Volume 12, Number 5 • May 1993 $ 3 75 US

Monitoring Times

A Publication of
Grove Enterprises, Inc.

MT Reviews the Yaesu FRG-100. Projects, frequencies and much, much more!

The Friendly Computer

A Painless Initiation into the world of computers and radio

Listen to the Lakers

It's Shipping Season!

- Deutsche Welle in the Land of the Cyclops
- Scanning the U.S. Navy

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OPTOELECTRONICS

BE SURE YOU HAVE AN OE10 INSIDE

May 1993

Monitoring Times

Listening to the Lakers

By Russell Hill

It's spring, and the big ships of commercial enterprise should be bound for ports on the Great Lakes. These private ship to shore and ship to ship channels can provide challenge, entertainment, and an opportunity to collect some unique QSL cards. Here is a compilation of maritime monitoring from the radio shack of a Detroit area hobbyist.

Deutsche Welle's Malta Relay

By Charles Sorrell

Shortwave stations have a great affinity for locating their relay transmitters on remote salt sea islands. For example, Deutsche Welle has a major relay site at a place called Cyclops on the tiny island of Malta. Like the one-eyed giant of the same name, it beams signals to the world — not for Deutsche Welle alone but also for the Maltese broadcaster, Voice of the Mediterranean.

The Friendly Computer

By Bill Grove

How can you get started using a computer in your radio hobby without the frustrating (and usually expensive) process of purchasing, installing and configuring software and accessories to make the computer do all you want it to? And is it worth the bother?

Well, this author says it's worth it and it's easy if you buy an already integrated system with all the features you could possibly desire already installed.

COVER: *Bill Grove puts the user-friendly Tandy "Sensation!" computer through its paces. Photo by Bob Grove.*

And More ...

In this issue you'll find the long-awaited review of the Yaesu FRG-100--"The Little Radio That Could." With one exception, this moderately-priced shortwave receiver receives high marks from Magne.

Projects in this issue include how to add time standard station WWV to an older shortwave receiver (see "What's New" for a WWV-format clock!), how to construct an HF sloper antenna, and how to add an S-meter to the Realistic® PRO-43.

If you're traveling this summer, you will be interested in "American Bandscan's" feature on Travelers Information Service broadcasts. TIS transmitters can be tucked away in the most unusual places! If you enjoyed the article on monitoring the Great Lakes, but the author's Detroit monitoring doesn't apply to your locale, "High Seas" provides the general allocations for private maritime communications in the U.S. and Canada.

No matter where you live or what your listening interest, there's something for you in the May issue of *Monitoring Times*!

DEPARTMENTS

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LETTERS

The Week That Wasn't

Have you ever had the sensation that a week of one's life just dropped into the Bermuda Triangle and mysteriously vanished?! It is difficult to believe that it was only a month ago that the Ides of March blew in a blizzard that effectively shut down Brasstown, North Carolina, and the surrounding communities. One hundred fifty power company employees, including crews borrowed from neighboring states, worked almost around the clock for ten days to restore full power to the region.

Property owners, highway crews and volunteers spent endless hours in the task occupying Bob Grove in the accompanying picture. This particular tree came down over the *Monitoring Times* layout department. A power company employee estimated 60 trees were down along the 1-1/2 mile stretch of Dog Branch Road alone!

If you were one of the many who tried to call *Monitoring Times* or Grove Enterprises March 15-19, you now understand why you received no answer! Even in the first week of April, we discovered phone lines were not completely back to normal. Many callers reported receiving no answer, or being cut off after a couple of rings, as GTE completed repairs on a major trunk line.

You probably also noticed your April *MT* arrived a few days late. Although they received the mailing labels a full week behind schedule, Ripon Community Printers in Wisconsin is to be highly commended for getting your issues mailed a mere three days past the deadline!

More Commendations

Jack Albert first started writing for *Monitoring Times* in November of 1987. His efforts in deciphering RTTY and other types of encoded communications have been much appreciated. However, Jack is turning in his typewriter to put into production some of the listening tools he helped to develop while working on the column. The company name is WILLCO Electronics, and we'll watch with great interest as it brings its innovative ideas to market.

The "Reading RTTY" column in its current form is being discontinued. In its stead, Robert Evans, known for his writing on data communication and aeronautical topics, will be authoring an expanded, quarterly column on data modes. It will alternate with two other quarterly topics, to be announced next month.

I also wish to commend our *Monitoring Times* readers. We continue to boast about how active and involved our readers are, but

you still manage to amaze us. The Radio Monitoring Listener's Survey that was enclosed in *MT*'s January issue was seen by 50,000 people, of whom more than 3,000 of you responded! This represents a response rate of 6% — a phenomenal figure, especially when compared to the industry average of 1-3%. The manufacturer for whom it was conducted (not Grove Enterprises, by the way) cannot help but be impressed and gratified as well! We thank you for taking the time.

False Alarm

Two amateur radio operators, Jim Condon and Bob Scupp, have already called us regarding an item in the April "Communications" column. No, the Local Multipoint Distribution Service is not getting ready to take away the amateur 10 meter band — that was a misprint. The article should have read 27.5 to 29.5 *GHz*, not MHz!

Up Against the Law

In Bob Grove's "Closing Comments," we get a chance to see exactly how the FCC will implement the anti-scanning law passed last fall. He makes it clear that to restore and even retain our listening rights will not be easy.

We can take a lesson from our friends overseas. A guest editorial on page 25 from a resident of the United Kingdom gives one account of what occurred when the first British scanner directory was published.

Steve Ziegler of South Portland, Maine, speaks for us all when he says, "I suppose, I had become complacent about the rights we enjoy in the United States when it comes to our monitoring hobby."

"In preparation for an overseas trip, I had written to aviation agencies in both Germany and England to request air traffic control frequencies that I could monitor while in their countries. Much to my surprise, I received polite but firm letters from each saying that it is forbidden to listen to ATC communications! Police, fire, security agencies I could have understood; but civil aviation?

LETTERS

"It just goes to show that, even though efforts are made from time to time to restrict our monitoring rights, we still enjoy a great deal of liberty to practice our hobby. Let's appreciate these rights and fight to protect them."

England is cracking down on pirate broadcasting also, with some far-reaching consequences to hobby magazines and others. Andy Cadier, who authors the quarterly pirate radio column "Off the Record" for the British *Shortwave Magazine*, provided *MT* with these facts about the Broadcasting Act 1990:

"It is illegal for those in charge of premises to allow the use for illegal broadcasts. Supplying or repairing equipment or rendering any service or providing any materials that might assist in the running of a station is contrary to the Act. It is illegal to perform as an artist, to provide entertainment, or to air a speech on an unlicensed station. It is illegal to publish details, to advertise or promote an unlicensed station."

Andy Cadier adds, "The problems over my article in *SW Magazine* was that the Radio Communications Agency thought publishing the names and frequencies of unlicensed stations gave them publicity. So now the article still goes ahead giving the frequency, program content, day and time it was heard, but making no mention of the station name.

"You can hardly be convicted of publicising an unidentified station, but readers just tune in as before and wait for the station ID. So far no further objection has been received."

The balancing act between freedom and responsibility is the greatest test of a democracy. At the moment, I'm not sure either U.S. citizens or the government has passing marks. But I found the remarks of Sean Yeoman of Cambridge, Massachusetts, to be thought-provoking.

"At the end of your [December] column you quote the title of Nat Hentoff's book, *FreeSpeech For Me, But Not For Thee*. [Guilty as charged; I had heard the title, but did not remember the author — rb] I recently heard an interview with Mr. Hentoff. He said that both the American left and right have a long history of censoring those voices they deem are dangerous.

"If Mr. Strom's ideas [on American Dissident Voices] are worthless, they will wither under the light of public scrutiny. If they have value, they cannot be repressed by censorship. In either case, only an informed public, with access to all kinds of thoughts and ideas can make informed choices. I am far more afraid of those who would censor Mr. Strom, than I am of Mr. Strom's ideas."

New Ways with Old Waves

Steve Hada asked a question in the January issue regarding a new technique for two-way conversations using a single frequency. Jeffrey Krauss of Rockville, MD, gives this clarification.

"Full duplex communications on a single channel is accomplished using a channel access method known as time division duplex (TDD). I prepared an FCC filing on behalf of PCSI, a San Diego company, which describes a service under development in Japan called Personal Handy Phone which will employ TDD at around 1900 MHz. PCSI feels that TDD is the best choice of a technology for some of the new personal communications services now being developed in this country."

The document points out that the same technology is being developed in Europe (Digital European Cordless Telephone) and that it would be to our advantage both for compatibility and for economy to conform U.S. standards to those being adopted in Europe and Japan.

Skip Article Skipped Freqs

Brian Webb's article on low-band skip in January and February reflected a great deal of personal monitoring. However, Jeff Koch of Valparaiso, Indiana, points out that in his list of federal and military bands to scan for skip, Brian omitted the 46.60-47.00 and 49.60-50.00 MHz segments.

A general search of these bands will turn up cordless phone signals almost exclusively, since they are interspersed with the government allocations. However, based on Koch's remarks, Brian tried it again with a different approach: "I programmed all of the exact federal frequencies for 46 and 49 MHz, and to my surprise most of them are clear. I intend to scan these frequencies during the sporadic-E (short skip) season that runs from April to August.

"The exact federal frequencies are:

46.60	46.50	46.70	46.79	46.85
46.90	46.99	49.61	49.63	49.65
49.70	49.75	49.80	49.85	49.90
49.95				

Since the government doesn't always follow their own frequency plan, I would suggest DXers check the following additional frequencies: 46.75, 46.80, 46.95, 47.00, 49.60 and 50.00 MHz."

Disabled DXers

Bill Miller of Phoenix, Arizona, says, "I cannot thank you enough for the article on our group, the DDXers (March "Letters"). One local *MT* subscriber, Paul Mofitt of Mesa, AZ, drove over fifty miles to donate us some 'elderly but neat' receivers! With a little work they will become a window to the outside world for some lucky disabled folks.

"We are within ten thousand dollars of purchasing our 'home' for the DDXers! Anybody looking for a tax-deduction, we do have a 501-C-3." (Address: DDXers, P.O. Box 42536, Phoenix, AZ 85080-2536; 602-375-9801.)

Bob Fraser of Cohasset, Massachusetts, says he "got a chuckle out of the article on the Disabled DXers. Not on the idea, for that is wonderful and long overdue, but on the price of $200,000 to purchase and remodel a house. Believe me, that would be a great bargain around here."

We're happy to hear you are close to meeting your goal, Bill, and hope more radio hobbyists will jump on the bandwagon.

Evolution of a Shack

Ron Bruckman, who wrote up the story of his experience being stuck in a snow drift in 1979, updated the picture of his monitoring post. Says Ron, "Since the episode of getting caught in the storm, my interest has grown 'til I'm not just an everyday monitor, but one of those real serious NUTSOS! I'm so intrigued with the hobby that I started a club and publication for the serious enthusiast here in Maryland and surrounding areas — the Radio Monitors of Maryland. After three years we have approximately 450 members!"

On the Medium Waves

K.S., from Cleveland, Ohio, sent this story for our enjoyment. "I just finished the article 'Log the Tough Ones' by J.D. Stephens in the Feb. issue of *MT* and it reminded me of a rare (for me, at least) catch I received one late afternoon on AM BCB. Around 5 pm the sun had just gone down and I usually try to get a few minutes of DXing in before supper. I usually try to catch some stations west of me after the east coast stations 'power down' for night time operation. I turned on my DX-440, which is connected to a rooftop longwire which was arbitrarily set at 720 kHz. Expecting to hear 50,000-watt WGN Chicago, which I listen to regularly, instead I was listening to CHTN-Charlottetown, Prince Edward Island! The news was on and they were reporting on Canadian Government news and giving temperatures in Celsius.

"Could this actually happen? I saw on the news that night that there was a rather large storm moving east. This is the only time I heard CHTN.

Continued on p. 99

Register before June 30th, 1993, and your registration fee will include a FREE copy ($30 value) of the all new *Grove Shortwave Directory, 8th Edition!*

(available in September 1993)

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"

Banquet Speaker Carol Perry, noted author, teacher and promoter of ham radio!

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

Saturday cont'd
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 12:30 pm

Enjoy accommodations at the *Atlanta Airport Hilton* and receive the special nightly rate of only $69 (save over 50% off the regular $140 per night rate!) which includes the following:

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Be sure to mention Monitoring Times when making your reservation to receive the special room rate.

Friday evening starts the weekend off 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:

An Introduction to Computers
Monitoring SW Military/HF and USB
ELF—Are We Being Fried?
Choosing a Scanner/SW Radio
Monitor 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:
- Monitoring 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
- Get Your Ham License

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Bay Area Scanner Enthusiasts
Bearcat Radio Club
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R.L. Drake
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International DXers Assn.
Optoelectronics
Scan*Star
Shortwave Paradise
Sony Corporation
SPEEDX
Worldcom Technology
Universal Radio

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[ ] Enclosed is my $21.95 banquet fee!

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A Dangerous Business

News of the fire at shortwave broadcaster WWCR in Nashville, Tennessee, came in to *Monitoring Times* at presstime. The station reported that the April 3rd fire destroyed all three shortwave transmitters and the entire transmitter building which included studios. The antennas were undamaged.

The spokesperson said that in spite of the devastation the station hopes to be back on the air in about 3-1/2 months. The cause of the fire was not yet determined, although the failure of the sprinkler system is a factor.

Radio for Peace International in Costa Rica has also suffered a serious set-back. No sooner did it celebrate the completion of its new high-power transmitting facility, than hurricane-force winds on March 14 blew down all three transmitting towers. Forty-five days was the earliest estimate for repairs.

Following the loss of their towers, RFPI is transmitting from a dipole antenna at around 1kW on 7375 kHz. The station reports that jamming on this frequency seems to have decreased, but at 1kW, the current signal will be probably audible only by very sensitive receivers.

The loss of these two broadcasters is especially poignant for radio hobbyists, since they are among only a handful of stations which offer alternative programming such as Glenn Hauser's *World of Radio*. Fortunately, both intend to rebuild, and would no doubt welcome your support. Write: Radio for Peace International, P.O. Box 10869, Eugene, OR 97440; WWCR, 1300 WWCR Avenue, Nashville, TN 37218.

Radio hobbyists can at least hear Glenn Hauser's new program, *DX Daily*, being carried on WHRI until May 8 (see his column, for schedule).

Spectrum, a new program on international communications and technology, had also been slated for its inaugural broadcast on WWCR on May 2nd. The radio magazine will be hosted by Dave Marthouse, radio enthusiast and professional broadcaster, and Mark Emanuele, a professional communications consultant. Each show will include a live phone in segment with featured guests...whenever WWCR resumes broadcasting.

Is Anybody Out There?

At least one international broadcaster is starting to scratch its head and wonder if, perhaps, anyone is out there. Portugal's Radio Renascenca, a Catholic station based in Lisbon that operates on AM, FM and even satellite, openly asked listeners whether anyone was

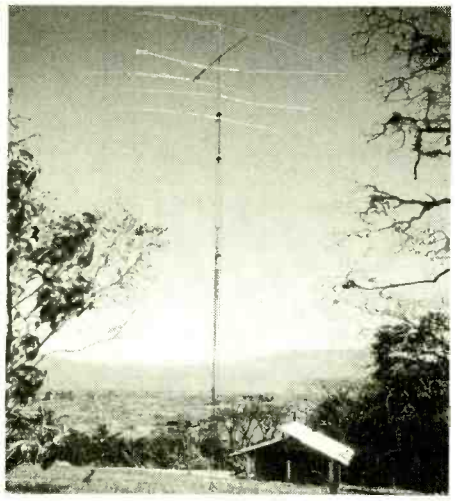


Photo by Harald Kuhl

The new transmitter building and the antennas of RFPI.

"still listening [to the station] on shortwave."

"So we're asking our listeners," said a recent broadcast, "as a matter of relative urgency, to write us a postcard or...give us a phone call. We shall be waiting..."

And so the fate of yet another shortwave station apparently hangs in the balance. If you'd like to skew the results in favor of keeping Radio Renascenca on the air (Maybe you don't — it's in Portuguese), write them a postcard. Their address is Rua Ivens 14, 1294 Lisboa Codex, Portugal. If you'd like to call, dial 011-351-1-3475270. Try to sound sincere. And sound like you're speaking Portuguese.

BBC + ABC = MORE NEWS

The BBC, with more than 50 foreign bureaus, has struck an agreement with ABC to cooperate in newsgathering and news coverage around the world. Stories, technical and broadcast facilities, correspondents and production crews may all be used jointly under the agreement.

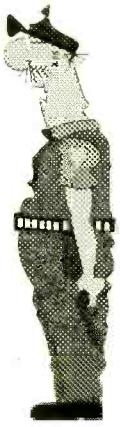
The BBC has had a similar arrangement with NBC for more than forty years, but this new partnership will create one of the world's largest newsgathering operations, according to an Associated Press report.

This is the broadcast police. Open up or we'll shoot!

The door buzzer rang. Over the intercom came the voice of a man who said he was from WDR, a German television station. "So far, so good," thought the *Washington Post*'s Berlin-based Marc Fisher. "German journalists often stop by to get a foreign correspondent's view."

Moments later, Fisher's assistant entered the room, a frantic facial expression indicating something odd was about to happen. "The visitor sauntered in behind her, removed his hat and turned his back to me," says Fisher. "I stood up and approached the man and said, after some seconds, `May I help you?'

Silence. Slowly, he rotated, casting his eyes above my filing cabinets, across my desk, along the windowsill, occasionally down at his clipboard. Finally he announced, 'Alles klar. Everything's in order. One radio. One television.'"



"I was mystified," said Fisher, "but my assistant understood. Our visitor was — though he never said so — from the German broadcast police."

Germany's government-owned broadcasters are funded through license fees charged on every radio and TV in the country. The job of the broadcast police is to discover unlicensed radios. In Berlin, 20 agents, called controllers, work mostly at night, snooping around houses and apartment stairwells, listening at doors for blaring newscasts or sitcoms. Other times they drive vans equipped with devices that can detect radios and TVs from their position n the street.

"We are not allowed to enter people's homes without permission," said a broadcast police spokesman, "but if they refuse, we send them threatening letters. Most people register right away." No wonder.

Says Fisher, "In Germany, a thick blue line separates the citizenry from the unruly."

Cult Buys Only the Best

The CBS documentary magazine *48 Hours* aired on March 17th a segment on religious cults. While covering such a community in Montana, the camera focussed on a round rock and concrete structure described by the reporter as appearing to have "gun slits" in the sides. On top of the structure were several antennas.

"The antenna that caught my eye," says reader Don Benningfield, "was the Grove Scanner Beam, mounted as suggested on a TV antenna rotor for boresight accuracy." He added, "I guess even 'cult' members recognize an excellent product when they see one."

Federal File columnist Steve Douglass, an admitted Scanner Beam fanatic, called to say he also noted that familiar profile.

Cell Phone Fun

You never know who you're going to hear

if you happen to accidentally scan across the cellular phone bands — unless you live in Boston or Washington.

According to newspaper reports, U.S. Representative Joe Kennedy II ran up nearly $21,000 in phone calls from his cellular telephone during the 1992 election. Reports show that during the 1992 race, Kennedy spent more on his car phone than any of the 405 House incumbents or their challengers. That year, Kennedy's cell phone bill was a mere $16,831.

High-Tech Target

A relatively new piece of crime fighting equipment that allows judges to restrict the travels of people accused of a crime and out on bail is under fire by the American Civil Liberties Union (ACLU). Electronic ankle bracelets use radio signals to set off an alarm if the wearer enters a prohibited area.

According to the ACLU, an individual on bail has the right to a presumed innocence and the forced wearing of the device "is saying you are guilty." Critics of the ACLU's position say that the radio bracelets are no more of an infringement than a high cash bail.

Power Down

Powerline is a nationally syndicated radio show that features Top-40 music interspersed with inspirational messages. The program is produced by the Southern Baptist Convention and sent to radio stations on compact disks.

Last month, the company that produces and distributes the compact disks for the Baptists made a mistake. Instead of sending out *Powerline*, they accidentally sent out *Fresh Fruit for Rotting Vegetables*, a 1979 release by the punk-rock group, the Dead Kennedys. The album features such melodies as *I Kill Children*, a song which opens with the line, "God told me to skin you alive."

"That," says Doug Dillard, vice president of external affairs at the Southern Baptist Radio and Television Commission in Fort worth, Texas, "is not the music typically aired on *Powerline*."

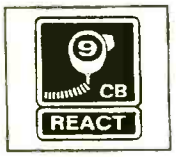
Seventy-two of the Dead Kennedy CDs were recovered. There are 900 stations on the Powerline network.

Monitoring FEMA

Monitoring the Federal Emergency Management Agency (FEMA) has been a favorite target of radio listeners for years. FEMA is charged with responding to natural disasters. Yet, according to an article in the Knoxville *News-Sentinel*, for every one dollar spent on responding to natural disasters, $12 has been spent on plans to keep the American government running during a nuclear war.

At the core of the project is a fleet of Mobile Emergency Response Support Units — vehicles so sophisticated that they are overkill for even the most devastating natural disaster. When Hurricane Andrew swept over south Florida eight months ago, FEMA came to the rescue. Homestead's City Manager pleaded for 100 handheld radios because the town had only one working telephone. FEMA instead arrived with high-tech vans capable of sending encrypted, multi-frequency radio messages to military aircraft halfway around the world.

FEMA's Multi-Radio Vehicle is a custom-built Kenworthy K100E diesel truck with a 444 horsepower engine. It weighs 24 tons and can run for seven days without refueling. While most communications remain centered at Mount Weather in Berryville, Virginia, roving vehicles stuffed with high-tech communications gear now serve as the wartime White House.



REACT Says Take a Break

If you're on the road this Memorial Day/ Victoria Day weekend, you may see signs encouraging you to take a Safety Break from driving on the highway and have a cup of coffee — compliments of REACT.

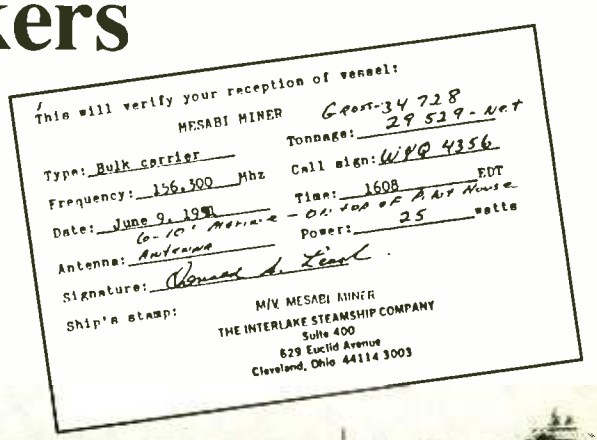
May is International REACT month, to honor the volunteers who have been monitoring CB Emergency Channel 9 for thirty years. REACT passes on this "Mayday" tip: To get help from REACT or police in an emergency, broadcast your report repeatedly, giving the same information each time. That information should include WHO you are, WHERE exactly you are, and WHAT is wrong.

If you stop by a REACT Safety Break, be sure to say thanks — and join up!

Communications is written by Larry Miller from a variety of sources including the BBC Monitoring Service, *National Scanning Report* and the *WSYI Report* and material submitted by the following readers: David Alpert, New york, New York; Howard Bailen, New York, New York; Rachel Baughn, Brasstown, North Carolina; Brian Cathcart, West Palm Beach, Florida; John Combs, Orlando, Florida; Victor Dricks, Phoenix, Arizona; Chuck Emberton, Alcoa, Tennessee; Dennis Embo; Thomas Folks, Coatesville, Pennsylvania; Kevin Klein, Appleton, Wisconsin; Bob Lucore, Takoma Park, Washington; Jon MacDonald, Derry, New Hampshire; Bernard Maguire, Montreal, Quebec; John Moran, Tempe, Arizona; David Pickett, Sharon, mA; Roland Soderholm, Virginia Beach, Virginia and Peter Zenk, East Stroudsburg, Pennsylvania.

Listening to the Lakers

By Russell Hill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Type: Bulk carrier
Frequency: 156.300 Mhz
Call sign: WPQ 4356
Date: June 9, 199[illegible]
Time: 1608 EDT
Antenna: Antenna
Power: 25 watts
Signature:
Ship's stamp:
M/V MESABI MINER
THE INTERLAKE STEAMSHIP COMPANY
Suite 400
629 Euclid Avenue
Cleveland, Ohio 44114 3003

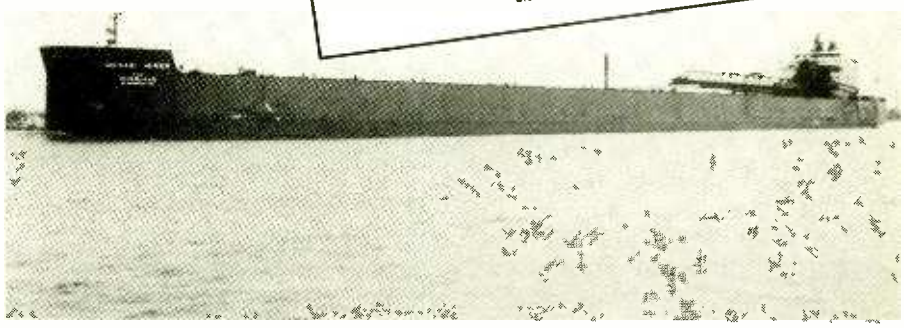


Photo courtesy of Freshwater Press, Inc.

The "Mesabi Miner" — a 1,000 foot giant!

When one hears the word Lakers, one usually thinks of basketball, with names like Magic Johnson, Kareem Abdul Jabaar and the famous Laker Girls.

But there are other lakers. Probably the most famous of these is the *Edmund Fitzgerald,* immortalized in a 1976 song by Gordon Lightfoot, and unfortunately these lakers have no Laker Girls.

These lakers are the ships that ply the Great Lakes hauling a variety of cargo, including ore, cement, coal, grain, salt, sand and petroleum products, from Duluth to Gary to Cleveland and many other U.S. and Canadian ports.

There are different types of lakers; the majority (about 200 of them) are bulk carriers and tankers, plus the many tug and barge combos and smaller craft. Also, dozens of ocean going vessels or "salties" are heard.

Ships range in size from approximately 400 feet to 1,000 foot giants, and some have been around for many decades. The oldest is the cement carrier, *E.M. Ford,* which was built in 1898.

'Tis the Season

The shipping season is usually from mid-April through December, although some vessels run into the first week of January. During this time there is plenty of action to be heard.

Several coastal stations handle radio traffic on the Great Lakes, such as the Canadian Coast Guard (try listening on 2598 kHz), and WMI in Lorrain, Ohio. The station closest to my location is WLC, "The Voice of the Great Lakes," in Rogers City, Michigan. This public correspondence station handles traffic for ships of the U.S.S. Great Lakes Fleet and Interlake S.S. Co.

During "call-ins" the ships will give their location on the lakes, relative to a geographical point, and report the weather conditions. WLC also takes coded weather info from the ships at specific times. In turn, WLC will relay any traffic to the ship from the company.

Most of the traffic is heard on channel 405, although channel 826 is sometimes used (See Table 1). Here is part of the schedule as monitored during the 1992 season:

Eastern Time	Type of Traffic
0930 or 1100	Call-ins, U.S.S. Great Lakes Fleet (weekends)
1430	Call-ins, Interlake S.S. Co.
1545	Call-ins, U.S.S. Great Lakes Fleet (weekdays)
1700	Traffic and coded weather
2130 or 2230	Coded weather
2300	Coded weather

WLC broadcasts MAFORS (Marine Forecasts) by voice, FAX and SITOR modes on a regularly scheduled basis. See Table 3 for help in decoding the weather information. Phone patches may be handled at any time.

Table 1: Laker Frequencies, Detroit area

2135.5 kHz	WLC, Rogers City, MI; SITOR
2195.5 kHz	WLC, FAX (night)
5898.6 kHz	WLC; FAX (day)
6314.3 kHz	WLC; SITOR
4369 kHz (shore) ch. 405	WLC; SSB
4077 kHz (ship)	
156.300 MHz ch. 6	Intership safety; ship-to-ship
156.350 MHz ch. 7	Ship-to-ship
156.400 MHz ch. 8	Ship-to-ship
156.500 MHz ch. 10	J.W. Westcott Co; Great Lakes Towing KDD 595 (Detroit Tug Office)
156.550 MHz ch. 11	
156.600 MHz ch. 12	Commercial; Sarnia Traffic/calling
156.650 MHz ch. 13	Navigational
156.700 MHz ch. 14	Port operations; Sterling fuel docks, various draw bridges

Voice frequencies are confirmed.

The Lakers on VHF

In addition to WLC on HF, the lakers are very active on VHF. Table 1 lists the channels and frequencies in use on the Coast Lakes, but what type of traffic can you expect to find? In the Detroit area the lakers are most active on channels 10 and 12. Channel 10 is used to contact the J.W. Westcott Co., which is the Marine Post Office.

This company delivers mail to the boats, as well as supplies, snacks and tobacco. Westcott also transfers personnel. The vessel will usually call in an order about an hour before it arrives at the

Table 2:
These are some of the ships that are regularly heard working WLC:

Interlake Steamship Co.		George A. Sloan	WA5307
James R. Barker	WYP8657	Edgar B. Speer	WQZ9670
Kaye E. Barker	WUV8856	Myron C. Taylor	WA8463
Charles M. Beeghly	WL3108		
Elton Hoyt 2nd	WE3993	Various	
Herbert C. Jackson	WL3972	Alpena	WAV4647
J.L. Mauthe	WE5184	Armco	WE6279
Mesabi Miner	WYQ4356	Buckeye	
Lee A. Tregurtha	WUR8857	Burns Harbor	WQZ7049
Paul R. Tregurtha		Courtney Burton	WE6970
		Joseph H. Frantz	WA6575
USS Great Lakes Fleet, Inc.		J.A.W. Iglehart	WTP4966
Arthur M. Anderson	WE4805	Michigan	WRB4141 (tug)
Roger Blough	WZP8164	Presque Isle	WZE4928
Calcite II	WB4520	Reserve	WA7207
Cason J. Callaway	WE4879	St. Clair	WZA4027
Philip R. Clarke	WE3592	Triton	WTU2310 (tug)
Edwin H. Gott	WXQ4511	Charles E. Wilson	WZE4539
John G. Munson	WE3806		

For a complete, 5-page list of lakers, send a #10 SASE to the author at: 22041 Sunset, Oak Park, MI 48237.

Westcott location on the Detroit River. Then the mail boat — the 46-footer *J.W. Westcott II* — will deliver the order/personnel to the vessel when it reaches the Westcott location.

Channel 12 is used to report the ship's position to the Sarnia Traffic Control Centre, operated by the Canadian Coast Guard. There are four geographical points that are used for reporting the ship's position:

1. Detroit River Light, at mouth of river
2. Grassy Island, off Wyandotte
3. Belle Isle, at upper end of river
4. Lake St. Clair Crib Light, in the middle of the lake

Securité calls are heard on ch. 12 as well as ch. 16. Securité is the French word for safety. Securité calls are usually made when a vessel is leaving a pier or turning into the Rouge River. Securité calls are also made by the Coast Guard to report navigational problems. Ch. 12 is also used as a calling frequency.

Activity on channel 6 is ship-to-ship communications for navigational purposes. Channel 8 is also ship-to-ship, but usually involves more informal traffic between captains sharing such things as news from home ports.

Channel 14 is used between ships and port facilities — i.e. draw bridges, fuel facilities, etc. Channels 7, 11 and 13 show only sporadic activity.

Equipment

Some of the radios used in these ships are Raytheon-Ray 50A and Ray 78 and ICOM IC-M 55 for VHF, and ICOM ICM 700 tied to FAX and SITOR for HF used in the American lakers.

The Canadian lakers use the Sailor RT143B and 144B, and Collins MR 201 for VHF. I have not heard any of the Canadian lakers on HF.

The power is 25 watts for VHF. Usually they drop down to 1 watt when they are near a city. On HF the power is 100 to 150 watts.

Reception Reports

QSLing these freighters is fairly simple. There are two marine post offices where these ships, both U.S. and Canadian, receive their mail. Most of the ships can be reached through the marine post office in Detroit (zip code 48222 is used exclusively for marine mail). Sault Ste. Marie should be used for the ships that regularly sail between Duluth and Lake Michigan ports.

Do not send reception reports to the company office. I did exactly that when I first started to QSL the lakers. I sent reports for three ships of the same company. Five days later I got all three back in the same envelope verified by the same person. I thought, "something's fishy here," since I heard the radio transmission here in Detroit, but the company office is in Buffalo.

Since using the marine post office, I have enjoyed about a 75% return rate. Reception reports should be addressed like this:

Ship's Name	Ship's Name
Attn: Master	Attn: Master
c/o Marine PO	c/o Marine PO
Detroit, MI 48222	Sault Ste. Marie, MI 49783

Be advised that the mail boat in Detroit usually lays up for the winter a few days before Christmas.

Here are a couple of books that are very helpful:

Greenwood's & Dills' Lake Boats; published yearly. This book lists the vessel's particulars as well as the captain's name. It is available from Freshwater Press, 1700 E. 13th St., Suite 3-R, Cleveland, OH 44114-3213.

Know Your Ships, Seaway Issue, lists ocean going vessels that frequent Great Lakes ports, as well as the lakers. It is available from Marine Publishing Co., P.O. Box 68, Sault Ste. Marie, MI 49783.

Maritime communications, like aero comms, are characterized by routine exchanges punctuated by high drama or human comedy — as well as providing the challenge of DXing a moving target. So if you live near the Great Lakes, or within earshot of the HF frequencies, punch in some marine frequencies. I'm sure that before long, you, too, will be Listening to the Lakers.

MT

Table 3: Decoding Marine Weather Forecasts

The international MAFOR code consists of an introductory group YYGG: YY = date of month / GG = Time beginning valid period of forecast in whole hours UTC. This is followed by the name of the area (e.g., Superior).

This is followed by five-figure groups of this form: 1GDFmW1. The first figure in each of the groups is an identifying number, which for North America will always be 1.

G = Period of time covered by forecast
0-conditions at beginning of period
1-forecast valid for 3 hours
2-forecast valid for 6 hours
3-forecast valid for 9 hours
4-forecast valid for 12 hours
5-forecast valid for 18 hours
6-forecast valid for 24 hours
7-forecast valid for 48 hours
8-forecast valid for 72 hours
9-occasionally

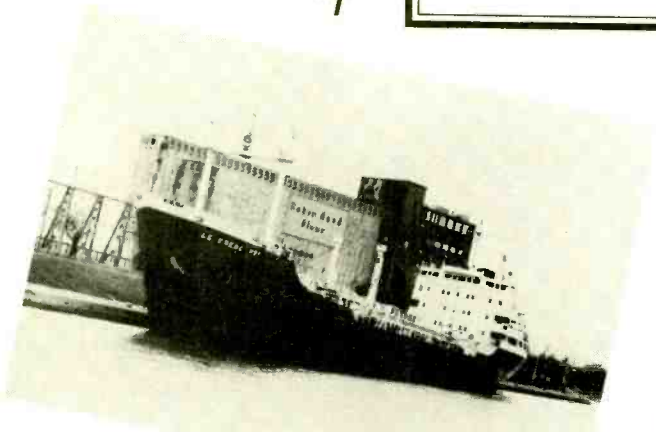
D = Forecast direction of wind
0-calm
1-northeast
2-east
3-southeast
4-south
5-southwest
6-west
7-northwest
8-north
9-variable

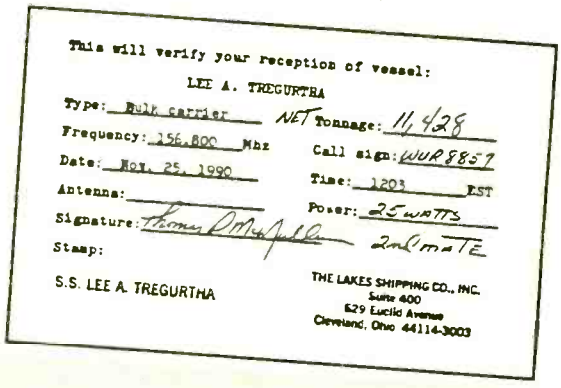
Fm = Forecast speed of wind
0-(0-10 knots)
1-(11-16 knots)
2-(17-21 knots)
3-(22-27 knots)
4-(28-33 knots)
5-(34-40 knots)
6-(41-47 knots)
7-(48-55 knots)
8-(56-63 knots)
9-(64 plus)

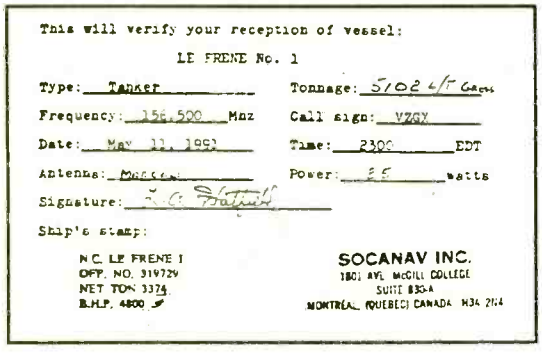
W1 = Forecast weather
0-moderate or good visibility
1-risk of ice accumulation
2-strong risk of ice accumulation
3-mist (visibility 5/8 to 3 nau. mi.)
4-fog (visibility less than 5/8 mi.)
5-drizzle
6-rain
7-snow or rain and snow
8-squally weather with or without showers
9-thunderstorms

Significant wave heights in half meters are given at the end of the message for each lake.

Source: Environment Canada brochure via Wayne Hutsul, Thunder Bay, Ontario.







Photos courtesy of Freshwater Press, Inc.

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Emergency Operations Center

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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 *Monitoring Times* readers have asked us for a world class *handheld* scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT is just what you've been waiting for. It can store frequencies such as police, fire, emergency, marine, race cars, 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 even has AUTO SORT - an automatic frequency-sorting feature for faster scanning within each bank. Order your scanner now.

For more information on Bearcat radio scanners or to join the Bearcat Radio Club, call Mr. Scanner at 1-800-423-1331. To order any Bearcat radio product from Communications Electronics Inc. call 1-800-USA-SCAN.

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Bearcat 200XLT-E handheld/SPECIAL	$208.95
Bearcat 100XLT-E handheld	$149.95
Bearcat 70XLT-E handheld/SPECIAL	$119.95
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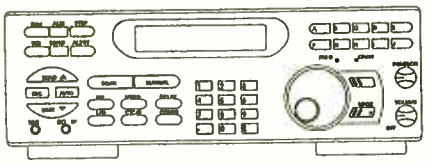
200 Channels · VFO Control · 10 banks
Turbo Scan · Weather Alert · Priority channels
Auto Store · Auto Recording · Reception counter
Size: 5-1/4" Wide x 6-15/16" Deep x 1-5/8" High

Frequency Coverage	*Steps*
29.000 - 53.995 MHz. (NFM)	5.0/12.5/25.0 KHz.
108.000 - 136.995 MHz. (AM)	5.0/12.5/25.0 KHz.
137.000 - 173.995 MHz. (NFM)	5.0/12.5/25.0 KHz.
216.000 - 224.995 MHz. (NFM)	12.5/25.0 KHz.
225.000 - 399.995 MHz (AM)	12.5/25.0 KHz.
400.000 - 511.995 MHz. (NFM)	12.5/25.0 KHz.
806.000 - 823.995 MHz (NFM)	12.5/25.0 KHz.
849.0125 - 868.995 MHz (NFM)	12.5/25.0 KHz.
894.0125 - 956.000 MHz. (NFM)	12.5/25.0 KHz.

The Bearcat 890XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology enables the Bearcat 890XLT 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. That's why Uniden's latest technology, *Turbo Scan* is built into our new Bearcat scanners. 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. ***10 banks*** - Each bank contains 20 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **BC002** CTCSS Tone Board $54.95. Order your BC890XLT from CEI today.



CB/GMRS Radios

The new Uniden GMR100 is a handheld GMRS UHF 2-way radio transceiver that has these eight frequencies installed: 462.550, 462.725, 462.5875, 462.6125, 462.6375, 462.675, 462.6625 and 462.6875 MHz. This one watt radio comes with flexible rubber antenna, rechargeable ni-cad battery, AC adapter/charger, belt clip, F.C.C. license application and more.

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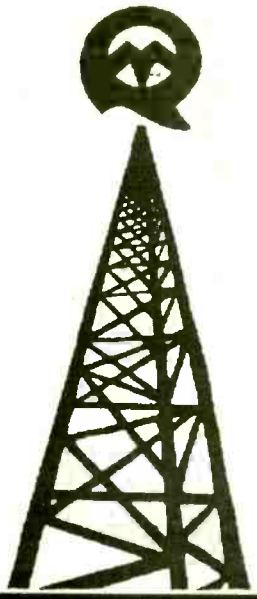
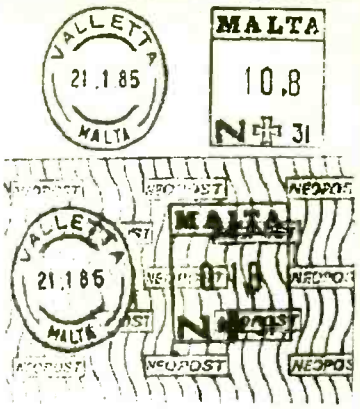


Deutsche Welle's Malta Relay

By Charles Sorrell



Radio Mediterranean

Islands are nice to dream about; they're even better as tourist destinations ... They are also places where (because of the peculiar properties of saltwater) shortwave broadcasters like to build relay stations: Antigua, Ascension, Montserrat, the Seychelles, and Sri Lanka, for example.

So for the tourist, who likes both islands and the radio hobby, our imaginary tour takes us to Malta, where the Voice of Germany built one of its several relay stations back in the early 1970's.

Deutsche Welle's Malta installation is a good example that there's a lot more behind a shortwave broadcaster's relay base than transmitter, feedline and antenna! These facilities aren't just thrown together and put on the air overnight; Things don't happen that fast.

Work on the Malta installation began in March 1972, but the first shortwave test transmissions didn't take place until more than two years later, in July 1974. Regular use of the relay did not begin until November, four months later. Even before deciding to build on that site, Deutsche Welle ran some medium wave test broadcasts from a nearby location.

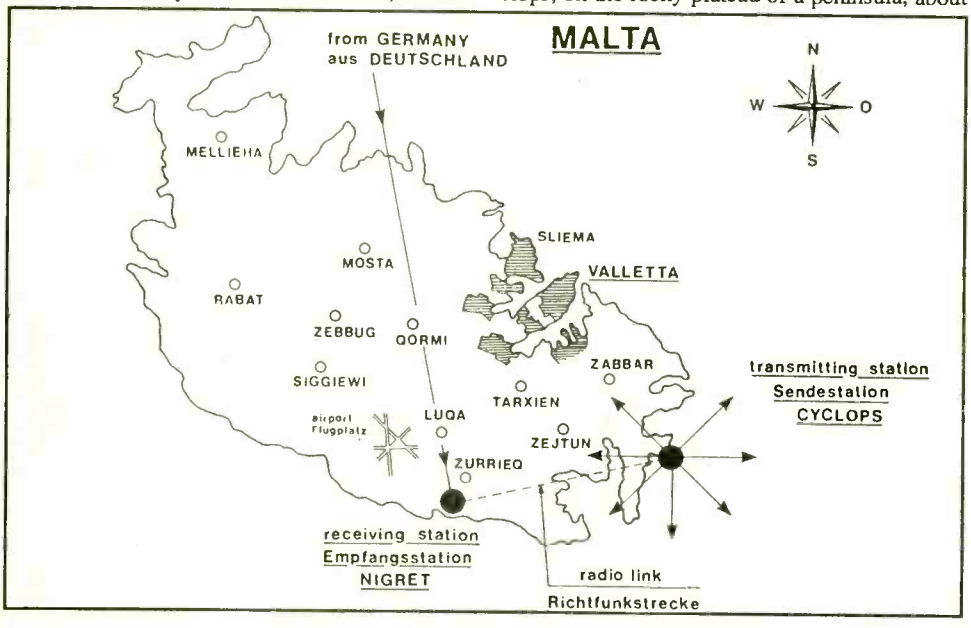
The transmitter site is at a place called Cyclops, on the rocky plateau of a peninsula, about a hundred feet above sea level (and with some sheer cliffs to worry about, too). The site is southeast of the Maltese capital, Valletta.

The main building is big — nearly a square block in size — and includes a transmitter hall, adjoining rooms and a supply wing which houses workshops, storage rooms and offices. A second, much smaller building houses the transmitter switching system. Feedlines go from there to the antennas.

Just across the road, on the southeast side, is a substation of the Malta Electricity Board, which was built by Deutsche Welle as part of the agreement with the government of Malta which allowed the relay to be placed there. DW also maintains its own diesel emergency generator which can be in action in as little as seven seconds following the loss of commercial power.

Deutsche Welle also had to build a reservoir and a biologically-operated sewage purification plant. The entire site area covers over 400,000 square feet, surrounded by a 6.5 foot wall which is about 4300 feet long.

The transmitting facility includes a 600 kilowatt medium wave AEG-Telefunken unit currently operating on 1548 kHz. Shortwave signals are generated by three 250 kilowatters, also built by AEG-Telefunken. These are essentially the same as the 500 kilowatt units at the Wertachtal site in Germany. The output power at Malta is reduced to half by using only one tetrode tube in the RF output stage. All three transmitters are tunable on all frequencies between 5.95 and 25.5 MHz. Extremely accurate frequency tuning and stability enables DW to operate the Malta transmitters co-channel with others at the Wertachtal and Julich sites within Germany.



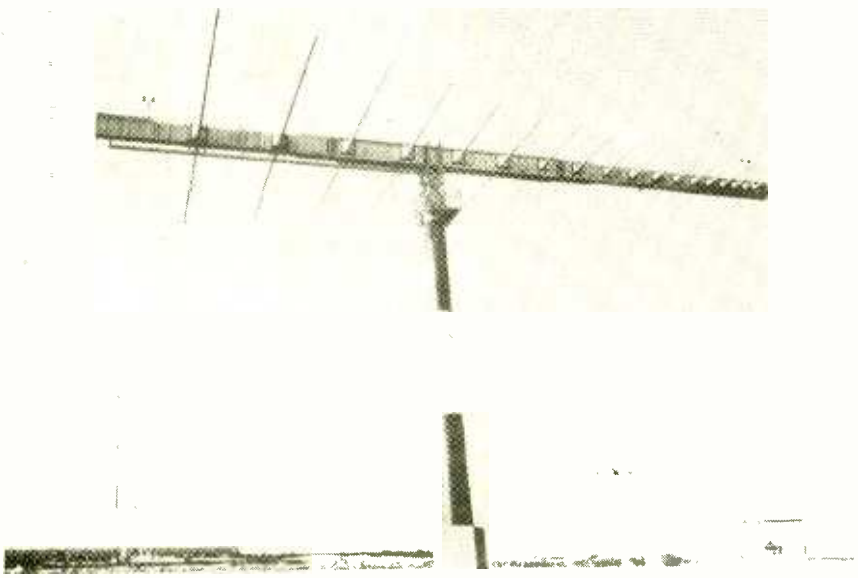
This map shows the two DW installations on Malta.

There is also a five kilowatt Philips teleprinter transmitter at the site, used for telex communication between Malta and the Cologne headquarters.

The Cyclops installation is used mainly for beaming programming to North Africa and the Middle East via short and medium wave. Asia and the Americas are lesser targets.

Radiating the DW signals are four-bander curtain antennas — six of them — suspended between three 325 foot towers. Three of these are at 260 degrees for South America and three are for 80 degrees for southeast Asia. The antennas can be electrically slewed left or right by 15 or 30 degrees. The curtain antennas have an average 20dB gain, giving them an effective radiated power in the main beam of 25 million watts.

A log periodic antenna which can be raised or lowered and is rotatable through 360 degrees is used when wider beam widths are required. Depending on the frequency being used, the gain on this antenna ranges from 10 to 13 dB. The medium wave antenna is supported by three towers, each about 290 feet high.



The rotatable log periodic antenna at the Cyclops site.

Like any relay station, Malta needs the mother signal from Cologne before it can do its job. Most, if not all of this is received via satellite at the Nigret receiving station, located about six miles away on the southern coast. These signals are then fed to the transmitter site via a radio link operating in the two gigahertz range.

Two link frequencies feed the programming, the one of higher quality always taking precedence. Four channels of modulation can be transmitted to and from the receiving/transmitting installations, with the return feed serving as a quality control check. The link also has a four wire talkback circuit plus regular phone lines and the telecommunications system.

The receiving station operates out of an older building, remodeled for the purpose, with an addition built by Deutsche Welle. Until satellites took over, the signal fed to Cyclops was picked up at the receiving site via a shortwave single sideband feed. In addition to the receiving equipment, the building houses a workshop, office, storeroom and recreation room complete with kitchen. There's also an announce booth for backup purposes. The newer section contains the emergency generator, power distribution equipment and another storeroom.

Another job the receiving site handles is monitoring the shortwave bands, checking frequency occupancy and measuring broadcast field strengths. This data, along with similar information from

other DW relay points and the main DW monitoring station at Brockhaken, Germany, is compiled and studied to help in making frequency usage choices. Commercial grade (read, "extremely expensive") Rhode and Schwartz receivers are used.

Receiving antennas are a double rhombic and an omni-directional. All programming transmitted by Cyclops is recorded and kept on file for three months.

Unfortunately, the Deutsche Welle program schedule, *Tune In*, no longer gives any indication as to what frequencies are in use from what transmitter sites at what time. So, unless you can catch a site ID as the transmitter is coming on the air, you probably won't know for sure whether or not you have a Malta transmission. Currently assigned frequencies are: 6025, 6075, 7225, 7235, 7250, 7265, 7270, 9515, 9545, 9565, 9605, 9615, 9625, 9735, 11865, 11915, 13780, 13790, 15105, 15185, 15425, 15595, 17810, 17825 and 21650.

If you don't have a copy of the current *Tune In*, write for one (Postfach 10 04 44, W-5000 Cologne 1, Germany), and try the frequencies given for the broadcasts to East, Central and Southern Africa and the Middle East at 0400-0500 or at 1500-1550, South Asia at 1600-1650, West Africa and the Middle East at 1900-1950. These seem to be among the most likely to be using the Cyclops facility.

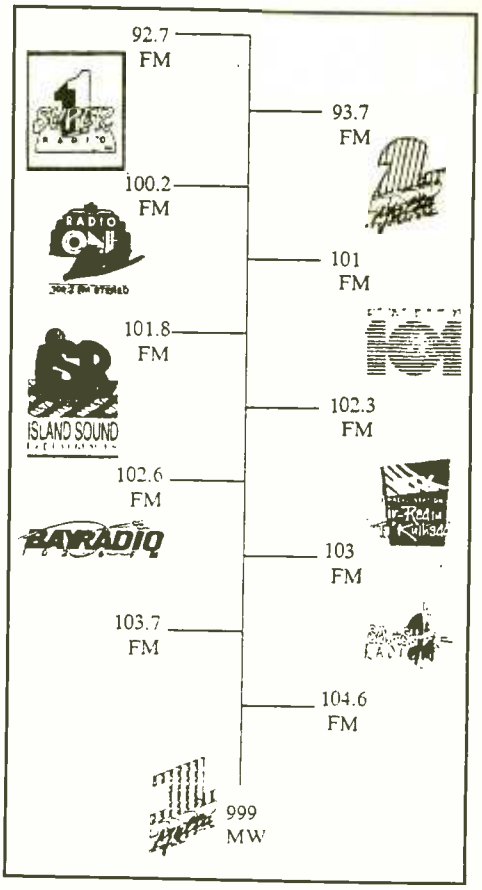
Although Deutsche Welle is unquestionably one of the largest and finest of the world's shortwave broadcasters, they don't cater to the serious SWBC DX'er. It's generally not possible to get a DW QSL with the site you heard indicated on it. This policy is suspended on occasion, usually to mark some sort of special event in the history of the station, but there's no way to know when we might receive the next such gift. If you need a site QSL, though, there's no reason not to have a try at getting one, rather than waiting for another offering from Cologne.

The National Tour

The nation of Malta is actually five islands. Besides Malta there's Gozo (popularly known as the Isle of Calypso) and Comino (which has no cars and only one hotel). The other two are very small and uninhabited. Malta is the largest of the five, but large is relative — its longest distance, from southeast to northwest, is under 17 miles. Even so, other broadcasters besides the Voice of Germany are active. The DW relay is currently used by the Voice of the Mediterranean and has been shared by others in the past.

The Voice of the Mediterranean is a joint Maltese-Libyan operation, co-owned by the two governments. It began broadcasting via the DW facility in September 1988, four years after the idea was conceived. The station's goal is to strengthen relations between the people of the two countries and with other countries of the Mediterranean. Its program schedule includes shows for teens and women and it also contains news programs, commentary, music and information from and about the various Mediterranean countries, as well as shows about Malta. There's also a mailbag and even a show for radio hobbyists (aired during the Tuesday transmission).

The current schedule has English at 0600-0700 on 9765 and 1400-1500 on 11925 and Arabic at 0700-0800 on 9765 and 1500-1600 on 11925. A French service, long on the drawing boards, has still not been implemented. The station is administered by a council of two "high ranking" representatives of each government. The Managing Director is named by Malta, the Deputy Managing Director by Libya.



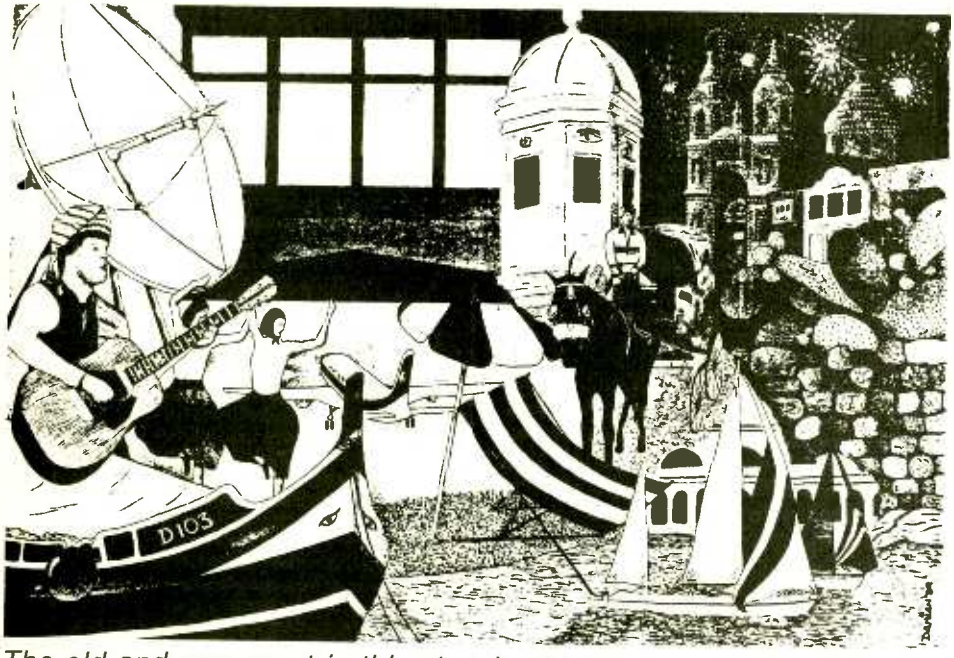
Malta's new broadcasting plan allows for a number of private stations on the FM band.

The Voice of the Mediterranean welcomes and replies to reception reports. The address is P.O. Box 143, Valletta, Malta.

The Maltese government operates Xandir Malta, running two local services — Radio Malta One on 999 kHz medium wave and Radio Malta Two on 93.7 FM. Up until about 1990, this station operated an international service called Radio Mediterranean, which also used the DW facility. Programs in English, Arabic and French were aired daily on 5960, later changed to 6110.

The religious organization, IBRA Radio, also used the DW facility for a time but this arrangement has also been discontinued.

More recently, something of a communications explosion is taking place on Malta. The laws governing broadcasting were changed last year and the state has lost its monopoly. Private, commercial broadcasting is now permitted and up to eight stations are now active on FM channels, or will be. In addition, Malta will have a color TV channel and, by July, a 33 channel cable TV service. So it looks as though Malta's thousands of real tourists (as opposed to our imaginary visit) will have a bit more to check out besides the shops and beaches, the casino, camping, boating, golfing, sailing, horse racing and scuba diving!



The old and new meet in this sketch which graces the front of a Voice of the Mediterranean QSL card.

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The Friendly Computer

A painless introduction into the world of computers!

By Bill Grove

As you look forward, you can see in the far distance a monstrous beast heading your way. Drawing your sword, you ready yourself for battle. Minutes later, a symphony blazes up right before your eyes. Then the scene changes to a blank canvas, paints ready for you to create a masterpiece.

Many fantastic and unlimited journeys are possible through the eyes of a magnificent tool — a tool that is serving and shaping the future. The computer is capable of creating or opening up new worlds. You can explore on your own, with friends, or with people all across the globe.

To begin this journey, let's take something with which you are already familiar: a radio. Not just any radio, but *your* radio. The one that you rely on every day to bring you information, the latest news, and voices from around the world.

Inside that radio are hundreds and thousands of parts. A few of those parts resemble a small, black rectangle with quite a few wires sticking out from the side, kind of like a little bug! Most people just know it as an integrated circuit. That little part, so vital to your listening, is a computer.

Now that we have this small computer with us, doing its everyday tasks, let's imagine that its performance could be enhanced. Isn't there *something* that you would like your radio to be able to do that it can't already do? Maybe you would like it to have more memory channels, or keep track of your favorite agencies? Or, if you travel a lot, you might want the radio to reprogram itself for the most used frequencies every time you enter a new town. Sound impossible? It's not! All we need is a little patience and one other item: a personal computer.

Some of you may have been tempted to turn the page as soon as you saw the word "computer," but bear with me. Computers don't have to be feared, just as you don't fear your radio. They are both computers, both able to react to what you tell them. The only difference is in the tasks they can perform.

A personal computer is capable of accepting information and signals from outside sources, such as a disk drive (which contains previously recorded information), another computer (such as your radio!), even (with the right accessories) your cable TV! You can take a computer and virtually run all the electronics in your house, right from one location (like your radio or hobby room)! This doesn't mean that one night you are going to wake up to find you've lost control of your life! You have control over this machine as much as you do your radio. You have to learn how to run it, just as you learned to listen to your radio.

A Sensational Computer

To get us started, we are going to need a computer — ideally, one that isn't difficult to learn, and can even teach you how to use it! I can recommend one computer that just recently came on the market that more than fills the bill. It is made by Tandy (the same people that make the Realistic® products, such as the PRO series of scanners). The name of the computer is the Sensation! and it is appropriately named.

Housing a top-of-the-line 486/25SX processor and boasting a standard 4 megabytes of RAM, this computer has all of the power you will need for any application, large or small. It comes complete with a 107 megabyte hard drive (to store all of the frequencies and programs you could ever need), a SuperVGA monitor (for viewing any type of graphics your program may throw your way), a CD-ROM drive (so you can house the entire FCC database if you want), a 3.5" high density floppy drive (to add more programs, information and frequencies), a modem and voice-mail system (so you can call your friend's computer and swap information with him over the phone lines), and even an 8 bit stereo sound card, capable of playing or recording music or sounds from all different sources!

The reason that I recommend this computer in particular is because it has something that very few computers have: the ability to teach its user how to use it! The first time I started up the Sensation, I wasn't sure how to open the CD-ROM drive door. So I waited a few moments and the computer came up and *showed* me visually how to open it and insert the disc! For those of you just learning computers, this one will teach you how to use its programs, its accessories (like the mouse), and even the volume control.

Teaching is not only on screen; a human voice *tells* you what you need to do next. And for those of you who like to learn slowly, you can repeat the lessons as many times as you like. The computer will never complain about how much time you are taking! You could never get a human teacher to be *this* patient!

Radio Applications

Now, let's take a look how we can get the popular hobbies of radio and computers to work together. First, there are the very basic computer tasks: memory storage and retrieval. The Sensation! has the ability to store tens of thousands of frequency records. There are numerous programs that allow you to quickly and easily store and retrieve your frequency data. There are also software programs to help you build antennas, test you for your next amateur class license, control your radio and let you store unlimited memory channels! In fact, the applications are too numerous to discuss here, but let's look at a few of the more popular ones as they would apply to the Sensation! computer.

One of the Sensation!'s virtues is its incredible storage capacity. Imagine having every record that the FCC has on file, right at your fingertips! This is no microfiche reader; the powerful CD-ROM drive on the Sensation! allows you to store the entire *five gigabyte* FCC database all in one small set of disks. All you do is to tell the computer what information you want to look up and, *blink*, it's right there on your screen!

You also have the ability to store all of your records and logs on the computer's hard drive. If you have any need to swap information, you can quickly copy the information you need onto the 3.5" high density floppy drive for portability.

To share programs or information with people around the world, you don't have to use the post office's "snail mail"; just plug your current phone line into the Sensation!'s phone port and you have infinite access to computers all over the world. Also, this computer has an answering machine built right in! Once you have your computer plugged up to the phone line, you have a complete voice-mail system, capable of handling numerous callers and even leaving multiple messages to different members of your family! If you need to

FAX a document or frequencies to someone else, that's built right in, too. But it doesn't stop there.

One of the "hottest" topics in the computer/radio world today is linking your receiver to your computer. A great many of the newer receivers and scanners, such as the Drake R8, JRC NRD535D, ICOM R71A and R7100, AOR 3000, and others, have the ability to accept input and commands from a computer. Some of these receivers require you to purchase an RS232 (computer) adaptor, but many have it pre-installed.

Once you have that adaptor, all you need is a program, and you can start realizing the unlimited potential of linking these two remarkable pieces of equipment. For instance, if you travel often, it can be quite a hassle to constantly reprogram your scanner or receiver. With a computer hook-up, tell it the city and the services that interest you, and it can program the radio.

You never lose *any* information. You can just keep adding more and more "banks" to the computer. Not only that, but certain programs actually allow you tune your radio, adjust its volume, set its modes and do all of the functions that you used to enter manually.

There are even programs that automatically log everything the radio hears. When the scanner hits an active frequency, it will log it, listing the frequency it hit and any information you have already entered, such as the name and location of the broadcaster, the frequency mode, as well as the date and the time logged. See "Scanning the US Navy," p. 18, if you doubt the value of this feature!

With the Sensation!'s powerful 486 processor, handling even multiple radios at the same time shouldn't be a problem. You could have a receiver and a scanner running and logging at the same time! The possibilities are unlimited.

Though you might not think graphics capability is important when buying a computer for use with communications and database management, it is with today's programs. The Sensation! comes equipped with a SuperVGA monitor and video card, capable of graphics up to 1024x768x256. That means that the screen will show 1024 pixels (dots) across by 768 pixels down, while simultaneously showing 256 different colors! This computer can handle any program you may have, no matter how graphics intensive.

Sensation! uses the popular operating system for IBM compatible computers called "Windows." Windows is a graphical user environment, allowing you to see pictures and words just as if they were on TV, or printed with high-quality color. Instead of using the keyboard for everything, Windows allows for other input devices, like a mouse, to choose and operate different applications. A "mouse" is a device that allows a user like yourself to move an arrow or other type of cursor around the screen and point to items you wish to use or view. When you use it, you will see how easy it can be!

Entertainment and Education

Now that you have an idea of the unlimited possibilities of computers and radio, let me say a word about how computers can expand your horizons. The Sensation! computer comes with many different programs on CD-ROM. CD-ROM is the same technology as a typical compact disc to be played in your stereo system, except that instead of storing music, it stores programs and data, as well as voices and sounds.

This technology of mixing video, audio, data and inputs of all sorts is called MultiMedia — the "buzz-word" in computers today and the first step toward true human/computer interfacing. For instance, instead of hearing a computerized voice, you hear a realistic human voice telling you stories, giving you help on how to do something, or just reading what is on the screen.

Some of the programs that come with the Sensation! allow you to ease the hassle and enhance your everyday life. A menu maker program compiles your shopping list after you've made your menu selections. A money-management program keeps track of your checking and bank accounts and helps you stay on your budget. Easy to use drawing programs will allow you to print out (if you have a printer) cards, posters, advertising, etc.

In the educational realm, the Sensation! comes complete with a full encyclopedia, filled with facts, pictures, and even music! There is an almanac, an atlas, a dictionary, two books of quotations and even *Roget's Thesaurus*. All of these programs come standard with the Sensation! computer. There is no thumbing through multiple volumes of books to find your topic; just tell the computer what you are looking for and it will list what it has.

The Sensation! can provide a variety of entertainment. You can sit back and listen to your favorite CDs. You can have the computer read you a story. With the optional PCTV television board, you can hook up your TV antenna, cable, or VCR and enjoy stereo sound, completely controlled from your computer. You can even adjust picture and audio quality from your keyboard.

The board is fully cable compatible and accepts multiple audio and video inputs. If you don't have a stereo or amplifier to hook up to the computer for more expansive sound, you can also purchase the optional Tandy MMS-10 amplifier, designed to supplement the Sensation!'s phenomenal capabilities. It comes with its own speakers built right in and output jacks for an additional four speakers.

The most exciting advances in the radio hobby are being made in the interaction between radios and computers. If you are ready to enhance your radio listening to its finest, discard your preconceived notions and fears and enter the computer age. It has never been easier!

MT

Scanning the U.S. Navy

By Jack Sullivan

Modern Military Monitoring

As most of the readers of *Monitoring Times* are aware, a number of significant changes have taken place in the United States military establishment over the past few years. The Cold War has ended, the role of peacekeeping is being redefined, the military is being reorganized and a number of bases are being closed.

Having been an active military monitor for most of the past 10 years, I have become intrigued not only by the numerous changes in military communications but also by the dramatic increase in the amount of radio traffic! Peace may have broken out around the world, but airmen, soldiers and sailors in the United States are training more now than ever. And those monitoring enthusiasts who are properly prepared will have a front row seat for all of the action!

Like most hobbyists, I spend the greater part of the day at work. Unfortunately, this is also when most military training operations happen. I finally sought to fill in this "daytime gap" by acquiring a computer interface between my ICOM R-7000 receiver and the IBM compatible computer I have in my listening post.

Now I can monitor the entire military VHF/UHF spectrum 24 hours per day, catching the audio on a cassette recorder as well as logging the frequencies on my computer screen. My ICOM is equipped with the voice synthesis option, so when I return home and replay the audio tape, a synthesized voice identifies the frequency of each transmission recorded on the tape.

Most "routine" channels (such as air traffic control) are locked out in my computer's memory. As the computer continually sweeps the 138-144 and 225-400 MHz bands, the tapes record either things of interest on "known" frequencies or entirely new and unexpected things on "unknown" or rarely used frequencies.

Monitoring the U.S. Navy

If it hadn't been for the automatic scanning, I would never have known when unexpected things started to happen around the middle of last December. Despite being near the Atlantic Ocean, Navy ship communications on VHF/UHF have always been very rare at my location. But as I replayed the 14 December daytime tape, some unusual communications appeared: two stations, Zero-Uniform-Echo and Two-Charlie-India, were caught on not one, but two different UHF channels: 336.8 and 277.8 MHz. (The Navy uses the UHF-AM military aero band for both aircraft and ship operations.)

A quick analysis of this traffic brought out its naval nature: the three-part alpha-numeric callsigns are typical U.S. Navy usage for ship tactical callsigns and both frequencies are nationwide U.S. Navy assignments. 277.8 is known as Fleet Tactical Warning Common and is primarily used for intership communications within vessel formations. What I had intercepted was traffic between two ships somewhere near me in the Atlantic.

I was ready for more U.S. Navy traffic when I played the tape from the next day. There it was, on a "new" frequency of 264.45 MHz, ASHLEY 760 calling RED CROWN repeatedly and growing weaker with each transmission, probably heading away to the south. Both 264.4 and 264.5 are nationwide U.S. Navy assignments, so it was an easy assumption that 264.45 was Navy also. The callsign ASHLEY had been previously identified as a C-130 4-engine prop transport aircraft. The three-digit identifier is also typical Navy usage for aircraft callsigns.

But RED CROWN? I hadn't a clue to that one. It might be a command post at a Navy airbase. The C-130 Navy aircraft nearest to me were EC-130 TACAMO (Take Charge and Move Out) command-and-control aircraft stationed at Patuxent River NAS in Maryland. But the codeword RED seemed to be most commonly used in callsigns at Norfolk NAS in Virginia.

My interest piqued, I decided to call for help from a monitoring friend near Cherry Point in North Carolina, which is just beyond my listening range for aircraft to the south. No, those callsigns didn't sound familiar to him, but he'd take a listen and let me know.

Two weeks later I got a package in the mail containing excellent quality tape recordings of what sounded like the most extensive joint Navy/Air Force/Marine/Coast Guard/Army exercise I have ever encountered. Using the single frequency of 264.45 MHz as a clue, ASHLEY 760 was indeed some kind of airborne command-and-control aircraft (probably an EC-130 from Patuxent), coming in from the north and dropping to low altitude while passing data on surface ship radar contacts to STRIKE (the aircraft carrier *U.S.S. Theodore Roosevelt* — see photo) and to Navy E-2C radar planes (BEAR 600-1). Radar tracks of both aircraft and vessels were being shared among the participating command elements via data links.

In the same exercise were Air Force AWACS (Airborne Warning and Control System) E-3 aircraft (SENTRY 42/BANDSAW JULIET) as well as Air Force KC-135 tankers (EXXON). Navy and Marine fighter and attack aircraft of all types (F-14/A-6/F/A-18/etc) were mixed with Marine AV-8B Harriers and Air Force fighters of every description. Many formations of H-46 Navy helicopters were heard (UGLIES and WARRIORS).

The callsign RED CROWN was also heard but not positively identified. Could it be a Navy ship? Many unusual frequencies and callsigns were used, as were digital KY-type scramblers. Table 1 is a partial list of the frequencies used.

All of these are apparently nationwide Navy assignments where unusual operations can be found. Sure enough, the day after submitting the draft of this article to *MT*, there arrived in the mail a copy of *Windsock*, the base newspaper put out by the 2nd Marine Air Wing Joint Public Affairs office at Marine Corps Air Station Cherry Point, North Carolina, sent by my local monitoring friend. On page 3 was a prominent story that began "Marines aboard aircraft carriers? Special purpose MAGTF (SPMAGTF, Special Purpose Marine Air Ground Task Force) tests '...From the Sea' doctrine."

A "potential new force option" was described where Marines were involved in a 10-day exercise aboard the *U.S.S. Theodore Roosevelt*. The purpose of the exercise was to demonstrate the effectiveness of our forces in regional conflicts rather than global ones as had been emphasized in the past.

"The SPMAGTF was composed of a reinforced, company-sized ground combat element, an aviation element with six CH-53 Sea Stallions and four UH-1N Hueys and command and service support elements working alongside a modified [Navy] carrier air wing [CAW 8]," according to the Marine Corps newspaper... "The SPMAGTF...will serve as the air-land-sea force trained to respond immediately from ships like the aircraft carrier," the *Windsock* stated.

"From the sea" was further described as a doctrine describing a force "swift to respond to crises in distant lands." What had been picked up by monitoring stations were the exercises in which around 600 ship-borne Marines practiced rescuing

Table 1: Naval Exercise Active Frequencies (MHz)

264.45 337.2 274.05 270.85
265.85 280.45 249.95 263.5
357.7 346.25

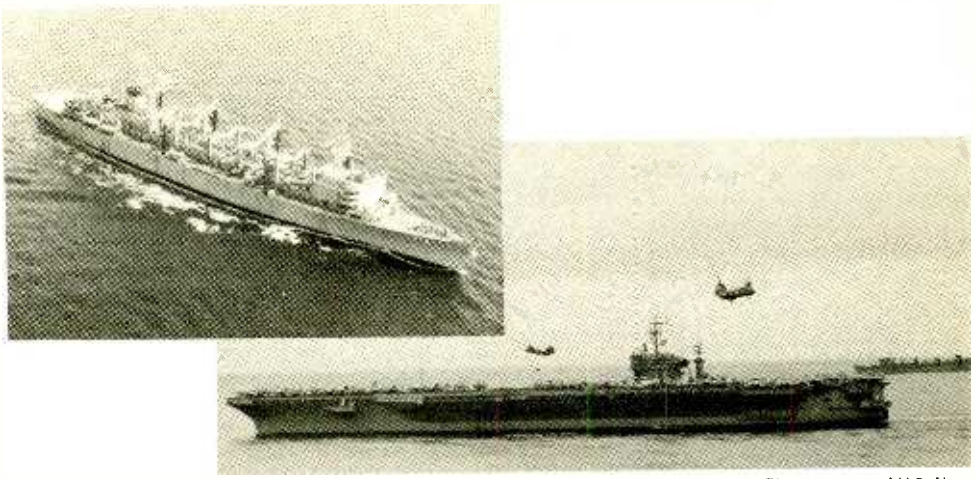


Photo courtesy of U.S. Navy

Top: The U.S.S. Detroit; Bottom: The USS Theodore Roosevelt during a military exercise.

hostages on land, performed raids and other training missions.

Further details of this exercise showed up a few days later in the 20 February issue of *Jane's Defence Weekly* which said this exercise was training in advance of a six-month deployment of the SPMAGTF aboard the *Roosevelt* destined for the Mediterranean (and possible action in the Middle East or Bosnia). Also going along for the ride would be VMFA-312, a Marine squadron of F/A-18 Hornet ground attack jets.

It was interesting to note that the F-14s left on board were fitted with bomb racks and their Top Gun fighter pilots trained in air-to-ground operations during the exercise. Additional units involved in the exercise included U.S. Army OH-58D Kiowa Warriors helicopters deployed aboard the guided missile cruiser *U.S.S. Hue City* to "practice joint tactics."

More Strange Callsigns

A tape from early January revealed a new callsign (SHUTTLE) on a new frequency (310.15 MHz). This, too, appeared to be a Navy frequency assignment. Analysis of numerous intercepts began to indicate that this was a large command-and-control aircraft (an E-6A Hermes TACAMO?) operating routine missions out of a nearby Navy airbase.

In a typical mission profile, the single aircraft would take off from its base in the morning, call its command post (SHUTTLE BASE) on 310.15, then check in with Northeast Sector Air Defense (HUNTRESS) on 364.2 just as it left land going east over the ocean to confirm that its secure IFF (Identification Friend or Foe) modes (2 and 4) were functioning correctly. Then it would proceed to orbit over the Atlantic within line of sight of its ground station.

Coincident with these missions were frequent use of secure digital voice/data links on the Navy channels 271.65, 310.95, 268.5, 308.05, and secure AFSK on 310.0 MHz.

Interestingly, a SHUTTLE mission (SHUTTLE 7, for instance) could occasionally be caught using an entirely different callsign (such as ALERT 50) when talking to the FAA air traffic controllers. This is similar usage to the Air Force AWACS, who use SENTRY callsigns for air traffic control but use callsigns like BANDSAW, DRAGNET and DARKSTAR for operations.

A friend subsequently confirmed that the TACAMO squadron VQ-4 at Patuxent River NAS had begun hosting E-6A aircraft, which are replacing the earlier EC-130 equipment. TACAMO aircraft are taking over the command-and-control of the nuclear ballistic missile submarine fleet from the Air Force, whose 6th Airborne Command and Control Squadron of EC-135 aircraft at Langley AFB has been phased out.

TACAMO aircraft fly over the ocean to avoid nuclear explosions in case of attack and then issue missile launch orders to our submerged fleet using VLF (Very Low Frequency) radio communications. The E-6A (a highly modified 707 aircraft) can trail a long wire VLF antenna several miles in length behind it while in flight and also communicate with other command elements via military communications satellites.

One transmission on 310.15 indicated the aircraft would be needing 109,000 pounds of fuel on landing, which is far greater than any conventional C-130 or 707. This intercept points to the E-6A, which is a very large and heavy aircraft specially modified to hold extra fuel for extended missions during war time.

Another transmission dealt with mechanical problems which would require putting the nose of the aircraft inside a hangar to fix. The aircraft would be forced to orbit for hours in order to reduce its weight to the point where it could be towed upon landing! Another interesting intercept mentioned that the Navy E-6 people "in back" would be getting off on landing and that the aircraft would take off for instrument training, possibly with an Air Force crew.

Stranger and Stranger

A mid-January tape intercepted a Coast Guard helicopter calling VANGUARD on the Navy channel 277.2 — another new callsign that no one had heard before! But later that day, a flight of F-16 interceptors from the New Jersey Air National Guard (callsign SMASH 61) deviated considerably from their normal practice drills over the ocean by accepting GCI (Ground Controlled Intercept) control from VANGUARD!

Who and where was VANGUARD? Or RED CROWN, for that matter? The mystery clarified itself a bit later in the month when the same interceptors worked GCI with VANGUARD and then stated an interest to the controller that they come out after the exercise and take a look at the ship! They requested vectors to do a fly past but were suddenly denied permission.

Recordings from later that day shed a lot more light on the unanswered questions. Another interceptor came up on a Navy channel being used by VANGUARD (292.2) and stated that he was looking for control for a fighter exercise...from either VANGUARD or RED CROWN! It was apparent that Navy ships, callsigns VANGUARD and RED CROWN, were deployed off the East Coast and were providing GCI radar control to Air Force, Coast Guard and other non-Navy aircraft.

This was the first time I had heard operations of this type in my area. It may now be common in coastal areas around the country.

More Navy Action

Also in mid-January, a small flotilla of ships was passing traffic among themselves on 357.4 MHz (AM mode). Callsigns were given repeatedly as the actual registration name of each ship: *U.S.S. Detroit* (see photo) was the lead ship. This is a Sacramento-class fast combat support ship.

Other ships whose calls were recognizable were the *U.S.S. Butte* (a Kiluea-class ammunition ship) and the *U.S.S. Suribachi*, a Suribachi-class ammunition ship. Traffic intership was passed for nearly three days!

Ammunition ships in my area may be related to the more significant deployment of Navy vessels in the Persian Gulf and Red Sea. Thirty-five miles east of my home is Naval Weapons Station Earle, home to many of the Navy's munitions, including Tomahawk cruise missiles, torpedoes and nuclear weapons.

On the HF Side

Being primarily interested in the VHF/UHF side of things, I don't pay a lot of attention to HF traffic. I will normally listen for AWACS and interceptor activity on 9023 kHz but the dramatic increase in Navy operations led me to start listening to Fleet Area Surveillance and Control Facility (FACSFAC) Virginia Capes on 4373 kHz (USB), callsign GIANT KILLER.

This facility, located on the grounds of Oceana NAS in Virginia Beach, Virginia, controls military operations in both the ocean and the airspace above it from Rhode Island to South Carolina.

I was suddenly in the middle of massive Navy exercises both on the sea and in the air. A few minutes of listening to 4373 kHz and you quickly get an idea of how massive and technically sophisticated these naval operations are.

Seven or more ships with callsigns like Three-Quebec-Papa and Bravo-Seven-Sierra would be involved at one time along with aircraft. Frequencies for aircraft operations that were passed on 4373 kHz included 281.2 and 271.0 MHz.

FACSFAC operations exist in a number of important areas of the country. Monitoring their HF frequencies is a good way to stay on top of naval operations around the country. Table 2 is a current listing.

From New Jersey to Margaritaville

A recent opportunity to vacation in Key West, Florida, provided a great chance to add to my growing mountain of Navy frequency usage data. And I wasn't disappointed!

Key West is home to both Key West Naval Air Station and Joint Task Force 4 (JTF4), the United States' front line of defense against drug smuggling from the south. Much Coast Guard/Customs/DEA/Navy anti-drug smuggling command and control has moved to Key West following the destruction of Homestead Air Force Base during Hurricane Andrew.

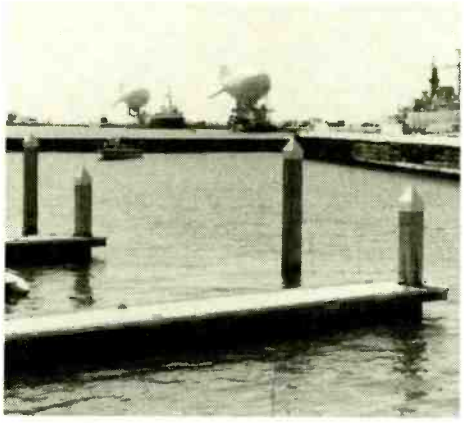
JTF4 is made up of personnel and units from the Army, Navy, Air Force, Coast Guard and Marines (Each has a separate telephone number under the JTF4 listing in the Key West phone book.) Using surface ships from the Navy and Coast Guard, helicopters, long-range patrol aircraft like P-3 Orions and Navy airborne radar picket planes (E-2Cs), JTF4 (callsign HERSHEY) shadows ships and aircraft around the clock throughout the South Atlantic, Caribbean and Gulf of Mexico areas. It also directs intercepts by Customs and DEA assets in the area and throughout the Southeast.

A large aerostat (a helium-filled balloon with tail surfaces that keep it pointed into the wind) containing sophisticated "look down" radar, which can detect both surface vessels and low-flying aircraft, is moored on a long tether cable at nearby Cudjoe Key. Nicknamed FAT ALBERT, this radar data is an important part of JTF4's ability to monitor everything that goes on in the area.

FAT ALBERT is supplemented by BABY

Table 2: Fleet Control Facilities
(kHz USB)

FACSFAC VACAPES - 2252/4373 (all upper sideband)
FACSFAC JACKSONVILLE - 3130/6723/6742/11252
FACSFAC PENSACOLA - 6835
FACSFAC SAN DIEGO - 6723
Data Courtesy of Hunterdon Aero Publishers)



Baby Huey aerostats at Key West, FL — mounted on ocean-going tugboats.

HUEYs, smaller aerostats mounted on ocean-going tugboats moored at the Navy's Truman Annex in Key West. These tugs go to sea frequently to take up positions in key areas, raising the aerostats on long cables to provide enhanced radar and communications coverage.

Monitoring JTF4 is a lot of fun. Extensive use is made of HF, so almost anyone can have a front row seat at America's "War on Drugs." Much traffic is scrambled, either digitally or with time-domain scramblers, when the request is made to go "green." Much traffic, however, is in the clear and makes for interesting monitoring. "Five-Alpha" reports, for instance, give the type of a vessel, its size, color, name, country of registry, position, heading, speed and so on! Table 3 is a line up of frequencies in current use by JTF4.

The U.S. Navy provides a lot of interesting monitoring for hobbyists with different interests, and activity is on the increase. Good luck and good listening!

MT

Table 3: Monitoring Joint Task Force 4

Freqs in kHz
- 11191 "Alpha Bravo" - This is the busiest channel.
- 6788 "Alpha Charlie" - Second busiest.
- 8972 Navy "safety of flight" channel, used extensively for communication with JTF4 aircraft.
- 4735 "Alpha Alpha" - Third busiest.
- 5399.5 "Three-Charlie-Five"
- 3130 This is another popular nationwide Navy channel used by JTF4.

In addition, the following UHF-AM channels are used by JTF4 in their area (freqs in MHz):
275.1 289.9 338.4 340.0 344.0

The following channels (some AM and some FM) are used by Customs/DEA/Coast Guard/Navy for JTF4 enforcement operations (freqs in MHz):
123.05/165.2375/165.975/164.775 - Customs
132.95/133.2/282.425 - FAA/Customs/DEA (callsign SLING SHOT)
354.1 - Navy (BRAVO FIVE)

While in Key West or South Florida, here are the frequencies in use at Key West Naval Air Station (actually located on Boca Chica Key); freqs in MHz:
Button 1 - 355.6 (Clearance Delivery paired with 121.2)
Button 2 - 336.4 (Ground Control paired with 121.7)
Button 3 - 340.2 (Control Tower - also 360.2, paired with 126.1)
Button 4 - 289.4 (Approach/Departure paired with 124.45)
Button 5 - 323.0 Miami Center low altitude sector
Button 6 - 275.4 (Tarpon Control - training area radar control)
Button 7 - 342.6 (Tarpon) Button 8 - 280.2 (Tarpon)
Button 9 - 344.2 (Tarpon)
Button 10 - 318.5 (Tarpon)
Button 11 - 265.0 (Tarpon)
Button 12 - 270.6 (Tarpon)
Button 17 - 313.2 (Approach/Departure)
(Courtesy Hunterdon Aero Publishers)

Additional channels of Navy interest at Key West are as follows (freqs in MHz):
138.6/138.675 (B/M) - Weapons testing nets
138.625R/139.525 (B/M) - Shore Patrol
140.075R - Command repeater (autopatches heard)
141.725R/140.825 (B/M) - Maintenance/engineers
140.6 (B/M) - Aircraft refueling net
142.075 (B/M) - Aircraft ordnance net
140.025/140.1 (both B/M) - Crash/fire nets
140.05R/139.5R - Additional repeaters heard

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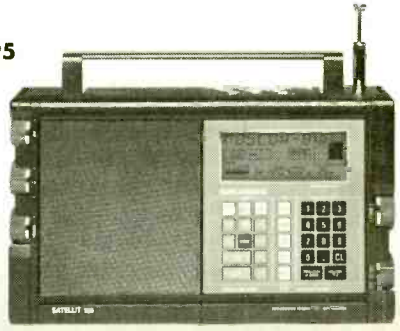

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An Introduction to Computer Bulletin Boards

By Bill Grove

What is your first name?

Millions of people everyday see messages like this one pop up on their computer screens welcoming them to the world of computers. These messages and many others like it are part of a "welcome screen" or a screen used for greeting the person that has just called a Bulletin Board System.

The term "Bulletin Board System" or "BBS" was first used to describe a method of passing notes and mail to one another via computer lines, from terminal to terminal. Since then, the popularity of BBSs has grown exponentially, not only in the United States, but worldwide. In this article, I will explain some of the jargon used by BBSers around the world and try to make you, the newcomer, or even the seasoned "hacker," feel more comfortable with the use of this wonderful medium of communication.

For years now, hackers (not a derogatory term, but rather people that devote a great deal of time working, playing, or learning on a computer) have been using BBSs to transfer messages, files, pictures and much more over the phone lines. It is a simple procedure, in its very basic stages, but for many people, known as SysOps, or System Operators, it has grown to become more of a way of life. These SysOps are responsible for programming, maintaining and adding to the BBSs.

A BBS is no more than a computer with software that knows how to manipulate the data coming into it. The data is transferred to and from the computer via hardware called a modem. This modem is what converts the data coming across the phone lines into legible information that the computer understands. That information is then sorted by the BBS software into usable information and is put into storage. When a user calls the BBS, he/she can then retrieve that information or pass new information to the system by following specific commands that the BBS understands.

If you are new to computers and the world of BBSs, I probably already have you wondering what I just said! If these terms are "old hat," you are wondering if I'm going to say something new! Don't fret, the good stuff is coming. For learning purposes, I am going to use the Grove Systems BBS as an example of how friendly BBSs actually are. As the SysOp of the Grove BBS, I therefore (hopefully) know a lot about it.

To contact a BBS, you must first have some hardware of your own. You'll need a computer, such as an IBM or IBM compatible, Apple, Macintosh, Amiga, Commodore 64 or 128—even the original Radio Shack TRS-80 can handle BBSs! Once you have the computer, you only need a few more things. First, you'll need a modem. You can find these new or used, with many different configurations from many different companies. They can range in price from $15 all the way up into the thousands! What makes them different from each other is the speed at which they can transfer data.

The speed at which the modem can transfer data is known as the baud rate or BPS. The BPS stands for "Bits-per-second" which is how many data bits (bits form letters, numbers and characters that people understand) the computer can send over the phone line each second. The older computers used 300 BPS modems, which may seem like a lot, but when you're transferring large files, it could take many hours with one of these modems. The average speed for the past year was 2400 BPS, but it is rapidly turning to 9600 and 14,400 BPS. That is definitely not where the speeds stop, however. Some of the larger systems using optical cabling are capable of enormous speeds, passing the 38,400 BPS barrier of conventional phone lines. But for our purposes here, you will only need a 2400 BPS modem; a new one should cost around $50-$100.

You will also of course need a phone line. Your house phone will do just fine. You can plug your modular jack directly into the modem, and plug your phone there, too. The modem is basically a "go-between" on your phone line.

Lastly, you will need some software. This software is what will run the modem and connect you to the BBS. Many modems come with this software. The software, or terminal program, will allow you to connect to the BBSs and allow them to understand you. You will be able to talk to people on the other computers, get files from computers all over the world, and run up your phone bill like the rest of us!

For those of you in the big cities, you have a great advantage in the availability of "nodes." Nodes are computers that are hard-wired or satellite linked to other computers all around the world. You don't have to pay a phone bill to talk to Japan, or Australia, or anywhere else! You just call the node and tell it where you want to go! These services, like GEnie, CompuServe, BIX and

ExecPC, use these worldwide connections with their own types of software. Yes, you will pay a fee for the use of these connections, but it is often much less than you would pay for a phone bill to those far away places.

Now that you've got the basics...

Now that you are set up and know the basics of BBSing, let's begin. In your software, there will be a way to dial numbers. Often it is a phone directory that you program in your software. But for those few who don't have that convenience, you will have to use command strings. The command strings tell the modem how to act and react to the information that is passing through them.

For example, if you wanted to call the Grove System, you would type:

ATDT17048379200

and then hit the enter key. This command tells the modem to get a dialtone on your phone line, and then dial the number 17048379200 (which is the actual number to get to Grove). Remember that some BBSs only operate part of the time, like the Grove System, so please observe the times that are advertised for the BBS. The Grove System's BBS is available from 6:30pm to 8am Monday through Friday (EST) and 24 hours a day on weekends.

The BBS can operate on its own, without the SysOp; however, the SysOp is needed to maintain and watch the system for bugs or quirks that may occur. Now, once you have dialed the number, your modem will take over. It will wait for the appropriate tones from the BBS, and then kick into action.

If the speaker in your modem is turned on, you will hear the phone ring, hear it pick up, and then hear several tones. These tones will change pitch and then go to a static sound. That "static" is data being transferred. At this point, the modem speaker will quiet and your modem and the BBS will begin "negotiating."

Negotiating is just like in the "people world." The BBS says that it would really appreciate it if your modem would transfer at 14,400 BPS. Your modem comes back saying that it can only handle 2400 BPS. The BBS agrees and they go on with a few more questions. After that is done, you will get a message across the top of your computer screen saying what type of BBS you are using, what version it is, and more strange information that you most likely will never use! The BBS will then ask:

What is your first name?

At this point, you are communicating with someone else's computer and are ready to launch into a new realm of communication.

After you have entered in your name, you will be asked to select a password. A password is any combination of letters and numbers that you will use to personalize your account. This is to ensure that no one else can use your account for any purpose. The only other person that can get to your account is the SysOp and the CoSysop (if the SysOp chooses). The CoSysOp is someone who helps the SysOp maintain the accounts, check the mail, and do other general tasks.

Next, you will answer some personal information about your address, what kind of computer you have and other general questions. When you have filled out that information, the BBS will thank you for completing the questionnaire and you will then have full access to the BBS and you won't be asked these questions again.

The next stage of a BBS is the Bulletin section. These are general announcements to all people on the board. You will get a list of the topics of the Bulletins and you can select the ones you wish to read. If you do not want to read any, then you can simply press the enter key to [Q]uit to the menu.

On most BBSs, you will use one letter to select a command. In the above example, Q was used for "quit." Most of the time the first letter of the command will be the key letter. If there is more than one command with the same first letter, then it would look something like this:

[Q]UIT
Q[U]ESTIONNAIRES

Whichever command letter is in the brackets ([ ]) is the letter that you will use.

The BBS will often check to see if you have any personal mail waiting. If you do, it will give you some options whether you would like to read the mail now, list who they are from, or continue into the board. For our purposes, let's continue into the BBS.

You are now going to be at the main menu. Again, each board has its own way of customizing their menus and commands, but they are all basically the same. Usually there are many menus you can go to. For example, if you want to get a file from the BBS, you would go to the File Menu. If you wanted to read or leave a message or letter, you would go to the Message Menu. It really is that easy! The Grove BBS also has on-line help that you can access at almost any point by pushing the ? key. This will give you some simple help about the menu that you are in and the commands contained in that menu.

We have now completed the basics of the BBS. You can now access, log on to, and begin using almost any BBS in the world.

Benefits of a BBS...

As mentioned earlier, a BBS allows you to retrieve many different types of computer information, including files, pictures and messages. If you want to get a file from a BBS, it is called downloading. If you want to put a file on the BBS, it is called uploading. No matter what it is called (we've come up with a lot of words for it during the rough times) here is how to do it:

Go to the file menu by pressing [F]. Once there you can list the files that are on the BBS by pressing [L]. When you press that, it will ask you which area you want to view or [L] again to list the areas. If you press [L], you will see all of the areas (ie. Games, Windows, Radio, Text info, etc.) that you have to choose from. You press the number that you would like to see, and it will list the files in that area alphabetically.

Any file you want, you can either [D]ownload by the filename or you can [M]ark for later download. That means that you can select a whole list of files and download them all in one batch.

Those of you who don't know much about computers will notice that a lot of the files have the extension .ZIP after them. That means that the file is "zipped," or compressed. There are ways on the computer to pack a file's information into a smaller package by compressing the data. This is done to shorten the time it takes to send the file, and thus the phone bill is cheaper!

Once you receive a file that has been "zipped," you must then uncompress, or "unzip" the file. This is done by using a program called PKUNZIP. That file is also on the Grove BBS and is ready to use as soon as it is downloaded. There are other methods of compressing data such as .ARC, .ARJ, .LZH and others, but .ZIP is the fastest and most popular method.

Now, to get to the original purpose of a BBS: the messaging. To send or receive a message is fairly simple. Press [M] to go to the Message Menu. You will see a menu of commands, most of them are self-explanatory. To send a message, press [E] for [E]nter a message. You may then enter who the message is to. If it is to a specific person, enter their name. If it is to the SysOp, enter SYSOP. If you want to send a general message to everyone, enter ALL.

Then you can enter the subject of your message and whether you would like it sent privately. If you say you want the message to be private, no one but the person to whom it is addressed (and the SysOp) can read it. It may be a bit disconcerting that the SysOp knows all, but it isn't good practice to talk behind a SysOp's back anyway!

A large amount of BBSs carry other networks, such as Fido, PCRelay, Wildnet, and Intelec. The systems are set up nationwide and allow messages to not only be entered and responded to on a single BBS, but also to be passed around the nation and sometimes the world! On the Grove Systems BBS, these specific conferences can be identified by the conference name, followed by a -WN. This stands for WildNet, which is one of the networks that is picked up by Grove. When you enter a message in one of those areas, it will be carried all around the nation for people to respond to! This is a marvelous way to get input and exchange ideas you may have.

Once you have chosen a topic that you would like to read by pressing [J]oin Conference and selecting the number you wish, you then can select [R]ead messages. This will give you a new command bar to go by. You can select [U]nread Personal, which are messages addressed to you only. You can select [N]ew Messages, which are messages in that specific topic that you have not yet read. You can select [L]ast Messages, which enables you to start from the last messages in case you don't want to read all the previous messages. If you know the number of the message you would like to read, you can just press the number, and that is where it will begin! There are other options, but I'll leave those for you!

...If you can find them, that is. Here's where the system breaks down, because your next logical question is, "Is there a radio hobby BBS in my local area?" The answer is: we don't know.

You can start by posting that question as a general message on the Grove BBS. When you sign off of the Grove Systems BBS, you will see a few boards listed which carry ham and radio related conferences. This is a very small sampling, but it's a place to start. You can log on to those and leave the same inquiry there.

Regional radio club publications will often list bulletin boards or even operate one; amateur radio clubs and ham radio stores are also good sources for information.

Until you do find the BBS that suits your locale and interests, practice and have fun with those hobbyists who are active on the Grove System. Good luck in all of your ventures into the incredible world of computers!

MT

A Matter of Opinion

The events in this letter have not been corroborated by Monitoring Times, but it is printed as a reminder of the fragile privileges many of us enjoy in North America. It has been edited for brevity.

The UK Scanner Conspiracy

A Guest Editorial by James R. Tayler

In Great Britain, a country supposedly built on and supporting freedom of speech and an uncensored press, the radio hobby is under attack from Government as a social evil. While shortwave listening is "tolerated," VHF and UHF scanning is severely frowned upon, and early signs indicate that legislation to ban scanners is being planned. The freedoms that both US and Canadian scanner enthusiasts take for granted, such as freely published scanner frequency guides, is something that only recently has appeared on the UK market, and that in itself was at great personal risk to both publisher and author.

Scanning in the UK began to raise its "ugly head" following the influx of reasonably priced CB radio equipment from the US in the mid 1970's. Originally, CB radios, too, were banned in Britain; however, such were the number of radios already illegally imported that the Government was forced to concede.

Conservative estimates put the number of scanners currently in the UK at around 250,000, yet under British law, these owners are only legally allowed to listen to portions of the band bounded by 88 and 108 MHz, the various amateur bands and the television band. Outside of these limits, enthusiasts caught listening can either face a $3000 fine and two years imprisonment under the Interception of Communications Act or a $7000 fine and confiscation of all equipment under the 1986 Wireless Telegraphy Act, or both!

For years, hobbyists relied on underground scanner frequency guides, often paying as much as $15 for just two pages. The first truly open publication of a comprehensive VHF/UHF frequency list was published by Interproducts of Perth in Scotland in mid 1991. The guide, *The UK Scanning Directory*, took the unprecedented step of listing actual spot frequencies, over 7000 in total.

The general sentiment within the UK was that this courageous publication would open the flood gates, and information would become available to the public. However, that was not to be, and MPs were soon demanding that "that subversive book should be banned." Indeed, its contents were generally considered to be innocuous, but sensationalized newspaper and television reports brought the hobby into disrepute, illustrating supposed risks to National Security.

When a Sky Satellite TV News report asked the British Department responsible for communications in the UK to comment on the book, a spokesman regurgitated the usual, "it is illegal to listen to any of these frequencies." However, he surprisingly added, "but it is not illegal to publish them."

If the Government plan was to create a false sense of security, that is exactly what they did. In December 1992, an advertisement in the UK based *Shortwave Magazine* proudly announced that the *British Scanner Guide* contained over 8000 spot frequencies. To the reader uninitiated in the ways of British politics, and unaware of what it is like to work in a country with neither written Constitution nor Freedom of Information Act, this would appear to be normal supply and demand marketing.

Alas, however, Britain is not the country of opportunity that it purports to be and neither is it an open society. The Official Secrets Acts, for example, which is the basis for all secrecy in the country, classifies everything as Secret. One of the more ridiculous examples of this is that the brand of tea bags used at 10 Downing Street is defined as a state secret!

At this point it is important to make the distinction between Scottish Law that covers the publication of the *UK Scanning Directory* and English Law that covers the *British Scanner Guide*.

Scottish Law, although similar in principle to its English counterpart, is widely accepted as being far less draconian, better evolved, more just and far less corruptible. English Law, on the other hand, has not changed much since the days when the axe was used to settle most legal debates. More significantly, it is controlled by the British Government through the Office of the Home Secretary (Scottish Law is not), which is also responsible for both the nation's Police forces and the Intelligence services—a potentially corrupting connection.

Two weeks prior to a dawn raid that decimated stock and equipment of the *British Scanner Guide* in Reading in England, Mr. Terence Cooper—publisher, author and former Metropolitan Police Communications officer—noticed that his mail had begun to mysteriously drop off to nothing. Unable to comprehend why trade could just drop to zero overnight, Mr Cooper approached his local Mail Sorting Office seeking an explanation. He was informed that several bags of his mail had "got lost." In fact, his mail was being intercepted by his former employers, the Metropolitan Police, who also deemed it necessary to tap his telephone lines.

The raid itself happened at 6.45 on the morning of 18th January 1993, and involved ten plain clothes policemen who, after producing a warrant, seized everything in the company office: radios, computers, disks, books, files, everything. The pretext of the raid was that the proprietor was being charged with the theft of a radio, a charge that was subsequently dropped after seven hours of police interrogation.

However, it does not end there, although Mr. Cooper had not broken any Law as there is no Law that bans such publications in the UK and he had certainly not stolen any radio. During his seven hour interrogation, several Policemen had taken up residence in his office to answer his telephone calls. However, rather than take orders for his book and help Mr Cooper's fledgling business, they instead impersonated his accountant and informed callers that he had gone bankrupt and the book was no longer unavailable.

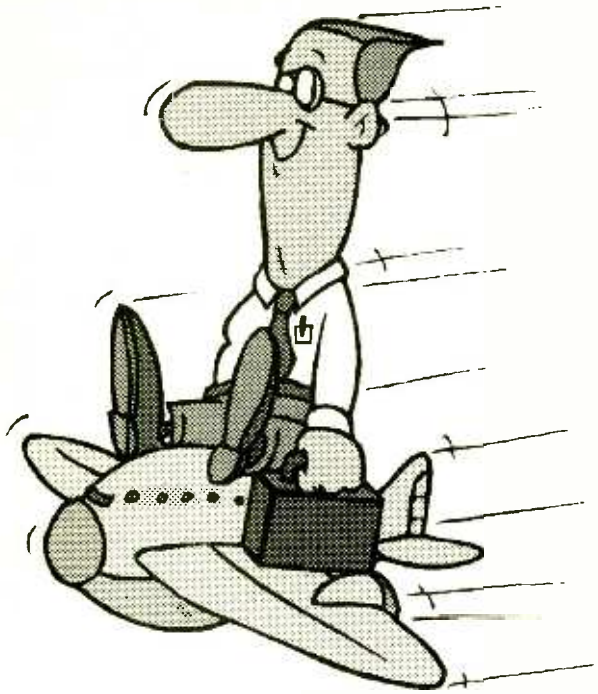
Within a couple of days of his release, customers whose mail had originally "got lost" received a letter from the Metropolitan Police (the Met). The letter revealed details of an on-going investigation by the International And Organised Crime Division of New Scotland Yard into Mr Cooper's business and implied that the *British Scanner Guide* did not exist but was merely a ploy by Mr Cooper to cheat customers out of their money. Not surprisingly, the customers who had allegedly been cheated were the same customers whose mail had disappeared. Accompanying the letter was a witness statement form which recipients were requested to fill in and sign and was to be used as evidence at Mr Cooper's trial.

In a final act to stifle trade, Mr Cooper was charged on 28th January 1993 with obtaining property and money under false pretences, and impersonating a police officer. However, one fact remains: the *British Scanner Guide* was available for sale and many customers did receive their ordered copy!

It now seems likely that the Metropolitan Police were just pawns in this conspiracy, and were taking their orders from a higher power, who some believe to be MI5 operating on behalf of a Government policy yet to be passed into Law that seeks to ban scanning in the UK! As more evidence becomes available, the extent of the lies and deception that the Met are involved in continues to grow, and almost certainly confirms that a conspiracy to silence Mr Cooper had been in operation since his first advert appeared in the December 1992 issue of *Shortwave Magazine*.

The oppressive US legislation embodied within the Electronic Communications Privacy Act of 1985 (ECPA) is surely nothing compared to the tactics used by the British Government to silence unwanted publications.

MT



Flights of Fancy

By Harold Cohen

Flight weather service said that there was a chance of a strong cold front making its way across the Great Lakes into the Northeast. Pretty typical for July, I thought. But nothing serious to worry about. I figured I would arrive in Philadelphia way ahead of any cold front, and right now it looked like it would stay to the north of my route.

Anyway, I was just outside the Washington D.C. area, and there was no hint of severe weather on the horizon. In fact, so far, my trip up from Florida was uneventful. My Cessna Turbo Skylane RG 11 had been performing flawlessly. At 7,000 feet everything below looked calm and peaceful. As I made my way across Washington, D.C., I looked down and was able make out the mall connecting the Washington Monument and the Capital building. Slightly further ahead I saw the familiar five point Pentagon building with Washington National Airport just to its west. I turned right toward the Potomac River and picked up the 210 degree radial of Middle River VOR. Then, while preparing for my approach into Philadelphia International, I saw them.

An ominous, black band of thunderstorms stretched across the sky ahead of me. Some cells appeared to top out at about 50,000 feet. I looked out of the side window of my Cessna, only to learn that the storm was closing in on me quickly. I descended to 2,500 feet hoping to escape its fury. Apparently there was no way around it.

By this time I was close enough to Philly to tune into ATIS. Just as I suspected, there was little letup in sight. Although the airport was not below minimums, the ATIS said that planes were making ILS landings on runway 9 ahead of the storms. By now my NAV2 radio was tuned to the Dupont VOR. I turned left to a heading of 330. The wind and lightning danced around my plane.

Visibility was zero. The ride became one of a roller coaster. A beautiful summer day had quickly turned into a nightmare for this VFR pilot.

All of a sudden my earphones went dead. All I heard was the constant roar of my engines. I tuned my NAV1 radio to 109.3 MHz, Philadelphia's ILS approach frequency. Thankfully, that radio bank was working. Carefully watching my ILS instruments, I turned right to a heading of 090 when the needles lined up. I prayed that Philadelphia was still open and there was no one immediately in front of me. I fought to keep the airplane lined up with what my ILS indicator was telling me was runway 9. My altimeter dropped quickly as I made my approach.

The DME read five miles from touchdown. I put my gear down. I thought I heard the comforting sound of the wheels locking into place. I turned on 10 degree of flaps, then 20 and finally 30. Flipped on my lights. At 800 feet I broke out of the clouds to see the welcoming lights of Philadelphia Runway 9. The wind and rain was intense. Strong storm cells had made their way into the Philadelphia TCA. The storm was full blown. But there was no turning back now.

I fought hard to keep the plane in line ... 700 feet, 500, 400, 300, 200, 100. Just as my wheels were about to hit the pavement, putting this agony to an end, I heard my wife's voice from behind me. "Dinner's ready!" I reluctantly turned off my computer and headed for the dinner table.

For many years I thought I was the only nut who would sit at a computer for hours flying a computerized airplane around the United States. Little did I know that the scene above was being repeated in thousands of households every day across this country.

While I am sure there are plenty of licensed pilots taking to computer airways, I am amazed how many are like myself, a category of individuals I call "flying enthusiasts."

Ever since my first plane ride in a twin engine prop from Newark to New Bedford, Massachusetts, at the age of nine, I wanted to fly. I remember as kid just going to the airport and watching planes land and take off for hours. I affectionately remember visiting Newark Airport's terminal building (now known as the North Terminal) and climbing up to its "observation deck." For 10 cents I was able to listen in on communication to and from the tower! I also remember those exciting visits to the cockpit of a plane in flight where I stood wide-eyed staring at the bank of instruments in front of the pilots.

Abbreviations Used

ATIS	Automated Terminal Information Service
DME	Distance Measuring Equipment
ILS	Instrument Landing System
TCA	Terminal Control Area
VFR	Visual Flight Rules

Boy, those were exciting days. Unfortunately, hijackings and other dangers of modern life have led to security controls and FAA regulations that make all that impossible. Many will tell you flying has become old hat. But for me, even though I am in my mid-40's, I am not ashamed to say that visiting the cockpit of a plane on the ground or watching planes take off and land from inside the terminal building is still a thrill.

For a variety of reasons, not the least of which is the expense and my wife's fear of my early demise, I never took flying lessons. Instead, I took to the computer. The fact is, I bought my first computer just to run Microsoft's Flight Simulator. When I think back and compare running FS on my current 386/20 65 megabyte machine compared to my original 64K system, it's a little like comparing flying the Wright Brothers' plane to the Concorde.

On a recent business trip from Cape Cod, I took a small commuter plane to LaGuardia Airport in New York. To my surprise, there was only one pilot and three passengers, including my wife and myself. When I asked him if I could fly in the right seat, and he said "sure," I naturally jumped at the opportunity. It was strange. I actually felt comfortable in that seat. For an instance I felt I would be able to fly that airplane should something happen to the pilot.

I guess the credit for the thrill of flying on a computer must go to the designers of today's flight simulator programs. Many of these programs duplicate, in detail, the thrill of flying. Scenery disks, representing nearly every state in the U.S. and several foreign countries, have given cross-country flying a whole new meaning. For us flying enthusiasts, flight simulator programs are not a day at the arcade. While they provide hours of "entertainment," today's sophisticated VFR and ILS programs are taken quite seriously by flying enthusiasts like myself.

I have since purchased a computerized flight planning program that allows me to computer fly even more realistically. While my main interests lie in general and commercial aviation, computerized flight simulators have allowed me to try my hand at attack choppers, a variety of military aircraft, and even dog fighting in Messerschmitts, Junkers, Spitfires and Hawker Hurricanes.

Maybe someday my lifelong wish to pilot my own plane will come true; but for now, the computer is a satisfying substitute. Now if you'll excuse me, I have to file my flight plan for a flight from JFK to LAX in the morning.

MT

Photo by Harry Baughn

Just as my wheels were about to hit the pavement, I heard my wife's voice...

Shortwave Broadcasting

Glenn Hauser
P.O. Box 81874
Albuquerque, NM 87198

All times UTC; all frequencies kHz.
**asterisk before/after time signifies station sign-on/sign-off;*
// means parallel; + means continuing but not monitored;
= 2 x indicates 2nd harmonic of following frequency.

ANGOLA RNA, Luanda, has usurped the very name of UNITA opposition station Voz da Resistência do Galo Negro for anti-Savimbi programming at 0455-0700 on 9720, 1055-1300 on 11955, 1655-1900 on 9535 (Richard Measham and/or Radio Netherlands *Media Network*)

ARGENTINA R. Nacional heard on 15780 LSB at 1200 // 15345, feeder to LRA36 Antarctica, like numerous private stations previously on 15780 ISB (Nobuyoshi Aoi, R. Japan *Media Roundup*)

ARMENIA R. Yerevan, English at 2242-2255 on 7440 and new 11920; 2342-2355 on 11920 and new 11970 (Eugene Gebruers, Belgium, RVI *Radio World*) 2245 on 7440, new 11920, 15585 (Wolfgang Büschel, Germany) These may be one hour earlier now.

AUSTRALIA AAFR to Somalia moved to 0300-0400 on new 17900-Darwin (Mike Bird, RN*MN*)

AUSTRIA ORF on 9880 ex-9875 at 0130, 0330 and 1130 ex-1230 on 13730 (via Dave Jeffery, NY)

AZERBAIJAN R. Dada Gorgud via Moscow in English at 1700-1800 on 9840, also announced 15135, and heard on 9580 (Eugene Gebruers, RVI *Radio World*) Also announced 11835 (Finn Krone, AWR Italy via Büschel) One hour earlier? (gh) Also 15175 (Jan Nieuwenhuis, original source deleted, *SW Echo* via Kirk Baxter)

BULGARIA R. Sofia planned new name R. Bulgaria from end of March (Measham, BBCM, RN*MN*)

CHINA CRI received 328 kiloletters from overseas audience in 1992 (Zhongguo Xinwen She news agency via BBCM)

COLOMBIA Ondas del Ranchería, Barranca, on harmonic 2393 at 1030-1058, Mexican music (Fernando Viloria, *The Radio News*, Venezuela via *Radio Nuevo Mundo*) Harmonic of what? No such station listed on likely fundamentals (gh) More harmonics: 4137, R. Estelar, Quiplá at 1014-1026, 3 x 1380 nominal; 4351, Ondas del Porvenir, Samaca, 1005-1013, 3 x 1450 nom. (Viloria, *TRN*) R. Brisas del Catatumbo, Tibú, at 2330 on 2680 = 2 x 1340 (Santiago San Gil, Venezuela)

COSTA RICA Perhaps the tail end of the storm which closed down Grove for a week, March 14 winds of 120 mph caused Radio for Peace International's new self-supporting tower to buckle, knocking down its other guyed towers. The new antenna had not been mounted atop it, so that was safe, but other antennas were damaged. RFPI returned to the air three days later with provisional equipment, antennas near ground, on 7375 AM and reactivated 21465 USB, soon joined by 7385 USB and reactivated 15030 AM, but not 13630. New tower by different company will be guyed, and log-periodic antennas allowing greater flexibility in frequencies and directionality, perhaps completed by mid-May with new high-power transmitter. Contributions to tower and antenna reconstruction welcome at Box 10869, Eugene, OR 97440. *FIRE* plans live coverage from Vienna of World Conference on human rights, in June (RFPI *Mailbag*) Announced schedule a dekaday after calamity: AM 24H on 7375, 15030; USB 1600-2400 on 21465, 0000-1200 on 7385.

AWR schedule is flexible as construction continues, but nominally 1100-1500 and 2300-0500 via Cahuita, TIAWR-1 50 kW on 5970, 11870 or 15460, log periodic bearing 120°; TIAWR-2 50 kW on 9725, l.p. 340°; TIAWR-3 20 kW 13750 l.p. 65°; TIAWR-4 20 kW 5030 single quad at 350°; TIAWR-5 20 kW 6150 cubic quad 105°; TIAWR-6 remains at Alajuela for time being, 5 kW 11870 Yagi 45°. Three-hop HF studio-transmitter link from Alajuela campus to Cahuita is not complete except for first hop to top of Irazú volcano (Adrian Peterson, IN, AWR) What frequency on HF, 26-MHz band? Or do you mean VHF?

CUBA See April column—"our" Arnie Coro on *DXers Unlimited* did not confirm or deny the dissident comments quoted, but spelled his own full name as Arnaldo Coro Antich, born in 1942—so are there really two different people named A. Coro A. on Cuban radio? We asked the *Globe* writer to clarify this but he never returned our call. The March storm also damaged RHC, knocking 15165 off the air for several days, as well as evening frequencies in English. Five-digit numbers station on 12325 at 0210 mixed with Havana audio in Spanish // 11970 (gh)

ECUADOR Yet another example of extremely lax engineering standards at HCJB—UT Mar. 22 at 0348, barely audible on 15155, instead putting out very strong distorted FM spur on 14915, audible down to 14875 (George Thurman, IL and gh) RFPI also continues to complain of HCJB blocking its 15030 outlet, mix of 15250 and 15140. Also lax are journalistic standards at *DX Partyline*, ripping off lots of DX news items without any credit whatsoever to individual or published sources. We hope this will improve with the imminent return of the pious Rich McVicar from furlough (gh) Contrary to publicity that 9600 would be used to Europe at 0700-0830, actually on 15270 // 11835 ex-6205, which was still used in French until 0700 (Brian Alexander, PA) HCJB is trying to coordinate with TWR to avoid duplicating coverage. Plans to develop one site in another continent, partially local programming, partially relay (Scott Higgins, HCJB Exec. Dir. on *DXPL*) We gather that Kenya and Hawaii are most likely.

On 2969.9 at 1130, R. Emisora Diocesana Guaranda (?), Parroquia de Suñate, Prov. de Bolívar (Santiago San Gil, Venezuela, DSWCI SW News) Nothing like that listed around 1485, 990 or lower fundamentals.

EGYPT R. Cairo, 9475 at 0200-0330, experimented in March with different parallels, one week each instead of 11865—9220, 9720, 11600, 11980 (via Sheldon Harvey, Bob Thomas, John Figliozzi) 9220 was strong and clear but useless due to low modulation; sometimes overmodulated instead (Harvey, Westenhaver and gh) 9720 blocked by WYFR-9715; 11600 fair (gh)

FRANCE Mysteries on 25710, 25900 and 26070 revealed thanks to detective work by phone: Run by Securicâble, radio links from ground to cable-car gondolas for emergency communications allowing equipment operators to talk to passengers during power failures or breakdowns, but normally with musical entertainment called Radio Neige produced by Radio Nostalgie in Paris; at 20 different ski resorts all over the Alps, several transmitters on each frequency playing tapes independently, randomly unsynchronized; heard almost daily from 1300 past 1700 including parody commercials, one mentioning ice cubes in Martinique, a red herring (Alan Roberts, PQ, *World of Radio*) Nice work!

GERMANY [& non] DW planned to intro new service to Africa via additional Rwanda transmitters, mid-April, English 2100-2150 on 9715, 15135, 15350, not parallel to Asian service at same time (DW via Diane Mauer) DW Elmshorn reduced-carrier USB test on 6140 at 0700-1655 has moved to Nauen site west of Berlin (ORF DX via Wolfgang Buschel) DW's 1993 calendar looks cool but is absolutely useless due to jumbled format (Dan Brame, IL, SPEEDX)

GREECE VOG announces Greek language lessons for English speakers, 0325 on 9375, 9420, 11645; 0730 on 7450, 9425, 11645; 0920 on 17525 (John Babbis, MD) Which days, every?

GUATEMALA AWR W-92 schedule showed 11795, 1100-1400 in Spanish, 2200-2300 English, 2300-0300 Spanish, also Saturdays only 1400-1900 Spanish, 1900-2200 English, always // 5980—but 11795 never reported and believed only plan for 11870 transmitter still unmoved from Costa Rica. (gh) AWR, Unión R. fair at 1434 on 17943.9, a 3rd harmonic (Sheldon Harvey, PQ, CIDX)

HAWAI'I KWHR due on air sometime mid-93 (Joe Hill, WHRI DJ)

INDONESIA RRI Jayapura, 9612.4, *1313 past 1325 during Ramadan, still detected after 1800. RRI Samarinda, 9614.37, from 1205

till blocked by VOA-Thailand at 1400 (David M. Clark, Ont., *Fine Tuning*) RRI Sibolga, 5256.0, very active, 1423 stately music, choruses, 1500 Jakarta news (Bill Flynn, Cave Junction, OR)

IRAN [non] V. of Human Rights and Freedom for Iran (Persian: *Seda-ye Bashar va Aazadi-ye Iran*), pro-monarchist from Egypt, at 1400-1445 on 15100, 9350, repeated at 0645 on 15670, 15100, 11470; 1630-1825 on 15620, 15100, 11470, repeated at 0330 on 9350 (BBCM)

ITALY Idea Radio is new private station on 7379.82, 500 watt Collins, testing at various times 24 hours, including English IDs; address is P.O. Box 38, I-16030 Gattorna (Genova) (Luca Botto Fiora, Roberto Pavanello, *Play-DX*) Though reported by RN*MN* and others as on 7135, schedules issued by IRRS continue to show 7125, with alternates 7105, 9815, 9860. March schedule shifted for DST should be: daily 0200-0300, weekdays 0600-0900, irregular 1000-1600, weekdays 1700-2130, weekends 0600-2230; UN, UNESCO and gospel programs except for *Hello There* mailbag, 0715 Suns. except last week of month, repeated at 1330 (*SWL-List* via Will Martin)

JAPAN R. Japan's *Media Roundup* is off the Canadian relay again for DST period; full sked is UT Sunday 0330 on 11815, 15210, 15230; 0930 on 9750, 11910, 15190, and Singapore 11740; 1530 on 9750, 11815, 11865, and Gabon 15355 [good in OK]; 2130 on 9650, 9750, 11815, 15430 and Singapore 6035, Gabon 11925; 2330 on 7140, 11815, 15430, and Skelton 6060, 6125. Hiromi Ito introduced new host starting in April. Pyongyang expanded jamming to include all Korean broadcasts of R. Japan (RJ*MR*) New host is Mark Robinson (Tom Sundstrom, *SW Echo* via Baxter) Ian McFarland has returned to Montreal; his successor at R. Japan is another ex-RCI person, Patrick De Volpe (Sheldon Harvey, PQ, *W.O.R.*)

[non] R. Aum Shinrikyo via dozens of R. Moscow frequencies sent schedule seeming to show only two different programs—one at 0430 Feb. 23-Mar. 31 and at 2030 Apr. 1-May 10; the other on reverse dates and times (via Scott Edwards, Gigi Lytle, John Schmid, Diane Mauer)

KIRIBATI R. Kiribati, 17440, verie signer and managing director is now Teraku Tekanene, liked *MT* article; former v/s Tomasi Kei Tariau died in Oct. 92 (Kevin Murray, OR, *FT*)

KOREA SOUTH [non] R. K'rea relay via Canada for DST makes usual move to 1030-1100 on 11715; but also in English now at 1100-1130 on 6145, 9650 (*SW Feedback*) Relay exchange with BBC Skelton starts May 1, 2030-2230 in English, French, German; adding July 1 Korean at 0630-0730. BBC via Kimjae, English 1300-1400, Chinese 2200-2300, adding Cantonese July 1 at 2300-2400; frequencies TBA (Tooru Yamashita, RJ*MR*)

KURDISTAN [non?] V. of Iranian Kordestan, in Kurdish and Persian 0315-0430 on 4643v, 3945v, repeated at 1630-1900 and unconfirmed at 0930-1100 on same; previous frequencies are 7360, 5080, 4890, 4665, 4070, 3965, 3935, all widely variable; maybe not exactly parallel, several seconds apart. V. of Independent Kurdistan (Kurdish: *Aira Dangi Kurdistani Sabakhoya*; Turkish: *Burasi Radyo Kurdistana Sarbakha*), referring to "fascist Turkish government" was first heard 25 Feb. 1993, varying 7024-7036 at 0700-0800, 1300-1400. Turkish newspaper claims this is broadcast from Damascus. V. of Iraqi Kurdistan, Salah-al-Din, 1400-1600 repeated at 0300 on 4180v (BBCM)

LIBYA Tripoli's eastern European service depends on the day of the month. Russian announcement gave these January dates for 15415 at 1600: 1-3, 16-18 Russian; 4-5, 19-20 German; 6-7, 21-22 Hungarian; 8-9, 23-24 Polish; 10-11, 25-26 Bulgarian; 12-13, 27-28 Czech; 14, 29 Romanian; 15, 30-31 Serbo-Croat; *Green Book* extracts (John Samson, World DX Club)

LITHUANIA [non] R. Vilnius replaced 7150 with 9810 from March 8 for English at 0000-0030 (Robert E. Thomas, CT, *DX Listening Digest*) Summer time shift to 2300 on 11750 (Derek ---, England, RN*MN*)

NETHERLANDS Revised Z-93 schedule of RN includes 15150, not 15145 from Madagascar to Asia at 1330-1630 along with 9890 and via Flevo 17610, 13700; from Bonaire to Africa 1730-1930 on 21590, 21515, 1930-2030 on 21590, 17605; to North America 2330-0130 on 6165-B, 6020-F, and second hour also on B-11835-USB; 0330-0430 on 9590-B, 6165-B. To Asia 0030-0330 on 13700-F, 11655-M, 9860-M; 0030-0130 9825, 0130-0330 12025 both Alma Ata. Pacific, 0730-1030 on 11895-B, 0730-0830 also 9630-B, 0930-1030 also 9720-B. Summer program topics: *Research File*, Mon. & Thu., futurism, brain sex, Dutch astronomers, epidemiology, Earth Summit, Caribbean tourist impact on environment, AIDS. *Mirror Images*, Tue. includes film festivals, pop profiles, opera at Antwerp, cultural capital. *Documentaries*, Weds. with repeats into Sats.—May 5, Liberation Day; May 12-19-26, *Dancing through Colombia*; June 2, UN Year of the Elderly Person; Asian topics the rest of June. *Encore*, Wed. alternate hours—May 12 starts a 6-week repeat of *On the Waterfront*, plus a seventh about Lake IJssel. *Sounds Interesting*, Sats., May 1 special, *A Bird's Eye View*, guided airborne tour of Holland; June 5, *To be Young and Gifted* (Jonathan Marks, *SWL-List* via Will Martin) 3000 special QSLs for the CIS relays were expected from printer April 19 (RN*MN*) Spanish to Américas including DX program *Radio-Enlace* Fridays, UT Sats.—2230 on 13700, 11715, 9895 all Flevo; 2330 on 15315-B, 9895 & 11715-F; 0230 on 6165 & 15315-B, 6020 & 9895-F; 0430 on 6165 & 9590-B (*Radio-Enlace*)

NETHERLANDS ANTILLES *Monitor DX*, in Spanish from R. Transmundial by Daniel Camporini in Buenos Aires, can be heard UT Sundays 0145 on 11930 with station profiles, DX news (*W.O.R.*)

NEW ZEALAND New antennas capable of using the 6 MHz band are for RNZI's winter season starting in May; most likely would replace 9700 during part of local night.

NICARAGUA R. Miskut was on 5571 signing off at 2314 until 1100, while two days earlier on 5770 mentioning 5970; the ID at 2328 sounded like Radio C, Pto Cabezas (F. Viloria, Venezuela, *The Radio News*)

NORWAY RNI's Sunday-only *Norway Now*, English half-hour this summer to us: 1900 on 15365, 2100 on 15165, 2300 on 9655, 11795, 0000 on 9675, 0100 on 9615, 0200 on 9565, 11925, 0400 on 9740, 11865 (via Bob Thomas, Richard Lemke) 15165 should clash with Cuba.

PERÚ R. Visión 2000 is new station from Bambamarca on 5131.02 at 0108-0200. R. Nuevo Mundo, Cuzco, reactivated 5082.60 at 2352-0006 (Ugo López, Chile via Barrera, *Radio-Enlace*) On the contrary, 3402.6 is *not* a R. Nacional harmonic, but a real new station, R. Internacional del Perú, San Pablo, Cajamarca, heard at 2330-2430 announcing 3395. Also new on 3869.7, R. Adventista Mundial, Celendín at same hour (Henrik Klemetz, Colombia, *Play-DX*) R. Cuzco now on 6203.76 at 2350-0230 (Finn Krone, M. Schnitzer, M. Molano and Dario Monferini, *Play-DX*)

PORTUGAL R. Renascença, now also on satellite asked for postcards or calls from anyone still listening on 31m shortwave (BBCM)

RUSSIA RMWS reported that the Russian external service would soon become part of Ostankino and be renamed Russian Wave—analogous to Deutsche Welle. V. of the Assyrians began broadcasts from Moscow Feb. 20 in that language, also announcements in Persian, Arabic and English, Weds. & Sats. 1600-1630 on 5905. R. Station Sofiya from Moscow Patriarchy had religious education from before 2250 to 2329 on 12070; address 113326 Moscow, ul. Kachalova 24. Is program on Ostankino Radio 1 service to Far East, also to western Russia at 0700-0730 Sats., probably all one hour earlier for summer (BBCM) Sakhalin Radio, 1800-1210 on 11840, 1800-0900 & 1120-1600 on 4050 (BBC German DX via W. Büschel)

SERBIA R. Yugoslavia denies reports it faces collapse, but admits

it is in serious financial difficulties. Announced summer English again shifted half an hour: 0030 on 9580, 11870, 0130 on 9580; 1130 to Australia 21605 with 17740 for us no longer mentioned. Trying to resume *Radio Ham Corner* alternate Fridays such as May 7 (BBCM)

SIKKIM AIR Gangtok, presumed, 4775 heard again from 0024, English news 0035. Very unlikely this is Guwahati, which has been consistenly off channel, 4775.4v with poorly performing transmitter (David M. Clark, Ont., *FT*)

SINGAPORE New Radio Japan relay of General Service in English, Japanese: 0100-0300 11860, 0500-1000 11740, 2100-2200 6035 (Bill Westenhaver, SPEEDX)

SOMALIA R. Rajo, Unified Task Force, Mogadishu, now heard daily 1100-1145 in Somali opening with Qur'an, news, on 9540 USB plus carrier (BBCM) [non] V. of Peace, via Ethiopia at 1100-1200 on 11800, 9560 in Somali, opening in English (Richard Measham, BBCM via RN*MN*)

SOUTH AFRICA R. Orion, mostly pop music, strong but muffled at 2300-0300 (Steve Hunter, PA) Scheduled on 3320 only (via Bill Westenhaver) But heard on 4810 saying the service would be gone by April (Bill McClintock, MN, RN*MN*) No more R. 2000 net, but told me on phone Orion would last to end of May or June (Jonathan Marks, RN*MN*)

SUDAN R. Omdurman, 9165 at 1800-1900 has anti-Christian talk re alcohol, Western civilization "sick" (RVI *Radio World*)

SWEDEN R. Sweden's first new 500 kW was due by end of March, the second by end of May, and the third by yearend; fire damaged MW 1179, resumed with very low power standby (*Sweden Calling DXers*) This summer all English except 0200 shifted one hour earlier for convenience of station, regardless of timeshifts in targets; North America now at 1500 should be clear of WYFR on 21500, 17870 changed to 15240; former 1330 to Asia audible in deep North America on 15240 now shifted to 1230, also on 21500. Also try the 1730 on 15270 (via Scott Edwards, CA)

SWITZERLAND SRI's RTTY service was to stop at end of March, due to lack of interest, uneconomical in opinion of new director (David Alpert, RN*MN*)

SYRIA R. Damascus in English at 2008, again from 2110 on 12085, 15095 (Brian Alexander, PA)

THAILAND Address for QSLs of VOA Udorn tests: Thailand QSL, Room G-759, Voice of America, Washington, DC 20547 (Victor Goonetilleke, Shri Lanka, RN*MN*) for US listeners, it's Room 1547 (Dan Ferguson, VOA, *SW Echo* via Baxter) 9715 ex-9615 at 1400 (David Clark, Ont., *FT*) But Z-93 schedule shows 9615 at 1400-1700, no 9685.

TONGA TBC may be back on SW 5030; Radio Australia news and Paficic program at 0700 Feb. 20 but local storms prevented hearing ID (Micharl Rolph, Australia, *OzDX*)

TURKEY VOT in English for Z-93: SW Asia 1230-1300 on 9675; Europe 2000-2100 9445; 2200-2300 Europe 11895, Mideast 7185, NE America 9445; 0300-0400 NE Am. 9445, Turkish to us at 2300-0300 on 9445, 0400-0900 on 9460 (TRT)

UKOGBANI *Around the World in 80 Minutes*, a 15-minute program, connects with local radio stations across the globe for top songs in different countries, such as Kathmandu, Delhi and Karachi, week of Apr. 25, continuing through May 18, Sundays 0415, Mondays 1930, Tuesdays 0915 on BBC (*London Calling*)

UKRAINE R. Ukraine on 17790 and 21765 transmit mixing product on 25740! Best at 1400-1500, QRMing DW before 1300 (Alan Roberts, PQ)

USA *GH's DX Daily* is running again at least through May 8, this time on WHRI, Indiana, sponsored by Grove and others, plus individual donations of $5 or more to gh—UT Tue.-Sat. 0130 on 7315, repeated at 0600 on 9495, 7315, except Sat. at 1400 on 9465, 15105. WHRI's full Z-93 sked: No. 1, 157° toward Caribbean, 2300-0800 9495, 0800-1000 7355, 1000-1300 9850, 1300-1400 11790, 1400-1800 15105, 1800-2300 17830; but on Sundays 1000-1100 on 7355, 1100-1300 on 11790. No. 2, 42° to N. America and Europe, 0000-1300 7315, 1300-1700 9465, 1700-2400 13760; but on Sundays 9465 changes to 13760 at 1600 (via Will Martin, MO)

World of Radio—see last month for anticipated DST scheduling; also expected to be aired on WWCR No. 3 including Sat. 0930, maybe 2030.

Pres. Clinton's hard-to-find Saturday radio speech is available on networks live at 10:06-10:12 am EST/EDT. Even VOA is not known to carry it, but WWCR does now—Sat. 2230 UT and Sunday 1245 on 15685, followed by Republican response, from USA Network. *Radio Techniques* resumed on WWCR with new sponsorship, should now be Sun. 0730 on 7435, 2200 on 15685, Wed. 1230 on 15685. *Radio Newyork International*, behind in payments, was finally cancelled by WWCR after March 7 broadcast; hopes to come back; keep in touch by calling info-line 914-376-0406, says Johnny Lightning. Big Steve Cole hopes to resume *Crossband* independent of RNI on some other station, perhaps reviving some elements of *Signals*. Gary Bourgois does not want to resume producing it, since that was supposed to be a temporary task for him, but could do *Birdwatcher* report for some new program. *RNI* was replaced on WWCR by Jewish-oriented *Talkline* with Zev Brenner, not UT Monday 0200-0500 on 7435. At times WWCR has been blown off the air—literally, due to winds causing pressure variations at air-cooling intake! Transmitter No. 3 arrived Mar. 23. WWCR has international weather minute, high-and-low predictions for next day from Prodigy, at times such as weekdays 1004, 1329, 1714.

WRMI, Radio Miami International, expects to start in May on 9955.

WEWN began testing second transmitter in early March on 17850 around 2200 (George Thurman, Bill Westenhaver) Lost little airtime despite dumping of huge snowfall in mid-March; maybe all that RF kept it melted! (gh) Agree WEWN pretty boring, unless you can treat endless rosary recitations as "sound poetry." Chinese version so mechanical it was almost cultish like KJES. Amused by English filler talks at end of hours by Father Ray, Oblate priest who sounds like he learned English from *Double Exposure's* imitations of Jean Chrétien! (Bill Westenhaver, PQ) Rev. Raymond Bourque is a Franco-American, his messages well-received here and he has a large following from the elderly (Edouard S. Provencher, Biddeford, ME)

KJES, New Mexico, returned to air March 11 after more than two months off due to blown RF Final; U.S. factory denied it was defective and new one had to be purchased. Resumed previous schedule but seven days a week; for Z-93 planned one change, beam toward Australia instead of W. Canada at 1800 on 9510. On and off times usually precise, tho on occasion half an hour late (gh, *W.O.R.*)

WINB's AM station WGCB has been sold; may affect SW output (George Thurman, IL)

Ronald D. Yoder, owner and C.E. of WVHI, 1330, Evansville, IN, says he soon plans to apply to FCC for a SW station, religious format (J.D. Stephens, AL, *DX Listening Digest*)

World Service of Christian Science Monitor changes frequencies on non-standard dates; some changes effective May 4-Aug. 30: to Africa, 1600 on 17510, 9355, 1800 on 17612.5, 2200 on 15665. Europe, 0600 9870, 0800 11705, 1800 & 2000 17510, 2200 on 15665. Mideast, 1800 & 2000 on 15665. N. America & Mexico, 1800 & 2000 on 17510. SE Asia & S. India, 1600 on 9355. Oceania, 1600 on 9355, 2000 on 9430 (WSCSM)

Pres. Clinton selected Joseph D. Duffey, president of American University and an old friend, to head US Information Agency; and his deputy to be Penn Kemble, a conservative Democrat. Among those competing for the top USIA job were Mary Bitterman, Rozanne L. Ridgway, David Gergen, Martin Peretz, Bill Moyers, Pierre Salinger, and Ben Wattenberg (David Binder, *NY Times* via Scott Edwards)

VIETNAM VOV domestic service at 1100-1300 on new 6160 ex-6135, // 5020; includes Meo at 1200-1230. RTV Kontum on 5062 at *1000-1200* including VOV DS relays, and: own Viet at 1045-1100, local language at 1130-1145; up from 5060 due to China QRM (Isao Ugusa, Japan, RJ*MR*) Hmong service from Hanoi up from 5020 to 5031.8 at 2235 // 6161v up from 6137, also at 1120 // 6160.2 (Foster & Martin, *OzDX*)

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.*

0031 UTC on 9022
IRAN: VOIRI. Station ID and national anthem. Islamic prayers and Koran readings. News and commentary on Palestinians and Iran's history of the revolution. (Robert Tucker, Savannah, GA)

0035 UTC on 9530
SPAIN: Radio Exterior Espana. *Radio Club* program with listener's letters and musical request. (Bob Fraser, Cohasset, MA) Programming monitored to 0110 news and sports. (Brian Webb, Thousand Oaks, CA)

0059 UTC on 4915
BRAZIL: Radio Anhanguera. Portuguese. English pop tune to mention of "Anhanguera". Five time tips at the hour to station ID as, "emissora ... Radio Anhanguera onda media al exterior 1360 kilohertz ... onda tropical 1305 kilohertz". (Webb, CA)

0100 UTC on 9575
ITALY: RAI. News item on Italy's political scandals. National news and station ID. (Fraser, MA) (Tucker, GA) (Webb, CA)

0120 UTC on 6085
GERMANY: Deutsche Welle. Music program of various German carnival tunes. Station ID to German language lesson program. (Jeremy Frenz, Milwaukee, WI) Germany's RIAS audible on 6005 kHz at 0800. ID at the hour heard as *Radio Rye-as*(Frank Hillton, Charleston, SC)

0130 UTC on 5025
CUBA: Radio Rebelde. Spanish. Very good signal quality. Latin music program to ID as, "Rebelde, La Habana, ocho media". (Webb, CA)

0133 UTC on 5960
CANADA: Radio Canada Intl. *Quirks and Quarks* science program from CBC radio. (Tucker, GA) BBC Canadian relay station monitored on 5965 kHz at 1200, and 5975 kHz at 2215. (Fraser, MA) Radio Japan's Sackville relay heard on 5960 kHz at 0250-0259*. (Hillton, SC)

0158 UTC on 4845
MAURITANIA: Radio Mauritania. Arabic. Extended programming of Islamic prayers, Arabic music and feature. (Hillton, SC)

0230 UTC on 9580
ALBANIA: Radio Tirana. Half hour programming of national news, program features, and Albanian music. (Dave Frenz, Milwaukee, WI)

0230 UTC on 4810
SOUTH AFRICA: Radio Orion. Pop tunes to ID and English sign-off. Afrikaans at 0300. Good signal. (Ray Backus, Richmond, VA) Station heard 2300 on 4810 kHz. Frequency IDs, time checks and popular tunes. (Stephen R. Hunter, Drexel Hill, PA) Weak signal heard 0042-0110 on 4810 kHz. (Webb, CA) SABC's Radio Oranje audible on 9630 kHz at 1630. (Backus, VA)

0312 UTC on 3249.6
HONDURAS: Radio Luz y Vida. Spanish. Pleasant regional music, amid scattered station IDs. (Frenz, WI) La Voz Evangelica audible on 4820.2 kHz at 0450-0502. Good signal strength and moderate interference. Religious music and sermons to ID. (Webb, CA)

0330 UTC on 3356
BOTSWANA: Radio Botswana. Tunes from Michael Jackson. Rooster wakeup calls to station ID. Strong signal quality to abrupt fadeout at 0438. (Franz, WI)

0331 UTC on 11945
UNITED ARAB EMIRATES: UAE Radio Dubai. News to ID and Dubai weather forecast. Program feature on Arab contributions to the western culture. Station ID to national anthem. (Tucker, GA)

0340 UTC on 4980
VENEZUELA: Ecos del Torbes. Spanish. Fair signal for Venezuelan llaneras music. Station information and anthem for Tachira. Announced "this is Venezuela, land of hope, generous and wide entrance of South America and the entire world." Closing information to ID and national anthem. (Webb, CA)

0355 UTC on 4914.5
PERU: Radio Cora. Spanish. Good signal quality with minimal fading. Station ID at 0356 as, "Radio Cora del Peru de la Compania Radio Conectadora Socidad Anonima ..OBZ4BWS 600 kilohertz ...OBZ4N y 4915 kilohertz banda tropical de 60 metros transmite desde Lima, capital del Peru, Sud America." (Webb, CA)

0400 UTC on 11680
CHINA: China Radio Intl. English news to current events programat 0420. Very good signal. (Backus, VA) (Rausch, NJ) *Letterbox* program audible on 7405 kHz at 1540. (Webb, CA)

0426 UTC on 7245
ANGOLA: Radio Nacional. Portuguese. Music mix of English/Portuguese pops. Morning exercise program via radio, to rap music. (Frenz, WI)

0453 UTC on 7255
NIGERIA: Voice of Nigeria. Station ID to program notes and *Morning Flight* show. Nigerian music and interview with local professor of federal/state relations. (Tucker, GA) Radio Nigeria monitored on 4770 kHz at 2200. Strong signal for music and IDs. (Backus, VA)

0455 UTC on 4990
PERU: Radio Ancash. Fair signal quality for great Peruvian huayno music. Announcer chat to station info and "Radio Ancash" ID. (GVH)

0457 UTC on 4895
COLOMBIA: La Voz del Rio Arauca. Spanish. Headlines, upcoming festival. Time pips at 0500 to public service announcement. ID "La Voz del Rio Arauca" during heavy interference. Fair signal quality. (Webb, CA)

0500 UTC on 7170
UNITED STATES: VOA. Interesting story on foreign musicians visit to America. (Webb, CA) VOA's Sunday program *VOA Europe* heard on 17710 kHz at 0900. (Daniel Coffey-GMG1/USS Juneau)

0500 UTC on 4970
VENEZUELA: Radio Rumbos. Spanish. Good signal quality for clear ID and station information. Nice Latin music program. (Sam Wright, Biloxi, MS)

0502 UTC on 5010
CAMEROON: CRTV-Garoua. Extended English programming. News to French programming. (Rausch, WI) CRTV-Bafoussam on 4000 kHz in English at 2115. Newscast and ID to music and French chat at 2125. (Wright, MS)

0508 UTC on 11860
ASCENSION ISLANDS: BBC Relay. French newscast with correspondents reports. Upbeat music and French ID at 0530. *The Vintage Chart Show* monitored on 15260 kHz at 2030. (Fraser, MA)

0640 UTC on 3316
SIERRA LEONE: SLBC. Fair signal quality for choral mass program to "SLBC Freetown" ID. (Rausch, NJ)

0710 on 3985
SWITZERLAND: Swiss Radio Intl. Interval signal and ID. Newscast to Swiss folk music. (Rausch, NJ) Heard // on 9535 kHz. (Robert Banks, Dallas, TX)

0800 UTC on 5020
SOLOMON ISLANDS: SIBC. Local news updates to island music. Ads to community announcements. // 9545 kHz heard to 0830 Pidgin service. (Rausch, NJ)

1025 UTC on 5082
PERU: Radio El Mundo. Spanish. Fair signal quality with minimal fading. Station promo as "Voz Campinsena" heard. Brief Peruvian ballads to time check. (Don Taylor, Green Cove Springs, FL)

1026 UTC on 4753.3
INDONESIA: (Sulawesi) RRI-Ujung Pandang. Indonesian. Regional music to 1100. Interval signal and station ID, national news topics. (Rausch, NJ)

1030 UTC on 6803.5
PERU: Radio Ondas del Mayo. Spanish. Male announcer with IDs and local time checks. Signal tone and chat between music selections. Poor/fair signal with fading rapidly increasing. (Mike Hardester, Jacksonville, NC)

1050 UTC on 6009.9
MEXICO: Radio Mil. Spanish. "XEOI" call letters between Latin tunes. "Radio Mil" ID and station promotional at the hour. (Frenz, WI) Radio Mexico Int'l heard on 9704.5 kHz at 0330. IDs and ranchera tunes. IDs and chat to time check. Mexico's Radio Universidad heard with Spanish/English. (GVH)

1105 UTC on 7260
C.I.S. (Commonwealth of Independent States) Radio Netherlands Relay. English programming on horticulture in the Netherlands. Program promotional for tomorrows' *Happy Station* show. Report request for the C.I.S. relay. Parallel frequency 9860 fair. (Hardester, NC)

1130 UTC on 3905
PAPUA NEW GUINEA: Radio New Ireland. Pidgin. DJ style program format. Station ID and American disco tunes. (Rausch, NJ)

1410 UTC on 17840
ANTIGUA: BBC Relay. *It's Your World* program on international radio and live phone-in calls. Additional monitoring this frequency with *International Recital* classical music program. BBC ID at 1600 to world news and *News About Britian* at 1609. Station sign-off at 1614. (Tucker, GA)

1753 UTC on 13760
UNITED STATES: WHRI. Religious music program to talk and station ID at 1754. New Orleans' WRNO monitored on 15420 kHz at 2159. (Tucker, GA) New frequency noted for WJCR noted on 13595 kHz at 2335. Religious music, scripture readings and ID. (Taylor, FL)

1910 UTC on 9785
RUSSIA: Radio Moscow. *Update* program with news items on the C.I.S. Additional programming monitored on 9860 kHz at 2210. *Focus on Asia and the Pacific* program. // 4860 weaker. (Fraser, MA)

2001 UTC on 11587
ISRAEL: Kol Israel. Newscast to *Spotlight* on Palestinian deportees. Station ID, news briefs and 2030*. // heard on 9435 kHz. (Tucker, GA) DX Corner show featuring a primer on propagation, heard on 11605 kHz at 2025. // heard on 9435 & 7465 kHz. (Fraser, MA)

2130 UTC on 11925
JAPAN: Radio Japan. Listener's letters on Japanese marriage proposals to regional music tunes. (Backus, VA) // 11815 kHz heard with fair signal quality.

2200 UTC on 7412
INDIA: AIR. English international news and station editorial about Pakistan. Very weak signal quality. (Frenz, WI)

Utility World

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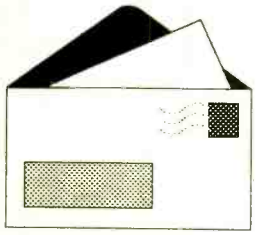


Ute QSLs

One Station's Point of View

From time to time Gayle and I get requests from folks on how to go about QSLing a utility station. We have answered this question several times over in the last few years. Now, however, we have a utility station's perspective on this. I recently received a very nice letter from Jim Clary at Marine Radio Station, WSC, Tuckerton, NJ, on their QSL policy.

Here is part of what Jim had to say. "QSLing some coast stations has been difficult for a long time, and I know first-hand that getting a confirmation out of WSC has been literally impossible for years (*Amen-LVH*). Being a WSC staffer, I can offer QSLing assistance."

Jim says, "Being a CW-only station, Tuckerton Radio is not likely to be around much past the turn of the millenium — if we see that far at all." According to Jim, "WSC has no QSLs printed up and that is not likely to change anytime soon."

He can easily verify correct reports and sign and return postpaid PFCs that are sent to his attention (or he can provide verification letters for those who don't send PFCs). To be verified, reports must be received within the year following the communications in question. The one-year time frame is pretty rigid; all traffic records and logs are dumped the first day possible and are only kept for one year.

Requests for WSC verifications should only be sent to Jim at the following address and should include return postage!

Jim Clary, P.O. Box 685, Jackson, NJ 08527

Jim says your request should also contain some specific information from the communications, preferably something beyond their CQ wheel; it could be a segment of the daily weather broadcast (transmitted on all frequencies at 1218 UTC) or a piece of traffic transmitted to a vessel. With the advent of code readers, most SWLs should have no problem in getting down something that is verifiable.

Along with sending the verification itself, Jim intends to include a brief description of the station and its operation, plus a couple of station photographs — perhaps to make up for not being able to provide a fancy QSL. "It's not much, but it's the kind of stuff that I'd like to receive (and rarely get) from a station that I'm looking to confirm," Jim said.

Jim has also provided the following information on Marine Radio Station WSC. The station is on the air every day running 1 kilowatt (licensed for 5 kilowatts) on 6484.5, 8680.0, 12879.5, and 16916.5 kHz. Beside those frequencies, they are licensed for 5 kilowatts on five additional HF frequencies and for 30 kilowatts on two more.

WSC uses Henry transmitters (no model placard) for HF, and a Scientific Radio System SR-216 MF kilowatt job for their 500 and 482 kHz work. They use 480 kHz for their working MF receive frequency. The HF antennas are all dipoles: horizontal for transmitting and sloping for receiving. For MF, the station uses a 300-foot tower for both transmitting and receiving. That tower is located behind the station in a marsh that is adjacent to the ocean. Jim says the mosquitos are horrendous in the summer, but he should do a tour in Louisiana where they fly in constant attack formation!

Most of WSC's receivers are ICOM R71A's but they are getting pretty beat up because the transmitters are only 40 feet away. They use a Drake R7A receiver for MF work and it, of course, is getting the same kind of abuse.

During the daylight hours, WSC announces on its CQ marker that they listen on 22 MHz calling frequencies and reply on 16 MHz. At night they use the 22 MHz receiver to monitor 4 MHz frequencies and reply on 6 MHz.

I would like to thank Jim for stopping by this month's Utility World and giving us that update on WSC and their QSL policy. Since I know you are going to ask, here is the lowdown on the "PFCs" that Jim mentioned.

PFC stands for Prepared Form Card. For stations like WSC that do not have printed QSL cards, a PFC or PFL (Printed Form Letter) is the best way to get that elusive station QSL. In other words, *you* produce the QSL, leaving places for the station to fill in the data. The basic information your form should ask for is: Date, Time, Frequency/Mode Station Identification/Callsign, Signature/Seal.

Sometimes you may want to include additional data on the form, such as type of aircraft, equipment used, etc. This is strictly up to you. You can make these fancy or plain. With the advent of some great desktop publishing programs, we can really produce some nice PFC/PFLs that would look great in any QSL collection.

I personally like to use a letter instead of a card. With a computer it is much easier to produce a letter for the station to sign than to get a card printed up. Remember, if you decide to use a card, the minimum post card size that the US Post Office will handle is 3½" X 5½". A 4" X 6" index card (blank on both sides) is better, for the extra half inch allows comfortable space for most, if not all, the data you seek. Also, the 4" X 6" card size fits neatly into a standard #10 size envelope.

If you prefer a form letter, the 6" X 9" note pad sheet is probably the best choice to send to non-North American stations. They tend to use an envelope smaller than the #10 size so common in American business.

Above all, in QSLing REMEMBER — the station is doing you a favor by QSLing, so use your common sense, and make it easy for them to do so. My own policy has always been: ALWAYS INCLUDE A PREPARED FORM (PFC/PFL) AND RETURN POSTAGE!!!

UVA Identified, Maybe!

Over the last year or so, I have gotten several reports on a new Russian marine band CW station, UVA. Any ID on this station has evaded monitors until now. Regular reporter and contributor, Robin Hood in the UK, believes he may have identified the mystery marine station.

He says he has sufficient evidence from monitoring RTTY traffic to believe that the callsign UVA is for Gelendzhik Radio, Russia CIS. Gelendzhik is located on the Black Sea coast near Novorossiysk.

Robin Hood made the identification using traffic analysis techniques. In the message header of Russian marine messages, the message will give the vessel's name and a three letter indicator for the station being worked, such as SPB for St. Petersburg or GLD for Gelendzhik.

In related Russian marine news, Robin is noting a considerable number of former-USSR vessels and coast stations changing over to SITOR modes, although there are still many ships using the old 170 shift/50 baud RTTY Cyrillic system on non-paired frequencies.

The Russian ship callsign situation still continues to fluctuate. There are some vessels which have been re-registered with 9H and P3 prefixes. Some calls are shifting from U... calls to LY.. and these are probably those ships which are registered from Lithuanian ports.

Many thanks to Mr. Robin Hood for the ID and ship update.

Astrophysical Observatories Still Active

Someone asked me recently if the big Astronomy Observatory at La Serena, Chile, was still active on HF. According to Stephen Canney in Willowdale, Ontario, they are. The University of Toronto - Dunlap Observatory, Richmond Hill, Ontario, callsign VE9LHM, maintains daily contact with the La Serena Observatory on a frequency of 20566.5 kHz LSB around 2100 UTC. Stephen says being so close to Richmond Hill makes their station hard to miss but the station in Chile is still quite a challenge to hear.

Thanks for the information, Stephen, and I hope you check in often here in the Utility World.

Government SSB Nets

Mike Hardester from my "soon to be home state" of North Carolina checked in with an interesting list of government SSB nets being prepared by Tom McKee via the Frequencies R' Us BBS. Tom is apparently trying to collect information on federal government agency HF SSB nets for a data file he is building. Table 1 is what he has so far. All modes are USB unless otherwise indicated.

What can you add to Tom's list? Don't send in the routine USCG weather broadcasts or the CAP State Wing nets. I would like to see a nice list of military MARS, Bell System Emergency Nets (I know, it isn't necessarily a federal gov net), etc. Let's help Tom's list grow, folks. Now the only thing missing is a phone number for the BBS!

Table 1: Federal Government HF SSB Nets
Compiled by Tom McKee

Time (UTC)	Freq (KHz)	Station	Notes
0130	7635.0	CAP	CAP nightime Communicators net on Monday-Wednesday-Friday evenings (which is the next day UTC).
1300	5015.0	WUB4	USACE Baltimore in Monday-Friday net with stations in the Susquehanna River Valley.
1400	6870		KUV6 FAA Atlanta in Wednesday Southern Regional Net (LSB).
1415	5327.5	WUE3	USACE Pittsburgh in first Tuesday of the month net with facilities in the Pittsburgh USACE District (LSB).
1500	9122.5	WUG	USACE Friday net with Divisions & Districts. Moves up to 12070 & 16077 kHz.
1545	8126.0	KDM50	FAA Atlanta in Wednesday FAA Eastern Regional Net.
1600	7635.0	CAP	Eastern Command CAP net Monday-Friday.
1615	10493.0	WGY912	FEMA Tuesday net with Regional offices. There are also free form tests between stations at various times on Wednesday & Thursday mornings.
1630	14902	CAP	Western CAP Command net Monday-Friday.
1730	13457.0	KCP63	FAA Longmont, CO, in Wednesday FAA Western Regional Net.
1730	7635.0	CAP	CAP Daytime Communicators net Tuesday-Thursday-Saturday

CAP= Civil Air Patrol
FAA=Federal Aviation Administration
FEMA=Federal Emergency Management Agency
USACE=US Army Corps of Engineers

No More Weather FAX Products on HF — *NOT!*

Yes sirree, folks, the National Weather Service and NOAA have been up to no good. They submitted budget proposals to the House and Senate Appropriations committees that would have discontinued NOAA sending charts and satellite images that are transmitted to Coast Guard and other shore marine stations in the HF spectrum. This would have affected charts sent by Coast Guard stations at Pt. Reyes, CA; Mobile, AL/New Orleans, LA; Rodgers City, MI; Boston, MA; Adak, AK; and Honolulu, HI. In other words, HF weather FAX products for those of us in the United States would have been effectively eliminated.

We can thank the quick work of John Hoot at Software Systems Consulting and Alden Electronics, among others, for averting this disaster. It appears that the reprogramming would have only saved $215,000, since the transmitting facilities already exist and the charts would have been prepared internally anyway. If we really want to save some taxpayers' money, how about killing off that study the administration wants to fund on "The Mating Habits of the Swordfish." Now those are some savings I can really sink my teeth into.

A tip of the Ute World hat to John and those who blew the whistle to save this valuable resource for marine, aviation, transportation, agriculture, scientific, education and Ute World interest.

SRI Discontinues RTTY Service

Tom Sundstrom has informed us that Swiss Radio International is discontinuing its RTTY service as of March 31. David Alpert of ABC News, NY, passed this reception along:

> DEAR SRI RTTY-USERS,
> SWISS RADIO INTERNATIONAL (SRI) WILL BE DISCONTINUING ITS RTTY TRANSMISSIONS AS OF 31 MARCH 1993. WE ARE CURRENTLY EXAMINING MORE EFFICIENT/AND TECHNICALLY DEVELOPED MEANS OF INTERCONTINENTAL TEXT TRANSMISSIONS. THE PRESENT RTTY SERVICE, AS A SOURCE OF INFORMATION, PROVED TO BE UNECONOMICAL AND DID NOT AROUSE THE INTEREST ANTICIPATED.
> SRI HOPES TO OFFER A NEW TEXT SERVICE VIA SATELLITE IN THE NEAR FUTURE. PLEASE LET US KNOW IF YOU HAVE ANY SUGGESTIONS. WE THANK YOU IN ADVANCE FOR YOUR APPRECIATION AND INTEREST. SWISS RADIO INTERNATIONAL PR+MARKETING PO BOX CH-3000 BERN 15 SWITZERLAND ZCZC

Thanks, Tom and Dave; my only comment to SRI was, you missed the boat by not beaming English here to North America where most of the RTTY demodulating equipment exists. That would have increased your audience. Wonder how many satellite folks will really give them a listen?

WFLA AM-970 on HF

Hugh Stegman reports on a studio link belonging to WFLA, which is being widely heard on HF. WFLA on 25870 is backfeed IFB (interruptable feedback) to the traffic helos in FM. The AM air signal on 970 is delayed 8 seconds most of the time for call-in shows, so they needed a way to cue the aircraft.

The transmitter is 100 watts to a vertical, and has the coverage of VOA on a good day. Thanks, Hugh, for the update on this widely heard station. Guess it is time for me to QSL this one for the books using a PFC.

Now it's time to see what targets you have a shot at QSLing this month, using this month's Ute World loggings section. *Laz le bon temps roule* — only one more month of New Orleans Hurricanes, and I'll see ya next month from Texas on vacation.

Utility World

Utility Loggings

Abbreviations used in this column

Aero	Aeronautical	LDOC	Long Distance Operational Control
AFB	Air Force Base		
AFTN	Aeronautical Fixed Telecommunications Network	MFA	Ministry of Foreign Affairs
		m/v	Motor Vessel
		NCS	Net Control Station
AM	Amplitude Modulation	NUCOS	Numerical Code follows
ATC	Air Traffic Control	Ops	Operations
CCG	Canadian Coast Guard	RTTY	Radioteletype
COMSTA	Communications Station	SAM	Special Air Mission
CQ	General CW call for any station	SITOR-A	Simplex teleprinting over radio, mode A
CW	Continuous Wave (Morse Code)	SWBC	Shortwave Broadcast
		Tac	Tactical
Fax	Facsimile	UN	United Nations
FEMA	Federal Emergency Management Agency	UNHCR	United Nations Humanitarian Committee for Refugees
Freq	Frequency	Unid	Unidentified
GHFS	Global HF System	UN-NUCOS	End Numerical Code (see NUCOS)
HF	High Frequency		
ID	Identification	US	United States
ISB	Independent Side Band	USAF	United States Air Force
KCNA	Korea Central News Agency	USB	Upper Side Band
		USCG	US Coast Guard

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

210.0 DKB-Non Directional Beacon Dekalb, IL, with CW ID at 1609. (Myke Weiskopf-Rockford, IL)

1619.5 PCH-Scheveningen Radio with CW ID and SITOR-A idler at 0540. (Mike Hardester-Jacksonville, NC)

2182.0 USCG Woods Hole, MA, working fishing vessel *Orion* with critically ill crew member in USB at 0325. (Allan MacDonald-Essex, CT)

2538.0 USVO - *Sovietsky Morak* working Norddeich Radio using SITOR-A at 1933. (Robin Hood-UK)

2598.0 VCM-CCG St. Anthony, NF, with ice report in USB at 0745.(Bill Fernandez-MA)

2638.0 USCG Woods Hole, MA, working USCGC *Taramillo* at 0411 in USB regarding 2182 intercept on the *Orion*. (MacDonald-CT)

2727.0 DAM-Norddeich Radio with CW ID at 0210. (Hardester-NC)

3117.0 JWT-Stavanger Naval, Norway, with radio check in USB at 1936 with 00F. (Ary Boender-Spykenisse, Netherlands)

3182.0 IDR-Italian Naval Radio, Rome, with a message in English to Q8P that X3S would be 30 minutes late for task in USB at 2308. (Robin Hood-UK) *Robin, I have never seen them listed here before, much less in a voice mode. Nice catch for sure; anymore of these voice channels around?-LVH*

3233.5 RMP-Kaliningrad Naval, Russia, working UJDO in CW at 1951. (Robin Hood-UK) *First time I have seen this frequency listed-LVH.*

3452.0 Dakar ATC, Senegal, working several aircraft in South Atlantic/ Africa in USB at 0609. (Fernandez-MA)

3810.0 HD210A-Guayaquil, Ecuador, with time signals in AM at 0600. (Weiskopf-IL)

4145.5 F working FF, Z,Xoz with NUCOS, PUs (Papa Uniform) and tracks in USB at 1040. (Harry Riddell-NY) *This is a USN Alligator Play ground/tracking network coordination frequency-LVH.*

4146.0 WAQ6260-Fishing vessel Peter One reporting to USCG at 0555: Crew member fell overboard in heavy seas off Hawaii at 0400 and was presumed dead despite intensive search by Peter One and fishing vessel Princess Mary. Coast Guard assistance not requested. (Wayne Mishler-Arlington, TX) *Thanks, Wayne, for the interesting report; now get back to the R8; you're on a roll!-LVH.*

4366.0 FFL-St. Lys Radio, France, with USB voice mirror (music) at 0408. (Rick Dettmann-Buffalo Grove, IL)

4378.0 ZLW-Wellington Marine Radio working unid vessel in USB at 0727. (Ed Rausch-Cedar Grove, NJ)

4632.5 FSB-Interpol Lyon, France, with CW marker and SITOR-A ideler at 0240. (Hardester-NC)

4700.0 Habitat-NAS Moffet Field, CA, working various Navy TAC calls in USB at 1054. (Riddell-NY) *To those of you who who wrote to say the Habitat call is some other name and location, NOT!!! I have verified this call, some of their frequencies and location-LVH.*

4735.0 FT, F, C, and K in USB at 0310. (Bob Pettengill-Blanchard, OK) *Looks like another Alligator Playground tracking net-LVH.*

5015.0 German female 'PB' number station with 3/2-digit numbers in AM at 0400. (John and Gabrielle Maky-Grass Valley, CA)

5205.0 English female 4-digit number station in AM at 0631. (Fernandez-MA) 5310.0 5KI, D5V, 4SY, and C8O with USB traffic at 0515. This has been associated with a UN Yugoslavia river embargo network, a definite frequency to watch. (Jeff Haverlah-Humble, TX) Various tactical callsign like above heard 1750 - 2223 in USB UNHCR Naval Ops (Boender-Neth) *Bosnia-LVH*

5423.0 G2K working U3A, I8Y with Atlantic Naval exercise in USB at 1059. Mentioned USS Pegasus, Bowen and Milwaukee. (Riddell-NY)

5700.0 Fixation working WR46 with communication checks in USB at 1325. Where have I seen WR46 before? (Riddell-NY) *That should read WAR46 and it is the FEMA bunch in Ft. Richie, MD-LVH.*

5770.0 German female 'KR' with 3/2-digit number station in AM at 0730. (Maky-CA)

5864.0 AOK-US Navy Rota, Spain, with fax weather charts at 2145. (Boender)

6338.5 ZRQ-Simonstown Naval, South Africa, with V CW Marker at 1917. (Robin Hood-UK)

6253.0 UFB-Odessa Radio, Ukraine, with CW traffic list at 1903.0 (Hood-UK)

6253.3 IGJ-Augusta Naval, Italy, with USB radio check for Z2T at 2156. (Hood-UK)

6421.5 FFL3-St. Lys Radio, France, with CW marker at 0443. (Dettmann-IL)

6446.5 WLO-Mobile Radio, AL, with CW marker at 0440. (Dettmann-IL)

6451.0 HLP-Seoul Radio, South Korea, with CQ CW marker at 1445. (Warncke-CA)

6463.5 VIS3-Sydney Radio, Australia, with DE CW marker at 1455.(Warncke-CA)

6467.0 VTG-Bombay Naval, India, with CW marker at 1502. (Warncke-CA)

6477.5 KPH-San Francisco Radio, CA, with CW marker at 0434. (Dettmann-IL)

6491.0 VCS-CCG Halifax, NS, Canada, with V CW marker at 0432. (Dettmann-IL)

6638.0 Air Force One working Andy, Crown, and Comm Center in USB at 0420. (Rod Sevier-Carterville, IL) *Glad you could finally log them, Rod-LVH.*

6686.0 J7L working O6B/B3O/C7F with "Whiskey" then gave position in USB at 0219. (Braun-DC) Pretty much the same noted at 1300. This is a frequency used by US Forces watching for Haitian refugees. (Riddell-NY)

6712.0 King 60 calling Charlie 97 and Rescue Ops (maybe Norton) but only raising Rescue Ops. Frequency ID as channel 2, so Pacific designator still holds. In USB at 0439. (Haverlah-TX)

6735.0 Single letter calls doing USB radio checks at 2350. (Fernandez-MA)

6780.0 Shiloh Test (USS Shiloh) working Dalhgren, VA, and Wallops Island in USB for live missile firing. Also monitored on 8095.0 and 10262.0. (Tim Braun-Washington, DC) *Nice to have you back again, Tim, please check in often-LVH.*

6800.0 Spanish male passing 5 word groups to two or more operators that repeated them as each group was passed. Words included Oso (bear), Rata (rat), Estaca (stake), Satan (devil), Alla (there), Mano (hand) and Indio (indian). This went on for about an hour around 0000. (Maky-CA) *Mexican Army frequency (See March 1993 MT)-LVH.*

6817.0 Sycamore working McClellan AFB GHFS, CA, with HF radio checks in USB at 1651. Thule sent them here from 17975.0. (Braun-DC)

6853.0 German female 'HK' with 3/2-digit number station in AM at 2330. (Maky-CA)

6908.3 King Cole 01 working Antidote in USB at 1229. Several mentions of "advance units," Radio checks on HF," "Preplanned missions," "ATC," and "Ground Alerts." (Riddell-NY)

7421.5 NMG-USCG COMSTA New Orleans working W1M with radio checks on this and 6561, 6961, and 8630 in USB at 0300. (Maky-CA) *Nice intercept-LVH.*

7422.0 Spanish female 4-digit number station in AM at 0315. (Carl Pinsonat-Plaquemine, LA) *Hey neighbor, Laz le bon tempo roule-LVH.*

7425.0 Spanish female 4-digit number station in AM at 0200. (Weiskopf-IL) Same heard at 0432. (HR Dutcher-Brooklyn, NY) Same heard at 0426. (Ron Pratt-Oak Harbor, WI)

7535.0 Norfolk, VA SESEF working USS Iwo Jima regarding shift/spacing for RTTY test transmission from Iwo Jima in USB at 1735. (Rausch-NJ)

7954.0 MFA Ankara, Turkey, with 5 letter group message using FEC-A at 1836. (Robin Hood-UK)

8063.0 German female 'SB' with 3/2-digit number station in AM at 2330. Also heard 'WP' header at 0100. (Maky-CA)

8160.0 English female 3/2-digit number station in AM at 0230.(Weiskopf-IL)

8344.0 BBNI-m/v *Le Yu Quan* working Hong Kong Radio in CW at 2245. (Hood-UK)

8346.0 ULJX-Salvage Tug *Nastorozhennyy* working PCH-Scheveningen Radio in CW at 0742. (Robin Hood-UK)

8522.5 FFL2/4-St. Lys, France, with CW marker at 2322. (James Laughlan-Youngstown, NY)

8638.0 VNG-Llandillo, Australia, with time signals in AM at 1330. (Weiskopf-IL)

8645.5 VNP-Unid Station with CW CQ marker at 1102. (Jack Dix-Yonkers, NY) *Jack, VTP Vishakhapatnam Naval, India, is in this neighborhood; possible-LVH?*

8650.0 NMO-USCG Honolulu, HI, with CW marker at 0507. (Dettmann-IL)

8722.0 BVA-Taipei, Radio, Taiwan, with USB voice mirror at 2020. (Boender)

8831.0 Gander ATC, Canada, working TPA501 in USB at 1202 (with Shanwick checking). New NAT-F frequency. (Hood-UK)

8876.0 H0D working A2I/A6E/C5G/E1R/E9Y, etc with coded messages in USB at 0145. Green communications and some talk of assuming guards. (John Gomer-Sacramento, CA) *Probably Coast Guard, but could also be Navy-LVH.*

8900.0 Elite 142 calling Elite Operations for 3 minutes with no response in USB at 0441. (Vigeant-CA) *Anybody know who this is? New airline?-LVH*

8903.0 Kano ATC, Nigeria, working Sabena 525 in USB at 2253. (Hood-UK)

8906.0 Medang ATC, Papua New Guinea, working several aircraft in USB at 0745 using Pidgin English. (Rausch-NJ)

8967.0 Unid stations talking about leaving a crash site with three bodies on board. Wanted permission to fly bodies direct to the US because the natives in the mountains were hostile. The base was to get into touch with a Sergeant ?. Said would transfer bodies to Marine C-130 transport and fly direct to unknown location with ETA of 1400. Said to make other arrangements to contact the victims' wives. Then all back to normal. In USB at 0050. (Bill Pittman-Odessa, FL) *Hummm, this one is interesting; nothing in news and 14 hours flying time by a C-130 from some mountains. Anybody-LVH?* Noted Tinker AFB, OK, via phone patch passing Head Dancer weather traffic in USB at 1331. (Mark Janacek-Summit, NJ)

8980.0 Spanish female 4-digit number station in AM at 0510. (Jeffrey Jones-Tracy, CA)

9003.0 JYJ-Royal Jordanian Airlines LDOC Alia working unid aircraft at 2122 in USB. (Braun-DC)

9014.0 Frequency very active with bomber traffic during midday. Flight pairs of stations such as Tiger, Runner, Bulldog, etc with detailed tactical traffic involving their bomb loads (status, placement in their bays), bullseye reports, low level runs, 'bandit' reports, etc. Super 74 (female operator) popped up on frequency with Raymond 7 phone patch to Mudbug Control at 1700 in USB. (Haverlah-TX)

9015.8 Commercial fisherman talking about illegal fishing and close calls with the authorities in USB at 0300. (Jones-CA)

9017.0 Headliner working Hothouse & Vagrancy. Told to use Xray-904/5 primary in USB at 0358. (Jones-CA) Fire Camp calling SkyKing in USB at 0114. (Alan Vigeant-San Diego, CA)

9023.0 Blue Grass working Okie Sam in USB at 0134. (Robert Thomas-Bridgeport, CT)

9026.0 In LSB San Diego charter fishing boat to buddy in Gulf of Mexico. Worried about getting bait in Mexico. Said Mexicans have been less than kind to American charters in their waters. Gave rival charter boat freq of 5565.6, said don't use it to transmit or they will change it at 0025. (Jones-CA) *Wonder if they will change it now, hi-LVH.*

9040.0 German female 'DT' with 3/2-digit number station in AM at 1600. (Maky-CA)

9057.0 McClellan AFB GHFS, CA, working Reach 938 on a discrete frequency. Moved from 11176.0, then moved to 13211.0 for phone patch traffic in USB at 2100. (Haverlah-TX)

9233.0 German female 5-digit number station in AM at 0528. (Haverlah-TX)

9381.0 NRK-Navy Keflavik, Iceland, with fax satellite picture at 1750. (Boender-Neth)

9424.8 5ST-Antananarivo Air, Madagascar, with weather in Portguese for East Africa using 50 baud RTTY. (Robert Hall-Capetown, South Africa)

9450.0 German female 'DT' with 3/2-digit number station in AM at 1600. (Maky-CA)

9831.0 English female 3/3-digit number station in AM at 1644. Jerry Brookman-Kenai, Alaska) *Nice to see you return Jerry; hope to hear from you again real soon-LVH.*

10000.0 BPM-Xian, China, with time signals in AM at 0130. (Weiskopf-IL) LOL-Buenos Aires, Argentina, with AM time signals at 0811. (Vigeant-CA)

10004.5 4XZ-Haifa Naval, Israel, with V CW marker at 1950. (Hall-RSA)

10240.0 English female 5-digit number station in AM at 1731. (Fernandez-MA)

10670.0 RZA26-Radio Moscow SWBC feeder in USB at 1752. (Boender-Neth)

11020.0 RCB52-Radio Moscow SWBC feeder in USB at 1720. (Boender-Neth)

11179.0 PJX periodically being called by PEM?MP. European English accent, presume Europe. Heard before on this frequency in USB at 1759.(Haverlah-TX) *Gee, Jeff, a little early for Europe, I think. Very interesting-LVH.*

11191.0 Hersey working Commentator and Oscar 01 in USB with Alpha reports at 1355. (Riddell-NY)

11193.0 Weak female Russian in USB at 1349. (Riddell-NY)

11220.0 Strike Eagle 99 (Female Operator) working Andrews with brief phone patch to Strike Eagle Control in USB at 1945. Moved here from 11243.0 (Haverlah-TX)

11229.0 Tussy 66 calling Big Ranch at 1853 in USB. (Dettmann-IL)

11243.0 USAF GHFS Incirlik, Turkey, with coded messages in USB at 1945. (Boender-Neth) *Interesting intercept, Ary-LVH.*

11248.0 Golf calling Bravo and Oscar, but only working Oscar. They spent their time passing signal checks and looking for Bravo. This was the primary frequency. In USB at 2327. (Haverlah-TX)

11318.0 Syktyvkar VOLMET, Russia, in USB at 0700. Sverdlovsk VOLMET, Russia also at 0705. (Boender-Neth)

11354.0 Springbok LDOC Johannesburg, South Africa, working aircraft in USB at 0325. (Marcelo Toniolo Dos Anjos-Osasco, Brazil) *Welcome to the column, Marcelo; please check in often-LVH.*

11413.0 McClelland working Gunboat in USB moved to P-380. (Jones-CA)

12490.0 MMKJ8-Canmar Victory working Portishead with message using SITOR-A at 1550. (Robin Hood-UK)

12688.0 HPP-Panama Intelmar Radio, Panama, with CW query on traffic at 2345. (Laughlan-NY)

13038.0 KLC-Galveston Radio, TX with CW marker at 1622. (Dettmann-IL)

13155.0 SPO62-Szczecin radio, Poland, with USB voice mirror at 1325. (Boender-Neth)

13365.9 CSY46-Santa Maria Air, Azores, with 50 baud RTTY weather and aero traffic at 0600. (Hall-RSA)

13580.2 HMS19-KCNA Pyongyang, North Korea, with English 50 baud RTTY news at 0543. (Hall-RSA) *Given the current tensions between North/South might want to watch the KCNA frequencies for some interesting propaganda-LVH.*

13870.2 9UA-AFTN Bujumbura, Burundi, with RTTY 40 baud RY's and ID at 0625. (Hall-RSA)

14646.5 PI95TC-Staelduim, Netherlands, with 300 baud packet (per January 93 column) noted at 1621. (Robin Hood-UK)

14677,5 PI95TC-Staelduim, Netherlands, heard this frequency also with 300 baud packet traffic at 1911. (Robin Hood-UK)

14704.0 English female with 3/2-digits in AM at 1600, Spy? (Pratt-WI) *Yep, sure is a Spy Numbers broadcast-LVH.*

14996.0 RWM-Moscow, Russia, CIS with time signals in AM at 1645.(Weiskopf-IL)

15021.0 Cape Radio working Orion One in USB at 1636 talking about telemetry. (Haverlah-TX)

15048.0 Bangor, Worship, Rammer and other stations passing tactical data in alphanumeric form in USB at 2153. (Fernandez-MA)

15610.0 German female 'HK' with 3/2-digit number station in AM at 1600. (Maky-CA)

16065.0 Radio Free Europe SWBC feeder, Holzenkirchen, Germany using ISB at 1835. (Boender-Neth) *Get'em while you can; we are doing away with RFE-LVH.*

16630.0 SQHD-m/v *Leonid Teliga* working Stettin Radio in CW at 0845. (Hood-UK)

16734.5 FCMU-French Navy Vessel Meuse working HWN in CW at 0838. Regularly hear French Navy vessels using the ships CW calling sub-bands to pass traffic-a nuisance at times. (Robin Hood-UK) *Shame on them-LVH.*

16801.5 EMXD-m/v *Timofey Gornov* working Kaliningrad Radio using 100 bd RTTY (not usual 50 baud) at 1628. (Hood-UK)

17038.0 WNU-Slidell Radio with nessage traffic in CW at 2146. (Dettmann-IL)

17167.0 JCT-Chosi Radio, Japan, with CQ CW marker at 0316. (Warncke-CA)

17251.0 JDO(JBO?)-Tokyo Radio, Japan, "Test transmission...stand by for traffic list" in USB at 0030. (Gomer-CA) *JBO is the call, John-LVH.*

18063.0 Andrews and SAM 050 calling each other but not connecting in USB at 1633. Also noted WNFT417-NCS with Bell National Net at 1700 in USB. Moved net later to channel 58. (Haverlah-TX)

18351.0 KWS78-US Embassy Athens, Greece, QRA CW marker at 1212. (Hall-RSA)

19870.0 4UZ-UN Geneva, Switzerland, with SITOR-A ID at 1259. (Hall-RSA)

22263.0 BOAS-m/v *An Yue Jiang* working Guangzhou Radio in CW at 0820. (Hood-UK)

22362.0 ESIZ-Factory Trawler *Ilmen* working Kaliningrad radio using 100 baud RTTY at 1231 and UTSS-Factory Ship *Yarkiy Luch* also using 100 baud RTTY at 1714.0 (Hood-UK)

22371.0 UTSL-m/v *Ivan Kuchecherenko* working Odessa Radio using 100 baud RTTY at 1714. (Hood-UK)

22774.0 7TK51-Skikda Radio, Algeria, with USB phone patch traffic on Marine duplex channel #1227 at 1445. (Boender-Neth)

The Scanning Report

Bob Kay

Public Service

When was the last time that you actually sat down and "monitored" your local police and fire departments? I'm not talking about turning on your scanner radio when you hear emergency sirens. I'm referring to a serious listening session that is entirely devoted to monitoring your local public service frequencies.

Have you identified all of your local police and fire frequencies? Do you have your SWAT team frequencies? And what about those elusive fire ground frequencies? Can you hear the fire department after they arrive on the fire scene? If you don't have all the answers, here are a few public service monitoring tips that will help you to hear it all.

Individual frequency use within any band can be identified with your regional edition of *Police Call*. The service codes for police, fire and local government are provided in the "Consolidated Frequency List." Simply run your finger down the frequency listings and make your selections accordingly. As you do so, don't forget that local police have been monitored under the following service codes: Highway Maintenance (PH), Local Government (PL), Police (PP), Special Emergency (PS), and All Public Safety (PX).

Suppose for a moment that 154.726 MHz is your local police frequency. To find additional frequencies, search between 154.00 and 155.00. A few of the specific frequencies that may be active in this range are: 154.740, 154.755, 154.770, 154.785 and 154.800. You can apply this lesson to any frequency that is active in your area. For example, suppose that your local police were operating on 45.540. To find additional frequencies, search between 45.00 and 46.00 megahertz. Again, a few of the specific frequencies are 45.02, 45.06, 45.10, 45.14, 45.18.

Unknown frequencies can also be found by scanning the "gaps" between published frequencies. The technique is simple, but effective. Here's a list of sample UHF police frequencies: 453.3500, 453.400, 453.500, 453.550, 453.600, 453.650, 453.750. As you study the list, you'll notice that there's a five megahertz gap between 453.400 and 453.00. The next gap is between 453.650 and 453.750. The two "hidden" frequencies are 453.450 and 453.700. Obviously, there's no guarantee that you'll discover a new police or fire frequency. The hidden frequency may belong to a utility company or highway maintenance crew. On the other hand, you could discover a discrete SWAT team frequency.

Secret or non-published frequencies can also be captured with a good quality frequency counter. Connect the counter to your mobile scanning antenna and sit in the parking lot of your local police station. This method is especially effective during shift changes. Police officers will usually "check in" prior to departing the parking area.

Fire ground frequencies are well published and easy to obtain. However, the low power output of hand held transceivers makes them very difficult to monitor. The hand held radios that are used on fire scenes, are usually less than five watts—two watts seems to be the common choice. To hear these low powered signals, an outside antenna is mandatory. But don't fool yourself into believing that an outside antenna will always solve the problem. If the fire team is inside a metal building, or if there are other obstructions natural or man made, it may be physically impossible to hear the action.

Joining a scanning club is another way to discover frequencies and make new friends. Can't find an elusive frequency? Club members are more than willing to share frequency lists and to help you with equipment problems. Three popular scanning clubs are: Northeast Scanner Club, P.O. Box 62, Gibbstown, NJ 08027; All Ohio Scanning Club, 50 Villa Road, Springfield, Ohio 45503-1036; Bay Area Scanner Enthusiasts, 4718 Meridian Ave. #265, San Jose, CA.

Have you been neglecting your police and fire frequencies? Too busy fixing the house and performing other warm weather jobs?

If your local police are using an 800 megahertz trunked system, don't get discouraged. Trunked systems can be monitored. Here are a few guidelines to follow:

1. Lock out the "signaling channel" and/or data channel(s). It is important to remember, however, that signaling and data channels may change from day to day.

2. Deactivate the delay feature on your scanner radio. In a trunked system, the channel may change as soon as the user releases the microphone button. Use of the delay function will not allow your scanner to follow the conversation to the next channel.

3. Use two scanner radios, with lightning fast scan rates. At first, the action may seem confusing, but you'll quickly master the technique of listening to more than one scanner radio.

4. When using scanner radios with conventional scanning rates, you can force the radio to follow the action by repeatedly pressing the scan button. The first few words of the transmission may be lost, but the main body of the transmission will be heard.

Public service monitoring is the life blood of scanning. More people have been attracted to our ranks by the public service frequencies, than by any other aspect of the hobby. If you've been neglecting your police and fire frequencies, it's time to plan that serious listening session and to update your old files.

Treasure Hunt

Low volume on handheld scanners is a common complaint. The problem becomes especially frustrating when handheld radios are used in a vehicle. Road noise can make the audio nearly impossible to hear.

The folks at Naval Electronics have provided a solution to the problem — the HTS-2 Amplified Speaker. The HTS is a compact, professionally crafted extension speaker that will give you "base station" sound. The 1.5 watt internal amplifier provides distortion free audio through a 3.5" speaker.

The HTS-2 can be powered from your vehicle's 12 volt battery, or from internal "AA" batteries. It has an internal Nicad battery charger and an automatic shut-off feature that saves battery power when your scanner

radio is squelched. The HTS-2 can also be manually turned off and used as an ordinary extension speaker.

To win the HTS-2, simply answer the following clues:

1. Provide the phone number of Naval Electronics in Tampa, Florida.
2. What is the "Blue Dot" frequency?
3. What type of frequency is 151.505 MHz?
4. Your scanner radio's IF is 10.7 MHz; the image frequency will be 21.4 higher. True or False?
5. Provide a frequency within the six meter Ham band.

Another feature of the HTS-2 is the "tape trigger." It can be used to activate a tape recorder for unattended recordings of your favorite frequencies. Lastly, the HTS-2 contains an input level adjustment that can be fine tuned to match the input from your scanner radio.

Send your entries to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. Please observe the following rules: Fax entries and bulk mailings will not be accepted. Post cards are recommended and encouraged.

Frequency Exchange

Welcome to ***Groveland, California.*** An anonymous contributor has invited us to monitor the following frequencies:

35.70 Pine Mountain Reality
35.76 Henely's Construction
42.30 California Highway Patrol (CHP)
42.52 CHP
42.54 Tuolumne County Sheriff
48.20 Hetchy Power & Water
48.30 Hetchy Power & Water
151.655 Pine Mountain Reality
151.715 Pine Mountain Reality
154.625 J. West Propane
461.625 AAA Tow Trucks
461.70 Moore Brothers Trash Removal

Our second stop in ***California*** is the city of ***Santa Ana.*** The invitation is from Norm Anderson, and here are Norm's favorite frequencies:

45.14 Harbor boats
132.000 Blimps
148.825 Coast Guard
160.44 Sante Fe Railroad
151.16 Flood Control
151.235 Park Rangers
155.40 Life Flight Helo
162.635 FBI
165.285 ATF
165.3375 Coast Guard Tactical
417.200 Federal Protection Service
418.225 IRS
457.60 Carl's Drive-in
460.325 Police, Orange County
462.950 Paramedics

Our third ***California*** invitation is from "Mr. X." Our anonymous contributor lives in ***Palermo***, and routinely monitors the following:

35.12 Garbage Pickup
44.64 Lake Oroville Park Rangers
44.94 Lake Oroville Park Rangers
44.96 Lake Oroville Park Rangers
45.18 Sheriff
151.865 Viacom Cable TV
151.90 Gridley Trucking
151.98 Pacific Bell
153.065 Elam Logging Company
153.590 Gas & Electric
153.650 Gas & Electric
155.115 Gridley Police
155.28 Oroville Hospital
155.55 Sheriff Glen Co.
158.32 Elam Logging Co.
158.34 Pacific Bell
166.585 State Forest Fire Net
464.00 Oroville School Bus
469.00 Oroville School Bus
563.175 MedCom

Our final ***California*** destination is the home of Sheldon Perry. Sheldon lives near ***Stockton***, and here is his list:

154.920 Tracy Police Dept.
155.370 Tracy Police Dept.
155.610 Ripon Police Dept.
155.790 Ripon Police Dept.
453.325 San Joaquin Co. Jail
453.600 San Joaquin Co. Honor Farm
460.025 San Joaquin Co. Sheriff
460.075 Stockton Police
460.10 San Joaquin Co. Sheriff
460.125 San Joaquin Co. Sheriff
460.200 Stockton Police
460.225 San Joaquin Co. Sheriff
460.250 Stockton Police

In ***Amery, Wisconsin,*** a scanner buff named Roger West, has compiled a nationwide list of sky diving locations. Here's an example of Roger's twelve page list:

Alabama locations	Arizona locations	Connecticut locations
Albertville Airport	Avra Valley area	Cheshire area
Hatch Army Heliport	Buckeye Airport	Harwinton area
Gadsden Airport	Eloy Airport	Woodstock area

Jump planes usually operate on 122.750, 123.400, 123.450 and 123.500 MHz. The jump locations for your particular state are free. Send a #10 SASE to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. If you want the complete list, send $2.00 dollars with a #10 SASE to the same address.

From Wisconsin, we travel Southeast to the home of Thomas Bozak, Jr. Tom lives in ***Louisville, Kentucky,*** and he has invited us to enjoy a few of his favorite monitoring targets.

154.085	Elizabethtown Police
154.160	Pleasure Ridge Park Fire
154.445	Dispatch, Pleasure Ridge Fire
154.740	Jefferson County Police
154.830	Jefferson County Police, car to car
154.860	Jefferson County Police
155.070	Jefferson County Police, command channel
155.160	Commonwealth Ambulance
155.190	Saint Matthews Police
155.22	Sky Care Helicopter
155.28	Mercy Ambulance
462.95	Louisville City EMS

Our trip for this month ends with a visit to ***Bergen County, New Jersey.*** Robert Wales lives nearby and he wanted to share his favorite frequencies:

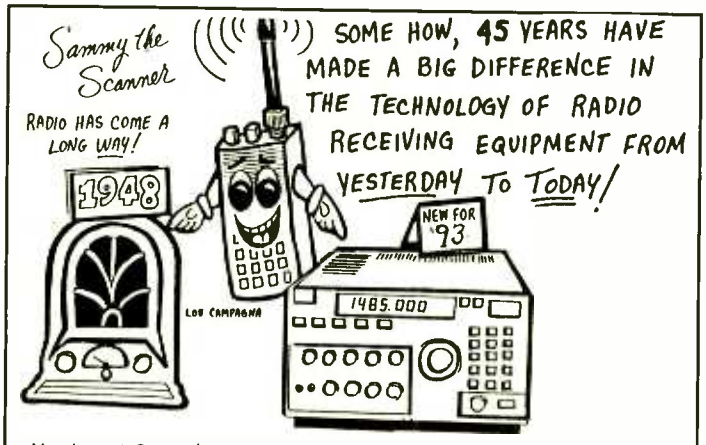
Bergen County	
33.86	Fire ground, N.E. & No central
153.785	Fire & Disaster EMS
477.2125	Special Assignments
472.7125	Sheriff Dispatch

Alpine City	
154.10	Police
154.16	Fire
155.13	Police
155.43	Police

Allendale City	
33.42	Fire
37.08	Police
37.10	Police

East Rutherford City	
154.16	Fire
154.28	Fire
155.73	Police
155.88	Police

Norwood City	
154.10	Police
154.16	Fire
154.265	Fire
154.28	Fire
155.43	Police



Northeast Scanning News, P.O. Box 62, Gibbstown, NJ 08027

Robert's complete list contains frequencies and CTSS tones for more than sixty New Jersey cities. I'll send you the twenty page list for $3.00 dollars and a #10 SASE. I'll also swap the list for twenty pages of your local frequencies. Send your lists/requests to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Upgrades

The Cumberland, Rhode Island, police department is planning to upgrade its communications system. According to the Police Chief, the department's radio communications suffer from extreme interference from other radio transmissions.

The chief admitted that he doesn't know when the new system would be on line, or how much it might cost. "If I could have had it yesterday, I would have been happy."

The exact type of upgrade that will be proposed, isn't clear. But one thing is certain; if the Chief is contemplating an 800 megahertz system, the multi million dollar price tag won't make him very happy. (News clipping from Raymond Scheicher.)

Cellular and Politics

A federal grand jury is investigating eavesdropping allegations in last year's North Carolina governor's race. An individual allegedly monitored former Republican Governor Jim Gardner's cellular phone calls.

This case suggests that political candidates and staff members monitored the cellular phone conversations of rival candidates. The information that was gained from the illegal eavesdropping was used to gain a "political edge" in the elections. (News clipping from C. F. Rinehardt, Jr.)

Digital Cellular

In the San Francisco Bay area, GTE Mobilnet will try to begin digital service in 1994. The folks at GTE face an agonizing choice — whether to adapt their digital standard so that everyone can use it.

As you know, digital cellular cannot be accessed with a conventional cellular phone. GTE claims that current subscribers will be able to use their existing cellular phones for several more years. The new digital technology will be phased in using both digital and analog transmissions side by side. New customers will be offered dual-mode phones, which can be used with either system. What GTE doesn't tell us, however, is the cost of the "dual-mode phones." The price tag is expected to be substantially higher than today's models.

Cellular Cancer

No doubt you've heard the reports, "Cellular phones cause cancer." Immediately following that news release, cellular stocks fell an average of two points.

Cellular companies nationwide claim that the lawsuit filed by a Florida family lacks merit. The lawsuit alleges that a woman developed a brain tumor by using a portable cellular phone. Supporters of the suit say that the radio signals emitted from handheld cellular phones are the same type used by microwave ovens.

While the experts examine the safety factor of cellular phones, here's something to think about. Portable cellular phones are limited to 1.5 watts. Ham radio operators routinely use handheld transmitters that pump out a full five watts of power. If there's evidence linking radio waves with cancer, ham radio buffs would seem to the logical place to start looking.

Next Month

The summer scanning action will be red hot!

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(*Excludes Cellular)

#CC-008 Heavy Duty Leather Carry Case **$27.99**

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BEARCAT BC100XLT	159.99	(7.00)
BEARCAT BC140	94.99	(7.00)
BEARCAT BC142XL	94.99	(7.00)
BEARCAT BC147XL	99.99	(7.00)
BEARCAT BC200XLT	279.99	(7.00)
BEARCAT BC205XLT	239.99	(8.00)
BEARCAT BC310A	85.99	(7.00)
BEARCAT BC330A	109.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC760XLT	269.99	(7.00)
BEARCAT BC800XLT	249.99	(8.00)
BEARCAT BC855XLT	186.99	(8.00)
BEARCAT BC950XLT	249.99	(7.00)
COBRA SR901	74.99	(6.00)
MIDLAND CB Radios	*In Stock*	
COBRA CB Radios	*In Stock*	
UNIDEN CB Radios	*In Stock*	
Two-Way Radio Batteries	*In Stock*	
Scanner Antennas	*In Stock*	
Power Supplies	*In Stock*	
RELM RH606B	414.99	(9.00)
RELM UC202 (2 or more)	129.99	(6.00)

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BCAD100	14.99	BP55	16.99
BCAD140	14.99	MA917	24.99
BCAD 580	16.99	MA518	14.99
BC003	7.99	ESP25	16.99
BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
UA502A	12.99	GRE9001	89.99
BP205/200	34.99	GRE 3001	62.99
BP70	16.99	FBE	5.99
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RELM RH-256NB HIGH BAND TWO-WAY RADIO

SPECIAL PACKAGE DEAL

$339.99

(Plus ($9.00 Shipping Each)

16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without retuning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2¾"Hx6½"Wx10¾"D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, ¼ wave body mount antenna, mobile mounting bracket and mobile power cord all for the low price of $339.99

UNIDEN BEARCAT BC-400XLT

$99.99 *($7.00 shipping)*

Our best selling mobile scanner. 16 channel, AC DC programmable, digital. AC DC cords, telescopic antenna, mobile mounting bracket, weather search, priority 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jack.

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100 Channel Digital Programmable Hand-Held Scanner

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Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

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Programmable, digital, AC/DC operation. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER

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SR-901

AVAILABLE ONLY FROM SCANNER WORLD

ONLY! **$74.99** Each

(Plus $6.00 Shipping Each)

$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty

(Optional mobile cigarette lighter cord #901MPC $4.99)

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Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous). 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9¼D x 4½"H x 12½"W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

UNIDEN BEARCAT BC-950 XLT

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Digital Programmable 100 Channel Scanner

BC-950 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16"Wx1-5/8"Hx7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only $34.99 plus a CTCSS tone board is available for only $59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #950 MPC $4.99.

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100 channel digital programmable mobile scanner, turbo scan up to 100 channels per second, lockout, priority, built-in automatic 2 second delay, dimmer control, back lighted keyboard, track tuning, direct programming of frequencies from front keyboard plus you can also program MR 8100 from your IBM compatible PC computer with software and cables included with scanner from Scanner World. Frequency coverage, 29-54 MHz, 118-174 MHz, 406-174 MHz, 406-512 MHz, 806-956 MHz. Dimensions: 7.9"W x 5.8"H x 1.9"D Earphone jack, BNC antenna jack, DC power cord, mobile mounting bracket, internal memory backup, bank scanning; 10 banks of 10 channels in any combination.

MODEL: FB-911 **ORIGINAL FIRE BOX PHONE**

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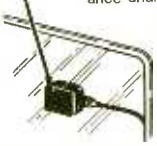
13 memory phone, 3 direct access emergency memories, auto redial, ringer on/off, top light flashes when telephone is ringing, tone/pulse switchable, desk/ wall mount, front door closes for authentic fire box appearance, FCC approved. Size: 16"Hx8½"Wx7"D.

GM-1™A GLASS MOUNT SCANNER ANTENNA

—ONLY AVAILABLE FROM SCANNER WORLD—



Frequency coverage 25-1200 MHz — only 22 inches tall. NEW REVISED DESIGN — no holes to drill — no glue needed. Complete with 17 foot cable, Motorola connector, and mounting hardware. Swivels to vertical position — performance unaffected by moisture on the window. Made in USA.

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GLASS MOUNT ANTENNAS FOR TRANSCEIVERS

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GM-27	27 MHz Low Band for CB	$39.99 ($4.00)
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GM-800	Cellular Telephone Band	$34.99 ($4.00)

ORDERING INFORMATION: Call (518) 436-9606 to place orders or mail orders to Scanner World, USA®, 10 New Scotland Ave., Albany, N.Y. 12208. Orders will be shipped within 24 hours by United Parcel Service if order is accompanied by MasterCard, Visa, cashier's check, money order, COD (COD shipped by United Parcel Service will be cash or money order only). (If a COD package is refused, customer will be billed for shipping and COD charges.) Mail orders with personal or business checks enclosed will be held 4 weeks for bank clearance. Prices, specifications, and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. Scanner World® warehouse in Albany, N.Y. We are not responsible for typographical errors. All merchandise carries full manufacturer's warranty. Bid proposals and purchase orders accepted from government agencies only. Free full line catalog mailed 4 times per year. Merchandise delivered in New York State add 7% sales tax. No returns accepted after 7 days of merchandise receipt. *Add ($) per item, and $3.50* for all accessories ordered at same time. COD orders will be charged an additional $4.95 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service to street address only. (No P.O. Box). Shipping charges are for continental USA only. All others ask for quote on shipping charge.

"Uncle Skip" Arey, WB2GHA

GEnie T.AREY1

Static Crashes, Grocery Shopping and Ninja Antennas

As the final remains of the spring thaw run down to the sea, and the static crashes of summer thunderstorms begin to clog the bands, it's time for DXers everywhere to come out of their winter shacks and greet the outside world once again. If you have opted for the American Dream of a single family dwelling, you are probably stumbling around in the garage trying to remember where you left the lawn mower.

Late spring is when we finally get around to doing all those outside tasks we meant to do in early spring. For the radio hobbyist, these tasks include antenna, feedline and outside ground connection maintenance. The Warrior Winds of Winter have no doubt done a job on all those wires that run outside of your listening post. This is also a good time to rethink your antenna strategies, perhaps even stringing up one or two new wires. After a bow to the Gods of Safety, we will press on into the land of antenna sustainment lore and legend.

Safety Stuff

Most of us are like bears coming out of hibernation when we attack outside work in the spring. We are often grumpy and a bit fuzzy headed from our long winter's nap. This often means we forget our abilities, and more importantly, our limits.

Antenna work almost always requires a certain amount of climbing and clamoring over precarious surfaces. For example, I have to ladder up onto a porch roof, pull up a second ladder to get to my main roof, and then climb over some terra cotta to get to my main antenna connections. Therefore, take some time to think about safety first.

Use sturdy, properly constructed ladders that are long enough to reach your antenna connections without forcing you to balance on the upper three steps. Do not use or move metal ladders in the area of power lines. Your antennas should never, never, never be strung in such a way that they might come in contact with your electrical service anyway.

Still, take care with swinging your ladder around. Don't try to move a ladder that is already extended. Chances are that the ladder's point of balance will be out of your reach. This has made for some great slapstick comedies, but has probably maimed or even killed a few folks along the way. Take the time to reduce the ladder to its minimum size before moving it. This is yet another way to assure that the ladder will not hit a power line, crash through a window or fall on someone's head.

Buy or borrow a tool belt. Climbing up a ladder to do work is hard enough without needing to fish through your pockets for a screwdriver or a pair of wire cutters. Plan to carry all the tools you are likely to need. This not only avoids extra trips up and down the ladder, it prevents you from trying to use the wrong tool for the job, a situation that can often damage connectors and brackets beyond repair.

You should never go climbing around, working up on a ladder without someone near by in case trouble happens. Since this person is likely to be on the ground, often right below you, they should wear a construction worker's hard-hat in case you drop something their way. Nothing is more likely to turn a significant other off to your hobby than getting hit on the head with a fumbled pair of pliers.

If you need to solder any connectors, do it at ground level. You may be trying to save some steps, but you just do not have enough control of a soldering iron or torch standing on a ladder. Hanging on to a roll of solder, a soldering iron, a connector, and a cable is usually a three handed process to begin with, so get your hard hatted friend on the ground to give you a hand.

Checking Out the World Around You

All the martial arts movies repeat the same refrain: "The Ninja is a master of the environment." You need to master a bit of Ninjitsu if you want to have a great antenna farm — no sword or black jammies or anything like that, though a Radio Japan head scarf might bring you good luck! You simply have to take some real time to look at the world around you. Great antenna locations are where you find them. Make yourself a map of your property. Note the location of trees and other high places that could serve an antenna run. Don't forget to mark the location of any power lines or other dangers in red. Measure the various distances and directions to get an idea of what the antenna possibilities might be. A comparison between your map and your existing antennas may be surprising.

Almost everyone starting out in the hobby has probably done the same thing: You are so excited to get into listening that you just string up a piece of wire and head for the headphones. That's okay; just about any length of wire will help you drag in the first fifty or so countries. But as your listening continues, you begin to come up against the limits of that first antenna.

Now that spring is here, you may want to rethink that first wire. Most beginners' first antenna projects can be improved upon by taking the aforementioned steps. At a minimum, your goal is to get the longest wire up as high and as safely possible. An inventory of your property will turn up a few ideas that should lead you down the pathway of antenna Ninjahood.

But, before we discuss new antenna construction, we should try to apply some Ninjitsu to existing antennas.

Antenna Renewal

Even if you are happy with your current antenna set-up, spring is the time to check out the condition of your existing system. You will still have to get out the ladder and the crash helmet for your assistant.

One of the most common causes of poor antenna performance is corrosion. Wherever two dissimilar metals come in contact with each other, the potential for corrosion exists, especially when coupled with moisture and environmental exposure. Any check of an existing antenna needs to begin at all those points where connections occur, from the feedline through to the ground stake. Obviously, corroded connections should be removed, the metal surfaces should be cleaned (fine grain sandpaper works best for this) and then reconnected or resoldered.

Once this is done you will want to make every effort to make all connection points as waterproof as possible. Moisture will lead to further corrosion. Make use of a commercial silicone sealant where your feedline attaches to the antenna, because moisture in a coaxial feedline will degrade its performance to the point of uselessness.

An often ignored environmental factor is sunlight. The ultraviolet radiation from routine exposure to the sun plays havoc with most plastics. This would include any plastics used as supports, insulators and even the jackets of

coaxial feedlines. The average life span of most plastics used in antenna construction is two years.

You can significantly improve the lifetime of coaxial feedlines by purchasing cable that is covered with an outer jacket designed to resist ultraviolet rays. Part numbers will end with the suffix A/U (e.g., RG58A/U). Of course, this cable is somewhat more expensive but the extended use should make up the difference in cost.

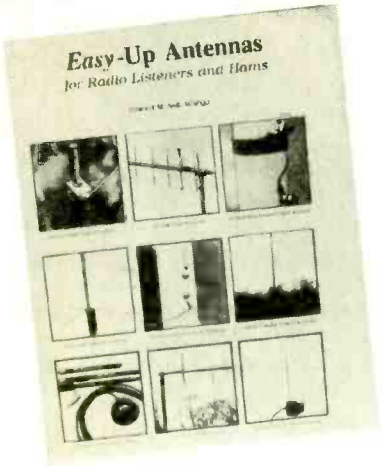
This brings us to a famous point of radio voodoo. If your antenna is constructed of uninsulated copper wire, is there any value in cleaning the patina (that green stuff that covers the copper when it's weathered) off of the antenna wire? Generally, no, it is not necessary to sand down your entire antenna. Concentrate your cleaning efforts where the antenna connects to the feedline. Any corrosion in this connection will be the most significant cause of poor antenna performance.

Actually, the slight coating of patina on the copper serves to protect the underlying copper surface against the ravages of pollution and acid rain. Still, I will get letters from long standing antenna sanders who swear by the process of cleaning the wire surface. If it makes you feel better, do it, just don't expect any miracles. If antenna wire corrosion really worries you, you can always hang insulated wire. Radio signals travel through the insulating jacket just fine. (Just like it does through the patina...see?!)

While you are cleaning and sealing all of your antenna's wire connections, you should also be taking a look at the antenna's supporting structures. Are any of the brackets, hooks, insulators or ropes showing signs of wear and tear? My caveats concerning ultraviolet radiation also apply to the nylon rope most often used to string antennas. Failure of a bracket or a supporting line in the dead of winter will put your antenna out of commission during the peak DX season. Repair and replace all worn supports now so you don't find yourself trying to do the job with ice on your wings next December.

Most outside ground wires are made of #8 gauge aluminum wire. This is fairly soft stuff and it can suffer the ravages of time brought about by continuous flexing and vibration. In fact, the only wire failure I have ever experienced in any antenna system I have used has been the ground wire. Take time to inspect your ground wire from end to end to assure that there are no weak spots that could break in the next few months. The ground wire is an important safety feature of your station. While you are checking your ground wire, go all the way to its connection at the ground stake. Clean and resecure this connection, ensuring that it is free from corrosion.

If your antenna runs near any trees or bushes, it is possible that some branches have grown to the point of contacting the antenna. It is time to break out the pruning hooks and cut these branches back. A tree branch slapping against your antenna cannot only generate noise, it can cause stress on the antenna system that may cause it to break along the wire or at one of the supports. You would be surprised at the damage even a small branch can create through repetitive contact.



Ed Noll's book on antennas is great for those summer rebuilding projects.

New Antenna Notions

Consumer advocates are always advising folks to go grocery shopping on a full stomach. If you're hungry you're likely to buy too much. This idea also applies to the radio hobby. Do your antenna work in the off season; you will put more care and consideration into the project.

Now that you have spruced up your existing antennas and have mastered the layout of your property, you may want to hang some new wire. Now is the time! Do it this summer so you won't be wishing for it this winter. If you are, or want to become, a confirmed antenna experimenter I strongly recommend the book *Easy-Up Antennas for Radio Listeners and Hams* by Ed Noll, W3FQJ, $16.95, MFJ Publishing. This book is available from many of the suppliers found in *MT* or directly from MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (include $3.00 shipping and handling). Ed's book will turn any beginner into an expert with one read-through. Furthermore, the antenna designs discussed in this book are practical. Ed recognizes that many of us do not have unlimited resources and real estate.

As the warm winds of summer waft across the yard, as the static crashes begin to blot out great DXing, as your significant other begins to find half a hundred chores for you to do, take some quality time with your antenna system. The dividends will be paid in full next winter.

Steve Douglass

Hybrid Scanning

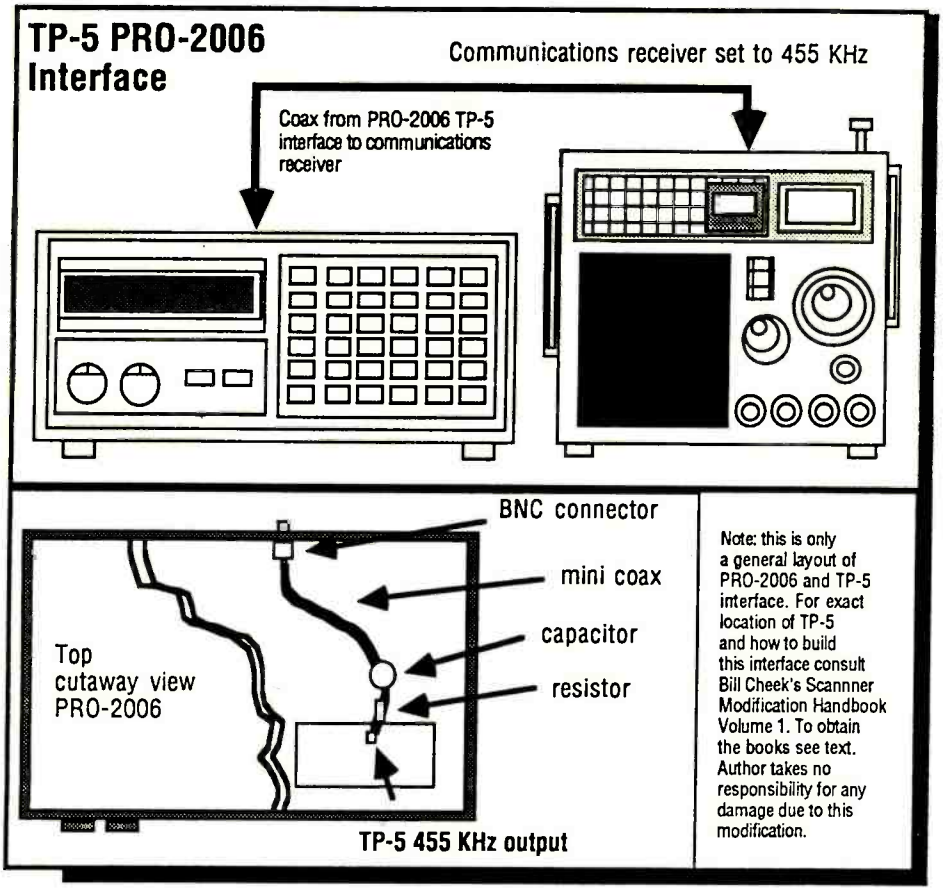
There is probably not a monitoring hobbyist out there who hasn't drooled over the mega-frequency dream machines offered up as the ultimate in radio technology by electronics catalogs. Some can even afford to buy those $5,000 wonder radios. But, if you are like most of us, what you can spend on monitoring equipment usually takes a back seat to paying the monthly bills. Still, most of us manage to do pretty good with our limited budgets and have some respectable receiving equipment.

Still, wouldn't it be nice to have a receiver that has the best features found on high dollar communications equipment — one that incorporates the best features of VHF/UHF scanners with HF communications receivers? Maybe you already do. If you own a Realistic® PRO-2004, 2005, 2006 and an HF receiver and like to tinker, then you are in luck. Read on.

The PRO-2004 (2004-6) series of scanners has become the standard by which other scanners will be measured for some time. With wide frequency coverage (25-520, 760-1300 MHz) and 400 channel capacity, these scanners became an instant hit.

A few intrepid scanner owners (who had a little electronics know-how) couldn't resist opening up these gems and taking a look inside to see what made them tick. Not until such electronic wizards started poking around inside these scanners did anyone understand the full potential of the Realistic® receivers. Suddenly, everyone realized that with a few snips here and a little soldering there these scanners could be enhanced in many ways. With just the clip of a diode, the deleted cellular frequencies could be restored, and by adding a chip the memory capacity could be drastically enlarged to over 6,000 channels! Other modifications include speeding up the scan rate, adding a signal strength meter and automatic search and store modules.

One of the pioneers in modifying the PRO-2004/2005/2006 scanners is *Monitoring Times* columnist Bill Cheek. Bill has written two books on the subject and they are a necessity for anyone wanting to modify their scanners. The books, *Scanner Modification Handbook Vol. 1 and Vol. 2*, are available through CRB Research Books, P.O. Box 56, Commack, NY 11725; Grove Enterprises, P.O. Box 98, Brasstown, NC 28902; and other *MT* advertisers.



If you really want to enhance the capabilities of your scanner, there is one simple modification in Bill's books that you should check out. It doesn't take a lot of electrical know-how, or any expensive parts. The whole modification takes less than an hour and can be done with only a screwdriver, drill and a soldering iron. With this simple modification you can add a signal strength meter, narrow/wide bandwidth control, upper and lower sideband modes, RF gain control, tone control and even a timer for automatic recorder activation. All this by doing a little soldering? Well, sort of. What you will actually be doing is interfacing your scanner with your communications receiver.

Out of respect for Bill Cheek, I won't give away his communications receiver interface modification secret here, but I suggest if you own a 2004/2005/2006, you invest in the books. I *will* describe how it works, though.

Test Port 5

Inside the Realistic® scanners is a little circuit known as TP-5 for *Test Port 5*. The circuit is used at the factory to test the scanner's electronic circuitry. TP-5 has a frequency output of 455 kHz. You can take advantage of this fact and use it to interface your scanner with a communications receiver capable of tuning to 455 kHz. All one has to do is solder on a resistor, a capacitor and some mini coax to TP-5 to access this 455 kHz output.

The mini coax is then connected to a BNC connector which you can mount on the back of the scanner. In this way you can connect or unconnect the interface at any time. Then all you have to do to access TP-5's output is to use a short length of coax (with the appropriate connectors at each end) and connect them between the scanner and the communications receiver's antenna input. Tune the scanner to 455 kHz to monitor the scanner through the communications receiver and take advantage of all the receiver's special functions.

SSB and FLTSATCOM

One of the best reasons for interfacing your scanner with a communications receiver is for the SSB capabilities. Why would one want SSB modes when most of the communications above 30 MHz are either in AM or NBFM modes? One reason is that hunting those elusive Navy FLTSATCOM communications satellites is much easier in the sideband mode.

By patching the scanner through a communications receiver in sideband mode, the FLTSATCOM birds can be found rather easily. All one has to do is set the scanner to search through the FLTSATCOM frequencies (240 MHz

through 270 MHz) in the AM USB mode. The FLTSATCOM satellites transmit homing beacons and data in the USB mode on many frequencies.

When searching through the frequencies, listen to the scanner as it is patched through the communications receiver (with the scanner's volume turned down). You'll soon hear the little "pips" or beeps as these beacons are found.

When a *pip* is heard, stop the search and adjust the gain on the receiver so the signal strength meter is not peaked out (if it is a strong signal) and set it to a certain signal strength reading. Using a directional beam or helical antenna (in conjunction with a rotator), it is then easy to aim the antenna (while watching the S-meter) to find the strongest signal reading. By watching the signal strength rise and fall you can position the location of the FLTSATCOM. I tried this myself and was able to zero in on all the FLTSATCOM satellites (and a few unidentified satellites) all in a couple of hours.

HF Scanner

Another great thing you can do with this set up is to turn your PRO-2004-6 into an HF military scanner. How can you program a scanner to scan through the HF bands? All you have to do is purchase a Grove Enterprises' CVR1 Shortwave Scanverter ($39.95). The CVR1 module converts the 4 to 22 MHz shortwave bands so they can be received on the scanner's VHF air band frequencies (118 to 135 MHz). Using the conversion chart, you can then enter the HF frequencies of your choice and scan them. Patching the signal through the communications receiver gives you the ability to listen to upper side band. Although the scanner will not be as sensitive as a good shortwave receiver, strong local military or utility (and hams) will come through loud and clear.

So, as you can see, there are a lot of advantages to making this modification. With this simple interface, the capabilities of your PRO-2004/2005/2006 will approach those of the expensive dream machines, and you didn't have to shell out mega bucks to get it.

Mailbag

Military Map Source

Most monitors are well aware how aeronautical charts can add to the knowledge and enjoyment of military monitoring.

Now there is a new source for those hard to find charts and maps. Aerial Development of New England introduces their new line of U.S. military aeronautical publications and charts. Monitoring enthusiasts will find complete up-to-date listings of HF, VHF and UHF frequencies for all military and civilian airfields. A wealth of other information and frequencies are available for control towers, control centers, low level bombing ranges, air refueling tracks and much more. Free product listings are available by mail or telephone. Contact Aerial Development of New England, P.O. Box 661-MT, Bangor, ME 04402-0661 or call 207-945-3961.

Fed File Freebie

There have been many changes in the U.S. military in recent months. The changes are also evident on the HF bands and in the way the military communicates. The Fed File editor has compiled a new list of the top 150 military shortwave frequencies that you can have at no cost by sending an SASE to Fed File Freebie, 6303 Cornell, Amarillo, TX 79109. Included in the list are the most active US Air Force, US Navy and the new *Global* frequency listings. Remember, only those sending an SASE get the list. This is a limited time offer, so act promptly.

Spy Business As Usual

From Great Britain and Gilbert Cerf comes this bit of information. It seems even with the end of the Cold War the spying game continues. According to a news clip Gilbert sent in, Russia and Cuba have signed an agreement allowing Russia to continue operating an ex-Soviet electronic intelligence gathering facility in Cuba. The clipping from an unknown magazine says:

"The two sides confirmed their reciprocal interests in the existence of the Russian radio-electronic center on Cuban territory. This was in reference to the listening post at Lourdes, near Havana, the largest such base outside the ex-Soviet Union. More than 2,000 intelligence specialists are believed to man the site, designed to monitor communications to and from the United States. Russia's deputy prime minister, Alexander Shohkin, who signed the agreement, revealed that in return for the use of the station Russia would supply Cuba with components for arms already bought by Cuba..."

And Congress is worried about hobbyists monitoring cellular phones!

MT

James R. Hay

Private Ship-Shore and Intership Frequencies

and some other things, too ...

In both Canada and the United States Single Side Band frequencies are set aside for "private" use. This refers to communications such as those between ships and their operating company, or between ships with the same company. Table 1 lists these upper sideband frequencies showing their uses in both Canada and the United States.

The frequencies in Table 1 can provide some interesting listening since they involve communications relating to the actual business in which the ships are engaged. You probably won't be hearing anyone calling home, but you can hear about operational problems and may learn where the ships are. When you find some interesting stations on these frequencies, let me know so that they can be shared with other readers. This month's feature story on "Listening to the Lakers" will give you an idea of the communications you can expect to hear.

The Maritime Mobile World Administrative Radio Conference which was held back in 1987 changed many of the frequencies used on the HF maritime bands effective July 1, 1991. The changes are not simply limited to converting old frequencies to new. Many stations have reevaluated their needs and have dropped or added frequencies where they saw the need. Conversion is an expensive process and stations try to save money where they can. On the other hand, they also add frequencies where needed while they are doing the necessary overhaul on their transmitters and receivers.

Table 1: Designated Use

Freq. kHz USB	USA	Canada
2065.0	Not Used	Ship-Shore East Coast and St. Lawrence River East of Montreal
2079.0	Not Used	Ship-Shore Great Lakes and St. Lawrence River West of Montreal
2082.5	*1. Intership safety (not Great Lakes)	Intership
2088.0	+Ship-shore Mississippi River	Not Used
2093.0	Intership Commercial Fishing (Not Great Lakes)	Commercial East and West Coasts. St. Lawrence River East of Montreal.
2096.5	Ship-shore Not Great Lakes	Not used
2100.0	Government	Government
2103.5	Government	Government

*Secondary use is commercial operational communications providing that it does not interfere with the primary use of the frequency.
+Secondary use on East, West and Gulf Coasts subject to non-interference to primary use. Not available on the Great Lakes.

Of the SSB distress and calling frequencies, 2182 and 4125 kHz did not change. However, the others changed as follows (kHz SSB):

Was 6215.5	*Now* 6215.0
Was 8257.0	*Now* 8291.0
Was 12892.0	*Now* 12290.0
Was 16522.0	*Now* 16420.0

It is useful to note that the ones which are changing are the less important frequencies. In the 6 MHz and higher bands, the distress frequency is not as critical due to the fact that ships are usually monitoring a coast station. This means that if something happens, the radio is already tuned to a station which can hear them. This makes it more efficient to obtain assistance when it is

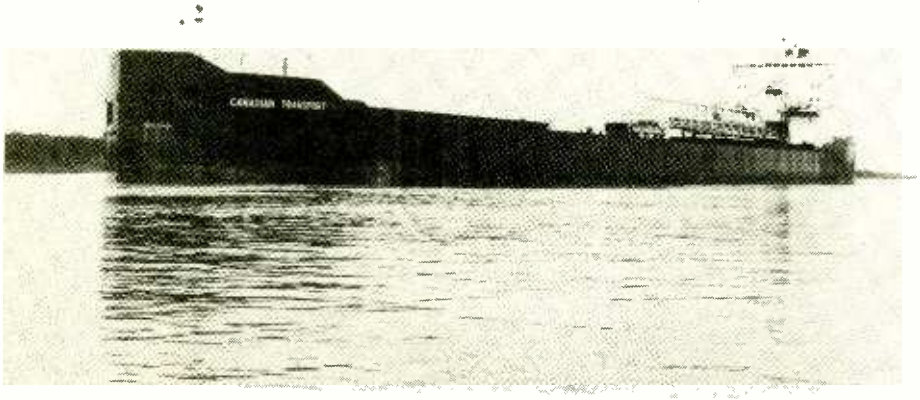
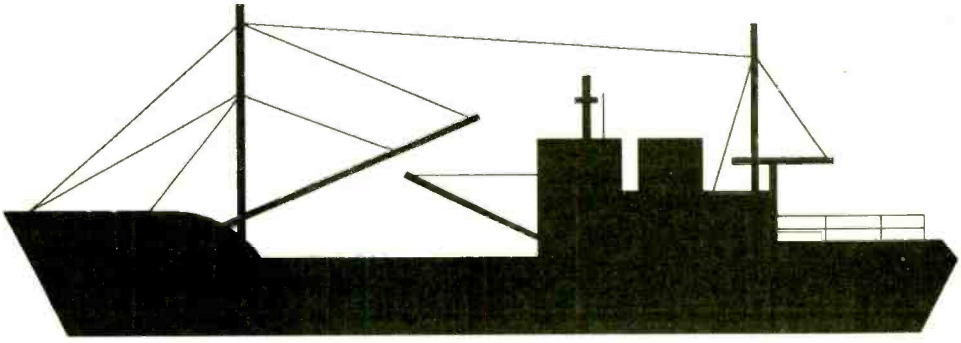


Photo courtesy Freshwater Press, Inc.

needed, and it is more likely that the station which responds to a distress call on HF radiotelephone will be one which can best give assistance.

In future columns, I will try to return to some more listings of new frequencies in the various modes — including FAX and RTTY. With the plethora of computer software and controllers out there, these modes are becoming more popular to monitor.



Department Stores on VHF?

An interesting item turned up in the March 1993 Scanning Column of the Canadian International DX Club's *Messenger*. In his column, Phillip Boucher reports the following information.

"An unconfirmed report by a fellow monitor indicates that several large department stores are using VHF Marine handheld transceivers for in-store communications. When shopping at a store one day, he noticed the staff walking around, each one with a VHF handheld in their pocket. While checking out at one store, he observed the marine handheld on the reception desk and he went over to take a look at it. The unit was set on Marine channel 13 (156.650 MHz), and it is a good bet that most other stores are using channel 13 as well.

"This low cost and convenient communications system, though totally illegal and subject to all sorts of fines and charges in the Radiocommunications Act, is a new monitoring catch for us. Set up your scanner and monitor channel 13. Until they are caught, we can be sure of hearing heavy duty stuff such as 'Where's the forklift?', and 'Price check on...'"

It seems likely that if this type of activity is happening in Canada, then it is probably happening in the United States as well. My thanks to CIDX for permission to reprint this excerpt.

As you are reading this, the St. Lawrence Seaway has re-opened and shipping has resumed on the Great Lakes. For those of you who are living around the Great Lakes, scanners should begin to become more active on 156.800, 156.3, 156.6, 156.65, 156.7 MHz, as well as the various other frequencies. Give them a listen and see what you hear.

Water Logged

Although many of you send your maritime loggings in to the utility column, it has been suggested that this column carry some loggings dedicated to marine monitoring. Let's do it!

If you hear an interesting station, send it in so that it can be shared with other readers. Let's make your loggings a regular department of the High Seas column.

As always, I am happy to answer questions in the column. My philosophy is that every letter I receive represents several other people interested in the same question, so I give priority to your input when deciding what to include in each column. In any event, folks, keep those cards and letters coming, and good listening until next time.

MT

Kevin Carey, WB2QMY

A Look Back

As another DX season comes to a close, it seems like a good time to reflect on how the longwaves have changed over the years, and explore some of the new things that are happening on the band.

In terms of active stations, there have certainly been some significant shake-ups. For instance, many of the FAA high power weather beacons are now silent. If you've been on the band for a while, perhaps you remember some of the formerly active stations.

One noteworthy example was **ELM** (Elmira, NY) on 375 kHz. Its signal was regularly reported throughout the northeastern U.S. When ELM was decommissioned in 1990, a new non-voice beacon took to the air from Elmira this time with an ID of **ALP** (245 kHz), which remains in service at this writing.

A few currently active voice stations to try for are **TUK** (194 kHz) Nantucket, MA; **GNI** (236 kHz) Grand Isle, LA; **LQ** (382 kHz) Boston, MA; and **ILT** (247 kHz) Albuquerque, NM.

Several coastal stations have also pulled the big switch. This is due, in part, to the increased use of satellites and RTTY over CW. One memorable coastal station was **WMH** in Baltimore, MD. It began operation way back in 1927, but in the late '80s it was shut down and the remaining two employees were given jobs at the State Highway Administration. Old timers tell me that WMH operators had just about the best sending "fists" in the business.

You can still hear a fair amount of CW on the upper end of the band. Try listening in the evenings from 405 to 515 kHz. If you're lucky, you may even hear some hand-sent code. It's good to know that some things are still done the old fashioned wav.

A heavy (but not really unexpected) blow came to CW earlier this year, when the US Coast Guard announced plans to halt operations on the international distress and calling frequency — 500 kHz. The order will take effect this August. It was felt that there are many other suitable modes and channels available to mariners for distress and calling purposes.

Not all of the news is bad. There are also some exciting things happening on the band that reflect the technology of the '90s. Consider GWEN, the Ground Wave Emergency Network. Its signals can be heard as raspy bursts of noise from about 150 to 175 kHz. (Often, they are mistaken for random static.) They are actually packet-like data signals from scattered Air Force sites, and could be used to maintain data communication in times of war.

Even navigation beacons are being updated for a new technology. Several maritime beacons have been retrofitted with equipment for sending correction signals to users of the Global Positioning System (GPS). This doesn't affect a beacon's role in traditional direction finding, but you might be able to hear a slight warble on the ID tone. The warble transmits important data that can be used by a properly equipped receiver to minimize GPS error.

LF Tip of the Month

When using a receiver equipped with an internal ferrite rod antenna, be sure to orient the set for best reception. These antennas are highly directional.

Recently, the Coast Guard has been upgrading the correction signals from 50 bits-per-second (BPS) to 100 BPS. The change-over process can take up to two days, and during that time the beacon is taken off the air. When all the bugs have been worked out of this system, I expect many inland beacons will also be equipped for GPS support.

Another positive change is the high level of activity on the unlicensed (yet legal) "lowfer" band from 160 to 190 kHz. Once limited to a handful of hardy experimenters, the band has come alive with over 40 active stations in the U.S. There's also growing interest in Canada.

Finally, over the past few years there have been big improvements in receiving gear. It used to be hard to find a decent receiver with an LF position on the bandswitch. Now, almost any shortwave receiver provides at least some basement band coverage. Even stock ham transceivers now come equipped for LF reception.

Clearly, the longwaves are, and will continue to be, an important part of the radio spectrum. The propagation stability, military applications, and endless opportunities for experimentation make it quite unique compared to any other band.

Longwave devotee Mark Buskirk and "DX Hound", Alex. (Cumberland, MD)

Beacon Loggings

Freq	ID	Location	By
24	NAA	Cutler, ME	T.K.
28.5	NAU	Puerto Rico	T.K.
60	WWVB	Boulder. CO	T.K.
* 175	KRY	Chardon, OH	P.C.
* 185.6	JPH	Riverdale, MD	J.M.
* 188	GSR	Frederick, MD	P.C.
* 189.4	TH	Colt's Neck, NJ	P.C.
+ 194	TUK	Nantucket, MA	M.C.
208	SSN	Romulus, NY	M.C.
+ 236	GNI	Grand Isle, LA	B.C.
263	YGK	Kingston, ONT	Mac.
281	HP	White Plains, NY	M.C.
331	LAN	El Salvador	B.C.
350	RG	Oklahoma City, OK	P.C.
359	TPX	Tepexpan, MEX	B.C.
372	CQD	Erie, PA	M.C.
375	DW	Tulsa, OK	B.C.
396	ZBB	Bahamas	B.C.

*Experimental 1 Watt "Lowfer" station
+Includes WX voice

Loggings

We always welcome your intercepts at "Below 500 kHz." Remember, your routine catch may be another listener's rare DX, so be sure to let us know what you're hearing — both at home and on the road. This month's list is from: Perry Crabill (VA), Bob Combs (NM), Terry Krey (TX), Mike Csontos (NY) and Joe Mikuckis (MD)

End Notes

Every now and then, I hear from readers who would like to see some sort of certificate for logging beacons from, say, five States/Provinces, or for catches beyond a certain distance. This might be a fun way to sharpen DXing skills and promote some good-natured competition in the hobby. If there's enough interest, I'd be glad to put together such an award.

To do this, I'll need your ideas. What should the criteria be for an award? Should there be more than one category? How about "endorsement" stickers for additional DX catches? What should the certificate be called? Send your ideas to me c/o *Monitoring Times* or via CompuServe (71064,1507).

The warmer weather is finally here, and it's a great time to enjoy your favorite flea market, compare notes with fellow DXers, and make those antenna repairs you've been wanting to do. I'll see you again next month with more tips for enjoying the world below 500 kHz!

MT

uniden and GROVE

introduce the ALL-NEW BC2500XLT and BC890XLT!

The BC2500XLT features specifications like:

- 20 memory banks
- Wide frequency coverage from 25-512, 760-1300 MHz (less cellular)
- Sensitivity: NFM 1.0uV from 25-550MHz, NFM 1.5uV from 760-1100MHz, NFM 3.0uV from 1100-1300MHz, AM 1.0uV from 26-550MHz, and WFM 3.0uV from 54-550MHz.
- Scan Rate: 100 channels/second (turbo), 20 channels/second (normal)
- Scan delay: 2 seconds
- Audio output: 400 milliwatts
- Size: 2-3/4" (W) x 1-1/4" (D) x 7-1/2: (H)
- Weight: 1lb 4oz.
- Power requirements: 12VDC (internal battery, AC adaptor/ charger, or cigarette lighter adaptor).

The BC890XLT features specifications like:

- 10 memory banks
- Frequency coverage: 29-54, 108-174, 216-512, and 806-956 MHz (less cellular)
- Sensitivity: NFM 1.0uV from 25-550MHz, NFM 1.5uV from 760-956MHz, AM 1.0uV from 25-550MHz, and AM 1.5uV from 760-956MHz
- Scan rate: more than 100 channels/second (Turbo mode) and up to 20 channels/second (Normal mode)
- Scan delay: 2 seconds
- Audio output: 3 watts max.
- Size: 5-1/5" (W) x 6-15/16" (D) x 1-5/8" (H)
- Weight: 1lb. 11oz.

Uniden has done it again! This low cost mobile **BC890XLT** scanner offers wide frequency coverage (including military aircraft!), 200 memory channels, and 100 channel-per-second TurboScan! The **BC2500XLT** handheld goes even further with 400 memory channels, a wider frequency range, and it Turbo-scans at 100 channels per second! Both scanners include instant NOAA weather channel access, a high contrast LCD, and much, much more!

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Brasstown, NC 28902
(704) 837-7081 (tech help)
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DISCOVER

Karl Zuk

What's TIS?

Just like the Energizer bunny, they just keep going, and going, and going! Their programs don't usually last longer than two minutes, yet millions of people tune in every day. What's TIS? Travelers Information Stations broadcasting on AM radio nationwide!

TIS stations continually deliver useful information to their listeners. They will inform you about traffic and road conditions, detour directions, availability of lodging, and locations of rest stops, service stations, and local points of interest. Listen for them along highways, in airports, at national forests and seashores, and just about anywhere you may go.

Only three things make these stations differ from conventional broadcasters: they are prohibited from airing commercials or music; they must be owned by a governmental agency; and they can operate with no more than ten watts. There are exceptions to these rules, but most stations operate within these standards.

Managers of TIS stations have discovered many clever applications for their broadcasts. The Oregon State Marine Board should be awarded for their originality. At the mouth of the Columbia River, they operate a station on 1610 kHz known as Fishing Radio. Anglers learn everything they need to know about fishing in this area when they tune in. Recorded announcements are updated daily revealing what kind of fish are biting and where you can catch them, boating facts, tips and how-tos, and even a daily fishing joke! Fishing Radio has been heard as far away as Medicine Hat, Alberta, 645 miles to the northeast. Not bad for ten watts!

Another novel station operates from a fireboat on display at the mouth of Commencement Bay in Tacoma, Washington. The local fire department uses the ship as a transmitter site to rebroadcast NOAA weather radio forecasts usually heard on a VHF marine frequency. The fireboat's hull is put to use as the station's ground system, creating an amazingly robust signal. "What a signal!" cheers TIS expert Bill Baker. "The thing is 30,000 tons of 1935 age steel."

Bill has installed dozens of TIS stations all over the country for Information Station Specialists, a company devoted to this niche of broadcasting. "We began out of the broadcasting industry back in Davenport, Iowa, in the early 80s. A lot of companies were making this gear, but no one was really servicing the buyer. They needed leg people to install it and maintain it. So, we set up a test system in Illinois to teach the trade to ourselves, and went on to become a vendor later."

Their company has blossomed. Information Station Specialists now installs most of the TIS stations you'll hear throughout North America, and also operates The National Travelers Information Radio Exchange (NTIRE), providing services to TIS operators similar to the support commercial broadcasters enjoy from the NAB. NTIRE informs member stations of FCC rule changes and current interpretations of regulations, guides new broadcasters through licensing procedures, and provides installation and maintenance advice.

Local AAA clubs receive information about TIS stations from NTIRE to encourage their members to listen in. NTIRE also publishes a bimonthly newsletter and a directory of all TIS stations across the country. Anyone interested in TIS broadcasting is encouraged to join! Just write to: NTIRE, P.O. Box 51, Zeeland, Michigan 49464.

NTIRE provides a free message recording service to member stations who want to polish their broadcasts with professional announcers. But sometimes TIS operators prefer the sound of the not-so-professional. A small network of stations in the Baltimore area guides baseball fans to the new Camden Yards Stadium. You'll hear the familiar voices of the stars of the Orioles guide you along highways to parking lots close to the game. Their comedic delivery is a treat for any fan of baseball or radio.

TIS is the product of high technology. "The development of the digital voice recorder is what has made this industry take off," says Bill. His company offers a multi-channel voice storage system, called the AP55 Digital Voice Recorder, that stores up to 250 messages in a box about the size of a small home stereo. Voices can be recorded into the unit from a microphone, prerecorded cassette tapes, or remotely by telephone. Each segment can be recalled and aired in any order you design over the period of seven days.

"Also, the work ham operators have done with ground planes has inspired our people to do the same. We are patenting a tiny ground plane that works with just a fraction of a percentage point of an acre of copper. This has made it possible for people to put stations on roofs, in yards, and in right-of-ways of streets and such."

ISS' AP55 Digital Voice Recorder.

An antenna system mounted atop a toll booth sends WNYF 574's signal over 20 miles from the Tappan Zee bridge.

A typical installation requires a loaded whip antenna, a ground plane, and a small transmitter outdoors connected to a digital voice recorder inside an adjacent building. Stations operating on 530 kHz require a 25 foot vertical, and top end stations on 1610 kHz use a shorter 15 foot vertical.

Antennas can be mounted almost anywhere. Utility poles and rooftops are favorite sites. To the untrained eye, they resemble vertical antennas used for two-way communications. A complete station kit can be purchased for $4500, not including installation.

Hundreds of 20 foot radials, fanning out horizontally from the base of the vertical antenna, create the ground for a TIS station. "It looks like a big skirt. The ground plane is designed so it is flexible. You can bend it around the base of a pole. It can be fanned out in a 360 degree circle, or 270 or 180 degrees around, so people can put it in just about any possible configuration." When installing stations on rooftops, a wood framework is built, and the ground plane is stapled to the structure creating a counterpoise system.

Often, existing masses of metal can substitute for a prefabricated ground skirt. WNYF 574 at The Tappan Zee Bridge in Tarrytown, New York, uses the canopy of a toll booth for its ground system. Completely portable stations can become operational anywhere in seconds. You'll often find them at temporary roadside construction sites or in disaster areas. A small trailer will house the transmitter and digital voice recorder inside a watertight utility box. The frame of the trailer becomes the ground, and a small vertical

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

with a large loading coil acts as the radiator. A large sign advises passersby where to tune in. Powered by a small gasoline generator, it's a radio station ready to roll!

The technology behind TIS stations is improving rapidly. Most stations continue to operate on two frequencies on the edges of the AM broadcast band: 530 and 1610 kHz. A new FCC ruling now allows these stations to move into the regular AM band and intermingle with commercial broadcasters. TIS stations are now often mistaken for sophisticated local broadcasters. Municipalities have been known to even air local community board meetings and election results over TIS stations.

When large areas require TIS service, several transmitters can be linked to create a small radio network. The New York State Thruway Authority has installed three stations along the Tappan Zee Corridor, synchronized together with ultrastable crystals. All three transmitters are fed by a single audio recorder via telephone lines. When the correct combination of telephone touch-tones are aired on the network, bright yellow lights will flash around road signs alerting passing vehicles to tune in for important traffic alerts. Look carefully at the tops of these large blue signs, and you'll see a whip antenna that feeds a special receiver mounted behind the sign that automatically activates the flashing lights!

TIS stations might be the greatest DX challenge broadcast band DXers ever encounter! To log a station operating with ten watts over hundreds of miles brings great satisfaction. And TIS stations continually identify themselves — you don't have to listen to an entire Larry King Show to hear an ID! A couple of telephone calls to the agency that runs the station will usually produce an address where you can apply for a QSL or verification. What a nice prize these letters are to those who receive them! So, if you're looking for something interesting and challenging, try TIS!

Bits 'N' Pieces

• "The Fly Jock" has clipped his wings! Tom Joyner has decided to cash in his millions of frequent flyer miles for a one-way ticket back to Dallas, Texas, his hometown. Every weekday, Joyner has spent eight hours on the air, and four hours in the air! Tom wakes up Texas on KKDA, Dallas's K-104. By the time his last tune fades out just before 9 am, he's already speeding to greet The Windy City on 107.5 WGCI in the afternoon. Tom also hosts "On The Move," a weekly countdown show on CBS Radio heard nationwide on hundreds of stations.

Now, Tom needs to update his handle! A five year, multi-million dollar contract will end Joyner's flying career. ABC's Satellite Music Network has signed him to be the cornerstone of their urban contemporary adult format called "The Touch." From SMN's studio complex in Dallas, Tom will greet listeners all across America every morning, continuing his ascent in the world of soul music. "The Touch" is one of ten networks produced by Satellite Music Network, serving over 1,000 stations across the country.

• KNHN is having babies! What do you do when your signal doesn't go as far as you'd like it to? You multiply! Under a newly approved arrangement with the FCC, KNHN has increased its coverage dramatically. Their sounds can be heard via their own transmitter in Kansas City, and 120 miles south on KSEK in Pittsburg, Kansas. A series of low-powered transmitters synchronized together fill in the gaps between the two cities creating a continuous signal that stretches almost 200 miles end to end. All the transmitters operate on a single frequency: 1340 kHz.

Mailbag

• Stations are shuffling in Windsor, Ontario. CHUM Limited, a Toronto-based broadcast group, now owns four radio stations in the sister city of Detroit. The owners of modern rocker 89X and CKWW-AM now own legendary CKLW AM and FM. Since the purchase, CKLW-AM has dropped their nostalgic music, and adopted CKWW's former format.

"The Power of Talk, CKLW, Detroit's only 50,000 watt talk station," now airs locally-produced telephone talk shows aimed at female listeners. "We think there's a big hole in this market for a contemporary female talk station," said general manager Al Pervin.

CKWW on 580 kHz has adopted the nostalgic sounds formerly heard on CKLW-AM. The greatest oldies of the rock 'n' roll era continue to be heard on CKLW-FM. Reader Ira Paul in the Detroit suburb of Oak Park tuned us in to the switches.

• Looking for a novel way to hear American broadcasting? Tune to the 26 megahertz band! Several stations are using narrow band FM auxiliary frequencies to relay their broadcasts to remote locations. Dave Kenny of The British DX Club invites us to try these frequencies: 25.87 MHz, WFLA AM-FM, Tampa, Florida; 26.25 MHz, WPLG-TV Channel 10, Miami; 26.35 MHz, WSVN-TV Channel 7, Miami, and KBEZ-FM, Tulsa, OK; and 26.45 MHz, WLW-AM Cincinnati and WHO-TV, Des Moines. Check Glenn Hauser's Shortwave Broadcasting column in the March '93 edition of *MT* for further listings!

International Bandscan

The most popular commercial station in the United Kingdom broadcasts from Ireland! With half a megawatt on longwave, Atlantic 252 has become a ratings leader with rock 'n' roll reminiscent of American contemporary hit radio. Broadcasting from a beautiful meadow just north of Dublin, their signal is just barely heard in the population centers of London and Southeast Britain. Even with this handicap, nearly 5 million listeners tune in every week. Atlantic 252 is also regularly heard by longwave DXers across North America and beyond!

Our loyal Scottish reporter, Ron Carruthers, brings us the news from his home in Edinburgh. Until next month, happy trails! MT

The Mailman Cometh

A number of letters have come in recently which are of interest to all readers of this column. If you have a question related to satellite communications, feel free to write care of *MT* and I will do my best to give you the information you need. Personal replies require an SASE.

Getting Started in TVRO

Armando Pasquini of Guanajuato, Mexico, wants to upgrade his shortwave listening by adding satellite audio to his listening post. As he says, "...I am held back by the lack of hands-on information on the installation and peaking of TVRO systems."

It's quite possible to spend a small fortune just reading about satellite television without actually buying any equipment. If one were to add up all of the books one would like to have on the shelf and subscriptions with which one would keep up to date on the subject, a tab of several hundred dollars would soon be reached.

Your best bet is a publication called *Home Satellite TV Installation and Troubleshooting Manual*. This 324 page, 8.5" x 11" format book has over 300 illustrations, photographs and tables as well as a glossary and various appendices. The third revised edition costs $30 plus shipping and is available from Baylin Publications, 1905 Mariposa, Boulder, CO 80302. You may phone your order at 1-303-449-4551 or FAX: 1-303-939-8720. This particular book is also available in Spanish and Portuguese. Baylin Publications has a free 16 page catalog of satellite TV related books, videotapes, software and installation tools which may be had by calling or writing the above address.

To find out what's happening on all of the satellites on a regular basis, I recommend Westsat Communications' *Satellite Channel Chart*. It's a 32 page bi-monthly periodical with a couple of drawbacks. First, at $65 per year, it's a bit expensive. Secondly, its publication, though supposedly bi-monthly, is erratic. The latest issue I received is dated 2-8-93, was received 2-27-93 and was called the November-December January-February issue. This kind of irregular delivery leads to some confusion and it's a bit of a nuisance. Despite these problems it remains the best single source of information on all video and audio services including FM subcarriers and SCPC services. For a sample of the *Satellite Channel Chart*, send $2 to Westsat Communications, P.O. Box 434, Pleasanton, CA 94566.

Canadian Satellite TV

Brian Romine of British Columbia, Canada, has been seeing a lot of ads in Canadian publications about descramblers with exotic names such as "Bullet Buster" and would like to know how to identify illegal decoders and more about so called "test" chips. "Satellite TV information ..." he says, "is a jealously guarded commodity, held onto by the purveyors and installers of systems..."

The Canadian satellite TV scene is an interesting one. Three satellites are operated by Canada of which Anik C3 (a Ku-only bird) has no video. Anik E1 (111.1 deg. W.) and Anik E2 (107.3 deg. W.) are both C-Ku satellites and are loaded with video, FM subcarriers and SCPC signals. Interestingly, no fewer than five modes of video are transmitted on these birds. Many channels are transmitted in the clear. Those which are encrypted use Oak/Orion, Leitch, VideoCipherII, or DigiCipher systems.

The nature of satellite broadcasting is similar to radio broadcasting in that signals may be received outside the area intended. In cases of unencrypted transmissions, all of us in North America benefit from the wide range of programming from both Canada and the U.S.

Encrypted channels are another matter entirely. Due to international trade agreements, encrypted channels on the Canadian satellites are not legally available to Americans. Likewise, such programming on American satellites is not available to Canadians. Back in the late '70s and early '80s, none of the programming on American satellites was scrambled and dish owners all across the continent enjoyed "free" what cable subscribers were paying for. With the advent of scrambling, Canadians were unceremoniously cut off from programming to which they had become accustomed: HBO, ESPN and the like.

American dish owners were allowed to continue watching by purchasing descramblers and paying a subscription fee. Canadians, because of the lack of an international agreement on the subject, were not given the option. The result was a keen interest in the activities of American video pirates who had easily defeated the original VCII encryption system. So there grew an active business in cross border VCII "hacking" and the pirate industry flourished. Canadians can, of course, legally subscribe to the Oak/Orion encrypted channels offered by Cancom, the Canadian cable programmer.

Buying unauthorized decoders which are "bootleg," "chipped," "hacked" or otherwise altered to allow reception of programming which has not been paid for is illegal, and folks in the U.S. are going to jail and being fined thousands of dollars for participating in such schemes. The Canadian government and cable industry does not appear to be nearly so concerned about such activities.

There are, however, periodic electronic countermeasures (ECMs) which are used to disable illegal decoders. These ECMs are sometimes called "bullets"; hence the "bullet buster," which claims to be immune. "Test Chip" is a euphemism for bootleg chips, sort of like those products which are sold "for educational purposes only." The hackers have a running battle with the programmers, but anyone who says he can sell you a decoder which is immune to ECMs is wrong.

The best place for legitimate information on the subject of encryption of video signals is found in Baylin Publications' *World Satellite TV and Scrambling Methods*. This 356 page 8.5" x 11" format book has over 2000 photos, diagrams, wiring schematics, tables, appendices and an index. It is designed as a technician's handbook and has the most information on the subject in one volume that I know of. The cost is $40 plus shipping from the address listed above.

LMDS: Old Wine/New Bottle

Several readers requested information on a widely publicized microwave TV system which recently debuted in New York City and has been touted as a real threat to cable.

The service is known as Local Multipoint Distribution Service (LMDS) and is similar to the much older system of microwave transmitting known as Multipoint Multichannel Distribution Service (MMDS). There are a few differences. First, LMDS uses the 28 GHz frequency band and a transmission scheme similar to that used by cellular telephone.

The New York company making all the headlines is called Suite 12 Group's CellularVision of New York, Inc. According to an article in the December 30, 1992, *Satellite Business News*, the company has operated a test system in Brighton Beach, New York, for the past two years and has convinced the FCC to allow it to have "pioneer's preference" status. This allows the company to be

an unfettered provider of the service to its choice of the two largest markets in the US. It looks like it will choose New York.

The service is said to transmit signals direct to the customer's home. The signals are received on small (six inch square) flat antennas and fed via coax to a small receiver plugged into the antenna input of the customers' television. According to *Satellite Business News*, M/A Com Inc. and Alpha Industries Inc. will manufacture the home components and Hughes Aircraft Corp. and Catel Corp. will make the transmission systems. This same report says that CellularVision has ordered 100,000 receiving sets for its venture in New York.

The future of the traditional cable industry is so uncertain that, in one's weakest moments, it's almost possible to entertain feelings which border on the sympathetic. This, however, quickly passes. Here are just a few of the beasts lurking 'round cable's corner: The traditional C band satellite TV systems continue to progress at the rate of about 30,000 installations per month. Ku band delivered "wireless cable," such as PrimeStar, fills in where satellite TV customers cannot have big C-band dishes. More extensive high-powered Ku band DBS services are just a year away from offering as many channel options as the new LMDS.

And then there's the dreaded TELCO invasion. This is where existing phone companies use their vast phone network to bring digitally compressed video and countless other services to our homes. All of this, of course, we can't imagine needing now, but no doubt in a year or two we'll wonder how we ever got along without it.

Cable Justice

Arnal Cook, N9AKX, of Tennessee, sent a clipping from the local newspaper detailing the conviction, in federal court, of one man for using a modified cable converter box which apparently allowed him to view cable programming for free. The federal judge, according to the report, decried the conviction saying that prosecutors should be going after the companies and people behind the manufacture of such illegal cable converters.

The judge, according to Arnal, has things a little backward. The newspaper story states that the man in question was a TV repairman who "... admitted selling illegal cable TV converters..." Surely this fellow understood the nature of his illegal activities when he attempted to enjoy a profitable business from stealing cable signals. Yet, the judge, as stated in the article, actually issued an apology to the felon for having to convict him!

We can all agree that it's important to convict the manufacturers of such bootleg converters, but the users remain as guilty. By the way, despite high technological wizardry, the cable industry has a theft rate of about 25%.

Table 1: Sources for WESAT Systems

Atlantic Surplus Sales
3730 Nautilus Avenue
Brooklyn, NY 11224
Phone: 212-372-0349

GTI Electronics
1541 Fritz Valley Road
Lehighton, PA 18235
Phone: 717-386-4032
FAX: 717-386-5063

METSAT Products, Inc.
1257 Glenmeadow Lane
East Lansing, MI 48823
Phone: 517-332-7665

OFS Software
6404 Lakecrest Court
Raleigh, NC 27612
Phone: 919-847-4545

Satellite Data Systems, Inc.
P.O. Box 219
Cleveland, MN 56017
Phone: 507-931-4849

Spectrum International Inc.
P.O. Box 1084
Concord, MA 01742
Phone: 508-263-2145

WeatherWise Corporation
P.O. Box 73
Jarretsville, MD 21084
Phone: 301-577-9451

Wilmanco Microwave Products
19529 Business Center Drive
Northridge, CA 91324-3402
Phone: 818-993-1662

WEFAX Via Satellite

Bill Perrelli, N1MRK, of Hamden, CT, says, "My question has to do with weatherfax satellite equipment. I am looking to get the most for the money, yet I would like to make the purchase once!..."

I think the key to your desires, Bill, is in the idea of wanting to only buy the system once. Each year, advances in electronics make possible many things which had been prohibitively expensive for most of us. This has certainly been the case with satellite TV, and I've seen the same thing happening in the world of weather satellites.

For those who aren't familiar with the subject of weather satellites, I recommend Dr. Ralph E. Taggart's *Weather Satellite Handbook*. Although the fourth edition is dated 1990, it's not likely that a replacement for this ARRL publication will happen soon. The book is about 200 pages in the 8.5" x 11" format, with probably that many pictures, diagrams, tables, etc. It is available from most of the radio related mail order houses including Grove Enterprises. The *Weather Satellite Handbook* typically sells for $20 plus shipping.

Getting started in weather satellites can be a very expensive proposition. The cheapest "turnkey" system I've come across runs about $1,100 and assumes that you already have a PC compatible computer with a decent monitor and printer (if you want hard copy pictures from the weather satellites). A top grade system will cost in excess of $3,000.

There is an impressive amount of current information available on the subject of weather satellites. Beyond the above mentioned handbook, there are the following periodicals:

WeatherSat Ink, a sophisticated quarterly designed for the serious hobbyist. Subscriptions are $15/year. Write: *WeatherSat Ink*, c/o Bluebird Greenhouses, 4821 Jessie Dr., Apex, NC 27502.

Weather Satellite Report is a monthly newsletter published by R. Myers Communications, P.O. Box 17108, Fountain Hills, AZ 85269-7108. Subscriptions are $30/year.

The companies in Table 1 have complete weather satellite systems, components and/or software. Write them for catalogs on their various products and do a little mail order product pricing.

MT

Ike Kerschner, N3IK

Satellite Communication

As amateurs we are aware that a mysterious inner clan of elite hams are talking to each other through satellites that orbit the earth. Of course the members of this inner clan are all PHD's and have tons of money to spend for the special equipment required to perform this extremely difficult task! At least that is what we assume.

The truth is somewhat different. If you hold a Technician plus license, chances are good that the gear you have in your shack will allow you to communicate via Orbiting Satellites Carrying Amateur Radio (OSCAR).

How Does It Work?

The satellite carrying amateur radio, or OSCAR, works very much like an FM repeater. That is, a signal on one band or set of frequencies is converted to another set of frequencies or band and retransmitted. These repeaters are called transponders, and instead of just a single frequency being retransmitted, a fairly wide range of frequencies is accepted at the input and retransmitted on the output, allowing a large number of contacts to take place at the same time.

OSCAR communications are usually carried out on SSB or CW, although some satellites carry packet gear and act as world wide bulletin boards. Television OSCARs are also coming. The first experiment of TV OSCAR — OSCAR 15 — failed; however, interest is still high in this field and TV is sure to be aboard some future OSCAR.

Each OSCAR has uplink (transmitting from earth to the satellite) and downlink (satellite to earth) frequencies. Generally these frequencies are a range of frequencies; for example, OSCAR-13 has an uplink of 435.420 through 435.570 and the down link is 145.825 through 145.975. As you might imagine it is possible for many stations to communicate at once simply by being on different frequencies.

For the most part, OSCARs operate on VHF, UHF and microwave frequencies. The RS satellites (Radio Sputnik) launched by the former Soviet Union, on the other hand, have high frequency transponders and operate on the ten and fifteen meter amateur bands as well as two meters (see table one).

Equipment Required

In order to operate on the OSCARs that use VHF and higher frequencies, a transmitter capable of SSB or CW on 144, 435 or 1200 MHz is required for the uplink signal. Output power of 100 watts will generally be more than adequate; in fact, power should be limited to just enough to communicate, as high power hogs the power from the transponder, consequently impairing communications for other users.

A receiver capable of tuning the downlink frequencies is of course required to hear the satellite. A high quality mast-mounted preamp is a plus, especially if the coax from antenna to receiver runs more than a few feet.

Satellite communication normally requires a circularly polarized antenna. For transmitting, a simple crossed dipole is adequate for close passes, but one should consider a crossed Yagi, or other circularly polarized high gain antenna. Two antennas will be required; one for transmitting, the other for receiving (this is because two different bands are used). Several manufacturers have dual band antennas designed especially for satellite work.

Lastly, one must know where to aim the antenna in order to optimize the pass of a given satellite. Many computer programs are available to do this. It is possible, in fact, to couple one's computer and antenna and have the whole thing done automatically!

Phase three satellites such as AO-13 have a high elliptical orbit extending several thousand miles above the earth. If you know where to aim the antenna, this particular machine is also available for more than ten hours a day to hams in the northern hemisphere.

You Call This Easy?

I know, right about now you're saying, "I don't have any of that stuff and don't have the dough to buy it." So you must be wondering where I got the audacity to say anyone with a Tech plus ticket has the gear to work the satellites. Well, they do if they use the Russian Satellites RS machines that carry HF transponders. These Radio Sputniks are easily accessible and knowing when they are in range is not that essential.

The RS machines are LEOs (Low Earth Orbiting) satellites. They operate at a distance of a few hundred miles above the earth and an overhead pass would only last twenty minutes or so if they were operating on VHF/UHF. But since they are on HF, the range is normally more than five thousand miles. Consequently, if you tune the downlink passband and hear signals, chances are that you will be able to access the satellite and work through it. All one needs is a simple antenna — dipole or vertical — and a transmitter capable of fifteen meter transmission, plus a receiver that covers ten meters (29 to 30 MHz required).

The RS satellites also carry a mode A transponder with an uplink on 145.860 thru 146.00 MHz and a downlink of 29.360 to 29.500 MHz. The interesting thing about this mode is that it is possible to operate through this machine using a simple handheld FM transceiver using the push to talk button as a key and sending CW through it while listening on the ten meter downlink. This is possible only when the satellite passes close by, though.

In order to listen to the RS satellite, simply tune the range of 29.360 to 29.500MHz and listen for signals. The signals should be SSB or CW and appear to have a slow downward drift (due to doppler effect) if they are coming from the satellite. To be sure you are able to access the satellite, simply set the transmitter frequency somewhere between 21.160 and 21.300 and listen for your own signal coming back on the ten meter downlink frequency.

The RS satellites also carry a beacon transmitter. The frequencies are listed in table one. So another option is to simply tune to the beacon frequency to hear the machine. Additionally, each of the RS machines (RS-10, RS-11, RS-12 and RS-13) carries a robot which will talk to you. Again, check the frequencies in table one, match the transmitting speed carefully on the uplink frequency, and the robot will acknowledge your call and issue a signal report. The RS machines are easy, and a great way to get started in satellite communications.

To learn more about this exciting phase of ham radio pick up one of the following publications: *The Satellite Experimenter's Handbook*, $20.00 from the ARRL, 225 Main St., Newington,

Table 1: RS Satellite Frequencies

Beacon is found on robot downlink frequency and serves as robot identifier.

	RS-10	RS-11	RS-12	RS-13
MODE A UPLINK	145.860 145.900	145.910 145.950	145.910 145.910	145.960 146.000
DOWNLINK	29.360 29.400	29.410 29.450	29.410 29.450	29.460 29.500
ROBOT UPLINK	145.820	145.830	145.830	145.840
DOWNLINK	29.357 29.403	29.410 29.450	29.454	29.504
MODE K UPLINK	21.160 21.200	21.210 21.250	21.210 21.250	21.160 21.300
DOWNLINK	29.360 29.400	29.410 29.450	29.410 29.450	29.460 29.500
ROBOT UPLINK	21.120	21.130	21.129	21.138
DOWNLINK	IDENTICAL TO MODE A			
MODE T UPLINK	SAME AS MODE K			
DOWN LINK IS	SAME AS MODE A UPLINK			
MODE T ROBOT UPLINK	SAME AS MODE K			
DOWNLINK	145.857	145.907	145.958	145.908

Rob Kessel's

Ham DX Tips

May is a month in which outdoor activities tend to draw your attention. Well, while you are out enjoying the great outdoors, why not take along your radio? After all, it is also the time of the year to catch some great DX as well. More hams are active from outdoor and/or rare locations, and also, May is the start of the VHF DX season. Here are some tips to help you...

ANGUILLA VP2EA/B is a 6 meter beacon operated by the Anguilla Amateur Radio Society. They would like to know if you hear their beacon. Send a reception report to: Anguilla Amateur Radio Society, Emergency Services, Box DX, The Valley, Anguilla, Leeward Islands, Caribbean). The frequency is 50.011 MHz, and the beacon sends its call letters in CW using 50 watts into an antenna 175 ft. high. ***ASCENSION*** G0DEZ will be active from here as ZD0DEZ 'til August. He will be on CW and SSB on the following freqs: CW: 1910, 7019, 10119, 14019, 21190, 21019, 28019 kHz; SSB: 7091, 14190, 21190, 28491 kHz. He asks that QSL requests be sent to his home address and he will answer them when he returns. That address is: 85 Ferndale Rd., Lichfield Taffs, WS13 7DL, England. ***BOSNIA-HERCEGOVINA*** If you want to try to send a report direct to this war torn country in what used to be Yugoslavia, Bosnian hams say after listing the entire address including Bosnia-Hercegovina, add: "5800 Split, Republic of Croatia, Europe." This routes the mail through the town of Split, Croatia, which will forward it on to the correct Bosnian address if possible. There have been many active reports of amateurs in Bosnia reporting on the war conditions here. Most of these reports have been on VHF frequencies, which our European readers should check, especially 2 meter SSB. ***LEBANON*** OD5SIX is a new six meter beacon. European hams report hearing its CW signal on 50.078 MHz, though no one yet knows to whom to send a report. ***MAY DX CONTESTS*** May 22 and 23 are the ARRL 6 meter (50 MHz) "Spring Sprint." Check around 50.125 MHz if you can receive SSB signals on that frequency during the evenings of both days. Also check 50.110 MHz to 50.125 MHz for DX signals as well. ***NAMIBIA*** V51P (whose address is simply: Peter, Box 9080, Windhoek, Namibia, Africa) has been on 14085 kHz RTTY at 0700 UTC. ***NETS*** 14345 kHz is a popular net frequency on Saturdays. At 1400 to 1530 UTC the Veterinarians, the 2 meter Earth Moon Earth net, meets to discuss VHF and UHF communications by bounding signals off the Moon from 1530 to 1730 UTC; next comes the Microwave DX net which meets at 1730 to 1930 UTC. The Midwest VHF net meets Mondays at 0200 UTC on the HF frequency of 3842 kHz. The West Coast "informal" VHF DX net meets on 3818 kHz from 0300 to 0400 UTC. If you are interested in Maritime operations, the Maritime VHF operator's net meets on 3765 kHz Thursdays at 0100 UTC. While all of these nets are on shortwave frequencies, some of them concern DX activities of VHF and UHF DXers. ***PARAGUAY*** ZP5AA is the six meter beacon operated by the Radio Club Paraguayo, Box 512, Asuncion, Paraguay, on 50.025 MHz CW. They are asking for reports. ***SAO TOME*** S92YL (Leslie Lewis, C Postal 522, Sao Tome, D.R.S.T.P., West Africa via Portugal) has been attracting her share of DXers daily on 21,280 kHz at 2100 UTC. ***TURKMENISTAN*** UH8AAB (V.A. Lebedyancev, 744000 Ashhabadnogina 5, Turkmenistan) has been active on 14083 kHz RTTY at 0600. ***USA*** The "Gateway Amateur Radio Club" (of the greater St. Louis, Missouri area) operates WA0RCR from Wentzville, MO, Monday thru Thursday and Saturdays. Listen to the *Gateway Radio Newsletter* on 1860 kHz in the AM mode at 5:30 pm Central time. This is a general "broadcast" of amateur radio news using material from such ham info sources as *Newsline* and the *RAIN* newsletters. WA0RCR is also on the air Sundays at 7 am Central time and Tuesdays at 0430 am. Using the AM mode this makes the broadcasts an interesting target for SWLs who might wish to try for a low band target. The Club also has a net which meets weekly on Wednesdays from 8 pm to 11:30 pm Central time. ***UGANDA*** 5X1A has been active on 21232 kHz at 0030 UTC. QSL to DL0MAR, MAR Clubst, Rie Senkopfweg 7, D-8209 Schlossberg/stknl, Germany.

Well, that is it for this month. Have a good time and enjoy both the spring and the DX. 73 de Rob.

CT 06111; *AMSAT Journal* (monthly publication which comes with membership in AMSAT) available from AMSAT, PO Box 27, Washington, DC 20044, $30.00 per year in USA; other countries write for current rates.

There is more to come concerning satellite communications next month.

Don't forget June is VHF Sweepstakes and Field Day month. Be sure to join the fun during these two contests. Field Day is the operating and social event of the year; don't miss it!

'Til next month, have fun and take care. 73 de Ike, N3IK

MT

George Zeller

Europirates: A Real DX Challenge

Given the current explosion of North American pirate radio activity, the "Outer Limits" has featured only limited European pirate coverage in recent months. This does not mean that Europirates are dormant. Many dozens of pirate stations make very regular appearances on the pirate bands in Europe. They represent some of the most challenging shortwave DX targets for us on this side of the Atlantic. A Europirate catch can really brighten up your log book!

Regular *MT* reporter Rob Ross of London, Ontario, sends in a few recent examples of what we can hear. While it is easier to hear Europirates from east coast locations, Rob's successes prove that many of these stations can be heard from inland locations.

Perhaps the most reliable Euro for us is **DLR-106.** Rob heard them at 0800 UTC on 6221.6 kHz. This one is a shortwave relay facility for an Irish FM station. Another widely heard Irish pirate is **Community Radio Dublin** on 6910 kHz. Rob's log came at 0830. They program pop music with occasional DJ announcements.

Rob reports amazingly good late winter reception from two other Irish stations. **Riverside 101 FM** came in well on consecutive evenings using 6238.8 kHz in the 0700-0900 window. Slightly lower on 49 meters is **Jolly Roger Radio** on 6229.1 kHz around 0730. This station is a completely different operation from North American pirate **Jolly Roger International.**

Rob's final recent Europirate log is **Radio Marabu** from Germany, which he noted on 6238.8 kHz at 0800. This probably came from the same transmitter used to relay Riverside 101 FM, given the frequency. All of these loggings were on UTC Saturdays and Sundays. Why not stay up during the wee hours next weekend? You might hear some of these transatlantic pirates.

Overseas Pirate News

Regular *MT* reporter David Alpert of New York, NY, spotted a notice from **Southern Music Radio** in the March issue of *Rock and Roll Confidential.* The station is produced in New Zealand, but is relayed by Europirates **Radio Waves International** and **Northern Ireland Relay Service.** They solicit recorded music, demo tapes, or pirate programs for potential airing. The contact person at this station is David Miller, 55 Falcon Street, Dunedin, New Zealand.

Stanislav Mekhonoshin of Perm, Russia, sends in schedules for two new Russian stations. **Radio Shark** uses 6185 kHz for two hours at 0300, 0700 and 1500 UTC. Independent Russian station **Radio ARS** plays progressive rock on

QSLs are arriving from Russian pirate "Romantic Space Radio."

11700 kHz at 1500 UTC. Dozens of new Russian stations are now straddling the line between pirates, licensed broadcasters and program services.

On the other hand, Stanislav says that **Radio Policy** in St. Petersburg and **Radio N** in Yekaterinburg have left shortwave. On the brighter side, Alan Masyga of Winona, MN, and your columnist George Zeller recently received QSL's from **Romantic Space Radio,** which we picture this month. This Russian pirate uses **Radio USA** as a North American relay.

Radio Peace in Action writes in direct to suggest that they anticipate a new North American relay sometime in 1993. If you hear them, they use the common Europirate maildrop of P.O. Box 22 03 42, D-W 5600 Wuppertal 22, Germany.

Radio Caroline

Some DXers have been hearing veteran pirate **Radio Caroline,** which recently reactivated on shortwave. Our report this month comes from Arunas Silickas of Vilnius, Lithuania, who notes them on Saturdays and Sundays from 1000-0000 UTC on 6295 kHz. Arunas says that their current address is c/o Horizon Sales, 121 Monkton Street, Monkton, Ramsgate, Kent CT12 4JQ, England.

MT hears direct from Horizon Sales, which sells merchandise to support Radio Caroline and the motor vessel *Ross Revenge.* They publish a Radio Caroline newsletter and sell stickers, key chains, Christmas cards, etc. One pound sterling or $2 US to the Horizon Sales address will get you a sample newsletter and information on the merchandise.

Far Right Clandestine QSL's

• Kevin Alfred Strom of **National Vanguard Radio** has started to verify reception reports. Both Michael Goetsch of Pittsburgh, PA, and Rob Ross have now received QSLs from the station, which previously had ignored reports. Their normal address, P.O. Box 90, Hillsboro, WV 24946, is now working.

• We have a follow-up on last month's **CCC Radio** address. As reported in *MT*, verie signer Tim Hurper has verified reports to P.O. Box 5635, Longview, TX. *MT* reader Greg Martin of Fruitport, MI, says that he had different results from a report to an announced address at P.O. Box 65, Fallbrook, CA 92028. Non-verie signer Tom Metzger sent back a QSL rejection, saying that the station cannot verify reports for "security reasons." Obviously, the Texas address is your best bet.

Yoder's New Pirate Book

Pirate expert Andrew Yoder has released the new *1993 Worldwide Pirate Radio Logbook.* This book lists all widely reported pirate station transmissions in 1992, sorted by frequency, time, and station name. Both North American and Europirate stations are included. Yoder's book contains the best Europirate address list that I have ever seen, and I recommend it to serious pirate chasers.

Many of you have heard by now that the 1993 fifth edition of *The Pirate Radio Directory* unfortunately had to be cancelled at the last minute. Fortunately, Yoder's new book fills the void in a new way. Copies are available for $10 US plus $2 shipping from Snallygaster Press, P.O. Box 272, Springs, PA 15562. Tell them that *MT* sent you!

What We Are Hearing

So far in 1993 we continue to see a blistering pace of North American pirate transmissions, and our readers have sent in dozens of loggings again this month. Maildrop addresses used by stations listed below include P.O. Box 146, Stoneham, MA 02180; P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; and P.O. Box 293, Merlin, Ontario N0P 1W0. Frequencies are in kHz, with times given in UTC:

CFEN- 7413 at 2330. "Fly by Night Radio," self-described as "Canada's Worst Pirate," has resumed activity. They feature folk music, comedy, and discussions of Canadian issues. Addr: Wellsville. (George Zeller, Cleveland, OH)
CSIC- 7413 at 0200. Pirate Rambo has promised future broadcasts in the 6800-7000 kHz area, so the range below the 40 meter amateur band is worth checking out. Addr: Blue Ridge Summit. (John Hollowell, Port Republic, MD; Masyga)
Ground Level Network- 7420 at 2300. Host "Just Bob" says that he is not Bob Grove, and is also not "Joe" of **One Voice Radio.** His programs are dominated by health tips. Addr: Blue Ridge Summit. (Scott Krauss, Cleveland, OH; Ross)
Happy Kanukkah- 7413 at 2300. Pirate Judas has mailed "Spinning Top" QSL sheets for his December holiday show to many DXers. Ron is one of the pleased recipients. Addr: Merlin. (Ron Hunter, Racine, WI)
North American Pirate Relay Service- 7416 at 0230. They sometimes produce their own rock music programming, but they also relay other pirates such as Radio Azteca. Addr: Wellsville. (Doug Merkel, St. Louis, MO)
Pan Global Wireless- 7416 at 0030. Mike Oxlong claims to broadcast from Sonora, Mexico. His satires and parodies continue to generate good reviews from DXers. Addr: Wellsville. (Jeff Voges, Memphis, TN; Krauss)
Radio Airplane- 7417 at 0230. Rock music from Captain Eddy's Piper Cub transmitter has been heard on a nationwide basis. Maybe he really does have an airborne upper sideband mobile rig! Addr: Wellsville. (Skip Harwood, Beale AFB, CA)
Radio Anarchy- 7418 at 0100. After a period of relative inactivity, this one has returned with many transmissions featuring their unusual combination of punk rock and Indian flute music. Their improved signal is still best heard in western North America, with announced future plans for broadcasts on 1610, 4760, 4816, and 6000 kHz. Addr: Blue Ridge Summit. (Harwood)
Radio Azteca- 7416 at 0230. The station mixes rock and clever comedy. Their attractive QSL still displays various Aztec symbols with an "official seal" of a green frog. Addr: Wellsville. (Merkel)
Radio Beaver- 7415 at 2130. Bucky Beaver finally got his wish. Canadian Prime Minister Mulrooney has resigned! Addr: Merlin. (Hollowell)
Radio Blandx- 7414 at 2300. This hilarious parody of DX programs and DX bulletins features Ralph Jensen, along with Sven Gonzalez' impersonations of *MT's* Glenn Hauser. Addr: Blue Ridge Summit. (Hollowell)
Radio Esoterica- 7417 at 2245. Moriarty lives up to his station name, with diverse musical programming from many countries. Addr: Stoneham. (Hollowell, Masyga)
Radio Free East Coast a.k.a. **WREC-** 7417 at 2115. P. J. Sparx' relatively new pirate mixes classic rock, novelty tunes, and Warner Brothers cartoon audio. Frank's first contribution; welcome to the column! Addrs: Wellsville and Blue Ridge Summit. (Frank Carson, Clinton, MD; Norm Alexander, Diamond Springs, CA; Merkel)
Radio Scottish Montreal- 7413 at 2300. Rob Roy's appropriately named station covers Scottish affairs in Quebec, including Scottish music, history, politics, sports, and upcoming local Scottish events in the Montreal area. Addr: Blue Ridge Summit. (Cathy Zylka, North Tonowanda, NY; Jim Laughlan, Youngstown, NY; Michael McDaniel, Detroit, MI; Masyga)
Tangerine Radio- 7415 at 2230. "Raunchy" Rick Forester's veteran anarchist rock station was inactive for several years, but his return with multiple 1993 broadcasts has been a welcome resurrection. Addr: Wellsville. (Ron Bruckman, Hempstead, MD)
The Fox- 7415 at 0015. Their male host has no single format. He promotes free radio with a well produced mix of rock, comedy, and seasonal fare. Station literature invites listeners to write President Clinton to lobby for a new pro-pirate FCC Chairman. Addrs: Wellsville, Blue Ridge Summit, and Merlin. (Masyga)
Union City Radio- 15050 at 2000. Many DXers were delighted by the return of this veteran station, previously inactive since the mid-1980's. Using an interval signal of a Morse code ID loop at sign-on and sign-off, they mix rock, country, folk, and comedy in a classic pirate radio style. Addr: Wellsville. (Masyga, Harwood)
Voice of Bono- 7415 at 0130. Station announcer Gary Daniels reports on QSLs that some of their recent broadcasts have been relayed via the **WSKY** transmitter. Addr: Wellsville. (Gigi Lytle, Lubbock, TX; Masyga)

Voice of Oz- 7417 at 0130. Howard E. Lyon is back with the latest news, weather, sports, and classic rock from Oz. Addr: Wellsville. (Zeller)
Voice of Pancho Villa- 7415 and 1610 at 0500. As usual, Pancho emerged with a broadcast during the Winter SWL Festival in Kulpsville, PA. Over Ecuadorian music from his Pink and Purple Room, Pancho announced his new "DX Daily" program that will air once a month. Addr: Blue Ridge Summit. (Marie Lamb, Brewerton, NY)
WCTU- 1610 at 0400. "The Fat Man" programs southern rock and parody ads on this new mediumwave station, allegedly from a location in Atlanta. His slogan is "The Mouth of the South." Addr: Blue Ridge Summit. (Lamb)
WEED- 7415 at 0115. They still program a confusing mix of pro-marijuana rock and sketches. However, their announced rumor that they would be using the Wellsville address has not yet been certified. Addr: Uncertain. (Lytle, Ross)
WKIK- 7415 at 0200. This rock station with a drifty upper sideband transmitter remains mysterious. Their claim of a Jacksonville, FL, location may be accurate, since they once relayed WZAZ (1400 kHz in Jacksonville). But, their announced maildrop reports lack of success at contacting them. Addr: Wellsville? (Rick Cunningham, Birmingham, AL)
WYMN- 7413 at 2300. Pirate Jenny's all-female format still mocks sexism. All musical selections feature female vocalists. Ron suspects that they sometimes use the Tangerine Radio transmitter. Addr: Wellsville. (Larry Gotts, Richfield, PA; Bruckman, Masyga)

MT

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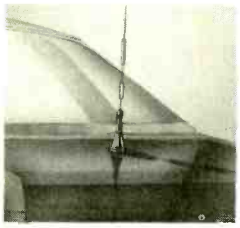

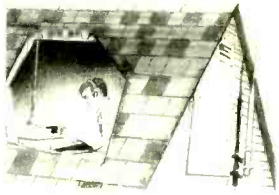

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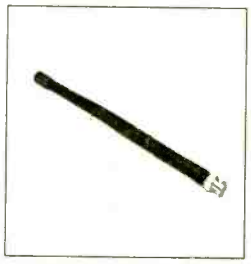

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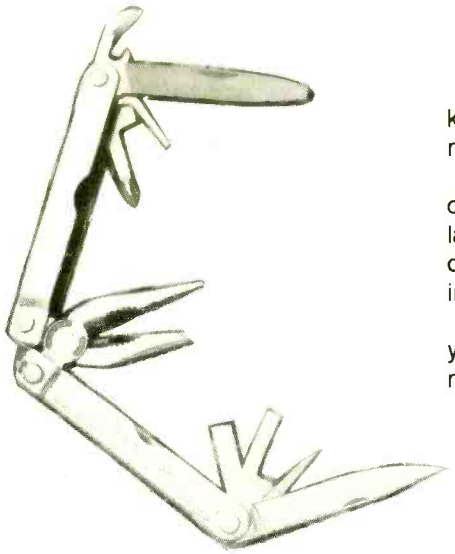

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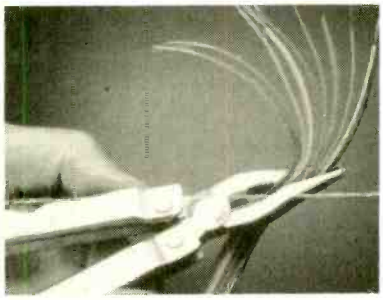

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VISA
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DISCOVER

Jack Albert

Tuning in Facsimile

I received several very clear fax photos from Robert Hall in Capetown, South Africa. The one shown below was copied on 18.238 kHz. He highlighted what appears to be the southern tip of the African continent and a portion of Antarctica. Robert also says that he was getting excellent reception on 20300 and 20910 kHz using 120/576.

Another photo (copied on the same frequency) apparently is a logo used by the NOAA Joint Ice Center. I don't quite understand why that was transmitted from RSA! Robert was using an Icom R71E, a Universal M7000 and a Seikosha 1200A printer. Robert also sent a nice frequency list from his personal log.

Also, Frank Moran sent in a nice FAX schedule that he copied on 16135 kHz using a PK232, a Heath SB-1400 transceiver and a random wire antenna in his attic! This proves you don't need an elaborate setup to copy FAX.

On the other hand, even if you have a simple setup, tuning FAX can be more complicated than RTTY. LPM (lines per minute), which is similar to baud rate, is used to set the FAX speed. Most shortwave weather FAX signals use 120 LPM while press FAX photos use 60 LPM. 240LPM is normally found on satellite frequencies. Nowadays, FAX photos are rarely found on shortwave.

The N/R (normal/reverse) settings are sometimes confused with L-R/R-L keys. N/R is used to change the polarity of the reception causing the image to be positive or negative (similar to a photographic negative). The polarity also changes when you switch from USB to LSB, so it's a good practice to jot down the receiver's setting. The L-R/R-L key reverses the rotation of the scan line and causes a mirror image to be displayed. When the characters are flipped, you know it's time to change this setting!

The IOC or Index of Cooperation, changes the width of the image or the number of line per inch. In other words, it changes the dimensions of the image. Most shortwave stations use 576 IOC. The biggest problem when you encounter a FAX signal is, what is the speed? Is it flipped or is the IOC set correctly? The answer to better FAX reception is the same as for RTTY: Experiment! Experiment! Experiment!

Change the speed and wait a few minutes. Does the image make sense? Change the N/R if the image is negative (it's easier to see a positive image). If all else fails, play around with the IOC. Sometimes when I copy FAX, I get the settings all "jumbled" up! Then I simply go to another mode and then switch back to FAX to find that the default setting was correct. Most fax decoders default to 120/576, N, L-R, so you really don't need to do anything except tune the receiver.

Only a Dream

In March I made a misleading reference to a feature that might "be included in the M9000." I did not intend to imply that any such unit is under construction; in fact, it is not. I saw the "M9000" as symbolic of the mythical dream machine we are always hoping for—the next generation just around the bend.

The End of an Era

Who was it that said, "Things never last"? Was he talking about President Bush, Coach Ditka, or maybe he was referring to a toaster that he just got for Christmas! Whoever he was, I agree. But fortunately, the Chicago Bears can hire a new coach and we can vote for a new president or that guy that said "things never last" can replace his broken toaster.

Being in this hobby for twenty five years I have seen dramatic changes. In the sixties you could tune to just about any frequency and with a limited amount of equipment, you could capture a new world called Radioteletype. Those days are gone! Now you need sophisticated computers and special radio modems to copy strange, esoteric modes like Piccolo. The ham bands are about the only place that produce clear text!

In 1987 (about the time *MT* switched from its tabloid to its current magazine size), I started writing the Reading RTTY column. Back then I was on a bimonthly basis sharing it with the FAX column. In 1988 the job was given to me on a monthly basis. I have enjoyed the past five years and have met many new friends. Even though we're miles apart we'll probably at least meet at the Dayton Hamvention for years to come. I would like to acknowledge the following individuals who provided outstanding support for the column:

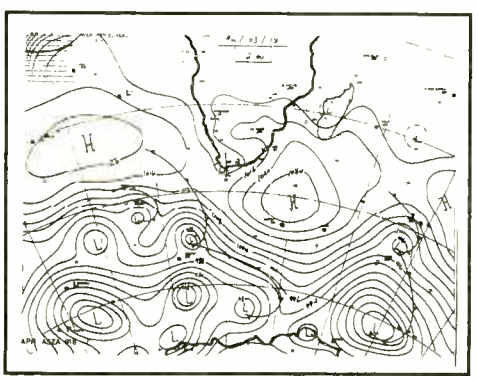
Riley Crate	Fred Osterman
Richard Crisp	Bob Parnass
E.R. Flynn	Tom Roach
Bob Grove	Will Torgrim
Robert Hall	Tim Tyler
Joe Lesson	Dave Wilson
Mike LeBlanc	And, the *MT* Staff
Larry Miller	

Because I have other commitments, this will be my last issue. But don't worry, it's not the end of *MT's* RTTY coverage. Bob Evans will be authoring a quarterly digital communications column that will carry us onward into new developments. Give him the support that you gave me, and we can keep this hobby going forever!

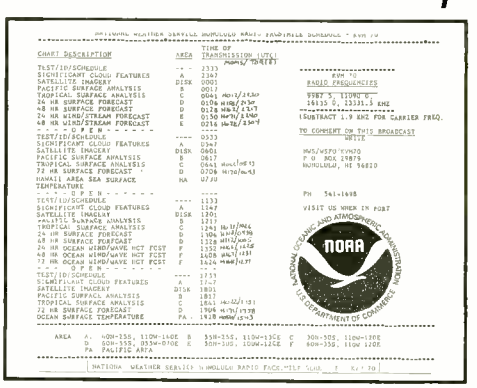
MT

An Abridged Fax list

FREQ	CALL	LPI/IOC	LOCATION
3557.0	NAM	120/576	NORFOLK, VA
5104.0	RWW73 90/576		MOSCOW, RUSSIA
6496.0	CFH	120/576	HALIFAX, NOVA SCOTIA
6850.0	WLO	120/576	MOBILE, AL
6944.0	CKN	120/576	VANCOUVER, BC
7805.0	ZR02	120/576	PRETORIA METRO RSA
8080.0	NAM	120/576	NORFOLK, VA
9060.0	RCU73 90/576		RUSSIA
9383.0	NPN	120/576	APRA, GUAM
10116.6	BAF4	120/576	BEIJING METRO PRC
10535.0	CFH	120/576	HALIFAX, NOVA SOCTIA
10667.0	LRN2	60/288	BUENOS AIRES, ARG
10863.0	NAM	120/576	NORFOLK, VA
17670.0	LQZ67 60/288		BUENOS AIRES, ARG (press photos)
18488.4	RUZU	120/576	SAAM MOLODEZHNAYA, ANT
19365.0	KGWC	120/576	USAF OFFUTT AFB NEB
19860.0	NPN	120/576	UFN APRA HARBOUR
20300.2	NKW	120/576	USN DIEGO GARCIA
20910.0	NKW	120/576	USN DIEGO GARCIA



Fax copied by Robert Hall.



Fax schedule copied by Frank Moran.

Here's a news update from Australia. Radio Australia has adopted a new QSL policy of one verification per listener per transmission, or two QSLs a year.

Australian Armed Forces is broadcasting daily to Aussie troops in Somalia (0530-0600 on 17840 kHz). Reception reports are welcomed with 2 IRCs, and an SASE. Send your reports to; Lt. Kerry Martin, Australian Armed Forces Radio, b/ 4/22/N, Russell Offices, Canberra 2600, ACT, Australia.

Okay, utility DXers, time for an address update for Spain's CQ marker EBA. Send your utility report to; Instituto Hidrografico da la Marina, Seccion Nautica, A la atencion de D. Fernando Calancha de Passos, TOLOSA LATOUR s/n, 11007 Cadiz, Spain.

Still searching for an address for Eritrea's Voice of the Broad Masses? Send your report to; Voice of the Broad Masses of Eritrea, Ministry of Information & Culture, P.O. Box 872, Asmara, Eritrea.

ALGERIA

Radio Algiers, 17745 kHz. Full data station logo card, without veri signer. Received in 35 days for an English report and 2 IRCs. Station address: 21 Bld. des Martyrs, Alger. (Raymond King, Kelowna, BC Canada)

AUSTRALIA

Townsville QLD Maritime Service, 4426 kHz. Full data station card, verified by Willy Rombout-Station Manager. Received in 30 days for an English report and mint stamps. Station address: OTC Maritime Townsville, 19-23 Wackett St., Pallarenda 4810 QLD Australia. (Ed Rausch, Cedar Grove, NJ)

ABC-Perth VLW 6, 6140 kHz. Full data map/transmitter site card, without veri signer. Received in 60 days for an English report and mint stamps. Station address: ABC Perth, ABC Box 9994, GPO Perth WA 6001 Australia. (Rausch, NJ)

COSTA RICA

UNESCO Radio via Radio For Peace Int'l, 13630 kHz. Date only form letter, card and UNESCO literature, verified by Erin Faherty-Mella-Executive Radio Producer. Received in 31 days for an English report, 1 IRC (returned), and address label (used). Station address: UNESCO Radio, 7, Place de Fontenoy, 75700 Paris, France. (Mike Hardester, Jacksonville, NC)

CZECH & SLOVAK REPUBLICS

Czech & Slovak Radio Int'l. Full data Lynx card for 7345 kHz (via Litomysl), 9580 kHz (via Velke Kostolany), 11990 kHz (via Rimavska Sobota). Received in 21 days for an English report, one US dollar and address label (used). Report was for 31 Dec 92/ 01 Jan 93 when the country split. All transmitter sites listed on QSL card. Station address: 120 99 Prague, Czechoslovakia. (Hardester, NC)

GUAM

KSDA Adventist World Radio Asia, 11980 kHz. Full data station card, without veri signer. Station stickers and AWR *Asiawaves* newsletter included. Received in 30 days for an English report. Station address: P.O.Box 7500, Agat, Guam 96928 USA.(Rausch, NJ)

GUATEMALA

Radio Buenas Nuevas, 4800 kHz. Full data "Quetzal" card, verified by Israel Rodas M.-Gerente. Paper pennant, station info sheet and religious tract included. Received in six weeks for a Spanish report, audio program tape, souvenir postcard, and mint stamps. Station address: San Sebastian H. 13020, Huehuetenango, Guatemala. (John Overman, Independence, MO)

HONG KONG

BBC East Asia Relay Station, 7180 kHz. Full data letter, signed by Philip Sandell. Received in 30 days for an English report and 2 IRCs. Station address: BBC East Asia Relay Co., Ltd., Tsong Tsui Broadcasting Station, Nim Wan, Yuen Long, New Territories, Hong Kong. (King, Canada)

JORDAN

Radio Jordan, 11810 kHz. Full data card verified by Jawad Zada. Stickers and program schedule included. Received in 374 days for an English report. Station address: P.O. Box 1041, Amman, Jordan. (Hardester, NC)

NON DIRECTIONAL BEACONS

CF-Chesterfield, VA. 392 kHz. Full data prepared QSL card verified by J. Myron Helms. Received in 12 days for an English utility report. Station address: Commonwealth of Virginia, Dept. of Aviation, 4508 South Laburum Ave., P.O. Box 7716, Richmond, VA 23231. (Hank Holbrook, Dunkirk, MD)

SN-Shinnecock Inlet Light, NY. 310 kHz. Full data prepared QSL card verified by illegible signature. Received in 8 days for an English utility report. Station address: U.S. Coast Guard Station Shinnecock, Hampton Bays, NY 11946-3298. (Holbrook, MD)

QATAR

A7D, 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: Qatar Public Telecommunications Corp., Commercial & Operations Dept., P.O. Box 217, Doha, Qatar. (Martin Nagl, Austria DX Club, Neulengbach, Austria)

SENEGAL

6WW Marine Nationale, 12857 kHz. Full data QSL folder, with illegible signature. Received in 31 days for a copy of CW report, 1 IRC, and mint stamps. Station address: Service T.V.L., Le Chef des Stations Interarmees des Transmissions, De Yembeul et de Rufisque, Boite Postal 3024, Dakar, Senegal. (Nagl, Austria)

SHIP TRAFFIC

USCGC CONFIDENCE-NHKW, 6200 kHz. Full data prepared QSL card verified by James J. Helring Jr., stamped with ship's seal. Received in 21 days for an English report and stamped-self-addressed-envelope. Ship address: c/o Patrick AFB, FL 32925-7518. (Russ Hill, Oak Park, MI)

USS DWIGHT D. EISENHOWER CVN-69-NNN0CVG, 14464 kHz. Full data prepared QSL card with illegible signature. Card stamped with ships Communications Division seal. Received in 13 days for an English report and stamped-self-addressed-envelope. Ship address: FPO AE 09532-2830. (Hill, MI)

NECHES-WENW, 500 kHz (Steam Tanker). Full data letter verified by Radio Officer. Received in 21 days for an English utility report and mint stamps. Ship address: Sabine Towing & Transportation Co. Inc., P.O. Box 1528, Groves, TX 77619-1528 (Holbrook, MD)

STAR VANRI-DUOF, 500 kHz (Bulk Carrier/Cargo). Full data prepared card verified by Radio Officer. Received in 72 days for an English utility report and one US dollar. Ship address: J.R. Teihcson & Management Co. Ltd., Room 1403, Tung Wai Comm'l Bldg., 109 Gloucester Rd., Hong Kong. (Holbrook, MD)

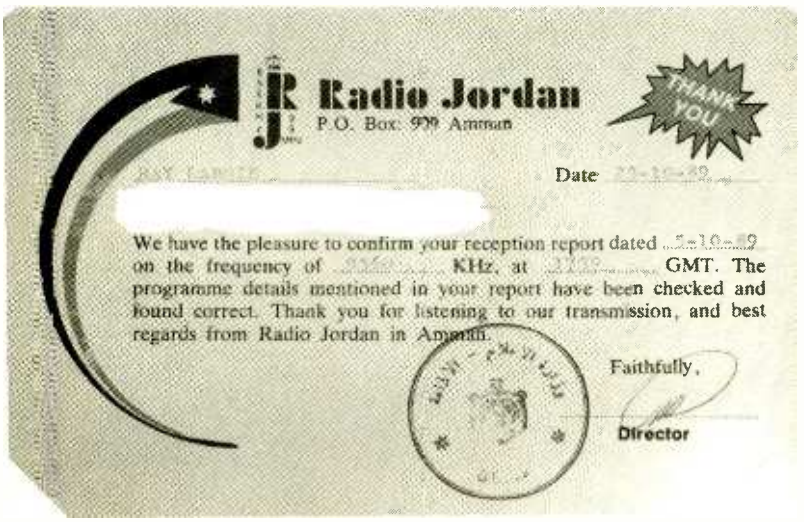
SOUTH AFRICA

Channel Africa, 15430 kHz. Full data wildlife card, without veri signer. Received in 24 days for an English report. Station stickers and magazine Southern Africa Today included. Station address: P.O. Box 91313, Auckland Park 2006, Johannesburg, Republic of South Africa. (Doug Merkel, St Louis, MO)

Radio Orion, 4810 kHz. Full data station card, verified by Kathy Otto. Received in 2 months for an English report and mint stamps. Station address: SABC, P.O. Box 91312, Auckland Park 2006, Johannesburg, Republic of South Africa. (Rausch, NJ)

SYRIA

Syria Broadcasting & TV Service, 15095 kHz. Full data station logo card, without veri signer. Received in 60 days for an English report and 2 IRCs. Station address: Ommayad Square, Damascus, Syria. (King, Canada)



Ray Labrie of Portsmouth, NH, received this QSL from Radio Jordan.

English language

shortwave guide

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	W: Wednesday	A: SAturday
M: Monday	H: THursday	
T: Tuesday	F: Friday	

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

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

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

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

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

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

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.

Programs for Shortwave Listeners:

This section, published quarterly, lists programs with news and information about shortwave radio for listeners. (RR) denotes reruns of programs broadcast earlier in the week. For brevity, only programs at certain peak listening times are included.

Sundays
0013 Spanish National Radio: DX Spot
0018 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round
0039 HCJB: DX Party Line
0106 Radio Prague: DX Special
0110 Voice of America (am,ca): Communications World
0113 Spanish National Radio: DX Spot (RR)
0117 Deutsche Welle: Technical Tips For DXers (monthly)
0130 Radio Romania Int'l: DX Mailbag
0140 Radio Havana Cuba: DX'ers Unlimited
0200 Radio For Peace Int'l: World Of Radio
0200 WRNO: World Of Radio
0215 KSDA, Guam: DX Asiawaves
0218 Swiss Radio Int'l: Swiss SW Merry-Go-Round (RR)
0239 HCJB: DX Party Line (RR)
0250 Radio Budapest: DX World
0305 WWCR: World Of Radio
0317 Deutsche Welle: Tech Tips For DXers (monthly) (RR)
0330 Radio Japan: Media Roundup
0330 TWR, Bonaire: Bonaire Wavelengths
0330 Voice of Turkey: DX Corner (biweekly)
0340 Radio Havana Cuba: DX'ers Unlimited (RR)
0406 Radio Prague: DX Special (RR)
0418 Swiss Radio Int'l: Swiss SW Merry-Go-Round (RR)
0509 HCJB: DX Party Line (RR)
0513 Spanish National Radio: DX Spot (RR)
0517 Deutsche Welle: Tech Tips For DXers (monthly) (RR)
0540 Radio Havana Cuba: DX'ers Unlimited (RR)
0635 Radio Korea: Shortwave Feedback
1135 Radio Korea: Shortwave Feedback (RR)
1250 Radio Korea: Shortwave Feedback (RR)
1325 Kol Israel: DX Corner
1435 Radio Korea: Shortwave Feedback (RR)
1440 FEBC Radio Int'l, Philippines: DX Report
1530 Polish Radio, Warsaw: DX Program
1530 Radio Japan: Media Roundup (RR)
1615 KSDA, Guam: DX Asiawaves (RR)
1635 Radio Korea: Shortwave Feedback (RR)
2300 Radio For Peace Int'l: World Of Radio (RR)
2300 WWCR: World Of Radio (RR)
2330 Radio Japan: Media Roundup (RR)

Mondays
0105 Radio Korea: Shortwave Feedback (RR)
0110 Radio Tashkent: DX Program (biweekly)
0145 FEBC Radio Int'l, Philippines: DX Dial
0430 Radio New Zealand Int'l: Mailbox (biweekly)
1230 Polish Radio, Warsaw: DX Program (RR)
1307 Radio Vlaanderen Int'l: Radio World
1400 Voice of the Mediterranean: DX Program
1420 R Romania Int'l: Special Program For Radio Amateurs
1435 All India Radio: DX'ers Corner (biweekly)
1500 Radio For Peace Int'l: World Of Radio (RR)
2320 Radio Vilnius: Feature For DX'ers

Tuesdays
0040 All India Radio: DX'ers Corner (biweekly) (RR)
0150 R Romania Int'l: Spec Program For Radio Amateurs (RR)
0340 Radio Sofia: Calling Amateurs And DX'ers
0600 Voice of the Mediterranean: DX Program (RR)
1130 Radio Australia: Communicator
1130 WWCR: World Of Radio (RR)
1243 Radio Sweden: MediaScan (biweekly)
1510 Polish Radio, Warsaw: DX Program (RR)
1513 Radio Sweden: MediaScan (biweekly) (RR)
1530 Radio Australia: Communicator (RR)

Wednesdays
0040 Radio Havana Cuba: DX'ers Unlimited (RR)
0113 Radio Sweden: MediaScan (biweekly) (RR)
0213 Radio Sweden: MediaScan (biweekly) (RR)
0240 Radio Havana Cuba: DX'ers Unlimited (RR)
0245 Radio Budapest: DX News
0300 Radio For Peace Int'l: World Of Radio (RR)
0415 BBC: Waveguide
0440 Radio Havana Cuba: DX'ers Unlimited (RR)
0640 Radio Havana Cuba: DX'ers Unlimited (RR)
1100 Radio For Peace Int'l: World Of Radio (RR)
1210 Polish Radio, Warsaw: DX Program (RR)
1315 FEBC Radio Int'l, Philippines: DX Spot

Thursdays
0014 Radio Prague: DX Special (RR)
0100 HCJB: Ham Radio Today
0130 BBC: Waveguide (RR)
0150 Radio Netherlands: Media Network
0215 RAE, Buenos Aires: DX Actuality
0250 Radio Budapest: DX World (RR)
0300 HCJB: Ham Radio Today (RR)
0314 Radio Prague: DX Special (RR)
0530 HCJB: Ham Radio Today (RR)
1150 Radio Netherlands: Media Network (RR)
1350 Radio Netherlands: Media Network (RR)
1415 FEBC Radio Int'l, Philippines: DX Dial (RR)
1550 Radio Netherlands: Media Network (RR)

Fridays
0050 Radio Netherlands: Media Network (RR)
0250 Radio Netherlands: Media Network (RR)
0350 Radio Netherlands: Media Network (RR)
1140 Radio Sofia: Radio Sofia Calling
1152 Radio Yugoslavia: Radio Hams' Corner
1511 Radio Portugal: DX Program (monthly)

Saturdays
0030 Radio Sofia: Radio Sofia Calling (RR)
0052 Radio Yugoslavia: Radio Hams' Corner (RR)
0115 FEBC Radio Int'l, Philippines: DX Report (RR)
0152 Radio Yugoslavia: Radio Hams' Corner (RR)
0241 Radio Portugal: DX Program (monthly) (RR)
0245 Radio Budapest: DX News (RR)
0340 Radio Sofia: Radio Sofia Calling (RR)
0400 Radio For Peace Int'l: World Of Radio (RR)
0618 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round (RR)
1118 Swiss Radio Int'l: Swiss SW Merry-Go-Round (RR)
1130 TWR, Bonaire: Bonaire Wavelengths (RR)
1200 Radio For Peace Int'l: World Of Radio (RR)
1210 Voice of America: Communications World (RR)
1305 Radio Vlaanderen Int'l: Radio World (RR)
1318 Swiss Radio Int'l: Swiss SW Merry-Go-Round (RR)
1340 Radio Tashkent: DX Program (biweekly) (RR)
1400 Radio Romania Int'l: DX Mailbag (RR)
1518 Swiss Radio Int'l: Swiss SW Merry-Go-Round (RR)
1615 KSDA, Guam: DX Asiawaves (RR)
2315 KSDA, Guam: DX Asiawaves (RR)
2335 Radio Vlaanderen Int'l: Radio World (RR)
2350 Radio Nacional, Bogota: Colombia DX

English language

shortwave guide

MT Monitoring Team

P.O. Box 98, Brasstown, NC 28902-0098

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Gayle Van Horn
Louisianna

Jim Frimmel
Texas

June Deadline: April 29

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.

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 Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l
Radio Norway Int'l [M]
Radio Prague
Radio Sofia
Radio Thailand
Radio Ukraine Int'l
SBC Radio 1, Singapore
Spanish National Radio
Swiss Radio Int'l
Voice of America
WWCR [T-A]
0005
Radio Pyongyang
0010
China Radio Int'l*
0030
All India Radio
C Science Monitor (as) [M]
Christian Science Monitor [T-F]
FEBC Radio Int'l, Philippines
HCJB
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio Netherlands
Radio New Zealand Int'l [M-F]
Radio Yugoslavia
Voice of America (am,as)
(Special English) [T-S]
V of America (as) (Spec Eng) [M]
0035
All India Radio (News Service)
0045
Radio Korea (News Service)
0055
WRNO [W, A]

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 [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Prague
Radio Romania Int'l
Radio Tashkent
Radio Thailand
Radiotelevisione Italiana
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
Voice of Indonesia
WWCR [T-A]
0115
Radio Havana Cuba* [T-S]
0125
Radio Korea [T-A]
0130
C 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 Tirana
Radio Yugoslavia
Voice of Greece
0145
Radio Finland [T-S]
0155
Voice of Indonesia

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 [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
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]
0215
Radio Cairo
Radio Nepal
0230
C Science Monitor (af,me) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio Pakistan (Special English)
Radio Portugal [T-A]
Radio Tirana
SLBC, Sri Lanka
0245
All India Radio (News Service)
0250
Radio Yerevan

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 Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio Prague
Radio Romania Int'l
Radio Sofia
SBC Radio 1, Singapore
Voice of America
Voice of Free China
WRNO [F]
WWCR [T-A]
0305
Radio Bangladesh
0309
BBC*
0310
China Radio Int'l*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (af)*
C 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
0355
Radio Japan [M-F]
WYFR (Network) [T-A]

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
BBC
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
China Radio Int'l
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 Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka
0402
Radio Botswana
0405
Radio Pyongyang
0410
China Radio Int'l*
0425
Radiotelevisione Italiana
0430
C Science Monitor (af,as) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Finland [M-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Romania Int'l
0445
BBC (af)* [M-F]
0450
Channel Africa, Johannesburg

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 Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio Thailand
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
WWCR [M]
ZNBC Radio, Lusaka
0510
China Radio Int'l*
Radio Botswana [M-A]
0515
Radio Canada Int'l [M-F]
Radio Havana Cuba* [T-S]
0520
Radio For Peace Int'l [T-A]
0530
C 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
0545
Radio Romania Int'l
Voice of Nigeria*

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
BBC (af)* [A-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle

newsline

GBC Radio, Accra*
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Prague
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Malaysia
ZNBC Radio, Lusaka [M-A]
0603
Croatian Radio, Zagreb [M-A]
0605
Radio Pyongyang
0609
BBC*
0630
BBC (af)* [M-F]
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio Vlaanderen Int'l
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0645
Radio Finland [M-A]
Voice of Nigeria*
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 Liberia
Radio Moscow
Radio New Zealand Int'l [M-F]
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
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 Ghana
Radio Moscow
Radio Netherlands
Radio Prague
0750
Radio For Peace Int'l [T-A]
Radio New Zealand Int'l* [M-F]
Radio Pacific Ocean [A]
0755
Radio Japan [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 Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
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
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 New Zealand Int'l [M-F]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0910
China Radio Int'l*
0915
Radio Korea (News Service)
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
Kol Israel
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S]
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
WYFR (Network) [M-F]
ZNBC Radio 2, Lusaka [M-A]
1010
China Radio Int'l*
1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Moscow
Radio Prague
Radio Sofia
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
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 Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Pakistan
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
WWCR [M-F]
ZNBC Radio, Lusaka
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Botswana [A-S]
Radio New Zealand Int'l* [M-F]
WYFR (Network) [M-F]
1130
Christian Science Monitor [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]
Radio Korea [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 [M-F]
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [M-F]
Radio Norway Int'l [S]
Radio Romania Int'l
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
TWR, Bonaire [A-S]
Voice of America
WYFR (Network) [M-F]
1203
Croatian Radio, Zagreb
1210
China Radio Int'l*
1215
HCJB [M-F]
Radio Korea
1230
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Cairo
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
HCJB [M-F]
1258
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 (na) [S]
Radio Iraq Int'l
Radio Jordan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Tanzania [A-S]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WYFR (Network) [M-F]
1305
Radio Pyongyang
1310
China Radio Int'l*
Radio Korea [M-F]
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 (as)
Radio Finland [M-A]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
V of America (Special English)
Voice of Turkey
1346
All India Radio [A]

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Canada Int'l (na) [S]
Radio France Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
ZNBC Radio 2, Lusaka [M-F]
1402
Radio Finland [M-A]
1410
China Radio Int'l*
1415
LBS, Monrovia (Special English)
Radio Canada Int'l (eu)
Radio Korea (News Service)
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 Moscow
Radio Netherlands
WYFR (Network) [M-F]
1440
FEBC Radio Int'l, Philippines* [M-F]
1445
BBC (as) (Special English) [M-F]
Voice of Myanmar
1455
All India Radio
Radio Korea [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l [S]
Radio Japan
Radio Jordan
Radio Moscow
Radio Omdurman, Sudan
Radio Portugal [M-F]
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka

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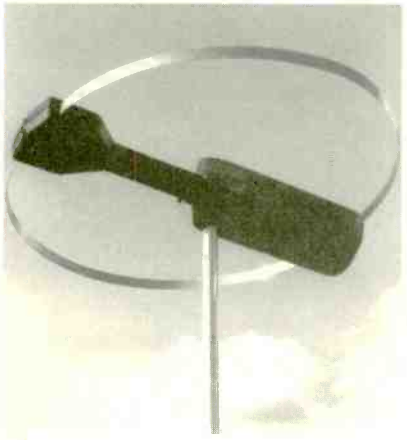

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Swiss Radio Int'l
Voice of America
Voice of Ethiopia
WYFR (Network) [A]
1505
Radio Pyongyang
1510
China Radio Int'l*
1520
Radio Tallinn [M-F]
Voice of Greece
1525
Radio Veritas Asia [T-F]
1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Moscow
Radio Netherlands
Radio Tirana
Voice of Ethiopia
Voice of Nigeria
1540
Radio Veritas Asia [A-M]
Voice of Nigeria*
1545
Radio Korea (News Service)
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 Canada Int'l
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Liberia
Radio Moscow
Radio Norway Int'l [S]
Radio Pakistan
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
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 Austria Int'l [M-F]
Radio Canada Int'l (as)
Radio Moscow
Radio Romania Int'l
UAE Radio, Dubai
V of America (eu) (Spec Eng)
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
Kol Israel
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Japan
Radio Moscow
Radio Norway Int'l [S]
Radio Pakistan
Radio Prague
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
WWCR [M-F]
1705
Radio Bangladesh
Radio Pyongyang
1710
China Radio Int'l*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Moscow
Radio Netherlands
Radio Sofia
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 Canada Int'l
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Omdurman, Sudan
Radio Portugal [M-F]
Radio Romania Int'l
Radio Tanzania
Radio Vlaanderen Int'l
Voice of America
WWCR [M-F]
ZNBC Radio, Lusaka
1815
ZNBC Radio 2, Lusaka*
1825
Radio New Zealand Int'l* [M-F]
1830
BSKSA, Riyadh
Christian Science Monitor [M-F]
Polish Radio, Warsaw
Radio Finland [S-F]
Radio Kuwait
Radio Mogadishu
Radio Moscow
Radio Netherlands
Radio Prague
Radio Yugoslavia
V of America (Special English)
1840
Voice of Greece
1845
BSKSA, Riyadh*
Radio Cote d' Ivoire
Radio Guinea, Conakry
1855
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 Canada Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Portugal [M-F]
Radio Vilnius
RAE, Buenos Aires [M-F]
SLBS, Freetown
Spanish National Radio
Voice of America
1903
Croatian Radio, Zagreb [S]
Voice of Greece
1905
Radio New Zealand Int'l* [S-F]
1910
China Radio Int'l*
Radio Botswana
1930
BBC (af)* [S, F]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Austria Int'l
Radio Ghana
Radio Moscow
Radio Netherlands
Voice of Nigeria
1935
Radio New Zealand Int'l* [F]
Radiotelevisione Italiana
1945
Radio Sofia
Radio Togo
1955
Radio Korea [M-F]
Radio New Zealand Int'l* [S-H]

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 Moscow
Radio New Zealand Int'l [S-F]
Radio Prague
Radio Romania Int'l
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*
2025
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional de Angola
2045
BSKSA, Riyadh
Radio Korea (News Service)
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 Canada Int'l
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Prague
Radio Ukraine Int'l
Radio Vlaanderen Int'l
Radio Yugoslavia
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka
2103
Croatian Radio, Zagreb
2110
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2115
Radio Finland [S-F]
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 Cairo
Radio Havana Cuba [M-A]
Radio Moscow
Radio Vilnius
2145
Radio Korea
Radio Sofia
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 Moscow
Radio New Zealand Int'l [A-H]
Radio Tirana
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*
Radio New Zealand Int'l* [S-H]
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
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Norway Int'l [S]
Radio Vilnius
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
WYFR (Network) [M-F]
2305
Radio Pyongyang
2330
Christian Science Monitor [M-F]
Radio Austria Int'l [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]

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CQ's New 1993 Guide to Amateur Radio

New hams—Novices, Techs, Generals or whatever ticket you start with—have questions. What do I look for in an HT? How should I operate on the local repeaters? What's it like to get on HF? How do I set up a station? How do I use an SWR bridge? These questions and a hundred more. As important as these problems are, there's one other question that's more important: Where can I go to find the answers?

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English language

shortwave guide

0000 UTC [8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0030	Australia, Radio	13605pa	15320va	15365pa	17630pa
		17715au	17750as		
0000-0100	Bulgaria, Radio Sofia	7225na	9700na	11720na	
0000-0100	Canada, CBC Northern Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	9755na		
0000-0100	China, China Radio Intl	9770na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0100	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0000-0030 a	Croatian Radio via WHRI	7315na			
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0027	Czech Republic, R Prague	7345na	9580na	11990na	
0000-0045	India, All India Radio	9910as	11715as	11745as	15110as
0000-0030	Lithuania, Radio Vilnius	7150am			
0000-0100	New Zealand, R NZ Intl	15120pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 s	Norway, Radio Norway Intl	9645am			
0000-0100	Palau, KHBN	9830va			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow	6000na	7115na	7150na	7170va
		7220va	7295va	9685va	9725va
		9750va	9870na	9890va	12050na
		15425na	15455va	17570as	17655as
		17890va	21480na	21690as	
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	Spain, Spanish Natl Radio	9530na			
0000-0030	Switzerland, Swiss R Intl	6135na	9650na	9885na	12035na
		17730na			
0000-0100	Thailand, Radio	9655as	11905as		

0000-0030	United Kingdom,BBC London	5975na	6005sa	6175na	6180eu
		6195as	7325am	9570as	9580as
		9590na	9915am	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15280na	15360pa		
0000-0100	USA, CSMonitor Boston MA	13760sa	17555as		
0000-0100 sa	USA, CSMonitor Boston MA	17865as			
0000-0100	USA, KCBI Dallas TX	15725va			
0000-0100	USA, KTBN Salt Lk City UT	7510am			
0000-0100	USA, VOA Washington DC	5995am	6130as	7120as	7405am
		9455am	9770as	9775am	11580am
		11695am	11760as	15120am	15185as
		15205am	15290as	17735as	17820as
0000-0100	USA, WHRI Noblesville IN	7315na			
0000-0100	USA, WINB Red Lion PA	15145eu			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WYFR Okeechobee FL	5985am	6085na		
0010-0015	Kirghizia, Bishkek	4010as			
0030-0100	Australia, Radio	11720pa	11880pa	13605pa	15240pa
		15320pa	15365pa	17715pa	17750pa
		17795pa	17880pa	21740pa	
0030-0100	Belgium, R Vlaanderene	9930na	13655sa		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	6020na	6165na	9825as	9860as
		11655as	11835na	13700as	
0030-0100	South Korea, Radio Korea	15575am			
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	United Kingdom,BBC London	5975na	6005sa	6175na	6180eu
		7325am	9580as	9590am	9915am
		11750sa	12095na	15260sa	15310as
		15360pa			
0035-0040	India, All India Radio	4860do	5120as	11920as	

SELECTED PROGRAMS

Sundays

0005 Radio Norway Int'l: Norway Now. See S 1205.
0011 Radio Havana Cuba: Spotlight On Latin America. Analysis of issues affecting Latin America.
0015 Radio Havana Cuba: Headliners. Views behind the stories making news this week.
0030 BBC: The Ken Bruce Show. Ken Bruce plays the latest releases, from pop to jazz to country.
0035 Radio Havana Cuba: World Of Sports. The latest sports news.
0040 Radio Havana Cuba: World Of Stamps. New releases and other news on the philately front.
0045 Radio Korea: News Commentary. Opinion on developments in Korea and worldwide.
0050 Radio Korea: Sites And Sounds. A look at Korea's tourist attractions and industry.

Mondays

0000 Radio Havana Cuba: Sunday Review. A look back at the week in Cuba.
0010 Radio Havana Cuba: The Mailbag Show. Listener letters and comments.
0020 Radio Havana Cuba: The Jazz Place. Langston Wright presents jazz music.
0030 BBC: In Praise Of God. Christian religious services and meditations.
0045 Radio Korea: Echoes Of Korean Music. See S 0615.

Tuesdays

0011 Radio Havana Cuba: Spotlight On The Americas. Analysis of issues affecting the Americas.
0030 BBC: Panel Game. This month, Brian Sibley hosts another series of the theatrical game show "Break A Leg."
0035 Radio Havana Cuba: Sports In Cuba. An in-depth look at Cuban athletics.
0040 Radio Havana Cuba: Let's Talk Law. A top jurist answers questions on Cuban justice.
0045 Radio Korea: News Commentary. See S 0045.
0050 Radio Korea: Seoul Calling. See M 0620.

Wednesdays

0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0015 Radio Havana Cuba: Headliners. See S 0015.
0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs. This month: "The Letters Of Charles Dickens" (7th); "Namibian Pictures" (28th).
0040 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0045 Radio Korea: News Commentary. See S 0045.
0050 Radio Korea: Seoul Calling. See M 0620.

Thursdays

0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0015 Radio Havana Cuba: Headliners. See S 0015.
0030 BBC: Comedy/Quiz (except 27th: Two Cheers For May). See W 1530.
0035 Radio Havana Cuba: The Way We See It. Commentary from Radio Havana Cuba staff.
0040 Radio Havana Cuba: Cuba Today. A magazine program.
0045 Radio Korea: News Commentary. See S 0045.
0050 Radio Korea: Seoul Calling. See M 0620.

Fridays

0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0015 Radio Havana Cuba: Headliners. See S 0015.
0030 BBC: Music Feature. Geoffrey Norris follows "In The Steps of Rachmaninoff" (7th); Edward Greenfield returns with more "Classic Recordings" (14th, 21st, 28th).
0035 Radio Havana Cuba: Feature Report. Interviews with prominent figures on topics in the news.
0045 Radio Korea: News Commentary. See S 0045.
0050 Radio Korea: Seoul Calling. See M 0620.

Saturdays

0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0015 Radio Havana Cuba: Cuba Today. See H 0040.
0030 BBC: From The Weeklies. The best extracts from the week's newspapers and magazines.
0035 Radio Havana Cuba: The Way We See It. See H 0035.
0040 Radio Havana Cuba: Kaleidoscope. Interviews with Cuban artists talking about their own contributions to Cuba's culture and the arts.
0045 BBC: Recording Of The Week. See M 0615.
0045 Radio Korea: News Commentary. See S 0045.
0050 Radio Korea: Let's Sing Together. See F 0620.

0100 UTC [9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0200 twhfa	Argentina,RAE BuenosAires	11710am			
0100-0200	Australia, ABC Brisbane	4920co	9660do		
0100-0200	Australia, ABC Perth	9610co			
0100-0200	Australia, Radio	11720pa	11880pa	15240va	15320pa
		15365as	17670as	17715pa	17750as
		17880as	21525as	21590as	21740pa
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200 sm	Canada, RCI Montreal	9535am	9755am	11845am	11940am
		13720am			
0100-0130 twhfa	Canada, RCI Montreal	5960na	9755na		
0100-0200	Costa Rica,R forPeace Int	7375am	7385na	13630am	15030am
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0127	Czech Republic, R Prague	5930na	7345na	9580na	
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9565na
		9700na	9765na	11810na	11865na
		13610na	13770na	15105na	
0100-0200	Guam, KSDA Agana	15610as			
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am	
0100-0120	Italy, RAI Rome	9575am	11800am		
0100-0200	Japan, NHK Tokyo	11840me	15195as	17810as	17835as
		17845as			
0100-0200	Namibia, Namibia BC Corp	3290af			
0100-0200	New Zealand, R NZ Intl	15120oa			
0100-0130 s	Norway, Radio Norway Intl	9560am			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow	6000va	6045va	7115na	7150as
		7295va	9725va	9750va	9870va
		9875na	11655va	11775as	12015as
		12050na	15425na	17655as	17825va
		17890as	21480na	21530va	21690va
0100-0200	Russia, Radio Moscow	21770va	21790va		
0100-0200	Singapore, SBC1	5010do	5052do	11940do	
0100-0130	South Korea, Radio Korea	15575am			
0100-0200	Spain, Spanish Natl Radio	9530na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Sweden, Radio	9695as	11820as		
0100-0200	Thailand, Radio	9655as	11905as		
0100-0200	Ukraine, R Ukraine Intl	6080eu	7180eu	7195eu	7240eu
		9640eu	9710eu	9860eu	10344eu
		17605na	17690na		
0100-0130	United Kingdom,BBC London	5975na	6005sa	6175na	6180eu
		7325am	9590am	9590am	9915am
		11750sa	11955as	12095na	15260sa
		15310as	15360pa	17790as	
0100-0200	USA, CSMonitor Boston MA	5850na	9850af	13760sa	17555as
0100-0200 sa	USA, CSMonitor Boston MA	17865as			
0100-0200	USA, KCBI Dallas TX	15725am			
0100-0200	USA, KTBN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, VOA Washington DC	5995am	6130am	7205as	7405am
		7651as	9455am	9670va	9740as
		9775am	11580am	11705am	15120am
		15205am	15250as	17740as	21550as
0100-0130	USA, WEWN Birmingham, AL		9825as		
0100-0200	USA, WHRI Noblesville IN	7315am			
0100-0200	USA, WINB Red Lion PA	15145na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA		7355na		
0100-0200	USA, WYFR Okeechobee FL	6065am	9505am	15440am	
0100-0130	Uzbekhistan, R Tashkent	5955as	5995as	7325as	7335as
		9740as	9755as	11975as	
0100-0130	Yugoslavia, Radio	9580am			
0130-0200	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	6015na	9870sa	9880na	
0130-0150 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0130-0200	Netherlands, Radio	9860as	11655as	12025as	13700as
0130-0200	United Kingdom,BBC London	5975na	6005na	6175na	6180eu
		7325am	9590na	9590am	9915am
		11750sa	11955as	12095na	15260sa
		15310as	15360pa	17790as	
0145-0200 smtwhf	Finland, Radio	9560na	11755na		
0145-0200	Vatican State, Vatican R	7335pa	9650as		

SELECTED PROGRAMS

Sundays

0101 BBC: Play Of The Week. This month: "Phoenix" (2nd); "Cider With Rosie" (9th); "The Ascent Of Rum Doodle" (16th); "The Tragical History of Dr. Faustus" (23rd); "Marlowe's Diaries" (30th, begins at 0030 UTC).
0105 Radio Korea: From Us To You. Listener letters, questions, and comments, interspersed with Korean music.
0105 Radio Norway Int'l: Norway Now. See S 1205.
0109 Deutsche Welle: Commentary. Opinion on current issues.
0111 Radio Havana Cuba: Sports Report. The latest sports news.
0117 Deutsche Welle: Feature. "Mailbag," "Nickelodeon" (listener requests for German music), or "Technical Tips For DXers."
0134 Deutsche Welle: German By Radio. An advanced German language course for English speakers.
0135 Radio Austria Int'l: Report From Austria. A magazine program, covering all aspects of Austrian life and events in the news, and opening with the latest news bulletin.
0140 Radio Havana Cuba: DX'ers Unlimited. Arnie Coro presents shortwave radio news.

Mondays

0100 Radio Havana Cuba: From Havana. Culture and the arts in Cuba.
0101 BBC: Feature. This month: "Breakfast Of Champions" (3rd); "When Madness Ruled The World" (10th); "Desire, Danger, And The Devil" (17th); "China Misperceived" (24th); "Advocacy" (31st).
0105 Radio Korea: Shortwave Feedback. See S 0635.
0109 Deutsche Welle: Commentary. See S 0109.
0115 BBC: Feature. Roger Hardy returns to re-examine "The Making Of The Middle East" (3rd).
0116 Deutsche Welle: Living In Germany. A weekly look at the social scene in Germany.
0130 Radio Havana Cuba: Feature. Topical programming on various subjects.
0134 Deutsche Welle: Larry's Random Selection. Larry Wayne takes a look at Germany from the lighter side.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0145 BBC: Musical Feature. Frank Renton profiles bands in "World Bandstand" (3rd, 10th, 17th); Peter Paul Nash meets "The Contemporary Virtuoso" (through June 28th).

Tuesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0110 Radio Korea: Tales From Korea's Past. See M 0640.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0130 BBC: Folk Routes. Ian Anderson presents a selection of roots music.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0135 Radio Havana Cuba: Feature. See M 0130.
0145 BBC: Health Matters. New medical developments and methods of keeping fit.

Wednesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0110 Radio Korea: Korean Cultural Variety. See T 0640.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0130 BBC: Talks. Tony Dortie talks with small-business experts in "Sound Business" (through June 9th).
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0135 Radio Havana Cuba: Feature. See M 0130.
0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.

Thursdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0110 Radio Korea: Pulse Of Korea. See W 0640.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0130 BBC: Waveguide. See W 0415.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0135 Radio Havana Cuba: Feature. See M 0130.
0140 BBC: Book Choice. See W 0425.
0145 BBC: The Farming World. An examination of agriculture, forestry, and fishing worldwide.

Fridays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0110 Radio Korea: Forward To Reunification. See H 0640.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0135 Radio Havana Cuba: Feature. See M 0130.
0145 BBC: Global Concerns. An update on environmental issues.

Saturdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0110 Radio Korea: Let's Learn Korean! See F 0640.
0111 Radio Havana Cuba: Sports Report. See S 0111.
0130 BBC: Short Story (except 1st: Seeing Stars). See S 0430.
0134 Deutsche Welle: Through German Eyes. See S 1513.
0135 Radio Havana Cuba: Feature. See M 0130.
0145 BBC: Jazz Now And Then. George Reid presents a mix of new releases and classic tracks.

English language

shortwave guide

0200 UTC [10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	6070do	9610do		
0200-0300	Australia, Radio	11720pa	11880va	15240pa	15320as
		15365pa	17670pa	17715pa	17750as
		17795pa	17880as	21525pa	21590as
		21740pa			
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			
0200-0300 twhfa	Canada, RCI Montreal	9535sa	9755sa	11845sa	11940sa
		13720sa			
0200-0300	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0200-0300	Cuba, Radio Havana Cuba	6010na	9655na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11865na		
0200-0210 smtwhf	Finland, Radio	9560na	11755na		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	13790as	15185as	15560as
0200-0300 as	Guam, KSDA Agana	13720as			
0200-0300	Hungary, Radio Budapest	6110na	9835na	11910na	
0200-0230 mtwhfa	Kenya, Voice of	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia, Namibia BC Corp	3290af			
0200-0300	New Zealand, R NZ Intl	15120pa			
0200-0230 s	Norway, Radio Norway Intl	9560na	11925na		
0200-0230	Philippines, FEBC Manila	15450as			
0200-0300	Romania, R Romania Intl	5990am	6155am	9510am	9570am
		11830am	11940am		
0200-0300	Russia, Radio Moscow	7115na	7150va	9775va	9830va
		9870va	9890va	11775va	12015va
		12050na	15425na	17570as	17655as
		17890va	21480na	21585as	21690as
		21790va			
0200-0300	S Africa, Channel Africa	9730af			
0200-0300	Singapore, SBC1	5010do	5052do	11940do	
0200-0227	Slovakia, Slovak Radio	5930am	9580am		
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	9765pa	11740ca
		11860as	15345as		
0200-0300	Thailand, Radio	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		
0200-0300	USA, CSMonitor Boston MA	5850na	9350af	13760sa	
0200-0300 sa	USA, CSMonitor Boston MA	17555as	17865as		
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	9740as
		11705as	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, WYFR Okeechobee FL	5985am	6065am	9505am	15440am
0200-0230	Yugoslavia, Radio	9580na	11870na		
0205-0238	Honduras,La Voz Mosquitia	4911do			
0205-0230 tes-vl	Moldova, Nat'l R of Mold.	7125na			
0230-0300	Albania, R Tirana Intl	9580na	11840na		
0230-0300 s	Kenya, Voice of	4935do			
0230-0300	Netherlands, Radio	9860as	11655as	12025as	13700as
0230-0245	Pakistan, Radio	9515as	17705as	17725as	21485as
		21730as			
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as	
0230-0300 twhfa	Portugal, Radio	9570am	9600am	9705am	11840am
0230-0300	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9915am
		11730af	11750sa	11955as	12095na
		15260sa	15310as	15360pa	17790as
0230-0300	USA, KCBI Dallas TX	9815am			
0245-0300	India, All India Radio	3945as	7110as	11830as	15120as
		15220as			
0250-0300	Vatican State, Vatican R	6095na	7305na		

SELECTED PROGRAMS

Sundays

0205 Radio Norway Int'l: Norway Now. See S 1205.
0209 Deutsche Welle: Commentary. See S 0109.
0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0213 Deutsche Welle: Sports Report. The latest news from the world of sports.
0215 Radio Havana Cuba: Headliners. See S 0015.
0219 Deutsche Welle: Mailbag Asia. Musical requests and answers to listener questions.
0220 Radio Budapest: Feature. Topical programming on various subjects.
0230 BBC: Feature. Margaret Mckee explores floral symbolism in "The Language Of Flowers" (2nd, 9th, 16th, 23rd); the plight of a Hungarian dissident is profiled in "I Leave Without Malice" (30th).
0230 Radio Budapest: Musical Feature. Programs in this time slot range from "Ball At The Savoy" to "Rap And The Video Age."
0235 Radio Havana Cuba: World Of Sports. See S 0035.
0240 Radio Budapest: Feature. Rotating programs in this time slot include "What You Say" and "Business Partner."
0240 Radio Havana Cuba: World Of Stamps. See S 0040.
0250 Radio Budapest: DX World. News about shortwave radio listening.

Mondays

0200 Radio Havana Cuba: Sunday Review. See M 0000.
0209 Deutsche Welle: Asia-Pacific Report. Correspondents' reports, interviews, and analysis from Asia and the Pacific.
0210 Radio Havana Cuba: The Mailbag Show. See M 0010.
0220 Radio Budapest: The Weeklies. Analysis from the weekend supplements of major Hungarian newspapers.
0220 Radio Havana Cuba: The Jazz Place. See M 0020.
0230 BBC: Composer Of The Month. Profiles of famous classical-music composers. This month: Berlioz.
0230 Radio Budapest: Short Story. Brief dramas written by Hungarian authors.
0234 Deutsche Welle: European Journal. A review of major events in Europe, with interviews and analysis.
0240 Radio Budapest: Feature. Rotating programs in this time slot include "Magazine 90," "Classics," "Hit List," and "Down Melody Lane."
0250 Radio Budapest: Coming To Hungary? People, places, and things Hungarian.

Tuesdays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio Havana Cuba: Spotlight On The Americas. See T 0011.
0230 BBC: Quiz. See M 1215.
0230 Radio Budapest: Musical Feature. See S 0230.
0234 Deutsche Welle: European Journal. See M 0234.
0235 Radio Havana Cuba: Sports In Cuba. See T 0035.
0240 Radio Havana Cuba: Let's Talk Law. See T 0040.

Wednesdays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio 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.
0230 Radio Budapest: Feature. See S 0240.
0234 Deutsche Welle: European Journal. See M 0234.
0240 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0245 Radio Budapest: DX News. News about shortwave radio listening.

Thursdays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio 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.
0230 Radio Budapest: The Weeklies. See M 0220.
0234 Deutsche Welle: European Journal. See M 0234.
0235 Radio Havana Cuba: The Way We See It. See H 0035.
0240 Radio Budapest: Feature. See M 0240.
0240 Radio Havana Cuba: Cuba Today. See H 0040.
0250 Radio Budapest: DX World. See S 0250.

Fridays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0215 Radio Havana Cuba: Headliners. See S 0015.
0230 BBC: Drama. See H 1130.
0230 Radio Budapest: Feature. See S 0220.
0234 Deutsche Welle: European Journal. See M 0234.
0235 Radio Havana Cuba: Feature Report. See F 0035.
0245 Radio Budapest: Coming To Hungary? See M 0250.

Saturdays

0209 Deutsche Welle: Commentary. See S 0109.
0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0215 Radio Havana Cuba: Cuba Today. See H 0040.
0223 Deutsche Welle: Panorama. A review of the major news events of the week.
0230 BBC: People And Politics. Background to the British political scene.
0230 Radio Budapest: Short Story. See M 0230.
0234 Deutsche Welle: Economic Notebook. See F 1534.
0235 Radio Havana Cuba: The Way We See It. See H 0035.
0240 Radio Havana Cuba: Kaleidoscope. See A 0040.
0245 Radio Budapest: DX News. See W 0245.

English language

shortwave guide

0300 UTC [11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Australia, Radio	11720pa	11880va	15240pa 1	5320as
		15365as	17670as	17715pa	17750as
		17795pa	17880as	21525as	21590as
		21740pa			
0300-0400	Bulgaria, Radio Sofia	7290eu	9700na	11720na	
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9770na	11715na	
0300-0400	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0300-0400	Cuba, Radio Havana Cuba	6010na	9655na		
0300-0330	Czech Republic, R Prague	5930na	7345na	9810na	
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11865na		
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na
		11810na	11890na	13610na	13770na
		13790na	15205na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 m	Honduras, La Voz Evangel.	4820do			
0300-0400 sm	Honduras, R Luz y Vida	3250ca			
0300-0400	Japan, Radio	5960am	15230na	15325ca	17765as
		17810as	17825na	21610na	
0300-0400	Kenya, Voice of	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0400	Netherland Antilles, TWR	9535am	11930am		
0300-0400	New Zealand, R NZ Intl	15120pa			
0300-0330	Philippines, R Pilipinas	17760as	17840as	21580as	
0300-0400	Russia, Radio Moscow	7115na	7150na	9480na	9685va
		9715na	9775va	9830va	11895va
		12015va	12050na	15350as	15425va
		17570as	17590as	17655as	17755as
		17890va	21690as		
0300-0400	S Africa, Channel Africa	3995af	9695af	9730af	
0300-0400	S Africa, Radio Oranje	3230do			
0300-0400	Singapore, SBC1	5010do	5052do	11940do	
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765as	11745as
		15345na			
0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Thailand, Radio	9655as	11905as		
0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	6175na
		6180eu	6190af	6195me	7135me
		7230eu	7325am	9410eu	9600af
		9915am	11730af	11750sa	11760me
		11955me	12095va	15260sa	15310as
		15360pa			
0300-0400	USA, CSMonitor Boston MA	5850na	9350af	13760sa	
0300-0400 sa	USA, CSMonitor Boston MA	17555as	17865as		
0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0330	USA, VOA Washington DC	5965eu	6035af	7270af	11890af
		11905me	15160me	17810eu	17895me
0300-0400	USA, VOA Washington DC	6035af	7265af	7280af	7405af
		9575af	9885af	11835af	11850af
		11890af	11965af	15115af	
0300-0400	USA, WHRI Noblesville IN	7315na			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400 vl	USA, WRNO New Orleans LA		7395am		
0300-0400	USA, WYFR Okeechobee FL	5985am	6065am	9505am	
0300-0315	Vatican State, Vatican R	6095na	7305na		
0330-0400	Albania, R Tirana Intl	9580na	11825na		
0330-0400	Austria, R Austria Intl	6015ns	9870ca		
0330-0355 vl	India, All India Radio	7110as	15120as	15220as	
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	UAE, UAE Radio Dubai	11945na	13695eu	15320eu	15435na
0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	7230eu	9410eu
		9600af	11730af	11760me	11955me
		12095va	15280as	15310as	15420af
		21715as			
0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0345-0359 varies	Armenia, Radio Yerevan	11675na	11790na	13645am	15580na

SELECTED PROGRAMS

Sundays

0309 Deutsche Welle: Commentary. See S 0109.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. News from the world of sports.
0317 Deutsche Welle: Feature. See S 0117.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0330 Radio Austria Int'l: Austrian Coffee Table. A look at the arts, especially music.
0334 Deutsche Welle: German By Radio. See S 0134.
0340 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

0300 Radio Havana Cuba: From Havana. See M 0100.
0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Sports Roundup. See S 0315.
0316 Deutsche Welle: Living In Germany. See M 0116.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0330 Radio Havana Cuba: Feature. See M 0130.
0334 Deutsche Welle: Larry's Random Selection. See M 0134.

Tuesdays

0309 Deutsche Welle: European Journal. See M 0234.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0334 Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0335 Radio Havana Cuba: Feature. See M 0130.

Wednesdays

0309 Deutsche Welle: European Journal. See M 0234.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Discovery. An in-depth look at scientific research.
0334 Deutsche Welle: Insight. See T 1534.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0335 Radio Havana Cuba: Feature. See M 0130.

Thursdays

0309 Deutsche Welle: European Journal. See M 0234.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See 0315.
0330 BBC: Assignment. A weekly examination of topical issues, from Batman to bandits.
0334 Deutsche Welle: German By Radio. See S 0134.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0335 Radio Havana Cuba: Feature. See M 0130.

Fridays

0309 Deutsche Welle: European Journal. See M 0234.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in the worlds of religion.
0334 Deutsche Welle: Science And Technology. See M 1634.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0335 Radio Havana Cuba: Feature. See M 0130.

Saturdays

0309 Deutsche Welle: European Journal. See M 0234.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett presents classic Top 20 hits from 1964 (1st); 1976 (8th); 1987 (15th); 1971 (22nd); 1961 (29th).
0334 Deutsche Welle: Through German Eyes. See S 1513.
0335 Radio Havana Cuba: Feature. See M 0130.

English language

shortwave guide

0400 UTC [12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0500 tes	Australia, AAFR	17840af			
0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Australia, Radio	11720pa	11880pa	15240pa	15320as
		15365pa	17670as	17715pa	17795pa
		17840af	17880pa	21525as	21590au
0400-0404	Botswana, Radio	3356do	4830af	7255af	
0400-0500	Bulgaria, Radio Sofia	7290eu	9700na		
0400-0500	Canada, CBC Northern Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9505me	9650eu	9670me	
0400-0500	China, China Radio Intl	11680na			
0400-0500	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030om
0400-0430 varies	Croatian Radio via WHRI	7315na			
0400-0430	Cuba, Radio Havana Cuba	6010na	6180am	9655na	9815na
0400-0427	Czech Republic, R Prague	5930na	7345na	9810na	11985va
		13715va			
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	13770af
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0415 irreg	Iraq, Radio Iraq Intl	11860am			
0400-0415	Israel, Kol Israel	9435na			
0400-0500	Kenya, Voice of	4935do			
0400-0500	Lebanon,King of Hope	11530as			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500	New Zealand, R NZ Intl	15120pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 s	Norway, Radio Norway Intl	9560na	11865na		
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11830na	11940na		
0400-0500	Russia, Radio Moscow	7150na	7270va	7295va	9665va
		9735va	9870va	11675va	11895va
		12050na	15425na	17765va	17870va
		17890va			
0400-0500	S Africa, Channel Africa	3995af	9695af	9730af	
0400-0500 vl	S Africa, Radio Oranje	3230do			
0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	12035na	13635na
0400-0430	Tanzania, Radio	5985af	9685af	11765af	
0400-0430	Thailand, Radio	9655as	11905as		
0400-0500	Turkey, Voice of	9445na			
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, KCBI Dallas TX	9815am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0500	USA, VOA Washington DC	5995me	6035me	6040me	6140me
		6155me	6873me	7170me	7405me
		15752af			
0400-0430	USA, VOA Washington DC	7265af	7280af	7405af	9575af
		9885af	11835af	11850af	11890af
		11965af	15115af		
0400-0500	USA, WHRI Noblesville IN	7315na	9495sa		
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, WYFR Okeechobee FL	5985am	6065am	9505am	
0425-0440	Italy, RAI Rome	5990eu	7275me		
0430-0500	Cuba, Radio Havana Cuba	6010na	6180na	9815na	
0430-0500	Nigeria, Radio	3326do	4770do		
0430-0500	Russia, AWR Russia	15125eu			
0430-0500	Russia, R Aum Shinrikyo	17590as	17610as	17620as	17635as
		17655as	17720as	17730as	17740as
		17835as	17850as	17860as	17870as
		17880as	21505as	21515as	21585as
		21685as	21690as	21790as	21830as
0430-0500 irreg	Sudan, Radio SPLA	9170af	9190af		
0430-0500	Swaziland, TWR	5965af	9655af	11740af	
0430-0500	United Kingdom,BBC London	3955eu	5975na	6005af	6180eu
		6190af	6195eu	9410eu	9600af
		11760me	12095va	15280as	15310va
		15400af	15575va	21470va	21715as
0430-0500	USA, VOA Washington DC	7265af	7280af	7405af	9575af
0435-0500 mtwhf	Namibia, Namibia BC Corp	3290af			
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0455-0500	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

0405 Radio Norway Int'l: Norway Now. See S 1205.
0409 Deutsche Welle: Commentary. See S 0109.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0413 Deutsche Welle: Sports Report. See S 0213.
0415 BBC: Feature. Tony Hawks visits local radio stations world wide in "Around The World In 80 Minutes" (2nd, 9th, 16th); Stephen Hedges talks with top doctors about "Growing Points In Medicine" (through July 25th).
0415 Radio Havana Cuba: Headliners. See S 0015.
0419 Deutsche Welle: International Talking Point. A round-table discussion on major trends and events.
0430 BBC: Short Story. This month: "The Bowgada Birds" (9th); "Samuel's Story" (16th); "Bitter Spring" (23rd); "The Owl" (30th) (except 2nd: Seeing Stars, a monthly look at astronomy).
0434 Deutsche Welle: People And Places. Interviews, stories, and music beamed to Africa.
0435 Radio Havana Cuba: World Of Sports. See S 0035.
0440 Radio Havana Cuba: World Of Stamps. See S 0040.
0445 BBC: Musical Feature. Pop trivia is the fare for host Mark Radcliffe on "Pop The Question" (through June 27th).

Mondays

0400 Radio Havana Cuba: Sunday Review. See M 0000.
0409 Deutsche Welle: European Journal. See M 0234.
0410 Radio Havana Cuba: The Mailbag Show. See M 0010.
0415 BBC: Talks. Christopher Cook looks at English life from A to Zed in "An English Alphabet" (through June 28th).
0420 Radio Havana Cuba: The Jazz Place. See M 0020.
0430 BBC: Off The Shelf. This month: Colin Thubron's "Falling" (3rd-11th); "Three Short Stories" (12th-14th); Margaret Attwood's "The Handmaid's Tale" (17th-31st).
0434 Deutsche Welle: Africa In The German Press. A look at what German papers and weeklies have to say about Africa.
0445 BBC: Andy Kershaw's World Of Music. New and unusual sounds from the world over.

Tuesdays

0409 Deutsche Welle: Africa Report. Reports and background to the news from correspondents.
0411 Radio Havana Cuba: Spotlight On The Americas. See T 0011.
0415 BBC: Health Matters. See T 0145.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0435 Radio Havana Cuba: Sports In Cuba. See T 0035.
0440 Radio Havana Cuba: Let's Talk Law. See T 0040.
0445 BBC: Talks. See M 2315.

Wednesdays

0409 Deutsche Welle: Africa Report. See T 0409.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
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. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0440 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0445 BBC: Country Style. See W 0145.

Thursdays

0409 Deutsche Welle: Africa Report. See T 0409.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: The Farming World. See H 0145.
0415 Radio Havana Cuba: Headliners. See S 0015.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0435 Radio Havana Cuba: The Way We See It. See H 0035.
0440 Radio Havana Cuba: Cuba Today. See H 0040.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0409 Deutsche Welle: Africa Report. See T 0409.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Musical Feature. See M 0145.
0415 Radio Havana Cuba: Headliners. See S 0015.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0435 Radio Havana Cuba: Feature Report. See F 0035.
0445 BBC: Folk Routes. See T 0130.

Saturdays

0409 Deutsche Welle: Commentary. See S 0109.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Good Books. See W 1445.
0415 Radio Havana Cuba: Cuba Today. See H 0040.
0423 Deutsche Welle: Panorama. See A 0223.
0430 BBC: Jazz Now And Then. See A 0145.
0434 Deutsche Welle: Man And Environment. See T 1634.
0435 Radio Havana Cuba: The Way We See It. See H 0035.
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

0500-0529 tes	Australia, AAAF	17840af			
0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0600	Australia, Radio	11720pa	11880pa	15320as	15365pa
		17715pa	17795as	17880as	21525as
		21590as	21740pa		
0500-0600	Canada, CBC Northern Svc	9625do			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	11840am			
0500-0600	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0500-0600	Cuba, Radio Havana Cuba	9510na			
0500-0600	Ecuador, HCJB Quito	9745am	11925am	21455am	
0500-0550	Germany, Deutsche Welle	5960na	6130na	9515na	9605na
		9670na	11705na	13610na	
0500-0600 irreg	Italy, IRRS Milan	7125eu			
0500-0600	Japan, Radio	6085me	7230eu	15230na	17765na
		17810na	17825na	21610am	
0500-0600	Kenya, Voice of	4935do			
0500-0600	Lebanon,King of Hope	11530as			
0500-0505	Lesotho, Radio Lesotho	4800dc			
0500-0600	Malaysia, RTM Radio 4	7295dc			
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	Russia, Radio Moscow	5950eu	6165eu	7150na	7165na
		7170va	7180na	7255af	7270va
		7390eu	9870na	9890eu	12050na
		15455va	17570va	17890va	
0500-0600	S Africa, Channel Africa	11745af			
0500-0600	Singapore, SBC1	5052dc	11940do		
0500-0600	Spain, Spanish Natl Radio	9530na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530 irreg	Sudan, RAdio SPLA	9170af	9190af		
0500-0530	Swaziland, TWR	5965af	9655af	11740af	
0500-0530	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0600	Thailand, Radio	9655as	11905as		
0500-0530	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410va
		9600af	9640na	11760me	12095va
		15070me	15280as	15310va	15360va
		15400af	15420af	15575va	17830va
		17885af	21470va	21715as	
0500-0600	USA, CSMonitor Boston MA	9445na	9840af	13760sa	17780as
0500-0600 sa	USA, CSMonitor Boston MA	17555as			
0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, VOA Washington DC	5995me	6035af	6040me	6060me
		6140me	6873me	7170me	7405af
		9530me	9575af	9635me	9700me
		9885af	11825me	11850af	12080me
		15115af	15205me	15600af	
0500-0600	USA, WHRI Noblesville IN	7315na	9495na		
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, WYFR Okeechobee FL	5985am	9880eu	11915eu 1	3695eu
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0510-0600 vl	S Africa, Radio Oranje	9630do			
0524-0600 f	Ghana, GBC Radio 2	3366do			
0525-0600	Ghana, GBC Radio 1	4915do			
0530-0600	Australia, AAAF	17840af			
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	11840af	15380af	17720af	17745af
		17790af	21665af		
0530-0600	Swaziland, TWR	5965af	11740af		
0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410va
		9600af	9640na	11760me	12095va
		15070me	15280as	15310va	15360va
		15400af	15420af	15575va	17830va
		17885af	21470va	21715as	

SELECTED PROGRAMS

Sundays

0509 Deutsche Welle: Commentary. See S 0109.
0511 Radio Havana Cuba: Sports Report. See S 0111.
0517 Deutsche Welle: Feature. See S 0117.
0534 Deutsche Welle: German By Radio. See S 0134.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0540 Radio Havana Cuba: DX'ers Unlimited. See S 0140.

Mondays

0500 Radio Havana Cuba: From Havana. See M 0100.
0509 Deutsche Welle: Commentary. See S 0109.
0516 Deutsche Welle: Living In Germany. See M 0116.
0530 Radio Havana Cuba: Feature. See M 0130.
0534 Deutsche Welle: Larry's Random Selection. See M 0134.
0535 Radio Austria Int'l: Report From Austria. See S 0135.

Tuesdays

0509 Deutsche Welle: European Journal. See M 0234.
0511 Radio Havana Cuba: Sports Report. See S 0111.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0535 Radio Havana Cuba: Feature. See M 0130.

Wednesdays

0509 Deutsche Welle: European Journal. See M 0234.
0511 Radio Havana Cuba: Sports Report. See S 0111.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0535 Radio Havana Cuba: Feature. See M 0130.

Thursdays

0509 Deutsche Welle: European Journal. See M 0234.
0511 Radio Havana Cuba: Sports Report. See S 0111.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0535 Radio Havana Cuba: Feature. See M 0130.

Fridays

0509 Deutsche Welle: European Journal. See M 0234.
0511 Radio Havana Cuba: Sports Report. See S 0111.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0535 Radio Havana Cuba: Feature. See M 0130.

Saturdays

0509 Deutsche Welle: European Journal. See M 0234.
0511 Radio Havana Cuba: Sports Report. See S 0111.
0534 Deutsche Welle: Through German Eyes. See S 1513.
0535 Radio Havana Cuba: Feature. See M 0130.

Graham Bannerman presents chart sounds old and new on the BBC's "Multitrack 2."

English language

shortwave guide

0600 UTC [2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0630	Australia, Radio	11720pa	11880pa	15320as	15365pa
	17715pa 17760as	17880as	21525as	21590as	21740pa
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica,R forPeace Int	7375na	7385na	13630am	15030na
0600-0700	Cuba, Radio Havana Cuba	6000na	9510na		
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0630	Georgia, Georgian Radio	11805.3			
0600-0650	Germany, Deutsche Welle	11780af	13610af	13770af	13790af
		15185af	15205af	17875af	
0600-0700	Ghana, GBC Radio 1	4915do			
0600-0700 f	Ghana, GBC Radio 2	3366do			
0600-0700 irreg	Italy, IRRS Milan	7125eu			
0600-0625	Kenya, Voice of	4935do			
0600-0700	Kiribati, Radio	17440do			
0600-0630	Laos,National Radio of	7116as			
0600-0630 s	Latvia, Radio Riga	5935eu			
0600-0700	Lebanon, King of Hope	6280me			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765eu			
0600-0700	Namibia, Namibia BC Corp	6175af			
0600-0658	New Zealand, R NZ Intl	15120pa			
0600-0700 s	New Zealand, ZLXA	3935do			
0600-0700	Nigeria, Radio	3326do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0645	Romania, R Romania Intl	7225eu	9510eu	9570eu	11775eu
0600-0700	Russia, Radio Moscow	5905af	7150na	7165na	7170va
	7175va 7180na	7270na	7345as	9860va	9870va
	9890eu 17570va				
0600-0700	S Africa, Channel Africa	11710af			
0600-0700 vl	S Africa, Radio Oranje	9630do			
0600-0700	Singapore, SBC1	5010do	5052do	11940do	
0600-0700	South Korea, Radio Korea	7275na	11945na	15155na	
0600-0700	Swaziland, TWR	5965af	11740af		
0600-0630	Switzerland, Swiss R Intl	9860af	13635af	17565af	
0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0600-0700 sa	Thailand, Radio	9655as	11905as		
0600-0630	United Kingdom,BBC London	3955eu	5975na	6180eu	6195eu
	7150pa 9410eu	9640va	11760me	11955as	12095me
	15070va 15280as	15310as	15360as	15400af	15575va
	15575me 17790as	17830va	21470me	21715as	
0600-0700	USA, CSMonitor Boston MA	5850eu	9455na	17555as	17780as
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6005af	6035af
	6040eu 6060me	6873eu	7325me	7405af	9530af
	9575af 9885af	11850af	11925af	12080af	15115af
	15600af				
0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	9680af	11915af
		13695af			
0600-0620	Vatican State, Vatican R	6245eu	7250eu		
0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0615-0700 mtwhf	Canada, RCI Montreal	6150eu	7155eu	9740af	9760eu
		11935af			
0625-0700	Kenya, Voice of	4935do			
0630-0700	Australia, Radio	6020pa	11720pa	11880pa	15240pa
	15320as 15365pa	17670as	17715pa	17880as	21525as
	21590as 21740pa				
0630-0700	Austria, R Austria Intl	6015na			
0630-0655	Belgium, R Vlaanderen	5910eu	9905va	11695pa	
0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0630-0700	United Kingdom,BBC London	5975na	6180eu	6195eu	7150pa
	9410eu 9640va	11760me	11955as	12095me	15070va
	15280as 15310as	15360as	15400af	15575va	15575me
	17790as 17830pa	17885va	21470me	21715as	
0630-0700	Vatican State, Vatican R	9695af	11625af	15090af	
0635-0700	Monaco, TWR Monte Carlo	9480eu			
0645-0700	Finland, Radio	6120af	9560me	11755eu	
0645-0700	Ghana, GBC	6130af			
0645-0700	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		

SELECTED PROGRAMS

Sundays

0609 Deutsche Welle: Commentary. See S 0109.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0613 Deutsche Welle: Sports Report. See S 0213.
0615 BBC: Letter From America. Alistair Cook's view.
0615 Radio Havana Cuba: Headliners. See S 0015.
0615 Radio Korea: Echoes Of Korean Music. No details available.
0619 Deutsche Welle: International Talking Point. See S 0419.
0630 BBC: Jazz For The Asking. Digby Fairweather, requests.
0630 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0634 Deutsche Welle: People And Places. See S 0434.
0635 Radio Havana Cuba: World Of Sports. See S 0035.
0635 Radio Korea: Shortwave Feedback. Listener letters, news.
0640 Radio Havana Cuba: World Of Stamps. See S 0040.

Mondays

0600 Radio Havana Cuba: Sunday Review. See M 0000.
0609 Deutsche Welle: European Journal. See M 0234.
0610 Radio Havana Cuba: The Mailbag Show. See M 0010.
0615 BBC: Recording Of The Week. Classical music.
0615 Radio Korea: News Commentary. See S 0045.
0620 Radio Havana Cuba: The Jazz Place. See M 0020.
0620 Radio Korea: Seoul Calling. Music, features, interviews.
0630 BBC: Feature. See S 1401.
0630 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0634 Deutsche Welle: Africa In The German Press. See M 0434.
0640 Radio Korea: Tales From Korea's Past. The history of Korea.

Tuesdays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio Havana Cuba: Spotlight On The Americas. See T 0011.
0615 BBC: The World Today. See M 1645.
0615 Radio Korea: News Commentary. See S 0045.
0620 Radio Korea: Seoul Calling. See M 0620.
0630 BBC: Rock/Pop Music. From hard workers to hard rockers: James Brown is profiled in "The Godfather Of Soul" (4th, 11th); Tommy Vance returns with another series of "Rock Salad" (18th, 25th).
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0635 Radio Havana Cuba: Sports In Cuba. See T 0035.
0640 Radio Havana Cuba: Let's Talk Law. See T 0040.
0640 Radio Korea: Korean Cultural Variety. A look at Korean cultural and artistic traditions.

Wednesdays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio 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.
0615 Radio Korea: News Commentary. See S 0045.
0620 Radio Korea: Seoul Calling. See M 0620.
0630 BBC: Meridian. Events in the world of the arts.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0640 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0640 Radio Korea: Pulse Of Korea. Development reports.

Thursdays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio 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.
0615 Radio Korea: News Commentary. See S 0045.
0620 Radio Korea: Seoul Calling. See M 0620.
0630 BBC: Sports International. See H 0230.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0635 Radio Havana Cuba: The Way We See It. See H 0035.
0640 Radio Havana Cuba: Cuba Today. See H 0040.
0640 Radio Korea: Forward To Reunification. The prospects for reunion between North and South Korea.

Fridays

0609 Deutsche Welle: Africa Report. See T 0409.
0611 Radio 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.
0615 Radio Korea: News Commentary. See S 0045.
0620 Radio Korea: Let's Sing Together. A sing-along program, featuring the always-popular Song of the Month.
0630 BBC: Meridian. See W 0630.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0635 Radio Havana Cuba: Feature Report. See F 0035.
0640 Radio Korea: Let's Learn Korean! Korean language lessons for native English speakers.

Saturdays

0609 Deutsche Welle: Commentary. See S 0109.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.
0615 Radio Havana Cuba: Cuba Today. See H 0040.
0615 Radio Korea: News Commentary. See S 0045.
0620 Radio Korea: Sites And Sounds. See S 0050.
0623 Deutsche Welle: Panorama. See A 0223.
0630 BBC: Meridian. See W 0630.
0634 Deutsche Welle: Man And Environment. See T 1634.
0635 Radio Havana Cuba: The Way We See It. See H 0035.
0635 Radio Korea: From Us To You. See S 0105.
0640 Radio Havana Cuba: Kaleidoscope. See A 0040.

English language

shortwave guide

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	6020pa	11720va	11880pa	15240pa
		15320va	15365pa	17715pa	17750as
		17795pa	21525pa	21590pa	21740pa
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	Czech Republic, R Prague	6055eu	7345eu	9505eu 1	1990eu
		17725as	21705as		
0700-0730	Ecuador, HCJB Quito	9600eu	11835eu	21455eu	
0700-0800	Ghana, GBC	6130af			
0700-0800	Ghana, GBC Radio 1	4915do			
0700-0800 f	Ghana, GBC Radio 2	3366do			
0700-0800 irreg	Italy, IRRS Milan	7125eu			
0700-0800	Japan, Radio	5970eu	6025eu	15170au 1	7765eu
		17810as	17860as	21575me	
0700-0800	Kenya, Voice of	4935do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 last a	Lithuania, Radiocentras	9710eu			
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, ZXLA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15350as	17765as		
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, Radio Moscow	5905va	7175va	7345va	9490eu
		9890va	12010af	12055af	13650va
		13705va	15190va	15280af	15345af
		15440eu	15465af	15470af	15520af
		15540va	15550af	17580eu	17655af
0700-0800	Russia, Radio Moscow	17675af	17860eu		
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800	Singapore, SBC1	5010do	5052do	11940do	
0700-0800	Swaziland, TWR	7200af	11740af		
0700-0715	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 sa	Thailand, Radio	9655as	11905as		
0700-0730	United Kingdom,BBC London	5975na	6190af	6195eu	7150pa
		7325af	9410eu	9640va	9760eu
		11760me	11940af	11955as	12095me
		15070va	15280as	15310as	15325eu
		15360pa	15400af	15420va	15575va
		17640me	17790va	17830as	17885af
		21470me	21660af	21715as	
0700-0800	USA, CSMonitor Boston MA	5850eu	7395am	9445na	9840va
		9870am	17555as	17780as	
0700-0800	USA, KCBI Dallas TX	9815am			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
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, WYFR Okeechobee FL	5985va	7355va	9680va	11915af
		13695eu			
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0730-0800	Australia, Radio	6020pa	11720pa	11880pa	15240pa
		17750as	17795pa	21525as	21590as
0730-0800	Austria, R Austria Intl	6155eu	13730eu	15450me	17870me
0730-0800	Ecuador, HCJB Quito	9600eu	9745pa	11835eu 1	1925pa
		21455eu			
0730-0800	Finland, Radio	17800as	21550as		
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0735	India, All India Radio	15250as	17850as		
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
		11760me	11955as	12095me	15070va
		15280as	15310as	15360as	15400af
		15420va	15575me	17640me	17790va
		17830as	17885af	21470me	21660af
		21715as			

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425va			
0800-0830	Australia, Radio	5995pa	9560pa	9580pa	15240pa
		17750pa	21590as		
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	7375na	7385na	13630am	15030na
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		21455eu			
0800-0900	Finland, Radio	17800as	21550as		
0800-0900	Ghana, GBC Radio 1	4915do			
0800-0900 f	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWR Agana	15200as			
0800-0900 irreg	Italy, IRRS Milan	7125eu			
0800-0900	Kenya, Voice of	4935do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0835	Monaco, TWR Monte Carlo	9480eu			
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZXLA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0845	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia, Radio Moscow	4940af	4975af	6110af	7130af
		9580va	11765af	12010va 1	2020va
		12055af	12070eu	13650va	13705va
		15190eu	15210va	15345va	15440va
		17675af	17805af	17860va	21655af
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0900	Singapore, SBC1	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550eu	13670eu		
0800-0820	Swaziland, TWR	7200af	11740af		
0800-0830	United Kingdom,BBC London	6190af	7325eu	9410eu	9660eu
		9760eu	11940af	11955as	12095me
		15070va	15280as	15360as	15420af
		15575af	17640me	17705eu 1	7790af
		17790af	17830as	17885af	21470af
		21660af	21715pa		
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, VOA Washington DC	11735eu	15160eu	15195me	17770me
		21455me	21570me		
0800-0900	USA, WHRI Noblesville IN	7315eu			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0820-0835 as	Swaziland, TWR	7200af	11740af		
0830-0900	Australia, Radio	5995na	9560pa	9580pa	17695pa
		17750as	21590as	25750pa	
0830-0900	Austria, R Austria Intl	15450au	21490au		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	India, All India Radio	7250as	9610as	11970as	15250as
		17850as			
0830-0900	Netherlands, Radio	11895pa			
0830-0900	United Kingdom,BBC London	6190af	7325eu	9410eu	9600eu
		9760eu	11940af	11955as	12095me
		15070va	15280as	15360pa	15420af
		15575af	17640me	17705eu	17790af
		17790af	17830as	17885af	21470af
		21660af	21715pa		
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0850 smtwhf	Monaco, TWR Monte Carlo	9480eu			

shortwave guide

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	9510pa	9580pa	13605as
		15170as	21725as		
0900-0925 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu		
0900-1000 s	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	
0900-0930	Costa Rica,R forPeace Int	7375na	13630am	15030na	
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	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			
0900-0910	India, All India Radio	9610as	11970as	15250as	17850as
0900-1000 s	Italy, AWR Europe	7230eu			
0900-1000 irreg	Italy, IRRS Milan	7125eu			
0900-1000	Japan, Radio	11815eu	11890eu	15270pa	17860pa
		21610as			
0900-1000	Kenya, Voice of	4935do			
0900-1000	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	Nigeria, Voice of	7255af			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000	Russia, Radio Moscow	4940af	6110af	7130af	9755af
		11765af	12010va	12020va	12055af
		12070va	13650va	15175va	15210va
		15435va	15440va	15540va	17565va
		17860va	21755va	21825af	21845af
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC1	5010do	5052do	11940do	
0900-0930	Switzerland, Swiss R Intl	9560pa	13685pa	17670pa	21820pa
0900-0930	United Kingdom,BBC London	6190af	6195as	9410eu	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095me	15070me
		15190sa	15310as	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, VOA Washington DC	11735eu	15160eu	15195me	17770eu
		21455me	21570eu		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0903-0909	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
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 smwha	Mongolia, R Ulaanbaatar	11850pa	12015pa		
0915-0930 smtwh	Guam, KTWR Agana	15200as			
0930-0945	India, All India Radio	9610as	11970as	15250as	17850as
0930-1000	Netherlands, Radio	9720pa	11895pa	12065as	15470as
0930-1000	United Kingdom,BBC London	6190af	6195as	9410eu	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095me	15070me
		15190sa	15310as	15400af	15420af
		15575va	17640me	17705eu	17790va
		17830va	17885af	21470af	21660af
		21715pa			
0940-0950	Greece, Voice of	17525au			

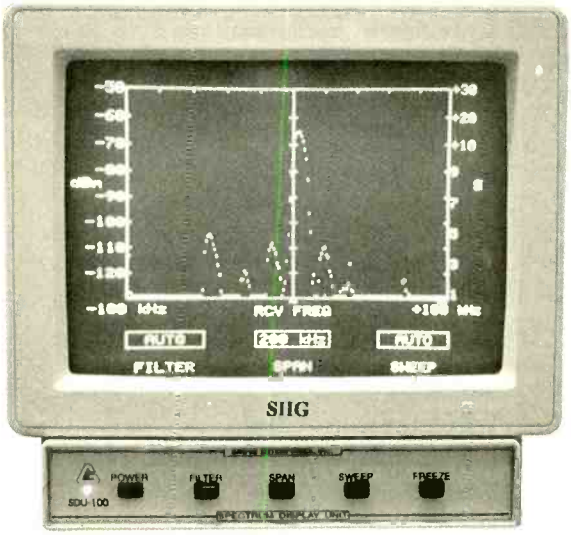
1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1100	Australia, Radio	5995pa	9580pa	21725as	
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	13630na	15030na	
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	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	17387as	7895as	21735as
1000-1030	Israel, Kol Israel	17545eu			
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 irreg	Italy, IRRS Milan	7125eu			
1000-1100	Kenya, Voice of	4935do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100	Russia, Radio Moscow	4975af	6110af	7130af	11765af
		12010eu	12020eu	12070va	13650va
		15175va	15210va	15345eu	15440va
		15465va	15475va	15550af	17565va
		17600eu	17805eu	21550eu	21755va
1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC1	5010do	5052do	11940do	
1000-1030	United Kingdom,BBC London	6190af	6195va	9410va	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, VOA Washington DC	5985as	7405am	9590am	11720as
		11735me	11915am	15120am	15160me
		15195me	15425as	17770me	21455me
1000-1100	USA, WHRI Noblesville IN	9850sa			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WYFR Okeechobee FL	5950am			
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 Sofia	11630eu	11720eu	13670eu	17780eu
		17825eu			
1030-1100	Iran, VOIRI Tehran	9525as	11715af	11790as	11910as
		11930me			
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	9410va	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		
1055-1100	Neth Antilles,TWR Bonaire	11815am	15345am		

GROVE SDU-100

SPECTRUM DISPLAY UNIT

SPAN: Selectable 0, 100, 200, 500 kHz; 1, 2, 5, 10 MHz
SPAN LINEARITY: 10 % (nom.)
RESOLUTION BANDWIDTH: Selectabe 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.



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The next addition to your radio should be a good one.

English language

shortwave guide

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
		15170pa	21725pa		
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 forPeace Int	7375na	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, GBC Radio 1	4915do			
1100-1110 mtwhf	Ghana, GBC Radio 2	7295do			
1100-1200 sa	Ghana, GBC Radio 2	3366do			
1100-1130	Iran, VOIRI Tehran	9525af	11515af	11790as	11910as
		11930me			
1100-1200 irreg	Italy, IRRS Milan	7125eu			
1100-1200	Japan, Radio	6120na	9750va	11815sa	11840na
		21610as			
1100-1200	Malaysia, RTM Radio 4	7295do			
1100-1130	Mozambique, Radio Maputo	11820af	11835af		
1100-1200	Neth Antilles,TWR Bonaire	11815am	15345am		
1100-1200	New Zealand, R NZ Intl	9700as			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	17595eu	17900eu	21520eu	
1100-1200	Russia, Radio Moscow	9705va	9780va	9855va	11675va
		11710va	12020na	12070va	13650va
		15435va	15470va	15475va	15530va
		15550va	15585va	17570va	17600va
		17755va	21515va	21755va	21785va
1100-1200	S Africa, Channel Africa	11900af			
1100-1200 vl	S Africa, Radio Oranje	9630do			
1100-1200	Singapore, SBC1	5010do	5052do	11940do	
1100-1200	South Korea, Radio Korea	15575af			
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	13635as	15505as
		17670as			
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, KTBN Salt Lk City UT	7510na			
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9760as	11720as	11915am	15120am
		15155as	15425as		
1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WYFR Okeechobee FL	5950am	7355am		
1100-1130	Vietnam, Voice of	7416as	9732as		
1115-1145	Nepal, Radio	3230as	5005as	7165as	
1120-1130 mtwhf	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
		21670eu			
1130-1200	Austria, R Austria Intl	6155eu	13730va		
1130-1155	Belgium, R Vlaanderen	17555as	21810na		
1130-1157	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1130-1200	Netherlands, Radio	5955eu	9855eu		
1130-1157	Slovakia, Slovak Radio	7345au	9505au	11990au	
1130-1200	South Korea, Radio Korea	9650na			
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	17705eu
		17790af	17885va	21470va	21660af
1135-1140	India, All India Radio	9675as	11770as	11970as	17705as
		17815as			

SELECTED PROGRAMS

Sundays

1109 Deutsche Welle: Arts On The Air. Reports and interviews on cultural events and developments.
1115 Radio Korea: Echoes Of Korean Music. See S 0615.
1130 BBC: The Ken Bruce Show. See S 0030.
1130 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
1134 Deutsche Welle: German By Radio. See S 0134.
1135 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review.
1115 Radio Korea: News Commentary. See S 0045.
1120 Radio Korea: Seoul Calling. See M 0620.
1130 BBC: Composer Of The Month. See M 0230.
1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1140 Radio Korea: Tales From Korea's Past. See M 0640.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 Radio Korea: News Commentary. See S 0045.
1120 Radio Korea: Seoul Calling. See M 0620.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1140 Radio Korea: Korean Cultural Variety. See T 0640.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 Radio Korea: News Commentary. See S 0045.
1120 Radio Korea: Seoul Calling. See M 0620.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1140 Radio Korea: Pulse Of Korea. See W 0640.

Thursdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 Radio Korea: News Commentary. See S 0045.
1120 Radio Korea: Seoul Calling. See M 0620.
1130 BBC: Drama. This month: "The Bagel Philosopher" (6th); "Shadows In The Doorway" (13th); "Just A Small Secret" (20th); "I Always Take Long Walks" (27th).
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1140 Radio Korea: Forward To Reunification. See H 0640.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 Radio Korea: News Commentary. See S 0045.
1120 Radio Korea: Let's Sing Together. See F 0620.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1140 Radio Korea: Let's Learn Korean! See F 0640.

Saturdays

1109 Deutsche Welle: Africa This Week. A review of trends and events on the African continent.
1115 Radio Korea: News Commentary. See S 0045.
1120 Radio Korea: Sites And Sounds. See S 0050.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Mailbag Africa. Listeners' questions, music requests, and the club corner.
1135 Radio Korea: From Us To You. See S 0105.

English language

shortwave guide

1200 UTC [8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Katherine	2485co			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21725as	
1200-1300	Brazil, Radiobras	1544 5am			
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			
1200-1300	China, China Radio Intl	9655na	9715as	11660as	11795pa
		15210na	15440pa		
1200-1300	Costa Rica, AWR Alajuela	9722ca	11870ca		
1200-1300	Costa Rica,R forPeace Int	7375na	13630na	15030na	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17890am	21455om
1200-1300	Ghana, GBC Radio 1	4915do			
1200-1225 sa	Ghana, GBC Radio 2	3366do			
1200-1300 irreg	Italy, IRRS Milan	7125eu			
1200-1300	Kenya, Voice of	4935do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1230	Neth Antilles,TWR Bonaire	11815am	15345am		
1200-1206	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1230 s	Norway, Radio Norway Intl	15335na	17780na		
1200-1300	Palau, KHBN	9830va			
1200-1300	Russia, Radio Moscow	6065va	7160va	7260va	7370va
		9705va	9745va	9780va	9780va
		9855va	11710va	11850va	11980va
		12020va	13650va	15175va	15210va
		15280na	15435va	15465va	15475va
1200-1300		15510va	15585va	17570va	17735va
		21755va			
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1230	Thailand, Radio	9655as	11905as		
1200-1230	United Kingdom,BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15260sa	15310as
		15575va	17640af	17705eu	17790af
		17885af	21470af	21660af	
1200-1300	USA, CSMonitor Boston MA	9425pa	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	9760au	11715as	15155au
		15425as			
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WYFR Okeechobee FL	5950am	6015am	7355am	11830am
		17760am			
1200-1230	Uzbekhistan, R Tashkent	5945as	9540as	15470as	17745as
1207-1300 ocasnal	New Zealand, R NZ Intl	9510as			
1210-1300	Finland, Radio	15400na	21550na		
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Radio Korea	9750am			
1226-1300	Ghana, GBC Radio 2	7295do			
1230-1300	Australia, Radio	5995pa	6020pa	7150pa	7240pa
		9580pa	9770pa	13755pa	21725pa
1230-1300	Bangladesh, Radio	15200eu	17750eu		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	21645na		
1230-1235	India, All India Radio	3925do	4860do	11770as	15145as
		17850as			
1230-1300	Netherlands, Radio	5955eu	9855eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	United Kingdom,BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15260sa	15310as
		15575va	17640af	17705eu	17790af
		17885af	21470af	21660af	
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1230-1300	Yugoslavia, Radio	17740na	21605na		
1235-1245	Greece, Voice of	15635na	15650na	17515na	

SELECTED PROGRAMS

Sundays

1201 BBC: Play Of The Week. See S 0101.
1205 Radio Norway Int'l: Norway Now. Commentary and features on issues and people in Norway.
1230 Radio Korea: Echoes Of Korean Music. See S 0615.
1250 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
1215 BBC: Quiz. General musical knowledge is tested in "Ned Sherrin's Counterpoint" (3rd. 10th); Robert Robinson returns for another series of "Brain Of Britain" (through Sept. 6th).
1230 Radio Korea: News Commentary. See S 0045.
1235 Radio Korea: Seoul Calling. See M 0620.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Tales From Korea's Past. See M 0640.

Tuesdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 1. See M 2330.
1230 Radio Korea: News Commentary. See S 0045.
1235 Radio Korea: Seoul Calling. See M 0620.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Korean Cultural Variety. See T 0640.

Wednesdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: New Ideas. See M 1615.
1230 Radio Korea: News Commentary. See S 0045.
1235 BBC: Talks. See M 1635.
1235 Radio Korea: Seoul Calling. See M 0620.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Pulse Of Korea. See W 0640.

Thursdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 2. See W 2330.
1230 Radio Korea: News Commentary. See S 0045.
1235 Radio Korea: Seoul Calling. See M 0620.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Forward To Reunification. See H 0640.

Fridays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Feature. This month, Gabriel Partos examines the Cold War era in "The World That Came In From The Cold."
1230 Radio Korea: News Commentary. See S 0045.
1235 Radio Korea: Let's Sing Together. See F 0620.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Let's Learn Korean! See F 0640.

Saturdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 3. See F 2330.
1230 Radio Korea: News Commentary. See S 0045.
1235 Radio Korea: Sites And Sounds. See S 0050.
1245 BBC: Sports Roundup. See S 0315.
1250 Radio Korea: From Us To You. See S 0105.

English language

shortwave guide

1300 UTC [9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1330 mtwtfs	Belgium, R Vlaanderen	17550as	21810eu		
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 mtwthf	Canada, RCI Montreal	9635na	11855na	17820am	
1300-1400	China, China Radio Intl	7405na	9715as	11660va	15440pa
1300-1400	Costa Rica,R forPeace Int	7375am	13630na	15030na	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490va	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1330	Finland, Radio	15400na	21550na		
1300-1325	Kenya, Voice of	4935do			
1300-1400	Lebanon, Wings of Hope	11530me			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400 ocasnal	New Zealand, R NZ Intl	9510as			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1350	North Korea, R Pyongyang	9345eu	9640as	13760am	15230as
1300-1330 s	Norway, Radio Norway Intl	9590eu	15335na		
1300-1400	Palau, KHBN	9830va			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, Radio Moscow	7330va	7370va	7380va	9705va
		9715va	9755va	9890va	11710va
		15480va	15510va	15520va	15540va
		15550va	17570va	17600va	17735va
		17840va	17860va	21610va	21785va
1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1315	South Korea, Radio Korea	9750na			
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
		17670as	21820as		
1300-1330	United Kingdom,BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740va	9750eu
		9760eu	11750as	11760me	11820va
		11940af	12095eu	15070va	15105af
		15220am	15310as	15420af	15575me
		17640va	17705eu	17790va	17885af
		21470va	21660af		
1300-1400	USA, CSMonitor Boston MA	9425pa	9495na	13625as	13760sa
1300-1400 as	USA, CSMonitor Boston MA	15665eu			
1300-1400	USA, KCBI Dallas TX	9815am			
1300-1400	USA, KNLS Anchor Point AK	9615as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1330	USA, VOA Washington DC	6110as	9760au	11715as	15155au
		15425au			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WYFR Okeechobee FL	5950am	9705na	11830am	13695na
		17760am			
1303-1310	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1320-1400	Jordan, Radio	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1357	Canada, RCI Montreal	6150as	9535as		
1330-1400 mtwhf	Finland, Radio	15400na	21550na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400	Netherlands, Radio	9890as	13700as	15145as	17610as
1330-1400	Sweden, Radio	15240as	21625pa		
1330-1400	Turkey, Voice of	9675as			
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
		15310as	15420af	15575me	17640va
		17705eu	17790va	17885af	21470va
		21660af			
1330-1400	USA, VOA Washington DC	6110as	9760as	15155au	15425au
1330-1400	Uzbekhistan, R Tashkent	5945as	9540as	15470as	17745as
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1345-1400	Vatican State, Vatican R	15090au	17525au		

SELECTED PROGRAMS

Sundays
1305 Radio Norway Int'l: Norway Now. See S 1205.
1330 Radio Austria Int'l: Austrian Coffee Table. See S 0330.

Mondays
1335 Radio Austria Int'l: Report From Austria. See S 0135.

Tuesdays
1335 Radio Austria Int'l: Report From Austria. See S 0135.

Wednesdays
1335 Radio Austria Int'l: Report From Austria. See S 0135.

Thursdays
1335 Radio Austria Int'l: Report From Austria. See S 0135.

Fridays
1335 Radio Austria Int'l: Report From Austria. See S 0135.

Late Breaking News

WWCR, RFPI Off the Air in May

WWCR in Nashville, TN, suffered a fire in April which destroyed its transmitters. The station does not expect to back on the air until sometime in June (see p.6).

Radio for Peace International in Ciudad Colon, Costa Rica, lost its antenna towers in March. RFPI hopes to have them replaced before the end of May, but meanwhile it is broadcasting on 7375 kHz at 1 kW.

1400 UTC [10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1500	Australia, ABC Brisbane	4920do			
1400-1500	Australia, ABC Perth	6140do			
1400-1430	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855pa	13755pa		
1400-1500	Australia, VLW6 Wanneroo	6140do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11855am	11955am	17820am	
1400-1500	China, China Radio Intl	7405na	11815as	15165as	
1400-1500	Costa Rica,R forPeace Int	7375na	13630na	15030am	
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1500	France, Radio France Intl	11910as	15405as	17650me	
1400-1500	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500 vl	Iraq, Radio Iraq Intl	15250as			
1400-1425 smtwh	Israel, Kol Israel	11587am	11603na	15640na	15650as
		17575eu	17590eu		
1400-1500 irreg	Italy, IRRS Milan	7125eu			
1400-1500	Japan, Radio	9535va	11815as	11865na	
1400-1500	Jordan, Radio	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Malaysia, RTM Radio 4	4950do	7295do		
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 ocasnal	New Zealand, R NZ Intl	9510as			
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	6065as	7135va	7170as	7260as
		7330as	7345as	7370va	7380as
		9715va	9755na	9855va	9890va
		11675va	11710va	11980va	15480va
		15550va	17730va	21610va	21755va
1400-1500	Russia, Radio Moscow	21785va			
1400-1500 vl	S Africa, Radio Oranje	9630do			
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500	South Korea, Radio Korea	9570as			
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as		
1400-1430	United Kingdom,BBC London	6190af	6195as	7180as	9410eu
		9515na	9660eu	9740as	9750eu
		9760eu	11750as	11820as	11940af
		12095eu	15070va	15310as	15575me
		17640va	17705eu	17790af	17840am
		17880af	21490va	21660af	
1400-1500	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu
1400-1500 sa	USA, CSMonitor Boston MA	13710na			
1400-1500	USA, KCBI Dallas TX	15375va			
1400-1500	USA, KTBN Salt Lk City UT	7510na			
1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
		15395as	15425as		
1400-1500	USA, WHRI Noblesville IN	9465na	15105na		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WYFR Okeechobee FL	6015am	9705na	11550as	11830am
		17760am			
1400-1405	Vatican State, Vatican R	15090au	17525au		
1415-1500	Bhutan, BC Service	5025do			
1415-1425	Nepal, Radio	3230do	5005do	7165do	
1430-1500	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9560pa	9770pa	11800pa
		11855pa	13755pa		
1430-1500	Austria, R Austria Intl	6155eu	11780as	13730eu	21490va
1430-1500	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1430-1435	India, All India Radio	7290do	9950do	10330do	
1430-1500	Myanmar, VO Myanmar	5990do			
1430-1500	Netherlands, Radio	9890as	13700as	15150as	17610as
1430-1500	United Kingdom,BBC London	6190af	6195as	7180as	9410eu
		9515na	9660eu	9740as	9750eu
		9760eu	11750as	11820as	11940af
		12095eu	15070eu	15310as	15575me
		17640va	17705eu	17790af	17840am
		17880af	21470va	21660af	
1430-1500 irreg	USA, KJES Mesquite NM	11715na			
1435-1440	India, All India Radio	7290do	10330do		
1445-1500 smwha	Mongolia, R Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. This month: "Heritage" (2nd); "Cold Comfort" (9th, 16th); "Life On Mars" (23rd); "The Third Age" (through June 27th).
1415 Radio Korea: Echoes Of Korean Music. See S 0615.
1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1435 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1415 Radio Korea: News Commentary. See S 0045.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Tales From Korea's Past. See M 0640.
1445 BBC: Musical Feature. See S 0445.

Tuesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0045.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Korean Cultural Variety See T 0640.
1445 BBC: Musical Feature. See M 0145.

Wednesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0045.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Pulse Of Korea. See W 0640.
1445 BBC: Good Books. This month: Fleming's "From Russia With Love" (5th); Condon's "The Manchurian Candidate" (12th); Deighton's "The Ipcress File" (19th); le Carre's "The Spy Who Came In From The Cold" (26th).

Thursdays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0045.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Forward To Reunification. See H 0640.
1445 BBC: Recording Of The Week. See M 0615.

Fridays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0045.
1420 Radio Korea: Let's Sing Together. See F 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Let's Learn Koreanl See F 0640.
1445 BBC: Global Concerns. See F 0145.

Saturdays

1401 BBC: Sportsworld. Extensive coverage and results of all the weekend's sports.
1415 Radio Korea: News Commentary. See S 0045.
1420 Radio Korea: Sites And Sounds. See S 0050.
1435 Radio Korea: From Us To You. See S 0105.

English language

shortwave guide

1500 UTC [11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do			
1500-1530	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9580pa	9770pa	11800pa
		11855pa	13755pa		
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			
1500-1600 s	Canada, RCI Montreal	11955am	17820am		
1500-1600	China, China Radio Intl	11815as	15165as		
1500-1600	Costa Rica,R forPeace Int	7375am	13630am	15030am	
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	13610af
		17765af	21600as		
1500-1600	Guam, KTWR Agana	15610as			
1500-1600 vl	Iraq, Radio Iraq Intl	15250as			
1500-1600	Japan, Radio	11865na	15355af		
1500-1600	Jordan, Radio	9560eu			
1500-1600	Malaysia, RTM Radio 4	4950do	7295do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1515 smwha	Mongolia, R Ulaanbaatar	7260as	13780as		
1500-1600	Myanmar, VO Myanmar	5990do			
1500-1600 ocasnal	New Zealand, R NZ Intl	9510as			
1500-1600	Nigeria, Radio	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1550	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu
1500-1600	Philippines, FEBC Manila	11995as			
1500-1600	Russia, Radio Moscow	6065na	7170na	7260na	7330va
		7345na	7370va	7380na	9745va
		9755na	9780va	9855va	9890va
		12065va	15210va	15465va	15480va
		15540va	15550va	21610va	21755va
1500-1600 vl	S Africa, Radio Oranje	9630do			
1500-1555	Seychelles, FEBA	9810as	11710as	15330as	
1500-1600	Singapore, SBC1	5010do	5052do	11940do	
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as		
1500-1530	Sudan, R National Unity	9165do			
1500-1600	Sweden, Radio	15190me			
1500-1530	Switzerland, Swiss R Intl	13635af	15505af	17670af	21820me
1500-1530	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9740va	9760eu	11750as
		11940af	12095eu	15070va	15260na
		15310as	15400eu	17705eu	17840au
		17860af	17880af	21470af	21660af
1500-1600	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu
		17510am			
1500-1600 sa	USA, CSMonitor Boston MA	13760na			
1500-1600	USA, KCBI Dallas TX	15375va			
1500-1600	USA, KTBN Salt Lk City UT	7510na			
1500-1600	USA, VOA Washington DC	6110as	7125as	9645as	9700eu
		9760as	15205me	15395as	
1500-1600	USA, WHRI Noblesville IN	9465sa	15105na		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WYFR Okeechobee FL	11830am	15215am	17760am	
1515-1530	Canada, RCI Montreal	9555am	11915am	11935am	15315am
		15325am	21545am		
1530-1600	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9580pa	11800pa	11855pa
		13755pa			
1530-1600	Austria, R Austria Intl	11780as			
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1545	India, All India Radio	3945do	6140do	7290do	7412do
		9950do	10330do		
1530-1600	Netherlands, Radio	9890as	13700as	15150as	17610as
1530-1600 mtwhf	Portugal, Radio	21515me			
1530-1600	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9740va	9760eu	11750as
		11940af	12095eu	15070va	15260na
		15310as	15400eu	17705eu	17840am
		17860af	17880af	21470af	21660af
1545-1600	Vatican State, Vatican R	15090au	17865as		

SELECTED PROGRAMS

Sundays

1509 Deutsche Welle: Religion And Society. News and developments concerning the world's major religions.
1513 Deutsche Welle: Through German Eyes. German journalists provide a perspective on world events.
1515 BBC: Concert Hall. This month: Bach's "Cantata No. 30" (2nd); Mozart's "C Minor" (9th); Beethoven's "String Quartet Op. 95" (16th); Schumann's "Dichterliebe" (23rd); Brahm's "Third Symphony" (30th).
1534 Deutsche Welle: Pop From Germany. A look at the German pop music scene.
1535 Radio Austria Int'l: Report From Austria. See S 0135.

Mondays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Feature. See M 0101.
1530 BBC: Feature. See M 0115.
534 Deutsche Welle: Monday Special. An interview or report on an event or development with special relevance for Africa.
5 Radio Austria Int'l: Report From Austria. See S 0135.

days

eutsche Welle: Newsline Cologne. See M 1109.
3C: A Jolly Good Show. Dave Lee Travis presents listener k music requests.
sche Welle: Insight. An in-depth feature, giving the round to political events and international develop-
ustria Int'l: Report From Austria. See S 0135.

Wednesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Talks. See M 0415.
1530 BBC: Comedy/Quiz. This month, join Brian Sibley as he examines the history of conjuring in "It's Magic!" (except 26th: Two Cheers For May, a humorous look at the month just past).
1534 Deutsche Welle: Living In Germany. See M 0116.
1535 Radio Austria Int'l: Report From Austria. See S 0135.

Thursdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Classics With Kay. See S 2315.
1534 Deutsche Welle: Spotlight On Sport. Background stories and coverage of important sporting events.
1535 Radio Austria Int'l: Report From Austria. See S 0135.

Fridays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Music Review. See H 2315.
1534 Deutsche Welle: Economic Notebook. See T 0334.
1535 Radio Austria Int'l: Report From Austria. See S 0135.

Saturdays

1509 Deutsche Welle: Africa Highlight. A weekly feature on an important topic concerning Africa.
1513 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1515 BBC: Sportsworld. See A 1401.
1534 Deutsche Welle: Science And Technology. See M 1634.

English language

shortwave guide

1600 UTC [12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1630	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9580pa	11800pa	11855pa
		11880pa	13755pa		
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	11575af	15110af	15130af	
1600-1700	Costa Rica,R forPeace Int	7375na	13630na	15030na	
1600-1700	Ecuador, HCJB Quito	17790me	21455am	21480me	
1600-1700	France, Radio France Intl	11705af	12015af	15530me	17620af
		17795af	17850af		
1600-1630	Georgia, Georgian Radio	9565.3			
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	11785as
		15105as	15595as	17810as	21680as
1600-1700	Ghana, GBC Radio 1	4915do			
1600-1700	Ghana, GBC Radio 2	7295do			
1600-1700	Guam, KSDA Agana	11980as			
1600-1645	Guam, KTWR Agana	15610as			
1600-1700 vl	Iraq, Radio Iraq Intl	15250as			
1600-1648 ocasnal	New Zealand, R NZ Intl	9510as			
1600-1700	Nigeria, Radio	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1630 s	Norway, Radio Norway Intl	15335na	17860af		
1600-1630	Pakistan, Radio	11570me	13685af	15555af	17558af
		21495af			
1600-1655	Poland, Polish R Warsaw	7285eu	9525eu	11840eu	
1600-1630	Russia, AWR Russia	15125as			
1600-1700	Russia, Radio Moscow	6065va	7170va	7250na	7260na
		7345va	7370as	9540va	9590va
		9660va	9705va	9715va	9755na
		9860va	9890va	9895va	11655va
		11840va	15465va	15480va	15540va
1600-1700	Russia, Radio Moscow	15550va	21755va		
1600-1700	S Africa, Channel Africa	5960af			
1600-1640 vl	S Africa, Radio Oranje	9630do			
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
1600-1605	Singapore, SBC1	5010do	5052do	11940do	
1600-1700	South Korea, Radio Korea	5975om	9870af		
1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as		
1600-1700	Swaziland, TWR	9500af			
1600-1645	UAE, UAE Radio Dubai	11795af	13675eu	15320eu	21605eu
1600-1630	United Kingdom,BBC London	3915as	6190af	6195eu	9410eu
		9515na	9740va	11750as	12095va
		15070va	15260na	15310as	15400eu
		17860af	17880af	21470af	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, KTBN Salt Lk City UT	15590am			
1600-1700	USA, VOA Washington DC	11920af	11995af	13710af	15205me
		15255af	15320af	15445af	19261af
1600-1700	USA, WHRI Noblesville IN	9465am	15105am		
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WYFR Okeechobee FL	11830am	15215na	15355am	17760eu
		21525af	21615af		
1600-1640	Vatican State, Vatican R	15090au	17865au		
1600-1630	Vietnam, Voice of	12020eu	15010eu		
1630-1700	Australia, Radio	5995pa	6060pa	6080pa	7240pa
		7260pa	9560pa	9580pa	11880pa
		11910pa	13755pa		
1630-1657	Canada, RCI Montreal	7150as	9555as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700 mtwhf	Portugal, Radio	21515me			
1630-1700	United Kingdom,BBC London	3915as	5975as	6190af	6195eu
		7160as	9410eu	9515na	9630af
		9740va	11720as	11750as	12095va
		15070va	15260na	15310as	15400eu
		15420af	17860af	17880af	21470af
		21660af			
1630-1700	USA, VOA Washington DC	6180eu	9700eu	9760me	11855me
		15205me	15245me		
1645-1700 s	Guam, KTWR Agana	15610as			
1650-1700 mtwhf	New Zealand, R NZ Intl	9675pa			

SELECTED PROGRAMS

Sundays

1605 Radio Norway Int'l: Norway Now. See S 1205.
1609 Deutsche Welle: Arts On The Air. See S 1109.
1615 BBC: Feature. See S 0230.
1615 Radio Korea: Echoes Of Korean Music. See S 0615.
1634 Deutsche Welle: German By Radio. See S 0134.
1635 Radio Korea: Shortwave Feedback. See S 0635.
1645 BBC: Letter From America. See S 0615.

Mondays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: New Ideas. A look at the latest technology, innovations, and new products.
1615 Radio Korea: News Commentary. See S 0045.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Science And Technology. New scientific and technological developments.
1635 BBC: Talks. This month, wonder "Whatever Happened To...?" famous people (3rd, 10th), then visit poetic settings in "Hallowed Ground" (17th, 24th, 31st).
1640 Radio Korea: Tales From Korea's Past. See M 0640.
1645 BBC: The World Today. A look at a topical aspect of the international scene.

Tuesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Megamix. See T 1130.
1615 Radio Korea: News Commentary. See S 0045.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Man And Environment. A program on all topics relating to the environment in industrial and developing countries.
1640 Radio Korea: Korean Cultural Variety. See T 0640.
1645 BBC: The World Today. See M 1645.

Wednesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Rock/Pop Music. See T 0630.
1615 Radio Korea: News Commentary. See S 0045.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Insight. See T 1534.
1640 Radio Korea: Pulse Of Korea. See W 0640.
1645 BBC: The World Today. See M 1645.

Thursdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Network UK. Issues and events affecting people across the UK.
1615 Radio Korea: News Commentary. See S 0045.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Living In Germany. See M 0116.
1640 Radio Korea: Forward To Reunification. See H 0640.
1645 BBC: The World Today. See M 1645.

Fridays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Science In Action. The latest in science and technology.
1615 Radio Korea: News Commentary. See S 0045.
1620 Radio Korea: Let's Sing Together. See F 0620.
1634 Deutsche Welle: Spotlight On Sport. See H 1534.
1640 Radio Korea: Let's Learn Korean! See F 0640.
1645 BBC: The World Today. See M 1645.

Saturdays

1609 Deutsche Welle: International Talking Point. See S 0419.
1615 BBC: Sportsworld. See A 1401.
1615 Radio Korea: News Commentary. See S 0045.
1620 Radio Korea: Sites And Sounds. See S 0050.
1623 Deutsche Welle: Development Forum. See A 1513.
1634 Deutsche Welle: Religion And Society. See S 1509.
1635 Radio Korea: From Us To You. See S 0105.

English language

shortwave guide

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1800	Algeria, Radio Algiers	9535me	17745af		
1700-1800	Australia, Radio	5880pa	5995pa	6060pa	6080pa
		7240pa	7260pa	9580pa	11880pa
		11910pa			
1700-1800	Azerbaijan, R Dada Gorud	9840as			
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			
1700-1730 mtwhf	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1800	China, China Radio Intl	9570as	11575as	15345as	
1700-1800	Costa Rica,R forPeace Int	7375na	13630na	15030na	
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 Agana	13720as			
1700-1715	Israel, Kol Israel	11587eu	11675as	15640eu	17575af
1700-1800 irreg	Italy, IRRS Milan	7125eu			
1700-1800	Japan, Radio	7140au	9535na	11865as	17775ma
1700-1800	Jordan, R Jordan, Amman	9560eu			
1700-1800 mtwhf	New Zealand, R NZ Intl	6035pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	11705eu
1700-1730 s	Norway, Radio Norway Intl	9655eu			
1700-1800	Pakistan, Radio	9420eu	11570eu		
1700-1800	Russia, Radio Moscow	7170as	7250na	7260as	7345as
		7370as	9540na	9685va	9705va
		9755na	9860va	9890va	12060va
1700-1800	S Africa, Channel Africa	5960af	17710af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1730	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
1700-1715	Switzerland, Swiss R Intl	9885af	13635af	15430af	17635af
1700-1730	United Kingdom,BBC London	3915as	6180eu	6195eu	7325eu
		9410eu	9515na	9740va	12095va
		15070va	15400af	15420af	17880af
		21660af			
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			
1700-1800	USA, VOA Washington DC	6040me	9700va	9760me	11920af
		11995af	13710af	15205m	e 15320af
		15445af	19261am		
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WYFR Okeechobee FL	21500va			
1715-1730	Vatican State, Vatican R	6245eu	7250af	9645me	
1730-1800	Bulgaria, Radio Sofia	6235eu	9560eu	9700na	11720na
1730-1800	Netherlands, Radio	6020af	7120af	21515af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17720af	17745af
1730-1800	Sweden, Radio	6065af	9645me	15270af	
1730-1800	United Kingdom,BBC London	6180eu	6195eu	7160me	7325eu
		9410eu	9740va	11720as	12095va
		15070va	15400af	15420af	17780af
		21660af			
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1745-1800	India, All India Radio	7412me	9950eu	11620eu	11860af

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1900 twhfs	Argentina,RAE BuenosAires	15345eu			
1800-1900	Australia, Radio	5880pa	5995pa	6060pa	6080pa
		7240pa	7260pa	9580pa	11880pa
		11910pa			
1800-1830	Belgium, R Vlaanderen	5900af	15440eu		
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio Sofia	15330na			
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			
1800-1830	Canada, RCI Montreal	13670af	15260af	17820af	
1800-1900	Costa Rica,R forPeace Int	7375am	13630am	15030am	
1800-1827	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
1800-1900	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
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 Agana	13720as			
1800-1900	India, All India Radio	7412me	9950me	11620eu	11860af
		11935af	15080as		
1800-1900 irreg	Italy, IRRS Milan	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1850 smtwhf	New Zealand, R NZ Intl	11735pa			
1800-1855	Poland, Polish R Warsaw	7270eu	9525eu		
1800-1900	Russia, Radio Moscow	7260va	9685as	9755va	9785va
		9860va	9890va	11685au	11770va
		11840va	12050va	13670va	15425va
		15485va	17605va		
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	South Korea, Radio Korea	15575eu			
1800-1900	Sudan, National BC Corp	9170do			
1800-1900	Swaziland, TWR	3200af	9500af		
1800-1830	United Kingdom,BBC London	3255af	6180eu	6195eu	7160va
		7325eu	9410va	9740va	11720as
		11955au	12095va	15070va	15400af
		15420af	17880af		
1800-1900	USA, CSMonitor Boston MA	9355eu	9430pa	13840na	15665eu
		21640af			
1800-1900 sa	USA, CSMonitor Boston MA	17555am			
1800-1900	USA, KCBI Dallas TX	15375va			
1800-1900 irreg	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	6040eu	9575af	9700eu	9760me
		11920af	11995af	13710af	15205me
		15410af	15445af	15580af	17650af
		17800af	19261va	21625af	
1800-1900	USA, WHRI Noblesville IN	13760na	17835sa		
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, WYFR Okeechobee FL	21500va			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730af
1830-1900	Bulgaria, Radio Sofia	15330na			
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	
1830-1900	Netherlands, Radio	6020af	7120af	21515af	21590af
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	United Kingdom,BBC London	3255af	6180eu	6195eu	7325eu
		9410va	9740va	11955au	12095va
		15070va	15400af	15420af	17880af
1840-1850 mtwhfa	Greece, Voice of	15630af	17525af		
1850-1900 smtwhf	New Zealand, R NZ Intl	15120pa			

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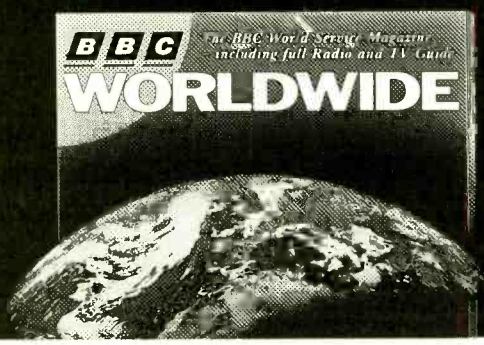

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BBC WORLD SERVICE

English language

shortwave guide

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-2000	Australia, Radio	5880pa	5995pa	6060pa	6080pa
		7240pa	7260pa	9580pa	11720pa
		11855pa	11880pa	11910pa	
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			
1900-1930	Canada, RCI Montreal	13670af	15260af	17820af	
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica,R forPeace Int	7375am	13630am	15030am	
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu	21480eu
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af	11810af
		13690af	13790af	15350af	15390af
		17765af			
1900-1915 mtwhfa	Greece, Voice of	7450eu	9375eu		
1900-2000	India, All India Radio	7412me	9950eu	11620eu	11860af
1900-1930	Israel, Kol Israel	11587na	11603na	11675as	15640na
		15650af	17575na		
1900-1930	Japan, Radio	9535na	11865pa		
1900-2000	Kuwait, Radio	13620na			
1900-1930 s	Lebanon, King of Hope	6280me			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-2000 smtwhf	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Radio	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-1930 s	Norway, Radio Norway Intl	15220va	17730va		
1900-2000	Romania, R Romania Intl	6105eu	7195eu	7225eu	
1900-2000	Russia, Radio Moscow	7170va	7260va	9685va	9725va
		9785va	9860va	9890va	11770va
		11840va	11920va	12050va	13670va
		15425va	15485va	17605va	
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	Spain, Spanish Natl Radio	9675af	9685eu		
1900-2000	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1900-2000	Swaziland, TWR	3200af	3240af		
1900-1930	United Kingdom,BBC London	3255af	6005af	6180eu	6190af
		6195va	7160me	9410va	9630af
		9740as	11955au	12095va	15070va
		15400af	17880af		
1900-2000	USA, CSMonitor Boston MA	9355eu	9430pa	13840na	15665eu
		21640af			
1900-2000 sa	USA, CSMonitor Boston MA	17555am			
1900-2000	USA, KCBI Dallas TX	15375va			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, VOA Washington DC	3990af	9525as	9700eu	11870as
		11920af	11995af	13710af	15320af
		15410af	15495af	15580af	17800af
		19261am			
1900-2000	USA, WHRI Noblesville IN	13760na	17835na		
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, WYFR Okeechobee FL	15355eu	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-1957	Czech Republic, R Prague	6055eu	7345eu		
1930-2000	Iran, VOIRI Tehran	9022va	15260va		
1930-2000 fa	Kazakhstan, R Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
1930-2000	Netherlands, Radio	17605af	21590af		
1930-2000	Poland, Polish R Warsaw	7145eu	9525eu		
1930-2000	Saipan, KFBS	9465as			
1930-2000	United Kingdom,BBC London	3255af	6005af	6180eu	6190af
		6195va	7160me	9410va	9630af
		9740as	11955au	12095va	15070va
		15400af	17880af		
1930-2000	Yugoslavia, Radio	6100eu	7200af		
1935-1955	Italy, RAI Rome	7275eu	9710eu	11800eu	
1940-2000 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1945-2000	Bulgaria, Radio Sofia	6235eu			
1950-2000	Vatican State, Vatican R	5885eu	7250eu		

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2030	Australia, Radio	5880pa	5995pa	6060pa	6080pa
		7240pa	7260pa	9580pa	11720as
		11855pa	11880pa	11910pa	
2000-2015	Bulgaria, Radio Sofia	6235eu	9560na		
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			
2000-2015	Canada, RCI Montreal	11945eu	13650eu	13670eu	15325eu
		17820eu	17875eu		
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	11500eu
		11715af	15110af		
2000-2100	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
2000-2100	Ghana, GBC Radio 1	4915do			
2000-2100	Ghana, GBC Radio 2	7295do			
2000-2100	Indonesia, V of, Jakarta	9675eu	11752eu		
2000-2010 mtwhf	Kenya, Voice of	4935do			
2000-2100	Kuwait, Radio	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2030	Lithuania, R Vilnius	9710eu			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11850eu	12015eu		
2000-2100	New Zealand, R NZ Intl	15120pa			
2000-2100	Nigeria, Radio	3326do	4990do		
2000-2030	Nigeria, Voice of	7255af			
2000-2050	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
2000-2025	Poland, Polish R Warsaw	7145eu	9525eu		
2000-2030 mtwhf	Portugal, Radio	11740eu			
2000-2100	Russia, Radio Moscow	4795va	4825va	7170va	7180va
		7205va	9685va	9725va	9785va
		9870va	9890va	15425na	17605na
		21480va			
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2045	Swaziland, TWR	3200af	3240af		
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af	15505af
2000-2030	United Kingdom,BBC London	5975na	6180eu	6195va	7160as
		7325eu	9410va	9740as	11955au
		12095va	15070va	15260sa	15340au
		17880af	21660af		
2000-2100	USA, CSMonitor Boston MA	1566eu	9455as	13770eu	15665eu
		17555sa			
2000-2100	USA, KCBI Dallas TX	15375va			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, VOA Washington DC	6040eu	9700eu	9760eu	11710eu
		13710af	15160eu	15205eu	15410af
		15445af	15495af	15580af	17650af
		17800af	17895af	19261eu	21485af
		21625af			
2000-2100	USA, WHRI Noblesville IN	13760af	17835va		
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA		15420na		
2000-2100	USA, WYFR Okeechobee FL	7355eu	15355na	15566eu	15585eu
		17610na	17750af	21525eu	21615na
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Voice of	4935do			
2025-2100	Belgium, R Vlaanderen	5910eu	9905eu		
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2100	Australia, Radio	5880pa	5995pa	6060pa	7240pa
		7260pa	9580pa	11720pa	11855pa
2030-2100	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af
		15325eu	17820af	17850af	17875eu
2030-2035	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2035	Latvia, Radio Riga	5935do			
2030-2057	Slovakia, Slovak Radio	7345eu			
2030-2100	South Korea, Radio Korea	6480af	7550me	15575eu	
2030-2100	United Kingdom,BBC London	5975na	6005af	6180eu	6195va
		7325va	9410va	9630af	11955au
		12095va	15340au	15400af	
2030-2100	USA, WHRI Noblesville IN	17835va			
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2130	Australia, Radio	5995pa	6060pa	9540pa	9580pa
		9645pa	11720pa	11855as	11880pa
		11910pa			
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
2100-2130	China, China Radio Intl	9920eu	11715af	15110af	
2100-2200	China, China Radio Intl	6950eu	9920eu	11500eu	
2100-2200	Costa Rica,R forPeace Int	7375na	13630na	15030na	
2100-2200	Cuba, Radio Havana Cuba	15165eu			
2100-2130	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2100-2130	Ecuador, HCJB Quito	21455va			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9640af	9670as	9765as	11785as
		13690as	15135af	15350af	15360as
2100-2200	Ghana, GBC Radio 1	4915do			
2100-2200	Ghana, GBC Radio 2	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	Japan, Radio	11815me	11840as	11925va	15195pa
		15280pa	15430eu	17810as	17890au
2100-2130	Lebanon, King of Hope	6280me			
2100-2136 smtwhf	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2130 s	Norway, Radio Norway Intl	15180va			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	5955eu	6105eu	7195eu	7225eu
		9690eu			
2100-2200	Russia, Radio Moscow	4795va	4825va	7115va	7150va
		7180va	7205va	9725va	9750va
		9785va	9860va	9870va	9890va
		12050na	13670va	15425na	17605na
		17665va	17690va	21480na	
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6130eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2200	Sweden, Radio	6065af	9655af		
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2200	Turkey, Voice of	9445eu			
2100-2200	Ukraine, R Ukraine Intl	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15135na	15570eu
2100-2130	United Kingdom,BBC London	3225af	5975ca	6005af	6180eu
		6195va	7180pa	7325eu	9410eu
		9590na	11955pa	12095va	15070af
		15260sa	15340au	15370as	15400af
2100-2200	USA, CSMonitor Boston MA	9455as	13770eu	13840pa	15665eu
		17555sa			
2100-2200	USA, KCBI Dallas TX	15375va			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200	USA, VOA Washington DC	13710va	15290af	15410af	15495af
		15580af	17800af	19261af	21485af
2100-2200	USA, WHRI Noblesville IN	13760am	17835na		
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, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525eu
2100-2110	Vatican State, Vatican R	5885eu	7250eu		
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2200	Finland, Radio	9730eu	11740eu	11810eu	
2115-2130 mtwhf	United Kingdom,BBC Carib	15390ca	17715ca		
2130-2200	Australia, Radio	9540pa	9645pa	11720pa	11855pa
		11880pa	11910pa		
2130-2200	Austria, R Austria Intl	5945eu	6155eu	9880va	13730af
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu
2130-2200	Kazakhstan, R Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Sweden, Radio	6065eu	9655pa	11955as	
2130-2200	United Kingdom,BBC Flk Is	13660sa			
2130-2200	United Kingdom,BBC London	3225af	5975ca	6005af	6180eu
		6195va	7180pa	7325eu	9410eu
		9590na	11955pa	12095va	15070af
		15260sa	15340au	15370as	15400af
2139-2200	New Zealand, R NZ Intl	17770pa			
2145-2200	Bulgaria, Radio Sofia	9700na	11720na		

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	15320pa	15365as	17795pa
2200-2215	Bulgaria, Radio Sofia	9700na	11720na		
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			
2200-2229	Canada, RCI Montreal	5960na	5995eu	7195eu	9755eu
		11705as	11730ca	11875na	13670ca
		15305ca			
2200-2230	China, China Radio Intl	3985eu	7170eu		
2200-2300	Costa Rica,R forPeace Int	7375ca	13630ca	15030ca	
2200-2300	Cuba, Radio Havana Cuba	6180va			
2200-2230	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2200-2300	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245	Finland, Radio	9730eu	11740eu	11810eu	
2200-2300	Ghana, GBC Radio 1	4915do			
2200-2300	Ghana, GBC Radio 2	7295do			
2200-2230	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2200-2300 irreg	Iraq, Radio Iraq Intl	15210eu			
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15120pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300	Russia, Radio Moscow	7115va	7170va	7180va	7300va
		9520va	9685va	9715va	9725va
		9735va	9750va	9785va	9795va
		9860va	9870va	9890va	12050va
		15425na	17570va	17605va	17655as
2200-2300	Russia, Radio Moscow	17690va	21480na		
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2230	Switzerland, Swiss R Intl	9810sa	9885sa	12035sa	15570sa
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	9850eu	11915eu		
2200-2300	UAE, Radio Abu Dhabi	9605na	11710na	11815na	
2200-2300	Ukraine, R Ukraine Intl	4795eu	6010eu	6020eu	7195eu
		7240eu	9710eu		
2200-2300	United Kingdom,BBC London	5970eu	5975na	6195va	7325eu
		9410af	9570pa	9590na	9750as
		9915sa	11750sa	11955pa	12095af
		15070va	15260sa	15340au	15400af
2200-2300	USA, CSMonitor Boston MA	9465na	13625as	13770eu	15405as
2200-2300	USA, KCBI Dallas TX	15725va			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2230	USA, VOA Washington DC	6030sa	7120as	9770as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2300	USA, VOA Washington DC	7120as	9770as	11760as	15185au
		15290au	15305au	17735au	17820au
2200-2300	USA, WHRI Noblesville IN	13760na			
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, WYFR Okeechobee FL	17610na	17750eu	21525eu	
2200-2230 s	USA,KGEI San Francisco CA	15280sa			
2200-2229	Yugoslavia, Radio	6100eu	7200eu	9505na	
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Australia, Radio	9645pa	11720pa	11855pa	11880pa
		15320pa	15365pa	17795pa	
2230-2300	Israel, Kol Israel	7465eu	9435na	11587na	11603eu
		11675eu	17575eu		
2230-2300	Lithuania, Radio Vilnius	9675eu	9710eu		
2230-2300	Sweden, Radio	6065eu			
2230-2300	USA, VOA Washington DC	9530eu	11905me	11960me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	7440eu	11980eu	12060eu	
2245-2300	India, All India Radio	9910as	11745as	15110as	15145as
		17830as			
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R	7310au	9600au	11830au	

2300 UTC [7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2330	Australia, Radio	11855va	15320pa	15365pa	
2300-0000	Bulgaria, R Sofia	9700na	11720na		
2300-2400	Canada, CBC Northern Svc	9625do			
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	Costa Rica, AWR Alajuela	9725ca	11870ca		
2300-2400	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
2300-2400	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
2300-2305	Ghana, GBC Radio 1	4915do			
2300-2305	Ghana, GBC Radio 2	7295do			
2300-2400	Guam, KSDA Agana	15610as			
2300-2400	India, All India Radio	9910as	11715as	11745as	15110as
		15145as	17830as		
2300-2400 irreg	Iraq, Radio Iraq Intl	15210eu			
2300-2400	Japan, Radio	6050eu	6125eu	11815as	15195as
		15430as	17810eu		
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do			
2300-2400	New Zealand, R NZ Intl	15120pa			
2300-2350	North Korea, R Pyongyang	11700am	13650am		
2300-2330 s	Norway, Radio Norway Intl	11795am			
2300-2400	Russia, Radio Moscow	4795va	4825va	4860va	7115va
		7150va	7170va	7180va	7300va
		9520va	9685va	9725va	9750va
		9860va	9870va	9890va	12050na
		15425na	17655na	21480na	21690as
2300-2310	Sierra Leone, SLBS	3316do			
2300-2400	Singapore, SBC1	5010do	5052do	11940do	
2300-2400	Thailand, Radio	9655as	11905as		
2300-2350	Turkey, Voice of	7185me	9445na	11895eu	
2300-2400	UAE, Radio Abu Dhabi	9605na	11710na	11815na	
2300-2330	United Kingdom,BBC London	5970eu	5975na	6175na	6195as
		7180as	7325eu	9570as	9590na
		9915sa	11750sa	11945as	11955va
		12095na	15070am	15260sa	15280as
2300-2400	USA, CSMonitor Boston MA	9465na	13625as	13770eu	15405as
2300-2400	USA, KCBI Dallas TX	15725va			
2300-2400	USA, KTBN Salt Lk City UT	15590na			
2300-2400	USA, KVOH Los Angeles CA	9725am			
2300-2400	USA, VOA Washington DC	7120as	7140va	9530me	9770as
		11760au	11905me	11960eu	15185au
		15290au	15305as	17735as	17820as
		17885me			
2300-2315 irreg	USA, WEWN Birmingham AL	7540na			
2300-2400	USA, WHRI Noblesville IN	13760sa			
2300-2400	USA, WINB Red Lion PA	15145eu			
2300-2400	USA, WJCR Upton KY	7490na	13595na		
2300-2400	USA, WRNO New Orleans LA		7355na		
2330-2400	Australia, Radio	11720va	11855pa	11880pa	15240pa
		15320pa	15365pa	17795pa	21740pa
2330-0000	Belgium, R Vlaanderen	9930na	13655sa		
2330-2400 a	Colombia, Radio Nacional	11822.5	17865am		
2330-2400	Netherlands, Radio	6020na	6165na		
2330-2400	Palau, KHBN	9830va			
2330-2400 m	Sri Lanka, SLBC Colombo	15425am			
2330-2400	Sweden, Radio	6065eu			
2330-2400	United Kingdom,BBC London	5975na	6175na	6195as	7325eu
		9570as	9590na	9915sa	11750sa
		11945as	11955va	12095na	15070am
		15260sa	15280as		
2330-2400	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11645sa	15650sa	
2345-0000	Croatia, Croatian Radio	5085eu	6210eu	9830eu	13830eu

SELECTED PROGRAMS

Sundays

2305 BBC: World Business Review. The previous week's news and upcoming events.
2305 Radio Norway Int'l: Norway Now. See S 1205.
2315 BBC: Classics With Kay. Brian Kay with his choice of classicalmusic.

Mondays

2305 BBC: World Business Report. The latest news from the markets worldwide.
2315 BBC: Talks. This month, join me in asking, "But Why A Degree?" (3rd) before catching another series of "The Learning World" (through August 2nd).
2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop-music charts.

Tuesdays

2305 BBC: World Business Report. See M 2305.
2315 BBC: Concert Hall. See S 1515.

Wednesdays

2305 BBC: World Business Report. See M 2305.
2315 BBC: From Our Own Correspondent. See S 0330.
2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.

Thursdays

2305 BBC: World Business Report. See M 2305.
2315 BBC: Music Review. News and features from the world of classical music.

Fridays

2305 BBC: World Business Report. See M 2305.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2330 BBC: Multitrack 3. Sarah Ward presents the latest from the alternative pop scene.

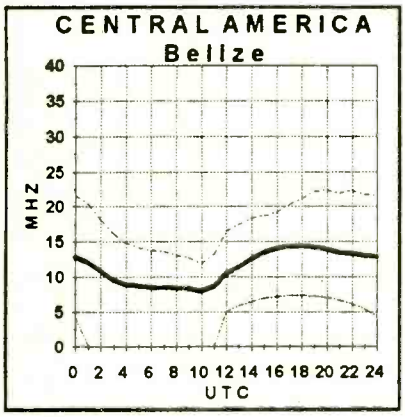
Saturdays

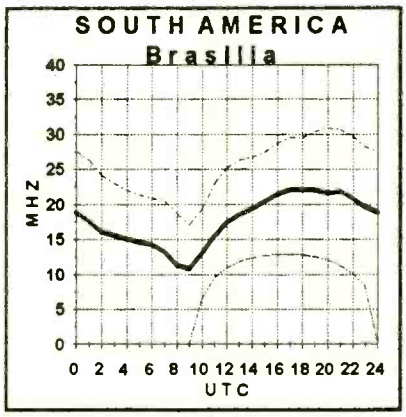
2305 BBC: Words Of Faith. See M 1209.
2310 BBC: Book Choice. See W 0425.
2315 BBC: A Jolly Good Show. See T 1515.

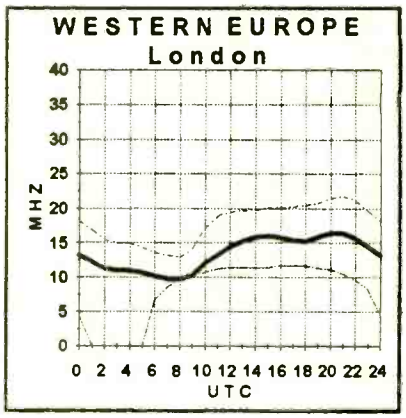
The English Department staff of TRT — The Voice of Turkey.

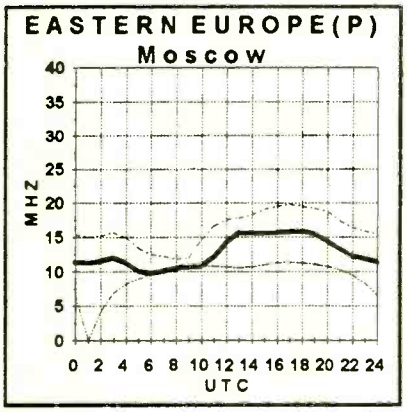
Propagation conditions: Eastern United States

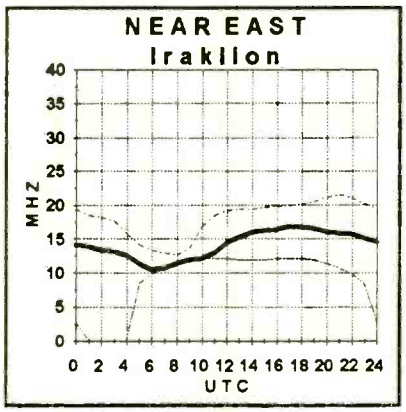
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

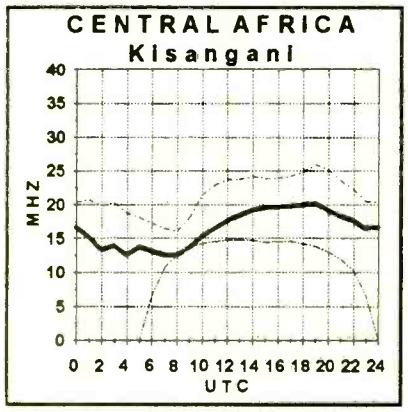


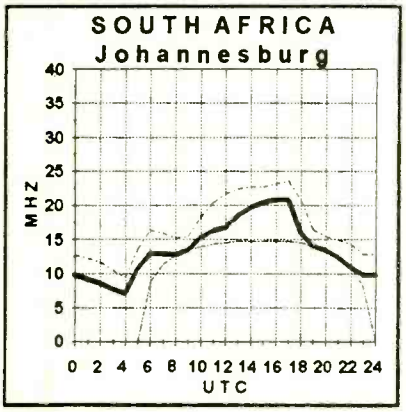


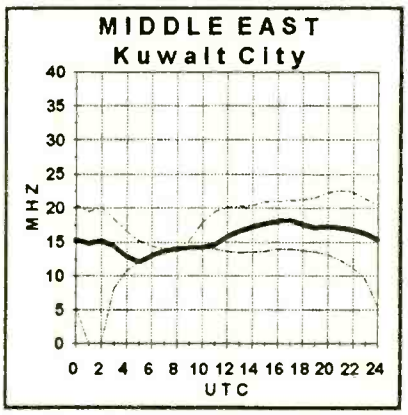


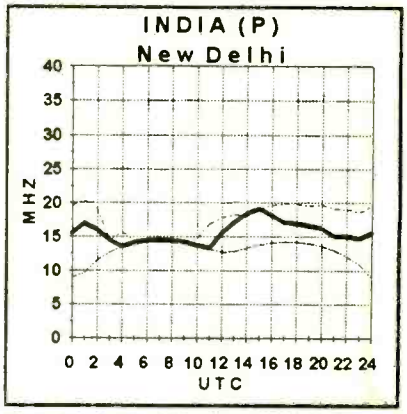


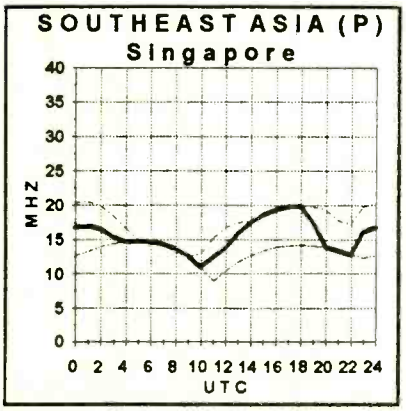


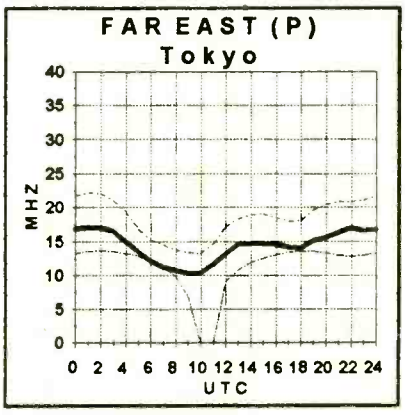


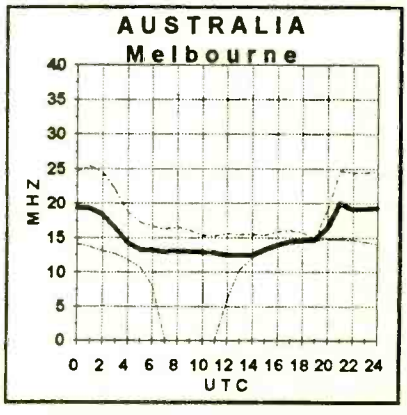






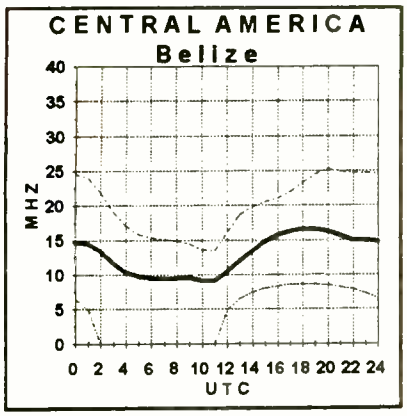


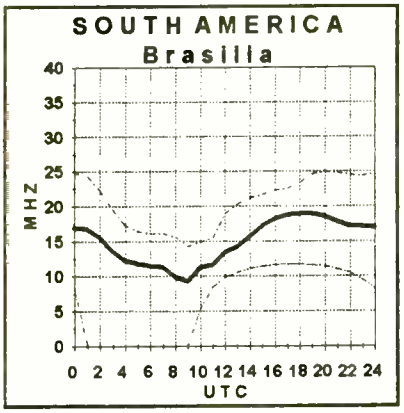


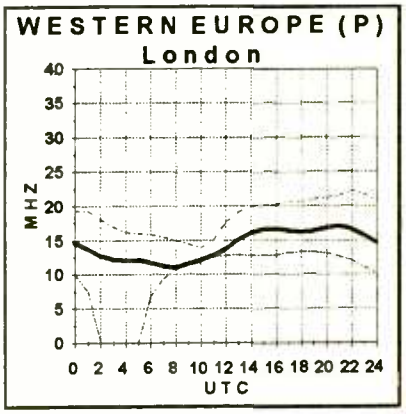


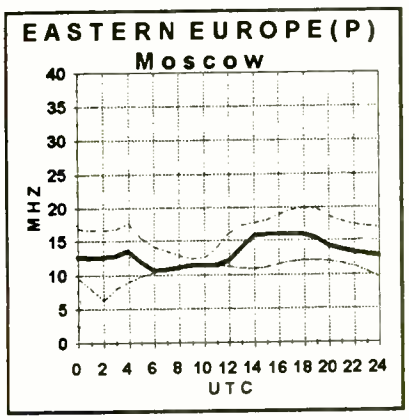
Propagation Conditions: Western United States

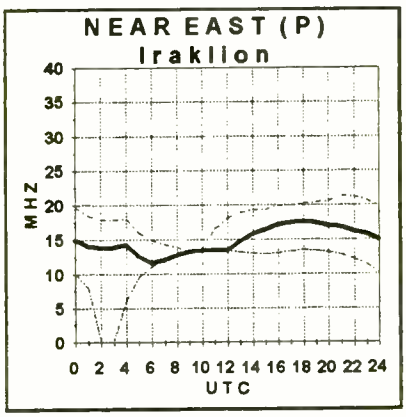
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom 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.

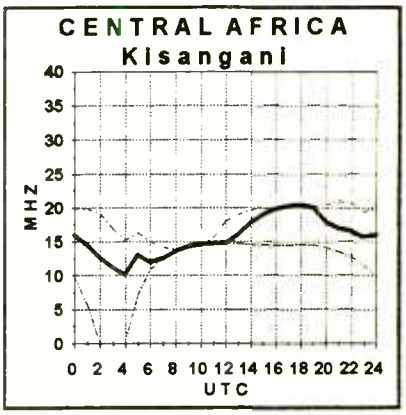


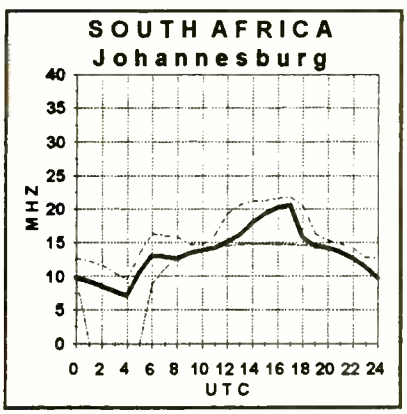


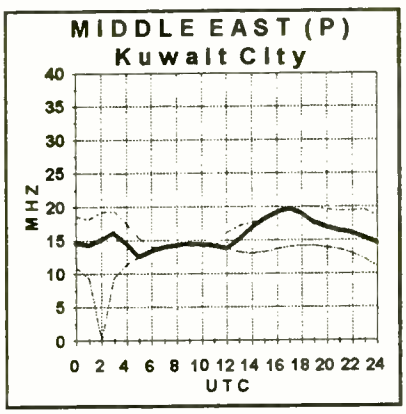


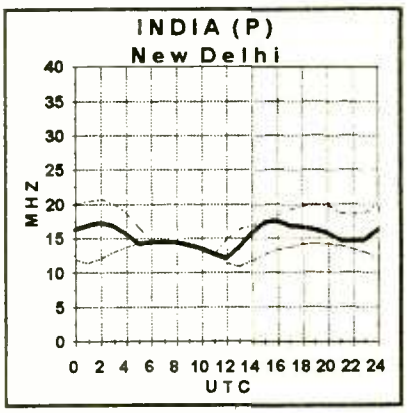


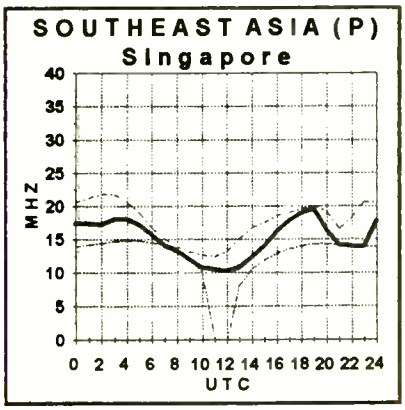


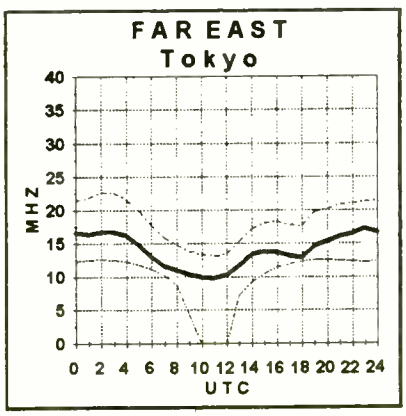


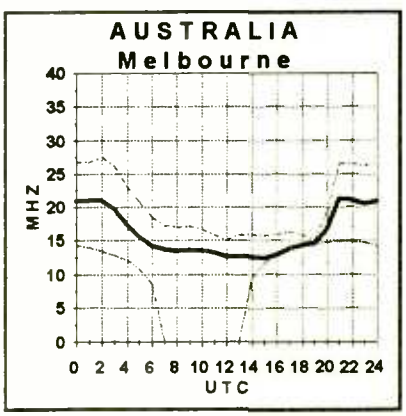






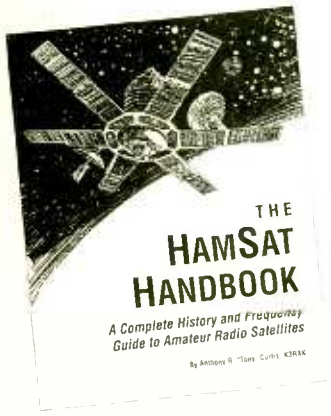






what's new?

Larry Miller



Space Radio

The *Hamsat Handbook* is a new book dedicated to amateur radio satellites. It is thorough, concise and packed with information.

The history of hamsats parallels roughly the history of the so-called space age, a time when outer-space technological triumphs seemed to scream from the nation's newspapers on an almost weekly basis. Covering so much information, even when you concentrate entirely on hamsats, is a massive task.

Author Anthony R. "Tony" Curtis documents every amateur satellite that has been, is now, or is on the drawing board. There is historical information, frequencies, even titillating "inside" anecdotes that make for interesting reading.

There is — if one can criticize the book at all — *too much* information and the author delivers it in one staccato machine gun burst after another. Curtis writes like a man with the world's greatest story to tell, and only 24 hours to live. A little editing would have made this a more readable, accessible book.

Still, it's a good one. Chapters include a snap course in satellite history, individual satellite profiles, hams in space (astronauts), modes and frequencies, balloons, meteors and the moon.

The *Hamsat Handbook* is $19.95 plus $2.00 book rate shipping from Tiare Publications, P.O. Box 493MT, Lake Geneva, Wisconsin 53147.

Radio Magazine on Tape

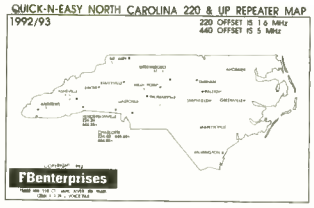
Every once in a while, the National Radio Club (NRC) releases one of their "After Dark" tape series. They're always a treat and edition number three is no exception.

Featured is an interview with Jonathan Marks of Radio Netherlands. Marks is host of the *Media Network* program. Also sharing tape space with Marks is Dr. Bruce Elving, editor of the *FM Atlas*.

There's also a complete bandscan of Las Vegas, Nevada; short items on WOBJ-FM, a Wisconsin station operated by an American Indian tribe; WWTC and its "All Kids" format; and *Voices of the Night* from Chicago radio.

NRC's "After Dark" tapes are an audio magazine, a feast for the discriminating DX ear. And best of all, the entire four-tape (90 minutes each!) collection goes for only $9.50 postpaid. To order yours, send your check or money order to National Radio Club Publications Center, P.O. Box 164, Audio Department, Mannsville, New York 13361-0164.

As a side note, the National Radio Club has discovered that a number of their *AM Station Location Map* books, which *MT* reviewed in March, were defective. If you received a copy in which the reverse side of the first 20 pages are blank, please notify Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164. The NRC will be happy to replace it.



Repeater Maps

FBenterprises is now offering their 2 meter amateur repeater maps in color. The maps are available for all 50 states (California is split into north and south) as well as the Canadian provinces, Central American countries, and all islands of the Caribbean.

The cards are 5-1/2 x 8-1/2" and are laminated in plastic. Each is $3.95 from 15800 NW 31st Ct., Vancouver, Washington 98685. Tell them that you read about it in *MT*.

Toll Free Hamming

Interested in ham radio? Lonely and just want to chat about radio? The American Radio Relay League has installed a toll-free number for people wanting free information on getting a ham license. Call 1-800-32-NEW HAM and receive a booklet entitled, "You're Invited...Getting Started in Amateur Radio," a list of local test centers and details on (ARRL) study materials. The line is answered live, although the hours of operation are not specified. Mention *MT* if you can.

Pirate Logbook

The name Andrew Yoder is probably familiar to pirate DXers. He's the gentleman who wrote Tab's ill-fated *Pirate Radio Stations* (Tab delayed release of the book so long it was out of date when it finally hit the streets), writes about pirates in the *ACE* club bulletin, has run articles in *Popular Communications*, publishes his own pirate newsletter (*Pirate Pages*) and has recently been accused by the FCC of himself being a pirate radio broadcaster.

Now comes the first edition of Yoder's own *1993 Worldwide Pirate Radio Logbook*. The book, which contains a brief introduction, is essentially a compilation of pirate loggings sorted in every conceivable way.

Incidentally, Yoder had offered a package deal on the *1993 Pirate Radio Directory* by George Zeller. This book was recently cancelled by its publisher, Tiare Publications, which leaves a significant void in the pirate realm — for the very capable Yoder to fill?

The *1993 Worldwide Pirate Radio Logbook* is a largely academic exercise that will provide unlimited "clues" for pirate chasers, *WPRL* is available from Snallygaster Press, P.O. Box 272-MT, Springs, Pennsylvania 15562. The price, including postage and taxes, is $10.00.

Software

Eric Svenson, Jr., has released computer software for the Drake R8 communications receiver. Previously marketed during beta testing as a much-simplified shareware program called DX-

COMM and QuikComm, **DX-COMM Plus** is now available from EBS Consultants.

With an IBM PC-compatible computer, preferably with hard drive, the user can control the Drake R8, program frequencies into the receiver, log new frequencies to create new records, and edit or sort the database by fields. Digital signals such as CW or RTTY can also be monitored using a Terminal Node Controller.

The most unique feature of DX-COMM is that it can even display current propagation conditions for reception of most stations. The program can import the English language database sold by TRS Consultants, although it contains a starter database of 1700 records.

For more details and price information, write EBS at 37 Stockton Road, Summit, New Jersey 07901 or call 908-522-8941 between 6pm and 9 pm EST. Tell Eric that *MT* sent you.

RAC Publications has released version 2 of their **RAC Catalog** for IBM compatible computers. Also a former shareware program, the new version is a copyrighted program retailing for $44.95. (Registered users of Version 1 can purchase an upgrade package for $29.95, which includes postage and handling.)

This menu-driven frequency database management program is applicable for any part of the spectrum and handles multiple databases. Included is a conversion program to import other databases into the RAC Catalog. Data can be searched, displayed, and printed by a number of fields. For more information or to order, contact Bob Cheek, author of the program which maintains *MT's* frequency section: 22320 SW 63rd Avenue, Boca Raton, Florida 33428 or call 407-451-2137.

Ham Link is also a Monitor Link

Several issues ago, we ran an item about a product that allowed

you to operate your radio by remote control using your telephone. The system, manufactured by Philip Collins, Ltd., in England, allowed you to dial up your receiver, punch in a frequency, mode, etc., and then listen via the telephone. The potential was intriguing. One person could set up a receiver while on vacation in the Solomon Islands and his friends could call by phone and monitor some local fare from the comfort of their stateside armchairs. The DX opportunities would be unparalleled. The problem was that the Collins version was about a thousand dollars or so.

That's when we noticed a device called HamLink. HamLink, though designed for ham radio operators, does everything that the Collins version does. The price, however, is a mere $269.00.

You can get a free brochure on the Hamlink by calling 1-800-432-8873. The brochure will give you an access code so that you can actually operate a radio from your phone using the HamLink.

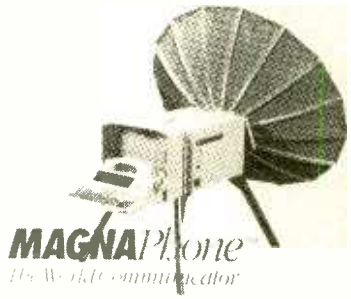
According to AEA, which sells the device, it works with ICOM, Kenwood and Yaesu radios that have a computer port. There's no word on whether it will work with scanners; however, it would be worth the call to AEA. Check it out!

Phone in the Clouds

You're on your way to the top of Mount Everest for a very special DXpedition and you realize that you need a PL252 connector. How do you get in touch with the Sherpas who will be stocking the next camp? MAGNAphone.

MAGNAphone is the world's lightest, most compact satellite telephone. You can call from any place on the planet, immediately ... For vital information ... To file your loggings with Gayle Van Horn ... Or just to say hello.

Weighing only 50 pounds, the



MAGNAphone can travel as carry-on luggage and is as easy to operate as an ordinary telephone. For a free video and brochure on the MAGNAphone, call Magnavox at 516-667-7710 or write 9 Brandywine Drive, Deer Park, New York 11729.

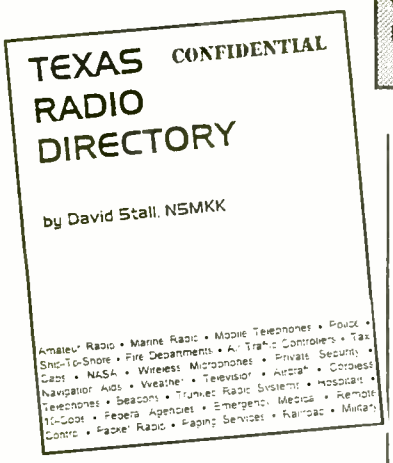
Chicago, Texas, San Diego, Utah Scanners

There have been a handful of scanner frequency guides coming on line over the past month. The *Utah Scanner Guide* is a worthy home-brew book that includes an alphabetical listing of frequencies — police, fire, business and more — plus a separate federal listing. The price is $25.00 postpaid from Smith Communications, Ogden, Utah 84412. Their phone number is 801-399-4222.

The *Texas Radio Directory* is a statewide book that contains over 40 different lists where frequencies are broken down into categories. Police and fire services are sorted by county. This one runs about 58 pages and costs $14.95 plus $1.05 shipping. But don't let the small size put you off; this one is packed with information. Checks or money orders go to Luna Lumen Press, P.O. Box 58023, Houston, Texas 77258-8023.

Also packed with information is the *Cook County* [Illinois]

When requesting information or purchasing products mentioned in "What's New?", please be sure to mention you saw it in *Monitoring Times*.



Scanner Frequency Directory for residents of Chicago and the surrounding suburbs. Produced by retired police officer Ed Heyer, it has that special edge that only a member of the law enforcement community can give. A "thumbs up" for this 52 page package of information, retailing for $14.95 plus $2.50 shipping. Checks and money orders go to Ed at 1800 S. 48th Ct., Cicero, Illinois 60650.

The *San Diego Heartland Scanner Digest* is a hot list of scanner frequencies for San Diego county and vicinity. This has more than just a lot of numbers. There are 10-codes, abbreviations, and a really good list of frequencies that range from police and fire to the local space shuttle repeater. Author Jerry Pickard, also known as the Santee Scanner, sells this book for $12.95 postpaid from 8961 Magnolia Ave., Santee, California 92071.

From the Horse's Mouth

The Bearcat Radio Club is now offering the official 1993 FCC frequency microfiche for sale at $15.00 postpaid, per state. The information is cross-referenced by location and contains every licensee in the state except amateur radio and federal government. Fields include frequency, call sign, licensee name and service type.

Send check or money order to Bearcat Radio Club, P.O. Box 291918, Kettering, Ohio 45429. Tell 'em *Monitoring Times* sent you.

Undeserved Bad Rap

According to some radio sages, the GE SuperRadio II is actually more sensitive than the GE SuperRadio III. This oft repeated bit of folklore does have a grain of truth, but has been blown entirely out of proportion. Here's the story.

According to the radio's manufacturer, Thomson, a few early models of the SuperRadio III shipped in mid-to-late 1992 did indeed have sensitivity problems. If you have one of the radios with this problem, it doesn't take a rocket scientist to realize it. The problem is severe.

If you're still unsure, check the four-digit date code (not the serial number) stamped on the box (and in some cases, inside the battery compartment). If the second number is a "2," then it was built in 1992, which means it could be defective.

Next look at the last two numbers. If the number is 42 or higher, you're off the hook. But even if you have a '41' or lower, it doesn't necessarily mean that the radio is defective — just that it's possible.

So don't trust the grapevine — or the numbers. Ultimately, your ears are the judge. It's a great radio.

Computer Pilots Beware

In the December '92 issue of *MT*, Jean Baker recommended the Computer Pilot's Association of America (P.O. Box 580608, Houston, TX 77258-0608) as a good source of computer flight games and updates. However, several readers have reported no response as a result of their inquiries and/or $35 membership fee. Jean also reports no reply to her follow-up messages.

If you have placed an order which has remained unfulfilled, Jean Baker would appreciate copies of all your transactions (cancelled checks, correspondence, etc.) to substantiate a formal complaint. Please send to Jean Baker, 213 West Troy Avenue Apt. C, Indianapolis, IN 46225.

CPAA, please RSVP.

Special thanks to Rich Piehl of St. Louis, Missouri, for his contribution to this month's "What's New."

Reviews

Sangean Reel-Out Antenna

Reel-out antennas are popular among travelers and apartment dwellers who are faced with the dilemma of constantly having to erect and remove good wire antennas. This newly-released Sangean product is yet a better answer.

The model ANT-60 extends to a full 23 feet (7 meters) and comes with both a whip clip and 1/8" (3.5 mm) miniplug, making it universally adaptable to virtually every portable shortwave radio.

A spring clip allows the user to suspend the far end of the wire antenna from a drape or other point. The housing is contoured for secure grasp, while a finger indent permits rapid rewind of the deployed wire for storage or transport.

The Sangean ANT-60 is $12.95 plus $4 shipping from Grove Enterprises and other *MT* advertisers.

Optoelectronics Interceptor

Neither fish nor foul — this ancient proverb may well apply to the unusual R10 FM Communications Interceptor released recently from Opotoelectronics.

Spanning 30 MHz through 2 GHz, the R10 continuously searches rapidly through the spectrum looking for local FM signals. Once discovered, the device stays on that frequency until the signal goes off the air, then it resumes its search.

The R10 is a test instrument, not a scanner; it cannot be programmed for a par-

continued...

Reviews contd...

ticular frequency, it only monitors FM — not AM — signals, it will not read out the frequency of a signal, it won't respond to weak signals, nor can it remain on frequency between transmissions.

While it may be marginally useful for listening to two-way communications close by — if there are no other stronger signals which will capture the R10's detector — its primary application is for quick testing of an FM transmitter (no AM capability) without needing to know its frequency.

Here it shines, for within a fraction of a second the R10 automatically zeroes in on any FM signal of at least -40 dBm (2250 microvolts) intensity and reads out its deviation. It will also show the relative signal strength on an LED light bar. A speaker provides detected audio; a plug-in earphone affords private monitoring or use in a noisy environment.

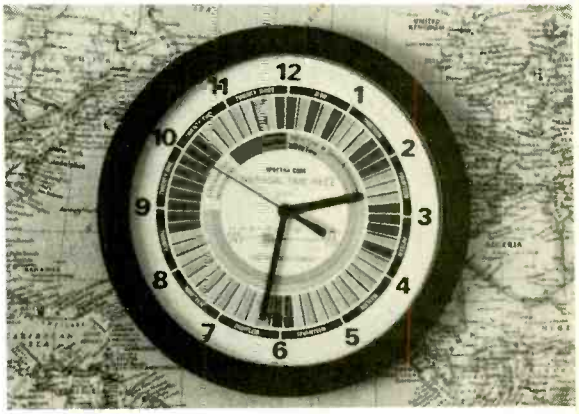
The R10 can also be used as a "magic wand" hidden transmitter detector; under certain conditions the device can be used to find a room bug. The telescoping whip (supplied) can be disconnected from the BNC connector to accommodate a variety of specialized antennas, or the optional Opto preselectors which extend its monitoring range from a few feet to several hundred feet on low power devices.

A squelch control serves as an ersatz sensitivity control, allowing rejection of distant, powerful broadcasters, while a "skip" button permits the receiver to leave an unwanted signal to look for others.

The R10 will operate for more than four hours from its internal nicad batteries; an AC charger/wall adaptor is included.

R10 FM Communications Interceptor, $359 from Optoelectronics, 5821 NE 14th Ave., Ft. Lauderdale, FL 33334; phone 305-771-2050.

WWV-Format Wall clock



Some products are elegant in their simplicity. This new quartz-based wall clock has an imprinted face which shows all the WWV time and propagation announcement segments throughout the hour. Interested in solar activity, GPS status, Omega navigation information? One glance and you'll know when to tune in.

The Spectra-Com Universal Time Piece is imprinted with both 24 hour universal and 12 hour local times; its five-color printing vividly displays its versatility. One AA cell powers it for a year or more.

This clever and attractive ten-inch clock would make a great gift for the ham shack, radio room, engineering lab, yacht or office.

Spectra-Com Universal Timepiece, $29.95 plus $4.50 shipping from JZO Research, 7140 Colorado Avenue North, Minneapolis, MN 55429.

MT

Bob Grove, WA4PYQ

Uniden Bearcat 700A
Mobile/Base Scanner

An interesting evolution has occurred over the last three or so years. The introduction of the popular Uniden BC760XLT (also known as the BC950XLT) has spawned a mobile-only version for Radio Shack, the PRO-2026. Now Uniden has released an innovative product which seems to be a hybrid of both radios with a little BC1 thrown in — the BC700A.

This new scanner is unusual from a number of standpoints. Cosmetically it departs from its predecessors with color-accented keys, beveled front panel corners and rounded LCD window.

Operationally it mimics its pre-programmed precursors, yet allows custom frequency entry without a keypad. How is this done?

The 700A covers 29-54, 108-174, 406-512 and 806-956 MHz (less cellular) and allows the user to automatically enter into memory up to 50 frequencies discovered active during the search routine — at up to 100 channels per second ("Super Turbo Scan")! An additional 20 "private" frequencies may be selected and memorized by manually controlling the search routine.

The listener may select pre-programmed autosearch sequences from nearly 1000 factory installed frequencies for police, fire/emergency, aircraft, marine and weather. Alternatively, he can choose from a dozen sub-bands (29-30, 30-50, 50-54 MHz, etc.) for continuous frequency search, entering desired frequencies into memory with simple key strokes.

Search step increments are appropriate for the frequency ranges: 5 kHz on 29-54 and 137-174 MHz, 25 kHz on 108-137 MHz, and 12.5 kHz on 406-512 and 806-956 MHz. Sensitivity is typically Bearcat: 0.4 microvolts or better on all land mobile (FM) frequencies.

Individual channel lockout is selected; it is possible to reactivate locked-out channels individually or all at once by a simple keypress procedure. All-channel delay (2 seconds) is not defeatable.

The non-volatile memory will store your favorite frequencies for up to a month before it loses your custom commands and reverts back to the factory default settings.

Audio is a strong and clear 3 watts at full volume from the bottom-mounted internal speaker; an external speaker/earphone jack affords mobile or privacy convenience. The antenna jack is a BNC and a rear-apron switch allows the panel to be locked to avoid accidental memory erasures. A hinged tilt bracket allows the front to be raised on a desktop.

The new Bearcat comes fully equipped for either base or mobile installation: an AC wall adaptor and attachable whip antenna are included for indoor use, and a mounting bracket with hardware, and DC cord are included for the vehicle.

The 700A measures a compact 5-1/4"W x 7"D x 1-5/8"H and weighs scarcely over one pound. Key legends are easily readable and the LCD is comfortably backlit.

The manual is a welcome improvement over those recently provided with Uniden products. It is bound like a booklet, not those awful, fold-out sheets, and is very thorough in its illustrated instructions and explanations.

Is this a good radio? Yes. We would recommend it for those who want to hear a variety of services, but don't want to bother entering frequencies from a keypad. Yet when such frequencies need to be entered, they can be.

The Uniden BC700A retails for approximately $200 from *MT* advertisers.

MT

Cellular Restoration for the BC700A

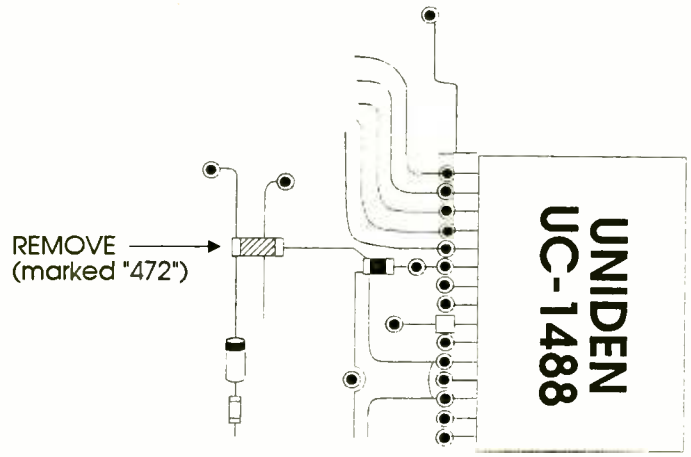
While it is unlawful in the United States to listen to cellular telephone conversations, it is not unlawful to own a cellular-capable scanner. Manufacturers provide a way to restore cellular frequencies in cellular-censored scanners for other countries which have no cellular monitoring restrictions.

NOTE: This modification may void your warranty. *Monitoring Times* assumes no responsibility for damages resulting from attempting this modification.

TOOLS REQUIRED: Philips screwdriver, jeweler's screwdriver or pointed tool, small soldering iron, rosin core solder.

1) Remove the screws holding the case halves; separate them using care to unplug the speaker lead.
2) Turn the scanner upside-down with the face away from you and remove the two side screws holding the faceplate; tilt it forward.
3) Carefully pry up and unplug, using a jewelers screwdriver or pointed tool, the edges of the connecter on the transparent cable so that the faceplate can be tilted fully forward.
4) Locate the copper/plastic shield under the faceplate; unsolder and remove it.
5) Unsolder the resistor marked "472" as shown in the illustration.

This completes the modification. Plug the cable back in place and test the scanner by entering "870.000" (channel spacing is still 12.5 kHz, not 30 kHz). Reassemble the scanner.



REALISTIC® HAS STRUCK *AGAIN!*

"The new PRO-46 handheld scanner is going to give Uniden's own BC200XLT a run for the money." – Bob Grove

Shorter and lighter than the Bearcat, the PRO-46 accepts both replaceable AA cells and rechargeable NiCads. Includes a belt clip and flex whip.

Frequency ranges are: 29-54, 108-174, 406-512 and 806-956 MHz (less cellular). Up to 100 channels may be stored in ten memory banks and scanned--up or down in direction--at approximately 20 channels per second. An additional 10 monitor channels can be temporarily stored in the search mode.

220 milliwatts of audio is available from the 1/8" mini phone jack.

Instant weather channel selection!

One-step erasure of all memory contents!

Any channel may be selected for priority, temporarily locked out of the scan sequence, and delayed for 2 seconds before scan resumes after signal dropout. A keylock prevents accidental erasure or activation of keys.

The 35 page, well-illustrated owner's manual is packed with easy-to-read instructions and helpful hints for better reception.

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USCN12	Uniden BC760XLT w/tone board	$340.85
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USCN14	ICOM R-100	$589.95
USCN15	ICOM R7100	$1219.50
UMISC	Kenwood R1000 -*Used, good condition*	$325
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UANT4B	Magnetic Mount Antenna Base	$15.95
UCPL63M	Antenna Multicoupler w/mot	$9.95
UBOK14	Shortwave Directory	$8.95
UBOK18	1993 Passport to World Band Radio	$13.95
UBOK22	Police Call Directory V2	$7.95
UBOK25	Police Call Directory V5	$7.95
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UBOK55	Canadian Military Radio Freq Guide	$11.95
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Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Yaesu FRG-100

The Little Radio That Could (With Help)

These are delicious times for world band listeners. Last year, Lowe introduced the HF-150, which demonstrated conclusively that a high performance radio could be brought to the market place for significantly less than a kilobuck. Our test team hoped this was the beginning of a new trend: more affordable "serious" receivers.

So, when the *Passport to World Band Radio* team saw the pre-production specifications for Yaesu's FRG-100, we drooled. A high-performance receiver within handshaking distance of $500 — this is more like it! But immediately two questions raised their heads: Could Yaesu (or any other company for that matter) build a worthy performer for that price? Would it live up to the specifications we had seen?

The short answer is that, in many respects, the FRG-100 is a top-notch performer. Yet, as it comes from the factory, it fails significantly to live up to its promise for world band listening.

Worthwhile Features

The FRG-100 looks and feels like a ham transceiver, reflecting Yaesu's presence in the amateur radio market. A small receiver (9.5" W x 11" D x 4.25" H), it weighs only three pounds and covers from 50 kHz to 30 MHz in USB, LSB, AM and CW modes. Out-of-the-box bandwidths nominally are 2.4 kHz (SSB/CW), 4 kHz (AM narrow) and 6 kHz (AM wide). An FM module, 500 Hz CW bandwidth, and high-stability crystal are optional. There is a noise blanker, selectable AGC, two attenuators, two clocks, on-off timers, 50 tunable memories that store frequency and mode information, a way to select 16 pre-programmed international broadcast bands (from longwave to 11 meters), a variety of scanning schemes, and an all-mode squelch.

The front panel is completed by a signal strength meter, a 7-digit LCD illuminated frequency display and a plastic tuning knob with a "speed" dimple. On the back panel are connectors for high- and low-impedance antennas, a switch for choosing between them, a jack for remotely controlling a tape recorder, a grounding post; and connectors for an external speaker, tape recorder, computer control of the FRG-100 and DC power supply. In short, the FRG-100 is replete with goodies.

Certain Attributes Lacking

Some of the advanced control that DX hounds cherish for squeezing the last erg out of a faint signal under crummy conditions are missing: there is no passband offset, no notch filter and no RF gain control. But that is no surprise in a tabletop radio in this price range. Significantly, for fastidious program listeners, there is no synchronous detector.

Even more interesting, there is no numerical keypad for direct frequency entry and no internal power supply. As a result, if you are listening to, say, the Coast Guard emergency frequency of 2182 kHz USB and decide to check on the 10-meter novice ham band at 28,300 kHz USB, you must first punch the "fast" turning button, then press the "up" slewing button and wait while megahertz after megahertz tick by. Strategic use of the FRG-100 memory channels can help to make broad frequency changes less cumbersome.

Performance Pluses

In most respects, the performance of the FRG-100 shines. Sensitivity at shortwave frequencies is excellent-to-superb, and good-to-excellent at AM and longwave frequencies. Blocking is excellent. Image rejection is superb, as is the AGC threshold. Front-end selectivity and phase noise both earn a good rating. And distortion in SSB is low — the worst measurement was a mere 0.5%. Quite a commendable showing for a receiver that can be delivered to your door for less than $600!

Dreadful Bandwidths

But there are also some reasons not to smile. The AM "wide" bandwidth, specified to be 6 kHz, actually measures 7.6 kHz at -6 dB. While this is broader than it should be, at -60 dB, this bandwidth measures a whopping 17.9 kHz! In practice, cruising one of the international broadcasting bands in the AM "wide" bandwidth can result in a series of howling heterodynes that greatly diminish the listening experience.

It gets worse. The AM narrow bandwidth, which is supposed to be 4 kHz, measures 6.9 kHz at -6 dB — that's 72% over specification — and 17.2 kHz at -60 dB! If you guessed that the listener can't hear much difference between the AM wide and AM narrow bandwidths, you're right.

Fortunately, the SSB bandwidth, which measures 2.6 kHz at -6 dB and only 3.7 kHz at -60 dB works very well for listening to programs and utility signals in the single-sideband mode. All three filters — AM wide, AM narrow, and SSB — earn good ratings for their ultimate rejection.

If you tire of trying to scan the bands using the overly broad AM-wide or AM-narrow bandwidths, you can change the default filter for any mode. So, for example, the default bandwidth for AM-narrow can be changed from 6.9 kHz (4 kHz nominal) to 2.6 kHz (2.4 kHz nominal), the single-sideband bandwidth. this is done through the receiver's software. It is very quick and easy, and can be changed back if you don't like the results.

Unfortunately, using the 2.6 kHz SSB bandwidth in the AM mode produces audio that sounds "choked." Moving the frequency up or down 1.5 kHz or so from the center frequency greatly improves readability, with audio quality becoming more natural. Although detuning also tends to increase distortion, it's usually a worthwhile tradeoff against the other benefits derived.

In all, whichever AM-bandwidth default pair you select, the end result is disappointing. Two of the three bandwidths are too wide, whereas the third doesn't sound up to snuff unless the set is tuned off frequency.

Other findings weren't so worthy. The dynamic range of this receiver, measured in our lab tests at "real world" 5 kHz spacing, comes in with only a fair rating. We found much more distortion in the AM mode than in SSB — of the six distortion measurements we made in AM mode, half were 4% or above, a fair showing, and only one was as low as 1%.

In addition, the FRG-100 is not equipped with an internal AC power supply. Instead, an external transformer is supplied that remains on whenever it is plugged in, regardless of whether the receiver is on or not. Because on rare occasions such transformers can fail and start fires, we suggest you unplug it when not in use or connect it to a power bar that you switch off when you are not listening.

Overall: Needs Better Bandwidths

The bottom line is that the FRG-100 goes a very long way towards being a worthy performer at a cut rate price — but it doesn't go far enough. It desperately needs more appropriate AM wide and AM narrow filters before it can be considered a great "first tabletop receiver." Best bet: Wait until Yaesu changes the bandwidths or until world band specialty houses offer a worthy retrofit.

Improved Bandwidths to be Offered

In that regard, at least three U.S. radio specialty firms already plan to offer filter modifications for the FRG-100. By this May, Electronic Equipment Bank hopes to be able to install a separate printed circuit board with three Collins mechanical filters (0.5 kHz CW, 2.4 kHz SSB, 6.0 kHz AM "wide") nominally having excellent performance characteristics, plus a 15-pole 4.0 kHz ceramic filter for AM "narrow." That's the good news. The bad news is that this modified version, which they plan to call the FRG-100HP, is to cost a whopping $899.95, only $79 less than the top-rated Drake R8.

Universal Radio, Grove Enterprises, and Gilfer Associates both plan to improve the FRG-100's filtering simply by replacing the existing MuRata ceramic filters with comparable filters having narrower bandwidths. The prices for this haven't as yet been announced, but in principle this should not be a costly modification.

$14.95 Radio!

MT reader Michael Shuster finds that the Pomtrex 120-00300 we reviewed two years ago is now being sold as the Apex 2138. As you may recall, the Pomtrex is a nice, simple bandspreaded analog portable suitable for use on trips or as low-cost gifts.

Whereas the Pomtrex, now virtually impossible to find, sold for $29.95, the Apex is currently being sold by Consumers Distribution as catalog #658-328 for *$14.95!* Consumers Distribution operates a chain of retail stores in the northeastern United States. You can find the location of their stores by calling their head office at 908-248-8400.

This price, an all-time low in our experience, is ridiculous. Grab 'em while you can!

MT

John Catalano

Two Days of House Cleaning or

How I Found My C-64 Software!

For the past few months I have been promising a review of C-64 software which could be useful to radio monitors. When I first conceived of this column, it seemed dead easy. I had two C-64s and lots of software collected over the past eight years in the USA and Europe. "What an easy column this will be to write," I thought.

What a miscalculation! First, *both* C-64s were found to have survived the past three house moves poorly; they didn't work. So after sending the C-64 for repair, I reported that I had it back. I did. Problem was it still didn't work. So much for getting value for money. In desperation, I repaired the second one myself over one weekend and spent a "you-owe-me" credit with my wife.

Ready to go, I got up at 6 am last Saturday ready to grab the software and get into high gear. By one in the afternoon I was still running through the house yelling at the black hole that I was sure had eaten all the C-64 software. I couldn't find one C-64 disk! By the time the sun was going down, trying to make my wife understand that I had looked in the closet she had suggested hours ago, and ripping apart a three car garage, I finally found it! So here we really go!

As I said, I have collected this software from various places. I'm not sure which are still available, or which are exclusively European or American. The enclosed table is a list of program names, functions, format (Disk/Cassette/Cartridge), additional equipment required (Tuning Unit/Decoder/Interface) and manufacturer or author (if known).

I had switched to the C-64 in about 1984 from the Atari 800. Although the Atari was a superior computer system, with the best radio frequency shielding of any home computer I've ever seen, I could only find a few monitoring programs for it. I never had that problem with the C-64, and therein lies its success. Using the tuning unit I had built for my Atari, I rewired it for the MBA-TOR program and the C-64.

The results with my Kenwood R-1000 were *great*. I used this software/equipment configuration for almost three years with lots of RTTY, CW and TOR loggings. The TOR synchronization was always a bit "touchy," but with a little practice, and increasing the gain of my tuning unit, I had some of my best monitoring sessions while in Europe. The Dutch program COM-IN 64, is a similar program with the addition of slow scan TV reception. I've used this successfully on the ham bands.

MBA-TOR uses a main menu with single letter mode, which then brings up two other screens; either command or option. MBA-TOR has lots of helpful features such as a real-time clock displayed on most screens. The color of the screen background and the characters can be set by the user. In the Morse mode the program tracks the speed of the sender. The user can override this feature if noisy conditions exist.

Morse (CW) decoding of strong to medium signals is done very well by the program. When RTTY decoding is chosen from the menu, the user's job becomes a bit more difficult, due to the number of command combinations. The speed, or Baud rate, of the RTTY signal must be determined by running through 60, 67, 75, 100 or 132 words per minute until the screen decodes something readable.

The complexity comes in when you consider that at each of these speeds the signal's "sense" must be determined. A RTTY signal is composed of two different tones, called a mark and a space. The difference between these tones is called the shift. But the mark tone can be the high frequency tone or the space. This is called the sense. This can be accounted for by setting the sense to normal or reverse. So each speed has two possible sense modes. That means lots of key pressing to decode new signals. But the result was usually pretty good.

The first time I received TOR (Telex Over Radio), it was with MBA-TOR. The program allows the user to decode both ARQ and FEC modes of TOR. Considering that this program was

Table 1: List of C-64 Monitoring Software

Name	Function	For	Equipment	Manufacturer
SWL	CW/RTTY/ASC	CAR	No	Microlog, Gaithersburg, MD; now called G&G Electronics
CM-64	CW/RTTY	CAR(2)	No	Newsome Elec., Trenton, MI
COM-IN	C/R/AS/SSTV	CAR	TU	Computer World, Holland
AIRDISK	C/R/AS/TOR	D	TU	G&G Elec., Gaithersburg, MD
MBA-TOR	C/R/AS/TOR	D	TU	AEA, Lynnwood, MA
FAX16.5	FAX/SSTV	D	DE	Public Domain, Holland
GEOSAT	Sat Position	D	-	Public Domain, USA
CAT	CAT FRG9600	D	I	Don Rasmussen
CATBASE	Database for CAT above			Don Rasmussen, Oceanside, CA
ME-CAT	CAT Frg8800	D	I	Modern Electronics Mag, Feb 88
WORLDCLOCK		D	-	Brookfield Soft, PB66, 5240 AB, Rosmalen, Netherlands
AMSAT PREDICTION		D	-	AMSAT
ANTENNA SCALER		D	-	C6A & N6NB Hayden Book Co.
DX CHECKER		D	-	KC6A & N6NB Hayden Book Co.
DIGISAT VHF/HF SATPIX		D	DE	F. VerGeest & J. Schot, Holland
EUROFAX	HF FAX	D	DE	?
VISIFAX	HF FAX	D	DE	G. Sargent, Willow Run, Dayton, OH
Dr. DX	Ham Simulator	CAR	-	AEA, Lynnwood, MA
KB1MA RTTY	RTTY/ASC	CAS	TU	KB1MA ham operator
MFJ-1265	RTTY/ASC	CAS	TU	MFJ, Mississippi State, MS
COMKEY	CW Trans	CAS	-	F. Reuning, Elk Rd., Bristol, TN

written in the middle 80's and for the C-64, this mode was a real breakthrough. In fact, many hams today still use this program for AMTOR since the program includes both receive and transmit modes.

On the command menu, which really should be called the input/output screen, whatever has been received can be stored on disk for later reading. Again, in the mid 80's this was pretty revolutionary. Going through my disks it was lots of fun reading the decodes from May 4, 1988, and many others I came upon. The saving feature means you don't have to stay glued to the screen. Often I would leave the program decoding for hours and just skim the results on disk later. The disk manufacturers love it! All-in-all, MBA-TOR still can hold its own in the 90's if you have a good tuning unit to go with it.

The AIRDISK, which I bought years later, is a similar product and very good as well. Airdisk includes a simple on-screen tuning indicator which makes tuning a bit easier. It also seems to take slightly less time to synchronize to an AMTOR signal than MBA-TOR.

Finally, another C-64 product which should be mentioned is the SWL cartridge. This product was an attempt to put a tuning unit inside the program cartridge. Nothing else is required to receive CW or RTTY but a connection to the speaker of a receiver. Pretty nifty concept. But the implementation only really works for medium strength signals in the clear, or for strong signals. The program itself operates similar to Airdisk. Since both were from Microlog, this is no surprise.

Re-visiting the C-64 after using a PC clone for the past three years was a pleasant surprise. If you have, or can buy, a *working* C-64 and TU cheaply at a hamfest or flea market, and get one of the aforementioned programs, you'll have the makings of a good solid system, useful for years. If any C-64 monitoring software manufacturers want to update me on their products, I'll pass the info or reviews along in future columns.

Well, so much for the "column from hell" which I never thought I'd get completed. If you're wondering where I finally found my C-64 software, well, let me just say I had to cash in yet another domestic credit. Now I'm going to brick up that *!#@ closet.

MT

LETTERS cont'd

The reception lasted about 1/2 hour with frequent station IDs. I'm sure that I didn't make a mistake. Could I have just been at the right place at the right time?"

I don't see why not, K.S.; stranger things have happened. That's one of the things that makes the radio hobby so addicting! Thanks for sharing your "once in a blue moon" catch. Do some of the rest of you have a logging of a lifetime you'd like to brag about?

Computerphobia

Lest our readers fear *MT* is changing its usual balance of articles, I want to assure you that this month's emphasis on computers is intentional, but not a permanent trend. We wanted to demonstrate the many things that are made easier, or perhaps only made possible, by means of a computer, as well as to reassure you that computers are becoming increasingly user-friendly.

Even though he is no beginner, you can tell that Bill Grove is very excited by the Tandy "Sensation!" computer and its ease of use. But anything it can do can also be done by other personal computers with the right accessories. Or, you can start from where you are, with the equipment you have — even the Commodore 64 is still a viable radio tool, as you'll see in the "Computers and Radio" column.

As you get into computers, you'll find more and more resources for the radio hobbyist, but sometimes software and bulletin boards can be hard to find until you get on a few mailing lists. One person who has offered a software package to our readers in years past, would like to upgrade that offer.

Chuck Bolland now has a "stand alone" Shortwave Broadcast Radio Station Database Program. It has between 3,500 to 4,000 records and covers all the shortwave broadcast bands plus some longwave and medium wave stations. The program can sort by country, frequency, schedule, station name, language or continent. You can add, delete or edit to keep the database current indefinitely.

The program runs on IBM compatibles with a hard drive, and is being offered at cost for $20 in the continental US and $25 elsewhere. Please mention diskette size. Anyone interested should write to: Charles Bolland, P.O. Box 18402-MT, West Palm Beach, FL 33416.

For getting started in bulletin boards, there is a small list of BBSs in the April issue of the *RCMA Journal* (P.O. Box 542, Silverado, CA 92676; cover price $2.95); *Spec-Com* magazine, though geared specifically to amateur radio video, digital and other specialized communications, has a regular column on BBSs by Gary Sanders (Spec-Com, P.O. Box 1002, Dubuque, IA 52004-1002; cover $3.75). Most club publications print a list of topical or regional BBSs from time to time.

Make the most of your May days; summertime is around the corner and you want to be ready to kick back and enjoy some "good ol' monitoring times"!

Rachel Baughn,
Editor

Doug Demaw, W1FB

Add WWV to that Old Receiver

Older receivers, especially those that were designed as hamband-only units, did not have provisions for receiving WWV. Also, some WW-II surplus receivers are incapable of covering the WWV frequency. This article describes a simple, inexpensive converter that may be used to receive the National Bureau of Standards (NBS) station, WWV, at 10 MHz. Only two transistors are used and the converter is operated from a 9-volt transistor radio battery.

Why Bother with WWV?

Being able to listen to WWV has many advantages for the SWL or amateur radio operator. If nothing more, we can set our clocks accurately by listening to the WWV broadcasts. We can also calibrate our receivers and test equipment by using WWV as a standard. WWV is a very useful tool for discovering propagation conditions.

WWV is located in Boulder, Colorado, and transmits on 1.5, 5.0, 10.0, 15.0 and 20.0 MHz. If our receiver appears to be dead on a particular band at a specified time of the day, we can tune in WWV at 20 minutes past the hour and learn what the current conditions are. Not only that, but WWV itself can be used as an indicator of band conditions by checking out each of the five frequencies. If the WWV signal in our band of interest is weak or fluttery, chances are conditions are generally poor and that we may not hear that rare DX we are seeking.

Our WWV Converter

The circuit in Figure 1 may be used with your present receiver to provide WWV coverage on 10.000 MHz. This is a good frequency for general assessment of stateside band conditions. The converter is used to down-convert 10 MHz to an IF (intermediate frequency) of 2.0 MHz in this case. Most older receivers can be tuned to 2 MHz and hence the choice.

Changing the frequency of crystal Y1 will yield a different IF, if you prefer. Simply add the desired IF to 10 MHz to find the new Y1. No circuit changes are needed at oscillator Q2 for crystals from 5 to 20 MHz. The only other change required is at L3. Its winding should have the

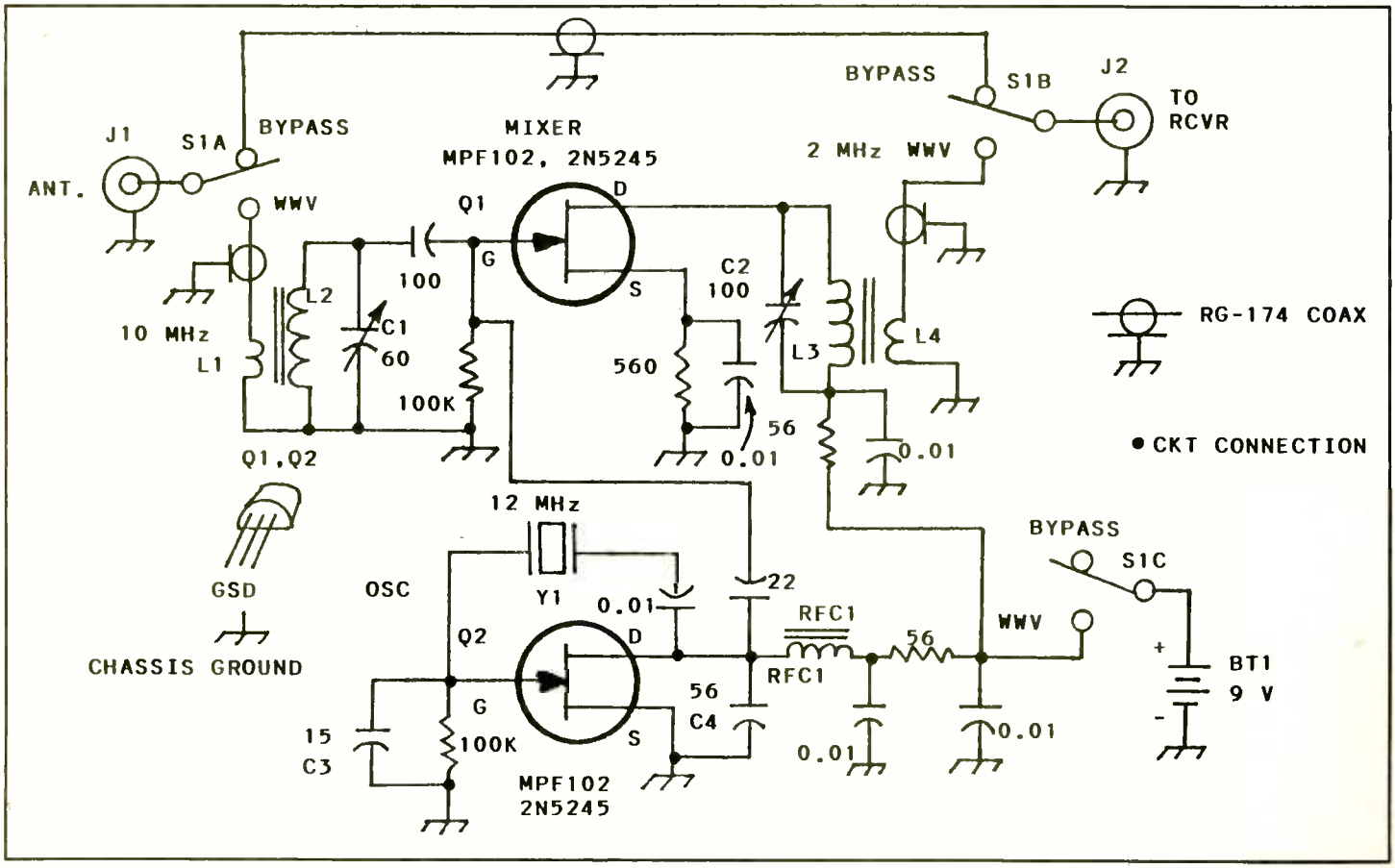


Figure 1: Schematic diagram of the 10-MHz WWV converter with an IF of 2.0 MHz. Decimal value capacitors are in µF. Others are in pF. Resistors are 1/4-W carbon composition. K = 1000.

C1, C2	Mica compression or ceramic trimmer.
C3, C4	See text.
J1, J2	Phono jack or SO-238 (builder's choice).
L1	4 turns of no. 26 enam. wire over grounded end of L2 winding.
L2	35 turns of no. 26 enam. wire (5 µH) on an Amidon Assoc. T50-6 toroid core.
L3	90-µH inductor. Use 36 turns of no. 26 enam. wire on an Amidon Assoc. FT-50-61 ferrite toroid.
L4	5 turns of no. 26 enam. wire over 9-V (lower) end of L3.
S1	Three-pole, double-throw ceramic or phenolic wafer switch.

proper inductance to resonate at the new IF with C2 about 3/4 meshed (75 pF). The turns ratio of L3 and L4 should be maintained when making changes in the IF.

I have included a bypass function (S1) to permit leaving the converter in the antenna line at all times (not to be used with a transmitter or transceiver!). When the converter is switched out of the antenna line to the receiver, we also remove the operating voltage (BT1) from the converter by means of S1C.

Q1 is a JFET (junction field-effect transistor) mixer. It combines the 10-MHz WWV signal with 12-MHz energy from oscillator Q2 to produce a difference frequency — the IF — of 2 MHz. The main receiver is tuned to 2 MHz in order to hear WWV.

Miniature 50-ohm coaxial cable, such as RG-174, should be used for the leads that go to and from S1. If your layout is such that nonshielded leads no longer than two inches are possible, you may eliminate the coax cable. If RG-174 is used be sure to ground the shield braid at both ends of each lead.

Q2 operates as a Pierce oscillator. C3 and C4 are the oscillator feedback capacitors. If you have a crystal that won't oscillate in this circuit, you can experiment with the values of C3 and C4. Values from 5 to 33 pF are suggested for C3. Values from 33 to 150 are okay for C4.

Any HF or VHF JFET is suitable at Q1 and Q2. The 2N4416 is a great device if you have access to a supply. They offer superior performance to the MPF102, but they cost a tad more.

Construction Notes

It is not necessary to build the converter on a PC board. Point-to-point wiring may be used if the lead lengths are keep short and direct. Perf Board is fine as the chassis, or you may wish to make a perforated board from a piece of scrap formica by drilling numerous small holes in it.

The assembled converter should be contained in a metal box in order to keep it shielded from stray RF energy. A wooden box that is lined with aluminum wrap — such as Reynolds brand — is fine too, provided you connect the foil to the converter's circuit-ground bus.

Tuneup and Use

Your station antenna is attached at J1. A short length of 50ohm coax cable is used between the converter output (J2) and the antenna input jack of your receiver. Tune the receiver to 2.0 MHz and activate the converter. You should hear WWV. Adjust C1 and C2 for maximum signal response. No other adjustments are required.

Final Remarks

Most of the parts for the Figure 1 circuit can be bought from surplus electronics dealers. The 12-MHz crystal and other parts are stocked by Hosfelt Electronics.[1] The crystal costs $1.

This project should provide a weekend of fun in your workshop. Being able to listen to WWV will add needed flexibility to your SWL efforts.

MT

1) Hosfelt Electronics, 2700 Sunset Blvd., Steubenville, OH 43952; 1-800-524-6464. Catalog $2.

Bill Cheek

An S-Meter and Other Mods for the PRO-43

Hold onto your socks, gang; I've got a few smokers for you this month. The PRO-43 Handheld Scanner from Radio Shack is one of the the finest yet. Not only is the PRO-43 a solid receiver, comparable or superior to the best, it is also quite modifiable for enhanced features and performance.

The PRO-43 has already been reviewed here in *MT* so I'll just briefly highlight its most notable claims to fame. Buried in the depths of the PRO-43's "real estate" are several specialized designs which conspire to result in one of the best receivers around, especially in a handheld package! An AGC-controlled RF Amplifier minimizes strong signal overload and desensitization. A doubly balanced 1st Mixer and a balanced 2nd Mixer team up to minimize harmonic modulation products, reduce conversion losses, and improve sensitivity with lower noise and a wider dynamic range.

Then, as if that weren't enough, a triple conversion IF section effectively wipes out image frequency interference. Also in support of the robust front end are five bandpass filters to help suppress or minimize harmonic interference and overload from nearby transmitters.

The PRO-43 sports a relatively new non-volatile random access memory (NVRAM) for storage of channel/frequency/mode/delay and lockout data. NVRAM means that battery backup is not required. When data is written to the NVRAM chips, it stays there, regardless of power status, until it is purposely erased or overwritten. This offers an advantage especially to the experimenter: Any errors made during modifications are not likely to result in loss of memory!

The PRO-43 packs a wallop in a number of other departments, including 200-programmable channels; user selectable AM & NFM modes; battery saver and get this: *forward or reverse* SCAN, SEARCH and MANUAL step directions! There are other nice design features inherent in the PRO-43, but let this overview suffice for now. Let's get down to extracting even more power from this excellent scanner!

PRO-43 Modifications

1. Continuous 800 MHz Coverage: This one has been covered recently (September 92), so only the sketchiest details are provided here. Make your way down to the Logic Board (3rd board down) and remove diode D-5. (Save it for the next modification below!)

2. Continuous 30-88 MHz Coverage: Install the diode (D-5) removed for the 800 MHz restoration in the empty spots for D-3 to permit coverage of the 54-88 MHz band.

Note: this is a largely uninteresting band since to the majority of it is allocated to the VHF-Lo Television Broadcast Band: Ch-2 = 54-60 MHz; Ch-3 = 60-66 MHz, Ch-4 = 66-72 MHz; Ch-5 = 76-82 MHz and Ch-6 = 82-88 MHz. But notice that gap between 72-76 MHz, which contains a wide variety of utility users in the US. You'll find a mixture of pagers, instrumentation, bugs, cross-band relays, navigation and weather signals.

If you're going to liberate the 800 MHz band in the first place, you may as well store that removed D-5 in the empty spot for D-3. What the heck? Sensitivity for the 54-88 MHz band won't be superb because US scanners have been optimized for the 30-54 MHz band, but it will be adequate for most needs.

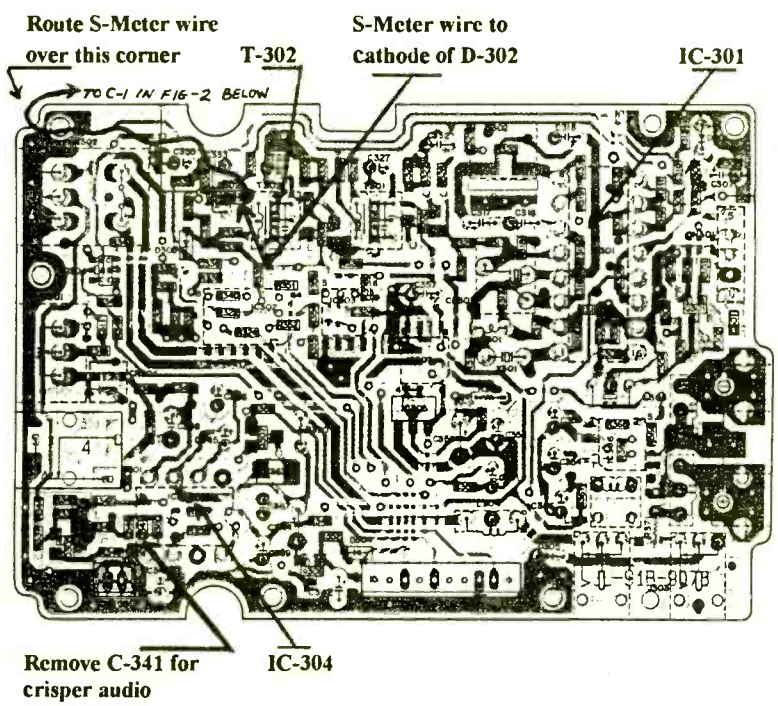
3. Improved Audio Quality: The PRO-43 has a tiny speaker, typical of miniature scanners nowadays. It sounds decent enough to "normal" ears, but my Viet-Nam deadened ears demand an improvement in the treble response. Even if you have normal hearing, you might appreciate a crisper, sharper audio for maximum intelligibility under arduous listening conditions.

This modification is easy and generally worthwhile. The input to the audio power amplifier is shunted by C-341, a 0.015-µF chip capacitor, the purpose of which is to limit the treble response of the audio section. C-341 is found on the bottom (solder side) of the Audio Board, the middle of three boards in the PRO-43. Remove it and turn it upside down. C-341 is physically located beneath IC-304, an LM-386 audio amplifier chip with 8-pins. Between Pins 4 and 5 of this chip are three components: two little black chip resistors and C-341, a brown chip capacitor. It's not marked, but it is between the two black chip resistors, all three of which are mounted in the same relative direction. *Refer to Figure 1 for a location guide.* Find the LM-386 chip; identify Pins 4 & 5 and then turn the board upside down and you really can't miss C-341. Remove it for crisper audio.

4. An Easy S-Meter for the PRO-43: The right kind of circuit is missing from most scanners to support an effective S-Meter, but the PRO-43 has it all with the exception of a surplus of "real estate." That's okay, we can work around it! The key S-metering point in the circuit is the cathode of D-302 located on the bottom (solder side) of the AF Board (middle board). D-302 is a tiny gray chip diode located near the forward, outboard corner of T-302. D-302's cathode connects to one lug of T-302, and that's the spot you need to find. *Figure 2 will guide you.*

Solder a small hookup wire to the cathode of D-302 and route it to the topside of the AF Board to feed the circuit shown in Figure 2. This wire

FIGURE 1: PRO-43 AUDIO BOARD - SOLDER SIDE VIEW



should be short, not more than a couple of inches in length. Route this wire forward and around the notch in the nearest corner of the circuit board next to the Volume Control so that the wire protrudes into the less crowded component side of the board.

Connect this wire to a lead of C-1, a 0.01-µF ceramic disk capacitor. Solder the anode of D-1 to a handy nearby ground (I selected Pin 7 of handy IC-302 for my ground). Solder the free lead of C-1 to the cathode of D-1. Solder the anode of D-2 to the junction of C-1 & D-1. Finally, solder R-1 & C-2 between the cathode of D-2 and ground as shown. Connect a wire to the junction of D-2, R1 & C-2 for output to an S-meter of your choice.

There won't be enough room to actually install an S-Meter in the PRO-43, so this wire and a ground wire must somehow exit the scanner to connect to an external meter. Exactly how you do that I will leave up to you, but I installed a miniature 3/32" phone jack in the right side of the metal frame wall just above and between IC-301 and D-301. I used a millimeter scale to mark off precise points of location so that a 5/16" hole neatly drilled through the right side of the rear plastic case matches perfectly over the 3/32" phone jack. A standard 3/32" phone plug inserts into this jack for quick and easy connection of an external S-Meter.

If this is too much trouble, I suppose you could just run a ground wire and the S-Meter wire out a tiny hole drilled most anywhere that's convenient.

If you use an analog meter, preferably a real S-Meter salvaged from a junked CB or ham radio, then rig it exactly as shown in Figure 2. You can also build the 10-segment LED S-Meter as shown in Volume 2 of my *Scanner Modification Handbook* (published by CRB Research Books, Inc. Commack, NY, and sold by many *MT* advertisers, including Grove Enterprises, DX Radio Supply and COMMtronics Engineering).

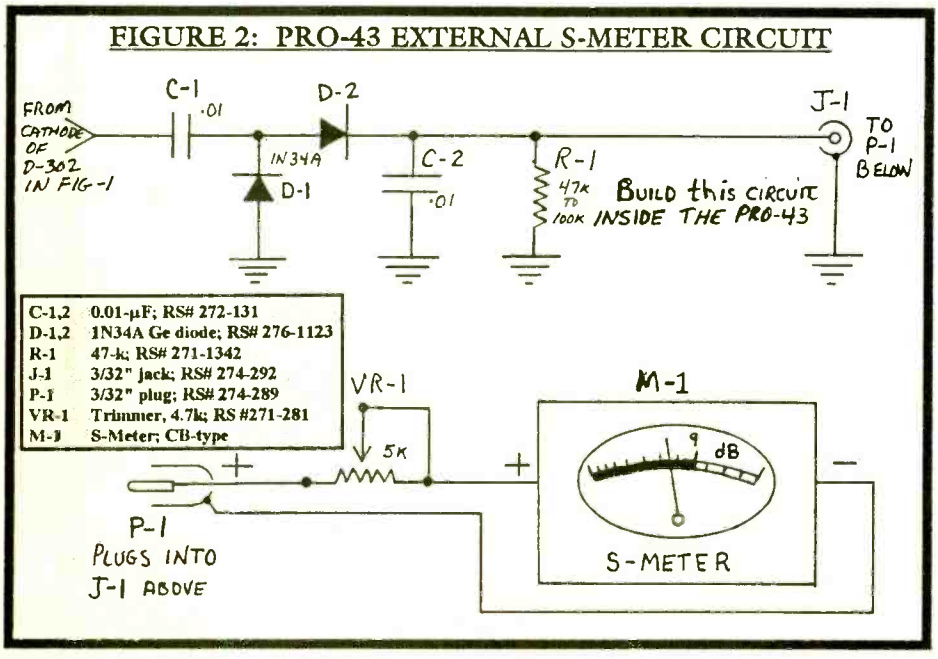
After your chosen S-Meter is connected and halfway working, operate the PRO-43 near a known strong transmitter, perhaps a ham transmitter, a police cruiser, your favorite security guard's handheld or right next to a cordless telephone — anything known to transmit a strong signal. Tune the scanner to that frequency, and adjust the 5-k trim pot so the meter reads **exactly** full scale. All other signals will read proportionally lower to yield "relative signal strength" measurements!

5. Other Mods for the PRO-43? Certainly a number of generic mods are possible, including Tape Rec jack, Automatic Tape Recorder Switch; Event Counter; CTCSS decoder; shortwave receiver interface, etc. The PRO-43 uses the common **TK-10420 NFM/ Discriminator** chip which has been thoroughly documented in the "***World Scanner Report***" for the above mods. It is not known yet if speedups and memory expansions are feasible, but we do know that the powerful new HB-232 Scanner/Computer Interface can be adapted to the PRO-43.

Certainly a lot is possible, but there are two limits to deal with here: (1) your imagination, and (2) the physical space available. The former should be unlimited, but although there's a definite boundary to the latter, I'm sure that compromise is possible. Now let's have YOUR ideas and requests. Happy monitoring!

MT

FIGURE 2: PRO-43 EXTERNAL S-METER CIRCUIT



W. Clem Small, KR6A, CET

An HF Collinear Sloper Beam, NVIS, Garden Hoses, BLOS, and More

Recently I wanted an easy-up HF antenna to talk from my new home in Montana to my old friends in Vermont. The antenna I used — a variation on the Franklin collinear antenna — depends on its sloped mounting (fig. 1) for its somewhat unidirectional pattern. The use of two in-phase halfwaves, in addition to the "beam action" created by reflection of signals from the ground, give this antenna a gain of probably 3 to 5 dB as compared to a dipole (dBd).

Let's Build One

You will need two half wavelengths of wire and a length of 300-ohm twinlead determined by the appropriate equations given below, a length of coaxial feedline to reach from the antenna to your operating position, four antenna insulators (three, if you use end feed rather than center feed), and a rope to hang the antenna from some high tie-point such as a tree or tower.

The wire you use for the elements can be any wire that will take the strain; number 12 to 14 copper is good. Stranded or hard drawn wire is less likely to break than solid wire copper wire. For the feedline use coax of any impedance.

Length of one halfwave section:
L (in feet) = 468/frequency (in MHz)
L (in meters) = 143/frequency (in MHz)

Length of the phasing section of 300-ohm twinlead:
L(in feet) = 202/ frequency (in MHz)
L(in meters) = 61/ frequency (in MHz)

Steps in Making the Antenna

1. Determine the length for the halfwave elements from the appropriate equation given above. If you use center feed (described below), add about 4 inches to the centerfed element's length and about two inches to the other element's length. This is to allow for the extra wire needed to wrap around the insulators. If you are going to use end feed (also described below), just add two inches to each element's length.

2. Put one end of one halfwave element into one end of an insulator and attach it as shown in fig. 1. Scrape the wire clean where it wraps around itself at the insulator; solder it there if possible. Do the same for the other halfwave element.

3. If you use center feed, cut one halfwave element at a distance of one fourth wavelength from its end insulator, leaving enough extra wire to attach the element to the feed point insulator. Insert the feedpoint insulator where you cut the wire as shown in fig. 1. Attach a coaxial feedline to the wires on the feedpoint insulator as shown. Scrape and solder the wires when you connect them as in step two. Seal the open end of the coax with coax sealant to protect against water and weather.

4. Take the remaining ends of the halfwave elements and insert them in the phasing-stub insulator as shown in fig. 1. Adjust the wire length through the phasing-stub insulator such that the length of each element is what is given by the halfwave equation above. Scrape and solder them as in step two.

5. Cut the phasing line 1-1/2 in. longer than its equation requires. Expose the line's conductors at one end for about 1/2 in., fold them toward each other so that they overlap, and solder them together. At the other end of the phasing line cut a slit at the center of the line so that the two ends can separate a bit as shown in fig. 1. Then expose the conductors for 1 in. and solder them to the two halfwave elements as shown.

6. Add ropes to the end insulators and mount the antenna as shown in fig. 1. Using a metal tower as a support gives the antenna more gain and directivity than using a tree or wooden tower. The higher and more in the clear it is mounted, the better the antenna should work.

7. Center feed is probably the best option for feeding this antenna; however, if you use end feed connect the bottom end of the antenna to a tuner capable of tuning a high impedance long-wire antenna (some tuners can't handle this). Connect coax from the tuner to your rig.

When using end feed you will need a ground at the antenna's lower end for the antenna tuner. A ground rod will work here for receiving; for transmitting you need a better ground — several ground rods if the ground is not too dry. If the ground is quite dry you can try a set of four or more quarter wavelength radials (L = 234/frequency in MHz), either buried just below the ground's surface or above and insulated from the surface. A distinct advantage of center feed is that no ground is needed at the antenna.

8. Don't forget lightning protection. Disconnecting the antenna and grounding it when it is not in use, and never using the antenna when the weather could produce lightning, is the minimum.

9. Attach the coax to your rig and the antenna is ready to use.

Using the Antenna

This antenna should perform best with DX signals, giving less response to close-in stations. The directionality of the antenna is relatively broad and thus it is also responsive to signals from other directions than its main direction of responsiveness.

Knowledge of when signals are likely to arrive from the general direction to which the antenna is most responsive will increase your

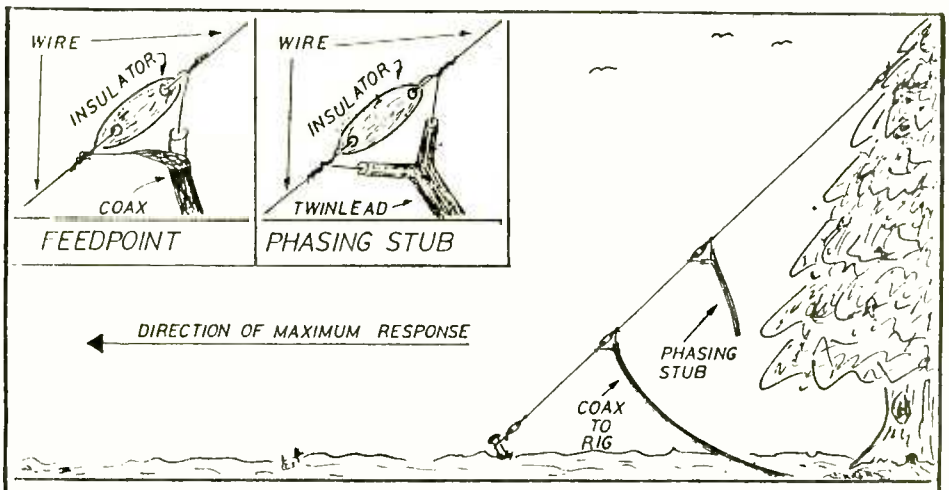


FIG 1. A SLOPING HF COLLINEAR ANTENNA FED AT THE CENTER OF ITS LOWER HALFWAVE ELEMENT.

success in using this antenna. Check the propagation charts and shortwave guide in *Monitoring Times* for help in predicting when the signals you want are likely to be "coming in."

Antenna History

If you like to read about antennas (which you must, since you're reading this column) you will most likely enjoy *Wireless Antenna History* by Walter Schulz. In its pages you will find a mixture of both the history and the technology of antennas, especially vertical antennas. Although the book does not flow like a novel, or even like most history books, it is entertaining as well as informative and gives a glimpse of radio's past that is not often available to us today.

Liberal use of photos and figures add to the interest this book's 140 pages hold for those of us who enjoy reading about antenna and radio history. It is available at $16.95 plus shipping from Ham Radio Bookstore, P. O. Box 209, Rindge, New Hampshire, 03461-0209. Order phone is 800-457-7373.

Radio Riddles

Last Month

Last month I said, "We sometimes read that HF radio waves which leave the antenna at high angles — especially those waves heading straight upward — pass through the ionosphere and on into space. But is this necessarily true? And what if you did make an HF loop ...and mounted it parallel to the ground? And what is "NVIS" anyhow, or "BLOS" for that matter?"

Well, no, it is not true that HF waves that leave a transmitting antenna at high angles necessarily penetrate the ionosphere. Some portion of the emitted waves, even if it is a very small portion, is invariably returned back to Earth.

An HF loop mounted parallel to the ground will beam much of its signal energy upwards, just as an upward pointed garden-hose nozzle shoots its water upwards. If you took a garden hose inside your home, and pointed it toward the ceiling of a room, the water squirted upward would splatter down around you. If you launch signals upward from an antenna toward the ionosphere, a sufficient portion of these signals can "splatter down" or return to earth in a large area around the antenna to support communication with nearby stations. Such signal propagation is known as "Near Vertical Incidence Skywave" (NVIS).

NVIS is one of the means by which "Beyond Line of Sight" (BLOS) communication is supported; skywave communication is another. In mountainous terrain, NVIS can provide BLOS communication between valleys where mountains block signals emitted at lower angles.

You are in a station's skip zone when you are too far out from that station to receive its signals by groundwave, but too close for skywave-skip signals to be received. NVIS propagation can be useful for receiving a station's signals when in such a region.

Forward scatter is a technique used in microwave work. Here antennas radiate their signals at relatively high angles, but usually not straight upward, and yet a small portion of the signal is returned to earth beyond the horizon from the transmitting antenna. Although forward scatter requires high-gain antennas, high power, and very sensitive receivers, this mode provides yet another means of ionosphere-supported BLOS communication.

This Month

What noise annoys an operator? Is the following statement true? "Just about everything that is important to say about antennas, transmitting or receiving, can be reduced to a concern at the receiving site with the relative levels of the desired signal in relation to the competitive electrical noise and interference."

We'll have the answer to this month's riddle in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

MT

Bob Grove, WA4PYQ

***Q.** My family has had an old Hallicrafters S38B receiver for years; is it worth anything? How do I hook an antenna to it properly? (John Hall, Millboro, VA)*

A. The S38B was manufactured in 1951 and originally sold for $49.95. In good condition it will bring anywhere from $25-$50 at a flea market or auction.

There are three screws marked A1, A2 and G on the rear chassis. Twin lead feedline would be connected to A1 and A2 with a ground connected to G. A single wire would be connected to A1 with A2 and G connected together (and to ground). A coax line would have its center conductor attached to A1, its braid to A2 (again, A2 and G are connected together and grounded).

This similar plan is used on most older receivers with that antenna screw configuration.

***Q.** Where can I find a current list of Ku band satellite transponder frequencies and polarizations? (Robert Selm)*

A. According to our satellite editor, Ken Reitz. you need Westsat Communication's "Satellite Channel Chart"; send $2 for a sample to PO Box 434, Pleasanton, CA 94566.

***Q.** How is it possible for me to be receiving police transmissions on the civilian aircraft band? Do they operate there? (Curious George)*

A. You are hearing an image from the 155 MHz high band on your scanner. Images are artifacts of superheterodyne design—all receivers have them, some worse than others. This is how scanner listeners will continue to hear cellular telephone conversations even after scanners are no longer allowed to receive them.

Depending upon whether you are using a Uniden Bearcat or a Radio Shack Realistic® scanner, the actual police frequency is 21.7 or 21.4 MHz higher than the airband image.

***Q.** Is there a way to remove the bits of dust that accumulate under the bezel of a scanner? (John Berenyi, Layton, UT)*

A. Ordinarily, the case must come apart completely to separate the LCD display from the protective bezel. Be careful during this disassembly; some keys may come loose and fall from their holes in the cabinet on some models.

A dab of window cleaner on a soft cloth or tissue works well on the underside of the bezel and even on the LCD if there is no permanent printing on that outside surface. Avoid hard rubbing which may scratch the plastic surfaces.

***Q.** Is there a complete list of Canadian AM and FM radio stations including addresses? (Christine Kline, Syracuse, NY)*

A. Yes, the *M Street Radio Directory* ($29.95 plus $2 bookrate from Grove Enterprises; also available from other *MT* advertisers) lists AM and FM stations in the U.S. and Canada by state or province, city and frequency, and includes not only addresses, but Arbitron, Birch and Willhight ratings as well.

***Q.** How can I plan my ham station so as not to interfere with my neighbors' TV, stereo or telephone? (Dwight Hanson, Tacoma, WA)*

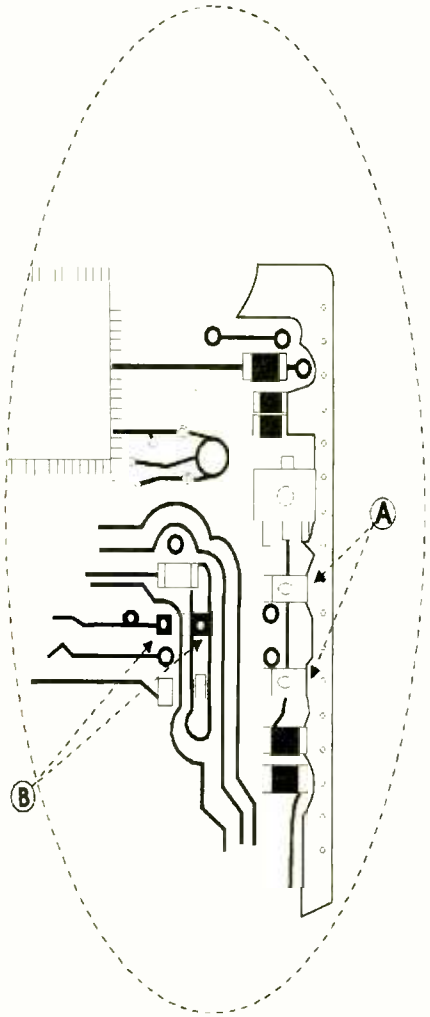
A. The major causes of interference are excessive transmitting power, harmonic energy radiating from the antenna system and poorly designed consumer equipment. We can help with the first two.

Always use the lowest power consistent with reliable communications; power amplifiers are rarely necessary (I've never used one). Secondly, add a low pass filter to the rig's antenna line; it will keep harmonics from interfering with your neighbors' reception.

If you still have problems, consult a good interference reference like *Radio/TV Interference* by Frank P. Hughes or the ARRL *Radio Frequency Interference Handbook*. The FCC also offers a free radio/TV interference manual.

Bob's Tip of the Month

Realistic® PRO-46 Cellular Restoration with 30 kHz Steps



NOTE: The following procedure will void the warranty on your scanner. Do not attempt this modification unless you have experience with microelectronic circuitry. *Monitoring Times* assumes no liability for damages resulting from attempting this modification.

1. Remove the battery pack, battery door and antenna.
2. Remove the four black screws from the back of the radio, then push upward on the bottom of the rear of the case, carefully swinging it upward and removing it.
3. Carefully insert a small (jeweler's) screw driver between the two boards next to the interconnect plug in the lower right corner. Gently pry the top board up to separate it and set it aside.
4. Unsolder the copper-coated plastic shield from the microprocessor and set it aside (CAUTION: Too much heat will damage the shield).
5. Locate the two chip jumpers imprinted with "0" (shown as "A" on the diagram); carefully unsolder and remove both.
6. Solder one chip jumper across the two upper most unused solder pads shown as "B" on the diagram. (Soldering a jumper across the lower two pads changes the 30-50 MHz low band to 68-88 MHz for foreign use.)
7. Reverse steps 1-4; the modification is now complete.

***Q.** Is there a simple interface I can build so that I can connect my FAX machine directly to the FAX modem on my computer? This way I can test various setups for my FAX machine as well as use it as a scanner and an auxiliary printer. (Ricardo Molinar, Fort Lee, NJ)*

A. I haven't the foggiest notion. Readers, can you help?

***Q.** Can I hook up a recharger to my portable radio so that I don't have to keep removing the nicads and charging them externally? It uses four D cells. (Denis Wilson, Sr., Gloversville, NY)*

A. Yes, but don't try it unless you know something about electronics. Nicads can explode if they are overcharged to produce excessive heat. Nicads are designed to be charged to full capacity, 1.25 volts per cell, then discharged to 1.0 volts per cell.

If you leave the radio plugged into the wall so that it charges continuously, your nicads will suffer voltage depression, a reduction in discharge life.

Nicads should be charged at approximately 10% of their capacity; thus, size D cells with a 1600 milliampere-hour capacity should be charged at approximately 160 milliamperes.

If you install a suitable jack on the radio to match the plug on the charger, the positive (+) lead is connected to the center terminal of the top battery and the negative (-) lead is connected to the bottom of the last battery.

You will need to connect a temporary milliameter in series with one of the leads to determine that you have approximately 100-200 milliamperes of charge current when the batteries have discharged to 4 volts across the stack (4 cells at 1.0 volts each). AA nicads would be charged at approximately 50-60 milliamperes over the same period.

Use an adjustable power supply like the Grove ACC20 or similar units available from electronic discount stores. The charger should be disconnected from the radio after about 16 hours of recharge time and not reconnected unless there has been use on the batteries or they have not been recharged for several weeks.

It is normal for nicads to get warm when being charged, but not hot.

MT

Club Circuit

Welcome to ...

Monitoring the Long Island Sounds

These club members may never meet face to face, but they recognize each other by voice and first name. The MLIS started a weekly net on amateur radio on 146.805 MHz in the spring of 1991. The net features 20-30 check-ins, with an average of 50-100 listeners.

The club's area of interest is primarily scanning (30 MHz through 800 MHz) in the Long Island, New York City, southern Connecticut area. Says Ed Hesse, "We are serious monitors who contribute regularly—on the air or via mail—information on what's going on in the 'Long Island Sounds' area." The club also publishes a monthly newsletter by the same name.

For more information, write Monitoring the Long Island Sounds, Ed Hesse, 2134 Decker Ave., No. Merrick, NY 11566.

The Rocky Mountain Monitoring Enthusiasts (RMME)

The RMME is a club in the making. James Richardson, founder, envisions the club as a unified voice in an otherwise forgotten monitoring section of the country—the Rocky Mountains! He anticipates a region-wide monthly newsletter, group outings and dispatch center tours, frequency and map exchanges, and networking.

Although the flyer would imply the club has a UHF/VHF focus, new members would no doubt have a voice in spectrum coverage. So if you live in Colorado, Wyoming, Montana, Utah, Kansas, Nebraska, New Mexico, etc.—you're not alone! Write to James L. Richardson, 11391 Main Range trail, Littleton, CO 80127-4049 (message or fax at 1-303-933-2195).

The World DX Club

WDXC is a British based DX club covering the radio scene through British eyes. However, it does have a large international membership, which makes its bulletin of worldwide interest. Membership is spread throughout the English speaking wold. Because the largest overseas membership is in North America, it has a separate secretary.

The club publication, *Contact*, runs about 40 pages each month, covering SW DXing, QSLing, medium wave, FM and TV DX, contests and reviews.

For a sample copy of *Contact* and membership information, send 2 IRCs or $1 to Richard D'Angelo, 2216 Burkey Drive, Wyomissing PA 19610 (in NA), or Arthur Ward, 17 Motspur Drive, Northampton, England, NN2 6LY. Airmail membership is $20; surface mail $18.

Club Listings A - L

If you belong to a monitoring club and you haven't seen it listed in *Monitoring Times*, write today to request a Club Circuit listing form. Your club will be listed every other month, and will receive a complimentary subscription to *MT* for club distribution. Listening clubs outside the U.S. are welcome as well and are eligible for the complimentary subscription if they will provide the difference in postage.

If your club has put on a noteworthy activity, why not send *MT* a snapshot and let others know of your participation in the spreading the word about radio? The Club Circuit would also be interested in any tips you can pass along on how to attract new listeners. Let your successes be an inspiration to other clubs!

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.

Canadian Int'l DX Club: Sheldon Harvey, President, 79 Kipps St., Greenfield Pk., Quebec , Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*

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.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (206) 356-3927 (Phil). Collecting radio related items.

Drake SPR4 Int'l Club: Rick Sitz, 5210 14th St. W. #11, Bradenton, FL 34207. 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.

European DX Council: Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. 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.*

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 147.445. *Monitoring the Long Island Sounds.*

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215)945-0543. Worldwide; Longwave only. *The Lowdown.*

New Additions:

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).

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
May 1	Downsview, Ontario	ODXA 1993 Convention/Steve Canney, 416-222-9658 Location: Ramada 400/401 Hotel, 1677 Wilson Ave.
May 1 2	Baton Rouge, LA	Baton Rouge ARC Hamfest and ARRL State Convention/Herb Ramey, KB5AQ (504 346-0000 days or (504) 654-6087 eves and wknds. Location: Great Hall, 7370 Airline Highway.
May 1 2	Anderson, SC	1993 Greenville Hamfest/Blue Ridge AR Society P.O. Box 6751, Greenville, SC 29606. Location: Anderson County Fairgrounds, $5 admission, Saturday 8am-5pm Sunday 8am-3pm. Talk-in on 146.01/146.61.
May 2	Yonkers, NY	Metro 70 cm Network/Otto Supliski, WB2SLQ 53 Hayward St., Yonkers, NY 10704.
May 8	Columbia, MO	Central Missouri Radio Assoc/Wayland "Mac" McKenzie, Jr. 8000 S. Barry Road, Columbia, MO 65201.
May 9	Medina, OH	Medina M2M Group Inc./Jan Miller 600 Oak St., Medina, OH 44056.
May 14-16	Tulsa, OK	Oklahoma State Section Convention/Ernie Buck, WB5CDW 3630 South Wheeling, Tulsa, OK 74105.
May 16	Peotone, IL	Kankakee Area Radio Society/Don Kerovac, K9NR 1377 NW Circle Dr., Kankakee, IL 60901.
May 16	Wheeling, WV	Triple States RAC/Ralph McDonough, K8AN Box 240, Rte. 1, Adena, OH 43901.
May 16	Hagerstown, MD	Great Hagerstown Hamfest/Antietam Radio Assoc., W3CWC P.O. Box 52, Hagerstown, MD 21741. Location: Hagerstown Jr. College Rec Center, $5 admission.
May 16	Hanska, MN	New ULM ARC will operate KB0IWV, 1600Z-2359Z to celebrate 9th annual celebration to commemorate the Constitution of Norway in 1814. Look for them at 3.875, 7.250, 14.250, 21.350, 28.350 +/- depending on QRM and prop. For certificate send QSL and a 9x12 SASE with two first class postage to: KB0IWV, NUARC, RR4, Box 14-A, New Ulm, MN 56073.
May 22	Kansas City, MO	PHD KC Mid-West AR Convention/Chuck Miller, WAKUH PO Box 11, Libery, MO 64068.
May 22-23	Henrietta, NY	Rochester Hamfest/Rochester ARC, 300 Shite Spruce Blvd, Rochester, NY 14623, 716-424-7184. Location: Monroe Co Fairgrounds.
May 29-30	Gastonia, NC	Gastonia ARC Hamfest/Mike Jackson, N4AYO 2568 Devon Dr., Dallas, NC 28034. Location: Karyae Park.
June 4-6	Arlington, TX	Texas State Convention/John Fleet II, WA5OHG 6208 Preston Rd., Dallas, TX 75205.
June 5	Knoxville, TN	Knoxville ARC and Computer Fair/Angela Crigger, N4RPR 2707 Pine Hill Dr., Knoxville, TN 37932 (615) 694-9071. Location: Tennessee Valley Fairgrounds at Chilhowee Park, 8am-4pm, $5 admission. Talk-in on 147.300+ 224.500-.
June 6	Queens, NY	Hall of Science ARC Hamfest/Charles Becker, WA2JUJ (516) 694-3955 or Arnie Schiffman, WB2YXB (718) 343-0172. Location: NY Hall of Science parking lot, Flushing Meadow Park, 47-01 111th St. $5 admission, free parking, opens at 9 am. Talk-in on 444.200.
June 6	Tamaqua, PA	Tamaqua Trans Society and Anthracite Repeater Assoc./Allen Breiner, Sr., W3TI 212 Race St., Tamaqua, PA 18252.
June 6	Princeton, IL	Starved Rock RC/Nils Barto, Jr., N9PLJ 2238 Schuyler Dr., Peru, IL 61354.
June 6	Butler, PA	Breezeshooters ARC/H. Rey Whanger, W3BIS Box 8, RD #2, Cove Run Rd., Cheswick, PA 15042.
June 12	Winston-Salem, NC	Winston-Salem Hamfest and Computer Fair/Forsyth ARC, B.J. Honeycutt P.O. Box 11361, Winston-Salem, NC 27116 (919) 723-7388. Location: Lawrence Joel Veterans' Coliseum Annex, 9am-5pm, $7 admission. Talk-in on 146.04/64.
June 13	Darien, NY	Lancaster ARC Hamfest/Nick, WA2CJJ, 5645 Genesee St., Lancaster, NY 14086 (716) 681-6410; Luke, N2GDU, 1105 Ransom Rd., Lancaster, NY 14086 (716) 683-8880. Location: Darien Center Fire Co. on Route 77 at Route 20, $5 admission, talk-in on 147.135 +.600, 146.550 Simplex, 443.850 +5.
June 13	Willow Springs, IL	6 Meter Club of Chicago/Joseph Gutwein, WA9RIJ 7109 Blackburn Ave., Downers Grove, IL 60516.
June 18-19	Albany, GA	Albany ARC/John Crosby, K4XA P.O. Box 1250, Albany, GA 31702.

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

INDEX OF ADVERTISERS

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.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads contact Beth Leinbach, 704/389-4007.

PROSCAN FREQUENCY MANAGER. Innovative DOS software. Track 9,999 frequencies. Indispensable for the scanner enthusiast. Fast, easy-to-use. SASE for details. Datafile, Box 20111MT, St. Louis, MO 63123.

PIRATE ZONE: 90 minute cassette! 30 RECENT pirates! $9.95 + $2 SH: Jabco, 15961 W. Bethel, Alexandria, IN 46001.

VOICEGATE swl noise reduction systems! 2 stamp SASE for catalog. Jabco, 15961 W. Bethel, Alexandria, IN 46001.

THE QUANTUM LOOP — A compact, high gain ferrite rod antenna for serious BCB DXers. Details — SASE. Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504.

ANTIQUE RADIO ENTHUSIASTS! Buy - Sell - Trade with Wireless Trader. One year (24 issues) - First Class $19.95. Trader Publications, 4290 Bells Ferry, Suite 106-36 MT, Kennesaw, GA 30144.

SHORTWAVE PARADISE BBS has new Shortwave schedules, HUGE Scanner area available, NOW up to 9600 baud. Call (305) 524-1035. We are a FREE computer system.

WANTED: SPY SUPPLY original manuals (PC eavesdropping, cellular phone)—will pay double; Gunn oscillators, feedhorns; MacIntosh IIci, IBM-compatible 386, portables, or better; laser printers, 100+ Mbyte drives; electronic components, test equipment. John Williams, Box 537, Almogordo, NM 88310; 505-434-0234.

SONY ICF-2010 WORLD RECEIVER. New September 1992. Have manual. $250.00 plus s&h. John Murphy, 201 W. Glencove Ave., Northfield, NJ 08225-1707.

ICOM R-71A with 12 volt cable and remote. $600.00 (216) 782-2086 or (216) 533-2478.

FOR SALE KENWOOD R-1000 shortwave receiver, HAM ROTON TR-44 KENWOOD TK820 transceiver UHF, and DENTON MLA 2500 amplifier. K4QV, 813-369-2778.

WANTED: GE PORTABLE SHORTWAVE MODEL 7-2990, a world monitor, any condition, Jack Freeman, 2512 Sunnycrest Drive, Reidsville, NC 27320 (919) 349-6656.

KENWOOD R-1000 $275; BEARCAT 800XLT $160; AOR AR-2515 w/ssb adapter $395; REALISTIC PRO 35 HANDHELD $135; GROVE POWER ANT III $40. All Plus UPS, Doug (206) 472-3478.

UNIVERSAL M-800 FAX DECODER w/ instructions $275; TELETEX DECODER (See Electra on cable or satellite) $200. Also, used scanners, CBs, crystals & acc. list. Send SASE to R. Snoe, P.O. Box 3299, Morristown, TN 37815.

R390-A SERVICE: Module repair and alignment to complete remanufacture, new front panels, knob sets, VFO calibration, new filter capacitors, tubes, squelch modification, 20 years expert service, 2-week turnaround, very reasonable, any condition accepted (419) 726-2249.

WANTED: USED ICOM R-7000 or R-7100 daytime (215) 657-1191 or (215) 789-3938 ask for Drew.

ZENITH TRANS-OCEANIC RADIO MODEL ROYAL 1000-D, solid state, works well, $195. Lash, 2679 Glenwood-Dyer Road, Lynwood, IL 60411.

WANTED: OLD SHORTWAVE RECEIVER, examples: Paterson, RCA, Aero, Breting, Howard, Meissner, McMurdo, Wasp, REL, AGS, SW3, SX112 etc. Need not work. Bob Mattson, KC2LK, 10 Janewood, Highland, NY 12528-2607 (914) 691-6247 after 7 pm EST.

FOR SALE in perfect condition/original box and instruction booklets, new GRUNDIG SATELLIT 700 and SONY 2010; both $600. Call (809) 883-2263 evenings.

FOR SALE OR TRADE: VINTAGE RECEIVERS — AMECO 45 (allwave); HALLICRAFTERS S-38DM, S-41W, S-94, and S-95; NATIONAL NC-60 SPECIAL; also CENTRAL ELECTRONICS SIDEBAND SLICER. Want trains, toys, board games or transceiver covering 10M. Bill Smith, 56 Locust St., Douglas, MA 01516.

WANTED: MAGNAVOX D2999 or GRUNDIG 650. Rathmann, 300 E. Marshall St., West Chester, PA 19380 (215) 436-5621.

Would like to contact other serious military monitors for Jax, FL, to Brunswick, GA, to meet and discuss monitoring topics. Contact Doug at P.O. Box 733, St. Marys, GA 31558.

SCANNERS: UNIDEN BC760XLT w/800 as new first $175; REGENCY MX4000 mint w/ 800 first $85. Keith (407) 260-8392.

PRESELECTOR MODEL MFJ1045, AUTEK QF-1A SSB/CW/AM FILTER, DATONG MULTI-MODE FILTER MODEL FL2 — all three items $80. Joe (407) 331-5982.

ATTENTION! If you want to have QSLs from (independent, commercial, pirate or other) radio stations of RUSSIA and CIS, please send your reports to address of our QSL office. It's no secret that the majority of stations in former USSR verify the reports in Russian only. If you don't speak in Russian or don't know the address of station, we can help you! We'll translate it and send to station. Your QSL from station will be returned to you. You can send your report (plus US$1) to address of new QSL office: RM, P.O. Box 1461, Perm 614036, Russia.

Closing Comments

The Anti-Cellular Scanner Law:

It's Now Official...Let's Take a Look

Docket 93-1, the prohibition against cellular-capable scanners, is now officially enforced by the Federal Communications Commission. Effective April 26, 1993, the Commission no longer type accepts scanners that are capable of — or that can be easily modified for — receiving cellular telephone frequencies.

Many questions regarding this new legislation have come to our offices, and we would like to take some space this month to answer them.

Q. Does the law affect transceivers as well as receivers?

A. Yes, the law covers the receiving portion of the transceiver; thus, amateur and commercial transceivers with scannable memories must conform.

Q. How can cellular telephones be exempted from the law? After all, they are scanning cellular transceivers.

A. The law exempts equipment operating as part of the licensed system which is protected by the legislation. Since the licensed system is cellular telecommunications, their equipment is exempted.

Q. What is the cutoff date for the manufacture and importation of previously lawful, but now banned, scanners?

A. April 26, 1994, is the last date that cellular-capable scanners, approved before April 26, 1993, can be manufactured in or imported into the U.S.

Q. Can new scanners still in a manufacturer's or dealer's inventory continue to be sold after April 26, 1994?

A. Yes, indefinitely.

Q. Will it be lawful to distribute cellular-restoration information after April 26, 1994?

A. Yes. Congress has no power to restrict the dissemination of non-secret information.

Q. Will it be lawful to modify a scanner to receive cellular after April 26, 1994?

A. Yes. Congress has directed the FCC to refuse type acceptance of cellular-capable scanners, but neither has the power to restrict you from modifying a product you own.

Q. Will it be lawful for individuals to own and resell their used cellular-capable scanners and for manufacturers to repair them after April 26, 1994?

A. Yes, indefinitely.

Q. What are the consequences of selling unapproved scanners?

A. The same consequences as selling any Part 15 unapproved devices. Computer manufacturers are faced with Notice of Apparent Liabilities (NALs) of typically $10,000-20,000. It is the Commission's prerogative to examine each violation and assess what it thinks is appropriate.

Q. Can non-scannable (tunable) receivers with cellular frequency coverage continue to be manufactured?

A. Yes, as can scannable test equipment and government receivers.

Q. Is it likely that the new law will be ignored just like other uncertified scanners that are presently being sold in the U.S.?

A. No. This time there is a Congressional mandate behind its enforcement, prompted by the powerful cellular telephone lobby.

Q. Is it possible that a grass roots movement could muster a repeal of the law?

A. Yes, but it has to be a good one. Congress will not reconsider what it has already done without reason.

Such a movement would require work on the part of scanner hobbyists as well as finding a sympathetic legislator to sponsor the bill in the House of Representatives. It's a big job, but it is truly an American opportunity. If I hear from enough of you, we will start the ball rolling.

Bob Grove
Publisher

JRC NRD-535D

"Best Communications Receiver"

World Radio TV Handbook 1992

"Unsurpassed DX Performance"

Passport to World Band Radio 1992

Setting the industry standard once again for shortwave receivers, the NRD-535D is the most advanced HF communications receiver ever designed for the serious DXer and shortwave listener. Its unparalleled performance in all modes makes it the ultimate receiver for diversified monitoring applications.

Designed for DXers by DXers! The NRD-535D (shown above with optional NVA-319 speaker) strikes the perfect balance between form and function with its professional-grade design and critically acclaimed ergonomics. The NRD-535D is the recipient of the prestigious World Radio TV Handbook Industry Award for "Best Communications Receiver."

- Phase-lock ECSS system for selectable-sideband AM reception.
- Maximum IF bandwidth flexibility! The Variable Bandwidth Control (BWC) adjusts the wide and intermediate IF filter bandwidths from 5.5 to 2.0 kHz and 2.0 to 0.5 kHz—continuously.
- Stock fixed-width IF filters include a 5.5 kHz (wide), a 2.0 kHz (intermediate), and a 1.0 kHz (narrow). Optional JRC filters include 2.4 kHz, 300 Hz, and 500 Hz crystal type.
- All mode 100 kHz – 30 MHz coverage. Tuning accuracy to 1 Hz, using JRC's advanced Direct Digital Synthesis (DDS) PLL system and a high-precision magnetic rotary encoder. The tuning is so smooth you will swear it's analog! An optional high-stability crystal oscillator kit is also available for ±0.5 ppm stability.
- A superior front-end variable double tuning circuit is continuously controlled by the CPU to vary with the receive frequency automatically. The result: Outstanding 106 dB Dynamic Range and +20 dBm Third-Order Intercept Point.
- Memory capacity of 200 channels, each storing frequency, mode, filter, AGC and ATT settings. Scan and sweep functions built in. All memory channels are tunable, making "MEM to VFO" switching unnecessary.
- A state-of-the-art RS-232C computer interface is built into every NRD-535D receiver.
- Fully modular design, featuring plug-in circuit boards and high-quality surface-mount components. No other manufacturer can offer such professional-quality design and construction at so affordable a price.

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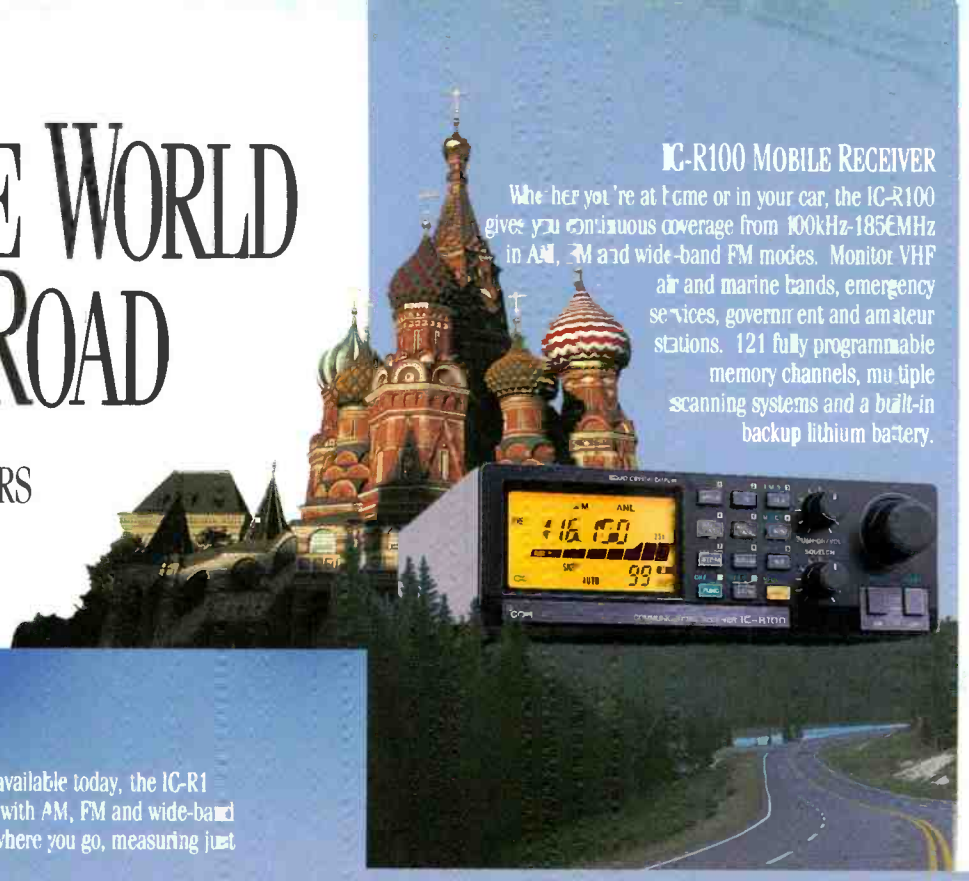
TAKE THE WORLD ON THE ROAD

WORLDWIDE RECEIVERS FROM ICOM

IC-R100 MOBILE RECEIVER

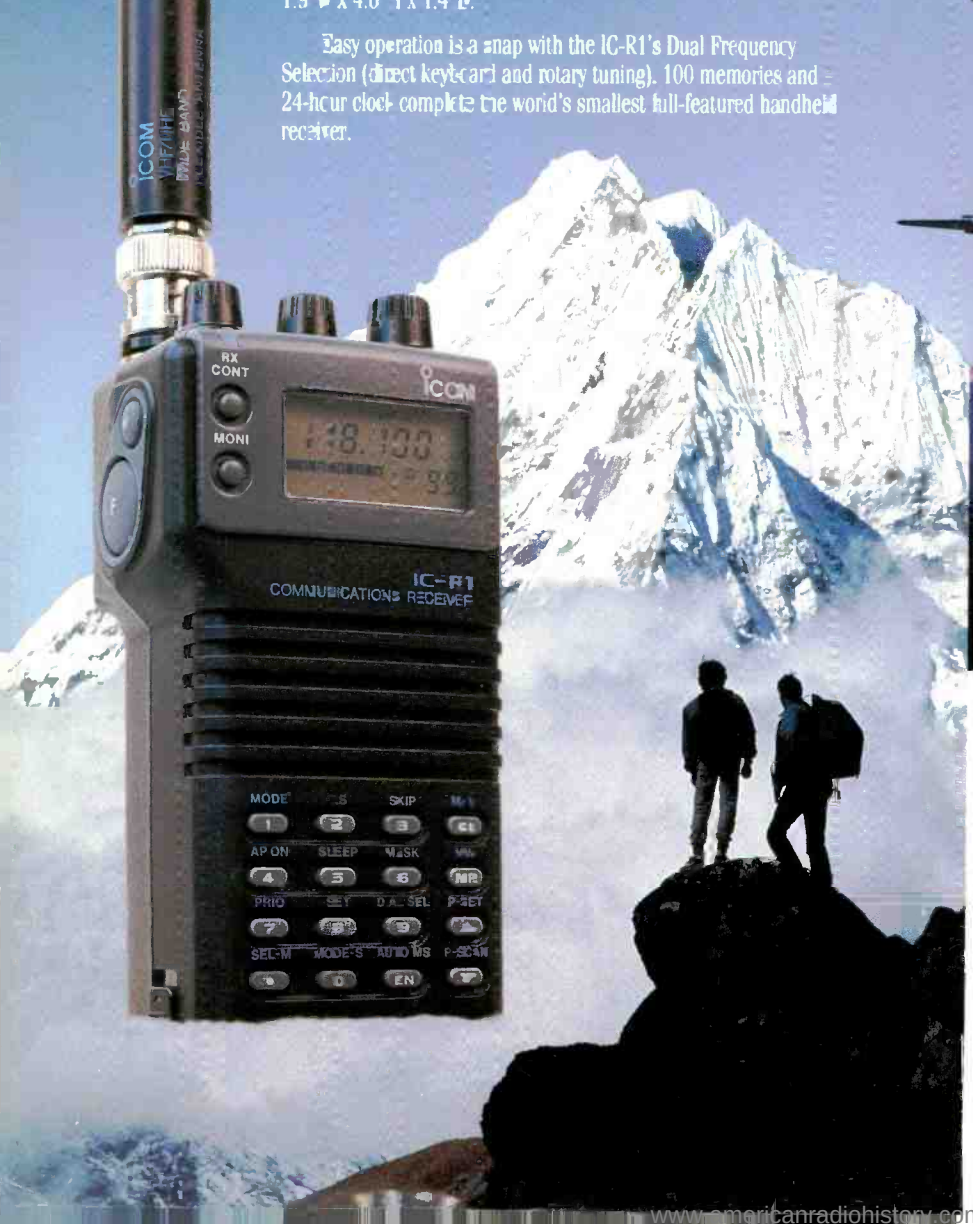
Whether you're at home or in your car, the IC-R100 gives you continuous coverage from 100kHz-1856MHz in AM, FM and wide-band FM modes. Monitor VHF air and marine bands, emergency services, government and amateur stations. 121 fully programmable memory channels, multiple scanning systems and a built-in backup lithium battery.



IC-R1 HANDHELD RECEIVER

The smallest wideband handheld available today, the IC-R1 continuously covers 100kHz-1300MHz with AM, FM and wide-band FM modes. This tiny receiver goes anywhere you go, measuring just 1.9"W x 4.0"H x 1.4"D.

Easy operation is a snap with the IC-R1's Dual Frequency Selection (direct keyboard and rotary tuning). 100 memories and a 24-hour clock complete the world's smallest full-featured handheld receiver.



IC-R72 BASE RECEIVER

The IC-R72 continuously receives 100kHz-30MHz in SSB, AM and CW modes with exceptionally high sensitivity. An optional UI-8 provides FM reception. The IC-R72 incorporates a noise blanker, five scanning systems, internal backup battery and built-in clock with Icom's DDS System. The IC-R72 boasts a 100dB wide dynamic range while an easy to access keyboard provides convenient programming versatility... superb for shortwave listeners!

See our complete line of quality receivers at your local authorized Icom dealer.

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