic Lists.

NBDP at 0440, 1240, and 1640 UTC immediately following Traffic Lists.



Closeup of a WCC longwire antenna tower.

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**Table 3: WCC SELCAL (1.0)
1092 F1B Telex Frequencies kHz**

Channel #	WCC	SHIP
414	4216.5	4179
621	6324	6273
816	8424	8384
821	8426.5	8386.5
1221	12589.5	12487
1238	12598	12495.5
1621	16817	16693.5
1638	16825	16702
2221	22386.5	22294.5

**Table 4: Worldwide Ship
Calling Frequencies kHz**

INITIAL	ALTERNATIVE
4184	4184.5
6276	6276.5
8368	8369
12552	12553.5
16736	16738
22280.5	22281

**Table 5: Atlantic Ocean
Ship Calling Frequencies kHz**

INITIAL	ALTERNATIVE
4182	4182.5
6277	6277.5
8366	8366.5
12550	12550.5
16734	16734.5
22279.5	22280

As the maritime voice of the northeast, WCC's 500 kHz transmissions were as welcome to Atlantic and Caribbean radio operators as Nobska Light to navigators transiting Vineyard Sound. The station produced and prospered throughout the Thirties.

Then, came World War II and once again the government took over all marine communications. The Orleans Road compound became a military encampment. Officers lived in a two-story brick building overlooking the cove nicknamed "The Hotel." Enlisted personnel were relegated to the other brick quarters, formerly RCA employee housing.

Following this war, the newly promoted Brigadier General David Sarnoff was also Chairman of the RCA Board and the company encountered few problems retrieving WCC.

Marine radio entered a gold-plated age. Thousands of ex-Navy radio operators went to the civilian merchant marine. This gave RCA a situational advantage. They acquired a 50 acre site overlooking South Chatham's Forest Beach and installed a new transmission tower along with a web of pole-mounted long wires and various half and quarter-wave verticles.

On June 9, 1986, GE purchased RCA Global Communications for \$6.3 billion. Next, MCI Communications Corporation acquired Chatham Radio/WCC in a deal that sent the marine station to MCI International.

Marine radio is in a state of flux. CW or radiotelegraphy is a dying medium, though some ships still rely on it. The WARC-87 spectrum reassignments have paved the way for more efficient technologies. As more high seas vessels convert to satellite communications, the ship's telegrapher will soon be an anachronistic occupation. By 2000, marine radio will be a totally different puppy.

Last February, employees at Chatham Radio were informed that MCI was "downsizing" the station. Only the receivers at Forest Beach would be active and would be auto-linked to KPH, Point Reyes, CA. This news came shortly after negotiations were completed on a new union contract for the 16 station employees.

No one questions the need for a business decision. Since the mid-80s, radiotelegraphy has been a dying art. It's the way MCI handled the situation that left a bad taste in everyone's mouth.

The days of the WCC callsign may be numbered. More and more maritime services are being handled through satellites.

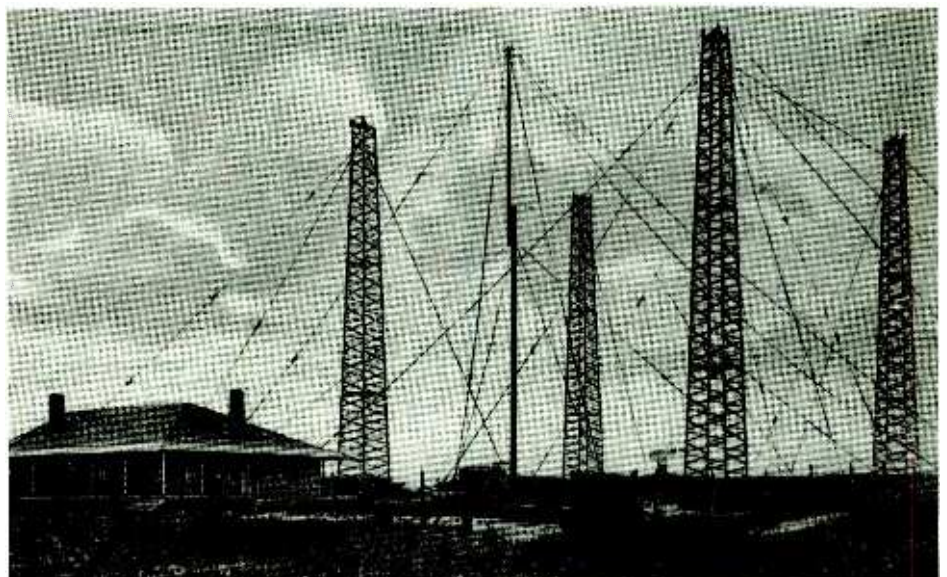
While no former employees were willing to go on record, many said privately the reduction to two technicians and an antenna rigger should have been handled with more sensitivity.

Bill Farris, former manager of WCC, referred all questions to Alan Garrett, an MCI executive ostensibly in charge of press relations.

Garrett has been hiding behind his voice mail system, refusing to provide any information or dispel rumors. After an initial contact, he no longer returns my calls.

With Point Reyes handling all WCC's traffic, the antennae at Ryder's Cove stand a mute

*Marconi Wireless
Station,
South Wellfleet,
Massachusetts.*





Both the Ryder's Cove and Forest Beach antenna farms make liberal use of telephone poles as antenna supports.

watch over the end of an era. Already, brush is beginning to reclaim the hillside and vines are creeping up the tower legs.

Chatham, long accustomed to "radio techs" with call sign license plates, acts saddened. Board of Selectmen Chairman Jeffrey Fryar, who has spent countless hours negotiating with MCI, wants the community to have first crack at the properties if the company decides to pull out.

Norman Pacun, retired attorney and head of the town's historic commission, is anxious to have the North Chatham facilities designated a National Historic Site, a project that must have the Massachusetts Historic Commission's blessings.

Then there are the wetlands, conforming use problems, zoning restrictions, and the potential loss of tax revenue from the parcels assessed at over \$3.5 million.

As the town and MCI wrestle with reality, WCC customers notice little or no difference. Ship-to-shore, shore-to-ship, and ship-to-ship communications, ATOR, CW, Marine Mailbox Services, and INMARSAT services continue to be provided.

Traffic lists maintain a regular schedule, the free weather information continues to be transmitted, and HOTLINE/INSIGHT® News and Information services in English, French and Spanish are still popular. OBS weather observations (see this month's "High Seas" column) still go to the National Weather Service and AMVERS USCG messages are handled routinely.

WCC delivers voice, data, fax, and telex through INMARSAT, covers the Atlantic and Pacific regions using Comsat's Coast Stations at Southbury, CT, and the Indian Ocean through Land Earth Station, Norway.

Try catching WCC soon, for according to Jack Martini, Station Manager, KPH, (17400 Sir Francis Drake Blvd., Point Reyes, CA 94956), while they are currently handling all traffic from the West Coast this may not last forever. And many suggest the days of WCC's call sign are numbered.

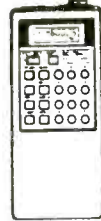
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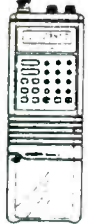


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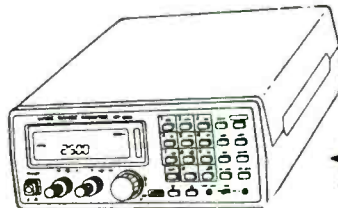
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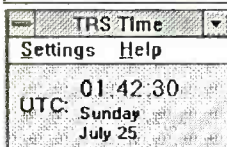
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Educational Radio in Costa Rica

Story and photos by Glenn Thompson

For many people, the mention of educational radio produces a mental image of an Australian youngster studying in front of a shortwave receiver in the outback. However, it is not necessary to go so far from home to find radio being used for formal education. Radio is used daily to provide instruction and recreation for approximately 30,000 people in rural areas of Costa Rica.

Costa Rica is a small country about the size of West Virginia. Located in Central America, it adjoins Nicaragua on the north, Panama on the south, the Caribbean on the east, and the Pacific on the west. With worldwide concern over the rapid depletion of jungles and forests, Costa Rica has been in the news for two opposing reasons. On the one hand, approximately one fifth of the country is set aside in national parks; on the other hand, slash and burn farming and extensive logging operations — some legal, some illicit — are rapidly eliminating the remaining forests.

Costa Rica has a population of slightly more than three million and the country is somewhat unique in that the majority of its inhabitants live on the central plateau in and around the capital city of San José. Because most of the country is mountainous or covered by jungles and forests

and there are relatively few roads, the rural population is scattered sparsely throughout the country in relative isolation from the people in San José. These rural inhabitants consist primarily of coffee farmers, workers on banana and palm oil plantations, and indigenous people on reserves in remote sites. The indigenous people represent a small portion of the population — less than two percent — and they still live in primitive conditions.

During the 1950's, Father Frank Tatenbach, a Jesuit priest, became concerned over the plight of the indigenous people and he realized that there would be little improvement unless the people were educated. There was no money available to establish regular schools, so, after surveying comparable situations in other countries, he decided that educational radio was the best, if not only, solution. He was influenced in this decision by broadcasts of the Central American Institute for the Extension of the Culture, and educational programs transmitted by Spain to the Canary Islands.

Through the efforts of Father Tatenbach, funds were obtained from Liechtenstein, and in 1973 the Cost Rican Institute of Educational Radio (ICER) was established as a joint venture of the Costa Rican and Lichenstein govern-

ments. Since 1979, the ICER has been a private and independent nonprofit organization, based on Christian principles and without political ties. Father Tatenbach, now in his eighties and living in Guatemala, has established educational radio systems in Guatemala and Honduras, as well as Costa Rica.

The ICER provides opportunities for adults in rural areas to complete the first three cycles of Costa Rica's program of General Basic Education. Special attempts are made to attract people who are considered to be "culturally marginal" because of their location and lack of opportunity, and to integrate them into the day-by-day activity and general progress of the country. However, every effort is made to adapt this program of education to the unique needs and characteristics of people in remote areas and to recognize and preserve their values, customs and traditions.

Instructional offerings to indigenous people are unique; they are designed to avoid the image of traditional courses and are carefully constructed to accommodate the manner of thinking and level of knowledge of the listeners. The General Basic Education program, as prescribed by Costa Rican law, consists of three cycles, with each cycle made up of three grades. The



Señor Jara Cacón, ICER's Executive Director, in his office.



The Costa Rican Institute of Educational Radio (ICER) is headquartered in Lourdes de Montes de Oca, a suburb of San José.

ICER's program of General Basic Education for indigenous people is known as "The Teacher in the Home," and it consists of nine courses; each course represents one grade level.

The courses are named after indigenous tribes. The first cycle of The Teacher in the Home is based on the Bribri, Brunca, and Cabécar courses; the second cycle is made up of the Chorotega, Huetar, and Talamanca courses; and the third cycle includes the Térraba, Ujarrás, and Zapandí courses. Courses consist of taped radio broadcasts supplemented with written materials, video cassette and tutorials.

ICER programs are broadcast from twelve stations located throughout Costa Rica in Amubri, Buenos Aires, Corredores, La Cruz, Los Chiles, Los Santos, Nicoya, Pital, Tonjibe, Turrialba and Upala. The station in Boruca has a one-kilowatt FM transmitter and broadcasts on a frequency of 101.5 MHz. The other stations have two-kilowatt AM transmitters and use either the frequency of 1580 kHz or 1600 kHz.

ICER headquarters are located in Lourdes de Montes de Oca, a suburb of San José. Radio and video production areas, a library, bookstore, and administrative offices are housed in two large, modern, three-story buildings. Dormitories, a cafeteria, and classrooms are provided to accommodate the needs of teachers who are brought in for periods ranging from one to three weeks for training, developing courses and preparing course materials. Licenciado Miguel Jara Chacón is ICER's Executive Director; he began his work at this organization soon after its founding in 1973.

Support for ICER's program is obtained from a variety of sources. The General Office of Adult Education in the Costa Rican Ministry of Education pays the salaries of thirteen full-time teachers; salaries of support personnel are paid by Liechtenstein's Agency for Adult Development. Technical assistance is provided by Radio Netherlands and student fees help defray the cost of producing materials. The Catholic Church funds special projects such as *The Journey of Faith*, a series of radio dramas, tapes, and textbooks commissioned by ADVENIAT, the Catholic Foundation of Germany for the Assistance of Educational and Developmental Programs. Also, the Distance Education University and other educational institutions provide space and assistance when their academic centers are near ICER radio stations.

Each radio station is independent, self-supporting, and locally administered. A community that wants educational broadcasting must provide land, a building, equipment, personnel, and money to pay for telephone and electrical services. ICER provides instructional materials, trains the local staff (usually volunteers), and maintains the equipment.

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Teachers find recording studios, classrooms, library and bookstore, plus room and board as they develop and prepare courses at the ICER headquarters.

Typical daily broadcasting is for a duration of five hours; although this varies from time to time and from one station to another. Each station is responsible for its own programming and a wide variety of educational and recreational topics are represented, including topics dealing with culture, religion, music, language, history, politics and geography. Each community is very proud of its radio station; fund-raising activities such as bullfights and soccer games are well attended.

ICER is licensed for 20 stations. In addition to the twelve existing stations, new facilities are planned for Chachagua, Chirripo, Pejibaye, Puerto Viejo, San Gabriel, Santiago, Telire, and Tilarán. Chachagua, Chirripo and Puerto Viejo will be FM stations; the others will be AM stations.

Lic. Jara Chacón indicated that "We are trying to develop a small library of materials at each radio station for use by students and tutors. Also, agreements are being worked out with the Ministry of Education and with certain church schools to use their classrooms for tutorials. The availability of classrooms will enable us to promote increased use of videos."

ICER is the primary avenue of communication with the outside world for many communities in Costa Rica. It is playing an increasing role as an interpreter between two cultures and as a vehicle to extend democracy to people in all parts of the country.

M
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*asterisk before/after time signifies station sign-on/sign-off;

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ALBANIA R. Tirana's Albanian service goes a lot faster than their English, with some of the most exotic folk music, 0000-0200, repeated 0200-0400 on 6120, 9760, best on 11745 (Steve Bagozzi, CA, SPEEDX)

ARMENIA Yerevan's English segments ID as Araks (Information) Radio Agency, 2144-2156 good on both 9450, 11920; different program 2245-2257, good on 11920, poor on 11945, 15385; not heard every day (Brian Alexander, PA)

AUSTRIA RAI now has two 500 kW transmitters, but the second one can't be used due to environmental objections; if legal case is lost, may add more relays (Edgar Sterbenz, RAI, Radio Japan *Media Roundup*)

BANGLADESH R. Bangladesh, English 1230-1300 on 13615, fair with modulation difficulties (Craig Jordan, CA)

BOSNIA R. Yugoslavia, English at 2100-2130 announced as on 9720, but is on 9505; 2130-2200 to Australasia heard on 9720, but not on 6100 as announced for Europe (Edgar Cronin, England, BDXC)

BRAZIL R. Progreso, 2460, Rio Branco AC, renamed R. Super Alvorada, 2300-2400 with news or music (Santiago San Gil, Barinas, Venezuela, *DX Listening Digest*)

BULGARIA Reception reports for R. Horizont home-service will not be verified, says the R. Bulgaria DX program (Hans-Peter Tillmann, Germany, BDXC)

CAMBODIA Domestic service changed name from V. of the People of Cambodia to National Voice of Cambodia (*Vithyu Samleng Cheat Kampuchea*) announced as 2230, 0400, 1100 on 4907, 6090. V. of the Great National Union Front, clandestine, has English daily 0100-0145, 1300-1330 on 5408 (BBC Monitoring)

CHINA V. of Pujiang, from Shanghai in Std. Chinese to Taiwan promoting patriotism and reunification, runs 0955-1545 on 7115, 4950, 3280. CPBS, Beijing, also known as China National Radio in English, changes frequencies progressively during several hour-long periods each day, not all at once; total span for First Program is 1958-1735 with a break Tue. 0600-0855. SW channels used for part or all of the day are: 17605, 15550, 15410, 15395, 15390, 12120, 12040, 11330, 9800, 9290, 9080, 7935, 7504, 6840, 6750, 6180, 6125, 5955, 5915, 5880, 5320, 4460. Includes English Sun. 0000-0030. Second Program, 2058-1600 except Wed. and Fri. 0600-0955 uses 17700, 15500, 11740, 11630, 11610, 11030, 10260, 9775, 9755, 7770, 7516, 7440, 6890, 5163, 4905, 4800.

National Minority broadcasts, 26 min. each: 0000 Tibetan 15670, 11630, 11375, and via Lhasa 7110, 5995, 5950, 4820, 4035. 0030 Uighur 15670, 11375, 12060, via Urumqi 4735, 3990. 0100 Kazakh same direct, Urumqi 4970, 4330. 0430 Korean 9920, 9775, 8566. 0500 Mongolian same plus Hohhot 6974, 4525. 0530 Tibetan 15670, 11630, 11375. 0600 Uighur & 0630 Kazakh 15670, 11375, 10260. 1000 Korean 9920, 9775, 8566. 1030 Tibetan 15670, 11630, 11375, Lhasa 7110, 5995, 4035. 1100 Uighur 15670, 11375, 10260, Urumqi 4735, 3990. 1130 Kazakh on same direct. 1200 Korean 9775, 8566. 1230 Mongolian 9775, 5420, 4800, Hohhot 6974, 4525. 1300 Tibetan same as 1030. 1330 Uighur same as 1100 plus Urumqi 7195. 1400 Kazakh as 0100. 1430 Mongolian 15670, 11375, 10260, Urumqi 4980, 4220. 2130 Korean 9775, 6110, 5420. 2200 Mongolian on same plus 4800, Hailar 4750 (BBCM)

COLOMBIA More harmonics heard: 9950 = 2 x 4975, Ondas del Ortegua at 1235, 9770 = 2 x 4885, Ondas del Meta at 1630, 5720 = 4 x 1430, R. Majagual at 1115. 3232.5, unID believed to be La Voz de Montería, 3 x 1080 off frequency, at 1030 \$ 1130. 3100 = 2 x 1550, R. Fantasía at 0620. 2620 = 2 x 1310, Caracol-Montería at 0535. 2360 =

2 x 1180, Caracol-Manizales at 0830 (Santiago San Gil, Venezuela) RCN is to reactivate 6160 by yearend, "a necessary prestige operation," says the C.E. (Henrik Klemetz, *WRTH LA-News*)

COMORO ISLANDS After seeing R. Comores 3330 reported in Europe, I wrote to station, and director Molle Hissani Ali Hamdi replied in June that due to a transmitter fault they had been inactive on SW and MW since Nov. 1992 (B. Gornati, Italy, *Play-DX*)

COSTA RICA RFPI celebrates 6th anniversary with another toll-free call-in, UT Sept. 16 at 0000-0400, repeated at 0800-1200 (Joe Bernard, RFPI) *Sound Currents of the Earth*, Wed. 2200 & Thu. 0600, has spun off a separate program occupying the other air-time, *Sound Currents of the Spirit*, Suns. 2030, Mons. 0430 and 1230, exploring ancient mystic books (James Bean, ME) New 30 kW transmitter and log-periodic antenna, first used on 7 MHz, then 15 MHz, make an ERP of 240 kW. 21465 reactivated but may not stay depending on reports, propagation. Also back was 6200 for vertical-incidence close-in coverage. *University of the Air*, radio courses planned to resume especially from Canadian clone (RFPI *Mailbags*)

Radio Exterior de España has finally added local sign-off tapes mentioning Cariari de Potosí, such as UT Sun. 0100 on 17890 (*WOR*)

AWR seems regular on 11869.8, but irregular on either 13749.87 (versus Israel 13749.85), or 6145 v or 9721 v; one night at 0715-0750+, both 11 and 13 MHz were on (Brian Alexander, PA)

ECUADOR *Studio 9* on HCJB, 0030, 0300, 0530 has these weekly themes, UT days: Tue., medical; Wed., meeting local people; Thu., environment, nature; Fri., history; Sat., exploring Latin America (*HCJB Program Notes*) 500-kW transmitter was off in July for upgrading, installing computerized diagnostic system, so it can identify which of 200 parameters is out of tolerance. A new 100 kW is on the way from Elkhart, too (*HCJB Today*)

GABON Adventist World Radio will cease relays via Africa Number One, Aug. 31, and replace them with Russia. Gabon schedule has been daily 0500-0600 on 9625, Sun. 1200-1300 on 11780 (Radio Netherlands *Media Network*)

GEORGIA [& non] Two different programs in Abkhazian: pro-Russian via Russian transmitter on 7305, Tue. & Sun. 1730-1800; pro-Georgian daily 0900-0930 on 7125 via Georgia (Rumen Pankov, Bulgaria, *DX Epistle*)

GERMANY DW ceased using the Leipzig transmitter site, reshuffled and reduced number of frequencies in various languages (Wolfgang Büschel, Stuttgart) Just as well, was excessive, and Leipzig not that effective to us anyway (gh) So English to N. America, Aug. revision: 0100 on 6040, 6085, 6145, 9700, 9765, 11865, 15105; 0300 on 6085, 6145, 9640, 9700, 11715, 13790; 0500 on 5960, 9515, 9670, 11705 (*Ihre Welle*, DW)

GREECE VOG shifted 15650 to 15652 to us at 1500-1550, plus 15630, 17535, except Tues. when only VOA-Kavala-15630 is on (John Babbis, Silver Spring, *W.O.R.*)

GUAM New for KSDA W-93 from Sept. 26 is 7455 at 1400-1700, 2000-2300 (George Jacobs) KSDA and KTWR are both expanding; visited Guam, found TWR has 4 x 100 kW, planning a 5th from Elkhart, previously destined for Swaziland or Shri Lanka. AWR expects another 100 kW on by later this year; then two old transmitters moved to new station somewhere in Africa, and replaced by new ones on Guam (Adrian Peterson, *RNMN*)



GUATEMALA Radio C. in La Soronda, TGPC on 4895, unlisted station, heard (Fernando Vilorio, Venezuela, via Santiago San Gil)

HONDURAS HRJA, R. Copán Internacional, installed beam antenna and began testing in July on 15674.5, daily exc. Suns. 1400-1500, 1745-1900, 2100-2230, music and IDs, programs from Estéreo Amistad, and R. Miami Internacional. Transmitter power only 100 watts, mostly beamed at Miami where Jeff White found strength sometimes exceeded neighbors WWCR and WCSN/WSHB. Gave away SW radios to first five reporters; addresses included street and box of RMI, Apartado 955 in Tegucigalpa; outdated ID tapes claimed 9950 kHz (Tim Hendel, FL; Ed Rausch, NJ; Henrik Klemetz, Colombia; Alan Roberts, PQ; Gigi Lytle, TX; Rob Keeney, KS) Only other broadcaster reported on 15675 lately is Pakistan, 1600 English, 1700 Turkish, spur from nearby frequency (Achim Brückner, Germany; Ivo Christov Ivanov, Bulgaria, DSWCI SW News)

INDIA List-loggers, beware! Many AIR stations are changing, or even exchanging frequencies to reduce interference; New lineup will be: 3205 Itanagar. 3245 Lucknow. 3268 Srinagar. 3277 Kohima. 3305 Bhopal and Imphal. 3345 Jammu and Jaipur. 4760 Imphal. 4775 Gangtok. 4940 Guwahati (?). 4950 Shimla and Port Blair. 4990 Bhopal and Guwahati. 5010 Thiru'puram. 5050 Aizawl and Srinagar (Manosij Guha, via OzDX, DX Grapevine)

A white paper proposes AIR establish relay stations abroad in Mauritius and Vietnam (but new Bangalore station obviates need for Mauritius); purchase airtime in Cyprus, Gabon, Yugoslavia [sic], Canada (Guha, DX Grapevine, via DX Ontario) About time.

INTERNATIONAL WATERS Conflicting info surrounds the radio-ship project mentioned in July MT, p. 6, and Aug. p. 29. Steve Coletti, former RNI broadcaster, has been covering this on *Spectrum*. Connection with St. Kitts is denied, but flag a secret till deal is firm; claims to plan broadcasts from western Mediterranean, within footprint of Becker's Galaxy 2 coverage. Was it being outfitted in Boston harbor? Bro. Stair claimed to do a broadcast by phone from the ship while there, but Coletti's info was that it was not in Boston. Contrary to Stair's claims, the project is owned by Becker, and Stair is one prospective client. Al Weiner and RNI are not investors, but has been employed to engineer the construction. First tests once outside U.S. waters should be on 7415 kHz, but regular broadcasting is not expected before late October (via Coletti and Diane Mauer, WI)

IRAN [non] Two associated clandestines are: V. of the Iranian Revolution, 1400-1500 in Kurdish on 6400v, 3888v, unconfirmed on same at 0900-1045 also in Persian; previously used 4470v. And, V. of the Communist Party of Iran, 1700-1800 in Persian, repeated 0415-0545 except Fris. 0530-0700 [sic, durations do not match] all on 6400v, 4190v, or alternates 4445v, 3888v, respectively; announcements in English give 6430, 4480, 4005, 3610, where has been observed in past as well as 4452, 3840 (BBCM)

IRAQ Heavy jamming of BBC, VOA, Monte Carlo in Arabic for three years suddenly stopped without explanation (Reuter via Mike Cooper) But then Baghdad appeared on VOA frequency 15205, heard 0330-0353* closing in English as for India/Pakistan at 0100-0400, also announced as 1100-1300 (John Mainland, New Zealand, RNMN) But heard at 1400-1600 in English, sometimes opening with news as late as 1445; ex-15250 (Victor Goonetilleke, Shri Lanka, *ibid.*)

ITALY Radio Uno, domestic relay on new 21775 around 0700-1400 // 9515. Domestic and external services of RAI moved to large new production centre in northern Rome, Saxa Rubra. Plans to add Japanese, Chinese, rent airtime about 3 hours per day on foreign SW relays; SW site Prato Smeraldo is surrounded by Rome's suburbs so plans new site in Toscana area (RAI schedule via Wolfgang Büschel) Tuscany? Is English programming any livelier from new building?

JAPAN Best chance to hear *Media Roundup* is Sun. 0530 on 7230 via England (Don Rhodes, Australia, ADXN) Also better here than 9725-Canada

(Gigi Lytle, TX)

JORDAN Strange frequencies heard: 7000 and mixing product on 7095 at *0500, +1500-1630*; also on 6255 in evenings, but something else there in mornings (Finn Krone, Side, Turkey, DSWCI SW News)

MÉXICO R. Educación, 6185, had brief English ID 0645, commentary on UN in Somalia (Ed Rausch, NJ, W.O.R.)

MOLDOVA [non] R. Moldova International, via Romania, now seems regular: French Mon.-Sat. 1200-1225 on 17800, 1800-1825 on 11950 (RVI Radio World via Büschel) Not regular (Büschel)

MONGOLIA Dalanzadgad/Uliosxai in Mongolian at 1310 drifted down to 3958.1 so separable from 3960 Kanggye, Korea (David Foster, Australia, OzDX)

MOROCCO New VOA site is 12 km south of the still-used Tangier relay, near Breich. This is outside the boundary of the former Tangier International Zone (Dan Ferguson, VOA, ADXN)

MOZAMBIQUE R. Moçambique, 11817.4, from 0450, then only after 0500 with RFE QRM (Ernie Behr, Ont.) A Voz da Renamo, clandestine, reportedly from Gorongosa, has external service on 10100 at 0500-0515, 1600-1615 in Portuguese; unconfirmed domestic in Port., vernaculars 0515-0600 on 7380 or 6155 (BBCM)

NETHERLANDS RN documentaries the first three Weds. of Sept. examine contributions Africans are making to European parliament, and their new religious sects in the Netherlands (via D. Mauer, F. Orcutt, G. Lytle, W. Martin)

NEW ZEALAND RNZI policy is one QSL per frequency per season; due to workload, those who report more often will get a rubber-stamp QSL endorsement on their report, returned (Tony King, RNZI Mailbox) RNZI summer-time schedule from 2200 Oct. 2 until 19 March 1994: 1650-2136 on new 9550 Mon.-Fri., 2137-0658 on 15150 and 0659-1206 on 9700 both daily; 1207-1648 on 9510 occasionally (Adrian Sainsbury, freq. mgr.) RNZI has 16 applicants for Ian Johnstone's position; Tony King is one of them (Arthur Cushen, via Gigi Lytle, W.O.R.) Originally from Cardiff, South Wales, much of my material is on BBC domestic where I worked until my arrival in New Zealand in 1970. Retired as head of RNZI in 1991, continue as free-lancer. Would like to do *Around the World* weekly, but scheduled 4-weekly on these Tuesdays: 7 Sept., 5 Oct., 2 and 30 Nov. at 0900 on 9700, repeated following Fri. at 0430 on 15120. *On the March*, weekly Thu. 0505 on 15120 brings in more correspondence, mostly from U.S. and Germany (Rudi Hill, RNZI, who appears to wear orange-tinted glasses; we usually hear him at 0930, not 0900)

NICARAGUA R. Miskut, 5770 at 2350 partly in English, homey style of programming reminiscent of pre-independence PNG stations in the 70s (W.J. Parks, FL, DXSF via *Radio Nuevo Mundo*) Country music program around 2330-2430* (Hans Johnson, MD, DXLD) Or on 5771.5, louder and clearer than before (Santiago San Gil, Venezuela, *ibid.*)

PERU 6137.4, R. La Voz de Alto Mayo, Nueva Cajamarca, almost daily from around 1000, strongest Peruvian here (Hans Johnson, MD, DXLD) 6499.0, R. Estación "C", Moyobamba ex-6323.9 (Henrik Klemetz, Colombia, via M. Schmitz, *Play-DX*) 4953.1 ex-4950.1, R.

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Madre de Dios, 2300-0200 (D. Monferini, R. Puppo, J. Penaud, *Play-DX*) 6032.95, R. Landa reactivated, *0900v-1100 fade, poor, folk mx, 1000 news (Takayuki Inoue N., Tokyo, *Relámpago DX* via *RNM*)

PORTUGAL RDP changed Africa frequency 17900 to 15515, including English M.-F. 1900 (RVIRadio World, Büschel) Features are: Mon., *Visitor's Notebook*. Tue., *Musical Kaleidoscope*. Wed., *Challenge of the 90s*. Thu., *Spotlight on Portugal*. Fri., *Listeners' Mailbag* alt. with *DX Program, Collector's Corner* (RDP) next UT day 0130 to us on 9570, etc. (gh) Heard at 0010 in Port. on 19410, 19140 // 9555 (Santiago San Gil, Venezuela, *W.O.R.*) = 2 x 9705, 9570 (gh)

RUSSIA Chita area power authority switched off all radio and TV transmitters in eastern Baikal region to protest non-payment of electricity bills, including R. Moscow International, in late June (ITAR-TASS and Ostankino via BBCM) Part of problem is devious accounting system—Finance Ministry pays TV and radio companies, who in turn pay employees, who in turn pay the power people (Russia TV via BBCM) Various other parts of Russia faced at least threats of shut-downs, and a number of R. Moscow frequencies apparently disappeared as a result (gh)

A parliamentary ban on religious broadcasting by foreigners has been proposed, favored by the Russian Orthodox Church, Chief Rabbi, and Muslim leaders; Pres. Yeltsin had not yet decided whether to veto it, but if he did, parliament could override that (HCJB *DX Partyline*) That would put a quick end to lots of shortwave relay deals! (gh)

R. Irina, Vietnamese clandestine, was halted in June, one less irritant in our relations with Vietnam (*Pravda* via BBCM) For administrative and technical reasons, resumed July 19 under new name Nadezhda (Hope, not to be confused with a private Russian station already named that), or in Vietnamese R. Hyvong, 1400-1500 on 11845, not 11725 as planned; now alternates one day in Russian, next day in Vietnamese (Tetsuya Kondo, *RJMR*)

Green Music Radio International, Moscow pirate, 200-250 W. Sats. 2300-2330 on 3020 or 2963 (*Pirate Connection* via *WDXC Contact*) Opens between 2130 and 2230, plans new frequency in 3900-3950 range. R. Without Borders Int'l, another pirate from 2200 Sats. around 3905-3920. R. Seven uses 5 kW on 9550, Tue. & Fri. 0100-0300 from Samara (Nikolai Rudnev, *ADXN*)

Radio Centre, Moscow, 0530-0600 on 12010, 1330-1400 on 15185, each 250 kW (Andrei Nekrasov, *DX Moscow* via *Play-DX*) Had been at 1530 (gh) R. Pamyat, 1430-1600 on 12000 moves Sept. 27 to 7230, 200 kW Yekaterinburg (via Jim Parker, *BDXC*) R. Vostok, Khabarovsk, includes English IDs, 0800-0930 (Sun 0900) on 4610, 7210 (Valery Ostroverkh, *DSWCI SW News*) Mariyskoye Radio, Yoshkar-Ola, local program 0220 on 7200 (Olle Alm, Kurt Norlin, Sweden, *SW Bulletin*)

SLOVAKIA SRI says IRCs not valid here (Edwin Southwell, England)

SOLOMON ISLANDS SIBC some days keeps 9545 on past 0800, local news at 1000, R. Australia news 1100 (Bill Westenhaver, PQ)

SOMALIA Like interference to R. Manta, 9540, BBC Somali service, 15420 subjected to mocking remarks at 0900-0915 (BBCM) Two competing R. Mogadishu, both USB + carrier; V. of the Great Somali People since mid-July on 6870 at 1500-1800, pro-Aydid, hostile to UN, US; the other nearby on 6862 supports warlord Ali Mahdi Muhammed (Richard Measham, BBCM, *RNMN*) IARN announced sked for R. Free Somalia it set up: 3870 at 1600-1800 in Somali, 1800-1815 English; 7460 0400-0500 Somali, 0400-0415 English [*sic*] daily (John Norfolk, OK)

SOUTH AFRICA R. 2000 replaces R. Orion on 3320, 2300-0300 (SENTECH via Westenhaver) BBC Meyerton relay on some frequencies formerly Lesotho: 9515 0430-0500, 0530-0600, 1700-1730 and 11940 0430-0500 in Portuguese (SPEEDX)

TIMOR EAST New Catholic station to be permitted in Díli, but only in Indonesian, not Portuguese (R. Renascença via BBCM)

TONGA UNESCO set up FM relays, but they were not effective and technicians emigrated; 1 kW SW covers the whole country and beyond (Martin Allard, UNESCO, AMARC, PeaceNet via Patrick Crumhorn)

TURKEY R. Izmir back on SW 7103.5 0800-1000, 1100-1300, but DW and Bosnian ham interference. Was listed in 1972 *WRTH* (Rumen Pankov, *DX Epistle*) As TAO-6, 7100, 0.75 kW, school station (DLS *DX-Actuell* via Büschel)

TURKS & CAICOS R. Visión Cristiana, 530 kHz MW, successor to Atlantic Beacon, 1570, also got its SW licence but no immediate plans to use it (Bob Janney, RVC, *W.O.R.*)

UAE There goes another 11m outlet: Abu Dhabi in Arabic at 1100 on 21630 ex-25690, // 17855, 21570, 21735 (Büschel, Germany)

UKOGBANI BBC programme tips: *The Fight Against AIDS*, 3 weeks from Aug. 22, Suns. 1401, Mons. 0630, 1001. *Looney Tunes*, six weeks from Aug. 15, Suns. 0415, Mons. 1930, Tues. 0915. *One Blood—The History of Jamaican Music*, 5 weeks from Aug. 23, Mons. 2215, Tues. 0630, Weds. 1615, Fris. 1030 (*BBC Worldwide*)

USA VOA drops German Oct. 1, and Spanish, Portuguese to Europe, French to Africa also affected by cuts; seven more languages to be stopped by 1995 (DPA via BBCM) Some Tibetan frequencies are via Germany, which cannot be heard in Beijing and thus are not jammed (USIA's *On the Air*, via Mike Cooper)

WWCR again plans to have third transmitter on shortly, using 5810, 12160, 15610; new building has room for a fourth. *Project Saturn Global*, commercially-sponsored educational programming, is on 15685 Mon.-Fri. 1000-1200, hopes to expand to 7-day strip on WWCR-3. Pres. Clinton's Sat. radio address on 15685: 1645, 2230, Sun. 1245. *Israel Magazine*, Sun. 1200, Tue. 2045; *In the Holy Land*, Sun. 2345 both produced by Israel Radio (via Adam Lock, WWCR)

Ernst Zündel's *Voice of Freedom* expanded from WRNO to two more stations: WWCR, 15685, Suns. 1630; WINB, 15295, Sats. & Suns. 2000, Tues. 1900, all in German except WRNO in English; denies Holocaust (Ernie Behr, Ont., *W.O.R.*) WWCR not aware of Zündel's agenda when 13-week contract signed, it will not be renewed (Adam Lock, WWCR) That should be up after Sept. 12 (gh) German and U.S. governments cannot prevent this, but German states could jam the broadcast (*Der Spiegel*, via RVI *Radio World* via Steven Cline)

Pastor Pete Peters, *Scriptures for America*, is raising funds to buy 15% but controlling interest in a "20 meter" SW station in need of repairs, presumably WINB which operates only on 19 meters (*W.O.R.*) Has nostalgic Hammond organ music around 1700 on 15295 (gh)

WHRI *DX Radio Show*, UT Suns. 0300-0400 on 7315; *DX Devotion*, weekdays 1630 on 9465, 15105, 1900 on 13760 (exc. Wed.) *For the People*, live weekdays 1800-2000 on 9590 ex-17830. *News of the Spirit*, live UT Mons. 0200 on 7315. WHRI T-shirts for \$12, size L/XL/XXL from 61300 S. Ironwood, South Bend, IN 46614 (Steven Michael & Joe Hill, WHRI) For W-93 season, WHRI can use 7315 as early as 2000 (George Jacobs)

World of Radio schedule keeps changing, listen for announcements, but at presstime: on WHRI, Sat. 0600 on 7315, 9495, Sun. 0130 on 7315, Mon. 0100 on 9495, Wed. 1900 on 13760 on WWCR, 15685, Fri. 2115, Sun. 2300, Tue. 1230; 7435, Sun. 0305, after 7435: Sat. 0630, Sun. 0305; see also COSTA RICA last month. *Mundo Radial*, gh's Spanish DX report follows some Fris. at 2145 on 15685. Despite widespread interference complaints by WWCR 7435 listeners, WEWN is registered for W-93 on 7425 from 2100 to 1000 (gh)

KCBI on new 13740 2300-0200 (George Jacobs) Monitor Radio doubled weekday *Letterbox* airtime to 6 minutes, with Bill Badger (Leslie Edwards, PA)

VENEZUELA R. Táchira, 4830, had UN Program in English at 0445 on a UT Sat. (Ron Young, BDXC)

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



Broadcast Loggings

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o *Monitoring Times*.
English broadcast unless otherwise noted.

0005 UTC on 6010

CUBA: Radio Havana Cuba. News item on the human rights conference. Parallel programming on 9815 kHz in SSB. (Bob Fraser, Cohasset, MA)(Jeff Gordon, New York City, NY)

0105 UTC on 3289

ECUADOR: Radio Centro. Spanish. "Centro" ID to musical jingle. Nice mix of pop vocals and Ecuadorian vocals. (Tom Banks, Dallas, TX)

0118 UTC on 3477

BOLIVIA: Radio Padilla. Spanish. Fair signal of Andean vocals. Local time check at ID break. Tentative log of Bolivia's Radio 9 de Abril on 3200 kHz at 0130. ID type break at the half-hour; dreadful signal quality. (Banks, TX)

0240 UTC on 17725

PAKISTAN: Radio Pakistan. Slow-speed international news at tune-in. Parallel programming on 17705 kHz. Brief musical bridge to sign-off ID at 0245. (Thomas S. Barnes, Marietta, GA)

0245 UTC on 4879.6

ECUADOR: Radio Nacional Espejo. Spanish. Upbeat Latin vocals at tune-in. Time check to musical jingle. Coffee and cola commercials. Station ID and sign-off routine to 0303. (Joel Alexander, Clearwater, FL)

0300 UTC on 7200

SUDAN: Radio Omdurman. Arabic. Station sign-on ID noted as "huna Omdurman" into world newscast. (GVH/NC) Station monitored on 9165 kHz at 1818, with music, IDs and feature. (Giovanni Serra, Rome, Italy)

0325 UTC on 4810

PERU: Radio San Martin. Spanish. Weak signal for Peruvian vocals. ID and closing station announcements. National anthem to 0332*. (Alexander, FL)

0500 UTC on 6135

SWITZERLAND: Swiss Radio Intl. Italian service, audible on parallel 9860 kHz. Station IDs, and organ music *La Rividta Svizzera*. (Serra, Italy)

0500 UTC on 17750

SEYCHELLES: FEBA. Interval signal to ID. Religious program *Saturday Night Alive*. Programming to Middle East on Fridays only at this time. (Ed Rausch, Cedar Grove, NJ)

0509 UTC 5075

COLOMBIA: Caracol Colombia. Spanish. "Cuarto de hora Caracol" Jingles and commercials to chat and news. (Sam Wright, Biloxi, MS) Colombia's *La Voz del Cinaruco*. Spanish 4865 kHz. World news, music, announcements. Signal fair with minimal interference. (David Williams, Pinson, AL)

0640 UTC on 9480

MONACO: Trans World Radio. Station ID at tune-in. Religious text to music and devotionals. (David Harrison, Crestview, FL)

0645 UTC on 6185

MEXICO: Radio Educacion. English/Spanish. Station ID to negative editorial on UN involvement in Somalia. Local guitarist. (Rausch, NJ)

0800 UTC on 15170

FRENCH POLYNESIA: RFO-Tahiti. French. Unusual sounding disco tunes from zany DJ format. Very good signal for world news and comedy sketch. Parallel 11827 kHz weaker. (Williams, AL)

0830 UTC on 15200

GUAM: Trans World Radio. Station IDs and time checks. Religious programming with fair signal quality. (Harrison, FL)

0842 UTC on 11990

SLOVAKIA: Radio Slovakia Intl. Topic the Academy of Sciences. Station ID and regional music. Chat about the Bratislava Economic school. Programming noted on parallels 21705// 17535// 15605 kHz. (Serra, Italy)

0900 UTC on 9545

SOLOMON ISLANDS: SIBC. ID and program lineup. *Mind Matters* to regional music. Fair signal on 9550 kHz. (Williams, AL)

0900 UTC on 6190

PERU: Radio Oriente. Spanish. AM rooster crow sound effects. Station ID and time check. Peru's Radio Mundo heard on 5082.6 kHz at 0930. IDs, time checks, promos and flute music. (Rausch, NJ)

0905 UTC on 11690

PHILIPPINES: FEBC. Station ID and brief devotional. Hymns and contemporary Christian vocals. (Frank Hillton, Charleston, SC)

0925 UTC on 4890

PAPUA NEW GUINEA: NBC. Station ID to regional news and music. Fair signal quality with occasional fading. (Hillton, SC)

1000 UTC on 4980

VENEZUELA: Ecos del Torbes. Spanish. National news and station ID. Lively upbeat Latin music. Very good signal! (Williams, AL)

1010 UTC on 9580

AUSTRALIA: Radio Australia. Live cricket match of England vs. Australia. (Fraser, MA) Australian Armed Forces Radio heard on 23678.5 USB at 0320. Fair signal with some fading to 0400*. Noted on 12070.5 USB to 1300*. (Jerry

Wilkins, Denver, CO)

1045 UTC on 9700

NEW ZEALAND: Radio New Zealand Intl. *Encore* program of light classical music and show tunes. (FRASER, MA)

1055 UTC on 17830

BULGARIA: Radio Bulgaria. Review of current political affairs. Station IDs, music and features. Station monitored on parallel 13670 kHz. (Serra, Italy)

1100 UTC on 6120

CANADA: Radio Japan. News on economy and trade with U.S. Radio Korea's Canadian relay on 6145 kHz at 1100. (Fraser, MA)

1100 UTC on 3214.9

INDONESIA: (Suiawesi) RRI-Manado. Indonesian. Time tips at the hour, to station ID. News style format very weak! Tentative logging for Sumatra's RRI-Tanjung Pinang. Muslim prayers heard on 3224.9 kHz at 1120. (Banks, TX)

1105 UTC on 3905

PAPUA NEW GUINEA: (New Ireland). Pidgin/English. Nice island tunes. Clear ID and announcer talk. No ARO interference this morning. (Barnes, GA)

1125 UTC on 3360

GUATEMALA: La Voz de Nahuala. Spanish. Nice signal of ID and regional tunes. Guatemala's Radio Tezulutlan heard booming in with marimbas on 4835 kHz at 1140. (Banks, TX)

1335 UTC on 15630

GREECE: Voice of Greece. Greek. Station ID/frequency quote. English news noted on parallel 17515 kHz. (Serra, Italy)

1350 UTC on 7265

GERMANY: Sudwestfunk. German. Pop music, station jingles, and commercials. Time tips at 1400 into international news. Station ID and announcer chat. (Serra, Italy)

1610 UTC on 9490

RUSSIA: Radio Nadezhda. Russian. Classical and lyrical music. Lady announcer's chat audible on parallel 17675 kHz. Station signal covered by Radio Prague's French service at 1630. (Serra, Italy)

1628 UTC on 17620

FRANCE: Radio France Intl. *Paris Calling Africa* with editorials on the fear of French industries relocating outside the nation. (Fraser, MA)

1700 UTC on 15240

AZERBAIJAN: Voice of Azerbaijan. Interval signal melody four times to sign-on ID. "This is the Voice of Azerbaijan." Greetings, instrumentals, news text to choral music. Editorial on Azerbaijan's economic reforms, military, and national assembly. Fair signal quality to fade out by 1717. (GVH/NC)

1800 UTC on 13620

KUWAIT: Radio Kuwait. English programming to sign-off at 2100. Difficult to monitor due to WEWN Birmingham, (Williams, AL)

1834 UTC on 15420

USA: WRNO. Religious phone-in talk show. Additional religious programming audible at 1845 included: KTBN 15590 kHz, WMLK 9465 kHz, WJCR 7490 kHz. (Hillton, SC)

1905 UTC on 15580

USA: Voice of America. African service with featured topics from Kenya, Somalia, and Ethiopia. Asian news topics on Sri Lanka, Pakistan, and China. (Hillton, SC)

1120 UTC on 2410

PAPUA NEW GUINEA: (New Guinea) Radio Enga. Pidgin. Weak signal at tune-in. Announcer chat and public service promo. Regional music fade out by 1135. New Guinea's Radio Sandaun heard on 3205 kHz at 1025 the next morning. (Barnes, GA)

1922 UTC on 1757

ISRAEL: Kol Israel. *DX Corner* with profiles of the Grundig "Yacht Boy 205" and Roberts R-621. Station audible on 15650 kHz at 2140 with *Letter from Jerusalem*. (Fraser, MA) (Gordon, NY)

1935 UTC on 17605

NETHERLANDS ANTILLES: Radio Netherlands-Bonaire. *Happy Station* with a report on a recent visit to Lebanon. (Fraser, MA)

1945 UTC on 15070

UNITED KINGDOM: BBC. *Farming World* the World Aquaculture Conference in Spain. *Brain of Britain* quiz show on 12095 kHz at 2030. *Seeing Stars* show on 9915 kHz at 2215. (Fraser, MA)

2100 UTC on 13830

CROATIA: Radio Zagreb. Time tips to interval signal. Station ID. U.K. rock music to English news at 2140, including reports of ongoing conflict in region. English news noted at 0705, 0905, 1305, and 2205. IDs included at the top of each hour. (Rausch, NJ)

2110 UTC on 15290

RUSSIA: Radio Moscow Intl. *Moscow Mailbag* on Russia's railroads, marriage and gold. (Fraser, MA) (Gordon, NY)

2130 UTC on 7415

BOTSWANA: VOA relay. English news and commentary. Station interval signal and ID at close. Audible on parallel 15205. (Rausch, NJ)

2210 UTC on 11810

IRAQ: Radio Iraq Intl. English news, commentary, and regional music to Arabic service at 2300. Parallel programming noted on 15180// 17940. English commentary 2342-2400. (Rausch, NJ)

Utility World

Larry Van Horn
c/o MT, P.O. Box 98
Brasstown, NC 28902

Good-Bye to ZLW

We start off this month's edition of UTE World with a bit of sad news; another marine utility station is closing. We received a Fax in the office from Graham Turner, Manager at Wellington Radio in New Zealand, informing us that they will close their doors at the end of this month on September 30.

In his brief letter, Graham wanted to thank all the DXers who had written ZLW/ZLD over the years from all over the world. Graham said, "Thank you for your correspondence, QSL and postcards...we have enjoyed hearing from you."

No reason for the closing was cited, but if you want to get ZLW/ZLD into your logbook before the station closes, here are the frequencies and modes to hear them on.

ZLD - Auckland Radio, Auckland, New Zealand, USB: 2207.0
ZLW - Wellington Radio, Wellington, New Zealand
CW: 4277.0 6393.0 8504.0 12740.0 17170.0 22533.0
USB: 2153.0 2601.0 4378.0 4384.0 4429.0 6501.0 6513.0 8737.0
8752.0 13101.0 13146.0 17257.0 17350.0 22732.0 22801.0

The station address, in case you would like to send a farewell card or report is: ZLW, Wellington Radio - New Zealand, P.O. Box 17-374, Karori, Wellington, New Zealand

NMN Info

Right now, we are at the peak of this year's hurricane season. One station you may not have considered for weather information is NMN-US Coast Station, Portsmouth, VA. They have a variety of broadcasts including special hurricane advisories from the National Hurricane Center in Coral Gables, FL.

MT reader John Holtz recently received the latest schedules and frequency information from the US Coast Guard Station NMN-Portsmouth, VA, with his QSL from the station confirming reception. John has shared that list with us in Table 1 and it should afford you many opportunities to hear NMN.

The offshore broadcast consists of the west central North Atlantic offshore waters between 32N and 41N and west of 65W, the southwest North Atlantic, Gulf of Mexico and Caribbean Sea and, with the exception of the 0400 UTC broadcast, the offshore waters east of New England north of 41N and west of 60W.

The High Seas forecast consists of the North Atlantic waters north of 03N and west of 35W including the Gulf of Mexico and the Caribbean Sea. During the hurricane season the latest hurricane advisory precedes each voice weather broadcast made by NMN.

Other Broadcast Types and Frequencies

Included in the package that John received from NMN was information on other broadcasts of interest to marine interest along the east coast. Here is some of that information.

LCMP - The Atlantic Composite Fleet/General Broadcast (LCMP) is a CW broadcast used by US Navy, US Coast Guard and Allied Fleet units unable to copy a secure broadcast. LCMP covers the Atlantic and Mediterranean Ocean areas and is keyed by the Coast Guard

Table 1

NMN - Coast Guard Portsmouth, VA, Communications Station Voice Weather Forecast Schedule

All times are universal coordinated time (UTC). All frequencies kilohertz (kHz.)

0400	Offshore except New England broadcast on 4426.0, 6501.0 and 8764.0.
0530	High Seas forecast on 4426.0, 6501.0, and 8764.0.
1000	Offshore broadcast on 4426.0, 6501.0 and 8764.0.
1130	High Seas forecast on 6501.0, 8764.0, 13089.0.
1600	Offshore and Gulf Stream broadcast on 6501.0, 8764.0, 13089.0.
1730	High Seas forecast on 8764.0, 13089.0, and 17314.0.
2200	Offshore and Gulf Stream broadcast on 6501.0, 8764.0, 13089.0.
2330	High Seas forecast on 6501.0, 8764.0, and 13089.0.

CAMSLANT-Chesapeake, VA, on a scheduled basis and provides specifically addressed traffic, weather, hydrographic data, navigational warnings, and general messages requiring electrical transmission. The broadcast authority for the LCMP broadcast is CINCLANTFLT Norfolk, VA.

NAM-US Navy Norfolk, VA	NAR-US Navy Key West, FL
8090.0 Continuous	5870.0 Continuous
12135.0 Continuous	26725 1500-2300 UTC
16180.0 Continuous	
20225.0 1200-2359 UTC	

NAVTEX Broadcast

NMN broadcasts NAVTEX on 518 kHz six times daily at 0130, 0530, 0930, 1330, 1730, 2130 UTC. Distress, Urgent and Safety traffic is broadcast on receipt at the first available time slot. Messages are then repeated full text on all scheduled broadcasts until cancelled. There are no abbreviated broadcasts in NAVTEX. Messages are serially numbered (from 01 to 99, then back to 01) according to message type.

One Operator Broadcasts

The one-op schedule is arranged for vessels unable to maintain a 24-hour radio guard. During the period 0800-1200 local, marine radio operators may request any distress, urgent or safety traffic they may have missed. All non-scheduled broadcasts which require transmission during the one-op schedule will be broadcast during a scheduled "silent period," for example, 0917:45 local, the third silent period of the one-op schedule. The requested message will be sent in the appropriate format for the particular type of message.

Facsimile Broadcast

NMF - Coast Guard Boston, MA Communications Station is the only

Coast Guard station for the U.S. East Coast with a scheduled fax broadcast. The Navy station NAM-Norfolk/NFAX conducts their broadcast for the West Central Atlantic area.

NMF - USCG Boston, MA
3240.1(0530UTC) 7528.1(1730UTC)
NAM - USN Norfolk, VA
4975.0 8078.0 10863.0 (All continuous 7 days a week)
3357.0 15957.0 20013.0 (Monday/Tuesday/Wednesday)

The following weather facsimile information was also provided for the Pacific Ocean region in the package that John received.

NMD - USCG Honolulu, HI 4855.0(0600-1600UTC)
21735.0(1600-0600UTC)
NPG - USN Stockton, CA 6453.0 9090.0 (Both continuous)
NOJ - USCG Adak, AK 8494.0 (Continuous)

A big thank you to John Holtz for shipping these interesting weather related frequencies our way; hope to hear from you again real soon.

HOKA Code 3—Round 2!

Simon Scheiner in Cherry Hill, NJ, has responded to Robert Hall's comments in the June 93 Ute World column regarding the Code 3 from Hoka. I will take the liberty of publishing his comments in full here for you to analyze. My original comment on support from Code 3 dealers still applies. I have not been able to contact anyone at the US dealer, nor has anyone associated with the company responded.

Simon says, "Your column included what I feel were some unjustified criticisms of the Dutch 'Code 3' system which I have used in several versions for quite a number of years. I personally was never happy with the M-7000 which receives so much praise in this country. There were too many changes of EPROMs needed to carry out fixes for such things as lock-ups, etc.

"I became interested in WEFAX with the purchase of an M-7000, but even there, there were significant limitations (to me, at least) particularly the inability to change scrolling direction when this was needed to accommodate certain transmitting stations; also moving the received image left or right was done in zigzag fashion. Code 3 provided very satisfactory fax receiving capabilities for me until, in connection with SSTV, I added a 32K 'hi-color' board to my computer and the Code 3 software would not support my particular video chips.

"I devote more of my time these days to SSTV, in part because propagation doesn't favor adequate signals levels during daytime (UTC) hours when most of the exotic modes still in use are beamed primarily from the third world to Europe, but I received many transmissions using Piccolo (only the admin channel was or may still be unencrypted), Coquelet, Twinplex, etc.

"I NEVER encountered any bugs in the Code 3 software.

"One reason why some may have had difficulties with the Code 3 is because of the LF3 interface, which is essentially a simple untuned demodulator. This may be satisfactory in Europe where incoming signals may be quite high in level, but the absence of selectivity was a problem for me. I have consistently used an external demodulator (a Frederick 1280) for all modes where only two frequencies are involved; for Piccolo, Twinplex, Coquelet, the LF3 interface still had to be used. Adequate receiver IF selectivity would help to some extent.

"Code 3 with the LF3 is not (was not) capable of tuning VFT signals, when there were such transmissions, so in that connection, the M-7000(M-8000) would have been better. Still, I don't know that there are enough signals which are encrypted and can be received at all these days that this would be a significant concern.

"Onevery irritating concern when using Code 3 is that the supplier's

paranoia about protection of software means that once Code 3 software is installed on a hard drive, there is no way the average user (including me with my level of knowledge) can make a back-up copy. You can run the program from a floppy (and then make a single back-up of the original) but speed would be much too slow for practical, long term use. I think that Hoka could better have used a protection method wherein, after software is installed to a hard drive, back-up copies can only be made of the original floppy disk. The program, however, would only run on the original computer on which it was installed.

"Code 3 has varying analysis tools but one interesting feature is the ability to store 'raw' data and then try various modes to decode.

"I think the Code 3 deserves more praise than it has received. Incidentally, there is a new, higher quality board/software called Code 30 which significantly improves capabilities, but it is quite expensive."

Thanks, John, for the comments, I think Robert's main beef on the Code 3 was lack of dealer response and support, which is also my knock against the Hoka Code 3. I would also agree with Robert that I have not yet seen a log in this column attributed to the Code 3. I don't mean to imply that the unit can't receive anything; it just looks as though as virtually no one is using the package to DX utes at this time. Gee, where is Ed Deasy when you need him?

KC-135 Tanker HF Bandplan Revealed

J. Layden from across the pond recently got a look at the HF radio panel aboard a KC-135Q tanker from the 9th Recon Wing based out of Beale AFB. He thought others might be interested in what he found. All transmissions in USB unless otherwise noted. My comments on each frequency appear in parenthesis after the frequency.

Channel	Frequency (kHz/MHz)	
0	6761.0	(S391)
1	7330.0	(S307)
2	9027.0	(S392)
3	11243.0	(S393)
4	15041.0	(Old SAC Mike channel)
5	18005.0	(PACAF channel Tango)
6	20631.0	(Old SAC Whiskey channel)
7	23337.0	(Old SAC Uniform channel)
8	Time Hack	(Probably a WWV frequency)
9	8989.0	(Old GCCS channel)
10	13201.0	(GHFS channel)
11	8967.0	(GHFS channel)
12	11176.0	(GHFS channel)
13	6750.0	(Old GCCS Discrete/FT network here)
14	6738.0	(GHFS channel)
15	11179.0	(Old GCCS channel)
16	15015.0	(GHFS channel)
17	8964.0	(GHFS discrete)
18	9018.0	(Mystic Star channel)
19	11236.0	(Old GCCS channel)
20	18002.0	(Old GCCS channel)
21	9014.0	(USAF AWACS/ACC channel)
22	11239.0	(Old GCCS channel)
23	18019.0	(Old GCCS channel)
24	21.60 (AM)	(Deutsche Welle is on this freq in English)
25	7295.0(AM)	(RCI is on this freq in English)
26	11.75(AM)	(BBC/VOA are on this freq in English)
27	11762.0(AM)	(Interesting!)
28	9515.0(AM)	(Deutsche Welle and BBC on this freq)
29	Time Hack	(Probably another WWV frequency)

Those of you looking for missing Papa/Sierra-2XX,9XX/Whiskey/Xray designators, might want to check a few of these frequencies out. It would appear that the USAF has not totally divorced those old SAC/GCCS channels.

Well, that does it for me this month. I hope to see quite a few of you next month in Hot Lanta at the 4th Annual MT Convention! It should be the best one yet! Time for a B&J and a check on your logs from the Utility World this month.

Utility World

Utility Loggings

Abbreviations used in this column

AM	Amplitude Modulation	Meteo	Meteorological
ARQ	Automatic Repetition on Request (SITOR-A)	MFA	Ministry of Foreign Affairs
ARQ-E	Single channel simplex ARQ teleprinting systems.	M/V	Motor Vessel
ARQ-E3	Single channel ARQ ITA3 data mode	NATO	North Atlantic Treaty Organization
ATC	Air Traffic Control	Nav	Navigation
AWACS	Airborne Warning and Control System	Ops	Operations
CF	Canadian Forces	PTT	Post & Telegraph Administration
CIS	Commonwealth of Independent States	QRK	What is the intelligibility of my signal?
CQ	General CW call for any station	QRM	Interference
CW	Continuous Wave (Morse Code)	QSA	What is my signal strength?
De	From	QSB	Are my signals fading?
Deg	Degrees	QSL	Can you acknowledge receipt?
FAF	French Air Force	QSW	Will you send on this frequency?
HF	High Frequency	QTH	Location
ID	Identification	RAF	Royal Air Force
IRC	International Reply Coupon	RCC	Rescue Coordination Center Report
ITU	International Telecommunications Union	Rpt	Report
KCNA	Korean Central News Agency (North Korea)	RTTY	Radioteletype
KHz	Kilohertz	SELCAL	Selective Calling
KW	Kilowatt	SI-ARQ	Siemens simplex ARQ teleprinting system
LDOC	Long Distance Operational Control	SITOR-A	Simplex Telex Over Radio
LSB	Lower Side Band	SLHFB	Single Letter HF Beacon
MAP	Maghreb Arab Press (Morocco)	UNHCR	United Nations High Commission for Refugees
MARS	Military Affiliate Radio System	Unid	Unidentified
		US	United States
		USB	Upper Side Band
		UTC	Universal Time Coordinated
		VFT	Voice Frequency Telegraphy
		wpm	Words per Minute

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

- 442.0 FFB-Boulogne-Sur-Mer Radio, France, with CW weather broadcast at 1625. (Ary Boender-Spykenisse, The Netherlands)
- 444.5 PCH-Scheveningen Radio, Holland, with a CW navigation warning broadcast in CW at 1627. (Boender-Neth)
- 2023.0 DKJU-M/V *Atlantis* working Norddeich Radio in USB at 2158. DEQC-M/V *Burgemeister Smidt* in the English channel working Norddeich Radio in USB at 2159. (Boender-Neth)
- 2182.0 OXP-Skagen Radio, Denmark, with voice traffic in USB at 2140. EJK-Valentia Radio, Ireland, calling for traffic on 1745 kHz at 2138 in USB. (Boender-Neth)
- 2274.0 APN/YTN/IRE-Dutch Army working each other in USB at 2220-2240. (Boender-Neth)
- 2390.0 Various Motor Vessels working each other on this simplex channel in USB. (Boender-Neth)
- 2607.0 FUG-French Naval Radio Toulon, France, with a V CW marker at 2215.0 (Boender-Neth)
- 2805.0 IGJ41-Italian Naval Radio Augusta with V CW marker at 2222. (Boender-Neth)
- 2823.0 IDR8-Italian Naval Radio Rome, Italy, with V CW marker at 2118. (Boender-Neth) *New frequency-Larry?*
- 2845.0 PBB-Dutch Naval Radio Den Halder with 75 baud RTTY traffic at 2108. (Boender-Neth)
- 3270.0 KPA-Israeli Mossad number station with two coded messages in AM at 2215. (Boender-Neth)
- 4246.0 Naval Radio-London, England, with RTTY encrypted messages separated by RY+VMGTCNJBH at 0944. (Boender-Neth)
- 4274.0 GKB2-Portishead Radio, England, with CW DE marker at 0947. (Boender-Neth)
- 4286.0 GKA2-Portishead Radio, England, with a CW weather broadcast at 0949. (Boender-Neth)
- 4560.0 Israeli Mossad number station with coded messages in AM at 0146. (Fernandez-MA)
- 4664.0 VIB-Israeli Mossad number station with a coded message in AM at

2249. (Boender-Neth) Heard marker VLB2 but no text in AM at 0149. (Fernandez-MA)
- 4667.0 Crossbow 1 working Silver Armor with authentication codes at 0625. At 0627 Silver Armor advised go down 100 kHz (4567.0). At 0629 changed back to original frequency. Crossbow 1 wanted to pass traffic but Silver Armor advised out of time, this window terminating window Silver Armor out. Crossbow 1 is a Secret Service call; Silver Armor unknown. (Rausch-NJ)
- 4763.0 UNHCR Naval Operations channel. Frequency for naval units involved in the naval blockade of Serbia using tactical call signs in USB at various times. (Boender-Neth)
- 5058.5 DV47/1AG1/1AG2/1AG5-Unid stations with 4-line blocks of RTTY RY and NNNN -several times using 50 baud at 0632. (Robin Hood-UK)
- 5300.0 MTO-Royal Navy Rosyth with RTTY traffic using 75 baud at 1615. (Boender-Neth)
- 5301.0 Russian female 5-digit number station in AM at 0201. Haven't heard a Russian number station in quite some time. (Fernandez-MA) *Yes, I agree, Bill, they have been noticeably absent. Wonder why they have just now made a reappearance? Could the civil unrest and financial woes be the reason?-Larry*
- 5310.0 UNHCR Naval Operations channel. Another UN Naval blockade channel for units in the Serbia operation. Noted with various units using tactical call signs in USB at various times from 1615-0110. (Boender-Neth)
- 5312.0 DFZG-MFA Belgrade, Serbia, with a press review using 75 baud RTTY at 0645. (Boender-Neth) *Language, Ary?-Larry*
- 5381.5 Guardia Civil working RETWLB-Guardia Civil Burgos, Spain, in SITOR-A with message traffic at 1903. (Boender-Neth)
- 5574.0 San Francisco working Philippine 101 with initial contact then shifted to 3413.0 at 0630 in USB. (Gordon Levine-Anaheim, CA)
- 5680.0 Fishing Boat Outbanders talking about fishing ops on a worldwide emergency/distress frequency. What Jerks! (Fernandez-MA) *I agree-Larry*
- 5713.0 RAF Architect (Strike Command) with an altimeter setting broadcast for various bases in USB at 0203. (Fernandez-MA)
- 5738.2 9GC-Accra Air, Ghana, with RTTY 50 baud RY/ID then traffic for GBLD at 0530. (Robert Hall-Republic of South Africa)
- 6287.0 ICJ-Italian Naval Radio Augusta with V CW marker at 0355. (Rich Dettmann-Buffalo Grove, IL)
- 6328.0 WOO-Oceangate Radio, NJ, with traffic list in CW at 0408. (Dettmann-IL)
- 6351.5 P2M-Port Moresby Radio, Papua New Guinea, with CQ CW marker and notice to mariner broadcast at 0913. (Jack Dix-Yonkers, NY)
- 6415.0 7TF4-Skikda Radio, Algeria, with CQ CW marker at 0425. (Dettmann-IL)
- 6439.0 LYL-Klaipeda Radio, with NAVIP(?-Larry) navigation warning for NAVAREA 1 using 50 baud RTTY at 1910. (Robin Hood-UK)
- 6537.0 SAA-Karlshrona Radio with CQ tape and "traffic for UPWQ in CW at 2225. Actually sending QSW as 6357/8450/4357.5 kHz but transmitting on wrong frequency of 6537.0 I wonder if UPWQ heard them? (Robin Hood-UK) *Bet they didn't-Larry.*
- 6761.0 Jedi League working Jedi Lead, Jedi 2 and Jedi 3 in USB at 0212. (John Robinson-Antioch, TN)
- 6810.0 Male lobsterman with XXX rated chit-chat about undersized lobsters in LSB at 0118. (Ed Rausch-Cedar Grove, NJ)
- 6840.0 Spanish female 4-digit number station in AM at 0236. (Fernandez-MA)
- 6963.0 RFFX-French Forces Versaille with a message to RFFVAY (MCA Baigen en Bosnie Herzebovine) using ARQ-E at 1948. (Boender-Neth)
- 7418.7 Clam Diggers off Delaware coast with idle chit-chat in LSB at 0400. (Rausch-NJ)
- 7885.6 RUEDEPB working NC with a duty list and duty periods for several Coast Guard vessels. Also gave a list of duty technicians and home phone numbers in SITOR-A at 0304. (Robinson-TN)
- 8048.0 RCV-Bliava Naval Radio, Russia, calling RMMV in CW at 0101. (Jack Dix-Yonkers, NY)
- 8441.4 7OA-Aden Radio, Yemen, with DE CW marker at 1710. (Aya Kaneko-Nagoya-city, Japan) *Thanks Aya-San for the logs. Please check in often as we do not get much from your part of the world, especially transmissions in your native language. Welcome Aboard-Larry.*
- 8448.0 A9M-Bahrain Radio, Bahrain, with DE CW marker at 1715. (Aya Kaneko-Japan)
- 8470.8 ZRH-SAN/Hydrosan with navigational warnings and weather (gales everywhere) in 75 baud RTTY at 1216. (Hall-RSA)

- 8473.5 A7D-Doha Radio, Qatar, with DE CW marker at 1720. (Aya Kaneko-Japan)
8474. 0 JYO-Aqaba Radio, Jordan, with a CQ CW marker at 1725. (Aya Kaneko-Japan)
- 8490.0 AQP-Karachi Naval Radio, Pakistan, with CW V marker at 1748. (Aya Kaneko-Japan)
- 8515.0 5AT-Tripoli Radio, Libya, with CQ CW marker at 1745. (Aya Kaneko-Japan)
- 8602.0 CWA-Cerrito Radio, Uruguay, with a CW CQ marker at 0834. (Levine-CA)
- 8816.0 GKW41-Portishead Radio, England, working several British warships with phone patches to families at home in England using USB at 1905. Portishead was contacting the warships just below and then running the patches on this frequency just inside the aero band. (Fernandez-MA)
- 8819.0 Rainbow Radio-Tors Cove, NF, Canada, working Delta 76 with a SELCAL check in USB at 2230. (Dix-NY)
- 8840.0 A warbling jammer on a broadcast station with on and off operation at 0250. This is an aero frequency used by aeradios in several countries. Another broadcast station on 8851.0. (Fernandez-MA)
- 8906.0 New York ATC working Condor 601 in USB at 2231. (Robin Hood-UK)
- 8987.0 MKL--Pitreevie Air calling 7FZ with CW message in 3 letter/figure groups at 0009. (Dix-NY)
- 9017.0 Pleasure working Scorpion through Andrews in USB at 2330. Andrews referenced their call sign as Arrowhead. (Robinson-TN)
- 9130.0 Israeli Mossad number station with coded message traffic in AM at 1920. (Fernandez-MA)
- 9378.7 3BZ-Plaisance Air, Mauritius, with a ARQ-E3 idling signal at 0546. (Hall-RSA)
- 9387.5 FDC-Metz-Frascaty Air, France, with V CW marker at 0018. (Dix-NY)
- 9400.0 A continuous CW tape heard at 10 wpm at 0856 sending, "CQ de Radiocentras QTH Vilnius, Lithuania, testing 9400 kHz 5kW Beam 250 deg QSW USB from July regularly at daytime. QSL via Box 1792 Vilnius, Lithuania, for rpt of QSA QRM QSB QRK and 2 IRC CQ de Radiocentras 73." (Robin Hood-UK) *You win the new station award this month, Robin. Nice to see some new targets appear from the former Soviet Union-Larry.*
- 10406.5 LNZA-ITU HF Beacon Sveio, Norway, in CW at 2359. (Dix-NY)
- 11214.0 Bandsaw India working Radio Maintenance in USB at 2300. (Robinson-TN)
- 11233.0 Rescue 305 working Trenton military with phone patches to RCC Trenton and 424 Squadron Ops to coordinate crew change in USB. (N.Hohm-Winnipeg, MB)
- 11270.5 DHN66-NATO Geilenkirchen working Magic 71(AWACS aircraft) with a signal check in USB at 1047. (Boender-Neth)
- 11300.0 Cairo ATC working Air France 491 in USB at 2231. (Robin Hood-UK)
- 11354.0 Gulf Air aircraft working Falcon Control (Bahrain) in USB at 1546-1740. (Boender-Neth)
- 11384.0 Northwest 95 working Honolulu ATC with position report and SELCAL check at 1110. (Rausch-NJ)
- 11453.0 IMB-Rome Meteo, Italy, with a CQ CW marker at 2332. (Dix-NY)
- 12422.0 UVKR-M/V *Desyataya Pyatiletka* working 4XO-Haifa Radio, Israel, in CW at 0745 after initial contact on 16 MHz. UFDG-M/V *Volgonett* 130 working OFJ-Helsinki Radio, Finland, in CW at 0821. (Robin Hood-UK)
- 12441.0 JQUV-M/V *Ohgishima Maru* working CBV-Valparaiso Radio in CW at 2058. (Robin Hood-UK)
- 12564.5 UWNX-M/V *Zefir* working UJY-Kaliningrad Radio using 50 baud RTTY at 2216. UJY answering in CW on 12690.0. (Robin Hood-UK)
- 12572.5 UULF-M/V *Petr Bujko* working URL-Sevastopol Radio using 50 baud RTTY at 1548. URL answering in CW at 17147.0 (Robin Hood-UK)
- 12573.0 RIW-Khiva Naval, Uzbekistan, CIS, calling RMMW in CW at 0927. (Robin Hood-UK)
- 12718.0 4RG-Unid, Sri Lanka? with traffic list followed by hand sent CW at 0003. (Dix-NY) *I would say Sri Lanka or possibly a Russian Naval; anybody?-Larry.*
- 12745.5 JJC-Tokyo Radio, Japan, with a Fax transmission of what appeared to be a news bulletin in Japanese at 1331. (Dix-NY)
- 12792.0 TBA2/3-Ankara Naval Radio, Turkey, with V CW marker at 0113. (Dix-NY)
- 12808.5 VTG4/5/6/7-Bombay Naval Radio, India, with V CW marker at 0116. (Dix-NY)
- 13101.0 ZSC27-Capetown radio, RSA, with voice mirror ID and frequency allocations in USB at 0830. (Rausch-NJ)
- 13113.0 DeBeers Guard working Halifax with information on helicopter ETA in USB at 0000. (Robinson-TN)
- 13128.0 TAH-Istanbul Radio, Turkey, with phone patch traffic in USB at 1740. (Boender-Neth)
- 13225.0 Amman Operations, Jordan, working Jordanian 102 in USB at 2030. Aircraft has problems. (Boender-Neth)
- 13304.0 Tel Aviv, Israel LDOC working an EI AI aircraft with weather for Keflavik in USB at 1752.0 (Boender-Neth)
- 13370.0 Royal Naval Radio London, England, with encrypted RTTY 75 baud messages separated by RY+VGMTCNJBH at 1834. (Boender-Neth)
- 13404.0 Unid station transmitting 5 letter groups in CW at 2339. (Dix-NY)
- 14429.1 PTT Lumumbashi, Zaire, with SITOR-A traffic in French for Kinshasa. (Hall-RSA)
- 14467.0 FDC-FAF Metz-Frascaty Air, France, with V CW marker at 2352. (Dix-NY)
- 14487.0 NNNOCYH working NNN0LCQ (US Navy MARS) with phone patch traffic in USB at 0216. (Robinson-TN)
- 14518.0 MFA Vienna with traffic Paris/Vienna using 96 baud SI-ARQ (5 character) at 0830. (Robin Hood-UK)
- 14760.2 CNM61-MAP Rabat, Morocco, with French news using 50 baud RTTY at 1040. (Hall-RSA)
- 14890.0 Unid British Airways flight working Portishead Radio with a phone patch in USB at 1406. (Boender-Neth)
- 15015.0 Ladybird calling Lajes for a phone patch in USB at 2224. (Robin Hood-UK)
- 15031.0 Gonzo 6 working Trenton military, on ground in Winnipeg doing radio checks. Training flight is headed for Salt Lake City, eventually to San Diego, and requests Trenton's assistance for relaying messages for the following 4-5 hours. Would call again once airborne, in USB. Gonzo flights are the CT-142 Dash 8 navigation trainer from the CF Air Navigation School in Winnipeg. (Holm-MB) *Jeff Haverlah down Texas way, this should answer your question regarding the Gonzo call sign. Many thanks to Mr. Holm-Larry.*
- 15633.0 HMF26-KCNA Pyongyang, North Korea, with a RTTY news broadcast at 1312. (Boender-Neth)
- 15655.0 CNM66-MAP Rabat, Morocco, with a RTTY 50 baud English news broadcast at 1314. (Boender-Neth)
- 16149.4 MKO-RAF Akrotiri, Cyprus, with foxes, 10 counts, RY test tapes on 5 channels of its VFT mode transmission. (Hall-RSA)
- 16318.7 MFA Cairo, Egypt, with Arabic traffic to various embassies using SITOR-A at 1611. (Hall-RSA)
- 16578.6 Unid station sending SITOR-A messages regarding Coast Guard billets expected to be vacant between now and Dec 31, 1993 at 2259. (Robinson-TN)
- 16681.0 UGXU-M/V *Olene Gorsk* working VCS-Halifax Radio in CW at 1505. (Robin Hood-UK)
- 16870.5 DJZ-Bulacan Radio, Philippines, working 3EBA9-M/V *Accadia 1* in CW at 1556. (Robin Hood-UK) *Robin also notes that DJZ has not yet changed this frequency to conform with the new WARC marine sub-bands-Larry.*
- 16916.5 WSC-Tuckerton Radio, NJ, working SZMZ-Mando V in CW at 1741. (Robin Hood-UK)
- 17015.8 SLHFB 'S' in CW at 0033. (Dix-NY)
- 17016.0 SLHFB 'C' in CW at 2313. (Dix-NY)
- 17091.3 XSQ-Guangzhou Radio, China, with a CQ CW marker at 2323. (Dix-NY)
- 17107.0 ESF-Tallin Radio, Estonia?, with CQ CW marker at 1702. (Dix-NY) *Sure looks like a likely candidate Jack; anybody have anything on ESF?-Larry*
- 17145.0 LZW6-Varda Radio, Bulgaria, with CW DE marker at 1348. (Boender-Neth)
- 17147.0 URL-Sevastopol Radio, Uzbekistan, CIS, with DE CW marker, then news at 1350. (Boender-Neth)
- 17117.5 WNU-Slidell Radio, LA, with CQ CW marker at 0150. (Dettmann-IL)
- 17162.0 PPO-Olinda Radio, Brazil, with DE CW marker at 0154. (Dettmann-IL)
- 17245.0 GKT62-Portishead Radio, United Kingdom, working GUUS-HMS Broadsword in USB at 2100. Broadsword was in the Adriatic waters. (Robin Hood-UK)
- 17432.0 DFZG-MFA Belgrade, Serbia, with RTTY 75 baud RY test tape at 1400. (Boender-Neth)
- 19867.9 PTT Lumumbashi, Zaire, with French traffic using SITOR-A at 0837. (Hall-RSA)
- 20113.5 FJY2-FM Disker (Kerguelen Island) with French traffic for TAAF Paris using ARQ-E3 at 1259. (Hall-RSA)
- 20350.0 German female 3/2-digit number station in AM at 1606. (Robinson-TN)
- 20845.3 RFFC-French Naval Radio Paris with 5 letter groups using ARQ-M2 on channel A for warship *Jules Verne* at 1227. (Hall-RSA)
- 20876.7 MFA Islamabad, Pakistan, with SITOR-A traffic to PAREP London and other embassies at 1235. (Hall-RSA)
- 22245.0 URWR-M/V *Akhtarskiy Liman* working PPR-Rio Radio, Brazil, in CW at 1418. (Robin Hood-UK)
- 22685.5 UJY-Kaliningrad Radio with ID and RYs using 50 baud RTTY and listening 22247.5 for traffic from ships at 0841. (Robin Hood-UK)
- 22729.0 5BA72-Cyprus Radio with a USB voice mirror at 1545. (Boender-Neth)

The Scanning Report

Bob Kay

*c/o MT, P.O. Box 98
Brasstown, NC 28902*

Invisible Antennas

Imagine living in a community that prohibits you from hanging out the laundry, washing the car, or placing sculptures in your front lawn. Are you surprised? If so, hang onto your hat, there's more: No barbecues, open fires, sheds, fences, or outside antennas!

Are you shaking your head and saying that you would never move into such a community? You'd better think again. There's a 75% percent probability that you will move into a community with some, though perhaps not all of these restrictions. In the Philadelphia area, there are 1000 association communities that have restrictive clauses. And don't be fooled into thinking that the restrictions are limited to apartments and condominiums. Restrictive clauses can be found in single home communities that are separated by one acre lots.

If you spent your summer moving into a single home, condo, or apartment complex that doesn't permit outside antennas, don't get discouraged. There are ways you can keep your scanner up to par by concealing both indoor and outdoor antennas. Here are a few tricks that will help you to get the basic idea.

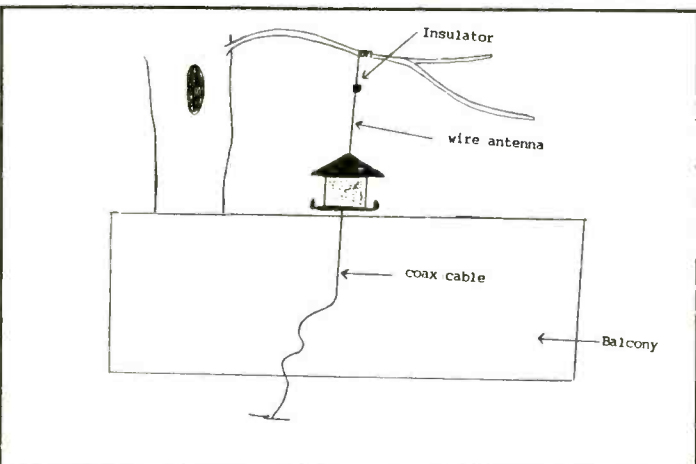
Indoor Antennas

1. The metal frame of a sliding glass door can easily be transformed into a scanning antenna. Cut a section of coax cable to the desired length, and attach the center connector to the frame. If the frame is aluminum, it won't be possible to solder the connection. The alternative is to use a screw or bolt to fasten the wire securely. After the coax is secured to the frame, install the proper connector, and plug it into your scanner radio. Search through several band increments to determine the optimum frequency response of your "Sliding Glass Door" antenna.

2. A wire antenna can be attached to the edge of a window. To attach the wire to the glass, use Radio Shack fasteners, catalog # 278-441. For a less visible method, use a hot glue gun to attach the wire to the glass. Insulated wire can also be used. The insulation won't affect the ability of the wire to capture radio signals.

Don't overlook the fact that a wire antenna can be adjusted to receive a particular frequency. Here's the formula: Divide the frequency (MHz) that you want to monitor into 468. The result is the correct antenna footage required to receive on that frequency.

3. One of the best places to conceal a wire antenna is behind hanging curtains. A needle and thread can be used to permanently attach the antenna to the backing material of the curtains. If you're not handy with a sewing needle, trade a favor with a household member who is!



Living in a high rise that doesn't permit outside scanning antennas? No problem—check out the Scanning Report.



4. The back of a wood door is an ideal place to mount an inverted "V" antenna. Be sure to install the coax cable with the door closed. If the installation is attempted with the door ajar, the length of the coax may not be sufficient to allow the door to close.

5. A variety of antennas can be hidden in a bookshelf. If you have a bookcase at home, study it carefully. You'll probably discover several more locations that can easily hide a scanning antenna.

6. To construct a "closet pole antenna," simply wrap a 10 foot section of wire around the clothes pole in your closet. If the wire is bare, make sure that the windings don't touch. The spacing between the coils should be uniform across the entire pole. A wire length of 10 feet will work quite well on the cordless phone band.

Since most of us can afford to lose storage space, however, after the wire is wrapped around the pole, it can be covered with electrical tape, or with a plastic sleeve that is available from most hardware stores. The tape or sleeve will allow you to utilize the pole for its intended purpose—to hang clothes!

7. Corner molding, similar to the type found in paneled rooms, can easily conceal a wire antenna. Carefully pry the molding away from the paneling, slip the wire behind it, and reinstall the molding with several light taps from a hammer.

8. If there is an existing TV antenna on the roof of your apartment or condo, it can be used to scan between 80 and 500 megahertz. The reception is prone to interference from local TV stations, but the extended range may be worth the hassle.

9. Discarded telephone wiring can also be used as a long wire scanning antenna. Scanner buffs living in apartments or condo's will discover that the old phone wires, which pass through the walls of other units as well, are especially receptive to the cordless phone and baby monitor frequencies. Before attaching the old phone lines to your scanner radio, use a voltmeter to determine that the lines are in fact dead. The voltage that is present in live telephone wires will fry your scanner radio!

Outdoor Antennas

1. The "bird feeder" antenna provides an easy way to erect an inconspicuous, outside antenna. The bird feeder is suspended from a tree with a random length of wire. The antenna wire passes through the top of the feeder and terminates into a chassis mount, S0-239, (see sketch). The coax is attached to the bottom of the feeder and is routed to your scanner radio. Since the antenna wire actually supports the feeder, don't use anything less than 18 gauge, stranded wire. It's also a good idea to insulate the wire from the tree.

2. A patio table with a center umbrella hole is a great place to mount a scanning antenna. The hole in the table will securely hold a wood or metal antenna mast. During the night, when no one can see the evidence,

a variety of different antennas can be attached to the mast. It's a fast and easy way to enjoy an entire evening of scanning action. When your scanning session is complete, pull the mast from the hole, and replace it with the umbrella.

3. The outside metal case of a window air conditioner is an excellent spot for a magnetic mount, mobile scanning antenna. Simply attach the antenna to the case, route the coax through the window, and you're ready to scan.

Living in a community that has restrictive antenna laws doesn't imply that your scanning reception must be compromised. With a little imagination, and some creative thinking, you can erect indoor and outdoor antennas no matter where you live.

Treasure Hunt

Military air monitors will be especially interested in the second edition of the *Directory of North American Military Aviation Communications*.

Published by Hunterdon Aero Publishers, the second edition has been greatly expanded and contains a glossary of abbreviations and military terms. The book comes in four regional editions (Northeastern, Southeastern, Central and Western), each organized alphabetically and by frequency.

The lucky winner of our Treasure Hunt will receive all four editions—more than six pounds of military air frequencies and information! Here are the clues.

1. Provide a popular space shuttle frequency.
2. Military control towers operate on 236.600 MHz. True or False?
3. Air Force One has been monitored on 4__700. (Fill in the blanks.)
4. Name the town and state featured on the front cover of the July 93 issue of *MT*.
5. Explain the abbreviation, "GPS."

The author of the *Directory* is Jack Sullivan. The *Directory* includes air show frequencies, a guide to HF frequency usage, a military aircraft call sign guide and much more. The guides are available at \$24.95 each from Hunterdon Aero Publishers, P.O. Box 754 Flemington, NJ 08822 (1-908-806-7134) or from Grove Enterprises.

Frequency Exchange

An anonymous vacationer in *Kent, England*, sent in the following frequencies for everyone to enjoy.

32.35	Army training	166.3625	Trains
44.37	Army training	169.5375	Reliance security
86.70	Nuclear fuels		company
86.95	"Dingo Control"	169.825	Burstin hotel security
87.163	Highway department	460.10	Debenhams store security
166.188	Sherway district council		

Our first U.S. invitation is from Greg Spak. Greg lives near *State College, Pennsylvania*, and here are his favorite air targets.

115.500	Phillipsburg VOR	128.450	Cleveland air traffic
118.550	New York air traffic	130.500	US AIR
119.100	Lycoming air services	133.150	New York air traffic
122.500	Altoona flight service	148.850	Civil air repeater
122.800	Piper Municipal Airport		

Scanning in *Point Pleasant, West Virginia*, is made possible by an invitation from J.E. Champion.

44.74	Ohio State Patrol post #27	45.24	Huntington Co EMS
39.50	Point Pleasant Police	154.815	Winfield Police
39.96	Mason County Police	155.025	St. Albans Police

GUIDE TO FACSIMILE STATIONS

13th edition • 400 pages • \$ 35 or DM 50

The recording of FAX stations on longwave and shortwave and the reception of meteorological satellites are fascinating fields of radio monitoring. Powerful equipment and inexpensive personal computer programs connect a radio receiver directly to a laser or ink-jet printer. Satellite pictures and weather charts can now be recorded automatically in top quality.

The new edition of our FAX GUIDE contains the usual up-to-date frequency lists and precise transmission schedules - to the minute! - including those of all US Coast Guard and US Navy stations worldwide. The new Bracknell and Washington meteo telefax polling services are also described. The book informs you with full details about new FAX converters and computer programs on the market. The most comprehensive international survey of the "products" of weather satellites and FAX stations from all over the world is included: 337 sample charts and pictures were recorded in 1992 and 1993! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, barographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else. Additional chapters cover abbreviations, addresses, call sign list, description of geostationary and polar-orbiting meteorological satellites, regulations, technique, and test charts.

Further publications available are *Guide to Utility Radio Stations* (11th edition), *Radioteletype Code Manual* (12th ed.) and *Air and Meteo Code Manual* (13th ed.). We have published our international radio books for 24 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see *MT* 4/93 page 90 and *SPEEDX* 2/93 page 43. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

Do you want to get the *total information* immediately? For the special price of \$ 170 / DM 250 (you save \$ 35 / DM 50) you will receive all our manuals and supplements (altogether more than 1700 pages!) plus our *Cassette Tape Recording of Modulation Types*.

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155.145	Kanawha County Fire	155.385	Pleasant Valley Hospital
155.25	Huntington Police	155.40	Life Flight
155.265	Kanawha County EMS		

In *Ann Arbor, Michigan*, Rafe Barber listens to the following:

31.24	H&H Towing	153.56	Edison Power
42.48	Prisons	153.62	Edison Line Crews
48.46	Consolidated Gas Co.	154.80	Michigan University Security
150.845	Fox's Sunoco	158.19	Consolidated Gas
150.935	Sakstrup's Towing	158.805	Chelsea Police
151.25	Park Rangers	159.405	Park Rangers
151.625	J.C. Penny Security	451.40	Michigan Bell
151.665	Triangle Towing	451.45	Michigan Bell

Rafe's complete list contains three pages of Ann Arbor Frequencies. The list is free for a #10 SASE. Send your request to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Our next stop takes us a long way from Michigan. Welcome to *Tulsa, Oklahoma*.

35.96	J&J construction	154.13	Bartlesville Fire Dept.
44.70	State Police troop L	154.49	Peabody Coal
44.84	Game Protectors	154.92	State Police Mobile repeater (Vinita)
44.90	State Police Vinita cars		
46.04	Nowata hospital	155.415	Bartlesville Police
47.44	Haliburton--statewide	155.49	Nowata Co. Sheriff
48.98	Chevron Oil	155.76	Vinita animal control
153.005	Hickory Coal	156.06	Highway Dept.

The above frequencies were submitted by Marshall Boland. Marshall also visited the U. S. Army ammunition plant at *McAlester, Oklahoma*.

Here's what he monitored: can anyone fill in the blanks?

138.925	Tones	143.520	Railroad
139.50	Operations	148.29	Maintenance
140.00	?	148.60	Fuel trucks and mechanics
140.04	Pagers	148.945	?
140.125	Security	149.37	Transportation
143.02	?	414.25	?

A good place to stop and stay awhile is *Monument County, Colorado*. I hope our host, Mike Lemmpuhl, is ready to bunk us down!

154.115	Monument Police	154.965	Cripple Creek ambulance
154.25	Tri-Lakes rescue		
154.725	El Paso Co. Sheriff	155.160	Search & Rescue
154.785	El Paso Co. Sheriff	463.175	Flite for Life helo
		465.725	Flite for Life dispatch

Invitations for the Frequency Exchange are accepted from around the world. Send your frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.



Computer Corner

If you're planning to attend the *MT* convention in Atlanta Georgia, here's an offer designed especially for you. I've got a floppy disk that is packed with nearly a thousand frequencies for Atlanta, Georgia. The frequencies range from the VHF low band to 800 megahertz.

The frequencies are in ASCII format and can be printed from the screen or merged into a word processing program. To receive the disk, send \$5.00 dollars to P.O. Box 173, Prospect Park, PA 19076.

To receive the disk absolutely free, send a disk containing your favorite frequencies. I'll swap my disk for yours and I'll pay the return postage. To be acceptable, your information should be contained on an IBM compatible disk in ASCII format. No matter which offer you choose, the address is: P.O. Box 173, Prospect Park, PA 19076.

Scanner Buff Foils Robbery

In Yonkers, New York, a woman robbed the Hudson Valley Bank. Approximately 45 minutes later, the same woman robbed the Westminster Bank and fled the scene in a black, Lincoln Town Car.

Police immediately broadcast the description of the woman and her vehicle over police radio. A Yonkers scanner buff was listening to his scanner radio and heard the broadcast. A few minutes later, the scanner buff looked out his window, spotted a vehicle matching the description and quickly called police.

The suspect was apprehended and the stolen money was recovered from the vehicle. Captain Robert Blair, commander of the 2nd precinct, gave all the credit to the scanner buff. "If he didn't call us with the information, the suspect would have probably escaped." (News clipping from Andrew Richards)

911 Anonymity

Suggestions for protecting your identity during a 911 emergency call have been pouring in. If you missed the past issues, here's an update on the information that has been received.

Calling 911 on a cellular phone will protect your identity. The phone number passed to authorities will belong to the facility where your wireless call is transferred to a wireline call. The number could be cross-referenced to your bill, but it would be after-the-fact.

Caller anonymity can also be purchased by calling 1-900-STOPPER. The service will charge you \$2.00 per minute. It is mainly used by individuals who do not want to divulge their locations. Husbands who owe child support use 1-900-STOPPER, to prevent authorities from discovering their location.

Pay phone calls to 911 are probably the only fool-proof and least expensive method of protecting your privacy. Anonymity is guaranteed—unless you're caught with the pay phone in your hand.

If you have additional ideas or comments on this subject, I want to hear from you. Send your information to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Simplex Cordless

As we all know, cordless phones can be monitored between 46.610 and 46.970 MHz. The frequencies found in this range belong to the cordless base unit.

Your letters indicate that some of you are monitoring the cordless handset frequencies between 49.670 and 49.970. The cordless handset frequencies are a "simplex signal." When you monitor a simplex transmission, only one side of the conversation will be heard.

To hear both sides of a cordless conversation, monitor the "duplex" signal of the cordless base unit. The specific frequencies are: 46.610, 46.630, 46.670, 46.710, 46.730, 46.770, 46.830, 46.870, 46.930, and 46.970 MHz.



Baby Monitoring

When you listen to the little screamers in your neighborhood there's no need to worry about simplex and duplex. You'll hear every word and sound by monitoring the following: 49.830, 49.845, 49.860, 49.875, 49.890 MHz.

Manufacturers may also designate a baby monitor as operating on channel #1, #2, #3, #4, or #5. The channel numbers correspond to the five baby monitor frequencies. Frequency 49.830 is regarded as #1. Manufacturers claim that the channel numbers are designed to help consumers solve interference problems. If your neighbor is operating a baby monitor on channel #1, you can avoid problems by purchasing a unit that operates on one of the four remaining channels.

CTCSS PL and Motorola

CTCSS stands for "continuous tone coded squelch system." Although it may sound confusing, it really isn't. CTCSS technology allows several different departments to use the same frequency. Each department is assigned a CTCSS subaudible tone that is designed to open the squelch of a respective receiver. If the proper tone isn't received, the squelch on the receiver simply won't open. With CTCSS, there's no need to monitor the constant chatter of other departments. Your radio remains silent until someone in your department presses the microphone key.

CTCSS is also called "PL" (Private Line—a Motorola trademark). To decode CTCSS you'll need a CTCSS capable scanner radio or an after market decoder. Check out the advertisers in *MT* for additional details.

Next Month

Don't allow the cooler weather and shorter days to get you down. In the fall and winter months you can devote more time to scanning and reading *MT*!

MT



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B TA-90 Telescope BNC antenna	12.
C TA-90-L Telescope elbow antenna	16.
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How I Spent My Summer Vacation

I've reached that point in life where I start looking for all those "little rewards" that are supposed to come with a successful career. You know, the kind of things that are meant to placate me into not having an over the edge mid-life crisis. Well, one reward finally showed. For fifteen years of dutiful service to my employer, I am now blessed with an additional five days of vacation per year.

Enough with the labor negotiations, Uncle Skip. This is a radio column!

Absolutely right, Chief! What turns this information into radio relevant rhetoric is how I turned my expanded vacation privileges into a super scanning safari. We will also talk a bit about how to bring your hobby on a family vacation without creating any bad blood with the kinfolk.

When I first announced to my assembled family that my vacation benefits had grown, the cry went up, "WE'RE GOING TO DISNEY WORLD!!!" We had yet to make the great American family pilgrimage to the land of The Mouse.

As planning and excitement grew through winter and spring, my loving spouse even pointed out to me that taking a scanner along might prove interesting. Who was I to argue?!

This is the point in the article where I must remind everyone that it is really unfair to let your monitoring enthusiasm intrude on family fun. Besides, I wanted to play in the Magic Kingdom just as much as my kids did. I had no intention of doing this trip with a radio duct-taped to my head. Still, a trip of this magnitude would have enough built-in "down time" that a few hours of dedicated listening would be possible.

So with monitoring time at a self-imposed premium, the key to getting the most listening done would be *extensive prior planning*.

Scanning Mickey's minions has always been shrouded in intrigue. Like any large corporation, the Disney folks do not go out of their way to make eavesdropping easy for the radio hobbyist. At gatherings of scanner folks far and wide, you will always hear a tale or two about superhuman efforts to gather a "complete" list of Disney frequencies. Tenacious hobbyists have devoted time and dared the occasional ejection from the theme park to acquire data on the Land of Enchantment.

On the Road Again

My first step in figuring out what to program into the Bearcat was to hit some of the traditional frequency resources. A recent addition to my radio library is *Monitor America* by Richard Barnett, Editor, SMB Publishing. This a big book (over 800 pages) designed for travelers and

vacationers. It covers most major metropolitan and resort areas across the US, giving an eclectic listing of fun frequencies for folks on the road or resting next to it.

I used this resource along with my road atlas to give me an idea of what might be fun to listen to along the thousand or so miles between Walt's World and my home. To minimize the stress on the family, we planned a layover along the North and South Carolina borders. The break gave me an evening of light listening to local public safety and related monitoring while the family lazed by the hotel pool—a mere shadow of the scanning that would follow when I started tracking the drones of Disney World.

This listening was also supported by Volume #6 of Gene Hughes' *Police Call Radio Guide* which covered the Washington, D.C. to Disney World leg of our trip. So you see, hitting the books before the trip will allow you to spend less time in the scanner's SEARCH mode and more time monitoring all the action. These two resources (available from many of the radio booksellers advertising in *MT*) also yielded a short list of Disney type frequencies, but I knew from other folks that there were over one hundred interesting channels to be had in the Orlando/Kissimmee/Disney World area. It was time to get serious!

Twenty-First Century Scanning

I didn't realize until too late that Grove has a pocket-sized book on sports and entertainment frequencies that I could have consulted. However, I did address the computer and crank up the Grove FCC Database. Checking both the Florida

and the USA listings, I searched by City (Orlando, Kissimmee, Lake Buena Vista and Reedy Creek), County (Orange and Osceola) and likely names of licensees (Walt Disney World, Disney, Buena Vista, Universal, Sea World). I also checked listings for hotels (Hyatt, Ramada, Days Inn, Sheraton, Hilton, Travelodge).

More promising frequencies were yielded in this search. Serious scanner enthusiasts have really embraced database technology as a way of frequency hunting. If your listening post already includes a personal computer, it would be well worth your while to shop around for a frequency database that meets the needs of your listening areas.

Computer users can also log in to some of the many Bulletin Board Systems (BBS) that cater to radio hobbyists. You would be sure to find a few additional frequencies as I did when paging through the GENIE and Fidonet systems.

I Get By With a Little Help From My Friends

Old Uncle Skip has always preached the value of radio club membership and participation. This notion paid off in a big way during the planning phase of my scanning vacation. The June 1993 issue of *Northeast Scanning News* produced a plethora of Disney World Frequencies. Through the efforts of dedicated scanner masters Mike Fowler and Sal Marandola and NESN editor Les Matson, I was able to pull together what may be as complete a list of WDW frequencies as has been compiled in recent memory. Mike Fowler, using a blend of ignorance and politeness, was given a list of the "10" codes by one of Walt's workers. Now we're cookin'!

I also placed a few calls to other scanner users who had experience with the Disney World communications system. I learned that, as with most theme parks nationwide, you are not allowed to take scanners into the park area. This did not trouble me because I planned to be a typical tourist and ride the rides anyway. However, nobody seems to frown on monitoring the operation from the confines of your hotel or resort.

Since our lodging was on the Disney grounds, I made sure our rooms were going to be on the top floor when I called for reservations. When the hostess asked why, I mumbled something about fear of armadillos. She let it pass and gave me what I asked for.

Concerning the scanner prohibition, I received one interesting idea from well-known scanner maven Bill Cole. Bill had been to WDW and noted that it seemed like everyone was carrying a video camera, taping the family fun for posterity. Bill thought it might be fun to find a blown out video rig at a local flea market or TV repair



Your intrepid author overprepared at Disney World.

store. You could take out the camera's guts and install your scanner and none of Disney's staff would be the wiser.

An interesting notion, but clearly in violation of my pledge to enjoy the fun with my family. Besides, I was the guy tasked to lug around the REAL video camera. I suppose carrying one in each arm would draw somebody's attention!

Traveling Light

Anyone who has encountered Old Uncle Skip at a radio convention knows that I like to bring a lot of hardware. I'm now even lugging a portable packet radio station with me to radio get-togethers. But this was a family trip so I cut back significantly. My trusty handheld Bearcat 200 XLT, while a bit long in the tooth, still gave me the best quick and dirty scanner station around, especially with the addition of a an Austin Conдор "big rubber ducky" antenna for weak signal work.

Since we were traveling by car, I brought along a two meter handheld for ragchewing and roadside emergencies. I also threw in my Sony 2010 just because I can't remember ever traveling without it. Fresh batteries and some earphones completed the collection which all fit easily in a small, soft-sided briefcase. This setup still represented overkill but old habits die hard.

Keeping Your Eyes Open

Once we actually got into Walt Disney World I was able to discover a few more things just by keeping my eyes open. For instance, I discovered the Mouse House's personal telephone company by observing several trucks labeled Vista United Telecommunications. Just about every truck on Disney's grounds is labeled "Buena Vista" this or "Reedy Creek" that.

I noted that many of the handie-talkies carried by Disney personnel were marked with a Motorola Rental label. Can you imagine what that Motorola account must be worth, given the fact that Disney employs literally thousands of folks who require radio contact?

I also saw a number of "plain clothes" Disney security folks. These guys stuck out like sore thumbs. They were dressed in dark suit, ties and sunglasses—in 98 degree heat, no less. Your basic "Secret Service" outfit.

We took a trip to Universal Studios and I discovered a store facade on Delancy Street called William B Hackenburg Appliances and Radios. In the window of this artificial store were a dozen beautifully restored receivers from the Golden Age of radio.

Of course, everywhere we went there were opportunities for antenna spotting. Orlando being a relatively flat place, all you had to do was look up to see antennas of all sorts.

I did, however, see something that vexed me. I saw a number of vacationers "doing business" on handheld cellular telephones. Take Uncle Skip's advice, there is no job in the world so important that you can't leave the phone at home. If you ever find yourself in this predicament, start sending out resumes fast. It's time to move on.

Get the idea? By keeping your eyes open you can discover all kinds of radio stuff without even turning on a rig.

RF Purgatory

When we arrived at our rooms in Disney's Caribbean Beach Resort, I made another important radio discovery. Disney's building techniques (no doubt via Buena Vista Construction) lean toward steel studs and metal roofing materials. This made my living arrangement an RF shield. The only radio station I could pick up on the Sony 2010 was 540 WGTO, a 50 thousand watt operation that I can even hear back in New Jersey on a good night.

I quickly realized that any decent listening was going to have to be done out on my balcony or down by the pool. Some scanner folks travel with a magnetic-based mobile scanning antenna which they can place outside their window when faced with a shielded room. Since I had not anticipated this need, I contented myself with listening at pool side when we took our afternoon "heat of the day" break from Disney activities.

Was It Worth It?

It surely was! My pool side scanning turned up plenty of interesting information about just how complicated it is to run an operation the size of Walt Disney World. The listening is more akin to monitoring a small city than it is to listening in on an amusement park. I quickly discovered that it was best to set the Disney frequencies in banks, just as you might do when monitoring the fire, public safety, municipal services and commercial enterprises of your hometown.

So, where are the frequencies, Uncle Skip?

Quite frankly they would fill the entire article and this is not the "Scanning Report." However, I will not leave you high and dry. Just send a stamped self-addressed envelope to T.J. "SKIP" Arey, PO Box 644, Waterford Works, NJ 08089, and I will be more than happy to send you a list of the frequencies that I found to be active as of June 1993. So if you're planning a trip to meet with The Mouse, drop me a line. Why not slip on down to Orlando after a greeat weekend at the MT Convention?! See ya real soon in Atlanta, Mouseketeers!

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Military monitoring from the High Plains of Texas has its advantages. The land here is as flat as a pancake with few obstacles to block radio signals. Amarillo's location means the airwaves are constantly busy with military aircraft transiting the country, or flying in or out of the major airbases that ring the area.

But living landlocked in the Texas Panhandle also has its military monitoring disadvantages. The closest ocean is a thousand miles away. We don't have to worry about hurricanes, but chances

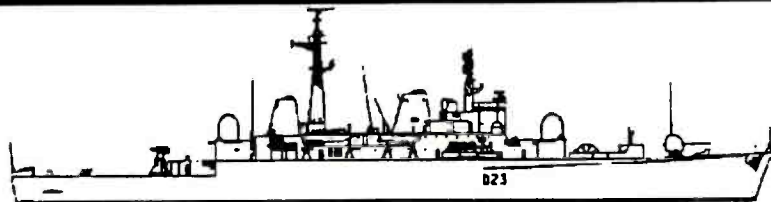
are that I won't monitor the Coast Guard or the Navy sailing the seven seas unless it's on short-wave. Not many F-18s land at the local airport and not many ships visit Amarillo on shore leave! It is possible to monitor the Navy on HF from my locale, but the conditions have to be just right to get a good copy.

But as those of you who live near the coast know, the really hot military action happens above 30 MHz. F-14 Tomcats on patrol, Navy ships involved in live missile firing exercises and

Navy brass in conference via FLTSATCOM, all happen on UHF.

Once in a while I do make it down to the sea, and when I do, I drag along the portable monitoring post, set up the antennas and point them towards the open ocean. Sometimes I hear nothing, and sometimes I hear it all. So, the following is the result of several monitoring safaris and also from the files of those lucky monitoring brethren who live near those major Navy bases, or serve on a ship at sea (frequencies MHz).

U. S. Navy Ship Designation



Role	Type	Designation	Classes
Aircraft Carrier	Multipurpose	CV	Kitty Hawk, John F. Kennedy, Forrestal, Midway, Nimitz, Enterprise
Battleship	Multipurpose, nuclear propelled	CVN	
Cruise	Gun	BB	Iowa
	Guided missile	CA	Des Moines
		CG	Ticonderoga, Belknap, Leahy, Albany
	Guided missile, nuclear propelled	CGN	Virginia, California, Trustun, Bainbridge, Long Beach
Destroyer	Gun	DD	Spruance, Forrest Sherman, Hull
	Guided missile	DDG	Kidd, Coontz, Charles F. Adams, Forrest Sherman, Converted Hull
Frigate	Gun	FF	Know, Garcia, Glover, Bronstein
	Guided missile	FFG	Perry, Brooke
Attack Sub	Diesel-electric powered	SS	Barbel
	Nuclear powered	SSN	Los Angeles, Lipscomb, Sturgeon, Ethan Allen, Washington, Thresher, Tullibee, Skipjack, Seawolf, Skate
Ballistic missile sub	Nuclear powered	SSBN	Ohio, Franklin
Amphibious assault ships	General purpose	LHA	Tarawa
	Multipurpose	LHD	Wasp
	Helicopter	LPH	Iowa Jima
	Transport dock	LPD	Austin, Raleigh
	Command ship	LCC	Blue Ridge
Mine Warfare Ships	Minesweepers	MSO	Acme, Aggressive
	Mine counter-measures vessels	MCM	Avenger
	Minesweeper/hunter	MSH	Cardinal

USS Carl Vinson CVN-70 HP: Bremerton

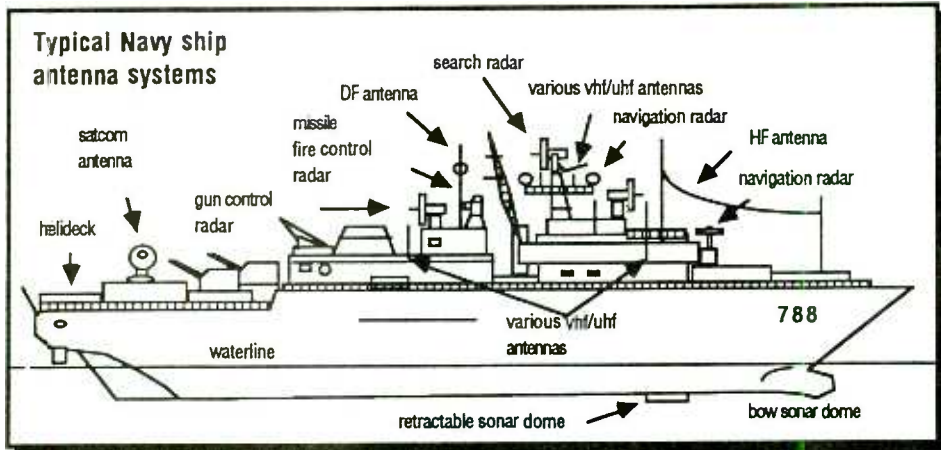
Frequency	Description
369.100	Approach
269.200	Departure
338.200	Land & Launch
343.300	Air Strike Command
259.200, 337.700,	
266.000, 354.300	Fleet Air Defense
324.850, 269.900	Fleet Air Defense
256.250	Squadron common
262.650	Air Wing Common

USS Enterprise CVN-65/SLEP: Bremerton

Frequency	Description
351.000, 286.700, 348.800	Approach
288.000, 357.700	Departure
265.000, 342.700,	
371.000, 350.700	Tower
336.900	Flight control
352.300	Flight Control LSO
373.800	Helicopter control
363.700, 369.100,	
284.800	Carrier controlled approach
339.400, 345.000,	
350.700, 352.300	Air Strike
371.000, 272.100, 367.400	Land/Launch
349.000, 249.800	Black Eagles (VAW- 1 13)
338.200, 302.500	Maintenance
234.200, 261.600,	
312.500, 382.300	ASW operations
292.800, 297.000,	
326.000, 345.600	Fleet Air Defense
338.400, 342.100, 326.400	Fleet Air Defense
282.800	Search and Rescue (common)
277.800	Fleet Tactical warning (common)

USS Abraham Lincoln CVN-72 HP: Alameda

Frequency	Description
369.100	Approach
380.650	Departure
280.600	Air Strike Command
236.450	Search & Rescue on scene
236.750	Strike (secure)
362.750	Land/Launch



USS America CV-66 HP: Norfolk

Frequency	Description
233.950	Tower
41.300, 138.660,	
138.350, 148.425	Deck Operations
400.000, 415.000	Fire control
410.000	Marine Guard

Interfleet Communications

Freq.	Hull	Ship name
226.800	AOR-5	USS Wabash
267.700	CGN-35	USS Truxton
278.900	AFS-7	USS San Jose
382.700	AD-37	USS Samuel Gompers
277.300	FF-1063	USS Reasoner
228.700	FFG-25	USS Copeland
381.900	FF-1069	USS Bagley

FASFAC (Fleet Air Control & Surveillance Facilities (Facility/CALL/Frequencies))

North Island NAS, San Diego CA	
BEAVER	289.900, 285.700, 266.900 314.700, 344.100
Pensacola NAS, Pensacola FL	
SEABREEZE	274.200, 275.600, 280.700 303.400, 306.800, 362.800, 313.200, 346.500, 353.200, 382.000, 383.800, 385.200
Jacksonville NAS, FLA	
SEALORD	267.500, 284.500, 313.700, 369.900
Norfolk NAS, Norfolk VA	
GIANTKILLER	233.700, 350.000 251.600 310.100, 249.800, 255.000, 338.100, 305.000
Whidbey Island NAS	
DOWNRIGGER	337.800, 360.200
Barbers Point NAS, HI	
HULA DANCER	308.100, 280.700

MAILBAG

Monitoring West

Roger West from Amery, Wisconsin, sends us a great list of military monitoring from his neck

of the woods. Thanks; Let's hear from some more of you on federal agencies in your area!

Wisconsin/Minnesota Military Monitoring

Frequency	Description
139.200	934th Air Combat Command Grp. (ACCG) Holloman Fld., St Paul MI (MN. Air Reserve)
299.100	934th ACCG
41.500	934th ACCG
126.200	MN Air National Guard (ANG)
41.40	MN Air National Guard
143.650	USAF MARS St Paul MN
148.100	133rd ACCW ANG Wold-Chamberlain Fld. MLPS MN
240.150	Same as above
148.545	Same as above
149.265	Same as above
163.5875	Same as above
153.990	ARMY MARS MLPS MN
148.150	Civil Air Patrol MLPS, MN, Eau Claire, WI
163.4125	Army Corps of Engineers (Mississippi River)
164.700	Same as above
172.1750	Federal Aviation Authority, Eau Claire, WI
363.000	McCoy Army Air Field (AAF) Sparta, WI.
40.55	McCoy AAF Sparta, WI.
242.400	McCoy AAF Sparta, WI.
288.900	179th Fighter Intercept Squadron (FIS) & 148th Fighter Intercept Group (FIG) MN ANG/Duluth, MN ANG Base
270.100	79th FIS & 148th FIG
255.900	79th FIS & 148th FIG MN
257.800	79th FIS & 148th FIG MN
348.600	79th FIS & 148th FIG MN
285.900	79th FIS & 148th FIG MN
324.600	Air to Air Refueling MN/WI
343.500	Air to Air Refueling MN/WI
327.600	Air to Air Refueling MN/WI
276.500	Air to Air Refueling MN/WI
235.100	Air to Air Refueling MN/WI
305.500	Air to Air Refueling MN/WI
406.025	"A new aircraft emergency frequency that sends info via satellite. It was used not long ago when a ANG fighter-jet-pilot was forced to eject. The signal was transmitted to the satellite which relayed it to a USAF computer in Colorado. The USAF then advised DULUTH ANGB. Total time involved was less than 30 seconds."

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Ship Weather Observations

One of the tools which the World Meteorological Organization has developed for the various weather forecasting bureaux around the world is the program of ship weather observations. This program uses ships which have been designated as weather observation stations by their country's government—usually government ships and merchant ships which spend much of their time at sea. These ships make weather observations from their location every six hours starting at midnight UTC.

Ship weather observations can also be sent in whenever severe weather or conditions which significantly differ from the forecast are encountered.

OBS messages will consist of up to twelve alpha numeric groups in the following form:

D...D	YYGGIw	99LaLaLa
QoLoLoLo	IrhhVV	Nddff
1snTTT	4PPPP	7wwW1W2
(222DsVs)	(6IsEsEsRs)	
(ICEc1S1b1D1z1)		

Now for the translation:

D...D is the ship's radio callsign, for example CYLD.

YYGGIw is the day of the month, the time of observation to the nearest hour GMT, and wind speed. **Iw**, if 3, means wind speed was estimated; and, if 4, means that it was measured with an anemometer.

99 is an indicator for the ship's position groups. **LaLaLa** is the ship's latitude north or south to the nearest tenth of a degree.

Qo indicates the quadrant of the earth: 1 means northeast, 2 means southeast, 7 means northwest, and 8 means southwest. **LoLoLo** is the ship's longitude in degrees and tenths.

Ir is the precipitation data indicator; a 4 indicates that the precipitation data is not available. **Ix** is the weather data indicator; it is 1 when the weather group is included, and 2 when it is omitted. **h** is the height of cloud base, usually coded as / since ships are not required to report this information. **VV** is the visibility according to the following table:

90	< 32 yards
91	55 < 220 yards
92	220 < 550 yards
93	550 yards < 1/2 mile
94	1/2 mile < 1 mile
95	1 mile < 2 miles
96	2 miles < 5 miles
97	5 miles < 11 miles
98	11 miles < 27 miles
99	27 miles or greater

N is the number of eighths of the sky covered by cloud, 9 means that the sky is obscured by fog. **dd** is the true direction of the wind given as tens of degrees. **ff** is the wind speed in knots.

1 is the indicator for the air temperature group. **sn** is the sign of the temperature: O if positive or zero; 1 if negative. **TTT** is the air temperature in degrees and tenths Celsius. If the ship only reads the temperature to the nearest degree, then the

third digit will be "7".

4 is the indicator for the air pressure group. **PPPP** is the sea level air pressure in millibars and tenths. If the ship only reads pressure to the nearest whole millibar, then the last digit will be "7" and the leading 1 is omitted when the pressure is 1000 mb or more.

7 is the indicator for the weather group. **ww** is the present weather: 00 to 49 indicates that no precipitation is falling, whereas 50 to 99 is used when there is precipitation at the time of the observation. The following table indicates the codings which are used:

- 00 Cloud development not observable
- 01 Clouds dissolving or becoming less developed
- 02 State of the sky on the whole unchanged
- 03 Clouds generally forming or developing
- 04 Visibility reduced by smoke
- 05 Dry haze
- 06 Widespread dust suspended in the air
- 07 Blowing spray at the ship
- 09 Dust storm or sand storm within sight
- 10 Mist (visibility half nautical mile or more)
- 11 Shallow fog in patches
- 12 Shallow fog more or less continuous
- 13 Lightning visible no thunder heard
- 14 Precipitation in sight not reaching surface
- 15 Precipitation beyond 3 mile reaching surface
- 16 Precipitation within 3 nautical miles reaching surface
- 17 Thunder at time of observation no precipitation at ship
- 18 Squalls (no precipitation) in past hour or at time of observation
- 19 Funnel cloud seen in past hour or at time of observation
- 20 Drizzle (not freezing) or snow grains
- 21 Rain (not freezing)
- 22 Snow
- 23 Rain and snow mixed or ice pellets
- 24 Freezing drizzle or freezing rain
- 25 Shower(s) of rain
- 26 Shower(s) of snow or of rain and snow mixed
- 27 Shower(s) of hail or of rain and hail mixed
- 28 Fog in past hour but not at time of observation
- 29 Thunderstorm with or without precipitation

Slight or moderate

- 30 dust storm or sand storm decreasing
- 31 dust storm or sand storm unchanging
- 32 dust storm or sand storm increasing

Heavy

- 33 dust storm or sand storm decreasing
- 34 dust storm or sand storm unchanging
- 35 dust storm or sand storm increasing
- 36 Slight or moderate drifting snow, low (below eye level)
- 37 Heavy drifting snow, low (below eye level)
- 38 Slight or moderate blowing snow, high (above eye level)
- 39 Heavy blowing snow, high (above eye level)
- 40 Fog at a distance but not at ship in past hour
- 41 Fog in patches

Sky visible

- 42 Fog has become thinner in past hour
- 44 Fog no change in past hour
- 46 Fog has begun or thickened in past hour
- 48 Fog, depositing rime

Sky invisible

- 43 Fog has become thinner in past hour
- 45 Fog no change in past hour
- 47 Fog has begun or thickened in past hour

49 Fog, depositing rime

Intermittent

- 50 Slight drizzle
- 52 Moderate drizzle
- 54 Heavy drizzle

Continuous

- 51 Slight drizzle
- 53 Moderatedrizzle
- 55 Heavy drizzle

Intermittent

- 94 moderate or heavy snow or rain and snow mixed in hail

Thunderstorm at time of observation

- 95 Slight or moderate thunderstorm with rain and/or snow but no hail
- 96 Slight or moderate thunderstorm with hail
- 97 Heavy thunderstorm with rain and/or snow but no hail
- 98 Thunderstorm with dust storm or sand storm
- 99 Heavy thunderstorm with hail

W1 and W2 are the past weather.

- 0 Cloud cover 1/2 or less throughout period
 - 1 Cloud cover more than 1/2 for part of period and 1/2 or less for another part of the period
 - 2 Cloud cover more than 1/2 throughout period
 - 3 Sand storm, dust storm or blowing snow
 - 4 Fog or thick haze (visibility less than 1/2 mile)
 - 5 Drizzle
 - 6 Rain
 - 7 Snow or rain and snow mixed
 - 8 Shower(s)
- Thunderstorm(s) with or without precipitation

222DsVs is the ship's course and speed group and is only included when the groups relating to ice conditions are included. It is usually coded 222/ to indicate that the ship's course and speed made good are not reported.

6 is the figure for the ice accretion group. **Is** is the cause of ice accretion on ships.

- 1 Icing from ocean spray
- 2 Icing from fog
- 3 Icing from spray and fog
- 4 Icing from rain
- 5 Icing from spray and rain

EsEs is the thickness of ice accretion in centimeters.

- | | |
|------------------|-------------------|
| 00 Less than 1/4 | 04 1-1/2 or 1-3/4 |
| 01 1/4 to 1/2 | 05 2 |
| 02 3/4 | - - |
| 03 1 or 1-1/4 | 23 9 or 9-1/4 |

Rs is the rate of ice accretion on ships

- 0 Ice not building up
- 1 Ice building up slowly
- 2 Ice building up rapidly
- 3 Ice melting or breaking up slowly
- 4 Ice melting or breaking up rapidly

ICE is the indicator for the ice group. **c1** is the concentration or arrangement of sea ice.

- 0 No sea ice in sight
- 1 Ship in open lead more than 1 nautical mile wide or ship in fast ice with boundary beyond limit of visibility
- 2 Sea ice present in concentration less than 3/10 open water or very open pack ice
- 3 4/10 to 6/10 open pack ice
- 4 7/10 to 8/10 close pack ice

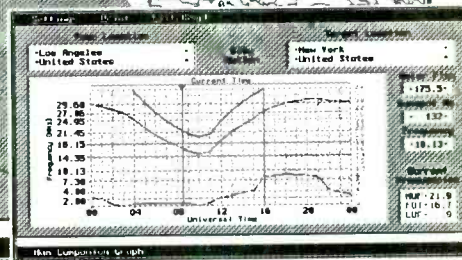
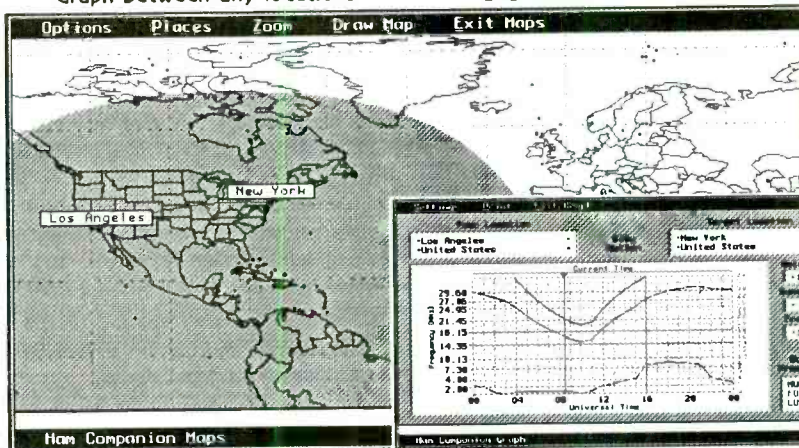
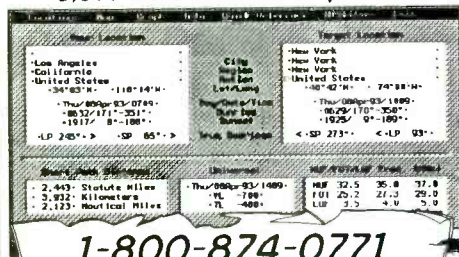
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- 5 9/10 or more but not 10/10 very close pack ice
- 6 Strips and patches of pack ice with open water between
- 7 Strips and patches of close or very close pack ice with areas of lesser concentration in between
- 8 Fast ice with open water, very open or open pack ice to seaward of the ice boundary
- 9 Fast ice with close or very close pack ice to seaward of the ice
- / Unable to report because of darkness, lack of visibility, or because ship is more than 1/2 nautical mile away from the ice edge

S1 is the stage of development of sea ice.

- 0 New ice only
- 1 Nilas or ice rind
- 2 Young ice
- 3 Predominantly new and/or young ice with some first year ice
- 4 Predominantly thin first year ice with some new and/or young ice
- 5 All thin first year ice
- 6 Predominantly medium first year ice
- 7 All medium and thick first year ice
- 3 Predominantly medium and thick first year ice with some old ice
- 9 Predominantly old ice
- / Unable to report because of darkness, lack of visibility, or because only ice of land origin is visible, or because ship is more than 1/2 nautical mile away from ice edge

b1 is ice of land origin.

- 0 No ice of land origin
- 1 1 - 5 icebergs, no growlers or bergy bits
- 2 6 - 10 icebergs, no growlers or bergy bits
- 3 11 - 20 icebergs, no growlers or bergy bits
- 4 Up to and including 10 growlers and bergy bits, no icebergs
- 5 more than 10 growlers and bergy bits, no icebergs

- 6 1 - 5 icebergs with growlers and bergy bits
- 7 6 - 10 icebergs with growlers and bergy bits
- 8 11 - 20 icebergs with growlers and bergy bits
- 9 more than 20 icebergs with growlers and bergy bits - a major hazard to navigation
- / Unable to report because of darkness, lack of visibility, or because only sea ice is visible

D1 is the bearing of the principle ice edge.

- 0 Ship in shore in flaw track
- 1 Principle ice edge to NE
- 2 Principle ice edge to E
- 3 Principle ice edge to SE
- 4 Principle ice edge to S
- 5 Principle ice edge to SW
- 6 Principle ice edge to W
- 7 Principle ice edge to NW
- 8 Principle ice edge to N
- 9 Not determined (ship in ice)
- / Unable to report because of darkness, lack of visibility, or because only ice of land origin is visible

z1 is the present ice situation and trend over the preceding 5 hours.

- 0 Ship in open water with floating ice in sight
- 1 Ship in easily penetrable ice, conditions improving
- 2 Ship in easily penetrable ice, conditions not changing
- 3 Ship in easily penetrable ice, conditions worsening
- 4 Ship in ice difficult to penetrate, conditions improving
- 5 Ship in ice difficult to penetrate, conditions not changing
- 6 Ice forming and floes freezing together
- 7 Ice under slight pressure
- 8 Ice under moderate or severe pressure
- 9 Ship beset
- / Unable to report because of darkness or lack of visibility

Now let's take a look at an example of an OBS report:

VOAA 06003 99502 70536 41/96 83032 1102/4008/76674 222//65021 ICE 22470

This report comes from the vessel with callsign VOAA and the observation was made at 0000Z on the sixth of the month with the wind speed being estimated. The ship is located at latitude 50.2 degrees North and 53.6 degrees West longitude. There is no precipitation group, but the weather group is included.

Visibility is 2 to 3 nautical miles and the sky is fully cloud covered. The wind is from 300 degrees true at 32 knots. The temperature is -2 degrees Celsius. The sea level pressure is 1008 millibars.

There is light freezing rain and there has been snow and fog in the past. Icing is due to spray and rain and is 2 cm thick with a slow build up. There is less than 3/10 of sea ice, the ice edge is to the Northwest and open water ice is in sight.

In the next "High Seas" column I will offer some suggestions as to where to catch some of these observations. Here's a hint to get you started: they will be sent to government coast stations and to those commercial stations which will accept OBS messages without charge. They can be sent in any mode: SSB, CW, or RTTY. So look around; you never know what you might find.

Until next time, keep sending in your loggings and any comments or suggestions for the column. Good listening until then.

MT

Classic Longwave

During the final hours of the Rochester Hamfest, a dusty old National RBL-5 receiver caught my eye. I was attracted to the large tuning dial, the black wrinkled paint finish, and the businesslike military tag dated 1944. After the usual price dickering, the seller and I agreed on a reasonable figure—one that included him helping me lug the 75 pound unit to my car. Actually, that was the easy part; I then had to convince my wife to allow the thing in the house!

I carefully cleaned the exterior of the cabinet and the control knobs. The inside was remarkably clean and required only a little dusting off with a soft brush. Cosmetically, this radio was in great shape, and more importantly, all the components were there.

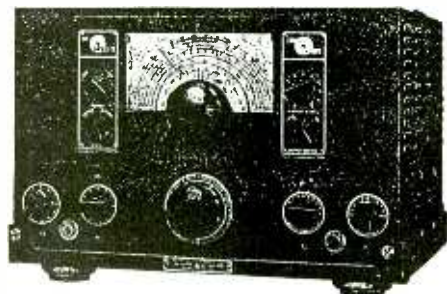
Next, I became familiar with the set's operating controls. Fellow LW fan and *MT* reader Jim Wilson (NY) was able to provide a photocopy of a manual for the receiver, which proved invaluable for learning the particulars of the set.

It was finally time for the "smoke test." I hooked up a 150 foot antenna, a pair of 600 ohm headphones, and a power cord to the rear panel. With great anxiety, I threw the power switch to ON.

To my relief, the dial lit up, and in just 30 seconds the speaker was alive with strong signals. I spent the next hour sifting through the signals of WWVB (60 kHz), numerous RTTY stations, including NLK at Jim Creek, WA (24 kHz), and even a few "whistlers" at the low end of the dial.

Unlike the receivers of today, the RBL-5 is a "regenerative" radio. This means that a portion of the received signal is fed back into the RF amplifier for reamplification or regeneration. It takes some practice to properly set the REGEN control. If it's not set correctly, you'll hear distortion or sometimes nothing at all.

Once a signal is tuned properly, I find that this 50 year old rig holds its own—even by today's standards. The National has now earned a permanent spot in my shack. It's true what they say: *real radios do glow in the dark!*



An RBL-Series Longwave Receiver

Searching for a Classic

Without a doubt, hamfest fleamarkets are your best opportunity to locate old relics. Here, you'll find equipment in various states of repair, ready for your best price haggling skills. To find the hamfests in your area check for listings in radio magazines, such as *MT's* Convention Calendar, or ask around at your local radio club.

Hamfests offer the opportunity to inspect the goods firsthand. Besides outward physical appearance, check to see that all the controls move freely, that the radio has a full complement of tubes, and that the inside of the set is free of rust or corrosion. Ideally, the instruction manual would also be included in the deal.

Another way to purchase vintage gear is through surplus catalogs. This is not always the cheapest way to go, but there is usually a fair assessment of the radio's condition such as "tested/ok," "repairable," "as is," etc. One well known dealer in vintage gear is Fair Radio Sales. They've been in the surplus market since 1947. For a catalog, you can write them at: P.O. Box 1105, 1016 E. Eureka St., Dept. MT, Lima, Ohio 45802.

Parts Resources

Consider yourself fortunate if your old LF receiver works the first time you plug it in. More than likely, some repair parts will be needed to put it in perfect condition. Fortunately, there are companies that can supply many of your parts needs. Table 1 lists some companies that specialize in antique radio supplies.

Museum Visits

Suppose you don't want to go to the trouble of restoring a classic receiver, but still want to enjoy old radios. You can do it with a trip to a radio museum in your area. There's not room for a complete listing here, but one example that stands out is the Antique Wireless Museum in Bloomfield, NY. If your travels take you into the Upstate NY region, be sure to check this one out.



(Sketch Courtesy RARA Rag)

The Antique Wireless Museum is housed in this 19th Century building

Table 1 Old Radio Parts Sources

Antique Electronic Supply
688 W. First St.
Dept. MT
Tempe, AZ 85281

Yeary Communications
12922 Harbor Blvd. Suite 800-MT
Garden Grove, CA 92640

Puett Electronics
P.O. Box 28572-MT
Dallas, TX 75228

Antique Audio
5555 N. Lamar, Bldg H-105-MT
Austin, TX 78751

Located just 20 minutes from Rochester, the museum features old longwave Spark Transmitters, early receivers of all types, Morse code keys, old "horn" speakers, radio advertising memorabilia, and even a hunk of the Transatlantic Cable! Knowledgeable guides at the museum are always ready to explain everything.

The museum is a part of the Antique Wireless Association (AWA), which is a "hub" of activity for collectors everywhere. As a part of AWA membership, *The Old Timer's Bulletin* is sent out four times a year. This professional-looking publication has articles on radio history, restoration techniques, and notices of upcoming swap meets. There are regional AWA meets in many areas of the country. For more information, write to: The Antique Wireless Museum, Bruce Kelley, Curator, Main Street, Holcomb, NY 14469.

News Clips

Despite being outside the mainstream, the basement band has received lots of press coverage lately. First, there was the recent broadcast of the "Below 500 kHz" column over HCB's *DX Partyline* program. This was a welcome surprise, and I hope it will serve to bring some newcomers into our ranks.

Also, a newspaper article in the *Daily Spectrum* carried a story about a longwave GWEN site that is under hot debate in Kane County, Utah. My thanks to Doug Chandler of St. George, Utah, for sending it.

Finally, in July, there was a PBS special on earthquakes that included many references to the value of "low frequency radio waves" for quake prediction. Although short on specifics, it did call attention to this part of the spectrum.

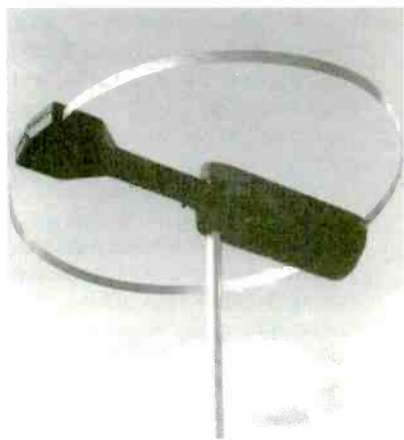
I always appreciate your news, loggings, and shack photos. In particular, if you are using an old classic LF receiver, send a photo of it along to me, and I will try to include it. See you next month!

MT

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Become an AM DXpert!

Are you searching for a new project now that the summer's winding down? Why not investigate the world of AM radio? You can maximize your listening fun with a minimum of expense, and DX anywhere you go. It's entertaining, educational, and most stations broadcast in English. The AMDX season begins every autumn, so now is the perfect time to start!

It's easy to become a AM DXer. First, get acquainted with your local neighborhood of stations. Begin a logbook to record what you hear. Devote one page to each frequency found, from 530 to 1710 kHz. Start with one end of the dial and identify all the stations you can hear during the daytime, then see what you can pull in at night. During the day, AM radio signals travel mostly by ground wave, allowing stations to be heard up to a few hundred miles. But at night you'll enjoy reception of stations up to two thousand miles distant at night via skywave. Using top-notch receivers and antennas, even worldwide reception is possible.

After you become familiar with all the stations easily heard at your location, you can move on to the next challenge of AM DXing: sunrise and sunset skip. Many AMDXers believe this is the most exciting time to listen. Twice a day, as the sun rises and falls, some areas near you will be in darkness, while others will be in daylight. Daytime only stations will also be signing on or signing off the air. At dawn and dusk, reception conditions change rapidly, so it's not unusual to hear several stations on a single frequency over a very short period of time.

Consider this sample scenario: You live in Chattanooga, Tennessee. During the day you'll hear a local station: WAPO in nearby Jasper. WAPO is a daytime-only station. When WAPO signs off at dusk, WNYC, New York, is already in darkness and is heard until WSCR in Chicago

fades in. Later in the evening, as nightfall continues westward, WSCR battles WBAP in Fort Worth, Texas, for domination of the frequency.

In transition periods, many other stations may find their way to your radio. At dawn, stations to the east of you will gradually weaken, revealing stations west of you still in darkness. Twilight will bring stations from the east of your receiver before westward stations fade in. Also, remember that sunrises and sunsets do not follow longitudinal lines. Stations north of you will be on the air later in the summer compared to stations in your locale. These same northern stations will sign off earlier than your locals in the winter. Want to log your first European station? Try around 0500 UTC when Europe and North America are sharing periods of darkness.

AM radio frequencies fall into three basic categories: Local, regional, and clear channels. At night, clear channels may be inhabited by only one or two powerful stations nationwide. Your first long distance catches will probably be logged on clear channel frequencies. Full power 50,000 watt stations operate on the channels in Table 1 covering hundreds of miles during the day and thousands at night. Crowded local frequencies are allocated almost 200 stations apiece. The six local frequencies are called "graveyards" by seasoned AM DXers: 1230, 1240, 1340, 1400, 1450 and 1490 kHz.

For an equally difficult challenge, try DXing travellers' information stations usually found on 530 and 1610 kHz broadcasting short messages about their locale. TIS stations transmit with very limited power and antenna systems making them excellent DX catches. Most constantly identify themselves, reducing your frustration when straining for a positive ID.

Add enjoyment to your AM DXing with an up-to-date listing of stations by frequency, call letters, and location. We highly recommend the National Radio Club's *AM Radio Log Book* available for \$19.95 postpaid from: NRC Publications, Box 164, Mannsville, NY 13361. An excellent companion to the NRC Log is the *IRCA AM-FM Almanac* published by The International Radio Club of America, 2301 Pacific Avenue, Aberdeen, WA 98520-4527. Over 200 pages long, it lists all the affiliates of every programming and sports network, and the stations that carry specific talk shows and other syndicated programming. You'll also see the slogans used by hundreds of stations, and which stations simulcast on FM. If you need clues to identify a rare DX catch, the *IRCA AM-FM Almanac* is the place to look. A brand new 6th edition will be available in a few months. Send them an SASE for details.

IRCA is also the leader in arranging special broadcasts specifically for DXers. Federal regu-

Table 1: American Clear Channel Frequencies

640	740	840	1040	1130	1500
650	750	850	1060	1140	1510
660	760	870	1070	1160	1520
670	770	880	1080	1170	1530
680	780	890	1090	1180	1540
700	810	1000	1100	1190	1560
710	820	1020	1110	1200	
720	830	1030	1120	1210	

lations allow stations to perform on-the-air maintenance of transmitters between the hours of midnight and 6 am local time. Many of these tests take place on Sunday night/Monday mornings when audience numbers are at a minimum. AM DXers see these hours as heaven on earth! Stations that might otherwise be out of their grasp sometimes operate at full power while testing. Up to the minute advisories of these broadcasts are available by receiving the IRCA's publication *DX Monitor*. You can join for \$25 a year by writing to: IRCA, P.O. Box 70223, Riverside, CA 92513-0223. Both clubs' bulletins provide a wealth of technical information, listening tips, and loggings from sleuthing members all across North America.

Learning to identify AM DX is easy with a little thought. You're lucky if you hear a nice clear voice say "WLEW Bad Axe, Michigan." Usually, only a couple of call letters or just a slogan or a mention of a city will pull through. Gather as many clues as you can to narrow down the possibilities. Ask yourself: What language was the program in? English? French? Spanish? Did the call letters begin with W, K, C, or X? Most W calls are assigned to stations east of the Mississippi River, and most K calls are west. C calls are from Canada, and X (pronounced eh-kiss) are used in Mexico. Was the station in your time zone? What nearby towns and highways were mentioned? A good road atlas can add essential clues in your search for identity.

Listen carefully to determine the format of the station. What kind of music did they play? What talk show was on? Was the station rebroadcasting their FM sister station? What ball game were they carrying? When did they sign on or sign off? Which stations are now in darkness? If your budget can afford it, don't be afraid to use the phone! Call the station and ask them "What's on the air?"

Pulling More Signal

Experiment with how your radio is positioned. Most AM radios use either a ferrite loop antenna coil or a wirewound loop antenna built into the cabinet. These antennas are bi-direc-

Your medium wave logbook can include some great entries with a systematic approach to listening.

**Be an American
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See any stories about radio in the local paper? Send them to Monitoring Times, PO Box 98, Brasstown, NC 28902.

tional and can be used to null out unwanted signals allowing others to push through into your log book.

You can also use this characteristic as a direction finder adding another clue to a station's identity. Larger tabletop radios can be rotated easily by placing them on sturdy lazy susans. Use a compass for added accuracy.

If you think your set could use a little more sensitivity to pull in weaker stations, try these tricks: Remember that simple radios that use built-in antennas were not designed for external antennas. Try listening in different places within your house to discover the location of best reception. You can also try using a long wire antenna strung outdoors and loosely couple it to the radio's internal antenna system. All you need is one or two turns of wire wrapped around the radio itself. Connecting the end of the antenna wire to a good earth ground may give you an added boost. Reduce the amount of turns around the radio if you start hearing lots of shortwave images across the dials.

Old car radios using simple whip antennas can make excellent receivers for AM DXing. Use an old power supply left over from your CB radio days, or look for them at a flea market, garage sale, or hamfest. Any 12 volt DC supply rated above one ampere of current should work well. Almost all car radios are negative ground, but carefully check your connections before you power up! Add a speaker and a whip antenna with a Motorola plug, and you'll be ready for action. Don't forget to adjust the antenna trimmer for maximum pickup with your antenna. Add a short piece of wire to the whip for added signal strength. If it overwhelms the radio with signal, cut it back until you find a good compromise. Again, try to avoid signal overload.

If you are DXing while in a car, search for good reception locations. Drive to places away from civilization, where noise makers like power lines and appliances won't ruin your fun. Areas that are adjacent to rivers and lakes are often excellent. The best DX sites in the world are found on isolated ocean beaches. Experiment!

Please Identify

To maximize your efficiency while DXing, tape record everything you hear. Once an announcement has passed, it's gone forever! Good quality tapes can also be sent as verification of reception to stations when you request QSL cards. When writing to a station for a QSL or verification letter, keep your letters concise and informative. Include information that makes the station unique: names of local advertisers, locally produced programs and personalities, station slogans and jingles, DJ's names, and music formats. Realize that the chief engineer that receives your report probably leads a busy life and will

answer your letter as a courtesy. Always include an SASE, and be patient. A follow-up letter or phone call a

month or two after you mail your letter may encourage a reply.

As you learn how to DX the AM broadcast band, you may want to advance to a more selective and sensitive communications receiver and use more efficient antenna systems. Simple modifications, such as adding crystal filters, can add a new dimension to your radio. Joining a national or a local club makes learning the hobby easy and fun. Stations are rolling in right now! Turn on your AM radio and start listening!

Bits 'N' Pieces

Get ready to read your radio! Next spring, Delco Electronics will introduce a new generation of car radios with several features never before seen or heard by drivers of GM automobiles. Using the new Radio Data System, you'll be able to instantly see what station you are tuned to by reading the radio's front panel alphanumeric display. Should you roam out of the range of the main transmitter, the radio will automatically switch to the strongest translator signal available of the same station; or switch you to another station that offers a similar programming. Choose your favorite sounds from a menu of 22 different formats, then sit back and enjoy! Endless scanning for a "good" station is no longer necessary!

RDS equipped radios will also provide instant traffic, weather or safety announcements that will automatically override the entertainment program you are listening to. If you desire, it will even interrupt the playback of a cassette or CD. RDS text and voice messages are transmitted via FM subcarriers. So keep your eyes on the road and on your radio!

International Bandscan

All-news radio has spread to Canada. CFTR-AM in Toronto dropped their all-hit music format to become "680 News." Rogers Broadcasting President Tony Viner is convinced CFTR can attract a big audience with his informational format. News headlines, sports, weather, and traffic all air at the same times each hour so listeners can tune in and hear what they need to know with ease. Seven on-air personalities and two music department staff members were let go, but the station hopes to more than double its news staff of 16 in the coming months. Thanks to David Alpert in New York City for sending in this item from Canada's Broadcast News Service.

Until next month, happy trails!



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Hi-Tech Changes in the TVRO World

As the summer of '93 winds down, the pace of change in the world of satellite television is accelerating rapidly. There will be many new developments to discuss at the upcoming *MT* Convention seminars. The industry's biggest trade event, the SBCA's Nashville summer show, will get under way just after this column is written. At the same time NASA will be launching a new type of satellite known as the Advanced Communications Technology Satellite (ACTS).

ACTS' 10th Anniversary

Assuming that ACTS achieves orbit and is functioning in the designed fashion, the bird will be celebrating its tenth anniversary almost to the month from the inception of the project to the day when it is finally turned on. Always an easy target for the previous three administrations, ACTS lumbered along in what can only be described as a very slow track.

Using a transmitting antenna over ten feet in diameter—the largest such for any existing satellite—and a receiving antenna in excess of six feet in diameter, ACTS will use the heretofore unused Ka band of 20 to 30 GHz. ACTS has on board six transponders of 46 watts each and will be located at 100 degrees west. The satellite will have a seven days a week 24 hours per day schedule with a nominal lifetime of two years beginning this October.

During its lifetime ACTS will be accessed by organizations throughout government, industry and universities, all of whom signed up long ago for experiment time on the bird. It would be very interesting for any home experimenters who have equipment in the Ka range to try tuning the band for signals.

TVRO Industry In Flux

If you feel left out of ACTS technology you'll feel right at home in the new world of direct broadcast TVRO. The chief players in this corner of our universe are RCA, DirecTv, USSB and Primestar Partners. All four will make their debut to the industry and show details of their marketing strategy. At present only Primestar has an actual, functioning service, albeit a minimal shadow of its future self. All will employ some form of digital compression to deliver their signals to homes. The compression schemes will be based on what's called the MPEG II standard (MPEG stands for Motion Picture Experts Group).

It appears that only two of the would-be DBS players will have the same receiver manufacturer. According to trade papers, Thomson Consumer Electronics Inc. will make the receivers for both DirecTv (Hughes Communications Inc.) and USSB (Hubbard Broadcasting Co., Inc.). General Instrument will apparently be manufacturing the encryption end of these receivers, all incorporating GI's DigiCipher II system.

As might be expected, the C band home dish market will be the last to be included in the digital compression switch. MPEG II technology will be incorporated into TVRO receiver designs, according to *Satellite Business News* "...perhaps a year after it is available on some cable systems."

Compression Pressure

While virtually all current C band programmers say they will continue analog transmissions for the back yard market, they will all be traveling the compression route. Eventually all programming which is now considered "cable fare" will be available only in the digitally compressed

format. The main reason for the move to compression must certainly be financial. Transponder leasing is not cheap. For program providers to offer more services, switching to digital compression makes sense.

A graphic example of this reasoning is found in a favorite service of the TVRO hobbyist: SCOLA. This scholastic service which retransmits a dazzling variety of international programming for America's educational institutions (currently on ASC 128 degrees west, channel 23) wants to ex-

pand its services to three additional channels. That would ordinarily mean increasing its transponder expenses by three times, a financial impossibility. However, by adding digital compression, the one existing channel easily becomes four. For less than a thousand dollars per institution (a price borne by each institution), SCOLA can go to digital compression and offer four separate channels. According to a report in *TVRO Dealer*, SCOLA will do so by this time next year. The switch will be made following a move to Telstar 401, the new PBS bird scheduled for launch later this year.

It is no coincidence that SCOLA is moving to T401. This is developing into the "education" bird and will be the location for the future of the Public Broadcasting System (PBS). For more than ten years the TVRO viewer has enjoyed choosing from at least four channels of PBS programming. By this time next year PBS should have in place its digital compression scheme and PBS for the backyard viewer will disappear. One C band analog channel will be maintained, for which those of us who are not in a good reception area for the local PBS channel will be grateful.

Is It Time To Panic?

In my nearly ten years of monitoring the satellite industry I cannot think of a service, technology or marketing scheme which came off within six months of its predicted arrival. The current batch of C and Ku band satellites just now brought into service have a lifetime of at least ten years. With more satellites offering more channels at higher output powers there will be a glut on the transponder market. There is no question that new and interesting things will be happening on those channels providing much channel scanning for TVRO buffs for the next decade.

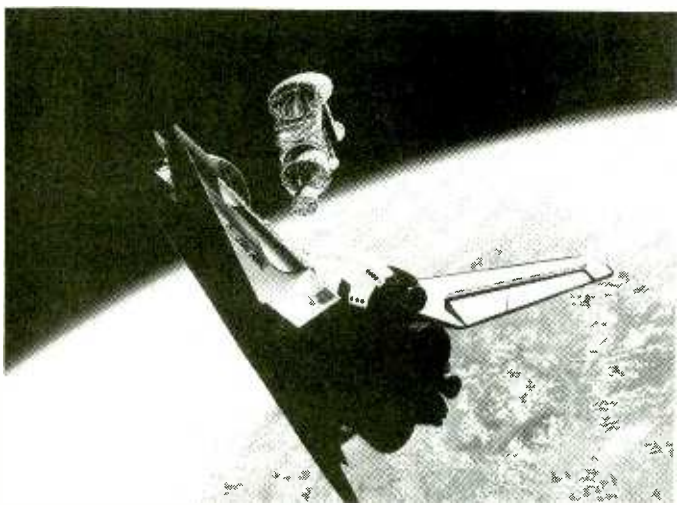
Given the instability of today's economy there is also no question that there will eventually be a major shakeout in the cable/satellite industry. The high-flying get-rich-quick days of the past decade are over.

MAILBAG

Michael Eilers AC4XS of Covington, KY, would like some information about Zenith TV sets with built-in World System Teletext decoders.

Michael, I contacted John Taylor, Director of Corporate Public Relations and Communications at the Zenith Electronics Corporation for answers to your question. According to Mr. Taylor, 1991 was the last year that Zenith built TV sets with the World System Teletext decoders built-in.

Briefly, for those who may not be familiar with WST teletext, it is a digital transmission of



NASA

Artist concept of the Advanced Communications Technology Satellite (ACTS) shown after release from Shuttle cargo bay.

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text which is sent via the Vertical Blanking Interval of a station equipped to transmit in the World System Teletext mode. This teletext mode was first done at least 15 years ago in England where it was known as Keyfax and migrated to the U.S. where it found a home on the VBI of WKRC-TV in Cincinnati, Ohio, operated by Taft Broadcasting.

All the editing is done at Taft where writers, using wire service reports, put together a continuously updated electronic service which is called Electra. The service is made available nationally, to all cable and satellite subscribers who get TBS via the TBS Superstation VBI. The teletext is not bothered by retransmission and encryption.

When a WST decoder, or a Zenith Digital System 3 of 1991 or earlier vintage, is interfaced with your satellite receiver or cable TV box, the teletext information is received and stored in the WST decoder. At your convenience you may access the data by operating a simple infra-red remote control. The data, in the form of colorful text, is displayed on your TV set. Considered hi-tech ten years ago, WST has not done well against the PC based text service X*Press X*Change (to be addressed in a future column).

Still, this has not prevented Electra from achieving a modest sort of success. It does have some advantages. First, it does not require an expensive computer; it takes up less space than a VCR; it requires no computer literacy; since it's displayed on the TV screen it's easy to keep up with world news events and current ball scores from all over America without leaving the sofa. It has numerous features such as Lifestyles, TV guide, Trivia, Sports, Business Index, Wall Street indexes, Weather and much more. Best of all, the Electra teletext service is free!

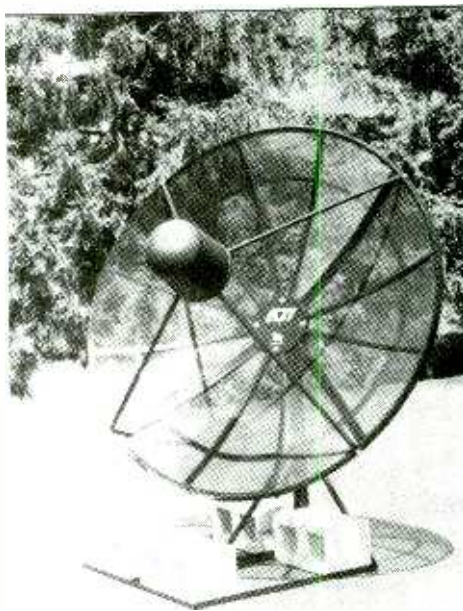
If you're interested in Electra look for used Zenith Digital System 3 TV sets of any size from 19" up. Zenith even provided WST decoders in their big screen rear projection sets in the Digital System 3 series. The set will have a remote control which has a slide switch at the top to switch between Cable-TV-Text. Many thousands of these sets are around and should be easy to find. Try advertising in your local newspaper's classified section.

If you want a stand-alone teletext decoder write to the following companies who make them. Astro Products Co., 340-A Rancheros Drive, San Marcos, CA 92069 or call (619) 471-9930 FAX: (619) 471-9943; or International Teletext Communications, Inc. 1307 S. Mary Avenue Ste. 203, Sunnyvale, CA 94087 or call (408) 735-8833 or FAX (408) 738-3166.

Even if you don't have a satellite system or are on a cable system, it may still be possible to view Electra. As of two years ago there were six over-the-air TV stations rebroadcasting the Electra service on their own VBI. They are as follows: WKRC Cincinnati, OH; WTVN Columbus, OH;

KOVR Sacramento, CA; KOIN Portland, OR; WTSP Tampa, FL; and WBSX Ann Arbor, MI. If you have a WST teletext decoder and live in any of these areas, let me know if they are still transmitting. If you have a WST decoder and are receiving Electra over-the-air from a station not listed please send details to this column care of this magazine.

For a complete description of the Electra service write: Great American Broadcasting Co., 1718 Young Street, Cincinnati, OH 45210. Ask for the brochure *The World At Your Fingertips*.



A "Temporary" Solution

And finally, for this month, Kaul-Tronics has introduced a great little dish holder for folks with temporary locations and those needing to support a small C band dish. They call it the NPRM, which stands for Non-Penetrating Roof Mount, and it provides "solid support for ...5 foot or 6 foot

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...antennas. The NPRM is also UPS shippable and incorporates a 2.5" O.D. pole."

Using eight cinder blocks (four are shown in the picture) the unit makes for easy temporary installations or for use on flat roofs where drilling or setting of poles is prohibited or impossible.

This ought to be just the solution to those townhouse apartments or condos where one's backyard is small and setting of steel posts in concrete is frowned upon. For more on this mount or any of the other great Kaul-Tronic products write Kaul-Tronics, Inc., 1140 Sextonville Road, Richland Center, WI 53581 or call 608-647-8902 FAX: 608-647-7394 International FAX: 608-647-4953.

MT

Where Are the Novices?

One of my favorite activities is operating in the Novice CW bands and chatting with new hams. While their CW might be slow, their interest and enthusiasm is always high. For about three years activity in the Novice segment of 80 meters (my favorite) has been dropping off considerably. With the advent of ten meter SSB privileges for the Novice, I assumed most of the newly licensed hams just migrated to that band to enjoy SSB. However, a recent editorial in "QST" magazine indicates that Novice activity has dropped off on all bands with about two thirds of new Novices being inactive!

Why would an individual go to the trouble of learning Morse code, theory and taking an exam and then do nothing with it? There are several explanations that spring to mind. Is it possible that the new hams have no one to help them through that important first CW contact? Or do they think equipment is too expensive? Maybe the thought of erecting an antenna stops some. Whatever the reasons, it is a trend that must be reversed!

If you read many of the ham magazines, I am sure you notice the photos published are mostly of stations that are very expensive and expensive! Articles are written for the more advanced amateurs. There are really very few beginner's articles available. The ARRL is trying to address that problem with their "New Ham Companion" feature in each issue of "QST" magazine. Unfortunately the majority of new hams read only what is available on the newsstand and do not join the ARRL. *CQ* has a Novice column and the columnist Bill Welsh does a fine job; but more is needed.

When I first got into ham radio, all of the magazines published simple-to-build transmitter and receiver articles. Easily built antennas were featured in nearly every issue and articles on operating were aimed at the newcomer. Today such a transmitter or receiver nearly always requires at least one circuit board which must either be etched or purchased and contains circuits that are a bit complex for the average beginner. Sometimes even obtaining parts is a major undertaking.

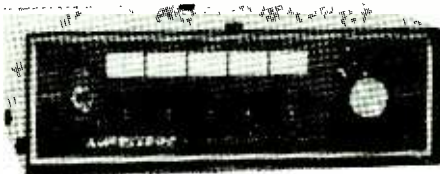
I suggest that those who write for the new ham show the builder how to build the unit using a pictorial diagram instead of a schematic (show the schematic, too). Keep circuits simple, and use crystal control on the basic transmitter circuit, and later show the reader how to add a VFO (variable frequency oscillator) to the transmitter. Use easy-to-obtain parts and perfboard and point-to-point wiring. Receivers should use the same approach, keeping it extremely easy to build and adding various bells and whistles later, so the first time builder has a chance to complete the unit successfully.

Each construction article should have a complete parts list and indicate where the reader can

obtain the parts. Articles telling the reader how to make a CW contact or work DX should appear more frequently in all of the magazines.

Especially important is that the new Novice has contact with someone who can help him along. If you have been an active ham for any length of time (say a year of operating) why don't you offer to help the newcomers in your area?

This column has always been interested in helping the new ham and will continue to do so. In the next several months we will feature some really effective and simple antennas, and an easily constructed novice CW station (pictorial diagrams and no circuit boards) that will be inexpensive and work great. In addition, if you have any suggestions or circuit ideas I would appreciate hearing from you. You can also help by requesting more beginners articles in the various ham magazines.



Ameritron RCS-8V
(Remote coax switch)

If you are like the average ham, there are a half dozen or more coax lines running into your shack. To run them requires drilling holes, leaving a window open and closing it on the coax, or construction of a special coax entrance board.

Ameritron has a better solution in their RCS-8V and RCS-4 remote coax switches. Mount the external switch at a convenient location on the tower, roof or external wall, run a single coax line and a five wire control line (Radio Shack five wire rotor control cable works great) into the shack and switch up to five antennas (four with RCS-4). A control head is located in the shack and a flip of the switch will put any of your antennas in line. The switch handles up to five kW to 30 MHz and one kW to 150 MHz. Loss is less than 0.1dB at 150 MHz and the unit is useable to 450 MHz (photo 1).

Price is \$134.50 for the RCS-4 and \$149.00 for the RCS-8V. It is available from most amateur radio dealers or direct from Ameritron, 116 Willow Road, Starkville, MS 38759.

No Code Video Course

The ARRL recently announced the availability of a video course that takes the beginner through the No Code theory exam. The course was designed by the same company that produced a video that has helped hundreds of thousands

pass the private pilot aviation exam. The five hour course is priced at \$99.00. A computerized review is available which creates, administers and scores sample tests using the exact questions in the test pool; price of the course with computer review is \$119.00. Available from the ARRL, 225 Main St. Newington, CT 06111.

Antennas and Neighbors

I receive a lot of mail concerning antenna restrictions and legal battles in various communities. While I am in full sympathy with the ham who is told that no antennas of any kind can be erected on his property, I do not feel a great deal of support for the ham who will put up a large tower that can endanger his neighbors. For example, a newspaper article described a recent tower fight in which the amateur put up an 80 foot tower on a 65 by 50 lot. No matter how the tower falls, it will come down on a public road or neighbor's house/lot.

Many communities do have restrictions that are senseless in that they attempt to restrict all antennas and towers regardless of the size of the amateur's lot. Most of these ordinances cite antennas to be a nuisance. To be fair, an ordinance should permit any tower that can be safely put up without endangering the community.

My experience has been that my neighbors will not be unreasonable if I put up an antenna that will not fall on their lot. The best way to avoid problems is to use thin wire (18 gauge copperweld is great) for antennas and run the feed lines in an unobtrusive manner. Small beams and verticals are seldom noticed or commented on unless put up high.

In addition, be sure you are not causing any kind of interference to TV or other electronics your neighbors may have. Run reasonable power (100 - 200 watts is plenty). Don't be a hardnose and insist on running a full gallon just because your license allows it. Be willing to talk about your station to anyone interested; in fact, if possible, demonstrate the rig and let them talk over it to some distant ham.

Whenever a problem occurs take the initiative in curing it. Don't tell your neighbor it is his problem or that his equipment is junk and he needs to buy a new set! I would rather invest a few dollars in some cores or filters than to create bad feelings. If necessary, get help from your local TVI committee, equipment manufacturers, the local phone company, etc. In general, people are understanding and using common sense and a calm approach usually goes a long way towards curing problems of this nature.

DX season is coming, are you ready?

73 de Ike, N3IK



Rob Secord's

Ham DX Tips

Well, here we are at the start of a new "DX Season." September sees the increase of North-South as well as East-West propagation, even though we are in a low sunspot cycle period. Here are some tips to help you discover the better propagation...

ALBANIA At 2100 UTC ZA1B appears almost daily on 14180 kHz SSB. Send your QSL requests to his manager: I2MQP, Pietro Mario Ambrosi, Via A Straagella 13, I-20129 Milino, Italy. **ANTARCTICA** Argentina's Esperanza Base located here has a new active ham station, LU1ZV, which can be found most days on 14300 kHz SSB at 1930 UTC. The address for LU1ZV is: Base Naval Esperanza, Inst Antartida Argentina, 9410 Antartida, Argentina. **BRUNEI** Viaradio you can travel from the cold of Antarctica to the steamy jungles of this Southeast Asian nation by checking the frequency of 14,180 kHz SSB for V85BJ daily at 1130 UTC. She asks that you send reports to her home address: K.G. Forbes-Smith, P.O. Box 62, Northbridge, New South Wales, 2063, Australia. **EQUATORIAL GUINEA** 3C1TR (whose QSL manager is K8JP Joseph Pontek, P.O. Box 80262, Indianapolis, IN 46280) is a very active amateur from this rare location on 21335 kHz at 1415 UTC. **GERMANY** DK0WCY operates a CW propagation beacon on the 30 meter frequency of 10144 kHz 24 hours a day. The beacon can be used to check when European signals can be heard on 30 meters. DK0WCY is very interested in reports of reception of this beacon, which can be sent to the following address: Auroa Warnbake, Uber Kappein, D-2341, Scheggerott, Germany. **JERSEY ISLAND** GJ4YMX (who is D.J. Warnecken, 10 St. Luke's Crescent, Saint Clements, JE2 6QH, Isle of Jersey, Channel Islands, United Kingdom) has been very active on the RTTY frequency of 14085 kHz at 2345 UTC daily. **LICHTENSTEIN** German DXer Helmut Enger wrote to advise MT readers that he will be active as HB0/DL1ECU between September 1st to the 11th on 10 to 40 meters SSB and CW. Helmut asks that all QSL requests be accompanied by two IRCs for return postage (due to recent German postal increases) and be sent to his home address of: Helmut Enger, Kottsiepen 78, D-42369 Wuppertal, Germany. **MARION ISLAND** ZS8MI is the permanent callsign of the amateur station located here no matter who is active using it. At present, ZS1CDK is the operator and is on assignment here 'til the first of the new year if not beyond. He appears regularly on 14243 kHz at 1645 UTC and on 14277 kHz at 0300 UTC. He asks that QSLs go to his home address (they will be answered upon his return home): Christie Dekock, 10 Markotter Ave., Uniepark, Stelienbosch, 7600 Cape Province, Republic of South Africa. **MALAYSIA** 9M8ZZ (whose QSL manager is PA3FWG, Arie Pols, Sportlaan 27, NL-3135, GR Vlaardingen, The Netherlands) is a very active amateur. He can be found on the 20 meter frequency of 14200 UTC at 1500 UTC daily by HF DXers. VHF DXers can check the OSCAR frequencies (145.890 to 145.895 MHz USB) for his signals. **MELLISH REEF** DXer and MT reader Neal Sumrell wrote to inform you of the DXpedition to this rare location this month. The DXpedition will be active on the usual DX frequencies on all bands (yes, this means the WARC bands too!) 6 to 160 meters 19 to 28 September. The DXpedition will have two operating sites which will be self-contained on this very small reef. The idea is to operate both CW and SSB on the same band simultaneously when propagation justifies such action. The group also will operate on more than one band and/or mode at the same time when possible. Mellish Reef, located off the Northern Australian coast, is one of the top 20 DXCC countries, making this the first major DXpedition of the new DX season! No QSL information was announced at the time of this writing. Our thanks to Neal, who shows that successful DXpeditions involve not just those who make the trip, but those, like Neal, whose work behind the scenes in such support roles contribute much to the total effort. **NETSKC2Q** would like to invite amateurs and SWLs with an interest in the life and work of famed inventor Nicola Tesla to tune into the Tesla Amateur Radio Net which meets on 14290 kHz SSB each Saturday at 1800 UTC. **SEYCHELLE ISLANDS** Operating daily on a frequency with the least QRM between 14200 and 14235 kHz SSB is S79MD starting at 1600 UTC 'til 1800 UTC. QSL to his manager: FD6ITD, Jean Pierre Bethoumieux, 29 Rue du Cammas, F-31650 Saint Orens de Gameville, France. **SRI LANKA** 4S7EA (Ernest Amarasinghe, 275 6 Colombo Rd., Divulpitya, Boralessgmuna, Sri Lanka) has been active on RTTY at 0035 UTC daily around the frequency of 14083 kHz. **TAIWAN** BV2A has been on 14025 kHz CW daily at 0010 UTC. QSL to: Charles Moraller, RD#1 Box 99-C, New Ringold, PA 17960.

Wishing you the best this new DX season, 73 de Rob.

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Many Pirates Moving Near 7470 kHz

In the last two issues of *MT* we have covered the newly crowded conditions around the traditional shortwave pirate frequency of 7415 kHz. Powerful interference from stations like the *Voice of America* on 7405 and 7415 kHz, *WEWN* on 7425 kHz, and *WWCR* on 7435 kHz is overloading the front ends of most hobby receivers.

It is now clear that North American pirates are responding to these new circumstances. As this month's loggings indicate, many stations have moved their operations to alternate frequency ranges. The 7465-7475 kHz zone has been the most popular destination so far. A loud RTTY signal (850/50 encrypted) blasts away on 7455 kHz while *WJCR* in Upton, Kentucky, dominates 7490 kHz. Pirates have discovered the quiet area between these two big signals.

On the other hand, we are in a transition period. Many pirates are still using the range near 7415 kHz, particularly around 0200 UTC when the VOA is silent for an hour on 7405 kHz. Since many stations use crystals to control their transmitters, some pirates won't be able to move away from 7415 kHz until they obtain a new crystal. Other stations are experimenting with a variety of frequencies like 6205, 6950, and 15050 kHz. Gigi Lytle of Lubbock, TX, reports an unidentified pirate logging with a singing announcer on 10085 kHz. *RFM* is famous for operations in the 31 meter band on spots like 9430 kHz.

It is always possible to find a pirate on virtually any frequency. But a consensus is starting to emerge. Pirate stations want an audience, and pirate DXers want to know where to find the pirates. A relatively standard frequency solves both problems, so a search for this "sweet spot" has begun. Until the dust settles, DXers should regularly check the areas around both 7415 and 7470 kHz. Where are you hearing the stations? Let us know.

Around the World

Distinctions between pirate, clandestine, and licensed broadcasters are not always clear. The astonishingly rapid political and economic change in many parts of the world, has resulted in literally scores of new semi-pirate and semi-clandestine stations. It's tough to keep up with all of them. We have five examples:

POLAND- An anonymous contributor sent in a dispatch from the Polish PAP news agency, which found that 47 radio and 11 television stations are operating without licenses in Poland. The government tolerated this laissez-faire situation until legislation was passed by Parliament in 1993 to mandate the licensing of broadcasters. Polish

Prime Minister Hanna Suchocka has ordered the Prosecutor-General to "take vigorous steps to restore order in the airwaves."

BRAZIL- Scott Edwards of Los Alamitos, CA, forwards an item from the July 1993 issue of *News From Brazil*. This publication reports that 12,000 (!) unlicensed radio and TV stations currently operate in Brazil. Some are pirates, but most are run by municipal governments in small towns. A lively pirate scene is supported by magazines sold at newsstands that provide how-to advice on setting up and managing a station.

GABON- We have all heard Afro-Pop music from longtime broadcaster *Africa #1*, but political opposition station *Radio Liberty* on 99.5 MHz is largely unknown. Four activist women operate the station. Its highly rated format mixes popular music, feminist barbs against longtime Gabon leader Omar Bongo, and irreverent political satire. Although licensed since March 1, the station jumps frequencies to avoid jamming from Bongo's government. *MT* reader David Carberry sent in an interesting Associated Press analysis of the station that appeared in the *New London, CT, Day*. BBCMS reports an apparently unrelated *Radio Liberty* clandestine that is operating on FM in Brazzaville, Zaire.

SERBIA- The Bosnian civil war has spawned many semi-clandestines. Kenneth Mason of Washington, DC, sends in wire dispatches about two of them. A medium wave station (frequency unspecified) currently broadcasts "honest news" to Belgrade from a ship anchored in the Adriatic Sea. It's financed by a \$1.2 million grant from the European Community, according to the AFP wire. Another local Belgrade station, *B-52*, straddles the line between an underground pirate and an opposition semi-clandestine. It regularly tweaks Serbian President Slobodan Milosevic. But, the *Christian Science Monitor* wire says that he tolerates this because the station's coverage area is limited to Belgrade, and it permits him to claim that Serbia has a free press.

ILLINOIS- In a July interview with the *Illinois Times*, Mbanna Kantako of *Black Liberation Radio* announced future plans for a local pirate television network in Springfield, IL, public housing projects. FCC spokesman Dan Emrick said that this would be technically feasible, but that the FCC "could enforce" regulations prohibiting unlicensed broadcasting. *MT* reader Lloyd Leheny of Springfield hears Kantako's FM transmitter on 107.1 MHz, which has maintained a 24 hour schedule for the last two years.

Clandestine News

BBCMS reports a new Somalia clandestine, *Voice of the Somalia Masses*. Its main purpose seems to be intentional jamming interference toward *Radio Manta*, a United Nations Somalia service on 9540 kHz at 1100 UTC. Both of these stations are probably impossible catches in North America at this hour.

Numerous DX sources have reported that Jeff White's new *Radio Miami International* hopes to be testing or operating by the time that you read this. Many construction delays have apparently been resolved, but it still is not clear when Jeff will actually start a regular service. RMI will use 9950 kHz for relays of numerous anti-Castro clandestines, so keep your eyes on this frequency.

During the last couple of months we have covered jamming that has been present on nearly all anti-Castro clandestines. The jamming is still heard on a daily basis. If you haven't logged it yet, check out *Radio Caiman's* 9965 kHz signal in the evening. The interference consists of steady heterodyne noises, not unlike the sound of a car horn. When Jeff White's new Miami operation starts up, it will not surprise anyone if Castro jams it as well.

Europirate QSL's

Rob Ross' London, Ontario, mailman recently delivered two full data Europirate QSLs, both of which have United States connections. Rob's report on a 1991 USA relay of *Radio Veronica* finally generated a QSL sheet after a follow-up report. Rob patiently used their regular address of 82 Wallpack House, Kennington Road, Enfield, Middlesex EN3 6UU. Another report on a 21524 kHz European transmission from *Radio Pirana* generated a station QSL from Jorge R. Garcia. Rob proved that this one can be reached through the Blue Ridge Summit, PA, maildrop.

Check Out 6840 kHz

Christopher Scheiner reminds us that 6840 kHz still supports daily numbers station activity. This could be the most consistently interesting frequency in the entire shortwave spectrum. The numbers are supplemented by digital transmissions, musical interval signals, voice announcements, and other wierd stuff. If you hear something unusual here, let us know what you heard and when.



URGZ
has a
new
collage
QSL
card.

What We Are Hearing

Our readers still hear plenty of North American pirates, despite high summertime levels of static and growing interference levels around 7415 kHz. Maildrop addresses used by stations listed this month include PO Box 452, Wellsville, NY 14895; PO Box 146, Stoneham, MA 02180; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 604, Huntsville, AL 35804; PO Box 293, Merlin, Ontario N0P 1W0; and 82 Pentland Place, Kirkcaldy, Scotland, UK.

Altered States Radio-7413 at 0200. This new station has featured the staple pirate format of rock music and comedy, with an interval signal of music from the old "Outer Limits" television show. Addr: Merlin. (George Zeller, Cleveland, OH)

Hit Parade Radio-7413 at 0240. If the old AM radio "hit parade" format from Boston in 1955 is your cup of tea, then you'll love this station. Addr: Wellsville. (Mike LeClerc, Somers, CT)

North American Pirate Relay Service- 7465 at 0100. A Press Release from Richard T. Pistek announces that NAPRS is operating on this frequency, both for relays of other pirates and for their own productions. The news release has proven to be valid. Addr: Wellsville. (Direct from the station)

Pirate Radio Boston- 7413 at 0245. Charlie Loudenboomer's classic rock format creates another entry in the current stable of New England pirates. Addr: Stoneham. (LeClerc)

Radio Azteca- 7413 at 0145. Bram Stoker's biting wit is earning a deserved reputation for excellence in pirate radio programming. His style mixes DX program parodies, editorials, and other fascinating bits. Addr: Wellsville. (Terry Provance, Zanesville, OH)

Radio Airplane-6951 at 0215 and 7475 at 0115. Pirate Captain Eddy is among the stations who have sought new frequencies. A recent show from his "FCC Fighter" aircraft featured highlight clips from several other pirates. Addr: Wellsville. (David Bland, Columbia, SC; Lytle)

Radio Fusion Radio-7415 at 0245. This ID is no typo; there are two "radios" in their name. From a claimed New York City location, they mix hard core rap music with interviews of local homeless people. It's a different station from Europirate Radio Fusion. Addr: None, but has verified loggings in the ACE bulletin. (Tim Rahto, Baltimore, MD)

Radio Stella International- 7413 at 1400. This Europirate continues to produce shows specifically for relay via North American pirates. A new version was transmitted on a Sunday morning. Addr: Kirkcaldy. (Jock Wilson; Direct from the station)

Radio USA- 7415 at 0030. Veteran pirate Mr. Blue Sky still appears regularly with an entertaining mix of punk rock music, comedy, and commentaries about pirate radio. Addr: Wellsville (Masyga; LeClerc)

Radio USA (fake version)- 7415 at 0115. An imposter still attacks Andrew Yoder and the "Outer Limits" column for some unknown reason. It's easy to spot the phony version, since it is dominated by pointless and vicious attacks on DXers. Addr: All announced addresses have not been valid. (Rahto; Bland)

RFJ Radio Network- 7415 at 0330. This new one features commercially recorded comedy, with a slogan of "Radio for Junkies." Addr: None yet. (Seiden; Scheiner)

The Kid- 7415 at 0315. Some bootleg stations like this one occasionally sneak down into the pirate band for CB-like two-way QSO communications. Tim heard them with some actual programming, including the Mickey Mouse Club theme. Addr: None so far. (Rahto)

URGZ- 7416 at 0400. Although some rock music sneaks into their shows, most productions are elaborate sketches about human urges and relationships. Addr: None, but has been verifying loggings in the ACE bulletin with the card pictured here. (LeClerc)

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Voice of Laryngitis-7406 at 0200. Genghis and Stanley Huxley have returned with another hilarious "Pirate Busters" program featuring J. Eager Heaver of the FCC. VOL is still sponsored by Friendly Freddie's Budget Burials, "where death is cheap." Look for their barking seal interval signal. Addr: Wellsville. (Direct from the station)

Voice of Oz- 7415 at 2300. Howard E. Lyon reports that he detected modulation trouble during one of his recent shows, perhaps caused by a Wicked Witch. The Wizard is working on transmitter repairs. Addr: For nonresidents of Oz, Wellsville. (Direct from the station)

Voice of Stench- 7414 at 2300. Eddie Egghead Johnson traditionally has mixed rock, comedy, and crude remarks, but this summer's shows have contained strong political criticism of the American two party system. Note their new address. Addr: Wellsville. (LeClerc)

WEED- 7465 at 0145. Their professionally produced format of rock and promajuana sketches is easy to spot, and their powerful transmitter gets out all over the continent. The news here is that they now announce a maildrop. Addr: Huntsville. (Lytle; Bland)

Wire Line Radio- 7445 at 0230. This rock/comedy operation probably uses an unusually high powered transmitter, since it is regularly logged throughout North America. Addr: Blue Ridge Summit. (Lytle)

WJLR-7415 at 0215. Captain Crook has settled into a rock and comedy format on "John Lennon Radio." Mike points out that their interval signal is a wolf call from Deep Purple's "Hush." Addr: Unfortunately, still none. (Masyga; LeClerc)

WLIS- 7415 at 0000. Veries are still signed by Charles Poltz, but Jack Boggin plays the interval signal tunes from worldwide international broadcasters. Addr: Blue Ridge Summit. (Rahto)

WMAD- 7417 at 0200. Host Al Jaffe thanks MT readers for their positive reaction to the station's creative QSL packages. Rob was a happy recipient of a full data "Who's the Shmuck" verie. Addr: Wellsville. (Ross; Direct from the station)

WORK-7414 at 0330. Their announcer "Workingman" discusses work, plays music about work, pokes fun at work, and uses call letters appropriate to the theme. Addr: Wellsville. (LeClerc)

WRAR- 7465 at 0330. Although John had a good signal from this classic rocker, he had trouble pulling out a clear identification. Addr: Huntsville. (Bland)

WQSL- 7412 at 0200. Here's a new one that describes its purpose in its identification. They play music with a slogan of "The Verification Station." Why not send in for one? Addr: Wellsville. (Seiden; LeClerc)

MT

program spotlight

Whether or not you understand the languages spoken on the shortwave bands, one language is universal—music. Below, two musicians share what the exposure to music from other cultures has meant to them, and the techniques they use to tune it in.

Music on the World Bands

David Lewis, *Isleboro, Maine*

Anyone who has tuned or scanned around on the High Frequency (HF) international broadcast bands is aware that there's a lot of music to be heard. Surprisingly, a good many listeners just keep on tuning, looking for news or feature programming—perhaps thinking that if they want to hear music, plenty of it is available on their local FM stations.

To those listeners I would say, slow down and see if the music really does sound like what the local stations are playing. Probably not. The diversity of music to be found on the shortwave bands exceeds that of any other medium, by several orders of magnitude. Classical, popular, ethnic and folk music from virtually every culture on our planet abounds at all hours of the day.

Many music programs occur regularly and schedules are published in the usual places, including this magazine. But the reception is not always predictable. Weak or fading signals, particularly if there is interference from other stations, can detract from the pleasure of listening to music. What works best when looking for music is to tune around for the active band—what you want is a strong, clear signal. Some of the most enjoyable music I've ever heard on the radio has been discovered by serendipity!

Most of the major broadcasters—BBC, VOA, Radio Moscow, et al—provide enjoyable music broadcasts because they can be found on a choice of several frequencies. Put a selection of frequencies into your receiver's memories and key

Traditional folk music is still heard in abundance on the SW bands. In addition to Africa, wonderful indigenous music can be found from Eastern Europe, the Middle East, South America and Asia. Try these stations for starters:

- All India Radio (anytime)
- Radio Tirana, Albanian Service
11745 @ 0000-0200 (0200 R) (via Speedx)
- VOA Music Time in Africa, Sundays
- RFPI Sound Currents of the Earth,
Jim Bean; 2200 UTC Wed (0600 R)
- ABC, Australia Music Deli?
- R. Portugal Tuesday 1:30 UTC
- Radio Havana, The Jazz Place, 0030 Mon
- VOA, Music USA, 2000 UTC M-F

from one to another until the best fidelity with the least fading is found.

Three years ago it was my privilege to meet, hear, and "jam" with a group of fine jazz musicians from Leningrad (now St. Petersburg). The leader of the group, David Golostchokin, shared with the audience at one of their concerts that his first exposure to jazz was over the Voice of America. He told us that for years, he (and other musicians who wanted badly to learn to play this unique American music) would gather at his apartment and cover the windows and doors with blankets to avoid discovery...listening to VOA was a crime!

He didn't mention a program name, but what he and his friends "dug" clandestinely was undoubtedly the *VOA Music USA*, announced by the remarkably knowledgeable Willis Conover. This fine jazz program, offering a mixture of recordings and transcriptions of concerts, can be heard weekdays at 2000 UTC on several of the frequencies listed in *MT's* shortwave guide. I have had the best luck here in Maine on 15205 kHz. Unfortunately (for Americans), this program is beamed at Europe. *Music USA* is one of the longest continuously running radio programs in history.

Another exciting jazz show, *The Jazz Place*, is heard on Radio Havana on Mondays at 0030, and repeated 2, 4, and 6 hours later. (Note: this is Sunday evening in North America). Cuba has produced some truly talented jazz players over the years, though we rarely hear much about them. One recent exception is the brilliant trumpeter Arturo Sandoval, who defected to the USA and won a Grammy Award last year for his *Flight to Freedom* album.

A word about audio quality. Perfectionists complain about the quality of music reproduction on AM, the mode used in shortwave broadcasting. True, FM provides superior frequency response and dynamic range; less fading-induced distortion. But keep this in mind: the wide proliferation and immense popularity of America's one original art form—jazz—is a direct result of broadcasts on AM radio. Try to imagine the existence of the "Big-Band Era" without all those programs originating from hotel ballrooms all over the country, blanketing the continent during the hours of darkness over the medium waves.

And then there's that fairly popular offshoot of jazz and blues: rock n' roll! Who out there over

the age of 35 or 40 can tell me that their first exposure to this music wasn't on AM radio? And who, during those exciting years, thought to complain about the audio quality?

Don't throw away your CD player or your FM radio. But do try tuning around the world bands in search of some new sounding music, music that can give you a taste and feel of another culture in another land. It's easy to find, and it's well worth putting up with a little static and fading to hear rhythms and melodies from distant lands.

David Gilden, *Watertown, Massachusetts*

I got my first shortwave radio in the early 80's. I had just graduated from music school and joined a "Top 40" band playing keyboards. While on a six-week job at a hotel in Cape Cod, I was looking for something to do for fun during my free time. On a whim, a visit to a small electronics shop found me purchasing a Sony 7600A (later upgraded to a Sony 2001).

When I first started listening, I was surprised to find the wealth of ethnic folk music. Back then the term "World Music" did not exist. With international radio broadcasters playing their popular local music, it was a great experience for me to hear Latin, African and Indian music coming out of my little SW receiver. I had been bitten by the SW bug!

One of the first stations that I discovered was Africa Number #1. That, plus the Voice of Nigeria and Radio France's "Paris Calling Africa" (in English), is a great way to find out the local and regional news that the BBC or VOA missed. The great thing about music is that, although I don't speak French, I still am able to enjoy hearing Hi-Life, Zairean Soukous, Antillean Zouk and JuJu music (today all lumped together under the term "Afro-Pop")!

On a typical day I wake up to this upbeat lyrical music by using the timer feature as an alarm clock. The last thing I do before going to sleep is to tune my receiver to 17630 kHz for Africa No. 1, or whatever I want to wake to.

Late in the afternoon I usually hunted for African stations in the tropical bands, but it was not easy until I got a table top radio (Kenwood R2000) and an outdoor antenna. At that time I lived in Boston's "Back Bay" in a tall apartment building. So I ran some coax cable from my third floor bedroom to an antenna on the roof, some



Gikden puts his love of ethnic music to good use. He and Radio Gambia announcer Lamin Ceesay (left) pose with the Gambian harp-lute "Kora."

10 floors above! I was logging all kinds of stuff I'd never heard before, and trying to figure out what they were. I learned to record some of the music or other signal I was listening to while looking up the frequency in the *World Radio TV Handbook*. This is called an "air-check"—a tape recording of the station, usually serving as an archive of a station's ID and Interval Signals.

Air checks can become a piece of history after the station goes off the air due to a natural disaster or government coup, etc. I have an air check of Radio Guinea when they were a communist country. I have recorded a lot of neat music and interviews with personalities, and these may one day also be a part of history. Although one can hear pop music from the West on shortwave, it is quite different to hear about the artist from their country of origin. Recently I heard one of the members from the rock group "Abba" being interviewed on their home station, Radio Sweden. So keep your tape recorder next to your radio!

There are two great "unplugged" music shows on the BBC. Ian Anderson, publisher of the English folk music magazine *Folk Roots*, hosts a show, *Folk Routes*, which primarily features acoustic British Isles music. Andy Kershaw's *World of Music* is a more modern cross-cultural fusion. If you're trying to expand your world folk music knowledge, don't miss these two gems!

In the wilds of West Africa, radio and television stations are typically under state control as they are in most of Africa. Mali has six private radio stations in addition to the government station, but only the government radio service can be heard at sunset, or if you want to stay up late. Unfortunately, propagation does not allow us here in the States to follow the African stations through a whole broadcast day. Senegal is another country you can hear playing Mbalax

(pronounced Mbalic) music. You can catch them on 7170 kHz in the late afternoon here on the East Coast. You will also hear chants from the Koran, as much of West Africa follows the religion of Islam.

The ease of finding African music on shortwave is deceptive, however. One of the most famous African music producers is Ibrahima Silla, a resident of Paris, who has recorded many African musicians. Silla says, "The troubled reality for musicians includes rampant piracy and a government that provides little support for its artists. Fewer than ten of Dakar's bands own their own equipment, a consequence of the government's 150% 'luxury tax' on imported musical instruments."

Musical piracy in the form of cassette pirates is also a big problem. Illegal cassette copies pour in from Hong Kong, Singapore, Liberia and Nigeria. According to Mr. Silla, "The people who sell pirate cassettes are members of a brotherhood, a religious sect called the Mourdiés. They are the most powerful and richest people in Senegal. If the police try to stop one of these vendors, they will put in a call to the president Abdou Diouf. Diouf will telephone the bureau of Authors Rights and say 'Stop it right now!'"

We in the Western world may have a better chance of hearing these musicians than do their own people. It's a privilege we should take advantage of!

M

What receivers provide best music reproduction at a reasonable cost? For pleasant listening, Larry Magne recommends as a portable, the brand-new Grundig Yacht Boy 400. In the desktop category, the Drake R-8 and the Lowe HF-150 are both excellent choices.

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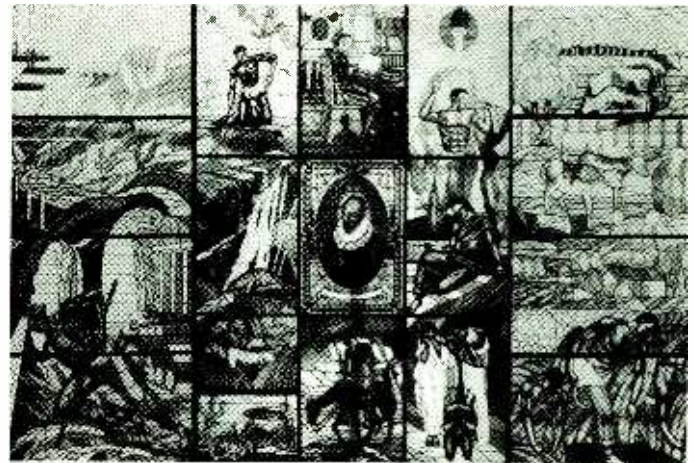
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ALBANIA

Radio Tirana, 9580 kHz. Full data QSL card signed by Ardiana Bisna. Personal note and schedule included. Received in 28 days for an English report. Station address: Radiotelevisione Shqiptar, International Service, Rruga Ismail Qemali, Tirana, Albania. (LeRoy Long, Edmond, OK)

ALGERIA

Radio Algiers Intl, 15215 kHz. Full data QSL card verified, program schedule and report form. Received in 60 days for a Spanish report, souvenir postcard and sticker. Station address: 21 Blvd. des Martyrs, Alger, Algeria. (Carlos Felipe Da Silva, Sao Bernardo do Campo, Sao Paulo, Brazil)

ASCENSION ISLANDS

BBC Relay Station, 15390 kHz. Full data QSL letter signed by Andrew Marsden-Transmitter Engineer. Received in 45 days for an English report, and one U.S. dollar. Station address: BBC Atlantic Relay Station, English Bay, Ascension Island, South Atlantic Ocean (Charlie Washburn, Robbinston, ME)

CAMEROON

CRTV-Garoua, 5010 kHz. Full data QSL letter, signed by James Achanyi Fontem. Received in 1 month for an English report and Cameroon mint stamps. Station address: Boite Postal 986, Douala, Cameroon Republic. (Ed Rausch, Cedar Grove, NJ)

CLANDESTINE

La Voz del CID, 6305 kHz. Full data logo QSL card, unsigned. Received in 10 months for an English report and souvenir postcard. QSL address: La Voz del CID, Cuba Independiente y Democratica, 10020 SW 37th Terrace, Miami, FL 33165. (Steve Hunter, Drexel Hill, PA) (Mikell Goetsch, Pittsburgh, PA)

GERMANY

Bayerischer Rundfunk, 6085 kHz. Full data color QSL card verified. Received in 34 days for an English report, audio tape (returned), and one U.S. dollar. Station address: Rundfunkplatz 1, W-8000 Munich, Germany. (Washburn, ME)

Deutsche Welle, 6085 kHz. Station letter, signed by the Station Manager. Station sticker and schedule included. Received in 35 days for an English report. Station address: P.O. Box 1004 44, 5000 Cologne 1 Germany. (William McGuire, Cheverly, MD) *New address for Deutsche Welle: D-50588, Cologne, Germany. (GVH)*

GREECE

SXA-Hellenic Navy Radiostation, 119.5 kHz. Full data QSL card, with illegible veri signer. Received in 88 days

for a copy of CW report, 1 IRC (returned), souvenir postcard, and mint stamps. Station address: Hellenic Navy Communication Centre, c/o Hellenic Navy General Staff, Cholargos, Athens, Greece. (Martin Nagl, Neulengbach, Austria/DX Club ADXB)

GUATEMALA

Radio Cultural-TGNA, 3300 kHz. Full data QSL and letter signed by Station Engineer. Received in 37 days for an English report. Station address: Apartado de Correo 601, Guatemala, Guatemala. (Long, OK)

Radio Buenas Nuevas-TGMI, 4800 kHz. Partial data card signed by Israel Rodas Merida-Gerente. Station information and religious literature included. Received for a Spanish report and one U.S. dollar. Station address: 13020 San Sebastian, Huehuetenango, Guatemala. (Washburn, ME)

HONDURAS

La Voz De La Mosquitia, 4910 kHz. No data QSL letter signed by Sammy Simpson-Executive Director. Station pennant included. Received in 11 days for an English report and U.S. mint stamps. QSL address: Global Outreach, P.O. Box 1, Tupelo, MS 38802. (Washburn, ME)

JORDAN

Radio Jordan, 15435 kHz. Full data QSL card verified by Jawad Zada-Director, and program schedule. Received in 20 days for an English report, audio tape, and souvenirs. Station address: Box 909, Amman, Jordan. (Da Silva, Brazil)

KIRIBATI

Radio Kiribati, 17440 kHz. Full data scenery QSL card, signed by K. Bienitz. Received in 37 days for an English report. Station address: Box 78, Bairiki, Tarawa, Kiribati, Central Pacific. (Dr. A.M. Peterson-N9GWY, Indianapolis, IN)

LIBYA

Radio Jamahiriya, 15235 kHz. Full data QSL card and program schedule. Received in 30 days for an English report and audio tape. Station address: European Branch Office, Radio Jamahiriya, P.O. Box 17, Hamrun, Malta. (Da Silva, Brazil)

QATAR

A7D-Qatar Public Telecommunications Corp., 8473.5 kHz. Full data letter signed by Abbas Ahmed Abbas-Senior Engineer Telegraph & Telematics. Received in 43 days for a copy of CW report, 1 IRC, and mint stamps. Station address: P.O. Box 217, Doha, Qatar. (Nagl, Austria)

SHIP TRAFFIC

TAMPERE-LAOP2, 156.65 kHz (RO/RO/Container). Full data prepared QSL verified. Received in 39 days for an English utility report and one U.S. dollar. Ship address: c/o Norwegian Telecom, Postboks 6701, St. Olavs Plass, Oslo 1, Norway. (Hank Holbrook, Dunkirk, MD)

M/V LIBERTY STAR-WCBP, 121.402 kHz (Bulk Carrier). Full data prepared QSL card verified. Received 37 days for an English utility report and U.S. mint stamps. Ship address: c/o Edward W. Tesson, P.O. Box 981, Main St., Wellfleet, MA 02667. (Holbrook, MD)

S/S ULTRAMAX-WHDI, 14.300 kHz (Ore-Bulk-Oil Carrier). Full data prepared QSL card verified. Received in 17 days for an English utility report and U.S. mint stamps. Ship address: c/o Herman T. Ellison Jr., 2200 Iowa Ave., Kenner, LA 70062. (Holbrook, MD)

M/T OVERSEAS NEW ORLEANS-WFKW, 14.300 kHz (Diesel Tanker). Full data prepared QSL card verified. Received in 6 months for a utility report and U.S. mint stamps. Ship address: c/o R.W. Gillis, 26 Daniel Blvd., Bloomfield, CT 06002. (Holbrook, MD)

ZIM BUENOS AIRES-4XLY, 156.65 MHz (Cargo Ship). Full data prepared QSL card verified. Received in 2 months for an English utility report and U.S. mint stamps. Ship address: Zim American Israeli Shipping Co., One World Trade Center, Suite 2969N, New York, NY 10048. (Holbrook, MD)

ST. HELENA

Radio St. Helena, 11092 kHz. Full data map/logo card signed by Tony Leo-Station Manager. Received in 163 days for an English report and one U.S. dollar. Station address: The Castle, Jamestown, St. Helena, South Atlantic Ocean. (Washburn, ME) (Dennis Timko, Pittsburgh, PA) (Errol Ubelis, Kings Park, NY)

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How to Use the Shortwave Guide**1: Convert your time to UTC.**

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Saving Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

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

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newsline" listing, which begins on the next page.

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

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

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

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

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "v1" (various languages).

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

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

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

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

Hot News and Hot Spots**Shortwave Stations and Programs on the Chopping Block**

The existence of Radio Vilnius, Lithuania, is at stake, due to budget cuts. We have had no current update on its status, but it hasn't been heard on the air at *MT* headquarters lately.

VOA plans to cease their German service October 1, 1993, for financial reasons.

Radio Finland is now the only Nordic broadcaster with a French service, since Radio Sweden ended their service July 2, 1993. Spanish programming was dropped at the same time.

Portugal's Catholic station, Radio Renascenca, is also considering a permanent sign-off, as we noted last month.

In better news, the Voice of Free China was also in danger of closing due to funding cuts. However, the cuts were reconsidered, and its future appears safe at least until next July. An exchange agreement with Deutsche Welle has been under consideration.

A policy and funding crisis seems to be brewing between the Russian media and the

Ministry of Communications. By September, many stations, including Radio Moscow International, may be facing bankruptcy due to the fact that state financing has fallen far short of what is needed, but companies have been denied the right to become joint stock enterprises in order to raise their own funds.

On the Upswing

Dr. Adrian Peterson, who recently visited the island of Guam in the Pacific, reported via R. Netherland's *Media Network* that Trans World Radio and Adventist World Radio are both planning expansion of their shortwave outlets in Guam. A new Crown 100 kW transmitter, originally intended for Swaziland, then reallocated to Sri Lanka, is now slated for installation at KTWR in Guam!

More difficult to predict are the end results of AWR's restructuring of its broadcast pattern. According to Peterson and interviewer Jonathan Marks, their plans involve new transmitters coming to Guam, old transmitters being sent to Africa, shifting the air time rented from Africa No 1 to a transmitter in Russia, and

boosting the signal from Costa Rica as well as from somewhere in Europe!

Also in Costa Rica, Radio for Peace International celebrates its sixth anniversary "of broadcasting the message of peace to our ever growing global family." Tune in prior to the live call-in show at 0000 UTC Thursday, September 16, to find out how you can call toll-free to offer your comments and perhaps receive some prizes!

As the VOA shifts its emphasis to focus on Asia, Marconi Communications has been given a contract to build a complete turnkey broadcasting facility for the VOA on the island of Sri Lanka. The site, containing three transmitters, should be completed in late winter of 1994. A contract with Scientific Atlanta to build an earth station in Colombo, Sri Lanka, will double Sri Lanka's international telephone and data capacity.

Thanks to:

Gayle Van Horn, Glenn Hauser, Rachel Baughn, *Broadcasting & Cable*, and the BBC Monitoring Service for this month's "Hot News."

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

October Deadline: August 27

Kannon Shanmugam, Program Manager
Kansas

Dave Datko
California

B.W. Battin
New Mexico

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

Jim Frimmel
Texas

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

<p>0000 UTC (8:00 PM EDT, 5:00 PM PDT) BBC ("Newsdesk") CBC, Northern Quebec China Radio Int'l Christian Science Monitor Croatian Radio, Zagreb [M-A] Radio Australia Radio Bulgaria Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l Radio Norway Int'l [M] Radio Prague Radio Thailand Radio Ukraine Int'l SBC Radio 1, Singapore Spanish National Radio Swiss Radio Int'l Voice of America WWCR [T-A]</p> <p>0005 Radio Pyongyang</p> <p>0010 China Radio Int'l*</p> <p>0030 All India Radio Christian Science Monitor (as) [M] Christian Science Monitor [T-F] FEBC Radio Int'l, Philippines HCJB Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio New Zealand Int'l [M-F] Radio Yugoslavia Voice of America (am, as) (Special English) [T-S] Voice of America (as) (Special English) [M]</p> <p>0035 All India Radio (News Service)</p> <p>0055 WRNO [W, A]</p> <p>0100 UTC (9:00 PM EDT, 6:00 PM PDT) BBC CBC, Northern Quebec [S-M] Christian Science Monitor Croatian Radio, Zagreb [S] Deutsche Welle FEBC Radio Int'l, Philippines Radio Australia Radio Canada Int'l Radio Havana Cuba [T-S] Radio Japan Radio Korea Radio Moscow Radio New Zealand Int'l [M-A] Radio Norway Int'l [M] Radio Prague</p>	<p>Radio Slovakia Int'l Radio Tashkent Radio Thailand Radiotelevisione Italiana SBC Radio 1, Singapore Spanish National Radio Voice of America Voice of Indonesia WWCR [T-A]</p> <p>0115 Radio Havana Cuba* [T-S]</p> <p>0130 Christian Science Monitor (as) [M] Christian Science Monitor [T-F] FEBC Radio Int'l, Philippines Radio Austria Int'l Radio Bangladesh Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio Portugal [T-A] Radio Tirana Radio Yugoslavia Voice of Greece</p> <p>0145 Radio Finland [M-A]</p> <p>0155 Radio Korea [T-A] Voice of Indonesia</p> <p>0200 UTC (10:00 PM EDT, 7:00 PM PDT) BBC ("Newsdesk") CBC, Northern Quebec [T-S] Channel Africa, Johannesburg Christian Science Monitor Deutsche Welle Radio Australia Radio Budapest Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l [M-F] Radio Norway Int'l [M] Radio Romania Int'l Radio Thailand RAE, Buenos Aires [T-A] SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Free China Voice of Myanmar WWCR [T-A]</p> <p>0215 Radio Cairo Radio Nepal Voice of Kenya</p> <p>0230 Christian Science Monitor (af, me) [M] Christian Science Monitor [T-F] HCJB</p>	<p>Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio Pakistan (Special English) Radio Tirana SLBC, Sri Lanka</p> <p>0245 All India Radio (News Service)</p> <p>0250 Radio Yerevan</p> <p>0300 UTC (11:00 PM EDT, 8:00 PM PDT) BBC CBC, Northern Quebec Channel Africa, Johannesburg China Radio Int'l Christian Science Monitor Deutsche Welle Radio Australia Radio Bahrain Radio Bulgaria Radio Havana Cuba [T-S] Radio Japan Radio Moscow Radio Prague SBC Radio 1, Singapore Voice of America Voice of Free China Voice of Kenya WRNO [F] WWCR [T-A]</p> <p>0305 Radio Bangladesh</p> <p>0309 BBC*</p> <p>0310 China Radio Int'l*</p> <p>0315 Radio Cairo Radio Havana Cuba* [T-S]</p> <p>0330 BBC (af)* Christian Science Monitor (af, me) [M] Christian Science Monitor [T-F] Radio Austria Int'l [T-A] Radio Bahrain Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands UAE Radio, Dubai Voice of Greece</p> <p>0355 Radio Japan [M-F] WYFR (Network) [T-A]</p> <p>0400 UTC (12:00 AM EDT, 9:00 PM PDT) BBC CBC, Northern Quebec [T-S] Channel Africa, Johannesburg China Radio Int'l</p>	<p>Christian Science Monitor Deutsche Welle Kol Israel Radio Australia Radio Bahrain Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio Norway Int'l [M] Radio Prague Radio Romania Int'l Radio Tanzania SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Kenya ZNBC Radio 2, Lusaka</p> <p>0402 Radio Botswana</p> <p>0405 Radio Pyongyang</p> <p>0410 China Radio Int'l*</p> <p>0425 Radiotelevisione Italiana</p> <p>0430 Christian Science Monitor (af, as) [M] Christian Science Monitor [T-F] Radio Bahrain Radio Finland [M-A] Radio Havana Cuba [T-S] Radio Moscow 0445 BBC (af)* [T-F] 0450 Channel Africa, Johannesburg</p> <p>0500 UTC (1:00 AM EDT, 10:00 PM PDT) BBC ("Newshour") CBC, Northern Quebec Channel Africa, Johannesburg China Radio Int'l Christian Science Monitor Deutsche Welle HCJB NBC, Windhoek Radio Australia Radio Bahrain Radio Canada Int'l [M-F] Radio Havana Cuba [T-S] Radio Japan Radio Lesotho Radio Moscow Radio New Zealand Int'l* [M-F] Radio Thailand SBC Radio 1, Singapore Spanish National Radio Voice of America Voice of Kenya</p>	<p>WWCR [M] ZNBC Radio, Lusaka</p> <p>0510 China Radio Int'l* Radio Botswana [M-A]</p> <p>0515 Radio Havana Cuba* [T-S]</p> <p>0520 Radio For Peace Int'l [T-A]</p> <p>0530 Christian Science Monitor (af, as) [M] Christian Science Monitor [T-F] Radio Austria Int'l Radio Havana Cuba [T-S] Radio Moscow Radio Romania Int'l Radio Thailand RTM, Malaysia UAE Radio, Dubai Voice of Nigeria</p> <p>0545 Voice of Nigeria*</p> <p>0600 UTC (2:00 AM EDT, 11:00 PM PDT) BBC BBC (af)* [A-S] Channel Africa, Johannesburg Christian Science Monitor Deutsche Welle GBC Radio, Accra* Radio Australia Radio Bahrain Radio Havana Cuba [T-S] Radio Korea Radio Moscow Radio New Zealand Int'l Radio Nigeria Radio Prague SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Kenya Voice of Malaysia ZNBC Radio, Lusaka [M-A]</p> <p>0603 Croatian Radio, Zagreb [M-A]</p> <p>0605 Radio Pyongyang</p> <p>0609 BBC*</p> <p>0627 BBC (af)* [M-F]</p> <p>0630 Christian Science Monitor [M-F] Radio Austria Int'l [T-A] Radio Havana Cuba [T-S] Radio Moscow Radio Romania Int'l Radio Vlaanderen Int'l RTV Congolaise, Brazzaville [M-F]</p>
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newslines

Voice of Nigeria
0645
Radio Finland [M-A]
Radio Romania Int'l
Voice of Nigeria*
0650
Radio New Zealand Int'l* [M-F]
0655
Radio Korea [M-F]

0700 UTC

(3:00 AM EDT, 12:00 AM PDT)

BBC ("Newsdesk")
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-A]
Radio Australia
Radio Bangladesh
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
Radio New Zealand Int'l* [M-F]
Radio Nigeria, Ibadan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
Voice of Kenya
Voice of Myanmar

0703
Croatian Radio, Zagreb [S]

0705
Radio Pyongyang

0730
All India Radio (News Service)
BBC (af)* [A]
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Prague

0750
Radio For Peace Int'l [T-A]
Radio Pacific Ocean [A]

0755
Radio Japan [M-F]
Radio Korea [M-F]

0800 UTC

(4:00 AM EDT, 1:00 AM PDT)

BBC
Christian Science Monitor
GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Finland [M-A]
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
Voice of Kenya
Voice of Malaysia
ZNBC Radio 2, Lusaka [M-A]

0802
Radio Botswana

0803
Croatian Radio, Zagreb [M-A]

0805
Radio Pyongyang

0830
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow

Radio Netherlands
Radio Slovakia Int'l
0840
Voice of Greece [M-A]
0850
All India Radio (News Service)
(Special English)
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC

(5:00 AM EDT, 2:00 AM PDT)

BBC
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre M-A
Radio Australia
Radio Bahrain
Radio Japan
Radio Liberia
Radio Moscow
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Kenya
Voice of Nigeria

0910
China Radio Int'l*

0930
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Afghanistan
Radio Moscow
Radio Netherlands
0940
Radio Togo
0945
Deutsche Welle (af)* [M-F]
0955
Radio Japan [M-F]

1000 UTC

(6:00 AM EDT, 3:00 AM PDT)

All India Radio
BBC
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
IRRS, Milan [S]
Kol Israel
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Voice of Kenya
WWCR [M-F]
WYFR (Network) [M-F]
ZNBC Radio 2, Lusaka [M-A]

1005
Radio New Zealand Int'l* [M-F]

1010
China Radio Int'l*

1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Bulgaria
Radio Korea
Radio Moscow
Radio New Zealand Int'l* [M-F]

Radio Prague
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
WYFR (Network) [M-F]
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC

(7:00 AM EDT, 4:00 AM PDT)

BBC ("Newsdesk")
CBC, Northern Quebec [A-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
MBC, Blantyre [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Jordan
Radio Moscow
Radio New Zealand Int'l
("Newsdesk")
Radio Nigeria, Ibadan
Radio Pakistan
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
Voice of Kenya
WWCR [M-F]
ZNBC Radio, Lusaka

1105
Radio Pakistan (Special English)
Radio Pyongyang

1110
Radio Botswana [M-F]

1115
Radio Nepal

1125
Radio Botswana [A-S]
WYFR (Network) [M-F]

1130
Christian Science Monitor [M-F]

Radio Austria Int'l [M-F]
Radio Finland [M-F]
Radio Lesotho
Radio Moscow
Radio Netherlands
Radio Thailand
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
RTM, Malaysia*

1135
All India Radio (News Service)

1145
Deutsche Welle* [M-F]

1150
Channel Africa, Johannesburg

1155
Radio Japan [M-F]

1200 UTC

(8:00 AM EDT, 5:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
LBS, Monrovia
MBC, Blantyre [M-F]
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l (am) [M-F]
Radio Korea
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [H-T]
Radio Nigeria, Ibadan

Radio Norway Int'l [S]
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
TWR, Bonaire [A-S]
Voice of America
Voice of Kenya
WYFR (Network) [M-F]

1203
Croatian Radio, Zagreb

1210
China Radio Int'l*

1215
HCJB [M-F]

1230
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Cairo
Radio Canada Int'l (as)
Radio Finland [M-F]
Radio France Int'l
Radio Moscow
Radio Netherlands
SLBC, Sri Lanka
WYFR (Network) [M-F]

1235
Voice of Greece

1245
SLBC, Sri Lanka

1255
Radio Bangladesh

1257
Radio Korea [M-F]

1258
HCJB [M-F]
Africa Number One, Libreville

1300 UTC

(9:00 AM EDT, 6:00 AM PDT)

BBC ("Newshour")
CBC, Northern Quebec
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
Kol Israel [S-H]
Radio Australia
Radio Bahrain
Radio Canada Int'l (am) [S]
Radio Iraq Int'l
Radio Jordan
Radio Korea
Radio Moscow
Radio Norway Int'l [S]
Radio Romania Int'l
Radio Tanzania [A-S]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Kenya
WYFR (Network) [M-F]

1305
Radio Pyongyang

1310
China Radio Int'l*

1320
Radio For Peace Int'l [T-A]
SLBC, Sri Lanka

1325
HCJB [M-F]

1328
Radio Cairo

1330
All India Radio

Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Canada Int'l (eu, af, as)
Radio Finland [M-A]
Radio Moscow

Radio Netherlands
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Special English)
Voice of Turkey
1346
All India Radio [A]
1355
Radio Korea [M-F]

1400 UTC

(10:00 AM EDT, 7:00 AM PDT)

BBC
CBC, Northern Quebec [A]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio France Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
Voice of Kenya
WWCR [M-F]
ZNBC Radio 2, Lusaka [M-F]

1410
China Radio Int'l*

1415
LBS, Monrovia (Special English)

Radio Nepal

1425
HCJB [M-F]
LBS, Monrovia

1430
All India Radio (News Service)
Christian Science Monitor [M-F]

FEBC Radio Int'l, Philippines
Radio Austria Int'l

Radio Moscow
Radio Netherlands

Radio Portugal [M-F]
Radio Romania Int'l

Radio Tirana
WYFR (Network) [M-F]

1440
FEBC Radio Int'l, Philippines*

[M-F]

1445
All India Radio

BBC (as) (Special English) [M-F]

Voice of Myanmar

1455
Radio Korea [M-F]

1500 UTC

(11:00 AM EDT, 8:00 AM PDT)

BBC
CBC, Northern Quebec [A]
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Japan
Radio Jordan
Radio Moscow
Radio Nigeria
Radio Omdurman, Sudan
Radio Prague
RTM, Malaysia
SBC Radio 1, Singapore

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SONY Pro-80	\$ 370
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PLUS - Speakers from the VOA, BBC and more!!!

Our KEYNOTE SPEAKER, Roy Neal, K6DUE, will talk about SAREX (Shuttle Amateur Radio Experiment) and Tuning the Space Shuttle Comms. He's the Chairman of SAREX, for ARRL-AMSAT and former NBC News Correspondent.

Dozens of manufacturers and dealers of SWL and amateur radio equipment will be on hand demonstrating their equipment and ready to answer your questions on the spot -- including -- Kenwood, Yaesu, JRC and more!

The SWL Conference will be held in conjunction with the 18th Annual Virginia Beach Hamfest and Computer Fair (the areas LARGEST hamfest and computer exhibit). The first Popular Communications Worldwide SWL Conference, held at the Radisson Hotel, Virginia Beach, Virginia has something for everyone!

Make Plans Now to attend both days - October 2 - 3, 1993 at the Virginia Beach Pavilion; minutes from the beach, Navy bases and historic sites!

Radisson Hotel is across parking lot from Pavilion. You can walk between both!

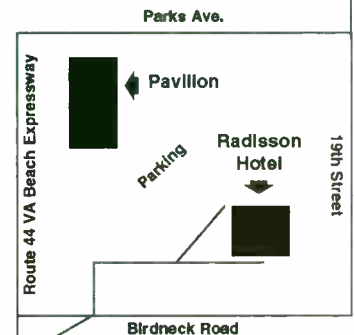
"Talk-in frequency 146.970 MHz."

To acquire room reservations at the Radisson Hotel Virginia Beach call 1-800-333-3333 and ask for Virginia Beach Hamfest rates.

Each Ticket is \$25 payable by check, money order, Mastercard, VISA, AMEX, Discover
(Pick up tickets and info. pack at the Radisson Hotel on October 1 between 2 and 8 p.m.)

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newsline

SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Ethiopia
Voice of Kenya
WYFR (Network) [A]
1505
Radio Pyongyang
1510
China Radio Int'l*
1520
Radio Estonia [M-F]
Voice of Greece
1525
BBC (af)* [S]
Radio Veritas Asia [T-F]
1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Finland
Radio Moscow
Radio Netherlands
Voice of Ethiopia
Voice of Nigeria
1540
Radio Veritas Asia [A-M]
Voice of Nigeria*
1550
Radio For Peace Int'l [T-A]
1555
Radio Veritas Asia [A-M]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Liberia
Radio Moscow
Radio Nigeria
Radio Norway Int'l [S]
Radio Pakistan
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Voice of Kenya
Yemen Radio
ZNBC Radio 2, Lusaka [M-A]
1609
BBC*
1610
China Radio Int'l*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1630
Christian Science Monitor [M-F]
HCJB [M-F]
Radio Canada Int'l (as)
Radio Moscow
UAE Radio, Dubai
Voice of America (eu) (Special English)
1655
Radio Korea [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra
IRRS, Milan [S]
Kol Israel
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Japan
Radio Moscow
Radio New Zealand Int'l* [M-F]
Radio Nigeria, Kaduna
Radio Norway Int'l [S]
Radio Pakistan
Radio Prague
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Kenya
WWCR [M-F]
1705
Radio Bangladesh
Radio Pyongyang
1710
China Radio Int'l*
1725
Radio New Zealand Int'l* [M-F]
Radio Surinam Int'l [M-F]
1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Bulgaria
Radio Moscow
Radio Netherlands
Radio Romania Int'l
1740
BBC (af)*
1750
Channel Africa, Johannesburg

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
CBC, Northern Quebec [M-H]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l* [M-F]
Radio Omdurman, Sudan
Radio Portugal [M-F]
Radio Tanzania
Radio Vlaanderen Int'l
Voice of America
Voice of Kenya
WWCR [M-F]
ZNBC Radio, Lusaka
1805
Radio New Zealand Int'l* [M-F]
1815
ZNBC Radio 2, Lusaka*
1830
BSKSA, Riyadh
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Finland [S-F]
Radio Kuwait
Radio Mogadishu
Radio Moscow
Radio Netherlands
Radio Slovakia Int'l

Radio Yugoslavia
Voice of America (Special English)
1835
Radio New Zealand Int'l* [F]
1840
Voice of Greece
1845
BSKSA, Riyadh*
Radio Cote d'Ivoire
Radio Guinea, Conakry
1855
Radio New Zealand Int'l* [M-H]
Radio Omdurman, Sudan
1857
BBC (af)* [M-F]

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
HCJB
Kol Israel
KVOH
Radio Australia
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Portugal [M-F]
Radio Romania Int'l
Radio Vilnius
RAE, Buenos Aires [M-F]
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Kenya
1903
Croatian Radio, Zagreb [S]
Voice of Greece
1910
China Radio Int'l*
Radio Botswana
1930
BBC (af)* [S]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Ghana
Radio Moscow
Radio Netherlands
Voice of Nigeria
1935
Radiotelevisione Italiana
1945
Radio Togo

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Bulgaria
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria

ZNBC Radio 2, Lusaka
2002
Radio Botswana
2005
Radio Pyongyang
2010
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2025
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Radio Canada Int'l
Radio Korea
Radio Moscow
Radio Nacional de Angola
2045
BSKSA, Riyadh
2055
Voice of Indonesia

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Budapest
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-H]
Radio Nigeria
Radio Norway Int'l [S]
Radio Prague
Radio Romania Int'l
Radio Ukraine Int'l
Radio Vlaanderen Int'l
Radio Yugoslavia
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Kenya
Voice of Turkey
ZNBC Radio 2, Lusaka
2103
Croatian Radio, Zagreb
2110
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2120
Radio Cairo
Radio For Peace Int'l [M-F]
2125
Radio Havana Cuba* [M-A]
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Austria Int'l [M-F]
Radio Cairo
Radio Finland [S-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio Tirana
Radio Vilnius
2145
Radio Bulgaria
Radio Korea
Radio Yerevan

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio

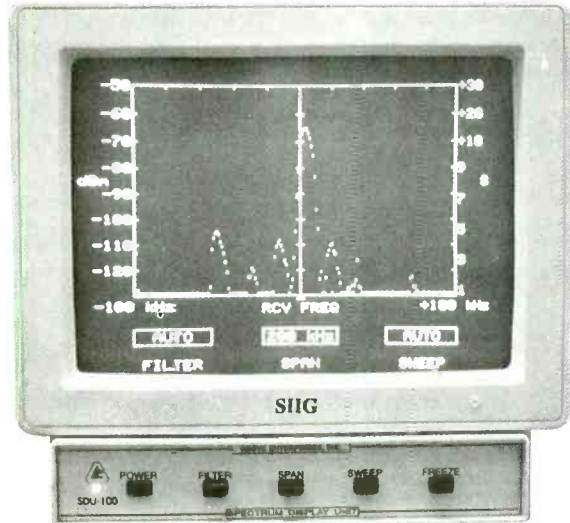
BBC
CBC, Northern Quebec [M-F]
China Radio Int'l
Christian Science Monitor
CIQX, Montreal [M-F]
GBC Radio 2, Accra
MBC, Blantyre
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow
Radio New Zealand Int'l [A-H]
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Free China
2209
BBC*
2210
China Radio Int'l*
2215
Radio Cairo
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Voice of America (Special English)
2240
Radio Cairo
Radio Korea [M-F]
Voice of Greece
2245
GBC Radio, Accra
Radio Yerevan

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor [M-A]
Radio Australia
Radio Canada Int'l [A-S]
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [A]
Radio Norway Int'l [S]
Radio Vilnius
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
WYFR (Network) [M-A]
2305
Radio Pyongyang
2330
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
Radio Netherlands
Radio Vlaanderen Int'l
RTM, Malaysia*
2335
Voice of Greece
2345
SLBC, Sri Lanka [M]
2350
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]
WRNO [W, F]

GROVE SDU-100

SPECTRUM DISPLAY UNIT

SPAN: Selectable 0, 100, 200, 500 kHz; 1, 2, 5, 10 MHz
 SPAN LINEARITY: 10 % (nom.)
 RESOLUTION BANDWIDTH: Selectable 5, 30 kHz
 SWEEP RATE: Selectable 0.1, 0.5, 2, 6 seconds;
 digitally stored and refreshed
 AMPLITUDE FLATNESS: +/- 1 dB
 DISPLAY DYNAMIC RANGE: 80 dB, logarithmic
 DISPLAY VERTICAL UNITS: dB, @ units (6 dB/S unit;
 S9=50 uV
 INPUT LEVEL: -130 to -50 dBm
 VIDEO OUTPUT: TTL monochrome monitor
 POWER REQUIRED: 12 to 14 VDC @ 800 mA
 OPERATING TEMPERATURE RANGE: 0 to 50 C (32 to
 122 F)
 STORAGE TEMPERATURE RANGE: -40 to +80 C (-40 to
 +176 F)
 DIMENSIONS: Approx. 8"W x 1.5"H x 10"D
 WEIGHT: Approx 1.5 lbs.



No more slow, frustrating searching back and forth, hoping to hear your target. Attach the new, low cost, **Grove SDU-100** and video display to an appropriate receiver like the ICOM R7000 or R7100 and immediately spot a transmission anywhere within a 10 MHz swath of radio spectrum!

Even better than the expensive spectrum analyzers that surveillance countermeasures teams use to find hidden transmitters, you can use the high sensitivity, memory channels, accurate frequency

readout, all mode detection and other multiple functions of your receiver for unsurpassed monitoring power!

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**The next addition to your radio
 should be a good one.**

0100 UTC

[9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

Table listing radio frequencies by country and time. Columns include call sign, frequency, and country name. Rows list various international broadcasts such as Australia ABC, Canada CFCX, Cuba Radio Havana, and USA CSMonitor.

SELECTED PROGRAMS

Sundays

- 0100 KSDA, Guam: Your Story Hour. Dramatized children's stories.
0101 BBC: Play Of The Week. Albert's Bridge (12th); The Dog It Was That Died (19th)
0111 Radio Havana Cuba: Sports Report. The latest sports news.
0130 KSDA, Guam: Voice Of Prophecy. H Richards' devotional program.
0135 Radio Netherlands: Happy Station. Pete Myers' family entertainment program with music and letters.
0140 Radio Havana Cuba: DX'ers Unlimited. Arnie Coro presents shortwave radio news.

Mondays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
0100 R Havana Cuba: From Havana. Culture and the arts in Cuba.
0101 BBC: Feature. The men and women behind top pop stars (6th, 13th); The "Riff" - melodic phrases (20th); The Sun in history and culture (20th)
0115 KSDA, Guam: Bible In Living Sound. See S 2315.
0130 KSDA, Guam: Greatest Story Ever Told. A Bible reading.
0130 Radio Havana Cuba: Feature. Topical programming on various subjects.
0135 Radio Netherlands: East Of Edam. See S 0235.
0145 BBC: Musical Feature. The Cello on Record.
0145 KSDA, Guam: Voice Of Prophecy. See S 0130.

Tuesdays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
0105 BBC: Outlook. See M 1405.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0115 KSDA, Guam: Bible In Living Sound. See S 2315.
0130 BBC: Folk Routes. Ian Anderson presents a selection of

- 0130 roots music.
0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
0135 Radio Havana Cuba: Feature. See M 0130.
0135 Radio Netherlands: Newline. See S 0035.
0145 BBC: Health Matters. New medical developments and methods of keeping fit.
0145 KSDA, Guam: Voice Of Prophecy. See S 0130.
0150 Radio Netherlands: No Boundaries. Carl Joseph looks at development issues worldwide.

Wednesdays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
0105 BBC: Outlook. See M 1405.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0115 KSDA, Guam: Bible In Living Sound. See S 2315.
0130 BBC: Michael Rosen reads requests in "Poems By Post" (through October 6th).
0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
0135 Radio Havana Cuba: Feature. See M 0130.
0135 Radio Netherlands: Newline. See S 0035.
0145 BBC: Country Style. Selections of country music.
0145 KSDA, Guam: Voice Of Prophecy. See S 0130.
0150 Radio Netherlands: Encore! This month, hear a repeat series profiling Dutch cities.

Thursdays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
0105 BBC: Outlook. See M 1405.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0115 KSDA, Guam: Bible In Living Sound. See S 2315.
0130 BBC: Waveguide. See W 0415.
0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
0135 Radio Havana Cuba: Feature. See M 0130.

- 0135 Radio Netherlands: Newline. See S 0035.
0140 BBC: Book Choice. See W 0425.
0145 BBC: The Farming World. An examination of agriculture, forestry, and fishing worldwide.
0145 KSDA, Guam: Voice Of Prophecy. See S 0130.
0150 Radio Netherlands: Media Network. Jonathan Marks surveys communications developments worldwide.

Fridays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
0105 BBC: Outlook. See M 1405.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0115 KSDA, Guam: Bible In Living Sound. See S 2315.
0130 BBC: On The Move. News from the world of travel and transport.
0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
0135 Radio Havana Cuba: Feature. See M 0130.
0135 Radio Netherlands: Newline. See S 0035.
0145 BBC: Global Concerns. An update on environmental issues.
0145 KSDA, Guam: Voice Of Prophecy. See S 0130.
0150 Radio Netherlands: Research File. See M 1150.

Saturdays

- 0100 KSDA, Guam: Your Story Hour. See S 0100.
0105 BBC: Outlook. See M 1405.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0125 Radio Netherlands: EuroPress Review. See S 0025.
0130 BBC: Seeing Stars (4th). Short Story. See S 0430.
0130 KSDA, Guam: Power To Cope. See S 1630.
0135 Radio Havana Cuba: Feature. See M 0130.
0135 Radio Netherlands: Newline. See S 0035.
0145 BBC: Jazz Now And Then. George Reid presents a mix of new releases and classic tracks.
0150 Radio Netherlands: Documentary. See W 1150.

0200 UTC

[10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am				15480am	17560am	17570am	17590am
0200-0300	Australia, ABC Brisbane	4920do	9660do			17600am	17640am	17835am	17850am
0200-0300	Australia, ABC Perth	4910do	9610do	15425do		17860am	17870am	21570am	
0200-0300	Australia, Radio	11720pa	15240pa	15365pa	17715pa				
		17750as	17795pa	17880as	21525as				
		21595as	21740pa						
0200-0300 vl	Australia, VL8A ALice Spg	4835do							
0200-0300 vl	Australia, VL8K Katherine	5025do							
0200-0300 vl	Australia, VL8T Tent Crk	4910do							
0200-0300	Bulgaria, Radio	15330na							
0200-0300	Canada, CFCX Montreal	6005do							
0200-0300	Canada, CFRX Toronto	6070do							
0200-0300	Canada, CFVP Calgary	6030do							
0200-0300	Canada, CHNX Halifax	6130do							
0200-0300	Canada, CKZU Vancouver	6160do							
0200-0259	Canada, RCI Montreal	6120na	9535am	9755na	11845am				
		11940am							
0200-0300	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na				
0200-0300	Cuba, Radio Havana Cuba	6010na	13660na						
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am				
0200-0300	Egypt, Radio Cairo	9475na	11660na						
0200-0210 smwhf	Finland, Radio	11755na	15185na						
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as				
		11965as	13790as	15185as	15560as				
0200-0300 as	Guam, KSDA AWR Agat	13720as							
0200-0300	Hungary, Radio Budapest	5970na	9835na	11910na	15220na				
0200-0300 vl	Italy, IRRS Milano	7125va							
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do							
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do							
0200-0300	Namibia, Namibia BC Corp	3290af							
0200-0300	Netherlands, Radio	9860as	11655as	12025as	13700as				
0200-0300	New Zealand, R NZ Intl	15120pa							
0200-0230 m	Norway, Radio Norway Intl	9560na	11925na						
0200-0230	Philippines, FEBC Manila	15450as							
0200-0300 vl	PNG, Natl BC	4980do							
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na				
		11940na							
0200-0300	Russia, AWR Russia	11835eu							
0200-0300	Russia, Radio Moscow Intl	7205am	7335am	9530am	9765am				
		11805na	11840na	12050am	13755as				
		13775as	15220am	15280am	15375am				
		15385am	15410am	15425am	15470am				
0200-0300	S Africa, Channel Africa	5960af							
0200-0300	Singapore, SBC Radio One	5010do	5052do	11940do					
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as					
0200-0230	Sweden, Radio	9695na	11705na						
0200-0230	Switzerland, Swiss R Intl	6135am	9650am	9885am	12035am				
0200-0300	Taiwan, VO Free China	5950na	9680na	11740na	15345na				
0200-0300	Thailand, Radio	4830as	9655as	11905as					
0200-0230	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu				
		7135me	7325am	9410eu	9590am				
		9915am	11730af	11750sa	11955as				
		12095na	15260sa	15310as	15360pa				
		15380as	17790as	21715as					
0200-0300	USA, CSMonitor Boston MA	5650na	9350af	9455na	13760sa				
0200-0300 sa	USA, CSMonitor Boston MA	17555as	17865as						
0200-0230	USA, KCBI Dallas TX	15375am							
0200-0300	USA, KTNB Salt Lk City UT	7510am							
0200-0230	USA, KVOH Rancho Simi CA		17775am						
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am				
		15120am	15205am						
0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	11705as				
		15160as	15250as	17740as	21550as				
0200-0300	USA, WHRI Noblesville IN	7315na							
0200-0300	USA, WINB Red Lion PA	15145eu							
0200-0300	USA, WJCR Upton KY	7490na	13595na						
0200-0300	USA, WWCR Nashville TN	5935am	7435am						
0200-0300	USA, WYFR Okeechobee FL	5985am	6065am	9505am	15440am				
0205-0230 tes-vl	Moldova, Natl R of Moldov	7125na							
0215-0255	Nepal, Radio	3230do	5005do	7165do					
0230-0300	Albania, R Tirana Intl	9580na	11840na						
0230-0300 s	Kenya, Kenya BC Corp	4935do							
0230-0245	Pakistan, Radio	17705as							
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as					
0230-0300	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu				
		7135me	7325am	9410eu	9915am				
		11730af	11750sa	11955as	11965na				
		12095na	15260sa	15310as	15360pa				
		17790as							
0245-0300	Armenia, Radio Yerevan	11790na	15180na						
0250-0300	Vatican State, Vatican R	9605na	11620na						

SELECTED PROGRAMS

Sundays

- 0200 KSDA, Guam: AWR Magazine. Stories about science, nature, discoveries, and health matters.
- 0211 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0215 KSDA, Guam: DX Asiawaves. News from the world of shortwave radio.
- 0215 Radio Havana Cuba: Headliners. See S 0015.
- 0230 BBC: Feature. Hoplite to the Harrier: History of warfare.
- 0230 KSDA, Guam: Digging Up The Past. No details available.
- 0235 Radio Havana Cuba: World Of Sports. See S 0035.
- 0235 Radio Netherlands: East Of Edam. Dutch and international stories, music, and arts features.
- 0240 Radio Havana Cuba: World Of Stamps. See S 0040.
- 0245 KSDA, Guam: Probe. A Bible study program.

Mondays

- 0200 Radio Havana Cuba: Sunday Review. See M 0000.
- 0210 Radio Havana Cuba: The Mailbag Show. See M 0010.
- 0220 Radio Havana Cuba: The Jazz Place. See M 0020.
- 0230 BBC: Composer Of The Month. Anton Bruckner.
- 0235 Radio Netherlands: Happy Station. See S 0135.

Tuesdays

- 0211 R Havana Cuba: Spotlight On The Americas. See T 0011.

- 0230 BBC: Quiz. See M 1215.
- 0235 Radio Havana Cuba: Sports In Cuba. See T 0035.
- 0235 Radio Netherlands: Newslines. See S 0035.
- 0240 Radio Havana Cuba: Let's Talk Law. See T 0040.
- 0250 Radio Netherlands: Research File. See M 1150.

Wednesdays

- 0211 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0215 Radio Havana Cuba: Headliners. See S 0015.
- 0230 BBC: Development '93. Aid and development issues for developing nations.
- 0235 Radio Netherlands: Newslines. See S 0035.
- 0240 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
- 0250 Radio Netherlands: Mirror Images. See T 1150.

Thursdays

- 0211 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0215 Radio Havana Cuba: Headliners. See S 0015.
- 0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
- 0235 Radio Havana Cuba: The Way We See It. See H 0035.
- 0235 Radio Netherlands: Newslines. See S 0035.
- 0240 Radio Havana Cuba: Cuba Today. See H 0040.
- 0250 Radio Netherlands: Documentary. See W 1150.

Fridays

- 0211 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0215 Radio Havana Cuba: Headliners. See S 0015.
- 0230 BBC: Drama. See H 1130.
- 0235 Radio Havana Cuba: Feature Report. See F 0035.
- 0235 Radio Netherlands: Newslines. See S 0035.
- 0250 Radio Netherlands: Media Network. See H 0150.

Saturdays

- 0200 KSDA, Guam: Digging Up The Past. See S 0230.
- 0211 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0215 KSDA, Guam: Focus On Living. Life's problems and their solutions.
- 0215 Radio Havana Cuba: Cuba Today. See H 0040.
- 0230 BBC: Inside Westminster (4th) People And Politics: British seaside conferences.
- 0230 KSDA, Guam: Power To Cope. See S 1630.
- 0235 Radio Havana Cuba: The Way We See It. See H 0035.
- 0235 Radio Netherlands: Newslines. See S 0035.
- 0240 Radio Havana Cuba: Kaleidoscope. See A 0040.
- 0250 Radio Netherlands: Toward 2000. See F 1150.

0300 UTC

[11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

Table of radio frequencies for various countries including Australia, Canada, China, and others. Columns include call letters, frequency, and bandwidth.

Table of radio frequencies for various countries including S Africa, Singapore, Sri Lanka, Taiwan, Thailand, Turkey, and the USA. Columns include call letters, frequency, and bandwidth.

SELECTED PROGRAMS

Sundays

- 0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. News from the world of sports.
0315 China Radio Int'l: Press Clippings. See S 0015.
0320 China Radio Int'l: Travel Talk. See S 0020.
0328 China Radio Int'l: Cooking Show. See S 0028.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0335 China Radio Int'l: Music From China. See S 0035.
0335 Radio Netherlands: Newslines. See S 0035.
0340 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0350 BBC: Write On. Listener letters, opinions, and questions.
0350 Radio Netherlands: Sounds Interesting. See S 0050.

Mondays

- 0300 Radio Havana Cuba: From Havana. See M 0100.
0315 BBC: Sports Roundup. See S 0315.
0315 China Radio Int'l: Sports Beat. See S 1215.
0320 China Radio Int'l: China Anthology. See S 1220.
0328 China Radio Int'l: Music Album. See S 1228.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Havana Cuba: Feature. See M 0130.
0335 Radio Netherlands: Happy Station. See S 0135.
0340 China Radio Int'l: Listeners' Letterbox. See S 1240.

Tuesdays

- 0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.

- 0315 China Radio Int'l: The Business Show or China's Open Windows. See M 1215.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0335 Radio Havana Cuba: Feature. See M 0130.
0335 Radio Netherlands: Newslines. See S 0035.
0340 China Radio Int'l: Learn To Speak Chinese. See M 1240.
0350 Radio Netherlands: Research File. See M 1150.

Wednesdays

- 0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0315 China Radio Int'l: Current Affairs. See T 1215.
0330 BBC: Pop Science (1st). Discovery: Developments from the world of science.
0335 Radio Havana Cuba: Feature. See M 0130.
0335 Radio Netherlands: Newslines. See S 0035.
0340 China Radio Int'l: Listeners' Letterbox. See S 1240.
0350 Radio Netherlands: Mirror Images. See T 1150.

Thursdays

- 0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0315 China Radio Int'l: Current Affairs. See T 1215.
0330 BBC: As I Recall: First person accounts of major crises.
0335 Radio Havana Cuba: Feature. See M 0130.
0335 Radio Netherlands: Newslines. See S 0035.

- 0340 China Radio Int'l: Learn To Speak Chinese. See M 1240.
0350 Radio Netherlands: Documentary. See W 1150.

Fridays

- 0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0315 China Radio Int'l: Current Affairs. See T 1215.
0330 BBC: Focus On Faith. Comment and discussion on major issues in the worlds of religion.
0335 Radio Havana Cuba: Feature. See M 0130.
0335 Radio Netherlands: Newslines. See S 0035.
0340 China Radio Int'l: Culture In China. See H 1240.
0350 Radio Netherlands: Media Network. See H 0150.

Saturdays

- 0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0315 China Radio Int'l: Current Affairs. See T 1215.
0330 BBC: The Vintage Chart Show. Paul Burnett presents classic hits from the UK Top 20.
0335 Radio Havana Cuba: Feature. See M 0130.
0335 Radio Netherlands: Newslines. See S 0035.
0340 China Radio Int'l: In The Third World. See F 1240.
0350 Radio Netherlands: Toward 2000. See F 1150.

0400 UTC

[12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0500	Australia, ABC Brisbane	4920do	9660do			
0400-0500	Australia, ABC Perth	9610do				
0400-0500	Australia, ABC	11720pa	11880pa	15240pa	15320pa	
	15365pa 17715pa	17795pa	17840as	21595as	21740pa	
0400-0500 vl	Australia, VL8A Alice Spg	4835do				
0400-0500 vl	Australia, VL8K Katherine	5025do				
0400-0500 vl	Australia, VL8T Tent Crk	4910do				
0400-0500	Bahrain, Radio 6010do					
0400-0404	Botswana, Radio	3356do	4830af	7255af		
0400-0500	Canada, CFCX Montreal	6005do				
0400-0500	Canada, CFRX Toronto	6070do				
0400-0500	Canada, CFVP Calgary	6030do				
0400-0500	Canada, CHNX Halifax	6130do				
0400-0500	Canada, CKZU Vancouver	6160do				
0400-0429	Canada, RCI Montreal	9650me	11905me	11925me	15275me	
	15445me					
0400-0500	China, China Radio Intl	11680na	11840na			
0400-0500 vl	Congo, R Natl Congolaise	4765do	5985do			
0400-0500	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030am	
0400-0430	Croatian Radio via WHRI	7315na				
0400-0430	Cuba, Radio Havana Cuba	6010na	6180am	9655na	13660na	
0400-0430	Czech Republic, R Prague	7345na	9485na	9810na	11990na	
	13715af	17535sa				
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am	
0400-0450	Germany, Deutsche Welle	6015af	6130af	6145af	7150af	
	7225af 9565af	9765af	11705af	11765af	13610af	
	13770af					
0400-0430	Guatemala, Radio Cultural	3300do				
0400-0415	Israel, Kol Israel	9435na				
0400-0500	Kenya, Kenya BC Corp	4935do				
0400-0500 mtwhf	Lebanon, Wings of Hope	11530me				
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do				
0400-0430	Netherlands, Radio	6165na	9590na			
0400-0500	New Zealand, R NZ Intl	15120pa				
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		
0400-0430 m	Norway, Radio Norway Intl	9655na	9740na			
0400-0500 vl	PNG, Natl BC	4890do				
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na	
	11940na					
0400-0500	Russia, Radio Moscow Intl	7205na	7335na	9530na	9610eu	
	9750eu 9765eu	9860na	11790na	12050na	12070am	
	13650am 15180na	15280na	15320na	15410na	15425na	
	15470na 15500na	15535na	17570as	17590as	17605na	
	17850na 17860na	21690as				
0400-0500	S Africa, Channel Africa	3995af	7230af			
0400-0500	Singapore, SBC Radio One	5010do	5052do	11940do		
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as			
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	12035na	
0400-0430 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu		
0400-0430	Tanzania, Radio	5985af	9685af	11765af		
0400-0430	Thailand, Radio	4830as	9655as	11905as		
0400-0500 vl	Uganda, Radio	4976do				
0400-0430	United Kingdom, BBC London	3955eu	5975na	6005af	6180eu	
	6195eu 7230eu	9410eu	9600af	11760me	11955me	
	12095va 15280as	15310va	15575va	21715as		
0400-0500	USA, CSMonitor Boston MA	9455am	9840af	13760sa	17780as	
0400-0500 sa	USA, CSMonitor Boston MA	17555as				
0400-0500	USA, KCBT Dallas TX	13720am				
0400-0500	USA, KTNB Salt Lk City UT	7510am				
0400-0500	USA, KVOH Rancho Simi CA	9785am				
0400-0430	USA, VOA Washington DC	5995eu	6040eu	6065eu	6140eu	
	6155eu 6873af	7170eu	7200eu	7265af	7280eu	
	7405eu 9575eu	9885eu	11965eu	15205eu		
0400-0500	USA, WEWN Birmingham AL	7425na				
0400-0500	USA, WHRI Noblesville IN	7315na				
0400-0500	USA, WJCR Upton KY	7490na	13595na			
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu				
0400-0500	USA, WRNO New Orleans LA	7395am				
0400-0500	USA, WWCR Nashville TN	5935am	7435am			
0400-0500	USA, WYFR Okeechobee FL	6065am	9505am			
0415-0440	Italy, RAI Rome	7275eu	9575eu			
0430-0500	Cuba, Radio Havana Cuba	6010na	6180na			
0430-0450 s	Finland, Radio	6120eu	9665eu			
0430-0450	Finland, Radio	11755me	15440af			
0430-0500	Italy, AWR Europe	15125eu				
0430-0500	Nigeria, Radio	3326do	4770do			
0430-0500	Russia, AWR Russia	15125eu				
0430-0500	Swaziland, Trans World R	5965af	9655af	11740af		
0430-0500	United Kingdom, BBC London	3955eu	5975na	6005af	6175eu	
	6180eu 6190af	6195eu	9410eu	9600af	11760me	
	12095va 15280as	15310va	15325eu	15400af	15575va	
	21470va 21715as					
0430-0500	USA, VOA Washington DC	3980eu	5995eu	6040eu	6140eu	
	6873af 7170eu	7200eu	7265af	7280af	7405af	
	9575af 15205eu					
0435-0500 mtwhf	Namibia, Namibia BC Corp	4965af				
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na			
0455-0500	Nigeria, Voice of	7255af				

SELECTED PROGRAMS

Sundays

- 0411 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0415 BBC: Looney Tunes (5,12,19); Audio treasures (26th).
- 0415 China Radio Intl: Press Clippings. See S 0015.
- 0415 Radio Havana Cuba: Headliners. See S 0015.
- 0420 China Radio Intl: Travel Talk. See S 0020.
- 0428 China Radio Intl: Cooking Show. See S 0028.
- 0430 BBC: Seeing Stars: Saturn (5th). Short Stories by BBC listeners. Remember Winter (N.Zealand, 11th), The Pilgrimage (Ireland, 18th), Speaking of Bunty (India, 25th).
- 0435 China Radio Intl: Music From China. See S 0035.
- 0435 Radio Havana Cuba: World Of Sports. See S 0035.
- 0440 Radio Havana Cuba: World Of Stamps. See S 0040.
- 0445 BBC: Miles Kington interviews literary characters (Aug 29,5th). Points of the Compass (12,19,26).

Mondays

- 0400 Radio Havana Cuba: Sunday Review. See M 0000.
- 0410 Radio Havana Cuba: The Mailbag Show. See M 0010.
- 0415 BBC: Parallel Lives: living with disabilities (6,13th). Western Philosophers (20,27th).
- 0415 China Radio Intl: Sports Beat. See S 1215.
- 0420 China Radio Intl: China Anthology. See S 1220.
- 0420 Radio Havana Cuba: The Jazz Place. See M 0020.
- 0428 China Radio Intl: Music Album. See S 1228.
- 0430 BBC: Off The Shelf. A Country Doctor's Notebook (begins 6th), A Straightforward Tale (13th), Jean De Florette (20th)
- 0440 China Radio Intl: Listeners' Letterbox. See S 1240.

- 0445 BBC: Andy Kershaw's World Of Music. New and unusual sounds from the world over.

Tuesdays

- 0411 RHavana Cuba: Spotlight On The Americas. See T 0011.
- 0415 BBC: Health Matters. See T 0145.
- 0415 China Radio Intl: The Business Show or China's Open Windows. See M 1215.
- 0430 BBC: Off The Shelf. See M 0430.
- 0435 Radio Havana Cuba: Sports In Cuba. See T 0035.
- 0440 China Radio Intl: Learn To Speak Chinese. See M 1240.
- 0440 Radio Havana Cuba: Let's Talk Law. See T 0040.
- 0445 BBC: On Screen. See M 2315.

Wednesdays

- 0411 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0415 BBC: Waveguide. Tips on how to hear the BBC better.
- 0415 China Radio Intl: Current Affairs. See T 1215.
- 0415 Radio Havana Cuba: Headliners. See S 0015.
- 0425 BBC: Book Choice. A short review of a recently released book.
- 0430 BBC: Off The Shelf. A Welsh short story (1st). See M 0430.
- 0440 China Radio Intl: Listeners' Letterbox. See S 1240.
- 0440 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
- 0445 BBC: Country Style. See W 0145.

Thursdays

- 0411 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0415 BBC: The Farming World. See H 0145.

- 0415 China Radio Intl: Current Affairs. See T 1215.
- 0415 Radio Havana Cuba: Headliners. See S 0015.
- 0430 BBC: Off The Shelf. A Welsh short story (2nd). See M 0430.
- 0435 Radio Havana Cuba: The Way We See It. See H 0035.
- 0440 China Radio Intl: Learn To Speak Chinese. See M 1240.
- 0440 Radio Havana Cuba: Cuba Today. See H 0040.
- 0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

- 0411 R Havana Cuba: Spotlight On Latin America. See S 0011.
- 0415 BBC: Musical Feature. See M 0145.
- 0415 China Radio Intl: Current Affairs. See T 1215.
- 0415 Radio Havana Cuba: Headliners. See S 0015.
- 0430 BBC: Off The Shelf. A Welsh short story (3rd). See M 0430.
- 0435 Radio Havana Cuba: Feature Report. See F 0035.
- 0440 China Radio Intl: Culture In China. See H 1240.
- 0445 BBC: Folk Routes. See T 0130.

Saturdays

- 0411 RHavana Cuba: Spotlight On Latin America. See S 0011.
- 0415 BBC: Good Books. See W 1445.
- 0415 China Radio Intl: Current Affairs. See T 1215.
- 0415 Radio Havana Cuba: Cuba Today. See H 0040.
- 0430 BBC: Jazz Now And Then. See A 0145.
- 0435 Radio Havana Cuba: The Way We See It. See H 0035.
- 0440 China Radio Intl: In The Third World. See F 1240.
- 0440 Radio Havana Cuba: Kaleidoscope. See A 0040.
- 0445 BBC: Worldbrief. See F 2315.

0500 UTC

[1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0530	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17795pa	17880as
		21525as	21595as	21740pa	
0500-0600 vl	Australia, VL8A ALice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0505	Canada, CBC Northern Svc	9625am			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0529 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	9750eu
		11775eu	15430eu	17840eu	
0500-0600	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
0500-0515	Croatian Radio via WHRI	7315na	9495na		
0500-0600	Cuba, Radio Havana Cuba	6180na	9510na		
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na
0500-0600 vl	Italy, IRRS Milano	7125va			
0500-0600	Japan, NHK/Radio Japan	6085me	7230eu	9725me	11725am
		11740am	15230na	15410am	17810am
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 vl	Kiribati, Radio	17440do			
0500-0600 mtwhf	Lebanon, Wings of Hope	11530me			
0500-0505	Lesotho, Radio	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600	New Zealand, R NZ Intl	15120pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600 vl	PNG, Natl BC	4890do			
0500-0600	Russia, Radio Moscow Intl	9750eu	9765eu	11690eu	11790eu
		12050na	13650af	15180na	15280na
		15410na	15425na	15470na	15500na
		15535na	15540af	15590af	17560af
		17570as	17590as	17605as	17635as
		17675as	17830as	17860af	17880as
		21690as			
0500-0600	S Africa, Channel Africa	9695af			
0500-0600 vl	S Africa, Radio Oranje	9630do			
0500-0553 l	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC Radio One	5052do	11940do		
0500-0556	Spain, Spanish Natl Radio	9530am			

0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, Trans World R	5965af	9655af	11740af	
0500-0515 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0500-0600	Thailand, Radio	4830as	9655as	11905as	
0500-0600 vl	Uganda, Radio	4976do			
0500-0530	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410eu
		9600af	9640na	11760me	12095va
		15070me	15280as	15310va	15360va
		15400af	15420af	15575eu	17830va
		17885af	21470va	21715as	
0500-0600	USA, CSMonitor Boston MA	9455na	9840af	13760sa	17780as
0500-0600 sa	USA, CSMonitor Boston MA	17555as			
0500-0600	USA, KCBI Dallas TX	13720am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Rancho Simi CA		9785am		
0500-0530	USA, VOA Washington DC	3980eu	5995eu	6040eu	6140eu
		6873eu	7170eu	9530eu	9700eu
		11825eu	11965eu	15205eu	
0500-0600	USA, VOA Washington DC	6035af	7405af	9665af	12080af
0500-0600	USA, WINB Red Lion PA	15145eu			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA		7395am		
0500-0600	USA, WWCR Nashville TN	5935am	7435am		
0500-0600	USA, WYFR Okeechobee FL	5985am	11580eu	11725eu	13695eu
0500-0520	Vatican State, Vatican R	6245eu	7250eu	11730af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0524-0600 f	Ghana, GBC Radio 2	3366do			
0525-0600	Ghana, GBC Radio 1	4915do			
0530-0600	Australia, Radio	15240pa	15320pa	15365pa	17715pa
		17795pa	21525pa	21595as	21740pa
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	15380af	17720af	17745af	17790af
0530-0600 vl	Russia, Radio Centre	12010eu			
0530-0600	Swaziland, Trans World R	5965af	11740af		
0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410eu
		9600af	9640na	9750eu	11760me
		12095va	15070me	15280as	15310va
		15360va	15400af	15420af	15575eu
		17830va	17885af	21470va	21715as
0530-0600	USA, VOA Washington DC	5995me	6035eu	6040me	6140me
		6873me	7170me	7200me	7405eu
		9665me	11965me	12080me	15205me

SELECTED PROGRAMS

Sundays

- 0500 RFPI: Sound Currents of the Earth. Music
 0511 Radio Havana Cuba: Sports Report. See S 0111.
 0530 RFPI: Peace Forum or Goodwill Lectures.
 0540 Radio Havana Cuba: DX'ers Unlimited. See S 0140.

Mondays

- 0500 Radio Havana Cuba: From Havana. See M 0100.
 0500 RFPI: United Nations News
 0530 Radio Havana Cuba: Feature. See M 0130.
 0530 RFPI: Focus on the Americas. Analysis

Tuesdays

- 0500 RFPI: UNESCO.
 0511 Radio Havana Cuba: Sports Report. See S 0111.
 0515 RFPI: UN News.
 0530 RFPI: Wings. News of interest to women.
 0535 Radio Havana Cuba: Feature. See M 0130.

Wednesdays

- 0500 RFPI: United Nations News.
 0530 RFPI: Vietnam Veterans Radio Network.
 0511 Radio Havana Cuba: Sports Report. See S 0111.

Thank You!

Additional contributors to this month's
Shortwave Guide:

Ed Rausch, Cedar Grove, NJ; Bob Fraser, Cohasset, MA; Jeff Gordon, New York City, NY; Robert Thomas, Bridgeport, CT; Giovanni Serra, Rome, Italy; David Williams, Pinson, AL; John Babbis, Silver Spring, MD; *BBC Monitoring Service, Shortwave Radio Today, The NASWA Journal, and Play DX.*

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- 0535 Radio Havana Cuba: Feature. See M 0130.

Thursdays

- 0500 RFPI: Dialogue.
 0511 Radio Havana Cuba: Sports Report. See S 0111.
 0515 RFPI: UN News
 0530 RFPI: Steppin' Out of Babylon. Interviews.
 0535 Radio Havana Cuba: Feature. See M 0130.

Fridays

- 0500 RFPI: UN News.
 0511 Radio Havana Cuba: Sports Report. See S 0111.
 0530 RFPI: Red Cross Broadcasting Service or Working Together.
 0535 Radio Havana Cuba: Feature. See M 0130.

Saturdays

- 0500 RFPI: Focus on Haiti.
 0511 Radio Havana Cuba: Sports Report. See S 0111.
 0530 RFPI: World Citizens Hour. Open forum.
 0535 Radio Havana Cuba: Feature. See M 0130.

0600 UTC

[2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

Table of radio frequencies with columns for frequency, station name, and call letters. Includes stations from Australia, Canada, USA, and various international locations.

SELECTED PROGRAMS

Sundays

0611 R Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: Letter From America. Alistair Cooke shares his intimate view of American life.

Mondays

0600 Radio Havana Cuba: Sunday Review. See M 0000.
0610 Radio Havana Cuba: The Mailbag Show. See M 0010.

Tuesdays

0611 R Havana Cuba: Spotlight On The Americas. See T 0011.
0615 BBC: The World Today. See M 1645.

Wednesdays

0611 R Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.

Thursdays

0611 R Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.

0615 Radio Havana Cuba: Headliners. See S 0015.
0630 BBC: Sports International. See H 0230.

Fridays

0611 R Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.

Saturdays

0611 RHavana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0700-0800	Australia, ABC Brisbane	9660do			
0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	6020pa 1	1720pa	11880pa	15240pa
15320pa		15365pa	17695as	17715pa	17750as
21525as	21595as		21740pa		
0700-0800 vl	Australia, VL8a Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
0700-0730	Ecuador, HCJB Quito	9600eu	9745na	11835eu	11925am
		15270am	17490am	21455eu	
0700-0800	Ghana, GBC	6130af			
0700-0800	Ghana, GBC Radio 1	4915do			
0700-0800 f	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125va			
0700-0800	Japan, NHK/Radio Japan	6050as	7230au	11740au	15170as
		15325au	15410au	17765as	17810as
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	17440do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, TWR Monte Carlo	9480eu			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZLXA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15340as	17765as		
0700-0800 vl	PNG, Natl BC	4890do			
0700-0800 vl	PNG, Radio Central	3290do			
0700-0800 vl	PNG, Radio Enga	2410do			
0700-0800 vl	PNG, Radio Milne Bay	3365do			
0700-0800 vl	PNG, Radio Western	3305do			
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, AWR Russia	11835eu			
0700-0800	Russia, Radio Moscow Intl	7345eu	9750eu	11710me	12020af
		12070af	13650me	13705am	15125me
		15225am	15225am	15280af	15140af
		15465af	15470af	15520af	15190af
		17570af	17580eu	15540am	15440me
				15550af	17560af
				17655af	17560af
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800 vl	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC Radio One	5010do	5052do	11940do	
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 as	Thailand, Radio	4830as	9655as	11905as	
0700-0730	United Kingdom, BBC London	5975na	6190af	6195eu	7150pa
		7325eu	9410eu	9640eu	9760eu
		11950eu	11955as	12095eu	11760me
		15325eu	15360pa	15400af	15070va
		17790va	17830as	17885af	15280as
				21470me	15310as
				9840eu	15575eu
				9455na	17640me
				13720am	17780as
0700-0800	USA, KCBT Dallas TX	7510na			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Rancho Simi CA		9785na		
0700-0800	USA, WEWN Birmingham AL	9350am	11580am		
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5935am	7435am		
0700-0800	USA, WYFR Okeechobee FL	5985va	7355va	9680va	11915af
		13695eu			
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0730-0800	Australia, Radio	6020pa	11720pa	11880pa	15240pa
		17695as	17750as	21595as	25750as
0730-0800	Austria, R Austria Intl	6155eu	13730eu	15450me	17870me
0730-0757	Czech Republic, R Prague	6055eu	11990pa	13600as	17535pa
		17725as	21705pa		
0730-0800	Ecuador, HCJB Quito	9745pa	11835eu	11925pa	15270eu
		17490eu	21455eu		
0730-0745 mtwhf	Iceland, Natl BC Service	92650m			
0730-0800	Italy, AWR Europe	7210eu			
0730-0800	Netherlands, Radio	9630pa	11895pa		
0730-0800	United Kingdom, BBC London	5975na	6190af	6195eu	7150au
		7325eu	9410eu	9640au	9760eu
		12095eu	15070va	15280as	15310as
		15420va	15575me	17640me	15400af
		17790va	17830as	17885af	15400af
		21470me	21660af	21715as	17885af
		21715as			

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425do			
0800-0830	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		15240pa	17695as	17750pa	21595as
21595as					
0800-0830 vl	Australia, VL8a Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R forPeace Int	7385na	13630am	15030na	
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		17490au	21455eu		
0800-0900	Finland, Radio	17800as			
0800-0900	Ghana, GBC Radio 1	4915do			
0800-0900 f	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWB Agana	15200as			
0800-0900	Indonesia, Voice of	9675au	11752as		
0800-0900 vl	Italy, IRRS Milano	7125va			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0830 vl	Kiribati, Radio	17440do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0845	Monaco, TWR Monte Carlo	9480eu			
0800-0825	Netherlands, Radio	9630pa			
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZLXA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0900 vl	PNG, Natl BC	4890do			
0800-0900 vl	PNG, Radio Central	3290do			
0800-0900 vl	PNG, Radio Enga	2410do			
0800-0900 vl	PNG, Radio Milne Bay	3365do			
0800-0900 vl	PNG, Radio Western	3305do			
0800-0900	Russia, Radio Moscow Intl	11765af	12010as	12020as	12055af
		12070as	13650as	15125me	15190eu
		15420as	15440me	15470as	15225as
		17660af	17675af	17735am	15590as
		21450am	21465am	17760am	17560af
				17805af	17645af
				21655af	17890am
				21690am	
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0830 vl	Sierra Leone, SLBS	3316do			
0800-0900	Singapore, SBC Radio One	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550af	13670eu	15155eu	
0800-0820	Swaziland, Trans World R	7200af	11740af		
0800-0830	United Kingdom, BBC London	6190af	7325eu	9410eu	9640eu
		9660eu	9760eu	11940af	11955as
		15280as	15360as	15400am	12095eu
		17705eu	17790af	17790af	15420af
		21660af	21715pa	17830as	15575af
				17885af	17640me
					21470af
0800-0900	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, WEWN Birmingham AL	9350am			
0800-0900	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5935am			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0820-0835 as	Swaziland, Trans World R	7200af	11740af		
0830-0900	Australia, Radio	5995na	9560pa	9580pa	17695as
		21595pa	25750pa		
0830-0900 vl	Australia, VL8a Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Georgia, Georgian Radio	11920eu			
0830-0900	Netherlands, Radio	11895pa			
0830-0857	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0830-0900	United Kingdom, BBC London	6190af	7325eu	9410eu	9600eu
		9760eu	11940af	11955as	15070va
		15360pa	15420af	15575af	15280as
		17790af	17830as	17885af	17640me
				21470af	17705eu
				21660af	17790af
					21715pa
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0845 smtwhf	Monaco, TWR Monte Carlo	9480eu			
0850-0900 s	Monaco, TWR Monte Carlo	9480eu			

shortwave guide

0900 UTC [5:00 AM EDT/2:00 AM PDT]

1000 UTC [6:00 AM EDT/3:00 AM PDT]

0900-0950	Australia, AAF Radio	20418as	25322af		
0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	6020pa	6080pa	9510pa
	9580pa 9710pa	13605pa	15170as	21725as	
0900-1000 vl	Australia, VLBA Alice Spg	2310do			
0900-1000 vl	Australia, VLBK Katherine	2485do			
0900-1000 vl	Australia, VLBT Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-0925 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu	13675eu	
0900-1000	Bhutan, BC Service	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755au	15440au	17710au	
0900-1000	Costa Rica, R forPeace Int	7375am	7385am	13630am	15030am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	15410af
	17780as 17800af	17820as	21465as	21600af	21650as
	21680as				
0900-0905	Ghana, GBC Radio 1	4915do			
0900-0905 f	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWR Agana	11805pa			
0900-1000 s	Italy, AWR Europe	7230eu			
0900-1000 vl	Italy, IRRS Milano	7125va			
0900-1000	Japan, NHK/Radio Japan	9750pa	11740pa	11815pa	11910pa
	15190pa	17860au			
0900-1000	Kenya, Kenya BC Corp	4935do			
0900-1000 mtwhf	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0915 s	Monaco, TWR Monte Carlo	9480eu			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwhfa	Palau, KHBN Voice of Hope	9830as			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000 vl	PNG, Natl BC	4890do			
0900-1000 vl	PNG, Radio Central	3290do			
0900-1000 vl	PNG, Radio Enga	2410do			
0900-1000 vl	PNG, Radio Milne Bay	3365do			
0900-1000 vl	PNG, Radio Western	3305do			
0900-1000	Russia, Radio Moscow Intl	7130af	9755af	11765af	11805as
	12010as 12020as	12055af	12070as	13650as	15190eu
	15345me 15420as	15440af	15470as	15490af	15525as
	17560af 17645af	17660af	17675af	17735am	17760am
	17805af 17890af	21655af	21690am	21825af	
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC Radio One	5010do	5052do	11940do	
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17670au	21820au
0900-0930	United Kingdom, BBC London	6190af	7325eu	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11765as
	11940af 12095eu	15070me	15190sa	15280af	15310as
	15360as 15400af	15420af	15575va	17640me	17705va
	17790va 17830as	17885af	21470af	21660af	21715pa
0900-1000	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
	17555as				
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0905-1000 sa	Ghana, GBC Radio 1	4915do			
0905-1000 mtwhf	Ghana, GBC Radio 2	3366do	7295do		
0905-1000 sa	Ghana, GBC Radio 2	3366do			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-0930 smtwh	Guam, KTWR Agana	15200as			
0930-1000	Netherlands, Radio	9720pa	11895pa	12065as	15470as
0930-1000	United Kingdom, BBC London	6190af	6195as	9410eu	9660eu

1000-1100	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	13605pa	15170as	21725as
1000-1100 vl	Australia, VLBA Alice Spg	2310do			
1000-1100 vl	Australia, VLBK Katherine	2485do			
1000-1100 vl	Australia, VLBT Tent Crk	2325do			
1000-1100	Bahrain, Radio 6010do				
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755au	15440au	17710au	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 sa	Ghana, GBC Radio 1	4915do			
1000-1100 mtwhf	Ghana, GBC Radio 2	7295do			
1000-1100 sa	Ghana, GBC Radio 2	3366do			
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1030	Israel, Kol Israel	17545eu			
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 vl	Italy, IRRS Milano	7125va			
1000-1100	Kenya, Kenya BC Corp	4935do			
1000-1100 mtwhf	Lebanon, King of Hope	6280me			
1000-1100 vl	Malaysia, RTM Kota Kinab	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1000-1025	Netherlands, Radio	9720pa	11895pa	12065as	15470as
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100 mtwhfa	Palau, KHBN Voice of Hope	9830as			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100 vl	PNG, Natl BC	4890do			
1000-1100 vl	PNG, Radio Central	3290do			
1000-1100 vl	PNG, Radio Enga	2410do			
1000-1100 vl	PNG, Radio Milne Bay	3365do			
1000-1100 vl	PNG, Radio Western	3305do			
1000-1100	Russia, Radio Moscow Intl	11630eu	11655eu	11765af	11800na
	11940af 12010eu	12020eu	12070eu	15125me	15140eu
	15225na 15350me	15355eu	15470eu	15490as	15795as
	17675af 17760na	17775as	17805af	21655af	
1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC Radio One	5010do	5052do	11940do	
1000-1045	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1030	United Kingdom, BBC London	6190af	6195va	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11940af
	12095eu 15070va	15190am	15260sa	15310as	15400af
	15420af 15575va	17640va	17705eu	17790va	17830pa
	17885af 21470va	21660af	21715pa		
1000-1100	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, VOA Washington DC	5985as	7405am	9590am	11720as
	11735me 11915am	15120am	15160me	15195eu	15425as
	17770eu 21455eu				
1000-1100	USA, WHRI Noblesville IN	7315am			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5935am			
1000-1100	USA, WYFR Okeechobee FL	5950am			
1000-1015 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
	21665eu				
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100	Austria, R Austria Intl	15450au	21490au		
1030-1100	Bulgaria, Radio	13670eu	17760eu	17830eu	
1030-1057	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
	15355eu				
1030-1100	Netherlands, Radio	12065as	15470as		
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, UAE Radio Dubai	13675eu	15320eu	15435eu	21605eu
1030-1100	United Kingdom, BBC London	6190af	6195va	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11940af
	12095eu 15070va	15190am	15260sa	15310as	15400af
	15420af 15575va	17640va	17705eu	17790va	17885af
	21470va 21660af				
1040-1050	Greece, Voice of	15650as	17525as		

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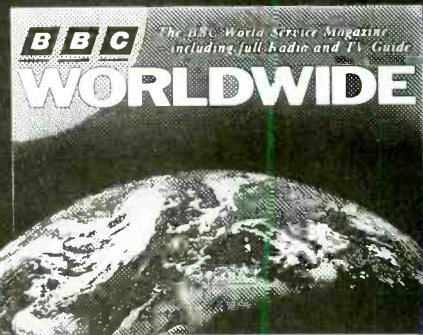


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BBC WORLD SERVICE

1100 UTC

[7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do			
1100-1200	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9510pa	9580pa	9710pa	13605pa
		15170as	21745as		
1100-1200 vl	Australia, VLBA Alice Spg	2310do			
1100-1200 vl	Australia, VLBK Katherine	2485do			
1100-1200 vl	Australia, VLBT Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Bulgaria, Radio	13670eu	17760eu	17830eu	
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, AWR Alajuela	9722ca	11870ca		
1100-1200	Costa Rica, R for Peace Int	7385na	13630na	15030na	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af	21465af	21600af
1100-1200	Ghana, BBC Radio 1	4915do			
1100-1110 mtwhf	Ghana, BBC Radio 2	7295do			
1100-1200 sa	Ghana, BBC Radio 2	3366do			
1100-1200 vl	Italy, IRRS Milano	7125va			
1100-1200	Japan, NHK/Radio Japan	6120na	11910na	15240na	
1100-1200	Jordan, Radio	13655eu			
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do			
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do		
1100-1130	Mozambique, R Mocambique	11820af	11835af		
1100-1125	Netherlands, Radio	12065as	15470as		
1100-1200	New Zealand, R NZ Intl	9700as			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as			
1100-1200 vl	PNG, Natl BC	4890do			
1100-1200 vl	PNG, Radio Central	3290do			
1100-1200 vl	PNG, Radio Enga	2410do			
1100-1200 vl	PNG, Radio Milne Bay	3365do			
1100-1200 vl	PNG, Radio Western	3305do			
1100-1200	Russia, Radio Moscow Intl	11765me	11785me	11800me	13650na
		15125as	15130as	15140me	15155as
		15225me	15280me	15290as	15355na
		15405as	15420as	15490me	15540as
		17570na	17595me	17670me	17675na
		17735as	17755me	17760na	17780me

		17815as	17875as	21785as	
1100-1200	S Africa, Channel Africa	9730af			
1100-1200 vl	S Africa, Radio Oranje	9630do			
1100-1200	Singapore, SBC Radio One	5010do	5052do	11940do	
1100-1200	South Korea, Radio Korea	6145na	9650na	9980na	
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	13635as	15505as	17670as	17670as
		21820as			
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1130	United Kingdom, BBC London	5965na	6190af	6195va	9410eu
		9515na	9600eu	9700au	9740va
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15220na
		15310as	15400eu	15420af	15575me
		17640va	17705eu	17790af	17885va
		21470va	21660af		
1100-1200	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTVN Salt Lk City UT	7510na			
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9760as	11720as	11915am	15120am
		15160as	15425as		
1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCN Nashville TN	5935am			
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na	11830na	
1100-1130	Vietnam, Voice of	7287as	9730as		
1100-1200	Austria, R Austria Intl	6155eu	13730eu		
1130-1200 s	Belgium, R Vlaanderen	15540as	17540as		
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1130-1200	Netherlands, Radio	5955eu	9860eu		
1130-1200	Serbia, Radio Yugoslavia	21605au			
1130-1200	Thailand, Radio	4830as	9655as	11905as	
1130-1200	United Kingdom, BBC London	5965na	6190af	6195va	9410eu
		9515na	9600eu	9740va	9750eu
		9760eu	11750as	11760me	11940af
		12095eu	15070va	15220na	15310as
		15420af	15575me	17640af	17695as
		17705eu	17790af	17885va	21470va
		21660af			

SELECTED PROGRAMS

- Sundays**
 1130 BBC: The John Dunn Show (12,19th); Play of the Week (5,26th) See S 0030.
 1135 Radio Netherlands: Happy Station. See S 0135.
- Mondays**
 1130 BBC: Composer Of The Month. See M 0230.
 1135 Radio Netherlands: Newslines. See S 0035.
 1150 Radio Netherlands: Research File. The latest developments in science and technology.
- Tuesdays**
 1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
 1135 Radio Netherlands: Newslines. See S 0035.
 1150 Radio Netherlands: Mirror Images. An arts magazine, featuring film, theatre, opera, books, and music.
- Wednesdays**
 1130 BBC: Meridian. See W 0630.



Robin Ray presents the BBC's Ray on Record.

MONITORING TIMES

- 1135 Radio Netherlands: Newslines. See S 0035.
 1150 Radio Netherlands: Documentary. This month, the Radio Netherlands team travels to "Africa" (1st, 8th, 15th, 22nd).
- Thursdays**
 1130 BBC: Drama. Spanish Gold-concl. (2nd); Cover Her Face, PD James' detective novel (9,16,23,30th).
 1135 Radio Netherlands: Newslines. See S 0035.
 1150 Radio Netherlands: Media Network. See H 0150.

- Fridays**
 1130 BBC: Meridian. See W 0630.
 1135 Radio Netherlands: Newslines. See S 0035.
 1150 Radio Netherlands: Toward 2000. A look at social affairs in Northern Europe.

- Saturdays**
 1130 BBC: Meridian. See W 0630.
 1135 Radio Netherlands: Newslines. See S 0035.
 1150 Radio Netherlands: Sounds Interesting. See S 0050.

1200 UTC

[8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1300	Australia, AAF Radio	12070as			
1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21745as	
1200-1300 vl	Australia, VLBA Alice Spg	2310do			
1200-1300 vl	Australia, VLBK Katherine	2485do			
1200-1300 vl	Australia, VLBT Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	15445am			
1200-1215	Cambodia, Natl Voice of	11938as			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1259 mtwhf	Canada, RCI Montreal	9635na	11855na	17820na	
1200-1300	China, China Radio Intl	8425as	9715as	11600as	11660as
		11795as	15210na	15440na	15450na
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca		
1200-1300	Costa Rica, R forPeace Int	7385am	15030na	21465am	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455om			
1200-1300	Ghana, GBC Radio 1	4915do			
1200-1225 sa	Ghana, GBC Radio 2	3366do			
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1200-1300 vl	Italy, IRRS Milano	7125eu			
1200-1300	Kenya, Kenya BC Corp	4935do			
1200-1230 mtwhf	Lebanon, King of Hope	6280me			
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300 vl	Malaysia, RTM Sarawak	4950do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1300	Netherlands, Radio	5955eu	9860eu		
1200-1206	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1230 s	Norway, Radio Norway Intl	17730as	17840as		
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as			
1200-1230 a	Palau, KHBN Voice of Hope	9830as			
1200-1300 vl	PNG, Natl BC	4890do			
1200-1300 vl	PNG, Radio Central	3290do			
1200-1300 vl	PNG, Radio Enga	2410do			
1200-1300 vl	PNG, Radio Milne Bay	3365do			
1200-1300 vl	PNG, Radio Western	3305do			
1200-1255	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Russia, Radio Moscow Intl	11765af	11785af	11800me	15140as
		15155as	15170me	15220am	15225as
		15320me	15355as	15440me	15480na
		15550me	17570na	17595na	17645na
		17760na	17765me	17790na	17815me
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC Radio One	5010do	5052do	11940do	
1200-1300	South Korea, Radio Korea	9640na			
1200-1230	Thailand, Radio	4830as	9655as	11905as	
1200-1230	United Kingdom, BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11940af	12095eu	15070va	15220na
		17640af	17705eu	17790af	17885af
					21470af
1200-1215	United Kingdom, BBC London	7160as	9605as	11920as	
1200-1300	USA, CSMonitor Boston MA	9425pa	9495na	13625as	13760sa
1200-1300 as	USA, CSMonitor Boston MA	15665eu			
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1200-1300	USA, WEWN Birmingham AL	9350am	15695am		
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCR Nashville TN	13845am	15685am		
1200-1300	USA, WYFR Okeechobee FL	5950am	6015am	11830am	17750am
1200-1225	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
1207-1300 ocasnl	New Zealand, R NZ Intl	9510as			
1215-1300	Egypt, Radio Cairo	17595as			
1226-1300	Ghana, GBC Radio 2	7295do			
1230-1300	Australia, Radio	5995pa	6020pa	7240pa	9580pa
		13755pa			
1230-1300	Bangladesh, Radio	11708eu	13610eu	13620eu	15200eu
1230-1259	Canada, RCI Montreal	9660as	15195as		
1230-1300	Finland, Radio	11900na	15400na		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	17575na		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240pa	21500as		
1230-1300	Turkey, Voice of	9675as			
1230-1300	United Kingdom, BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11940af	12095eu	15070va	15220na
		17640af	17705eu	17790af	17885af
					21660af
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	

SELECTED PROGRAMS

Sundays

- 1201 BBC: Play Of The Week. See S 0101.
 1215 China Radio Intl: Sports Beat. News from the world of sports.
 1220 China Radio Intl: China Anthology. Episodes from China's past, with profiles of historical figures.
 1228 China Radio Intl: Music Album. A combination of traditional and Western musical selections.
 1235 Radio Netherlands: East Of Edam. See S 0235.
 1240 China Radio Intl: Listeners' Letterbox. Listener letters and information about China.

Mondays

- 1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
 1215 BBC: Quiz. Robert Robinson hosts the finals of the game show "Brain Of Britain" (6th). Musical panel game (13,20,27th).
 1215 China Radio Intl: The Business Show or China's Open Windows. News on Chinese industry or trade.
 1225 Radio Netherlands: Press Review. A review of stories from the Dutch press.
 1235 Radio Netherlands: Newslines. See S 0035.
 1240 China Radio Intl: Learn To Speak Chinese. Chinese language lessons for English speakers.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Netherlands: Let's Get To Business. Barry O'Dwyer explores the world of business.

Tuesdays

- 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 1. See M 2330.
 1215 China Radio Intl: Current Affairs. An in-depth look at events and happenings in China.
 1225 Radio Netherlands: Press Review. See M 1225.
 1235 Radio Netherlands: Newslines. See S 0035.
 1240 China Radio Intl: Listeners' Letterbox. See S 1240.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Netherlands: No Boundaries. See T 0150.

Wednesdays

- 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: New Ideas. See M 1615.
 1215 China Radio Intl: Current Affairs. See T 1215.
 1225 Radio Netherlands: Press Review. See M 1225.
 1235 BBC: Features. See M 1635.
 1235 Radio Netherlands: Newslines. See S 0035.
 1240 China Radio Intl: Learn To Speak Chinese. See M 1240.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Netherlands: Encore! See W 0150.

Thursdays

- 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 2. See W 2330.
 1215 China Radio Intl: Current Affairs. See T 1215.
 1225 Radio Netherlands: Press Review. See M 1225.
 1235 Radio Netherlands: Newslines. See S 0035.
 1240 China Radio Intl: Culture In China. The rich cultural heritage

- of China, as manifested in literature and art.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Netherlands: Research File. See M 1150.

Fridays

- 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Feature. White Nights, portrait of St. Petersburg (3,10,17th); Whiskey: Water of Life (24th).
 1215 China Radio Intl: Current Affairs. See T 1215.
 1225 Radio Netherlands: Press Review. See M 1225.
 1235 Radio Netherlands: Newslines. See S 0035.
 1240 China Radio Intl: In The Third World. Reports and music from developing nations.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Netherlands: Documentary. See W 1150.

Saturdays

- 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 3. See F 2330.
 1215 China Radio Intl: Press Clippings. See S 0015.
 1220 China Radio Intl: Travel Talk. See S 0020.
 1225 Radio Netherlands: EuroPress Review. See S 0025.
 1228 China Radio Intl: Cooking Show. See S 0028.
 1235 China Radio Intl: Music From China. See S 0035.
 1235 Radio Netherlands: Newslines. See S 0035.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Netherlands: Airtime Africa. Analysis of issues that concern both Europe and Africa.

1300 UTC

[9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1400 vl	Australia, VLBA Alice Spg	2310do			
1300-1400 vl	Australia, VLBK Katherine	2485do			
1300-1400 vl	Australia, VLBT Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1330 mtwtf	Belgium, R Vlaanderen	15540na	17540as		
1300-1320	Brazil, Radiobras	15445am			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	9405as	9715as	11660pa	11855as
1300-1400	Costa Rica, R forPeace Int	7385am	15030na	21465am	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1325	Israel, Kol Israel	11587na	11603na	15640na	15650as
		17575eu	17590eu		
1300-1400 vl	Italy, IRRS Milano	7125va			
1300-1325	Kenya, Kenya BC Corp	4935do			
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400 vl	Malaysia, RTM Sarawak	4950do			
1300-1325	Netherlands, Radio	9660eu	5995eu		
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1350	North Korea, R Pyongyang	9345eu	9640as	11740as	15230as
1300-1330 m	Norway, Radio Norway Intl	9590eu	15230eu		
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400 vl	PNG, Natl BC	4890do			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855au			
1300-1400	Russia, Radio Moscow Intl	9640am	9755am	9825am	9885am
		9895am	11940eu	11995as	15140me
		15225na	15280as	15290as	15335as
		15355me	15480as	15550as	17595as
		17735me	17760as	17790as	17860me
		21610as	21625me	21785me	
1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC Radio One	5010do	5052do	11940do	
1300-1330	South Korea, Radio Korea	9750as	13670as		

1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
		17670as	21770as		
1300-1330	United Kingdom, BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740am	9750eu
		9760eu	11750as	11760me	11820am
		11940af	12095eu	15070am	15105af
		15220am	15250as	15310as	15420af
		15575me	17640af	17705eu	17790af
		17885af	21470af	21660af	
1300-1400	USA, CSMonitor Boston MA	9425pa	9495na	13625as	13760sa
1300-1400 as	USA, CSMonitor Boston MA	15665eu			
1300-1400	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1300-1400	USA, WEWN Birmingham AL	9350na			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	13845am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
		17750na			
1302-1400	Taiwan, VO Free China	11550as			
1315-1325	Nepal, Radio	3230do	5005do	7165do	
1325-1400 mtwhf	Kenya, Kenya BC Corp	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1359	Canada, RCI Montreal	9535as	11795as	11935eu	15315eu
		15325eu	17820eu	17895af	21455eu
		21710eu			
1330-1400 mtwhf	Finland, Radio	11900na	15400na	21550na	
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	17610as
1330-1400	UAE, UAE Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom, BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740va	9750eu
		9760eu	11750as	11760me	11820va
		11940af	12095eu	15070va	15220am
		15250as	15310as	15420af	15575me
		17640va	17705eu	17790va	17885af
		21470va	21660af		
1330-1345	United Kingdom, BBC London	15105af	17810af	21640af	
1330-1355	Uzbekistan, R Tashkent	7285as	9715as	15295as	17815as
1330-1400	Vietnam, Voice of	9840as	15010as		
1335-1345	Greece, Voice of	15630na	17515na		
1345-1400	Vatican State, Vatican R	15090as	17525as		

SELECTED PROGRAMS

Sundays

- 1315 China Radio Int'l: Sports Beat. See S 1215.
- 1320 China Radio Int'l: China Anthology. See S 1220.
- 1328 China Radio Int'l: Music Album. See S 1228.
- 1335 Radio Netherlands: Happy Station. See S 0135.
- 1340 China Radio Int'l: Listeners' Letterbox. See S 1240.

Mondays

- 1305 Radio Netherlands: From Sapphire To Laser. Robert Green presents selections of classical music.
- 1315 China Radio Int'l: The Business Show or China's Open Windows. See M 1215.
- 1335 Radio Netherlands: Newline. See S 0035.
- 1340 China Radio Int'l: Learn To Speak Chinese. See M 1240.
- 1350 Radio Netherlands: Research File. See M 1150.

Tuesdays

- 1315 China Radio Int'l: Current Affairs. See T 1215.
- 1335 Radio Netherlands: Newline. See S 0035.
- 1340 China Radio Int'l: Listeners' Letterbox. See S 1240.
- 1350 Radio Netherlands: No Boundaries. See T 0150.

Wednesdays

- 1315 China Radio Int'l: Current Affairs. See T 1215.
- 1335 Radio Netherlands: Newline. See S 0035.
- 1340 China Radio Int'l: Learn To Speak Chinese. See M 1240.
- 1350 Radio Netherlands: Documentary. See W 1150.

Thursdays

- 1315 China Radio Int'l: Current Affairs. See T 1215.
- 1335 Radio Netherlands: Newline. See S 0035.
- 1340 China Radio Int'l: Culture In China. See H 1240.
- 1350 Radio Netherlands: Media Network. See H 0150.

Fridays

- 1315 China Radio Int'l: Current Affairs. See T 1215.
- 1335 Radio Netherlands: Newline. See S 0035.
- 1340 China Radio Int'l: In The Third World. See F 1240.
- 1350 Radio Netherlands: Toward 2000. See F 1150.

Saturdays

- 1315 China Radio Int'l: Press Clippings. See S 0015.
- 1320 China Radio Int'l: Travel Talk. See S 0020.
- 1328 China Radio Int'l: Cooking Show. See S 0028.
- 1335 China Radio Int'l: Music From China. See S 0035.
- 1335 Radio Netherlands: Newline. See S 0035.
- 1350 Radio Netherlands: Sounds Interesting. See S 0050.

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1400 UTC**[10:00 AM EDT/7:00 AM PDT]****FREQUENCIES**

1400-1450	Australia, AAF Radio	10815as	13508af					15225am	15290am	15320af	15355as
1400-1500	Australia, ABC Brisbane	4920do						15480as	17580af	17595af	17760am
1400-1500	Australia, ABC Perth	6140do						17790am	17890af	21785as	
1400-1500	Australia, Radio	5995pa	6060pa	7240pa	7260as	1400-1500 vl	S Africa, Radio Oranje	9630do			
		9510as	9580pa	9770as	11800pa	1400-1500	Singapore, SBC Radio One	5010do	5052do	11940do	
		11855as	13755as			1400-1500	South Korea, Radio Korea	5975as	6135as		
1400-1500 vl	Australia, VL8A Alice Spg	2310do				1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as		
1400-1500 vl	Australia, VL8K Katherine	2485do				1400-1430	United Kingdom, BBC London	6195as	7180as	9410eu	9515na
1400-1500 vl	Australia, VL8T Tent Crk	2325do						9660eu	9740as	9750eu	9760eu
1400-1500	Bahrain, Radio	6010do						11750as	11820as	11940af	12095eu
1400-1500	Canada, CFCX Montreal	6005do						15070va	15250as	15260af	15310as
1400-1500	Canada, CFRX Toronto	6070do						15575me	17640va	17705eu	17790af
1400-1500	Canada, CFVP Calgary	6030do				1400-1500	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu
1400-1500	Canada, CHNX Halifax	6130do				1400-1500 sa	USA, CSMonitor Boston MA	13710na			
1400-1500	Canada, CKZU Vancouver	6160do				1400-1500	USA, KCBI Dallas TX	15375va			
1400-1500 s	Canada, RCI Montreal	11955na	17820na			1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500 mtwhfa	Canada, RCI Montreal	11935eu	15315eu	15325eu	17820eu	1400-1500	USA, KTBN Salt Lk City UT	7510na			
		17895eu	21455eu	21710eu		1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
1400-1500	China, China Radio Intl	4200as	7405as	11815na	11855as			15160as	15255as	15395as	15425as
		15165as				1400-1500	USA, WEWN Birmingham AL	9350na			
1400-1500	Costa Rica, R for Peace Int	7385am				1400-1500	USA, WHRI Noblesville IN	9465na	15105na		
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am	1400-1500	USA, WJCR Upton KY	7490na	13595na		
		21455am				1400-1500	USA, WWCR Nashville TN	13845am	15685am		
1400-1500	France, Radio France Intl	11910as	17575eu	17650me	17695eu	1400-1500	USA, WYFR Okeechobee FL	6015am	11830am	17750na	
1400-1500	Ghana, GBC Radio 1	4915do				1400-1405	Vatican State, Vatican R	15090au	17525au		
1400-1500	Ghana, GBC Radio 2	7295do				1415-1500	Bhutan, BC Service	5025do			
1400-1500 mtwhfa	Honduras, R Copan Intl	15675am				1415-1425	Nepal, Radio	3230do	5005do	7165do	
1400-1500	India, All India Radio	11760as	15120as			1430-1500	Afghanistan, Radio	7200as			
1400-1500 vl	Italy, IRRS Milano	7125va				1430-1500	Albania, R Tirana Intl	7155eu	9760eu		
1400-1500	Japan, NHK/Radio Japan	9535am	9750am	11735as	11815as	1430-1500	Austria, R Austria Intl	6155eu	13730eu	15450eu	21490va
		11865am				1430-1500	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1400-1500	Jordan, Radio	9560eu				1430-1500 m	Indonesia, RRI Padang	4003pa			
1400-1500 mtwhf	Kenya, Kenya BC Corp	4935do				1430-1500	Myanmar, VO Myanmar	5990do			
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do				1430-1500 mtwhf	Portugal, Radio	21515me			
1400-1500	Malaysia, RTM Radio 4	4950do	7295do			1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1400-1500 vl	Malaysia, RTM Sarawak	4950do				1430-1500 vl	Uganda, Radio	4976do			
1400-1500	Malta, V of Mediterranean	11925eu				1430-1500	United Kingdom, BBC London	6190af	6195as	7180as	9410eu
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af						9515na	9660eu	9740as	9750eu
1400-1500	Netherlands, Radio	9890as	13770as	15150as	17610as			9760eu	11750as	11820as	11860me
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as						11940af	12095eu	15070eu	15250as
1400-1500	Philippines, FEBC Manila	11995as						15260me	15310as	15575me	17640va
1400-1500 vl	PNG, Natl BC	4890do						17705eu	17790af	17840am	17880af
1400-1500	Russia, Radio Moscow Intl	9640am	9755am	9825am	9895am	1445-1500 smha	Mongolia, R Ulaanbaatar	21470va	21660af		
		11665me	11705as	11870as	11940as			13780as			
		11995am	15110as	15125af	15140as						

SELECTED PROGRAMS**Sundays**

- 1401 BBC: Feature. Fight against AIDS (5,12th); World's water supply (19,26th).
 1415 China Radio Intl: Sports Beat. See S 1215.
 1420 China Radio Intl: China Anthology. See S 1220.
 1428 China Radio Intl: Music Album. See S 1228.
 1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
 1435 Radio Netherlands: East Of Edam. See S 0235.
 1440 China Radio Intl: Listeners' Letterbox. See S 1240.

Mondays

- 1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
 1415 China Radio Intl: The Business Show or China's Open Windows. See M 1215.
 1430 BBC: Off The Shelf. See M 0430.
 1435 Radio Netherlands: Newline. See S 0035.
 1440 China Radio Intl: Learn To Speak Chinese. See M 1240.
 1445 BBC: Feature. See S 0445.
 1450 Radio Netherlands: Let's Get To Business. See M 1250.

Tuesdays

- 1405 BBC: Outlook. See M 1405.

- 1415 China Radio Intl: Current Affairs. See T 1215.
 1430 BBC: Off The Shelf. See M 0430.
 1435 Radio Netherlands: Newline. See S 0035.
 1440 China Radio Intl: Listeners' Letterbox. See S 1240.
 1445 BBC: Musical Feature. See M 0145.
 1450 Radio Netherlands: Mirror Images. See T 1150.

Wednesdays

- 1405 BBC: Outlook. See M 1405.
 1415 China Radio Intl: Current Affairs. See T 1215.
 1430 BBC: Off The Shelf. Welsh short story (1st) See M 0430.
 1435 Radio Netherlands: Newline. See S 0035.
 1440 China Radio Intl: Learn To Speak Chinese. See M 1240.
 1445 BBC: Good Books. Welsh short story (1st) Literary heroines from Vanity Fair (8th), Moll Flanders (15th), Anna Karenina (22nd), Wuthering Heights (29th).
 1450 Radio Netherlands: Encore! See W 0150.

Thursdays

- 1405 BBC: Outlook. See M 1405.
 1415 China Radio Intl: Current Affairs. See T 1215.
 1430 BBC: Off The Shelf. Welsh short story (2nd) See M 0430.
 1435 Radio Netherlands: Newline. See S 0035.
 1440 China Radio Intl: Culture In China. See H 1240.

- 1445 BBC: Recording Of The Week. See M 0615.
 1450 Radio Netherlands: Research File. See M 1150.

Fridays

- 1405 BBC: Outlook. See M 1405.
 1415 China Radio Intl: Current Affairs. See T 1215.
 1430 BBC: Off The Shelf. Welsh short story (3rd) See M 0430.
 1435 Radio Netherlands: Newline. See S 0035.
 1440 China Radio Intl: In The Third World. See F 1240.
 1445 BBC: Global Concerns. See F 0145.
 1450 Radio Netherlands: Documentary. See W 1150.

Saturdays

- 1401 BBC: Sportsworld. Extensive coverage and results from all the weekend's sports.
 1415 China Radio Intl: Press Clippings. See S 0015.
 1420 China Radio Intl: Travel Talk. See S 0020.
 1428 China Radio Intl: Cooking Show. See S 0028.
 1435 China Radio Intl: Music From China. See S 0035.
 1435 BBC: Global Concerns. See S 0035.
 1450 Radio Netherlands: Airtime Africa. See A 1250.

1500 UTC

[11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do								
1500-1530	Australia, Radio	5995pa 9580pa 11855as	6060pa 9770as 13755as	7260as 11690as	9510as 11800pa					
1500-1600 vl	Australia, VLBA Alice Spg	2310do								
1500-1600 vl	Australia, VLBK Katherine	2485do								
1500-1600 vl	Australia, VLBT Tent Crk	2325do								
1500-1600	Bahrain, Radio	6010do								
1500-1600	Canada, CFCX Montreal	6005do								
1500-1600	Canada, CFRX Toronto	6070do								
1500-1600	Canada, CFVP Calgary	6030do								
1500-1600	Canada, CHNX Halifax	6130do								
1500-1600	Canada, CKZU Vancouver	6160do								
1500-1559 s	Canada, RCI Montreal	11955na	17820na							
1500-1600	China, China Radio Intl	4200as	11815as	15165as						
1500-1600	Costa Rica, R forPeace Int	7385am								
1500-1527	Czech Republic, R Prague	6055eu 15605af	7345eu 17535eu	13600me	15535af					
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am					
1500-1600	Ethiopia, Voice of	7165do	9560do							
1500-1550	Germany, Deutsche Welle	7185af 17735af	9735af 21600as	11965af	13610af					
1500-1600	Guam, KTWR Agana	15610as								
1500-1600 vl	Italy, IRRS Milano	7125va								
1500-1600	Japan, NHK/Radio Japan	9750as	11815as	11865na	15355af					
1500-1600	Jordan, Radio	9560eu								
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do								
1500-1600	Malaysia, RTM Radio 4	4950do	7295do							
1500-1600 vl	Malaysia, RTM Sarawak	4950do								
1500-1600	Malta, V of Mediterranean	11925eu								
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as								
1500-1600	Myanmar, VO Myanmar	5990do								
1500-1600	Netherlands, Radio	9890as	13770as	15150as	17610as					
1500-1600	Nigeria, Radio	4990do	7285do							
1500-1600	Nigeria, Voice of	7255af								
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu					
1500-1600	Philippines, FEBC Manila	11995as								
1500-1600 vl	PNG, Natl BC	4890do								
1500-1555	Poland, Polish R Warsaw	7285eu	9525eu	11840eu						
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as						
1500-1600	Russia, Radio Moscow Intl	9505am 9895na 15125as	9640am 11665me 15170me	9755am 11995me 15180as	9825am 12030me 15290as					
		15355as	15425as	15480as	15550am					
1500-1600 vl	S Africa, Radio Oranje	4875do								
1500-1555 s	Seychelles, FEBA Radio	11710as								
1500-1600	Seychelles, FEBA Radio	9810af	15330af							
1500-1600	Singapore, SBC Radio One	5010do	5052do	11940do						
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as							
1500-1530	Sweden, Radio	15190na	15240na	21500na						
1500-1530	Switzerland, Swiss R Intl	13635af	15505af	17670af	21770af					
1500-1600 vl	Uganda, Radio	4976do								
1500-1530	United Kingdom, BBC London	6190af 9515na 11750as 15250as 17705eu 21470af	6195eu 9740va 11940af 15260na 17840au 21660af	7180as 9750eu 12095eu 15310as 17860af 17880af	9410eu 9760eu 15070va 15400eu 17880af 1790am					
1500-1600	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu					
1500-1600	USA, KCBI Dallas TX	15375am								
1500-1600	USA, KTBN Salt Lk City UT	15590na								
1500-1600	USA, VOA Washington DC	6110as 9760as 19379eu	7125as 15205eu	9645as 15255as	9700as 15395as					
1500-1600	USA, WEWN Birmingham AL	17510am								
1500-1600	USA, WHRI Noblesville IN	9485sa	15105na							
1500-1600	USA, WJCR Upton KY	7490na	13595na							
1500-1600	USA, WRNO New Orleans LA	15420na								
1500-1600	USA, WWCR Nashville TN	13845am	15685am							
1500-1600	USA, WYFR Okeechobee FL	6015na	11705na	11830na	17750na					
1520-1530 mtwrf	Estonia, Radio	5925eu								
1530-1600	Australia, Radio	6060pa 9580pa	7260as 11800pa	9510as 11855as	9560pa 13755as					
1530-1600	Austria, R Austria Intl	11780as								
1530-1545	Finland, Radio	6120eu 21550af	11755eu	11820eu	15240me					
1530-1600	Georgia, Georgian Radio	11920eu								
1530-1540 mtwhfa	Greece, Voice of	15630eu	15652na	17525na						
1530-1600 vl	Russia, Radio Centre	15185eu								
1530-1600 irreg	Tanzania, Radio	11765af								
1530-1600	United Kingdom, BBC London	6190af 9515na 11940af 15310as 17860af	6195eu 9740va 12095eu 15400eu 17880af	7180as 9760eu 15070va 17705eu 17860af	9410eu 11750as 15260na 17840am 21660af					
1545-1600	Vatican State, Vatican R	15090au	17865as							

SELECTED PROGRAMS

Sundays

- 1515 BBC: Sunday Sportsworld (26th) Concert Hall (5,12,19th).
- 1515 China Radio Int'l: Sports Beat. See S 1215.
- 1520 China Radio Int'l: China Anthology. See S 1220.
- 1528 China Radio Int'l: Music Album. See S 1228.
- 1535 Radio Netherlands: Happy Station. See S 0135.
- 1540 China Radio Int'l: Listeners' Letterbox. See S 1240.

Mondays

- 1505 Radio Netherlands: From Sapphire To Laser. See M 1305.
- 1515 BBC: Feature. See M 0101.
- 1515 China Radio Int'l: The Business Show or China's Open Windows. See M 1215.
- 1525 Radio Netherlands: Press Review. See S 1225.
- 1535 Radio Netherlands: Newslines. See S 0035.
- 1540 China Radio Int'l: Learn To Speak Chinese. See M 1240.
- 1550 Radio Netherlands: Research File. See M 1150.

Tuesdays

- 1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
- 1515 China Radio Int'l: Current Affairs. See T 1215.

- 1525 Radio Netherlands: Press Review. See M 1225.
- 1535 Radio Netherlands: Newslines. See S 0035.
- 1540 China Radio Int'l: Listeners' Letterbox. See S 1240.
- 1550 Radio Netherlands: No Boundaries. See T 0150.

Wednesdays

- 1515 BBC: Talks. See M 0415.
- 1515 China Radio Int'l: Current Affairs. See T 1215.
- 1525 Radio Netherlands: Press Review. See M 1225.
- 1530 BBC: Comedy (1st), Just a Minute panel game (8,15,22nd), Two Cheers, humorous look at month just past (29th)
- 1535 Radio Netherlands: Newslines. See S 0035.
- 1540 China Radio Int'l: Learn To Speak Chinese. See M 1240.
- 1550 Radio Netherlands: Documentary. See W 1150.

Thursdays

- 1515 BBC: Ray On Record. See S 2315.
- 1515 China Radio Int'l: Current Affairs. See T 1215.
- 1525 Radio Netherlands: Press Review. See M 1225.
- 1535 Radio Netherlands: Newslines. See S 0035.
- 1540 China Radio Int'l: Culture In China. See H 1240.
- 1550 Radio Netherlands: Media Network. See H 0150.

Fridays

- 1515 BBC: Music Review. See H 2315.
- 1515 China Radio Int'l: Current Affairs. See T 1215.
- 1525 Radio Netherlands: Press Review. See M 1225.
- 1535 Radio Netherlands: Newslines. See S 0035.
- 1540 China Radio Int'l: In The Third World. See F 1240.
- 1550 Radio Netherlands: Toward 2000. See F 1150.

Saturdays

- 1515 BBC: Sportsworld. See A 1401.
- 1515 China Radio Int'l: Press Clippings. See S 0015.
- 1520 China Radio Int'l: Travel Talk. See S 0020.
- 1525 Radio Netherlands: EuroPress Review. See S 0025.
- 1528 China Radio Int'l: Cooking Show. See S 0028.
- 1535 China Radio Int'l: Music From China. See S 0035.
- 1535 Radio Netherlands: Newslines. See S 0035.
- 1550 Radio Netherlands: Sounds Interesting. See S 0050.

1600 UTC

[12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1630	Australia, Radio 9560pa 9580pa	6060pa	7240pa	7260pa	9510pa
1600-1700 vl	Australia, VLBA Alice Spg	11800pa	11855as	11880pa	13755as
1600-1700 vl	Australia, VLBK Katherine	2310do			
1600-1700 vl	Australia, VLBT Tent Crk	2485do			
1600-1700	Bahrain, Radio	2325do			
1600-1700	Canada, CFCX Montreal	6010do			
1600-1700	Canada, CFRX Toronto	6005do			
1600-1700	Canada, CFVP Calgary	6070do			
1600-1700	Canada, CHNX Halifax	6030do			
1600-1700	Canada, CKZU Vancouver	6130do			
1600-1700	China, China Radio Intl	6160do			
1600-1700	Costa Rica, R forPeace Int	4130af	11575af	15110af	15130af
1600-1700	Ecuador, HCJB Quito	7375na	7385am	13630na	15030na
1600-1700	France, Radio France Intl	17790me	21455am	21480me	
		6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1650	Germany, Deutsche Welle	6170as	7225as		15105as
		15595as	17810as	21680as	
1600-1700	Ghana, GBC Radio 1	4915do			
1600-1700	Ghana, GBC Radio 2	7295do			
1600-1700	Guam, KSDA AWR Agat	11980as			
1600-1645	Guam, KTWR Agana	15610as			
1600-1630	Italy, AWR Europe	15125eu			
1600-1700 vl	Italy, IRRS Milano	7125va			
1600-1630	Jordan, Radio	9560eu			
1600-1700 s	Lebanon, King of Hope	6280me			
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as		
1600-1630	Netherlands, Radio	9890as	13700as	15150as	17610as
1600-1700	Nigeria, Radio	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1630 s	Norway, Radio Norway Intl	15230eu	17825me		
1600-1700	Pakistan, Radio	11570me	13590me	15515af	15555me
		15675me	17725af		
1600-1700 vl	PNG, Natl BC	4890do			
1600-1700	Russia, Radio Moscow Intl	9505am	9660eu	9755eu	9825eu
		9880eu	9895eu	11705am	11940am
		15125as	15180na	15290na	15355as
		17580af	1770af	17735na	17760na
				17765af	17790na
1600-1700	S Africa, Channel Africa	5960af	17710af		
1600-1700 vl	S Africa, Radio Oranje	4875do			
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
1600-1605	Singapore, SBC Radio One	5010do	5052do	11940do	
1600-1700	South Korea, Radio Korea	4945af	5975as	15220af	

1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1700 irreg	Tanzania, Radio	11765af			
1600-1645	UAE, UAE Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700 vl	Uganda, Radio	4976do			
1600-1630	United Kingdom, BBC London	3915as	6190af	6195eu	9410eu
		9515na	9740va	11750as	12095eu
		15310as	15400eu	17840af	17860af
		21660af			
1600-1700	USA, CSMonitor Boston MA	11580as	13625va	17510na	21640af
1600-1700 sa	USA, CSMonitor Boston MA	13710na	17555am		
1600-1700	USA, KCBI Dallas TX	15375va			
1600-1700	USA, KTNB Salt Lk City UT	15590am			
1600-1700	USA, VOA Washington DC	6110as	7125as	9645as	9700as
		9760as	11920af	11995af	13710af
		15395as	15410af	15445af	17785af
		19379af			17895af
1600-1630	USA, VOA Washington DC	9700eu	15205eu	15255eu	19379eu
1600-1700	USA, WEWN Birmingham AL	17535na			
1600-1700	USA, WHRI Noblesville IN	9465na	13760na	15105na	
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420na			
1600-1700	USA, WWCR Nashville TN	13845am	15685am		
1600-1700	USA, WYFR Okeechobee FL	11705na	11830af	15355eu	17750eu
		21525af	21615af		
1600-1630	Vatican State, Vatican R	6245eu	7250eu	15090as	17865as
1600-1630 a	Vatican State, Vatican R	15090af	17730af		
1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1600-1630	Yemen, Radio TV Corp	5970eu	7190eu		
1615-1645	Sweden, Radio	6065eu			
1630-1700	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9510pa	9580pa	11695pa	13755as
1630-1657	Canada, RCI Montreal	7150as	9555as		
1630-1700	Ecuador, HCJB Quito	17790me	21455me		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	United Kingdom, BBC London	3915as	5975as	6190af	6195eu
		7160as	9410eu	9515na	9630af
		11750as	12095eu	15070va	15260na
		15420af	17860af	17880af	21470af
					21660af
1630-1700	USA, VOA Washington DC	15255eu	17735eu	19379eu	
1645-1700 s	Guam, KTWR Agana	15610as			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwhf	New Zealand, R NZ Intl	9675pa			

SELECTED PROGRAMS

Sundays

1600 KSDA, Guam: AWR Magazine. See S 0200.
 1610 Yemen Radio: Commentary press analysis.
 1615 BBC: Feature. See S 0230.
 1615 China Radio Intl: Sports Beat. See S 1215.
 1615 KSDA, Guam: DX Asiawaves. See S 0215.
 1615 Yemen Radio: Press Review. Local, Arab, and intl'.
 1620 China Radio Intl: China Anthology. See S 1220.
 1620 Yemen Radio: Western Songs And Music. The latest pop music from Jackson, Madonna, etc.
 1628 China Radio Intl: Music Album. See S 1228.
 1630 KSDA, Guam: Power To Cope. Advice for life's problems.
 1640 China Radio Intl: Listeners' Letterbox. See S 1240.
 1645 BBC: Letter From America. See S 0615.

Mondays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1610 Yemen Radio: Commentary. See S 1610.
 1615 BBC: New Ideas. A look at the latest technology.
 1615 China Radio Intl: The Business Show or China's Open Windows. See M 1215.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Yemen Radio: Music. Traditional songs from Yemen.
 1620 Yemen Radio: Feature. A miscellany of programs on Yemen.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1635 BBC: Tales from Wales (6th); A World of Its Own, elemental properties (13,20,27th).
 1640 China Radio Intl: Learn To Speak Chinese. See M 1240.
 1645 BBC: The World Today. International topics.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Tuesdays

1600 KSDA, Guam: Music Scrapbook. See S 2300.

1610 Yemen Radio: Commentary. See S 1610.
 1615 BBC: Megamix. See T 1130.
 1615 China Radio Intl: Current Affairs. See T 1215.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Yemen Radio: Music. See M 1615.
 1620 Yemen Radio: Spotlight. Current affairs in Yemen and highlights of the week.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 China Radio Intl: Listeners' Letterbox. See S 1240.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Wednesdays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1610 Yemen Radio: Commentary. See S 1610.
 1615 BBC: Rock/Pop Music. See T 0630.
 1615 China Radio Intl: Current Affairs. See T 1215.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Yemen Radio: Press Review. See S 1615.
 1620 Yemen Radio: Economic Corner. Economic achievements and problems in Yemen.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 China Radio Intl: Learn To Speak Chinese. See M 1240.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Thursdays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1610 Yemen Radio: Commentary. See S 1610.
 1615 BBC: Network UK. Domestic issues and events.
 1615 China Radio Intl: Current Affairs. See T 1215.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Yemen Radio: Music. See M 1615.

1620 Yemen Radio: Mosaic. A variety of topics, including the arts.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 China Radio Intl: Culture In China. See H 1240.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Fridays

1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1610 Yemen Radio: Commentary. See S 1610.
 1615 BBC: Science In Action. Latest in science and technology.
 1615 China Radio Intl: Current Affairs. See T 1215.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Yemen Radio: Music. See M 1615.
 1620 Yemen Radio: Yemen This Week. News.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 China Radio Intl: In The Third World. See F 1240.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Saturdays

1600 KSDA, Guam: Micronesian Snapshots. The news, music, and culture of Micronesia.
 1610 Yemen Radio: Commentary. See S 1610.
 1615 BBC: Sportsworld. See A 1401.
 1615 China Radio Intl: Press Clippings. See S 0015.
 1615 KSDA, Guam: DX Asiawaves. See S 0215.
 1615 Yemen Radio: Music. See M 1615.
 1620 China Radio Intl: Travel Talk. See S 0020.
 1620 Yemen Radio: International Events. The latest current affairs developments on the world scene.
 1628 China Radio Intl: Cooking Show. See S 0028.
 1630 KSDA, Guam: Digging Up The Past. See S 0230.
 1635 China Radio Intl: Music From China. See S 0035.
 1645 KSDA, Guam: Probe. See S 0245.

shortwave guide

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1800	Australia, Radio	5995pa 9510pa 13755pa	6060pa 9580pa	6080pa 11695pa	7240pa 11880pa
1700-1800	Azerbaijan, Voice of	15240as			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	4130af 11575as	7405af 15345as	8260af 15370as	9570as
1700-1800	Costa Rica, R forPeace Int	7385am	15030na	21465am	
1700-1727	Czech Republic, R Prague	6055af 15605af	7345af	9490af	13600af
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Ghana, GBC Radio 1	4915do			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1715	Israel, Kol Israel	7465na	11587eu	11675eu	15640eu
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio Japan	9750na	11815as	11865as	17750me
1700-1735	Kazakhstan, R Alma Ata	5035eu	5260eu	5960eu	15270eu
1700-1800 s	Lebanon, King of Hope	6280me			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwhf	New Zealand, R NZ Intl	6035pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785af
1700-1730 s	Norway, Radio Norway Intl	9655eu	15220eu		
1700-1800	Pakistan, Radio	11570eu	15550eu		
1700-1755	Poland, Polish R Warsaw	7270eu	9525eu		
1700-1800	Russia, Radio Moscow Intl	9505am 11940af 12065af 15395af 17735na	9540am 11960af 15290na 15425na 17760am	9880am 11995am 15355af 15580na 17790am	11705af 12050am 15385af 17605am
1700-1800	S Africa, Channel Africa	4945af	11750af		
1700-1800 vl	S Africa, Radio Oranje	4875do			
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1730	Switzerland, Swiss R Intl	13635af	15430af	17635af	21770af
1700-1800 irreg	Tanzania, Radio	11765af			
1700-1800 vl	Uganda, Radio	4976do			
1700-1730	United Kingdom, BBC London	3915as 9410eu 15070am 17880af	6180eu 9515na 15260af 21660af	6195eu 9740na 15400af	7325eu 12095eu 15420af
1700-1800	USA, CSMonitor Boston MA	11580as	13625va	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston MA	13710na	17555am		
1700-1800	USA, KCBI Dallas TX	15375va			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1730	USA, VOA Washington DC	11920af 15445af	11995af 17785af	13710af 17895af	15410af 19379eu
1700-1800	USA, WEWN Birmingham AL	13615na			
1700-1800	USA, WHRI Noblesville IN	13760am			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA		15420na		
1700-1800	USA, WWCR Nashville TN	13845am	15685am		
1700-1800	USA, WYFR Okeechobee FL	21500af			
1730-1800	Bulgaria, Radio	11720na	13670na		
1730-1800	Netherlands, Radio	6020af	7120af	21515af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17745af	17805af
1730-1800 vl	Sierra Leone, SLBS	3316do			
1730-1800	Sweden, Radio	6065af	9645me	15270af	
1730-1800	United Kingdom, BBC London	6180eu 9410eu 12095eu 15420af	6195eu 9515me 15070va 17780af	7160me 9740va 15260af 17880af	7325eu 11720as 15400af 21660af
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1745-1800 mtwhfa	Honduras R Copan Intl	15675am			
1745-1800	India, All India Radio	7412eu 11935af	9950me 15080af	11620eu	11860eu

1800-1900	Bahrain, Radio	6010do			
1800-1830	Belgium, R Vlaanderen	5910af	13685eu		
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio	11720na	13670na		
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R forPeace Int	7375am	7385am	13630am	15030am
1800-1900	Ecuador, HCJB Quito	21465am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Ghana, GBC Radio 1	4915do			
1800-1900	Ghana, GBC Radio 2	7295do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900 mtwhfa	Honduras, R Copan Intl	15675am			
1800-1900	India, All India Radio	7412eu 11935af	9950me 15080af	11620eu	11860eu
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1900	Lebanon, King of Hope	6280me			
1800-1900	Netherlands, Radio	6020af	7120af	17655af	21590af
1800-1850 smtwhf	New Zealand, R NZ Intl	11735pa			
1800-1830 mtwhf	Portugal, Radio	9780eu			
1800-1900	Russia, Radio Moscow Intl	9880eu 12015af 15290na 15425as 17790na	11630af 12050af 15355me 17605na 17875as	11770as 15150af 15385af 17760af 21670me	11995na 15185af 15405as
1800-1900 vl	S Africa, Radio Oranje	4875do			
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900 vl	Sierra Leone, SLBS	3316do			
1800-1900	Sudan, Radio Omdurman	7200do	9165do		
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900 irreg	Tanzania, Radio	11765af			
1800-1900 vl	Uganda, Radio	4976do			
1800-1830	United Kingdom, BBC London	3255af 7325eu 11955au 15420af	6180eu 9410eu 12095eu 17880af	6195eu 9740va 15070va 1780af	7160va 11720as 15400af
1800-1900	USA, CSMonitor Boston MA	9455pa	15665eu	17510na	17612af
1800-1900 sa	USA, CSMonitor Boston MA	17555am			
1800-1900	USA, KCBI Dallas TX	15375am			
1800-1900 irreg	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	3980me 11920af 15410af 19379eu	6040eu 11995af 15580af	9700eu 13710af 17800af	9760eu 15205eu 17895af
1800-1900	USA, WEWN Birmingham AL	13615na	15695na		
1800-1900	USA, WHRI Noblesville IN	9590na	13760na	17830na	
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA		15420na		
1800-1900	USA, WWCR Nashville TN	13845am	15685am		
1800-1900	USA, WYFR Okeechobee FL	21500af			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730me
1830-1900	Bulgaria, Radio	15330na			
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	15440eu
1830-1900	Serbia, Radio Yugoslavia	6100eu	7200eu	9505eu	17710af
1830-1900	Slovakia, R Slovakia Intl	5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	Switzerland, Swiss R Intl	6065eu	9655af	15270af	15505af
1830-1900	United Kingdom, BBC London	3255af 9410eu 15070au	6180eu 9740am 15400af	6195eu 11955au 15420af	7325eu 12095eu 17880af
1835-1900	Kazakhstan, R Alma Ata	17605eu	17910eu		
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af		
1845-1900 irreg s	Mali, Radio Malienne	4783do	4835do	5995do	
1850-1900 smtwhf	New Zealand, R NZ Intl	11735pa			

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1900	Australia, Radio	5995pa 7260pa 11880pa	6060pa 9580pa	6080pa 11695pa	7240pa 11855pa
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1900-2000	Algeria, Radio Algiers	9535eu	15205eu	17745eu	
1900-2000	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	5995pa 7240pa 11880pa	6000pa 6060pa 11695pa	6080pa 11720pa	6080pa 11855pa
1900-2000	Bahrain, Radio	6010do			
1900-1930	Bulgaria, Radio	11720af			

1900 UTC continued

1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af	11515me	
1900-2000	Costa Rica, R forPeace Int	7385am	15030na	21465am	
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu	21480eu
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af	11810af
		13790af	15350af	15390af	17765af
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1900-1930	Israel, Kol Israel	7465eu	9435eu	11585na	11603na
		11675eu	15640na	15650af	17575na
		7125va			
1900-2000 vl	Italy, IRRS Milano	9640am	9750as	11815pa	11865pa
1900-2000	Japan, NHK/Radio Japan	11875pa			
		13620na			
1900-2000	Kuwait, Radio	6280me			
1900-2000	Lebanon, King of Hope	9710eu			
1900-1930	Lithuania, Radio Vilnius	11920as			
1900-2000 s	Morocco, RTV Marocaine	6020af	7120af	17655af	21590af
1900-1930	Netherlands, Radio	11735pa			
1900-2000 smtwhf	New Zealand, R NZ Intl	3326do	4990do		
1900-2000	Nigeria, Radio	7255af			
1900-2000	Nigeria, Voice of	15355pa	15365am		
1900-1930 s	Norway, Radio Norway Intl	17900af			
1900-1930 mtwhf	Portugal, Radio	9750eu	11810eu	11940eu	15365eu
1900-2000	Romania, R Romania Intl	9835eu			
1900-2000	Russia, AWR Russia	9610af	9860eu	9880af	11630eu
1900-2000	Russia, Radio Moscow Intl	11760na	11770af	11840af	12015eu
		15180af	15290eu	15355eu	15385af
		15480af	15535af	15580af	15405af
		17760na		17560af	17605af
		9465as			
1900-2000	Saipan, KFBS Marpi	9705eu	9720eu		
1900-2000	Saudi Arabia, BSKSA	3316do			
1900-2000 vl	Sierra Leone, SLBS	15375af			
1900-2000	Spain, Spanish Natl Radio	9720eu	15120eu		
1900-2000	Sri Lanka, SLBC Colombo	3200af	3240af		
1900-2000	Swaziland, Trans World R	11765af			
1900-1915 irreg	Tanzania, Radio	4976do			
1900-2000 vl	Uganda, Radio	3255af	6005af	6180eu	6190af
1900-1930	United Kingdom, BBC London	6195eu	7160me	9410eu	9630af
		12095eu	15070va	15400af	17880af
		9445pa		15665eu	17510na
1900-2000	USA, CSMonitor Boston MA	17555am			
1900-2000 sa	USA, CSMonitor Boston MA	15375va			
1900-2000	USA, KCBI Dallas TX	15590am			
1900-2000	USA, KTBN Salt Lk City UT	3980me	6040me	9525as	9700eu
1900-2000	USA, VOA Washington DC	9760eu	11870as	11995af	13710af
		15205eu	15410af	15495af	15580af
		19379eu			17800af
1900-2000	USA, WEWN Birmingham AL	13615na	15695na		
1900-2000	USA, WHRI Noblesville IN	13760na			
1900-2000	USA, WINB Red Lion PA	15295eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	13845am	15420na		
1900-2000	USA, WWCR Nashville TN	15355eu	21615af		
1900-2000	USA, WYFR Okeechobee FL	9840eu	12020eu	15010eu	
1900-1930	Vietnam, Voice of	3356af	4830af	7255af	
1910-1920	Botswana, Radio	9022eu	15260eu		
1930-2000	Iran, VOIRI Tehran	17605af	21590af		
1930-2000	Netherlands, Radio	6135eu	7270eu	7285eu	9525eu
1930-2000	Poland, Polish R Warsaw	3255af	6005af	6180eu	6190af
1930-2000	United Kingdom, BBC London	6195eu	7160me	9410eu	9630af
		12095eu	15070am	15400af	17880af
		7275eu	9710eu	11800eu	
1935-1955	Italy, RAI Rome	11790eu	11850eu		
1940-2000 mha	Mongolia, R Ulaanbaatar	5885eu	7250eu		
1950-2000	Vatican State, Vatican R				

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2100	Australia, Radio	5995pa	6000pa	6060pa	6080pa
		7240pa	7260pa	9580pa	11695pa
		11880pa	11910pa	11720as	11855pa
2000-2100	Bahrain, Radio	6010do			
2000-2100	Bulgaria, Radio	11720eu	15330na		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	4130eu	8260eu	9440af	9920eu

2000-2100	Costa Rica, R forPeace Int	11500eu	11715af	15110af	
2000-2027	Czech Republic, R Prague	7385am	15030am	21465am	9490eu
2000-2100	Ecuador, HCJB Quito	6055eu	7300eu	7345eu	
2000-2100	Ghana, GBC Radio 1	21455am			
2000-2100	Ghana, GBC Radio 2	4915do			
2000-2015 mtwhfa	Greece, Voice of	7295do			
2000-2100	Indonesia, Voice of	7450eu	9375eu		
2000-2030	Iran, VOIRI Tehran	9675me	11752eu		
2000-2100 vl	Italy, IRRS Milano	9022eu	15260eu		
2000-2010 mtwhf	Kenya, Kenya BC Corp	7125va			
2000-2100	Kuwait, Radio	4935do			
2000-2100	Lebanon, King of Hope	13620na			
2000-2010 smwha	Mongolia, R Ulaanbaatar	6280me			
2000-2025	Netherlands, Radio	11790eu	11850eu		
2000-2100	New Zealand, R NZ Intl	17605af	21590af		
2000-2100	Nigeria, Radio	11735pa			
2000-2100	Nigeria, Voice of	3326do	4990do		
2000-2100	North Korea, R Pyongyang	7255af			
2000-2100	Russia, Radio Moscow Intl	6576eu	9345eu	9640af	9977af
		9785eu	9870eu	9890eu	11630af
		11675af	11730na	11750na	11770af
		12050na	15150af	15180af	15290na
		15425na	15580na	17560af	15355as
		17760na			15405af
					17720na
2000-2100 vl	S Africa, Radio Oranje	4875do			
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2100 vl	Sierra Leone, SLBS	3316do			
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2045	Swaziland, Trans World R	3200af	3240af		
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af	15505af
2000-2100	Turkey, Voice of	9445eu			
2000-2100 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom, BBC London	5975na	6180eu	6195eu	7160as
		7325eu	9410eu	9740as	11955au
		15260sa	15340au	15400au	12095eu
					17880af
2000-2100	USA, CSMonitor Boston MA	9430as	9455as	15665eu	17510na
		17555sa			
2000-2100	USA, KCBI Dallas TX	15375va			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2030	USA, VOA Washington DC	11720af	13710af	15160af	15410af
		15495af	15580af	17895af	21485af
2000-2100	USA, VOA Washington DC	6040me	9700eu	9760eu	15205eu
		19379eu			
2000-2100	USA, WEWN Birmingham AL	13615na			
2000-2100	USA, WHRI Noblesville IN	13760na			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	13845va	15420na		
2000-2100	USA, WWCR Nashville TN	15355eu	15665eu	17612af	21525eu
2000-2100	USA, WYFR Okeechobee FL	9645af	11625af	15090af	
2000-2030	Vatican State, Vatican R	12085na	15095na		
2005-2100	Syria, Radio Damascus	4935do			
2010-2100 sa	Kenya, Kenya BC Corp	7235me	9575me	11800me	
2025-2045	Italy, RAI Rome	5995eu	7235eu	13650eu	13670af
2030-2100	Canada, RCI Montreal	15325eu	17820af	1785af	17875af
		6145eu	9830eu	13830eu	
2030-2035	Croatia, Croatian Radio	15375af			
2030-2100	Egypt, Radio Cairo	5925eu			
2030-2100 mh	Estonia, Radio	5935do			
2030-2035	Latvia, Radio Riga	11980as			
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	7345eu			
2030-2057	Slovakia, R Slovakia Intl	5975eu	6035af	9640me	9870eu
2030-2100	South Korea, Radio Korea	6065af	9655eu		
2030-2100	Sweden, Radio	5975na	6005af	6180eu	6195eu
2030-2100	United Kingdom, BBC London	7325eu	9410eu	9630af	11955au
		15260au	15340au	15400af	12095eu
					15070af
2030-2100	USA, VOA Washington DC	13710af	15410af	15495af	15580af
		17800af	17895af	21485af	
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2130	Australia, Radio	9645pa	11720pa	11855pa	11880pa
2100-2106	Bahrain, Radio	6010do			
2100-2130	Belguim, R Vlaanderen	5910eu	9905eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af
		15325eu	17820af	17850af	17875eu
2100-2200	China, China Radio Intl	4130eu	8260eu	9920eu	9940af
		11500af	11715af	15110af	
2100-2200	Costa Rica, R forPeace Int	7385am	15030na	21465na	

2100 UTC continued

2100-2200	Cuba, Radio Havana Cuba	17760eu			
2100-2130	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu
2100-2130	Ecuador, HCJB Quito	21455va			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9715af	9760as	9765as	11785as
		13690as	15135af	15350af	15360as
2100-2200	Ghana, GBC Radio 1	4915do			
2100-2200	Ghana, GBC Radio 2	7295do			
2100-2200 mtwhfa	Honduras, R Copan Intl	15675am			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200 vl	Iraq, Radio Iraq Intl	11810na			
2100-2130 vl	Italy, IRRS Milano	7125va			
2100-2200	Japan, NHK/Radio Japan	6035eu	9640eu	9750eu	11815au
		11925eu	15430af		
2100-2200	Lebanon, King of Hope	6280me			
2100-2200 mtwrf	Lebanon, Wings of Hope	11530me			
2100-2136 smtwhf	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2130 s	Norway, Radio Norway Intl	15165na			
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9750eu	11940eu
2100-2200	Russia, Radio Galaxy	11880eu			
2100-2200	Russia, Radio Moscow Intl	9480af	9530na	9610me	9725eu
	9880eu	11730na	11750na	11760af	11905af
	15150as	15180af	15290na	15350af	15355as
	15480as	15580na	17605af	17690af	17720as
2100-2200 vl	S Africa, Radio Oranje	4875do			
2100-2130	Serbia, Radio Yugoslavia	6100eu	9505eu		
2100-2200 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6070eu	6090eu	7150eu
	7195eu	7240eu	7285eu	9600eu	9640eu
	15135eu	15195eu	15570eu	17725eu	
2100-2130	United Kingdom, BBC London	3225af	5975ca	6005af	6180eu
	6195eu	7180pa	7325eu	9410eu	9590na
	12095eu	15070af	15260sa	15340au	15370as
2100-2200	USA, CSMonitor Boston MA	9430as	9455as	15665eu	17510na
		17555sa			
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200	USA, VOA Washington DC	6040me	9700eu	9760eu	11870as
	11960eu	13710af	15185as	15205eu	15410af
	15580af	17735as	17800af	17895af	19379eu
2100-2200	USA, WEWN Birmingham AL	13615na			
2100-2200	USA, WHRI Noblesville IN	13760na			
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595va		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA		15420na		
2100-2200	USA, WWCR Nashville TN	13845va	15685va		
2100-2200	USA, WYFR Okeechobee FL	15565eu	17612eu	17750af	21525eu
		21615eu			
2100-2110	Vatican State, Vatican R	5885eu	7250eu		
2103-2110	Croatia, Croatian Radio	9830eu	13830eu		
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom, BBC Carib	15390ca	17715ca		
2130-2200	Albania, R Tirana Intl	9780eu	11840eu		
2130-2200	Australia, Radio	9645pa	11720pa	11855pa	11880pa
	15240pa	15320pa	15365pa	17795pa	21740pa
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu
2130-2200	Finland, Radio	6120eu	11755eu	15440eu	
2130-2200	Israel, Kol Israel	7465na	9435na	11587na	11603na
		11675eu	15640eu	15650na	17575sa
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu		
2130-2200	Sweden, Radio	6065eu	9655pa	11955as	
2130-2200	United Kingdom, BBC Fik Is	13660sa			
2130-2200	United Kingdom, BBC London	3225af	5975ca	6005af	6180eu
	6195eu	7180pa	7325eu	9410eu	9590na
	12095eu	15070af	15260sa	15340au	15370as
2139-2200	New Zealand, R NZ Intl	15120pa			
2140-2200 s	Eq Guinea, Radio Africa	7190af			
2145-2158	Armenia, Radio Yerevan	9450na	11920na	11945na	11960na
		15385na			
2145-2200	Bulgaria, Radio	11720na	15330na		
2145-2200	South Korea, Radio Korea	6480eu	15575eu		

2200 UTC

[6:00 PM EDT/3:00 PM PDT]

2200-2230	Albania, R Tirana Intl	9760eu	11825eu		
2200-2230	Australia, Radio	9540as	9645pa	11720pa	11855as
	11880pa	15240pa	15320pa	15365pa	17795pa
				15330na	
2200-2300	Bulgaria, Radio	11720na			
2200-2300	Canada, CBC Northern Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960na	5995eu	7195eu	9755na
	11705as	11730ca	11875na	13670ca	15305ca
2200-2300	China, China Radio Intl	9880eu			
2200-2220 s	Congo, R Natl Congolaise	4765do	5985do		
2200-2300	Costa Rica, R forPeace Int	7385ca	15030ca	21465ca	
2200-2300	Cuba, Radio Havana Cuba	6180va			
2200-2230	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245 s	Eq Guinea, Radio Africa	7190af			
2200-2245	Finland, Radio	9730eu	11740eu	11810eu	
2200-2300	Ghana, GBC Radio 1	4915do			
2200-2300	Ghana, GBC Radio 2	7295do			
2200-2230 mtwhfa	Honduras, R Copan Intl	15675am			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2300 vl	Iraq, Radio Iraq Intl	11810am	15180am	17940am	
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Lebanon, King of Hope	6280me			
2200-2300 mtwrf	Lebanon, Wings of Hope	11530me			
2200-2230 mtwhf	Lithuania, Radio Vilnius	12040na			
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300 vl	Malaysia, RTM Sarawak	4950do			
2200-2300	New Zealand, R NZ Intl	15120pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2200-2300	Russia, Radio Moscow Intl	9480af	9530na	9885eu	9715eu
	9725eu	9815eu	9820eu	11705na	11750na
	11905af	12050na	15140af	15290na	15410na
	17570af	17675af	17720na	21690af	17560af
2200-2300 vl	S Africa, Radio Oranje	4875do			
2200-2300 vl	Sierra Leone, SLBS	3316do			
2200-2300 vl	Singapore, SBC Radio One	5010do	5052do	11940do	
2200-2300 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, Radio Korea	7275as	9640as		
2200-2245	South Korea, Radio Korea	6480eu	15575eu		
2200-2230	Switzerland, Swiss R Intl	9810am	9885am	12035am	15570am
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21720eu		
2200-2300	Turkey, Voice of	7185me	9445na	11895eu	
2200-2300	UAE, Radio Abu Dhabi	11885na	15305na	15315na	
2200-2300	Ukraine, R Ukraine Intl	4795eu	6020eu	7195eu	7240eu
		9710eu	9860eu		
2200-2300	United Kingdom, BBC London	5970eu	5975na	6195eu	7325eu
	9410eu	9570pa	9590na	9750as	9915sa
	11955pa	12095eu	15070va	15260sa	15340au
2200-2300	USA, CSMonitor Boston MA	9465na	13625as	15665eu	17555sa
2200-2300	USA, KCBI Dallas TX	15725va			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, VOA Washington DC	7120as	7140as	7215as	9770as
	11760as	15185as	15290as	15305as	17735as
				17820as	
2200-2300	USA, WEWN Birmingham AL	7425am			
2200-2300	USA, WHRI Noblesville IN	13760eu			
2200-2245	USA, WINB Red Lion PA	15185eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA		15420na		
2200-2300	USA, WWCR Nashville TN	13845am			
2200-2300	USA, WYFR Okeechobee FL	17612na	21525eu		
2200-2230 s	USA, KGEI San Francisco CA	15280sa			
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Australia, Radio	9645pa	11720pa	11855pa	11880pa
	15240pa	15320pa	15365pa	17795pa	21740pa
2230-2300	Canada, RCI Montreal	5960am	5995eu	7195eu	9755am
		13670am			
2230-2300	Sweden, Radio	6065as	11910eu		
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2257	Armenia, Radio Yerevan	9450na	11920na	11945na	11960na
		15385na			
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R	9600as	11830as	15090pa	

2300 UTC

[7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2400	Australia, Radio	11720pa	11855pa	11880pa	15240pa				
		15320pa	15365pa	17795pa	21740pa				
2300-2400 vl	Australia, VLBA Alice Spg	4835do							
2300-2400 vl	Australia, VL8K Katherine	5025do							
2300-2400 vl	Australia, VL8T Tent Crk	4910do							
2300-2315	Bulgaria, Radio	11720na	15330na						
2300-2400	Canada, CFCX Montreal	6005do							
2300-2400	Canada, CFRX Toronto	6070do							
2300-2400	Canada, CFVP Calgary	6030do							
2300-2400	Canada, CHNX Halifax	6130do							
2300-2400	Canada, CKZU Vancouver	6160do							
2300-2400 mtwhf	Canada, RCI Montreal	5995eu	7195eu	9755na	13670na				
2300-2400 as	Canada, RCI Montreal	5995eu	7195eu	9755na	11940na				
		13670na	15235na						
2300-2400	Costa Rica, AWR Alajuela	9725ca							
2300-2400	Costa Rica, R forPeace Int	7385na	13630na	15030na	21465na				
2300-2400	Ecuador, HCJB Quito	9745am	21455am						
2300-2315 a	Eqt Guinea, Radio Africa	7203af							
2300-2305	Ghana, GBC Radio 1	4915do							
2300-2305	Ghana, GBC Radio 2	7295do							
2300-2400	Guam, KSDA AWR Agat	15610as							
2300-2400	India, All India Radio	9910as	11745as	11785as	15110as				
		15145as							
2300-2400 vl	Iraq, Radio Iraq Intl	15180am							
2300-2400	Japan, NHK/Radio Japan	6060eu	6125eu	7140eu	15430as				
		17810as							
2300-2400	Lebanon, King of Hope	6280me							
2300-2400 mtwhf	Lebanon, Wings of Hope	11530me							
2300-2330	Lithuania, Radio Vilnius	11750na	12040na						
2300-2400 vl	Malaysia, RTM Kota Kinaba	5980do							
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do							
2300-2400 vl	Malaysia, RTM Sarawak	4950do	7160do						
2300-2400	New Zealand, R NZ Intl	15120pa							
2300-2350	North Korea, R Pyongyang	11700am	13850am						
2300-2330 s	Norway, Radio Norway Intl	9655am	11795am						
2300-2400 mtwhfa	Palau, KHCN Voice of Hope	11980as							
2300-2400 vl	PNG, Natl BC	4890do							
2300-2400	Russia, Radio Moscow Intl	9480na	9815eu	9860na	11720na				
		11790na	11805na	11840na	11975na				
		12050na	15140na	15410na	15425na				
		15535as	17560as	17570as	21625as				
2300-2400 vl	S Africa, Radio Oranje	21670as	21690as						
2300-2310 vl	Sierra Leone, SLBS	4875do							
2300-2400	Singapore, SBC Radio One	5010do	5052do	11940do					
2300-2400 vl	Solomon Islands, SIBC	5020do	9545do						
2300-2330	Sweden, Radio	6065pa	11910pa						
2300-2400	Thailand, Radio	4830eu	9655as	11905as					
2300-2400	UAE, Radio Abu Dhabi	11855na	15305na	15315na					
2300-2330	United Kingdom, BBC London	5970eu	5975na	6175na	6195as				
		7180as	7325eu	9410eu	9570as				
		9590na	9915sa	11750sa	11945as				
		11955va	12095na	15070am	15260sa				
		15280as							
2300-2400	USA, CSMonitor Boston MA	9465na	13625as	15665eu	17555am				
2300-2400	USA, KCBI Dallas TX	15725va							
2300-2400	USA, KTBN Salt Lk City UT	15590na							
2300-2400	USA, VOA Washington DC	7120as	7140as	7215as	9770as				
		11760as	15185as	15290as	15305as				
		17735as	17820as						
2300-2400	USA, WEWN Birmingham AL	7425am							
2300-2400	USA, WHRI Noblesville IN	13760am							
2300-2400	USA, WINB Red Lion PA	15145eu							
2300-2400	USA, WJCR Upton KY	7490na	13595na						
2300-2400	USA, WWCR Nashville TN	13845am	15685am						
2300-2315	Vatican State, Vatican R	9600as	11830as	15090pa					
2315-2330	United Kingdom, BBC London	6110sa	9560sa	9825sa	11765sa				
		15390sa							
2330-0000	Belgium, R Vlaanderen	9930am	13655am						
2330-2400 a	Colombia, Radio Nacional	11822.5	17865am						
2330-2400	Netherlands, Radio	6020na	6165na						
2330-2400 m	Sri Lanka, SLBC Colombo	15425am							
2330-2400	Sweden, Radio	6065as	11910eu						
2330-2400	United Kingdom, BBC London	5975na	6175na	6195as	7325eu				
		9570as	9590na	9915sa	11750sa				
		11945as	11955am	12095na	15070am				
		15260sa	15280as	15340am					
2330-2400	Vietnam, Voice of	9840as	12020as	15010as					
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa					

SELECTED PROGRAMS

Sundays

- 2300 KSDA, Guam: Music Scrapbook. No details available.
 2305 BBC: World Business Review. The previous week's news and upcoming events.
 2315 BBC: Ray On Record. Robin Ray presents selections of classical music.
 2315 KSDA, Guam: Bible In Living Sound. Dramatized Bible stories.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2335 Radio Netherlands: East Of Edam. See S 0235.

Mondays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2305 BBC: World Business Report. The latest news from the markets worldwide.
 2315 BBC: On Screen. Movies and the movie business reports.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop charts.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2350 Radio Netherlands: Let's Get To Business. See M 1250.

Tuesdays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Concert Hall. This month, classics featuring themes of war.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2335 Radio Netherlands: Newslines. See S 0035.

- 2350 Radio Netherlands: No Boundaries. See T 0150.

Wednesdays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: From Our Own Correspondent. See S 0330.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2335 Radio Netherlands: Newslines. See S 0035.
 2350 Radio Netherlands: Encore! See W 0150.

Thursdays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.

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- 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Music Review. News and features from the world of classical music.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2335 Radio Netherlands: Newslines. See S 0035.
 2350 Radio Netherlands: Research File. See M 1150.

Fridays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 BBC: Multitrack 3. Sarah Ward presents the latest from the alternative pop scene.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2335 Radio Netherlands: Newslines. See S 0035.
 2350 Radio Netherlands: Documentary. See W 1150.

Saturdays

- 2300 KSDA, Guam: Micronesia Snapshots. See A 1600.
 2305 BBC: Words Of Faith. See M 1209.
 2310 BBC: Book Choice. See W 0425.
 2315 BBC: A Jolly Good Show. See T 1515.
 2315 KSDA, Guam: DX Asiawaves. See S 0215.
 2330 KSDA, Guam: Focus On Living. See A 0215.
 2335 Radio Netherlands: Newslines. See S 0035.
 2345 KSDA, Guam: Probe. See S 0245.
 2350 Radio Netherlands: Toward 2000. See F 1150.

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Synchronous detector: Selectable sideband synchronous detector helps to eliminate interference from adjacent stations and annoying heterodyne tones.

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400 Channels • 20 Banks • Turbo Scan
Rotary tuner feature • Auto Store • Auto Sort
Size: 2-3/4" Wide x 1-1/2" Deep x 7-1/2" High

Frequency Coverage	Default Steps
25.000 - 25.995 MHz. (AM)	5.0 KHz
26.000 - 28.995 MHz. (AM)	5.0 KHz
29.000 - 53.995 MHz. (NFM)	5.0 KHz
54.000 - 71.995 MHz. (WFM)	50.0 KHz
72.000 - 75.995 MHz. (NFM)	5.0 KHz
76.000 - 107.995 MHz. (WFM)	50.0 KHz
108.000 - 136.995 MHz. (AM)	12.5 KHz
137.000 - 173.995 MHz. (NFM)	5.0 KHz
174.000 - 215.995 MHz. (WFM)	50.0 KHz
216.000 - 224.995 MHz. (NFM)	5.0 KHz
225.000 - 399.995 MHz. (AM)	12.5 KHz
400.000 - 511.995 MHz. (NFM)	12.5 KHz
512.000 - 549.995 MHz. (WFM)	50.0 KHz
760.000 - 823.995 MHz. (NFM)	12.5 KHz
849.0125 - 868.995 MHz. (NFM)	12.5 KHz
894.0125 - 1,300.000 MHz. (NFM)	12.5 KHz

Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, have asked us for a world class handheld scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT has what you want. You can program frequencies such as police, fire, emergency, race cars, marine, military aircraft, weather, and other broadcasts into 20 banks of 20 channels each. The new rotary tuner feature enables rapid and easy selection of channels and frequencies. With the AUTO STORE feature, you can automatically program any channel. You can also scan all 400 channels at 100 channels-per-second speed because the Bearcat 2500XLT has TURBO SCAN built-in. To make this scanner even better, the BC2500XLT has AUTO SORT - an automatic frequency sorting feature for faster scanning within each bank. Order your scanner from CEI.

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- Bearcat 350A-F info mobile \$119.95
- Bearcat 210XLT-F base/SPECIAL \$119.95
- Bearcat 200XLT-F handheld/SPECIAL \$208.95
- Bearcat 148XLT-F base w/ weather alert. \$94.95
- Bearcat 147XLT-F base \$83.95
- Bearcat 100XLT-F handheld \$149.95
- Bearcat 70XLT-F handheld/SPECIAL \$119.95
- Bearcat 65XLT-F handheld/SPECIAL \$99.95
- Bearcat BCT2-F info mobile \$139.95

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On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. Supplies of full coverage 800 MHz. scanners are in very short supply. When this inventory is exhausted, there will be no more full coverage scanners available to our U.S. customers. If you have an inquiring mind that wants to know, today could be your last opportunity to own a Bearcat 800XLT scanner. Call Communications Electronics now to order your scanner.

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Wide 800 MHz. coverage • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512, 806-912 MHz.
The Uniden 800XLT receives 40 channels in two banks.
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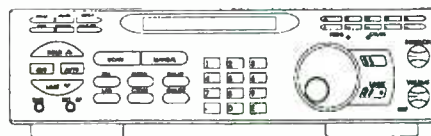
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25.000 - 28.995 MHz. (AM), 29.000 - 54.000 MHz. (NFM), 54.000 - 71.995 MHz. (WFM), 72.000 - 75.995 MHz. (NFM), 76.000 - 107.995 MHz. (WFM), 108.000 - 136.995 MHz. (AM), 137.000 - 173.995 MHz. (NFM), 174.000 - 215.995 MHz. (WFM), 216.000 - 224.995 MHz. (NFM), 225.000 - 399.995 MHz. (AM), 400.000 - 511.995 MHz. (NFM), 512.000 - 549.995 MHz. (WFM), 760.000 - 823.9875 MHz. (NFM), 849.0125 - 868.9875 MHz. (NFM), 894.0125 - 1,300.000 MHz. (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include VFO Control - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. **Weather Alert** - Lets your scanner function as a severe weather warning radio. **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. **20 banks** - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: P5001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; P5002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from CEI now.



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Grundig Yacht Boy 230-F portable	\$139.95
Grundig Traveller 2-F portable	\$79.95
Sangean ATSG6G-F ultra compact	\$149.95
Sangean ATSG6G-F radio with antenna & AC adapter	\$169.95
Sangean ATSG800-F portable	\$79.95
Sangean ATSG803A-F portable with AC adapter	\$159.95
Sangean ATSG808-F portable	\$159.95
Sangean ATSG18-F portable without cassette recorder	\$189.95
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Sangean ANT60-F portable shortwave antenna	\$9.95

Weather Stations

Public safety agencies responding to hazardous materials incidents must have accurate, up-to-date weather information. The Davis Weather Monitor II is our top-of-the-line weather station which combines essential weather monitoring functions into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Our package deal includes the new high resolution 1/100 inch rain collector part #7852-F, and the external temperature/humidity sensor, part #7859-F. The package deal is order #DAV1-F for \$524.95 plus \$15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for \$149.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part #7862-F. For Apple Mac Plus (AM) or higher including Quadra or PowerBook, order part #7866-F.

Other neat stuff

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WR200-F Weather Radio with storm alert	\$39.95
RELM RH256NB-F VHF synthesized transceiver	\$289.95
Ranger RC12950-F 25 watt 10 meter ham radio	\$244.95
Ranger RC12970-F 100 watt 10 meter ham radio	\$369.95
Uniden LRD9000W-F Laser/Radar Detector	\$159.95
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LIN-F Latest Intelligence by James Tunnell	\$12.95
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FBW-F Uniden Western Frequency Directory	\$12.95

Buy with confidence

It's easy to order from CEI. Mail orders to: Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$15.00 per radio for U.P.S. ground shipping and handling in the continental U.S.A. unless otherwise stated. Add \$6.00 shipping for all accessories and publications. Add \$6.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/FPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Order toll-free by calling 1-800-USA-SCAN. For information or if outside the U.S.A. call 313-996-8888. FAX anytime, dial 313-663-8888. Order your electronic equipment from Communications Electronics Inc. today.

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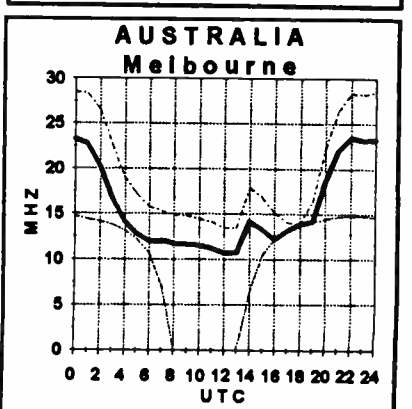
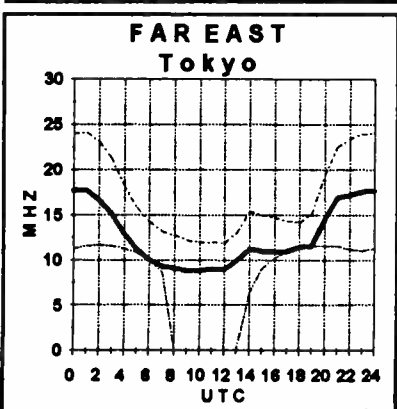
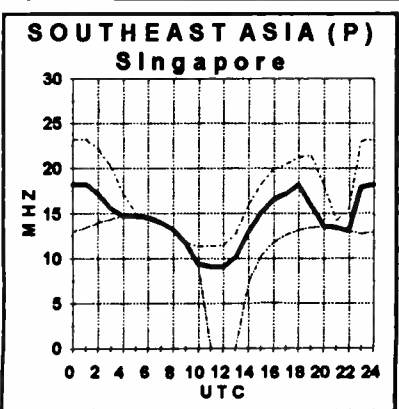
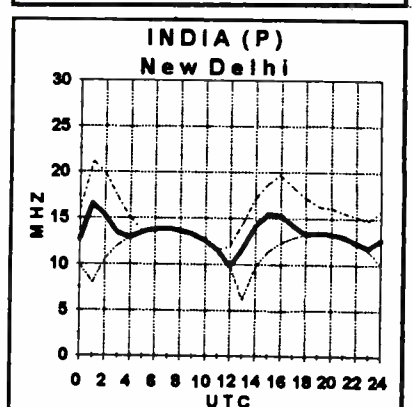
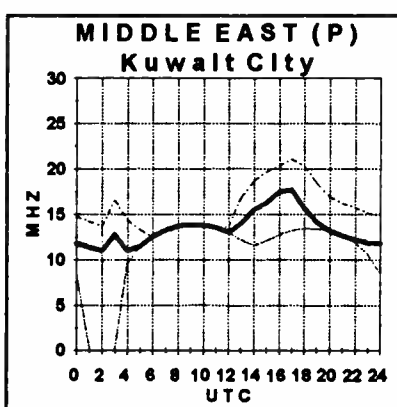
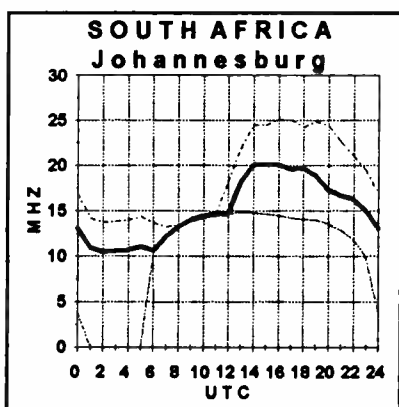
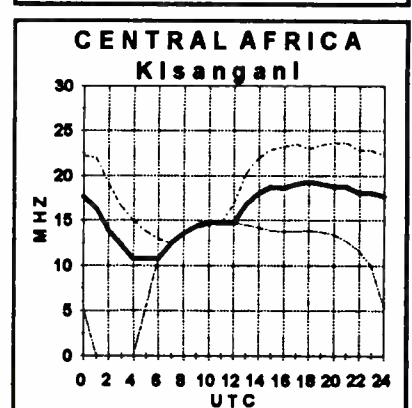
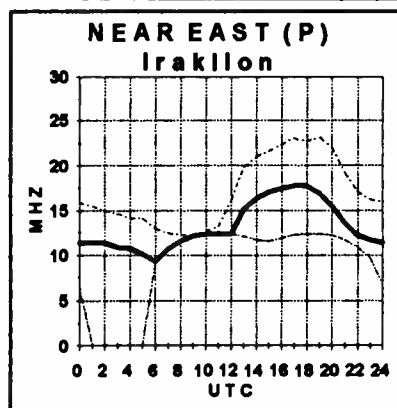
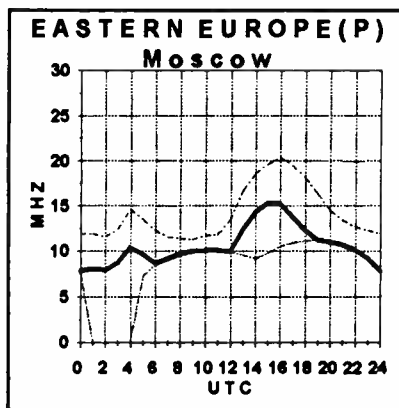
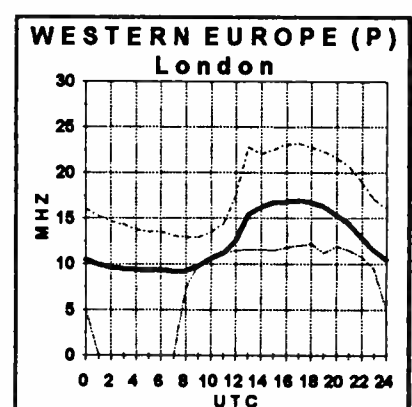
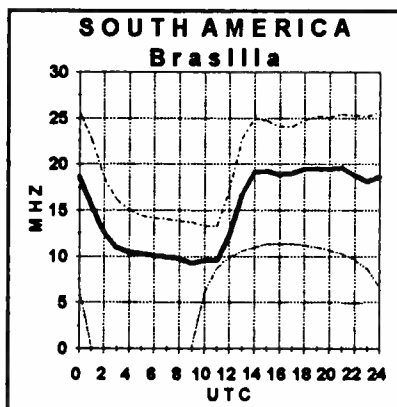
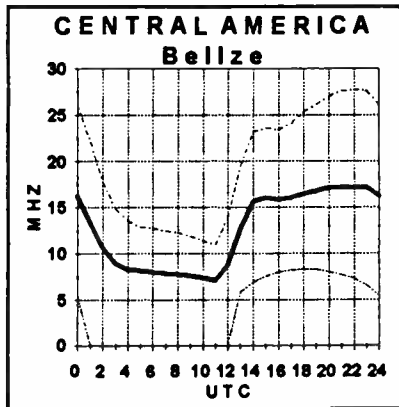
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For information call 313-996-8888 or FAX 313-663-8888

Propagation conditions: Eastern United States

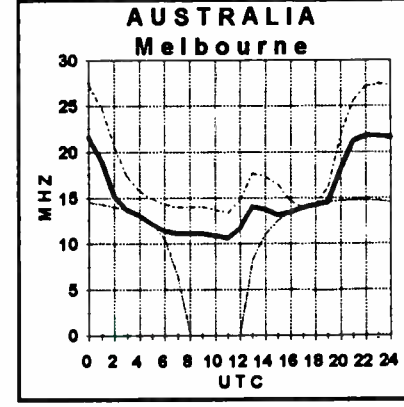
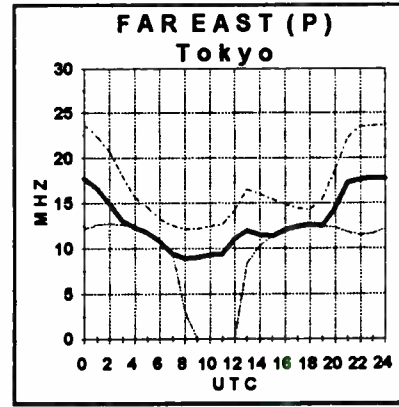
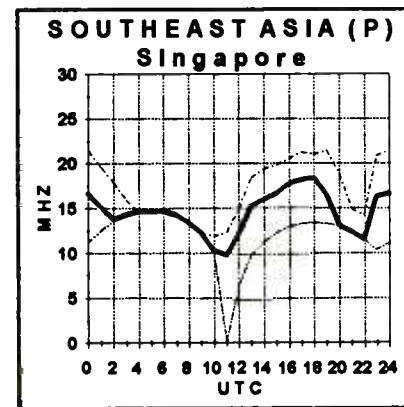
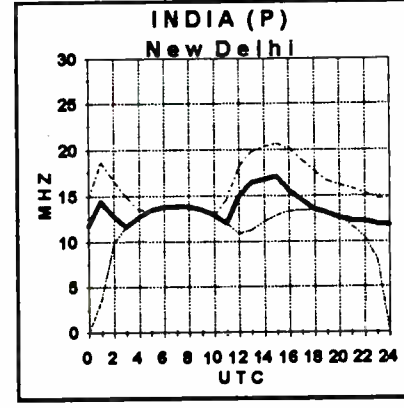
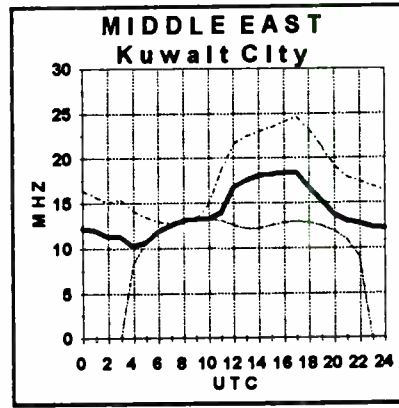
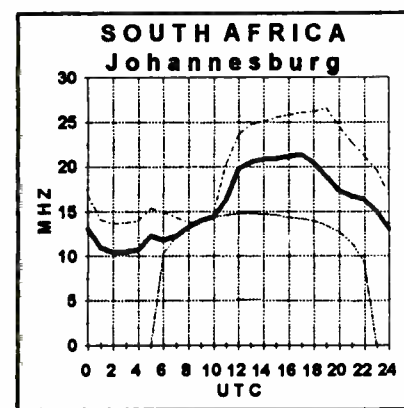
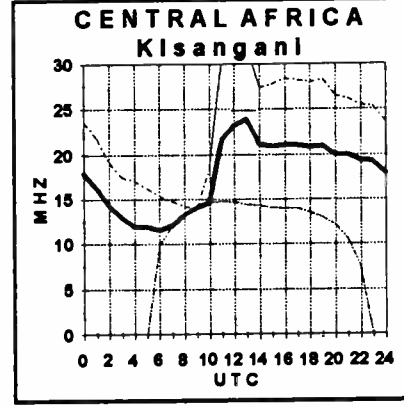
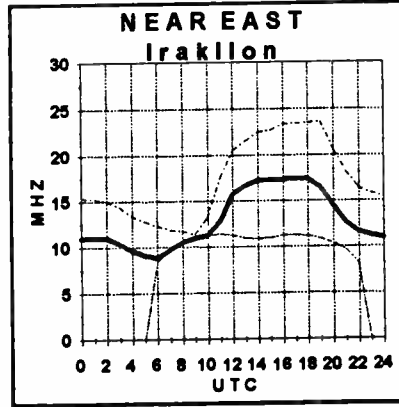
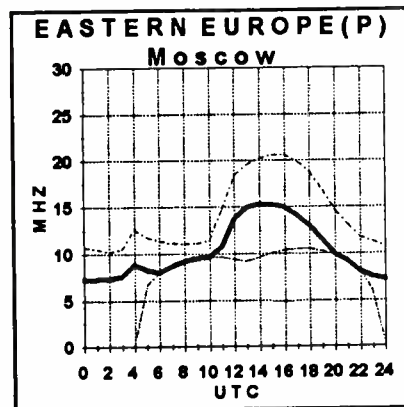
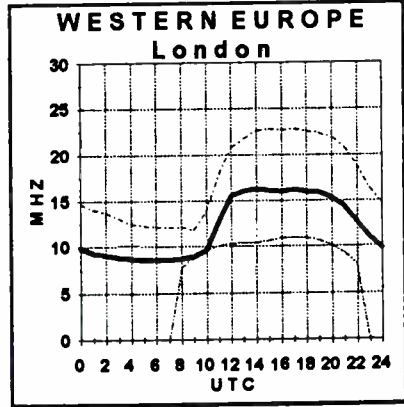
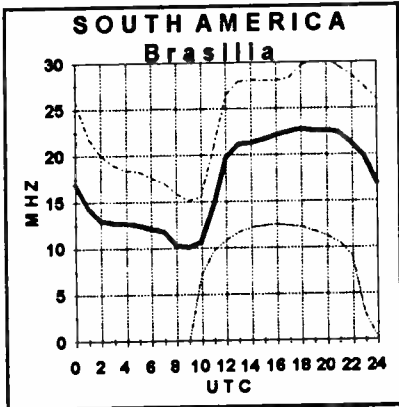
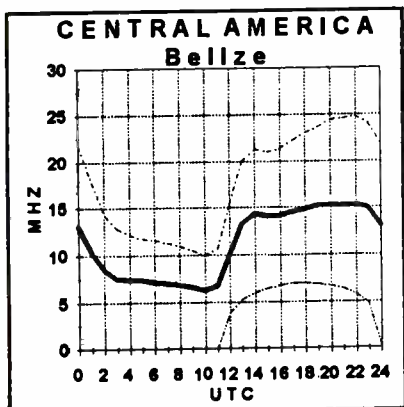
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows



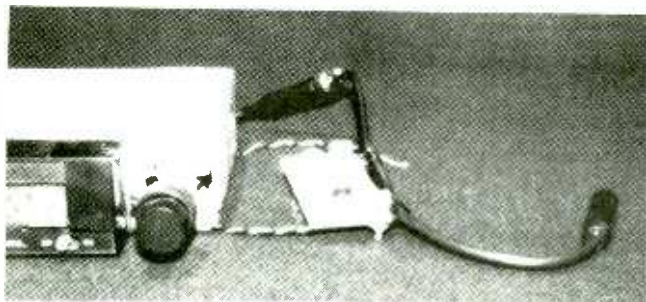
Propagation Conditions: Western United States

the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances. Due to the decrease in the sun cycle, the graphs have been adjusted so that the maximum frequency is now 30 MHz instead of 40 MHz.



what's new?

Larry Miller



Shortwave Mobile Rig

DWM Enterprises has released another in their series of interesting no-frills radio products. This time, DWM has put together a 2" x 1-1/2" circuit board that allows your car radio to tune in shortwave broadcasts.

The "AM-to-Shortwave Converter" is easy to install and requires no soldering or heavy-duty electronics. All you do is connect the converter to your car's 12 volt power supply. Plug the converter into your radio's antenna jack and plug the car antenna into the converter.

There are six models of AM-to-Shortwave converters. Each model number represents the meter band it primarily covers. There's the Model 49, 41, 31, 25, 22, and 19 meter. The model that we tested was for 31 meters including a little of 41 meters. On our car radio the calibration ran something like this: 520 kHz = 9515 kHz, 700 kHz = 9575 kHz, 1000 kHz = 10000 kHz, 1500 kHz = 7510 kHz.

You won't be sending any incredibly rare DX loggings in to Glenn Hauser from your DWM Enterprises AM-to-Shortwave Converter, but you can have a little inexpensive fun with this one.

The DWM Enterprises AM-to-Shortwave Converter is available for \$29.95 plus \$3.00 shipping. The address is 1709 N. West Avenue, Suite 103, Jackson, Michigan 49202.

The Ute Top-40

If it's the exotic whirring and beeping of HF communications systems that makes your tubes glow red, Jorge Klingenfuss' new two-CD recording of modulation types will come as great news. Klingenfuss, the king of the utes, includes 71 different recordings of conventional and non-conventional systems. Audio quality is described by the publisher as "superior" and perfect not only for the hobbyist hoping to identify the "things that go beep in the ether" but for professionals as well.

Says Klingenfuss, "with the audio connected to state-of-the-art decoding hard- and software, immediate analysis and display of these professional teleprinter and radio paging systems is done in no time. Needless to say, synchronization is absolutely perfect because the digital recording technique prevents any play-back speed deviations."

This CD is not the perfect gift for that hard-to-please someone on your Christmas list, but it should make #5 on Bob Grove's Top 40 Hit Parade. Get your copy from Universal Radio at 6830 Americana Parkway, Reynoldsburg, Ohio 43068 or call 1-800-431-3939. The price is \$69.95 plus 3.00 shipping. Tell Fred Osterman that *MT* sent you.

CellPhone Good News/ Bad News

Monitoring cellular phone calls can be such a pain. First, most of the callers are so uninteresting that they could put you in to a boredom-induced coma. When you finally do latch on to something hot and spicy, the call "switches off" to another cell/frequency and you lose it before the conversation is over.

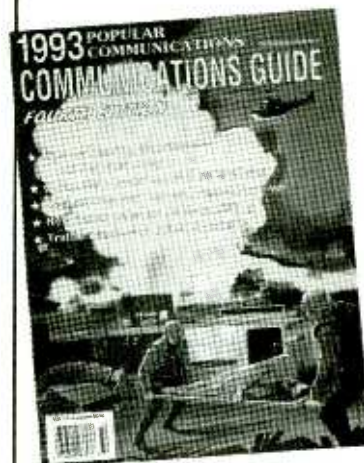
Finally, as if that weren't enough, if they catch you flirting with 800 MHz, you could end up doing time in federal prison. You do know that listening to cellular phone calls is against federal law, don't you? So what's a techno-creep to do?

A Canadian firm called E.C.I. claims that they can help you with the problem of tracking cellular phone calls as they go from cell-to-cell, frequency-to-frequency. We've not actually had a chance to see the product, but E.C.I. advertises an interface that connects between your home computer and your ICOM, AOR or Radio Shack "PRO" series scanner. In advertisements, the firm promises that you'll be able to "automatically follow all or specific calls from channel to channel."

The whole deal, including interface, radio modification kit, cables, software, taxes and shipping, costs US\$369 (C\$479). Payment must be by money order only. The address is E.C.I., 65-31 Avenue S.W., Calgary, Alberta, Canada T2S 2Y7.

Communica- tions Guide

The 1993 *Popular Communications Summer Communications Guide* is a good buy any time of the year. At just \$4.95, it features information on year-round shortwave DXing, as well as choosing a receiver and accessories. For those who find them-



selves traveling, there's a state-by-state, province-by-province look at traffic laws and frequencies, a radar detector listing, and the popular "stations along the way" listing for the "best bets" for news, music and information as you travel.

The 1993 *Popular Communications Summer Communications Guide* costs \$4.95 plus \$2.50 shipping from CQ Communications, 76 North Broadway, Hicksville, NY 11801 or call 516-681-2922. Tell 'em *Monitoring Times* sent you.

New Scanner Books

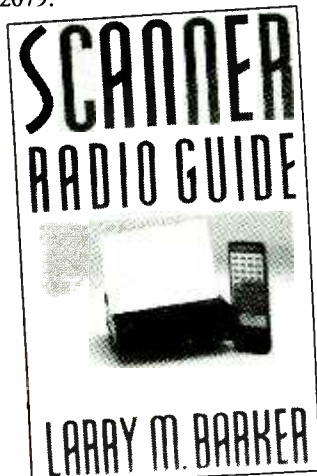
- Canadians looking to get into the exciting world of scanning now have a great source of information. Published several months ago but only recently come to light is J&M Communications' *How To Get The Most From Your Scanner*. A 70-page book by John Cain, it's directed to new users and has an appropriately Canadian slant. You can get your copy by sending \$9.95 to 3149 Beverly Crescent, North Vancouver BC V7R 2W4.

- French-speaking residents of the Province of Quebec have a new publication to consult: *Guide des Radiocommunications du Quebec, 1993 Edition*. Containing 6100 frequencies along with locations and licensees, this informative publication also has

introductory chapters on monitoring basics including several ten codes.

Since this is a first edition, some omissions and errors can be expected. One entire railway system has been either omitted or improperly identified; 121.5 MHz is designated "ELT" when actually it is a universal emergency and distress frequency; there is no glossary to identify "ELT" (emergency locator transmitter) or any other of the myriad abbreviations used in the listings.

The *Guide* is available for C\$20.95 from COSMELEC, P.O. Box 57064, Longueuil, Quebec, J4L 4T6, Canada; phone 514-647-2079.



• From south of the border comes HighText Publications' *Scanner Radio Guide*. It's an introductory book to the exciting world of scanning by Larry M. Barker, a pseudonym the publisher claims is for an employee of a major scanner manufacturer. Included in the table of contents are chapters on choosing a scanner, propagation, land mobile radio services, as well as a list of frequencies. *Scanner Radio Guide* is \$14.95 plus shipping from HighText Publications, P.O. Box 1489, Solana Beach, California, 92075.

• The bargain of the week — this almost qualifies as our monthly "Radio Freebie" — is the *Scanner Directory and Frequency List 1993-94*. Published for the mid-Alabama region by the Telephone Pioneer Radio Club of Alabama, it covers

not only local VHF/UHF but even a smattering of shortwave and longwave. Best of all, the book's only \$5.00 (no typo) postpaid. Send your check or money order to Joe Myers, 1746 Tecumseh Trail, Pelham, Alabama 35124.

• And now, *a la* Scanning Report, "Let's grab our bowler hats and put on a stiff upper lip. We're off to the British Isles..."

Those who seek accuracy in British scanning turn to the widely reviled (by British authorities) book, *The UK Scanning Directory*. The new 3rd edition is now 250 pages and has been completely revised and updated with more than 12,000 frequencies between 25 MHz and 1.215 GHz. The price is £16.95 including UK postage. Overseas orders add £2 for seairmail delivery (you will grow old and die before the book arrives) or £5 airmail. The address is Interproducts, 8 Abbot Street, Perth, PH2 0EB, Scotland.



Railroad Classic

Looking for a handy guide to railroad radio monitoring? Gary L. Sturm's and Mark J. Landgraf's *American Railroad Radio Frequencies* guide is hard to beat. Now in its 12th edition, this compendium contains a wealth of reference information in a convenient format.

Alphabetized by railroad or transit system names and cross-referenced by major cities, listings provide frequencies and their uses for U.S. and Canadian transportation, industrial, museum/tourist and even some foreign railroads.

American Railroad Radio Frequencies (197 pages, 8-1/4" x 5-1/2", perfect bound) is \$16.95 plus \$2 shipping from Grove Enterprises and other MT advertisers.

Computer Aided Scanning

a new dimension in communications from Datametrics



Now Radio Shack PRO 2006 owners for the first time have access to the exciting world of Computer Aided Scanning with the highly acclaimed Datametrics Communications Manager system. Computer Aided Scanning is as significant as the digital scanner was five years ago and is changing the way people think about radio communications.

- The Datametrics Communications Manager provides computer control over the Radio Shack PRO 2006 receiver.
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- Uses innovative Machine State Virtualizer technology (patent pending) hardware interface by Datametrics.
- Comprehensive manual includes step by step instructions, screen displays, and reference information.
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Datametrics, Inc

- Computer Aided Scanning system \$ 349
- PRO2006 receiver w/interface installed and CAS system \$ 749
- Manual and demo disk \$15
- Requires Radio Shack PRO 2006 receiver and IBM PC with 360K memory (640K for full channel capacity) and parallel (printer) port.

Send check or money order to Datametrics, Inc., 2575 South Bayshore Dr. Suite 8A, Coconut Grove, FL 33133. 30 day return privileges apply.

Low Band Monitoring

Ken Stryker is one of a handful of solitary figures who devote their lives to monitoring aeronautical and marine beacons. They spend their waking hours down, way down, in the basement of broadcasting, below the lowest AM radio stations.

The result of Ken's meticulous research is the *Aero/Marine Beacon Guide Updater* and it's yours for only \$3.00 postpaid. Included are nearly 600 new listings, from North American and Foreign Beacons to NAVTEX Communications on 518 kHz, GWEN stations and experimental "Lowfers."

Get your copy from Ken at 2856-G West Touhy Avenue, Chicago, Illinois 60645.

Reheated Ham

Radio Amateur Callbook, a division of Watson Guptill (they publish the *World Radio TV Handbook*) has re-released eight classic radio books: *All About VHF Amateur Radio*, *Simple, Low-Cost Wire Antennas for Radio Amateurs*, *The Radio Amateur Antenna Handbook*, *All About Vertical Antennas*, *All About Qubical Quad Antennas*, *Beam Antenna Handbook*, *The Truth About CB Antennas* and *Interference Handbook*. Each book is \$11.95 plus shipping from Radio Amateur Callbook, 1-800-451-1741.

Ham CD

The July edition of the "Computers and Software" column introduced two compact disks for amateur radio enthusiasts and others. For comparison,

we've been notified of another one: *QRZ! Ham Radio CD-ROM*. Compiled by Fred Lloyd, AA7BQ, this CD includes the March 1993 US Callsign Database (in ASCII) with PC-compatible management software; hundreds of ham-related shareware programs; nearly 200 radio and scanner modifications; USENET news articles and internet ham radio archives; Canadian and US club callsigns; FCC Part 97 Rules and Regs; and much more.

QRZ! CD-ROM is only \$25 plus \$5 S/H in NA (\$10 overseas) from Walnut Creek CDROM, 1547 Palos Verdes Mall, Suite 260, Walnut Creek, CA 94596; (800) 786-9907, (510) 674-0821 fax.

Tell them Fred's friends at *MT* sent you!

440 MHz Handheld

Radio Shack has released its new HTX-404 transceiver, a 5-watt radio that's perfect for both the newly licensed Technician-class ham and the more experienced amateur. It features rugged construction, easy operation and performance that many say rivals a full-sized mobile transceiver.

According to the release, the selective 440 MHz-band receiver front-end minimizes intermod, and true FM modulation provides a clear voice signal and superior performance on packet. Both CTCSS and DTMF decoders are built in.

Check your local Radio Shack for more details.

Decoding the Weather

Monitoring radioteletype and facsimile weather broadcasts can be fascinating, but what do all the encoded abbreviations mean? It's

You Haven't Made It If You Haven't Made *Monitoring Times*.

Got a new book or product relating to radio? Send it in to "What's New?" for a jump start on your sales! And don't forget to add *Monitoring Times* to the top of your mailing list for future press releases — Hobbyists look here for the latest and greatest, be sure your product is among them!

not secret — the key to the endless combinations can be found in Klingenfuss's *Air and Meteor Code Manual*.

Synoptic codes for solar and geophysical data, World Meteorological Organization (WMO) message formats and decoding instructions, city/country codes for location identification, aviation meteorological network details, and aircraft type identifiers are here — just about everything you need to know to interpret maritime and aeronautical weather transmissions worldwide.

Look for this 374-page 13th edition from many *MT* advertisers.



Scanner-Proof Cordless Phone?

The new 900 MHz spread spectrum cordless phones are here. Cobra is touting their new Intenna 900 cordless phone as the only phone that delivers "900 MHz extended-range...with digital spread spectrum technology..."

Digital spread spectrum converts analog voice information into digital codes. The digital signals are transmitted in a random pattern that's spread across the full 5 MHz spectrum of each channel. There are 100 user-selectable channels.

The sales pitch on the Intenna 900 definitely has the scanner listener in mind. Keith Parke, Cobra Marketing Manager, is saying that "The voice-conversion process effectively scrambles all speech...preventing electronic eavesdropping and ensuring absolutely private conversations..."

Of course, there's a hefty price to pay for all of this. The Intenna 900 retails for \$349.95 at your local department or electronics store. Still, the company expects the new phone to "ignite new interest in the cordless phone phenomenon, especially among the millions of cordless owners looking for a technologically advanced model."

To take a look at the Cobra Intenna 900 Cordless Phones, visit your local department or electronics store.

1993 World Satellite Yearly

Baylin Publications specializes in satellite TV books, not only theirs but works of other authors as well. *The World Satellite Yearly*, as the name implies, is an annual and excellent update of broadcasting satellites.

For a thorough and enthusiastic review of this massive, 500 page reference work by Dr. Frank Baylin, see the June *MT* "Satellite TV" column by Ken Reitz.

1993 World Satellite Yearly is \$50 from Baylin Publications (1905 Mariposa, Boulder, CO 80302).

The Radio Station

The Radio Station is a concise and candid guide to the internal

workings of radio stations and the radio industry. The book details the functions of each and every job that makes up a successful radio station, showing how each interacts with others. The new 3rd edition includes discussions on such topics as digital audio broadcasting, regulatory developments, innovations in marketing and the ever-changing regulatory environment.

The Radio Station is designed for radio professionals but provides helpful insights for radio hobbyists and radio hopefuls. To get your copy, send \$34.95 to Focal Press, 80 Montvale Avenue, Stoneham, Massachusetts 02180 or call 617-438-8464.

Go West, Young Man

Gordon West has been hard at work on yet another book. This time, West takes on *Mobile 2-Way Radio Communications*. Although we haven't seen a copy of the book, West promises that it includes information on business radio, mobile telephone, GMRS, CB, marine radio, amateur radio, as well as the installation of mobile antennas and other equipment.

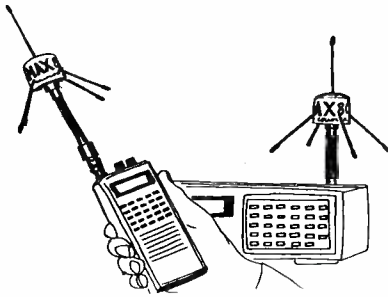
Mobile Two-Way Communications is \$6.95 and available from your local Radio Shack store.

Correction

A line was omitted from the review of the National Radio Club's *County Cross Reference*. The review implied that the cross reference contains station call signs, but it does not. It contains two lists: a by-state list of the counties within each state, and a by-county list of those states that contain a county by that name. The reference is meant to be used in conjunction with the *NRC AM Radio Log* to help pinpoint the probable identity of an unknown DX catch. (NRC, P.O. Box 164, Mannsville, NY 13661.)

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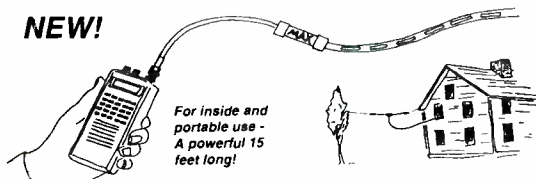
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Reviews By Bob Grove

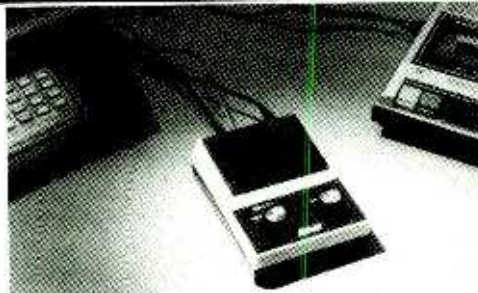
"Nitelogger" Tape Recorder Activator

Looking for a way to record those short-wave programs or scanner intercepts? The Nitelogger (\$69.95 plus \$4.50 shipping from Benjamin Michaels Industries, 65 East Palatine, Prospect Heights, IL 60070; phone 414-835-4299) could be the answer.

Readily connected to any tape recorder that has a remote activator jack, the Nitelogger plugs into your radio's external speaker or earphone jack. A self-contained speaker allows continued monitoring of the signal (a volume control is provided) even when the radio's speaker is disconnected.

Powered by an AC wall adaptor, the Nitelogger can be adjusted to stop the recorder after signal dropout anywhere from a fraction of a second to approximately 15 seconds, allowing time for replies to communications.

An LED provides a visual indicator that audio is at the appropriate level for recording. The unit has a neat, commercial appearance and is 100% American made (although the cabinet bears the "Japan" mold stamp).



"Nitelogger" is a handy gadget for the listener who wants to preserve his monitoring targets. Although the price seems a little steep for a unit that has been around a number of years, it has proven its worth, and is unique in its class, being the only voice-activated recorder with a built-in speaker for simultaneous monitoring.

Ramsey Speech Scrambler/Descrambler Kit

In 1987, with the passage of the Electronic Communications Privacy Act, speech decoders became illegal to manufacture, sell or possess. No longer were simple, add-on decoders accessible for monitoring scrambled police transmissions. But kits are another matter.

The SS-7 kit (\$129.95 plus \$3.95 shipping from Ramsey Electronics, 793 Canning Parkway, Victor, NY 14564; phone 716-924-4560) contains all the parts to assemble a full-duplex telephone or radio scrambler/descrambler for

privacy assurance, utilizing the common speech inversion method. RCA phono jacks are used for input and output audio; a front-panel trimpot can be adjusted for voice clarification.

A step-by-step assembly manual includes a part layout diagram, applications illustrations and schematic diagram. The kit does not include case, knobs, speakers, plugs or battery; only the circuit board and all circuit components are provided. A case and knob set is available separately.

Our Test

The circuit board is nicely laid out with quality components. Assembly is very easy and the manual quite specific. The optional cabinet and knobs complement the design.

The SS-7 is designed to work with a telephone earpiece, earphone or a set of headphones, but not a speaker. The amount of input audio necessary to operate a speaker overdrives the balanced demodulator circuitry and scrambled speech, rather than descrambled, will still be heard. If a speaker is required, it will have to be an amplified model.

The unit must be physically removed from the system when it is not being used; no bypass function is provided when switched off.

For the stalwart experimenter, the SS-7 provides the foundation of an effective scrambler/descrambler once its limitations are understood.

Uniden BC2500XLT

For the first time in several years, Uniden has released a series of innovative products. Most recently, the BC2500XLT has caught the fancy of the scanning public.

About an inch shorter than its predecessor (the BC200XLT), the new 2500 measures 2-1/2" W x 6-1/2" H (less knobs) x 1-3/8" D and weighs 16.5 ounces with whip and case.

A six-inch flex whip, sturdy vinyl carrying pouch with belt loop, rechargeable battery pack, removable belt clip, earphone and instruction manual are included.

Frequency range is the widest ever for a Bearcat: 25-550 and 760-1300 MHz continuously, less cellular (restorable). Up to 400 memory channels may be stored in 20 banks. All seven NOAA Weather Service frequencies are preprogrammed for rapid retrieval.

Memory channels may be stored in 20 banks. All seven NOAA Weather Service frequencies are preprogrammed for rapid retrieval.

Memory channels may be scanned at a normal 20 channels per second, or "turbo" scanned at up to 100 channels per second. Up to ten



BC2500 Cellular Modification

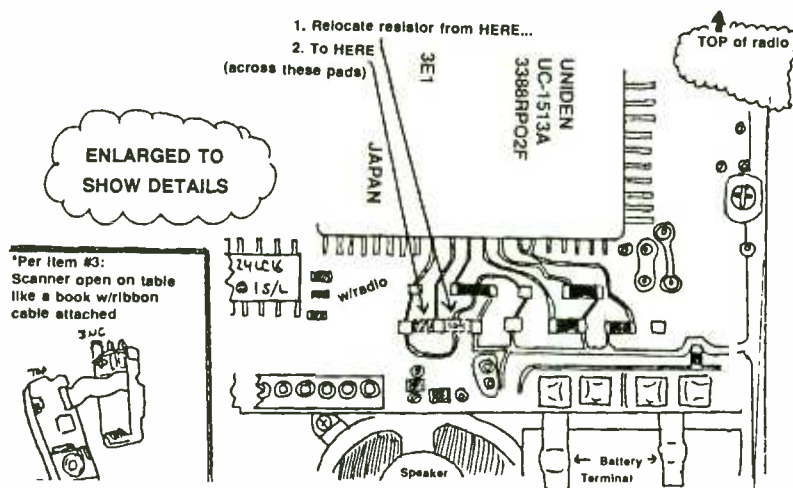
CAUTION!: This procedure must not be attempted by anyone unfamiliar with microsoldering miniature chip components. *MT* assumes no responsibility for damage resulting from attempts to restore cellular telephone frequency coverage. Attempting this procedure may void your factory warranty.

Listeners should be aware that it is unlawful to listen to mobile telephone conversations.

TOOLS NEEDED: Micro-tip soldering iron, fine rosin-core solder, Philips screwdriver, magnifier, tweezers.

1. Remove the antenna and battery pack from the BC2500XLT. Lay it on its face on a soft cloth or towel, bottom of the radio facing you. Remove the two upper (black) and two lower (chrome) screws.
2. Carefully pry the back loose from the radio and lift it off. Similarly, grasp the visible circuit board by the edges and carefully pull it away from the radio just far enough to separate it from the white (11 pin) Molex connector. Do not stretch the remaining ribbon connector. Lay the board alongside the radio.
3. Locate microprocessor chip "UNIDEN UC-1513A," and the cluster of chip resistors marked "104" below it (see diagram). Using a magnifier and fine-point soldering iron, unsolder the lower-left-most chip resistor and move it one place to the left, soldering it in place.

Cellular restoration is now complete. Reassemble the radio by reversing steps 1 and 2, and test it by entering 879.990 MHz. Search steps in this range will be the correct 30 kHz.



different priority channels may be assigned, one in each memory bank.

A VFO mode allows any displayed frequency to be tuned up or down by a small, flattened knob. Any channel may rescanned immediately after a signal drops out or may be delayed for two seconds awaiting a reply.

A multipurpose shift key is used in combination with the keypad to select memory banks, clear an erroneous entry or reset the count function.

An autostore feature allows active search-discovered frequencies to be automatically stored into memory. An autosort feature then arranges them in numerical order for faster scanning.

A non-volatile memory retains all 400 memory channel settings for a reasonable length of time if the battery pack is removed or discharged. An edge light illuminates the LCD window for up to 15 seconds when it is pressed for night viewing.

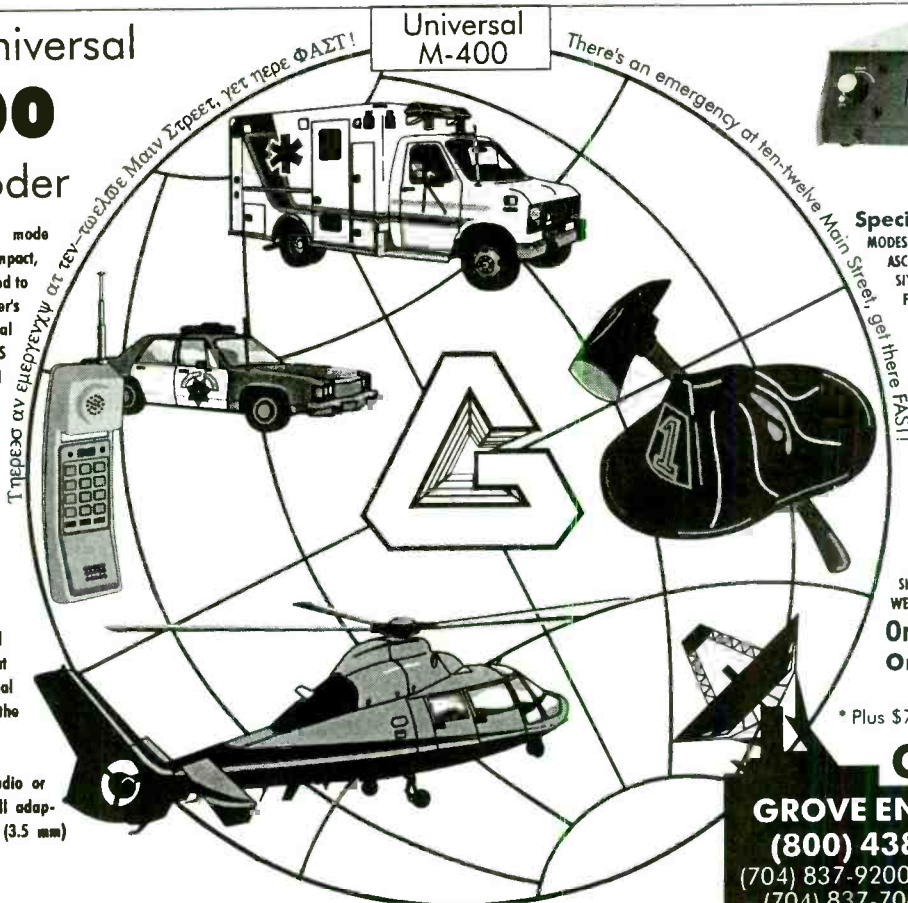
A count function allows the user to determine how many times a channel was active during unattended scanning. Any channel may be temporarily locked out of the scanning sequence without erasing it from memory.

The NEW Universal M-400 Digital Decoder

Featuring simple, pushbutton mode selection, this self-contained, compact, menu-driven decoder, when connected to your scanner's or VHF/UHF receiver's external speaker jack, will reveal CTCSS (PL) subaudible tones, DCS (DPL) squelch tones, POCSAG and GOLAY digital paging messages, DTMF (Touch Tone*) telephone numbers, even air-to-ground ACARS digital aircraft messages!

Connected to your shortwave receiver (SSB mode), you can read RITTY, SITOR, FEC-A, SWED-ARG, and even FAX pictures when used with a printer! There is no Morse code or packet capability. A jack is included to attach an external speaker so that you can still listen if your internal speaker is disconnected when using the M-400.

Input jacks provided for either audio or discriminator interconnect. AC wall adapter, full manual and pair of 1/8" (3.5 mm) plugs included.



Universal
M-400



Specifications:

MODES: Baudot (45, 50, 57, 100 baud)
ASCII (75, 110, 150 baud)
SITOR A & B (Automatically selected)
FEC-A (96 & 144 baud)
SWED-ARG (S, M and L lengths)
FAX (120 LPM/576 IOC, to parallel printer port)
Paging (GOLAY, POCSAG)
ACARS
Encoded squelch (CTCSS, all 41 frequencies; DCS, all 104 codes)
Tone dialing (DTMF, all 16 digits)
FILTER: Low tone (mark) 1275 Hz
INPUTS: Speaker, 4-16 ohms @ 100 mW
OUTPUT: ASCII 8 bin Centronics standard, DB25 connector
DISPLAY: Two-line, 20 characters each, 5/7 dot matrix LCD
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Any channel may be erased simply by entering a zero. All channels may be erased by holding down the MANUAL, 2 and 9 keys when the unit is off, then switched on and the buttons released.

Our Impressions

The new BC2500XLT offers a number of departures from its predecessors.

The Good

Wide frequency coverage, including wideband FM detection of FM and TV audio.

The reinforced BNC antenna connector resists torquing from the whip or an external antenna cable.

Audio is crisp and powerful from the internal 400 milliwatt amplifier; a 1/8" external speaker jack delivers full audio power, while the 3/32" earphone jack has series resistance for anti-blast protection.

The keypad routines remain intuitive, most operable at turn-on without having to refer to the

instruction manual. Bearcats are still the simplest to operate in the scanner industry.

Tuning steps are automatically defaulted to the most commonly used in each frequency range: manual selection of 5, 12.5, and 50 kHz is accessible as well.

The pocket-sized instruction manual is well written and easy to understand.

The Not So Good

Although the display is larger than those found on previous Bearcat handhelds to show more information, the frequency readout is only about half size.

All-channel delay doesn't allow the user to select the channels which should delay for a reply to a transmission and those which should not.

Modes are not selectable; the user cannot, for example, look for narrowband FM wireless mikes in the TV bands which automatically default to wideband FM, nor can he listen to FM satellite downlinks in the 225-400 MHz AM military aircraft band.

Dynamic range is poor, especially noticeable when using an external antenna. In the 406-420 MHz range phantom signals from international broadcasters are overwhelming.

The battery pack is incompatible with previous Uniden products. Our test sample discharged within a few days, requiring frequent recharges. No third-party replacements are available.

The DC power jack is sub-miniature, unlike those used on other Uniden products, making alternative DC power cords hard to find.

The Bottom Line

The new BC2500XLT is a welcome addition for scanner owners who want extended frequency range, VFO tuning, 400 memory channels and simple operation. The autolock and count functions are definite plusses.

Used with its flex antenna, the 2500 provides good sensitivity and reliability. High performance replacements whips like the Austin Condor and Grove ANT8 should work well in most environments. Rooftops and mobile antennas can be expected to produce overload interference in the presence of strong signals.

The Uniden BC2500XLT is advertised at \$359.95 including shipping by Grove Enterprises; it is also available from other MT advertisers.

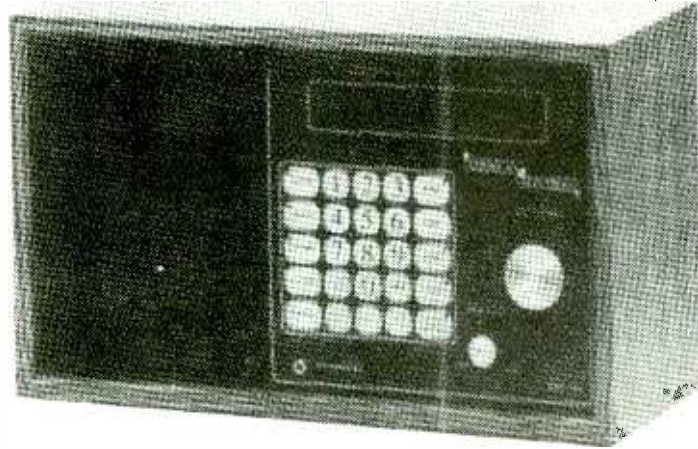
MT

• American Electrola DXC-100 World Access Radio 8A

In politics, it's the advance man who gets crowds in place for candidates on the road. If he does his job right, the candidate is greeted by a sea of enthusiastic faces.

In radio, there must have been a seasoned advance man working for the American Electrola DXC-100, also sold as the World Access Radio 8A; few topics have aroused the interest of *MT* readers to this degree. Indeed, like Elvis sightings, the Electrola has reportedly been seen as far back as a year ago—many months before a single radio was ever produced.

At last, the wait is over and the sightings are real. The initial version of that unit, which we reported on last month, appeared only a couple of months ago. Yet, the manufacturer has already come out with a revised edition, and more revisions are on the drawing board. Listing at \$319.95, the street price has already settled in at well under \$300.



Targeted to General Public

This is not, and never will be, a DX receiver. It is obviously designed with a refreshingly simple concept: Bring in world band stations in a way the general public can relate to.

Being a tabletop design, it's not portable, either. After all, how much world band listening is actually done on the road?

What, then, is it? It's a straightforward attempt to create an affordable, uncomplicated world band radio designed for the "silent majority" of listeners who don't appear in print. Folks who just want to listen in peace in the evening. For this, the manufacturer has created a radio that even looks like something you'd expect to find in a den or family room.

Made in America by Americans

That's not all that's unusual, yet sensible, and here's why. The radio did not spring from the mind of some nerdy radio engineer or MBA eyeshade type. Rather, it came about when Chuck Harder, host of the populist radio program *For The People*, noticed that although the United States has the fastest-growing world band audience anywhere, there was not a single American company manufacturing affordable world band radios. So, *For the People* commissioned the

EDSI Co. of Pittsburgh, Pennsylvania, to solve the problem.

For The People is opposed to Americans' buying products made abroad, so there was another objective: to make it as close as possible to 100% US-made—not to merely assemble it in the U.S. from mostly foreign parts. Given the degree to which the electronics industry has moved offshore, this was no small feat. In fact, it held up introduction of the radio for months.

Yet, in the end they succeeded. The manufacturer now claims that over 75% of the dollar value of the radio comes from American manufacturers—and they let you know in no uncertain terms! The operating manual contains patriotic references and one fierce-looking American eagle...and, just to make sure you get the point, its bright red LEDs proudly display "USA 1" when you first plug in the radio. You almost find yourself searching for a control that switches on Kate Smith singing "God Bless America."

Has Features Usually Missing

Although the radio lacks much that DXers relish—single-sideband demodulation and signal-strength indicator, for starters—it does have FM. So what, you say? So this: Most people listen mainly to FM. In the real world, people want FM on their world band radios; It's that

simple. Yet, this basic truth has escaped virtually every tabletop shortwave receiver manufacturer in the world. Even Lowe.

Something else tabletop manufacturers overlook: Most people don't want to install a separate antenna. So this radio comes with its own telescopic antenna for world band and FM, plus a little outboard antenna for AM that's tunable, rotatable and tiltable.

Exceptional Clock and Timer

That "USA 1" disappears once you program the radio's World Time clock, which actually shows seconds numerically, plus the day of the week. This clock forms the basis for the radio's exceptional 12-event timer. With it, you can choose the station and on/off times, plus whatever day or combination of days of the week when you want to hear that station. With the \$14.95 Remote Recorder Interface accessory, which should be available by the time you read this, the radio is supposed to be able to turn a tape recorder on and off.

The radio tunes longwave, FM, AM and shortwave, and there are fully 60 presets. There's also a tuning knob and scanner circuit not only to cruise the bands, but also to tune through the presets.

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Several Improvements Needed

All this is fine and well, but in other respects it's obvious the manufacturer is new at this game. For starters, there's the keypad. It's of the membrane variety found on some appliances. Its "keys" don't depress easily and are completely lacking in feel. It's to the point where none of us who tested the radio would personally purchase a radio with a keypad like this. The manufacturer is keenly aware of the problem and tells us that they've devised a way to make the "keys" depress more easily in the future.

The original version of this radio was exceptionally sensitive to weak signals. Now, within some world band segments, such as 6 MHz, sensitivity in the revised version continues to be quite good. However, on higher segments, sensitivity varies a bit; and on some other bands, such as 5 and 7 MHz—even with the attenuator off—sensitivity is far below what it should be. Ironically, "For The People" is aired evenings over WHRI on 7.315 MHz.

Sensitivity is not just how much a signal moves an "S" meter; it's also how much that signal overcomes noise inherent in receiver circuitry. On this radio, that noise—hiss—is considerable and obtrusive. Too, there are distorted sounds from FM broadcasts bleeding here and there into the shortwave bands. How bad this

is depends on what frequency the radio is tuned to and the FM situation where you live.

Another intrusive sound comes from digital "whine" mixing in with the station you're tuned to. It's as bad as we've encountered in our tests over the years. Image rejection is much better, even if it's not all it could be. Audio quality is okay, nothing more, but there's lots of power so you can turn the radio up loud without excessive additional distortion.

On our tested unit, the one bandwidth was so broad—12 kHz—that you could hear a station two channels away. Thankfully, the manufacturer advises us that this filter is being replaced with one of 4 kHz. Those with older sets can have the new filter installed for \$15.

Like a portable, this model has been designed to work best off its built-in telescopic antenna. You can add an external antenna, and in central and western parts of the continent this might be helpful. However, on the East Coast this is likely to lead to the radio's limited dynamic range going into "overload."

The radio is currently available from *For The People* (800/888-9999 U.S.) and Universal Shortwave (800/431-3939 U.S., 614/866-4267 elsewhere). In due course, the manufacturer hopes to expand distribution significantly both here and abroad.



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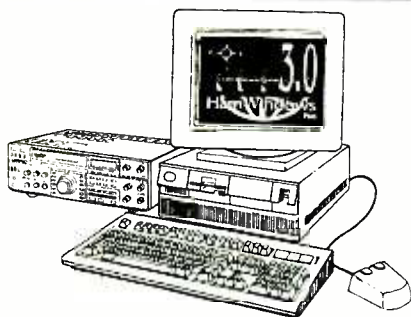
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A New Window of Opportunity

Ham Windows Plus

A Window into the Past

The time is the early 1980's. IBM is making a mark with the PC but it's not king yet. Atari is fighting for market share by introducing a line of 16-bit computers, but wants something that makes it really different from all the rest of the 8-bit machines already out. Apple is in a similar situation with a hugely successful Apple II and two major failures after that. Apple needs a winner, a big winner, to stay in the computer race.

History is a bit hazy about who is first with what, but in the end both companies bring out computers which have symbol screens with pictures of operator actions and equipment. For example, turning on the computer brings up a screen which shows symbols (also called icons) of disk drives corresponding to the ones you have in your computer, and a command line at the top of the screen.

With a new device called a "mouse," the user moves an arrow around the screen to the device he/she wants to use. For example, to see what is on your C disk drive you move the arrow to the C drive picture and press a button on the mouse. The original screen is then partially covered by a new screen, or Window, on which is listed all the programs and files on your C drive. Running a program is as easy as moving the arrow to that title and pressing, or "clicking" the mouse button. No more keyboard commands to memorize (in theory); "Just point and click." Enter the Graphics command environment.

After a minor legal battle both Atari and Apple won the right to use this method of computer control and display. The Atari ST system was modestly named after Atari's owner Jack Tramiel, TOS, Tramiel Operating System. Apple called theirs GEM for Graphics Environment and used it on their successful Macintosh computers. During this period there were many different names for the graphic point and click operating system, few of which survive today.

Well, IBM went on its merry way for the next six years ignoring the graphical method and sticking to the keyboard entry; and for good reason. Both Atari and Apple had designed computers which had a high level of graphics capability and display speed, for their time. The IBM PC, XT, and even the 286AT, were 'way behind in these areas. They would, at best, run very, very slowly when lots of graphical data

(pictures) were displayed on the screen. But when the 386AT was designed, IBM and Microsoft had the power to bring a graphical command environment to the IBM PC camp. Thus Windows was born and given to the IBM user masses, who had hungered in the desert for a MAC for many years.

Was it worth waiting for? Well, my experience with Atari STs and MACs made me say "Blah" when I first tried Windows. It was still slow, you had to keep track of which window you had open since they were on top of each other, and, worst of all, it had bugs in it which would freeze up the computer or pop you back to keyboard operated DOS.

Much has happened since that first Windows, and version 3.1 is pretty good. However, if it weren't for programs such as the ones we are about to look at which will only run in Windows, I personally would prefer the controllable feel of DOS. Let's look at one of these programs which made this old DOS maven willing to convert to Windows.

Ham Windows

Back in September of 1992 I received for review a program called Kenwood Ham Windows version 2.2. I put off reviewing it for a number of reasons: although it had lots of information on propagation, frequency lists and almost a total listening environment, it was limited to a few Kenwood products only. In addition, it was well over \$100 and required a fast, and then-expensive computer: too limited in its use to justify the extra added equipment and program costs.

Since then the price of 33 MHz 386s have dropped tremendously. As for the authors at California Software: they were 'way ahead of me. This June they released Ham Windows 3.0 and Ham Windows Plus 3.0. Notice the Kenwood prefix is gone from the title, and so is that major limitation. Icoms, Yaesu, SGC and Kenwoods can all be controlled, along with customizing the interface if you know the programming details.

A cautionary note: This program is attempting to provide the highest degree of total listening environment in a graphical control environment. It takes time to master; over two hundred pages of well-written instructions are included. Minimum machine requirements are still high. Ham Windows Plus requires: 386AT-33MHz or faster, 8 MEG of RAM, SVGA monitor and card, two serial ports, DOS 5.0 or higher, and Windows 3.1 "properly installed" and a bus mouse. That's an awful lot. But they promise everything needed for a total listening environment in return.

Is this the landmark piece of radio software it claims to be? With a name like Ham Windows is it worth the effort and cash for the SWLer and monitor? We'll see.

For this review we'll concentrate on Ham Windows Plus 3.0, called from now on, HW+. It comes on five high density disks which install easily on a hard drive, but installation takes almost 20 minutes to complete. A four page "Quick Start" manual is also included which is excellent for getting the basics up and operational within an hour. I must say that the documentation is very high quality in its composition and content. The 200 page manual is multi-colored and heavily illustrated. It is broken into four clearly labeled sections: Introduction, Using HW+, Reference Manual and Customer Service Plan. The sixteen chapters are arranged so that any question the user has on operation or program content is easily found.

We start by entering personal and station data such as Name, Address, Longitude and Latitude. These last items are used in station bearing and antenna pointing features of the program. The local time relative to GMT is set so that it can be used to show what program schedules are currently valid in a logging and listening section of the program.

Now we need to tell HW+ what equipment we have and on which port. This is done by clicking on the COMM PORT SETUP. A menu appears which lists six computer ports, for example COM1. Next to each is a box labeled EQUIPMENT TYPE. By moving the mouse to the box and holding down the left mouse button, titles such as HF Rig or TNC are displayed. To choose one you just have to highlight with the mouse and it appears in the EQUIPMENT TYPE box. I added the equipment type HF RECEIVER to the factory programmed list since I wanted to use HW+ with an ICOM R71E. Then it's on to the exact EQUIPMENT MODEL box where we tell the program the command structure of the radio as contained in the radio's manual or from the list provided by the authors.

Once the radio(s) ports are indicated we install the signal decoder: for example, AEA's PK-232. Repeating the above procedure (with TYPE being "TNC"), the pre-programmed choices include AEA PK-232 with all required details.

But wait! With two serial ports used for equipment where do we connect our mouse?! This is the reason California Software specifies a bus mouse which does not use a communica-

tions port needed for our radio equipment. If you are a dyed-in-the-wool Windows user you should have a bus mouse anyway.

I hear you. "Are we there yet?!" Remember the old proverb "All good things come to those who wait." The updated version adds, "... as long as they work like heck while they're waiting." So keep going; we're almost there.

Still continuing with our "Quick Start," we configure the logging program to suit our needs. I found the pre-programmed log page fine for most listeners' basic requirements. Then we set up a "logbook" name for our database. More than one can be created so that each type of listening can be stored in a different "logbook." This pre-sorting makes for easy retrieval.

Start up your Windows in the normal manner and make sure you are in the SVGA video mode. Otherwise, when you try to run HW+ only the top half of each screen will be accessible. Getting into the SVGA mode may require clicking your Windows Setup symbol (icon), selecting SVGA and copying the appropriate files from the original Windows 3.1 installation disks.

Once Windows is running you will see the icon of a little house with a beam antenna and the words HamWindows Plus 3.0. Clicking this will (ta-da!) start the program. Stay with me: From the items on the Main Menu, I think it will be worth it. Twelve items, which look really useful to any radio monitor, appear on this menu: Log, Maps, SWL (yes!!), Scheduler, Almanac, TNC, Control (radio), RCS, Utilities, Setup, Help and Exit. Which will be first? You have to ask?!

Clicking SWL brings up the Shortwave Database window. Along the right side are the same icons displayed in the Main Menu. The bottom half displays 00 to 24 using vertical lines much like the format used in *Passport to World Band Radio* and *World Radio TV Handbook*. At the top is a selection of pre-programmed databases: SW Broadcasters 1 & 2, Misc, USA Packet Clusters and Repeaters, and any databases that you made in the Quick Start.

Double clicking on SW 1 brings a list of categories to the right. In alphabetical order these range from Afghanistan to Myanmar (Burma). Let's see when the COOK Islands are on the air (*now off-ed*). By clicking Cook Islands under categories it also appears under the sub-categories box. Clicking here draws a line on our time chart from about 09 to 1600 hours. The station name and location is displayed next to the line in the extreme left hand location and in between this and the time line is the frequency of 11.7600 and the mode, AM.

Let's try a big gun, Radio Netherlands. That's in SW 2. Click on SW 2, then on Netherlands in categories and again in the sub-category box to bring up pages of frequencies and times.

Listening is always fun. But knowing about the country you're listening to can make it much more fun. Where is it? Clicking on the map icon brings up a mapwindow which displays Northern Europe and flashes the Netherlands. Clicking on the country name brings up the almanac window with all you will want to know about the Netherlands from general facts, military, telecommunications details, government details to people data (birth/death rate).

Other information is tailored to the user's location. Remember the longitude data we entered during installation? Well it's now being used to give direction and distance data to, in this case, Radio Netherlands. Clicking the SWL icon brings us back to the database and the RN schedule.

Well, I'm impressed—and we've just looked at three of the icon commands so far. We have more windows to open before we enter the total listening environment, but that's enough of Ham Windows Plus 3.0 for this month. You did great following us this far. We'll finish our evaluation together next month.

More on Radio Related CD Roms

We have been covering the new media of CD ROM useful to radio monitors. If you are a ham, or monitor the ham bands, then a CD called HamCall may be of interest. Produced by Buckmaster Publishing, Route 4, Box 1630, Mineral, VA 23117, this CD ROM has all the USA hams in a database that can be searched by town, callsign, name, county and other topics. In all, over 500,000 are listed.

It's easy to find out what hams are in your location with HamCall's HAM program. In addition, a program on the CD called ICALL allows you to look up all US hams, clubs, military R.A.C.E.S. and 89 foreign country listings. Included is a program, LOOKUP, which allows you to access these programs while inside another program by pressing Control-Alt-C. We'll see next month if, and how well, HamWindows Plus 3.0 accesses HamCall capabilities.

HamCall is updated a number of times during the year. The version I have, April 1993, has a few THOUSAND radio related public domain files on it in addition to the ham databases. In a directory named BCAST, there are ten programs pertaining to commercial broadcasting. FMTVCALL is a data base which asks the user to input the call letters of a commercial USA TV or FM station and then displays station data including location, channel and power. A similar program is included for AM radio stations.

The never-ending storage of the CD ROM allows HamCall to include many more programs, files, demos and frequency lists in sixteen alphabetized directories. Running the MENU

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program displays one line descriptions of each program. There's lots here for the ham, SWL and VHF monitor. At \$50.00 plus \$5.00 shipping, it's well worth looking into. Buckmaster Publishing can be reached on 800-282-5628 and 703-894-5777.

Next month we will continue our odyssey through HamWindows Plus 3.0 and in coming columns we'll review a program which uses the Windows environment to present an audio spectrum of a signal. Called Audio Spectrum Analyzer by Pioneer Hill Software, we could very well have another candidate for breakthrough software replacing thousands of dollars of test equipment. Reviews of these programs, plus a low cost Frequency Manager for Windows, are in sight. Will we look into Windows and see the light? 'Til next time!

M

Boosting AM BC-Band Reception

The standard AM broadcast band appeals to a lot of SWLs because of the myriad stations that can be monitored in the hours of darkness, especially during the winter months when QRN (static interference) is at a minimum. But, few urban dwellers are able to string up an antenna that is sufficiently long to provide good DX reception from 500 to 1600 kHz. After all, a dipole for, say, 1000 kHz would be 468 feet overall! Most modern communications receivers of quality are designed for use with an external 50-ohm antenna system.

This article describes ways to use an active antenna or to enhance the BC-band performance of short wire antennas. I have found both methods outlined here to be effective when I dig for those distant AM stations that feature Big Band music, such as WOKY, WJJD, WKNX, WCCW, WATT, CKLW and a host of others.

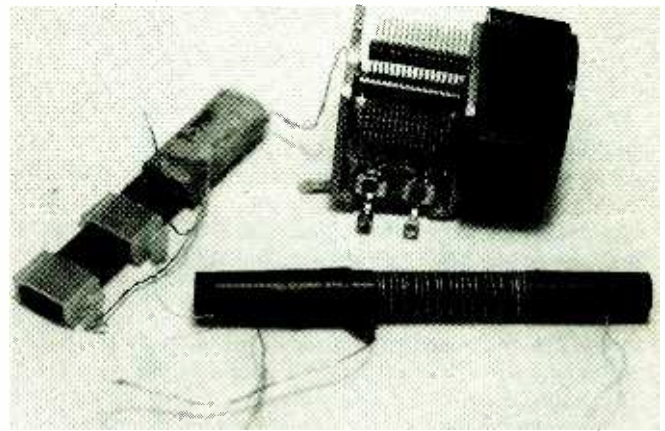
Dealing with a Short Antenna

Causing any untuned antenna to become resonant at the listening frequency greatly improves reception. I have measured signal increases as great as 30 decibels by resonating a 15 foot end fed wire at, for example, 1210 kHz when using a receiver with a 50-ohm input port. This is done by creating a matched condition between the receiver and the wire. Maximum signal or power transfer always occurs when unlike impedances are matched.

Figure 1 shows a circuit you can tack together in a few minutes. It is a series tuned network that will resonate any piece of wire that is less than 1/4 wave in length at the chosen frequency. L1 must have sufficient inductance so that it and the piece of wire are greater than 1/4 wavelength

Figure 2: Photograph of the components for the circuit in Figure 1.

A flat ferrite bar loop of 650 μ H is seen at the upper left. A hand-wound rod loop is in the lower foreground and a 365-pF variable capacitor is seen at the upper right.



electrically. C1 is then adjusted to tune out the unwanted extra inductive reactance to cause antenna resonance. This results in a low feed impedance that the receiver can accommodate with minimal signal loss. In other words, the tuning capacitor serves to lengthen or shorten the overall antenna.

I use a similar tuner for operation in the 160- and 75-meter ham bands when I'm camping and using my Kenwood transceiver. I string up a piece of wire that's shorter than 1/4 wavelength and tune it to resonance with a circuit that is similar to that in Figure 1.

L1 is a ferrite-rod antenna loop from a discarded transistor radio. Most of these loops have an inductance of 400 to 700 micro-henries. The one I use has 650 mH of inductance and was used with a 125-pF variable capacitor in the original circuit. C1 in Figure 1 is a 365-pF variable capacitor, which allows sufficient tuning range for all of the BC band with my loopstick. The loop seen at the upper left in Figure 2 is the one I use. The hand-wound ferrite loop in the lower foreground is one I made by winding some Litz wire

from a slug-tuned coil on a ferrite rod I had in my shop. Both work very nicely in my tuner.

A single-gang 365-pF variable capacitor is shown also in Figure 2. If you are not able to find a 365- or 400-pF variable, use a multigang capacitor and parallel the sections to increase the maximum capacitance. A smaller-capacitance variable may be used also if you switch fixed-value capacitors in parallel with it for various parts of the BC band.

Active Antenna

An active antenna is an untuned RF amplifier. Therefore, it responds to a broad spectrum of frequencies. It must be used with a short, nonresonant vertical or horizontal wire. Adding the tuned circuit of Figure 1 will cause it to self-oscillate. The term "active" means that a device or circuit must have operating voltage in order to function. Conversely, a "passive" circuit (such as in Fig. 1) requires no operating voltage.

Figure 3 shows the circuit for my active antenna. It provides a power gain of approximately 10 dB and serves also as a matching device between a short antenna and the receiver (like a step-down transformer). Any HF JFET, such as an MPF102 or 2N4416 is suitable for Q1. I have also used a 3N211 or 40673 at Q1 by simply tying gates 1 and 2 together and treating it like a single-gate FET.

The protective diodes in Figure 3 may be omitted if you do not have a transmitter operating nearby. They are used to prevent excessive RF voltage from reaching the gate of Q1.

The active antenna may be used in the radio room by eliminating RFC1 and feeding +12 volts to Q1 through R4. For remote use out of doors, the +12 volts is supplied to Q1 through the 50-ohm coax cable that connects to the receiver. A 0.01- μ F blocking capacitor is then used between the center conductor of the coax and the antenna jack of the receiver to prevent the dc voltage from reaching the input circuit of the receiver. As in Figure 3, an RF choke is used at the receiver end

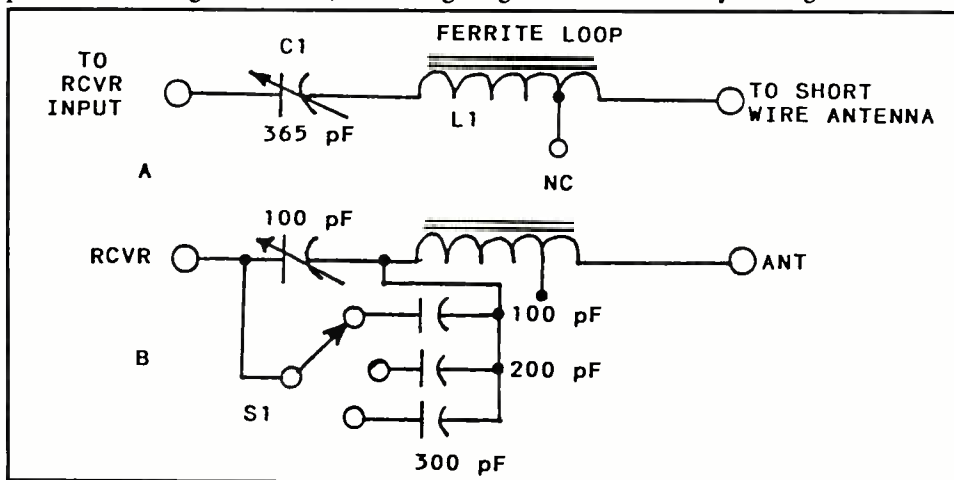


Figure 1: Examples of LC antenna resonators for use with short wires. Circuit A employs a 365-pF variable capacitor and a ferrite loop antenna from an old transistor radio (see text). Circuit B shows how to use fixed-value capacitors at S1 to enable the user to cause antenna resonance when C1 is less than 365 pF.

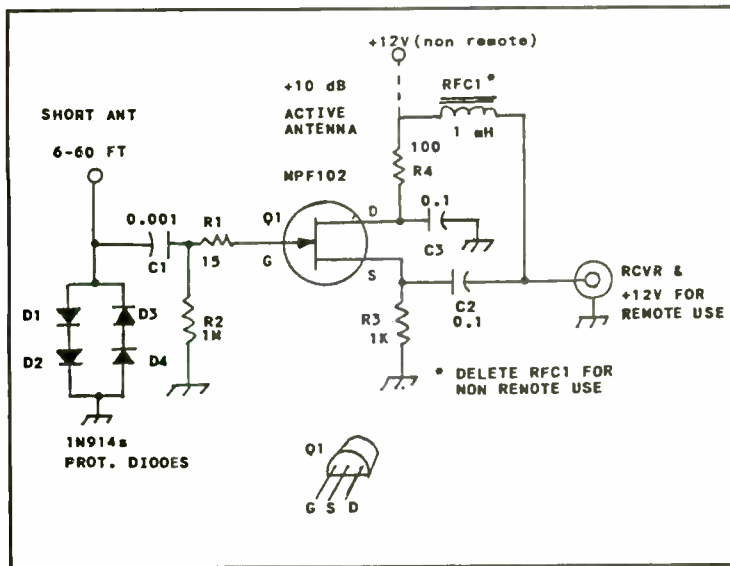


Figure 3: Schematic diagram of an active antenna. It provides 10 dB of gain and matches a short wire to the receiver. It may be used as a remote active antenna by supplying +12 volts via the 50-ohm coax cable to the receiver (see text for details). Capacitors are 50- or 100-volt disc ceramic. Resistors are 1/4-watt carbon types.

of the coax to isolate the center conductor of the coax from the power supply. The chokes allow the dc current to flow, but they block the flow of RF signal energy and prevent it from being lost to ground through the power supply.

A PC board etching pattern is provided in Figure 4 and a parts-replacement guide is depicted in Figure 5. Circuit boards for this project are available by mail.¹

Final Comments

My active antenna with 15 feet of hookup wire provides signals that are as loud as those I obtain with a 100-foot length of wire that is used with the Figure 1 tuning network. The wire can be as short as four feet or as long as 40 feet when the active antenna is used for BC-band reception. In fact, strong signals are heard when I touch my finger to the input terminal of the active antenna.

The pickup wire for the active antenna may be deployed vertically or horizontally. Reception will differ with each polarity, and experimentation yields the best results. I suggest that you use an 8-foot ground rod near the active antenna if it

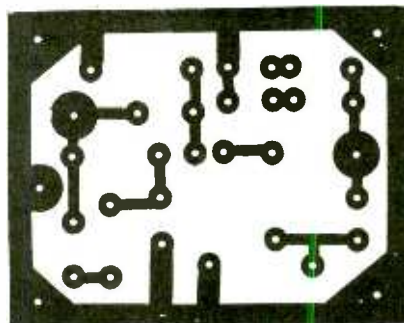


Figure 4: Scale etching template for the active antenna PC board as viewed from the etched side.

is located in your backyard. Connect the ground bus of your PC board to the ground rod.

This active antenna can be used from the BC band through 30 MHz without any circuit changes. It can greatly enhance reception of the short wave frequencies if you are unable to use an outdoor antenna. Placing the unit out of doors is helpful, however, when man-made noise is abundant within your home. Do not use the active antenna with the circuit in Figure 1, because of the unwanted self-oscillation mentioned earlier.

M_T

Reference 1
Etched, drilled and plated PC boards for this project are available from FAR Circuits, 18N640 Field Court, Dundee, IL 60118. Send \$3.50 plus \$1.50 s/h.

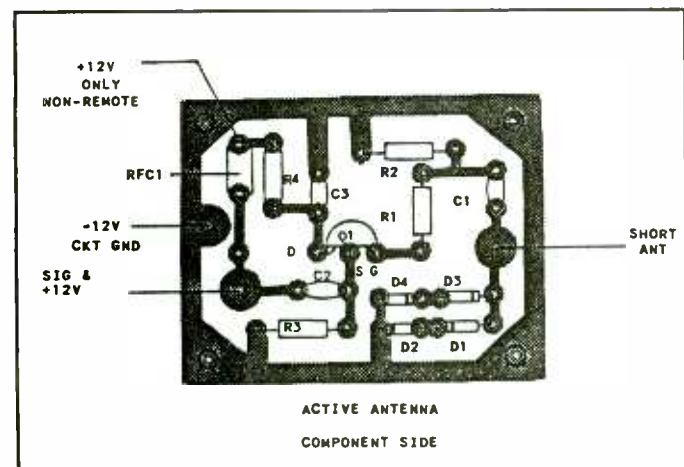


Figure 5: Parts placement overlay for the active antenna as viewed from the component side of the board. Not to scale.

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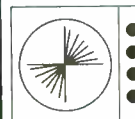
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S-Meters Old and New

Greetings, radio fans! Hot stuff this month with a little something for everyone. S-meters are old hat these days, but they always seem to be one of the hotter topics. A radio without an S-meter is only a radio. A radio with an S-meter is an instrument. Not only does it lend "personality and flavor" to incoming signals, but it can be used to evaluate the quality of antennas, coaxial cable, and receiver adjustments.

It's possible for most any receiver to be fitted with an S-meter. The December 1991 "Experimenter's Workshop" offered a practical driver circuit, good for virtually any receiver, easy to fabricate and install, and suited for analog or LED meters. This month we look at two other approaches: a time-honored and proven LED S-meter for those of you who want to stop right there, or, a circuit which can convert 0-10 output states to binary "code" for reading by a computer.

The heart of either circuit is the LM-3914 Dot/Bargraph Display Driver. This chip is a basic single-digit, digital voltmeter that carves up an analog input signal into 11 outputs from 0 to 10, with a 10% change indicated from one output to the next. The LM-3914 requires few external components, the main ones being 10-k trimmer potentiometers to set minimum and maximum calibration levels and brightness of the LEDs. If you want both a visible LED S-Meter and a computer-based version, then you will need two nearly identical LM-3914 circuits, one with LED's and one without. The computer-based version cannot accommodate LEDs because of the need for 0-5v logic levels which are not possible when LEDs are in the circuit.

The visible LED S-Meter offers eleven indications of the relative strength of an incoming

signal. The computer-compatible version is eminently suited for those who have computer-aided scanners and shortwave radios and who want to log relative signal strengths along with the customary frequency, date, and time data. A 4-bit binary word or byte encodes sixteen decimal values from 0-15, but since the LM-3914 has only 11 outputs, the largest binary byte will be 1-0-1-0 (decimal 10). The smallest, of course, will be 0-0-0-0, or decimal 0.

By the way, our Computer-Compatible S-Meter can be used for a thousand things other than an S-Meter! It could be applied to logging data on significant temperature and weather shifts, to burglar and fire alarms, to changes of speed and direction—anything where one digit in a range of values from 0 to 10 will be adequate. Unleash your imagination!

LED S-Meter Circuit Description

R-1 provides some isolation from the circuit to which the LED S-Meter circuit is connected. C-1 absorbs voltage spikes and undue fluctuations of the input signal. R-2 offers a discharge path for C-1 so that a displayed relative signal strength can quickly decay to zero when signals are not present. VR-1 sets the zero reference level for the output of the LM-3914. For input signals where the lowest value is zero, VR-1 is not needed, but I have found that many S-Meter circuits always have some DC level of signal. VR-1 allows a zero reference to be set for the LM-3914.

VR-2 sets the maximum reference level for the output of the LM-3914. VR-1 and VR-2 allow the LED S-Meter to be calibrated from 0 to 10 for a wide variety of input signals, from, say, 0-volts,

minimum and 0.5-volts maximum to real weird signal levels that might be 0.5 volts at minimum and 3 or 4 volts or more a maximum. Regardless of the output of the S-meter circuit, VR-1 and VR-2 allow calibration of the LM-3914 such that all LED's are OFF at minimum and all ON at maximum.

If you are sure that minimum value of your S-signal is 0-volts, then you can dispense with VR-2

and simply ground Pin 4 of the LM-3914. Otherwise, include VR-2 if you're not sure. It can always be set to zero if needed.

VR-3 sets the brightness of the LEDs, and R-3 serves as a brightness limiter, to protect the chip and the LEDs if VR-3 is inadvertently cranked up all the way. Obviously, you will need ten LEDs, typically six green, two yellow and two red. I prefer T-1 size or smaller LEDs but color and size are your choice.

Computer S-Meter Circuit

The visible LED S-Meter cannot be made to function for both LEDs and your computer. The S-Meter part of the computer circuit is essentially identical to the visible LED S-Meter circuit discussed above except as follows: The computer-compatible S-Meter circuit does not require VR-3. Any value between 1-k to 10-k (4.7-k nominal) should be just fine for R3, the bottom side of which should be connected to directly to ground.

In place of the ten LEDs, this circuit requires ten resistors, 10-k each, to be installed between the LM-3914's output pins and a common bus to +5v DC. This technique "pulls" the LM-3914 output pins "high" (+5v) until the chip drives them low (0v). The output pins of the LM-3914 are also fed to the input pins of a 74HC147 Decimal-to-BCD-Encoder chip, which converts the highest active of the LM-3914 outputs to an inverse binary value between 0 and 9: 1-1-1-1 to 0-1-1-0. (I'll get into the 10th output in a moment.) The logic output of the 74HC147 is opposite that which we want for a literal interpretation, so its outputs are fed to a 74HC04 Hex Inverter to change the above logic to the desired 0-9 range of 0-0-0-0 to 1-0-0-1.

"So what about the 10th output from the LM-3914?" you might ask. That bothered me, too. So I devised a way of utilizing that extra bit. That's the purpose of the CD-4066 Bilateral Switch: to sense when the 10th bit is present and to alter the binary output to 1-0-1-0. If you can live without that 10th S-Meter output, then you can dispense with the 4066 chip altogether and simply take the A0 and A1 outputs straight from the 74HC04 inverter, Pins 2 and 4. Do note, however, that a 10th output offers 11% better resolution than just 9 outputs; it's your call.

My Computer-Compatible S-Meter is functionally an analog-to-digital converter in a most

Table 1: Decimal to Binary

Decimal #LEDs Lit	BINARY OUT at A3-A0
0	0-0-0-0
1	0-0-0-1
2	0-0-1-0
3	0-0-1-1
4	0-1-0-0
5	0-1-0-1
6	0-1-1-0
7	0-1-1-1
8	1-0-0-0
9	1-0-0-1
10	1-0-1-0

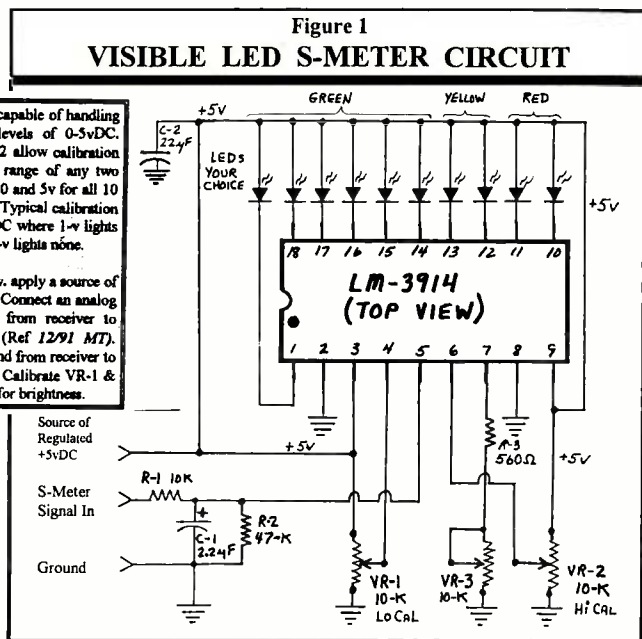
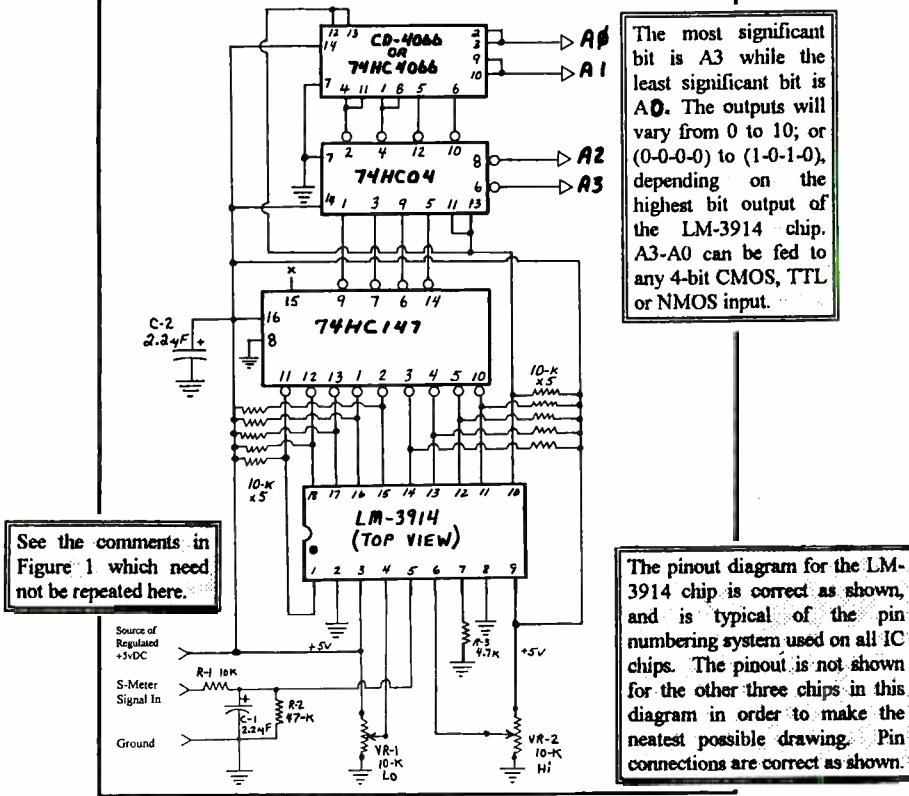


Figure 2
COMPUTER-COMPATIBLE S-METER CIRCUIT



elementary form, so you might ask, "Why not just use a real A-D converter?" Good question: A-D converters are expensive (in the \$30-\$40 range), and require some sophisticated external support circuitry. A-D converters are the way to go, if you don't mind spending the bucks and taking the time to develop the extra circuitry. Our project is a lot cheaper, less scary, and works as well as any for a 0-10 range with 1-digit resolution. See Table 1 for binary outputs of a 0-10 decimal input.

The Computer-Compatible S-Meter is so generic that it can be applied to many different needs where ever there is available an interface with at least four unused or spare input bits. It is eminently suited for the HB-232 Scanner/Computer Interface to display and automatically log relative signal strengths or other analog electrical parameters. Just connect A3-A0 outputs to the desired Status or InByte ports of the HB-232 and select the Extended Logging feature for the AutoLogger. The A3-A0 outputs of the Computer-Compatible S-Meter are CMOS and therefore capable of driving other CMOS, NMOS and TTL loads. Perfect for RS-232/RS-422 applications! Check your radio's interface diagrams or consult with the manufacturer about the possibility of four spare binary inputs somewhere; just half an 8-bit byte will do nicely!

How to Calibrate Your S-Meter

Easy. With no signals coming into your receiver, you obviously want a 0 indication from the S-Meter. Disconnect the antenna, short the an-

tenna terminals with a piece of wire, and tune to a known quiet, unused frequency. Adjust VR-2 so that all LEDs are just extinguished (computer version: binary output at A3-A0 is 0-0-0-0).

All LEDs should be lit when there is a monster signal coming in, right? Find some way to generate that strong signal, be it a CB radio, ham rig, 49-MHz Handitalkie, or cordless telephone held next to the antenna, or use a signal generator to inject around 10,000-uV (-27 dBm). Adjust VR-1 so that all LEDs just come on (computer version binary output at A3-A0 is 1-0-1-0). (There is some interaction between VR-1 and VR-2, so a couple of repetitions may be necessary to get it right.) Adjust VR-3 for the desired brightness of the LED's. For all practical purposes, signals much greater than zero and something less than magnasty will provide a 1-10 output for your viewing or logging pleasure!

Circuit Contest

Effective immediately, a contest is on for hot, new experimenter circuits that have at least some distant relationship to radio monitoring. Winning entries will be published here with credit rendered and an award of your choice of either of my *Scanner Modification Handbooks* or a year's extension of your subscription to *Monitoring Times*. Rules are few, but neatness and clarity count heavily, as do eccentricity and ingenuity of your submittal. Crawl out from under your rocks, experimenter's; I know you're there! Let's get to work!

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M

Two Basic Antennas: The Halfwave Dipole and the Groundplane

Dipole and groundplane antennas are utilized in more monitoring posts than any other antennas around, and with good reason. They are relatively easy to make, inexpensive, and good performers. When one compares the relative size and ease of mounting for these two antenna designs, the dipole generally emerges as the better choice for the HF band and the groundplane as more appropriate for the VHF-UHF bands. By building dipoles for your HF work, and ground plane antennas for each of the VHF or UHF bands you monitor, you can inexpensively and fairly easily construct your own complete "antenna farm."

The Halfwave Dipole

Traditionally, the halfwave dipole, or Hertzian antenna as it is sometimes known, is mounted with its elements (legs) horizontal as in fig. 1A. This antenna supports communications in all azimuth directions except for a very narrow null off each end. Horizontal dipoles mounted at heights up to about a quarter wavelength above radio ground (which may be several feet below the surface in dry soil) tend to function as an upward-pointed beam, utilizing the ground beneath them as a reflector.

At the low end of the HF band, low-mounted antennas are good for close-in communications out to a few hundred miles. If a horizontal dipole

is mounted a half wavelength above ground or higher it has a lower-angled reception pattern which will support DX work much better than the low mount.

Let's Make a Dipole

1. To make your dipole, calculate the desired total wire length by the formula:

$$\text{Length(in feet)} = 468/\text{Frequency(MHz)}$$

For instance, a dipole for 10MHz would be cut to a total length of $468/10$ or 46.8 feet. This length would be cut in its center to insert the center insulator, making each leg one half the length found by the formula.

In the metric system:

$$\text{Length(in meters)} = 143/\text{frequency (MHz)}$$

Add a few inches to the total length found by the formula to allow for wrapping the wire around the insulators at four places as shown in fig. 1A. Any wire strong enough to take the strain of wind and weather will work well.

2. Any good coax should work fine as a lead-in on shortwave. At higher frequencies above the HF band a low-loss cable will usually give better

performance. TV twinlead will work well for receive-only applications on HF; just connect one twinlead conductor as if it were the center conductor of a coax lead-in and the other conductor as if it were the shield of the coax.

3. Put the ends of the wires through the three insulators and twist the ends of the wire back around the wire itself as shown in fig. 1A. Scrape the wires bright and solder the lead-in cable conductors in place. Seal the open end of the coax with coax sealer.

4. Put ropes in the outer ends of the end insulators and hang the antenna in the clear, well away from power lines.

5. If you live in lightning country the minimum protection is to never use the antenna during weather likely to produce lightning, and to disconnect and ground the antenna when it is not in use.

Groundplane Antennas

The nondirectional reception pattern, relatively low angle of radiation, and modest space requirements of groundplane antennas make them a good choice for general use on the VHF-UHF bands.

Let's Make a Quarterwave Groundplane Antenna

1. Calculate the element lengths shown in fig. 1B from the formula:

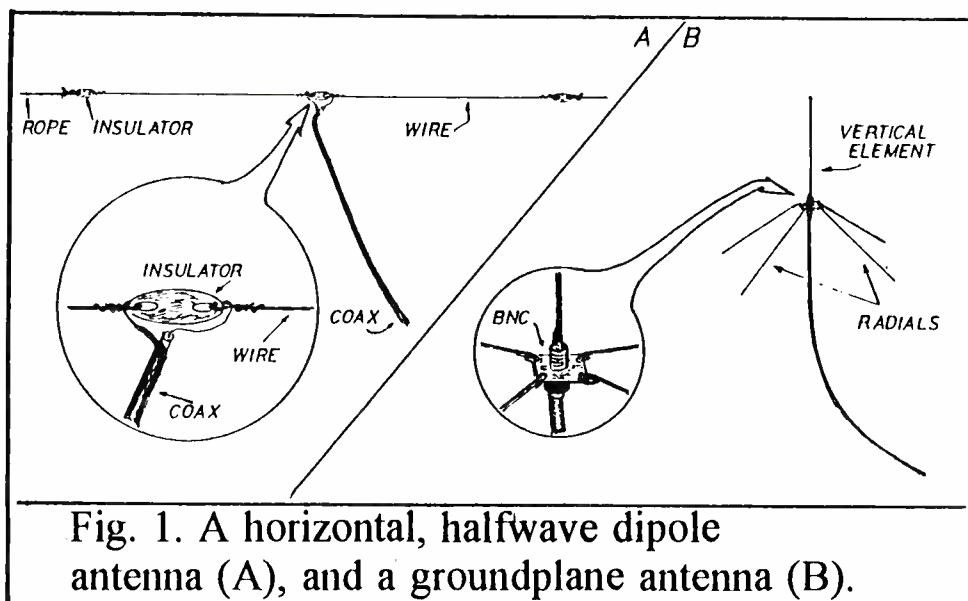
$$\text{Length(ft)} = 234/f(\text{MHz})$$

In the metric system:

$$\text{Length(m)} = 71.3/f(\text{MHz}).$$

These formulas give the length for each element; the vertical element and the radials are each a quarter wavelength long. Heavy wire, sufficiently rigid to be self supporting, or light tubing can be used for antennas at VHF or higher frequencies.

2. Connect the radials to the corners of a female BNC connector as shown in fig. 1B. The BNC connector serves as the base of the antenna.





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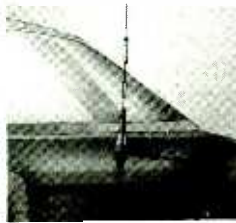
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3. Solder the vertical element to the connection which connects to the center pin of the female BNC connector. You may need extra support for this element; building up a thick wall with non-conductive epoxy around the junction is one method. Seal this joint with coax sealer.

4. In mounting the antenna keep the radials well above ground. Drooping the radials about 45 degrees, as shown in fig. 1B, will give a better match between the coax and antenna.

From heavy aluminum or soft steel make a bracket with a hole in one end for the BNC connector, drill the other end to accept screws which will attach the bracket to a wooden mounting mast.

5. Remember to observe the same minimum lightning-induced damage protection as for the dipole.

Roll Your Own

Antenna is a computer program I used to design many of the antennas in my *Antenna Handbook* (published by Grove). You can purchase *Antenna* from Small Planet Systems, 664 29th St., San Francisco, CA 94131 for \$9.95 plus \$2.00 shipping and handling. *Antenna* requires

an IBM® PC compatible computer with 640k of memory, a monochrome, CGA, or VGA monitor and either a 3-1/2" or 5-1/4" floppy drive.

RADIO RIDDLES

Last Month

Last month I asked if standing waves really stand "...like you and I stand? And if so, what do they stand on? Are there also 'sitting waves,' or perhaps some kind of waves that do something besides just standing around?"

Well, actually, all radio waves move at or near the speed of light; none of them stand around! If your feedline and receiver input are mismatched, waves moving forward from your antenna down the line to your receiver may be reflected back toward the antenna. As forward and reflected waves continually combine in electrical value their sum "stands" or remains in place as standing waves on your transmission line. Sitting waves? I have never heard of any.

The Hunt for the Hum Continues

In April I discussed the mysterious humming sound that has been reported in various parts of the nation. Several readers responded with sug-

Looking for a Good Antenna Handbook?

If you'd like a good source of information about antennas you will be interested in **THE ANTENNA HANDBOOK** by Clem Small. Within its 200-plus, 8 1/2" by 11" pages, there is much material from past "Antenna Topics" columns plus a considerable amount of new material.

It is an excellent source of information for selecting, constructing, understanding, and utilizing your antenna system. Also covered are subjects like the history of antennas, odd and unusual antennas, signal propagation, factors affecting antenna performance, antenna accessories, and antenna troubleshooting.

THE ANTENNA HANDBOOK is available from Grove Enterprises, P.O. Box 98, Brasstown, NC, 28902 for \$12.95 plus \$2.00 book rate postage (\$4.50 UPS).

gestions or offers of help in tracking it down. So many people have now reported hearing the hum that the U.S. Government has assembled a research team to search for the source of this puzzling sound. The team includes scientists and engineers from the University of New Mexico, Sandia Labs, Los Alamos Labs, and the U.S. Air Force. Hopefully we will have more to report to you on this enigma in the future.

This Month

We discussed the Hertz antenna above; who was Hertz? Also what is the Marconi antenna and how is it related to the Hertz antenna?

We'll have the answer to this month's riddle, and much more, in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

Q. *I can hear my neighbors talking on their cellular telephone when I tune my TV set to channel 83; am I breaking the law? (A.L.B., Virginia Beach, VA).*

A. Yes. The Electronic Communications Privacy Act of 1984 forbids the uninvited monitoring of mobile telephones on any receiver.

Q. *I have a Radio Shack discone antenna. Can I enhance VHF low band coverage by adding a vertical element to the top section? (Paul Bukowski, Palmer, MA)*

A. Absolutely; that's the way the Diamond D130J and ICOM AH7000 do it. Simply select a length that represents a quarter-wavelength near the frequency of greatest interest; divide 2808 by the frequency of interest to get the length in inches. For 42 MHz highway patrol monitoring, use about 67 inches, and for 49 MHz monitoring, use about 57 inches.

Q. *I am hearing the Stateville Correctional Center on 868.4375 MHz in the cellular telephone band. I know they are using walkie-talkies borrowed from the state police. What gives? (Donald Clark, Lockport, IL)*

A. If the voices are perfectly clear and undistorted, you are probably hearing an image of the actual repeater output frequency. One thing is sure: they aren't transmitting on the cellular telephone band!

Frequency directories show your state police using both 37 and 155 MHz frequencies. Since we don't know the frequency range of the walkie talkies or the model of your scanner, we have no way of calculating the actual repeater output frequency.

Q. *How can I get a chart of sunrise/sunset times so I can compute grayline propagation myself without having to resort to a computer? (Russ Conte, Berwyn, IL)*

A. Calculating correct grayline propagation predictions is not all that easy with a pencil and pad. If you want to give it a try, however, you might get a recent copy of the Ephemeris and Nautical Almanac from a library, nautical or astronomy

More on SCA and Predetection Recording

In our August issue we stated that subsidiary carrier systems (SCS, formerly called SCA) were detected as AM; reader Rob Cave pointed out correctly that these 67 and 92 kHz subcarriers are actually FM.

Rob also reminds fellow readers that similar subscriber programming is also found on TV baseband audio as L-R AM double sideband (DSB), dolby (dbx) compressed, with a stereo subcarrier at 31.468 kHz, a secondary audio program (SAP) at 78.670 kHz, and sometimes even a third voice or data subcarrier at 102.271 kHz.

Rob replied as well to our discussion about using VCRs for recording the radio spectrum right off the air. Rob says that VCRs are specialized for sync signals, stereo, audio and chrominance, and will not record properly.

Rob tried to record baseband video with his VCR, but found that the 4.5 MHz audio subcarrier was stripped off, detected and recorded as mono audio on a linear track. In the past other readers have expressed problems as well with poor dynamic range.

Thanks, Rob.

publication. Look-up tables allow you to compute these times with considerable accuracy.

After you give up, contact one of *MT's* ham radio advertisers and ask for the "DXer's Edge," an easy-to-use grayline propagation aid.

Q. *I have seen antenna housings in MT that look like they are made of PVC pipe. Isn't it true that PVC is lossy to RF signals? (Rob Cave)*

A. Yes and no. Generally speaking, stay with white PVC and you'll have no trouble. The problem seems to be with the black pipe. A simple test is to slip the PVC over a whip antenna while watching the signal levels on a receiver's S meter; any reduction would reveal signal absorption by the PVC.

Another test suggested by a reader is to compare the relative temperatures of black and white PVC in a microwave oven after a few seconds of exposure; the hotter pipe absorbed more microwave radiation and would be lossy to radio signals.

Q. *What frequencies do airline credit card telephones operate on? Does the FCC consider these cordless or cellular? (Daniel Fellows, Seattle, WA)*

A. Those radiotelephones operate in the 894-896 MHz (air) and 944-946 MHz (ground) range. The FCC considers them air to ground telephones.

Q. *Are the new 900 MHz cordless telephones as suspect in causing*

cancer as cellular telephones? (Name withheld, Round Rock, TX)

A. CT-2 phones operate in the 902-928 MHz band, very close to the 824-849/869-894 MHz cell phones, but CT-2 power is much lower. Even if a health hazard is finally determined for cell phones, cordless phones run a fraction of the power. They are not presently suspect.

Q. *I recently received an ad from Boedecker Electronics (1653 Parkside Trail, Lewisville, TX 75067) offering plans and a parts kit for a wired remote control for the Realistic PRO-2006 scanner. Is a remote controlled scanner really possible? (J.R., Detroit, MI)*

A. Absolutely. While we know nothing about the firm you mentioned, Shinwa offers a scanner with a remote control option. The trick is to access the controller circuitry from the microprocessor. Basically, a bunch of pushbuttons and some wire is all you need.

Q. *I replaced the battery in my old Regency R1600, but it still loses memory anywhere from an hour to a week. All solder connections are good. What gives? (Rudy O'Dell, Winfield, WV)*

A. Several old-age problems cause loss of memory in scanners. Low power supply voltage from dried-out filter capacitors is often the culprit in early-model Bearcats. Check the voltages on the RAM chip; if they are correct, then chances are the chip itself needs replacement.

Bob's Tip of the Month

Grove SDU-100 Interference Improvement

Present models of the popular Grove SDU-100 spectrum display unit offer reduced radio frequency interference (RFI) to the host receiver. If your SDU-100 has a ferrite bead (a black, vinyl-clad bulge) just behind the power plug, you have this later version; if not, you may wish to make this modification.

TOOLS NEEDED: screwdriver, small hand grinder (Dremel or similar) or scraping blade, RFI choke (part no. 273-104 from Radio Shack outlets; or Grove RFC-1, \$6 including U.S./Canadian shipping if ordered before October 30, 1993, from Grove Enterprises, PO Box 98, Brasstown, NC 28902).

PROCEDURE:

1. Remove all 12 cabinet screws (8 on the sides, 4 on the bottom) from the SDU-100. Separate the two covers carefully.
2. Using the grinder or scraping blade on the **INSIDE** of the two cabinet halves, remove approximately a 1/2" area of paint from around all 12 screw holes, exposing the bare metal.
3. Using the grinder on the **OUTSIDE EDGES** of the front and rear panel, remove approximately 1/4" area of paint from the holes where they attach to the cabinet. **NOTE: BE VERY CAREFUL NOT TO REMOVE TOO MUCH PAINT FROM THE SIDES OF THE FRONT AND BACK PANELS OR THE BARE SURFACES WILL BE VISIBLE AFTER REASSEMBLY!**
4. Brush any residue away and reassemble the cabinet tightly. Be sure the screws holding the monitor into its socket are secure.
5. Placing the RFI choke as close as practical to the DC plug end of the power cord, wrap at least 3 turns around the choke and snap it closed. You may wish to wrap it with tape. It may be permanently secured with a piece of heat shrink tubing which may be heated with a blow drier.

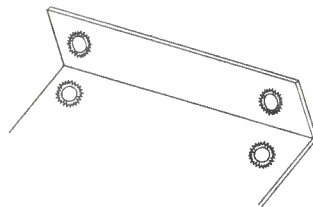
This completes the modification.

Cover Detail

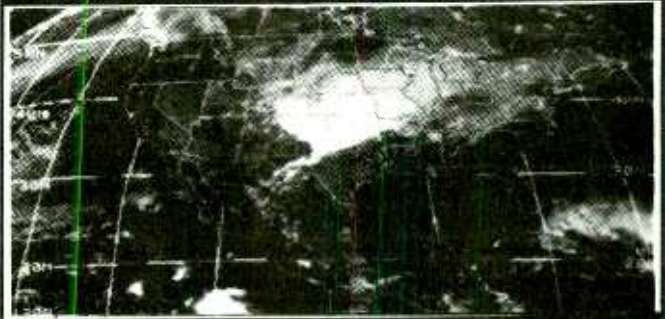
Scrape paint from around the **INSIDE** holes.

Panel Detail

Scrape paint from around the **OUTSIDE** holes, but leave enough paint toward the forward edges so the bare metal won't show after reassembly.



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Club Circuit

Welcome to ...

Club Diexistas de la Amistad (Friendship DXers Club)

Founded in 1976 by a group of students, this Venezuelan club states as its purpose: "dedicated to the DXing entertainment in order to receive and report every kind of radio signal from all over the world!" The club maintains a computer database, sponsors a DX program "International Radio Guide" on amateur radio station YV-2-FSW (Sunday at 1130-1330 UTC on 7113 and 14113 kHz) and on Radio Continental of Barinas, Venezuela (Sunday 0000-0400 UTC on 940 and 4940 kHz), and produces tapes demonstrating types of signals, jingles, etc.

Membership to join this all-mode radio club is free of charge; language is primarily Spanish, though you may write in English to Ing. Santiago San Gil Gonzalez, CDXA-I General Manager, P.O. Box 202, Barinas, 5201-A, Venezuela.

Drake SPR-4 International Club

This specialty club wishes to thank *MT* for its recent surge in popularity—now over 300 members in the US and Canada. Original "Festmeister" Rick Sitz, says, "If you have ever owned one of these beautiful gems you understand why we have started an international SPR-4 club." The club's main goal is to create a network through which information, stories, and equipment parts can be traded.

The club subsists on contributions of stamps, money and postal coupons; there are no formal dues. The club's semi-annual newsletter is published at the time of the winter and summer solstice.

A new "Festmeister" has just taken the leadership of the club: Bill Swigger, Route 1, Box 142A, Bridgeport, WV 26330. Since most SPR-4 owners also own other Drake products, there is discussion about expanding to become the International Drake Users' Club.

Other News

Paul Swearingen of the National Radio Club points out that many clubs' bulletins do not fit a regular envelope, so an SASE is often useless. Send a 29 cent stamp and a mailing label, or, simpler yet, just send one dollar.

NRC has a product catalog which they automatically include to those who send a dollar. If you send stamps, enclose a second stamp for the catalog.

By the way, NRC is celebrating its 60th anniversary convention Labor Day weekend, Sept. 3-6th! Call the Harley Hotel of Hartford/Springfield in Enfield, CT, 203-741-2211 for room reservations. Send \$40 for registration and banquet to NRC Convention, P.O. Box 118, Poquonock, CT 06064.

Change in dues: Chicago Area DX Club, dues are now \$17 per year.

Net change: Long Island Sounds: Net Tues 8PM on 146.805 MHz.

Club Listings A-L

All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. Ohio and surrounding states; VHF/UHF and some HF and amateur coverage. *American Scannergram*.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballad Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia, & Middle East; SWBC, utilities, longwave. *SWL*.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.*

Association of DX Reporters (ADXR): Reuben Dagold, 7008 Plymouth Rd. Baltimore, MD 21208. International; Utilities, ham band, QSLing, MW, LW, and SWBC. *DX Reporter*.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF

Bay Area Scanner Enthusiasts: Herman Frisch, 4718 Meridian Ave. #265, San Jose, CA 95118. San Francisco Bay area; 30+ MHz. *Listening Post*

Bayonne Emergency Radio Network (BERN): Ray Baron, P.O. Box 1203, Bayonne, NJ 07002, 201-662-2222. NE Jersey; Fire/disaster.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. US and Canada; Scanning only. *National Scanning Report*.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810, (508)470-1971, 50 mile radius Boston; SWBC.

British DX Club: Colin Wright, 54 Birkhall Road, Catford, London, SE6 1TE, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine radio. *Communication*. Sample 3 IRCs or \$2 US cash.

Canadian Int'l DX Club: Sheldon Harvey, Presi-

dent, 79 Kipps St., Greenfield Pk., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/member-ship open to all; General coverage. *The Messenger*

Central Florida Listeners Group: David Grubbs, 956 Woodrose Court, Altamonte Springs, FL 32714-1261; (407)273-5088 Andy Fountain. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 150 mile radius of Chicago; Dxing all bands. *DX Chicago*.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6536 N. Francisco 3E, Chicago, IL 60645. Chicago & midwest. Public safety & general coverage. *CARMA Newsletter*.

Cincinnati Area Monitoring Exchange (MONIX): Mark Meece, 7917 Third St., West Chester, OH 45069-2212. SE Indiana, Kentucky, SW Ohio; SWBC, utility, military, satellites, scanning, BCB.

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (206) 356-3927 (Phil). Collecting radio related items.

Drake SPR4 Int'l Club: Bill Swigger, Route 142, Box A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

DX Audio Service (NRC): NRC Publications Center, P.O. Box 164, Mannsville, NY 13661-0164. Worldwide; AM/FM; DXAS Cassette 90-min monthly audio magazine. Sample \$3 to above address

DX Club of India: Navin Patel, 809, M.G. Road, 1-Dutt Niwas, Mulund, Bombay-400 080, India; India; SW DXing.

DX Club Paulista: Marcelo Toniolo Dos Anjos, C. Postal 592, Sao Carlos - SP (Brasil), 13560-970. South America. Shortwave, including utilities. *Actividade DX* (in Portuguese).

European DX Council: Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England, ph: 0480-468885. Europe. *Euro DX*.

Finnish DX Association: Mr. Risto Vahakainu, Suomen DX-Liitto, P.O. Box 454, SF-00101 Helsinki, Finland. Finland and worldwide. SW and BCB. *Radiomaailma*.

Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. International. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 and 14113 kHz. Membership free.

Houston Area Scanners & Monitoring Club: 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 70223, Riverside, CA 92503. Worldwide; BCB/AM DX. *DX Monitor*.

Long Island Sounds: Ed, 2134 Decker Ave, North Merrick, NY 11566. Public Safety. Net Tues 8pm 146.805. *Newsletter*.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215)945-0543. Worldwide; Longwave only. *The Lowdown*.

New Listings:

DMS-News: Jerry Pickard, 8961 Magnolia Ave #59, Santee, CA 92071. Nationwide; VHF/UHF; *Dreaded Mod Sheet*.

Eastern Pennsylvania Scanner Club: Greg Spak, 214 S. Saint Lucas St., Allentown, PA 18104, 215-770-0448. Pennsylvania and Delaware; VHF/UHF/HF utilities. Beginners welcome.

Fire Net: Tom Kravitz, Box 1307 Culver City, CA 90232, 310-838-1436. Southern California; alphanumeric paging fire notification net, tied in with nationwide net.

Minnesota DX Club: Al Samson, 8367 Monroe St. NE, Spring Lake Park, MN 55432, 612-786-5915. Twin cities area; SW, MW, TV, FM, utilities. *MDXC Newsletter*.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Sept 3-6	Enfield, CT	NRC 60th Anniversary Convention Harley Hotel of Hartford/Springfield, 203-741-2211. Registration fee is \$40 which includes banquet and may be paid in advance.
Sept 4	Troy, OH	Miami County ARC/Gary Kercher, KB8XLN 1263 Gettsburg Dr., Troy, OH 45373.
Sept 5	Burlington, IA	Burlington Hamfest '93/Iowa-Illinois ARC/Check Gysi, N2DUP, P.O. Box 911, Burlington, IA 52601, (319) 752-3000. Location: Iowa Army National Guard, Summer Street Road. \$5 admission, talk-in on 146.790.
Sept 17-19	Ventura, CA	ARRL SW Division Convention/Marc Holzer, N6UNX 712 Primrose St., Thousand Oaks, CA 91360.
Sept 18-19	Anchorage, AK	Anchorage ARC Hamfest/Richard Mote, AL7MO, P.O. Box 101987, Anchorage, AK 99510-1987.
Sept 19	Mt. Clemens, MI	L'Anse Creuse ARC Swap and Shop/Ted MacKinnon, NW8W 19534 Warwick, Beverly Hills, MI 48025-3970, (313)647-1628. Location: L'Anse Creuse High School. \$3 admission.
Oct 2	Boaz, AL	Boaz Outlet Hamfest/Marshall County ARC/Hal Colfield, KK4OT, 110 Beason Lane, Albertville, AL 35950. Location: VFW Fairgrounds on Highway 431 North, 8am-3pm, talk-in on 147.07+.
Oct 2-3	Va Beach, VA	Virginia Beach Hamfest and Computer Fair Presented by Tidewater Radio Conventions/Manny Steiner, K4DOR 3512 Olympia Lane, Virginia Beach, VA 23452, (804) 340-6105. Location: Virginia Beach Pavilion. Saturday 9-5, Sunday 9-4. Tickets \$5 in advance, \$6 at the door. Talk-in on 146.97.
Oct 2-3	Va Beach, VA	Popular Communications Worldwide SWL Conference 76 North Broadway, Hicksville, NY 11801, (516) 681-2922. Location: Virginia Beach Pavilion. \$25 registration. Hotel accommoda- tions at the Radisson Hotel Virginia Beach, 1-800-333-3333.
Oct 3	Springfield, OH	Springfield Hamfest/Independent Radio Association P.O. Box 523, Springfield, OH 45501. Location: Clark County Fair- grounds, 8am-4pm, \$5 admission. Talk-in on 145.450 and 224.26 MHz.
Oct 3	Queens, NY	Hall of Science ARC Hamfest/Arnie Schiffman, WB2YXB, (718) 343-0172. Location: New York Hall of Science parking lot. Opens at 9am. Admission by donation. Talk-in on 440.200.
Oct 8-9	Augusta, GA	ARC of Augusta Hamfest/P.O. Box 3072, Augusta, GA 30914. Location: Augusta College Sports Complex, \$5 admission, talk-in on 144.89/145.49.
Oct 10	Durham, CT	ARRL Connecticut State Convention/Nutmeg Hamfest/Bob Schulte, WK1N, (203) 349-1373. Location: Durham Fairgrounds, Rt 17.
Oct 15-17	Atlanta, GA	1993 Monitoring Times Convention/P.O. Box 98, Brasstown, NC 28902. Location: Atlanta Airport Hilton. \$50 registration for full weekend. \$5 admission for exhibit room only. For more details see the ad on page 8.
Oct 16	Starke, FL	ARC-BA Hamfest/Bradford Area ARC/Tony Spatafore, WB2FGL, P.O. Box 852, Starke, FL 32091. Location: Bradford Co Fairgrounds, US301 North, \$2 admission, talk-in on 145.15 or 146.52.
Oct 17	Kalamazoo, MI	Kalamazoo Hamfest/SW Michigan Amateur Radio Team and Kalamazoo ARC/Gary Hazelton, KB8PL, 75075 M-40, Lawton, MI 49065. Location: Kalamazoo Central HS. \$2 advance or \$3 at the door; doors open at 8am. Talk-in on 147.040.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Event Calendar,
P.O. Box 98, Brasstown, NC 28902-0098

National Radio Club DX Tests

P.O. Box 5711, Topeka, KS 66605-0711

Sunday, Sept. 5, 1993: WSEZ-1560: P.O. Box 26, Paoli, IN 47454, will conduct a DX test between 1:30 and 2:00 am EDT. The test will be run at 1000 watts and will include Morse code ID's. Our thanks and your reports to Todd Edwards.

Sunday, Sept. 5, 1993: WCEI-1460, 306 Port St., Easton, MD 21601, will conduct a DX test between 2:30 and 3:00 am EDT. The test will be run at 500 watts and will include Morse code ID's and contemporary music.

Sunday, Sept. 5, 1993: WASB-1590 6675 Fourth Section Rd., Brockport, NY 14420, will conduct a DX test between 4:30 and 5:00 am EDT. The test will run at 1000 watts and will include Morse code ID's and contemporary music.

Sunday, Sept. 19, 1993: WEAM-1580, P.O. Box 766, Columbus, GA 31902, will conduct a DX test between 12:30 and 1:00 am EDT. The test will be run at 1000 watts and will include Morse code ID's and black gospel music.

INDEX OF ADVERTISERS

Advanced Electronics Applications	47
Aerial Dev. of New England	43
AIE Corporation	3,49
Antique Audio	13
Antique Radio Classified	43
ARRL	5,53
ASA	103
Ashton ITC	23
Austin Antenna	105
BBC World Service	75
Cellular Security Group	19,93
Chilton Pacific	103
Commtronics	57
Communications Electronics	86,87
Connect Systems	59
Dallas Remote Imaging	63
Datametrics	91
Jacques d'Avignon	79
Delta Research	97
R.L. Drake Company	15
EBS Consultants	25
Galaxy Electronics	25
GRE America	59
Grove Enterprises	17,21,65,95
Glenn Hauser	29
Ham Companion	45
ICOM America	Cover IV
IEEE	11
Intercepts Newsletter	43
J&J Enterprises	99
Japan Radio Company	Cover III
Javiation	19
JPS Communications	97
KIWA	101
Klingenfuss	37
Lentini Communications	23
Marymac Industries	3
Microcraft Corporation	49
MilSpec Communications	63
Mobile Diagnostics	107
Monitoring Times	8,9,17,93
Motron Electronics	13,27
National Scanning Report	3
Naval Electronics	59
OptoElectronics	Cover II
Palomar Engineering	13,101
Percon	97
Pioneer Data	15
Popular Communications	63
Radio Accessories	23
Radioware Corp.	49
RDI White Papers	99
Satman	51
Skyvision	51
Software Systems Consulting	7,107
Startek International	39
Tiare Publications	41
TranSel Technologies	15
TRS Consultants	25
Universal Radio	55
US Radio	7
V-Comm (ScanStar)	97
Viking International	51
Willco Electronics	101
Worldcom Technology	57

STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date. All ads must be paid in advance to *Monitoring Times*. Ad copy must be typed for legibility.

Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: \$.25 per word - *Subscribers only*. All merchandise must be personal and radio-related.

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SHERLOCK FREQUENCY FINDER software. Works with HB-232 Computer-To-Scanner Interface. New feature packed version now records audio. SASE for details. DataFile, Box 20111-MT, St. Louis, MO 63123.

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"**Annuaire de Frequences du Quebec 4e Edition 1993**" avec plus de 7000 frequences (Monitoring Times June issue Page 91) \$17.95 plus \$4 postage. Gilles Thibodeau, VE2 KGF, P.O. Box 193, Lac-Megantic, Quebec, G6B 2S6, Canada. (819) 583-1817; fax (819) 583-5638.

Are you an SWL? Licensed ham? Have PACKET? Write to me at NONNI at WOLJF, P.O. Box 22202, Denver, Colorado 80222. Correspondence requested. 73 Rob, NONNI, SWLer.

JRC NRD-525 RECEIVER with Sony speaker, in excellent condition. \$750. Firm. (419)782-6787.

BC-210XLT scanner. One year old. Mint. Manual/original carton. \$85 plus \$5 UPS. Pete Carron, 3015 Avon Road, Bethlehem, PA 18017.

DRAKE R8, with Drake VHF internal converter, Drake MS-8 matching speaker, Drake R8PC control software, dust cover, and owners manual. \$850. Eves: (201)470-0430.

ICOM R71A with CI-IV(UX-14) computer parallel I/O port interface option installed. Perfect condition, complete with box and manual. \$625. Call Dan (714)894-7584.

WANTED: Drake R7 or R8. Don't have a lot of money and would like a good used receiver. John Alexander, PO Box 1633, Emigrant, MT 59027. (406)333-4786.

FOR SALE (Upgrading!): Kenwood R-5000, Sony 6800-W, Yupiteru 7000, Icom R-1, Alinco DJ-X1. Hugh Waters (attending PopCom/MT Conventions) (912)839-3482.

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KENWOOD R-2000, \$395 w/manual; **KIWA MAP Synchronous Detector** for 455 kHz IF RX, \$250 w/manual; **GROVE TUN-4**, \$85. (206) 591-2863 digital pager, or (206) 564-0529 evenings. Buy all and receive PC HF FAX and PC SWL free.

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Short Shorts

"I read your news flash about Radio Shack withdrawing its scanners from New Jersey stores. I am hardly a spokesperson for Tandy but the Clifton, NJ, store had scanners. Like all your readers I am dismayed by the effort of our Federal Government to pump up the cellular phone industry at the expense of the innocent, law abiding, taxpaying radio hobbyists."

Jerome Mc Kenna
Upper Montclair, NJ

[As noted in the August report, not all scanners were being withdrawn—primarily single-conversion scanners and those with 800-MHz coverage—ed.]

"I saw the May issue concerning the new anti-cellular law. Like the rest of scanning enthusiasts, I feel that this law is a crock of nonsense and we should all ban together and let the fat cats in Washington know how we all feel. This type of censorship is along the lines of 'big brother' and not the type of law one would expect to find in a free democratic society. I also feel that it is unconstitutional, violating our right to free speech, expression and freedom of the press. I hope you have gotten a favorable response from MT readers. Now let's get together and demand that Washington repeal this crazy law."

Jack McCartan
Newark, DE

[As to constitutionality: I imagine the unsuspecting users of mobile/cellular phones feel their right to privacy has been violated as well by radio hobbyists! The trick is to find a way for all individual rights to be respected without Congress pretending they can alter the laws of science—ed.]

"I am puzzled! On page 58 of your July issue, there is a picture of a QSL from Guyane. In the small print: Position Geographique 52°20' EST 4°54' NORD. They must reckon from a different set of longitude than we do."

E. McMullin
Inglewood, CA

[While the longitude and latitude are correct for this country on the northern shores of South America, the longitude should indicate it's WEST of Greenwich instead of east. Could be a simple mistake which appeared in print. Does anyone know otherwise?—ed.]

"Please suggest a directory of AM broadcast stations in the USA. In addition to listening to worldwide broadcasts listed in *Monitoring Times*, I'd like to seek out major US cities."

Don Hanauer
Atascadero, CA

[I recommend the National Radio Club's *AM Radio Log*, \$19.95 from NRC Publications, Box 164, Mannsville, NY 13661--ed.]

These are your pages to share your opinions, thoughts and experiences relating to the features and columns in this magazine or the world of radio in general. We have some good letters to hold over 'til next month, but let's hear from you, too, about your monitoring times or your *Monitoring Times*!

Rachel Baughn, Editor

Hope to see you in Atlanta next month at the Fourth Monitoring Times Convention! It's your chance to tell me in person how we're doing!

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Refarming the Spectrum

When Congress created the Federal Communications Commission (FCC) some six decades ago, little did they envision the radio congestion that was yet to be. Millions of U.S. licensees inhabit the first 300 gigahertz of the electromagnetic spectrum.

Early operators had plenty of room for error; frequency drift was not a problem. The dominant mode was amplitude modulation (AM) and exact frequency tuning was not required. Even with later frequency modulation (FM) there was adequate margin for error.

With the advent of single sideband, however, all that changed. Then FM tuning became more critical as narrowband techniques evolved. Even on AM the old 100 kilohertz channelization for aircraft was reduced to 25 kilohertz.

With co-channel interference becoming a serious problem in metropolitan areas, the FCC has proposed a sweeping change in the radio industry, a reduction in VHF and UHF two-way radio channel spacing, now typically 12.5 and 15 kHz, to 6.25 kHz. The new requirement, assuming its successful passage, will require tighter specifications and sharper filters.

When this new FCC proposal, called Part 88 of 47 Code of Federal Regulations, was first announced, rumors hit the fan: All police agencies were going to be forced to move to 800 MHz...all present equipment would become obsolete...licensees were going to be reshuffled all over the

spectrum...scanners would be unable to hear the new equipment...and so on. But the facts are much different.

The FCC intends the procedure to be orderly without imposing financial hardships. Part 88 is directed only toward metropolitan, not rural, areas. Initially, only new licensees will be required to utilize the narrower equipment. Existing licensees will probably be purchasing the newer equipment as their older equipment is due for replacement anyway.

The process, which will take several years, will not begin before 1996 at the earliest, and this optimistic timetable is bound to stretch.

Part 88 is expected to be acted upon by the end of the year. Even with its unaltered adoption (unlikely), no profound changes will occur, only gradual changes over several years. Present-day scanners will still be able to monitor the new frequencies much as they do now: slightly off-centered, but still receivable. Newer scanners will accommodate the new bandplans.

So, in the meantime, enjoy your monitoring hobby — and continue to enjoy it even after the FCC begins refarming the spectrum. There will be even more to hear.

Bob Grove
Publisher





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