Volume 13, Number 6 • June 1994 $3.95 U.S.

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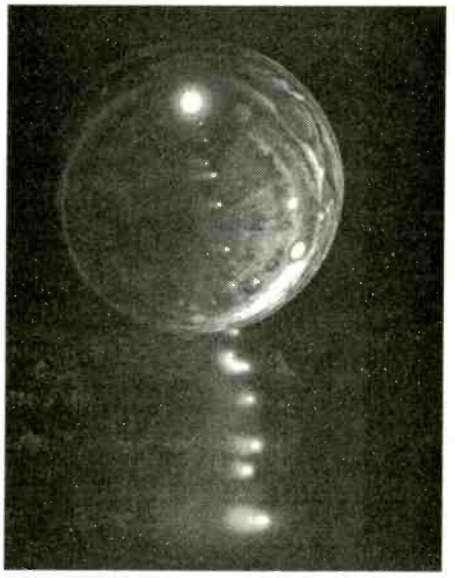
June 1994

Monitoring Times™

Countdown to the Crash

By Larry Van Horn

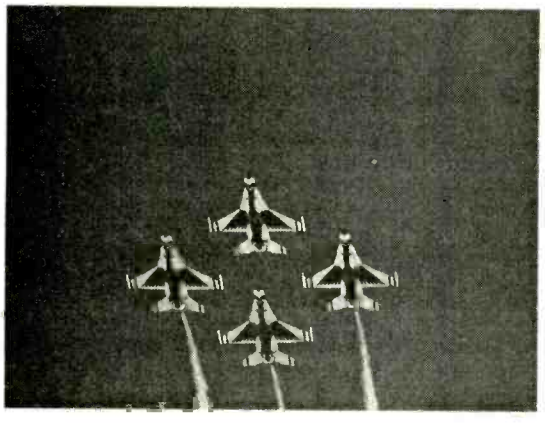


For the first time in history we can see it coming–an impact as great as that which may have led to the extinction of the dinosaurs. Well, no, it's not on Earth this time, but you can still be there–by radio. Although it will not require elaborate equipment to overhear the event, you should start now to acquaint yourself with what's normal; then prepare yourself for anything!

Bolivia: Radio Under the Gun

By Don Moore

Another fascinating look into the development of radio in Latin America underscores the important role it has played. The history of radio in Bolivia is one of a mining economy based on the severe oppression of the miners. Radio was their most effective weapon and their greatest source of hope.



Dayton's Aviation Extravaganza

By John Ward

Not exactly your ordinary air show, the U.S. Air and Trade Show is the largest civilian/military/corporate aviation event in the United States. The latest in aviation, communications, and electronic technology is on display to potential customers, but for a couple of days it is open to the public as well. Given the unique wares, the customary air show, and the nearby Air Force Museum, it's heaven for an aero buff.

COVER: *Fragments of Shoemaker-Levy 9 comet on a collision course with Jupiter. Computer mock-up courtesy NASA's Jet Propulsion Laboratory.*

Zap Proof Your Radio Room 24

By Bob Grove

Today's transister-based electronics are susceptible to disruption by man and by nature, from anything as incidental as static electricity in clothing, to lightning strikes, to an atomic blast! Is there any protection? With careful installation of purchased or home-built devices, there is quite a bit you can do to keep your radios from being zapped.

Gathering Communications Intelligence 28

By F.J. Harris

Do you gather frequency and user information as a hobby or as your business? The techniques used vary mostly in degree, but here are some ways of ferretting out what's really going on in your neighborhood that you may not have thought of, developed by a team that is undeniably professional.

D-Day 31

By Brian Rogers

This month we observe the fiftieth anniversary of D-Day. That day will always live in the memory of Brian Rogers, not really because of the events of the day (he was seven years old at the time), but because of how he heard about them.

And More ... !

There is good news in the product line for those looking for a new shortwave receiver or a new scanner. Especially if you need a radio to take on vacation, Magne says it's "love at first sight" when it comes to the new Sony ICF-SW-100 pocket radio! And the new AOR AR3000A scanner is a winner in its class, too, according to reviewer Bob Grove.

This issue of *MT* has many excellent tips to keep your hobby interesting during the summer months, from advance planning, to vacation frequencies, to finding components for home projects. Check out the fine columns below and get the most from your radio!

DEPARTMENTS

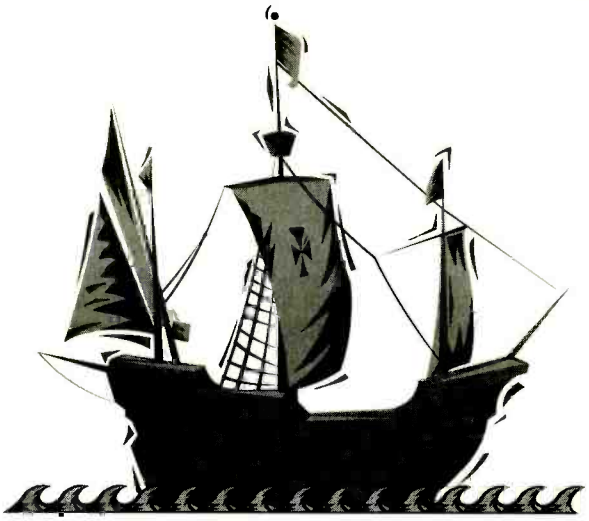
MONITORING TIMES (ISSN: 0889-5341)
is published monthly by Grove Enterprises, Inc.
Brasstown, North Carolina, USA.

Address: P.O. Box 98, 300 S. Highway 64 West
Brasstown, NC 28902-0098
Telephone: (704) 837-9200
Fax: (704) 837-2216 (24 hours)
BBS: (704) 837-9200 (M-F 6:30 pm-8 am;
24 hours on weekends)
Subscription Rates: $21.95 in US and $32.00
US funds elsewhere; Label indicates last
issue of subscription.

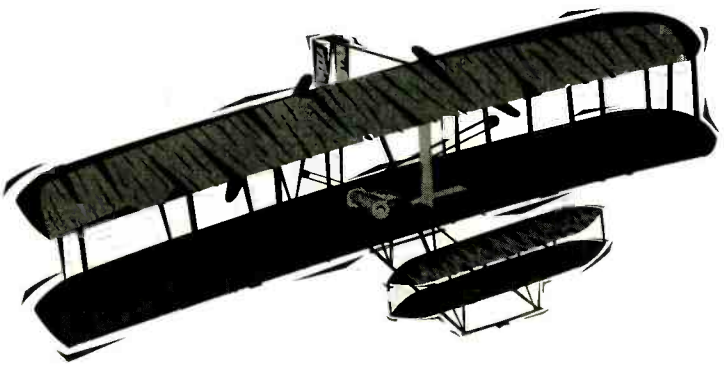
STAFF

Second class postage paid at Brasstown, NC, and additional mailing offices.

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



"THE WORLD IS FLAT"



"THAT THING WILL NEVER FLY"

"THAT ANTENNA IS TOO SMALL TO WORK"

There's one in every crowd—one that pushes the limits and proves the skeptics wrong. The world sailed into a new era of discovery with Columbus. The Wright brothers propelled us into the age of air travel. AEA advances into the ranks of these distinguished pioneers with the IsoLoop 10-30 HF antenna—a 35" loop antenna with low-angle performance that is better than many full-size HF antennas.

One IsoLoop 10-30 HF pioneer offers this: "Big-gun DXers will tell you nothing *that* small can work. They will continue to tell you this after you work a couple hundred countries with it. Ignore them. In 24 months, I have worked 213 countries and confirmed 198."

The reason you get such a big performance in a small package is the efficiency of the IsoLoop 10-30 HF; it's 72% on 20m, rising to 96% on 10m. The main loop serves as an inductor, tuned with a 10,000 volt variable capacitor. Frequency range is 10 MHz to 30 MHz with continuous coverage. The unique compact design is also ideal if you're facing space limitations—mount it in your attic, on a balcony, or go mobile.

With the optional IT-1 Automatic Antenna Tuner (below), tuning your IsoLoop 10-30 HF becomes an adventure in speed — 2 or 3 seconds is typically all the time it takes before you're tuned and ready to go. (Antenna comes standard with a manual tuner.)

Discover the world of big antenna performance in a small antenna. Call our literature request line at (800) 432-8873 and request the "Inside Story" on the IsoLoop 10-30 HF or call us direct at (206) 774-5554. For best pricing, see your favorite amateur radio equipment dealer.

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LETTERS

Are You Prepared?

Sometimes, when we run post-crises stories in *Monitoring Times*, I feel like I'm mimicking those signs posted along the highway (especially here in the South), which ask, "Are You Prepared?" Well, a couple of readers have responded to the message from this "radio evangelist."

• Bob Fraser of Cohasset, MA, tallied up *MT* reports of inadequate warning and/or follow-up information following two earthquakes, a major fire, and severe snowstorms. Not only does it appear things haven't changed one bit, says Fraser, "I would say in comparing the reports of October '92 and April '94 things have gotten even worse.

"There should be a national disaster program for all radio services, not only for commercial radio and TV, but also for the police, fire, ham, and any other related radio service; all should be ready to go at a moment's notice. Panic must be averted and false rumors squelched in a major disaster, but above all, the public must also be instructed what to do and where to go. Planners show a lack of common sense by not having emergency generators in the radio and TV studios, for the studio to transmitter links.

"There used to be such a national plan back in the 1950's when a nuclear war with the Soviet Union was expected at any minute. What happened to this plan and why wasn't it implemented for a major natural disaster?

"I do know that a number of commercial, public, and private radio services have gone out of their way to help the public in such disasters, but there should be one major overall plan. Remember, the "Big One" has yet to hit California."

• Martin Wishnewitz of Jackson Heights, NY, responded to E.R. Haroldsen's article in April regarding the black-out experienced in Idaho due to the quake in California. Wishnewitz says, "As a resident of New York City who has gone through two major black-outs, we have seen that the major high-powered radio stations with back-up capability have taken up to 30 minutes to get back on the air. Even then the studios are away from the transmitter sites which may still prevent them from broadcasting.

"If they had a news staff out on the road with cellular phones and information from city hall, the police and fire departments handy, they just might be able to calm the public's fears. I can report that the phone company has taken steps to keep the dial tones on, although slower than normal, in cases of emergency."

Wishnewitz raises a good question about whether you will actually learn anything of use, even if you are able to pull in a station from outside the affected area: "What responsibility do those radio stations in nearby communities who are unaffected by the disaster have toward those areas in trouble?"

"Are community stations staffed, or are they automated stations broadcasting play lists or talk shows from satellite feeds, with nobody around to run the station? I am sad to report that the latter is generally true.

"We have in the New York area enough radio stations both on AM and FM to really keep us informed, yet sadly this country is in trouble when disaster strikes. In the State of Israel where the country is constantly in conflict, radio stations report to the people right away when things happen. Although that is a different society, maybe we can learn something from them."

Here's a case in point: the Twin Trade Towers bombing in New York City. A substantial number of antennas were housed on top of it, causing an enormous scramble for alternative routes for both broadcasting and two-way communications when power was disrupted.

Continued on page 114

A NEW LAUNCH!

Satellite Times™

A well-guarded secret at the ***MT*** offices has been the preparation for launch of an exciting, new magazine. Even our writers were kept in the dark just to make sure that accidental leaks didn't give our competitors any ideas!

In a couple of months you will receive your sample issue of ***Satellite Times,*** a full-size magazine that follows the successful ***MT*** format. ***MT***, of course, will continue to be the most timely and authoritative shortwave and scanner magazine; ***ST*** will take over where ***MT*** leaves off. If you think shortwave and scanning are exciting, aim higher!

Covering every aspect of space age communications, ***ST*** will bring you commercial, military, broadcast, amateur, scientific, government, and even private satellite insights by leaders in the field.

ST's Technical Editor, Larry Van Horn, is well known to ***MT*** readers for his expertise in satellites; three sold-out editions of his book, *Communications Satellites*, attest to that!

Other luminaries' bylines will appear as well, names like USAF space computer technologist Dr. T.S. Kelso, Radio Sweden's international TV host George Wood, Society of Amateur Radio Astronomy founder Jeff Lichtman, *World Satellite Yearly* author Frank Baylin, Dr. Jeff Wallach of the Dallas Remote Imaging Group, *South Scanner Satellite Services Chart* publisher Robert Smathers, *Space News* publisher John Magliacane, GPS expert Todd Dokey, Grove Enterprises Chief Engineer Chuck Morrison, Phillip Clark of the British Molniya Space Consultancy, satellite columnist for *Popular Communications* Don Dickerson, and career journalist and electronics experimenter Wayne Mishler. A veritable "who's who" of the satellite industry!

If you think we're excited about our new magazine, you're right! Just as ***MT*** was the first full-spectrum monitoring magazine for earth services, the new ***ST*** is the first full-spectrum monitoring magazine for space.

Watch your mailbox for your free, premier September/October issue. If you wish to be a charter subscriber at the introductory price of only $16.95, subscribe now! The subscription form on page 5 will give you the details.

Bob Grove, ST Publisher and Editor

From the publisher of *Monitoring Times* comes...

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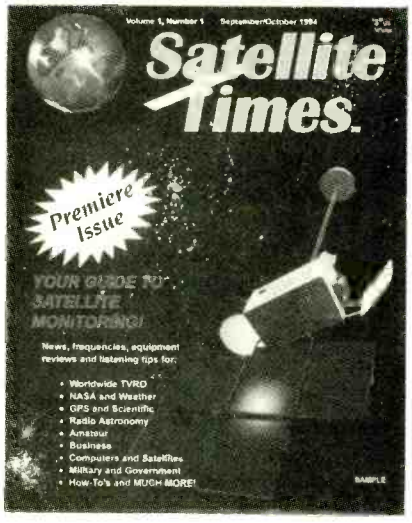

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Family Station Shut Down

It was, from all reports, a popular radio station. Along with a mix of oldies, dance, country and rock music, Power Radio gave away prizes, had Family Feud-style competitions, and even produced its own features. Listeners marveled at the quality of the audio.

Power Radio was the creation of 15 year old Pete Sinadinos and his father, who together built the station using a 5-watt transmitter on 87.9 FM that they purchased at a flea market. Signing on in 1992, the station's popularity continued to grow until last month when officials at WLTV, the local high school station, filed a formal complaint with the FCC. A short time later, the feds arrived and shut the station down. Neither Pete, nor his father, Jim, apparently knew that their broadcasts were illegal.

They point out that they made no attempt to evade authorities and regularly broadcast a phone number and address. One regular listener to the station, interviewed by the local newspaper, lamented the closing. "He did it so well. The quality of the sound was like a professional radio station. And it was family-oriented music."

The Sinadinos feel that jealousy spawned the complaint by the school. Paul Gomoll of the FCC's Midwest regional office confirmed that the station had been shut down but said that no civil charges have been filed in the case. The station operated out of Broadview, Illinois.

A License to Trash

Meanwhile, in Fort Worth, Texas, a duly licensed radio station conducted a stunt that nearly wrecked a city library and could have injured hundreds.

The "contest" began when a disc jockey on KYNG-FM announced that he had hidden $10,000 in the library's fiction section. The library knew nothing of the stunt and was in the process of closing for the day when the crowds poured in. "One minute there's 30 or 40 people leisurely looking through books," said library spokeswoman Marsha Anderson, "and the next minute there were more than 500, tearing the section apart. People were actually climbing on shelves." In an effort to stem the damage, the library staff repeatedly announced that the money had been found, but to no avail. The mayhem continued well into the evening.

As many as 100,000 books were thrown from their shelves and left in piles. Many were severely damaged. The library says that it intends to bill the radio station for damages.

KFMU ... Naturally

A Colorado FM station is a real natural. So says writer Dee McVicker in *Radio World*. KFMU-FM, in Steamboat Springs, claims to be the world's only wind and solar-powered radio station.

It's a windmill spinning atop the station's 163-foot tower that provides most of the energy, along with a collection of solar panels. The windmill was hand-built when the station went on the air in 1975 and came about initially, not as the result of any particular desire to use alternative energy, but because the utility company had no power lines to the top of the station's 9,100 foot location at the top of Stagecoach Mountain.

Since then the station increased its power and added solar panels. General Manager Ward Holmes said that he can't remember the last time the station went off the air due to power failure. "The two systems really compliment each other," says station engineer J.C. Renaud. "When there's no wind there tends to be sun and when there's no sun, there tends to be wind."

Crash Landings

An electronics teacher annoyed by noise from a model airplane club has been charged with using radio waves to crash more than 100 model planes. According to an Associated Press report, Rene Le Mancq, 62, of Marseille, France, had been feuding with members of the club since he moved next door to the "airport" in 1977.

In 1980 he won a court decree prohibiting the planes from flying over his property. In 1992, disaster began to strike the model airplane club like a plague. During a two-year period, plane after plane crashed for no apparent reason. Eventually, over 100 models lay on the ground, broken.

Investigators determined that the crashes were caused by powerful electronic interference originating from Le Manq's house. Le Manq denies the coincidence.

Radio Author Gets 10 Years

Chuck Robertson, the *Popular Communications* writer who often tackeled subjects like "Scanning the Pot Busters," was himself sentenced to 10 years in prison for "manufacturing marijuana with the intent to distribute..."

Police spotted marijuana plants while flying over a rural part of Creal Springs, Illinois, and later watched the 42 year old author watering and fertilizing the plants. After his arrest, Robertson admitted that he owned the plants and that part of the $43,389 found in his home was obtained by selling marijuana. Robertson's record of drug arrests stretches back to 1988, say local papers, and police report that they have seized $130,994 from Robertson since that time.

Previous convictions resulted in probation, but this time, says Drug Enforcement Administration agent John Yacup, "his luck ran out."

For his part, Robertson told Judge Phil Gilbert that he "pledged to God" not to be involved in drugs again. Said Robertson, "In my own heart I know I've changed my ways."

In addition to his 10 year sentence, Robertson will also pay a $10,000 fine, be placed on eight years probation, and participate in testing and treatment for drug and alcolohol abuse.

Hoaxer Sentenced

A New Bedford, Massachusetts, man who made a false mayday call to the Coast Guard in February of last year, is the first person to receive a jail sentence under the Studds act.

Edward Chipelo, 24, was sentenced to three months in jail. He was also ordered to pay $2,534 in restitution for Coast Guard expenses and to undergo three months of in-patient substance abuse treatment and follow-up testing.

The Coast Guard picked up Chipelo's call when he said "I'm abandoning ship! I'm abandoning ship! I'm taking water! I'm losing my boat! I'm going over! I'm losing my crew all over!" A helicopter and two cutters were dispatched in search of the vessel; Chipelo made the transmission from aboard a trawler tied up in Nantucket Harbor.

The Studds Act, named for Rep. Gary Studds, was prompted by a 1990 tragedy in which William Hokanson and his 14 year old son died in the freezing waters off Martha's Vineyard. Coast Guard officials received Hokanson's distress call but decided not to dispatch help when they received a simultaneous mayday in which laughter was heard in the background.

No Reasonable Expectation of Privacy

The cellular telephone industry has reacted sharply to a statement by Illinois Attorney General Roland Burris that listening to cellular or cordless telephone calls on a

COMMUNICATIONS

scanner is legal under state law because callers have "no reasonable expectation of privacy." The opinion does not affect federal law, which specifically prohibits cellular monitoring.

The whole episode started when a citizen called Burris' office and said that they had overheard a conversation about a crime while listening to the scanner. Could the information, the called wanted to know, be used as evidence?

The Cellular Telecommunications Industry issued an absurd "the emperor has no clothes" statement about the Burris opinion, saying "as an industry, we are totally committed to the personal privacy of cellular telephone users. The same expectation of privacy enjoyed by all Americans on the traditional wired phone network should apply to cellular."

After the bluster, CTIA spokesman Mike Houghton was quoted as saying that, "realistically, it's [anti-monitoring laws] tough to enforce." Does the ruling make any difference? Not really. David Strauss, a professor of law at the University of Chicago, said that states don't automatically outlaw everything prohibited by the federal government. It's not illegal under Illinois law, for example, to counterfeit U.S. currency," he said. "But you can't do it," said Strauss.

Meanwhile, one Illinois representative, at least, is trying to change the status of monitoring in his state. Representative Cross introduced House Bill 4180 which attempts to outlaw ALL receivers or transceivers which cover public safety frequencies and are capable of being powered by DC current!

The Chicago Area Radio Monitoring Association (CARMA) and other radio hobby groups have acted quickly to mount a campaign to inform legislators of the implications of this bill, and to rally public opinion. They have been successful in helping draft a more reasonable ordinance for the City of Chicago, which they offered to the state as a more workable model. Bill 4180 may be amended, but its form was not known at press time.

However, Ted Moran of CARMA reports that the Judiciary Committee was not sympathetic to scanner listening as a legitimate hobby. Representative Rafael "Ray" Frias (Democrat-1st Ward, Chicago) stated: "It's vitally important that we immediately start taking some steps to prevent citizens from monitoring these police frequencies."

Contact Rep. Frias at his Chicago office, 4106 S. California, Chicago, Illinois, 60632 (312) 890-0125; Springfield office (217) 782-3316.

Yugoslavian Ship Heads for France

The radio ship, *Brod,* anchored off the coast of Yugoslavia for the past two years, went off the air last month. The station, which attempted to broadcast to all of the former communist nation, was operated by journalists from throughout the nation. It received financial backing from the European Union, which had to withdraw because of what it called "administrative reorganization."

The ship is now sailing to Marseille, France, and the 19 journalists on board all plan to return home—except for the three Bosnians, who have no home to return to.

Al Who?!

Vice President Al Gore probably had his American Express card, but it didn't help when trying to identify himself to a disbelieving supervisor at the Academy Awards. *MT* reader Dan Amaniera was listening to Air Force 2 communications with Andrews AFB, when he heard the operator request a phone patch (on 11488 kHz USB) to the Dorothy Chandler Arena, so that the VP could pass along his congratulations to his old buddy Tommy Lee Jones.

In Dan's words: "The supervisor refused to believe that this message was authentic. Then Al Gore's personal secretary tried to convince the man, who then demands to speak personally with Vice President Gore. The VP personally attempts to pass the message.

"The supervisor, who refused to identify himself, then asked the VP for 'background information' about himself and proof of his identity! Al Gore invited the man to 'call me back' at a WHCA number (which he gave over the air) and ask to be connected to AF-2 which was over Brazil at the time."

To the best of our listener's knowledge, the message never was passed on. Says Amaniera, "Mr. Gore remarkably kept his composure throughout and never lost his temper (at least not on the radio)." MT

"Communications" is written by Larry Miller from material contributed by the following sharp-eyed reporters: Mr./Mrs. Anonymous; Dan Amaniera, Hollywood, CA; Merrill Ash, Seattle, WA; Rachel Baughn, Brasstown, NC; Jeff Helgoe, Deerfield, IL; Ted Moran, Chicago, IL; Jakie Stotzfus, Lancaster, PA; Joseph Vukovich, N. Chicago, IL; Sherman Wolf, Amherst, NH; *National Scanning, World Broadcast Information Service*. Many thanks.

NEW OPTOSCAN 456

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It's a well known fact that the microprocessor made it possible to develop the programmable scanner in 1974. Virtually all programmable scanners could have had (many feel should have had) a computer interface. It's as if the scanner manufacturers had a secret meeting on some deserted island and agreed to put computer interfaces on only a few of the most expensive radios. Why are they trying to limit the number of computer controlled scanners? What don't they want you to listen to or to find?

Well they didn't invite Optoelectronics to the big secret meeting. We don't agree to keep computer scanning expensive! The OptoScan 456 makes computer controlled scanning available at half the price with unbeatable performance and features.

The OptoScan 456 includes every thing you need to easily convert the superb Realistic PRO 2005/6 scanners into computer controlled screamers. Hardware, cables and software for the PC is included for the introductory price of $299. Step by step video instructions show installation details without drilling, cutting or soldering. Simple hand tools are all you need. Features such as CTCSS, DCS, and DTMF decode give the OS456 superior performance.

Why Computer Controlled Scanning?

The computer makes the scanner *really* perform, simply and effortlessly. Even when you are not around the computer can continue to search out those frequencies you want to listen to and record them into virtually unlimited numbers of memory channels. The OptoScan 456 becomes a relentless monitor of the VHF/UHF frequency spectrum searching out illusive signals. The OptoScan software makes using the PRO-2005/6 easier and much less confusing than using the front panel controls. Complex store, search, and scan features are more easily accessible through software menus.

Why Decode CTCSS Tones and DCS Codes?

Virtually all non-trunked VHF/UHF two way radio uses squelch tones or codes for privacy and efficiency. These sub audible tones and codes are identifying signatures that can aid in following transmissions across channels. The OS456 decodes tones, codes and touch-tone characters to provide the Radio Monitoring Enthusiast with a powerful new tool in sorting out who is talking, accessing a repeater and in general what is going on. Like the computer interface, tone decode should have been built into the radio but wasn't. Optoelectronics has produced the OptoScan 456 to make the PRO-2006 family radios perform to a new standard that no one else can match for any price!

Complete Installation Kit, Model OS465, includes the assembled and tested controller board, mounting hardware, cables, OptoScan 456 software for the PC and the installation video

Introductory Price **$299**

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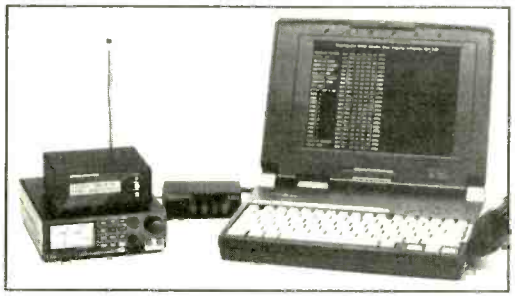
With the DC440 We bring you a Complete Scanning System

Scanning the busy VHF/UHF communications bands has always been exciting. Now monitoring enthusiasts are discovering that adding a DC440 to their Scanner or Communications Receiver* adds a new dimension to listening. Virtually all commercial, industrial, business and governmental two-way radios are now using sub-audible tones or codes and being able to display them provides valuable insight into who is talking or being called. Keep tabs on individuals and monitor repeater access codes.



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COUNTDOWN to the Crash

By Larry Van Horn

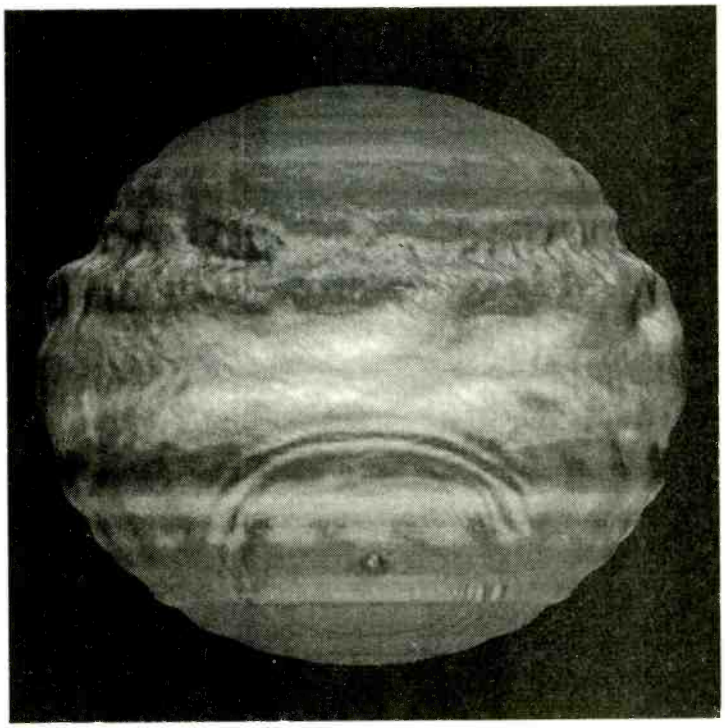
The countdown now stands at a little over a month and a half away. In mid-July, 21 frozen objects will leave the darkness of space and crash to their fiery deaths in the planet's atmosphere.

These icy chunks of water and ammonia will enter the atmosphere at a speed of 60 kilometers per second or 130,000 mph. At an altitude of 100 km above the visible cloud deck, aerodynamic forces will overwhelm the material strength of each piece of ice, squeezing and tearing it apart.

Five seconds after each fragment enters the atmosphere, it will release its kinetic energy of 250.000 megatons of TNT at 100-150 kilometers below the cloud layer. Some of the bigger pieces will have more energy and go deeper into the atmosphere. Hot gases (30,000 degrees Kelvin) from each stopped piece of ice will explode, forming a fireball similar to a nuclear explosion, but much larger.

Fortunately, this event will not happen on Earth, but on our nearby neighbor in the solar system: Jupiter. The above description represents one of many theories of what will happen when the fragments of the shattered comet Shoemaker-Levy 9 crash into the Jovial atmosphere during 5.6 days between July 16-22.

The impact of comet Shoemaker-Levy 9 onto Jupiter represents the first time in human history that people have discovered a body in the sky and been able to predict its impact on a planet more than mere seconds in advance. The impact will deliver more energy to Jupiter than the largest nuclear warheads ever built. In fact, it is theorized that these impacts could deliver up to the same energy created by a similar event generally thought to have caused the extinction of the dinosaurs on Earth, roughly 65 million years ago.



This computer simulation of what will happen when a fragment of Shoemaker-Levy 9 hits Jupiter, shows that enormous surface waves will travel around the planet. The simulation shows the waves two days after impact.
Photo courtesy of MIT.

Astronomers worldwide are preparing for this major astronomical event. Virtually every major observatory on earth and in space is being readied for some sort of observation of this big crash.

The Story Behind the Story

Comet Shoemaker-Levy 9 is named for its discoverers Eugene and Carol Shoemaker, and David H. Levy. They first discovered the faint 13.8 magnitude fragmented comet on March 25, 1993, on photographic plates taken three days earlier. The photographs were taken at Palomar Mountain in Southern California with a 0.46 meter Schmidt camera.

On the afternoon of the 25th, Carolyn Shoemaker was examining the films that the team had taken on the 23rd using a stereomicroscope. She straightened up in her chair. "I don't know what this is," she said. "It looks like...like a squashed comet."

A call was placed to James V. Scotti who confirmed the discovery that evening with the Spacewatch Telescope at Kitt Peak in Arizona. He could hardly contain his excitement. "Have you got a comet!" he shouted. "There are at least five separate condensations!" Scotti announced the discovery in an International Astronomical Union circular and described the comet's appearance:

> "It is indeed a unique object, different from any cometary form I have yet witnessed. It has the appearance of a string of nuclear fragments spread out along the orbit with tails extending from the entire nuclear train as well as what looks like a sheet of debris spread out in the orbit plane in both directions."

Little did Scotti know at the time, but Shoemaker-Levy 9 would also prove to be more interesting for its orbit than any other object he had ever witnessed.

During the four months following the discovery, astronomers made over 156 observations of the fragmented comet. Based on these obser-

vations, they concluded that the comet had broken apart due to the tidal forces on its close approach to Jupiter (or *perijove*) on July 7, 1992.

It was also discovered that instead of orbiting the Sun as most comets do, Shoemaker-Levy 9 was orbiting around Jupiter and that the current orbit would be the comet's last. There is a 99% chance that at the comet's next perijove in July 1994, all the pieces will crash into the planet Jupiter.

The Big Crash: Where and When

According to the latest orbital calculations, observers on Earth will miss seeing this spectacle, at least directly. Any of the fragments striking Jupiter will do so on the night side of Jupiter, thus out of view from Earth. Current predictions indicate that the middle objects of this cometary train will strike the planet at about 67 degrees east (toward the sunrise terminator) from the midnight meridian and in the southern hemisphere around 44 degrees latitude, as pictured in our cover photo.

These new impact point estimates are much closer to the morning terminator of Jupiter than the initial estimates. Even though these impact points are still on the far side of Jupiter as viewed from Earth, they are now only 5-9 degrees behind the planet's limb. About 20-40 minutes after each hit, the impact points will rotate past the limb of Jupiter as seen from Earth. After these points cross the limb it will take another 17 minutes before they cross the morning terminator into sunlight.

Table One gives the latest impact information available at press time for each of the objects. The 21 major fragments are denoted A through W in order of impact, with the letters I and O not used. In the latest predictions, fragments J and M have been deleted as they were not visible in the latest Hubble Space Telescope imagery taken in late January 1994.

The time between impacts is thought to be known with more certainty than the actual impact times. This means that if somehow the impact time of the first fragment can be measured experimentally, then impact times of the fragments that follow can be predicted with more accuracy.

Table One: Comet Shoemaker-Levy 9 Jupiter Impact Times

Fragment	UTC Date/Hour of impact month dy hr
A = 21	July 16 1926
B = 20	July 17 0236
C = 19	July 17 0629
D = 18	July 17 1131
E = 17	July 17 1438
F = 16	July 18 0029
G = 15	July 18 0712
H = 14	July 18 1843
J = 13	Disappeared
K = 12	July 19 1005
L = 11	July 19 2122
M = 10	Disappeared
N = 9	July 20 0950
P = 8	July 20 1438
Q = 7	July 20 1912
R = 6	July 21 0643
S = 5	July 21 1438
T = 4	July 21 1800
U = 3	July 21 2107
V = 2	July 22 0418
W = 1	July 22 0741

Predictions by P. W. Chodas, D.K. Yeomans and Z. Sekanina - JPL/Caltech

Notes:
1. The impact times above include the light time to the Earth (approximately 43 minutes).
2. Object Q=7 is the brightest of the fragments in the Shoemaker-Levy 9 cometary fragment train.

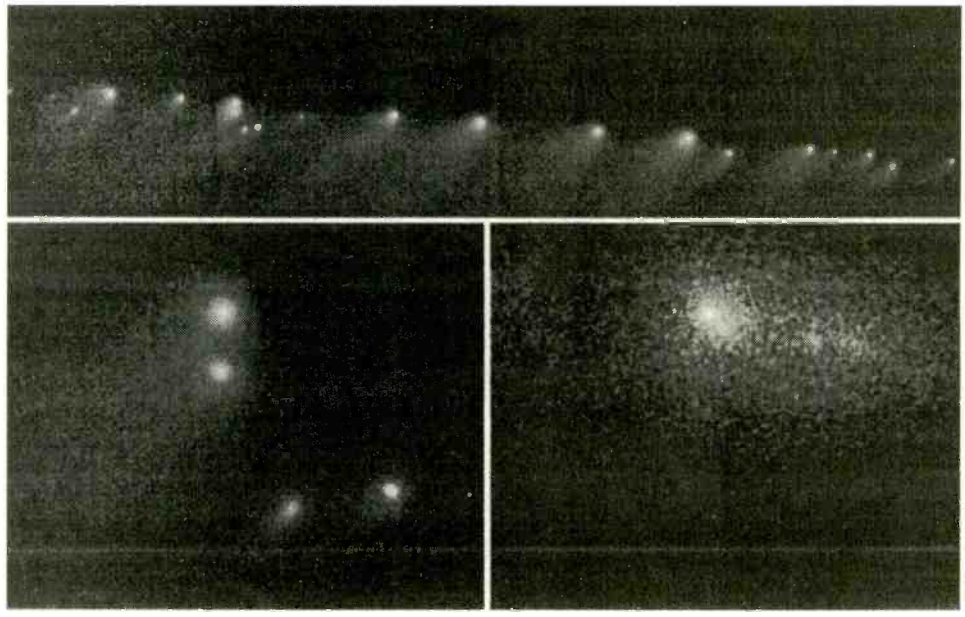
Photo of a squashed Shoemaker-Levy 9 comet taken from an Earth based observatory last summer. Photo courtesy of NASA.

Observing the Big Crash

One of the first questions most people ask is, "Will I be able to see the comet crash in a telescope?"

My recommendation is not to run out and buy a telescope just for this event. You will probably be very disappointed with your results. As I mentioned before, you will not be able to observe this event directly due to the crash occurring on the far side of Jupiter. Jupiter has normal cloud features that can be seen in a telescope, but spotting them requires some observing skill and the use of a high-quality telescope and eyepieces.

If you were planning to observe the crash through a telescope, you should already have spent many hours observing Jupiter under vari-



Nineteen of the nuclei from the Shoemaker-Levy 9 comet appear in this mosaic of images taken in late January 1994 by the Hubble telescope's new Wide Field and Planetary camera. The total width is about 605,000 kilometers.
(Photo courtesy of Nasa and the Space Telescope Science Institute)

ous viewing conditions to get used to a normal view of the planet. This would then aid you in spotting changes out of the ordinary when the event occurs.

There is another way you can observe this historic event, and you can do it with the shortwave equipment you have in your radio shack.

Hearing Jupiter's Big Show on your Shortwave Radio

The first reported observation of Jupiter's radio emissions occurred in the winter of 1955. Radio astronomers Bernard Burke and Ken Franklin, working at an Observatory in Australia, were making a series of observations at 22.2 MHz to produce a shortwave, or decametric, sky survey. Burke and Franklin observed a strong fluctuating noise at one point in the sky (+22 degrees declination). The noise was noted at about the same time, 10 out of 30 nights, and lasted for the period it would take a stellar source to pass through the beam of the antenna.

After a careful study of current and previously recorded chart data, it was confirmed that the planet Jupiter was the source of the noise. The noise heard through the receiver's loud speaker was very similar to the ebb and flow of the ocean surf pounding on a beach.

In 1964, the position of the innermost Galilean moon Io was determined by E.K. Biggs to be the influencing factor in the process that created radio noise from Jupiter. The very close proximity of Io to Jupiter and the movement of this moon through the large magnetic field of the planet at certain locations was confirmed to be the trigger for noise storms originating from Jupiter.

With the projected impact of Comet Shoemaker-Levy 9 and its almost unimaginable effect, this event literally begs for radio observation next month. Luckily, the equipment required to receive Jovian originated electromagnetic storms is quite reasonable to assemble.

Antenna

Dipole Antenna

The antenna required to observe Jupiter may be as simple as a half wave dipole antenna. The gain from this antenna will be quite low, therefore requiring a preamp to be used on less sensitive shortwave receivers.

A half wave dipole antenna can be constructed with two pieces of wire 11 feet 8.4 inches in length, connected to a 50 ohm coax cable. One length of wire is connected to the inner conductor, and the second piece of wire is connected to the coax shield. The antenna should be laid out on a East-West line. The antenna should be raised above the ground by poles or some other means to a height of at least seven feet.

The dipole antenna described above will probably be the easiest, cheapest and all around best performer for Jovian storm reception.

DDRR Antenna

The Directional Discontinuity Ring Radiator (DDRR) antenna is a good compromise between the 1/2 wave dipole and a large beam antenna.

DDRR is a loop antenna made from soft aluminum or copper tubing 1/2 inch in diameter, which is cut to 125.5 inches (21 MHz). A reflector is made of metallic window screen and mounted on a wood, metal or PVC tube frame, which is placed 5 inches behind the loop antenna. The loop is supported by a minimum of four insulating wood or PVC stand-offs attached to the reflector's frame. The coax cable inner conductor is connected to the antenna element and the outer conductor is connected to the wire screen reflector. A good preamp should be located very close to the loop antenna element. The antenna assembly is then located on an East-West line and will be used in a fixed position, or "drift scan mode."

Receiver

Any good quality communications receiver capable of receiving in the 18 to 28 MHz range will work well. The receiver's selectivity is very important in reducing the effects of nearby radio transmissions. The frequencies on which the Jovian noise is detected are used by many other services. Since there is no protected frequency for the reception of Jupiter radio emissions, care must be taken in finding a clear channel at your location. Since Jupiter noise is broad banded, I recommend using the AM wide position on your receiver.

If at all possible the receiver should have the ability to shut off the AGC (Automatic Gain Control). The AGC tries to keep the volume constant by biasing the RF (Radio Frequency) or IF (Intermediate Frequency) amplifiers in such a way as to hold the audio output at a constant level. This may reduce sensitivity of the receiver; however, it will increase the ability of the receiver to detect the slight signal changes emanating from a Jupiter storm.

Tape Recorder

A tape recorder capable of turning on from a signal level increase (voice actuated) or which can be controlled by the communications receiver is necessary for verification of what you hear.

An excellent way to monitor Jovian noise is with a stereo cassette tape deck. The left channel is connected to the audio output of the shortwave receiver, while the right channel is connected to another receiver monitoring the US time station WWV at 2.5, 5, 10, 15 or 20 MHz. This setup will allow you to time stamp monitored signals to accurately determine when a storm has occurred.

Table Two: Astronomy Related Bulletin Board Systems

Astronomical Society of the Atlantic BBS (Atlanta, GA)	404-321-5904
Astronomy (Fullerton, CA)	714-738-4331
Canadian Space Society BBS (Toronto, ON Canada)	416-458-5907
Celestial BBS (Fairborn, OH)	513-253-9767
Dallas Remote Imaging Group BBS (Dallas, TX)	214-394-7438
Digital Circus (Ocean Beach, CA)	619-223-5348
Enviro BBS (Arlington, VA)	703-524-1837
Homer (Tustin, CA)	714-939-1041
Homeschool BBS (Bossier City, LA)	318-746-8360
Kingmont Astro Observatory BBS (Loomis, CA)	916-652-5920
New Jersey Astronomical Association BBS (High Bridge, NJ)	908-638-8593
NOVAC BBS (Springfield, VA)	703-256-4777
The Observers Database (Old Greenwich, CT)	203-637-6710
Rancho Palos Verdes Astronomy (Rancho Palos Verdes, CA)	310-541-7299
Rochester Astronomical Information Network (RAIN) (NY)	716-224-0078
Skywatch (Regina, SK Canada)	306-569-0581
SpaceMet Physics Forum (Amherst. MA)	413-545-1959
Stargate BBS (Plano, TX)	214-578-7618
Starry Night (Shawnee, KS)	913-631-0761
Universal World (Granite City, IL)	618-931-8226
Zeke (Del Mar, CA)	619-755-5675

Listening Strategy

If you plan to try hearing Jupiter's big crash next month, you should spend time prior to the event monitoring signals from Jupiter. This will test out your equipment prior to the encounter and will also give you first hand experience in observing Jovian storms.

Frequencies to be observed are best determined by you, given your monitoring position. You may have to spend many hours in an attempt to find a quiet frequency between 18 and 28 MHz to monitor Jupiter activity.

The actual monitoring of Jovian storms and the encounter require a Maximum Usable Frequency (MUF) below the frequency you are planning to monitor. The MUF is the maximum usable frequency which radio waves may be propagated by atmospheric skip. If the atmosphere is reflecting signals back to Earth, then it stands to reason that the atmosphere will also reflect Jupiter emissions at those frequencies back out into space.

The best observation times are between Midnight and 6:00 a.m. when the MUF has usually dropped below the 18 MHz area. You will probably have a better opportunity to detect Jovian noise at the higher frequencies (i.e. 22-26 MHz than at 18 MHz due to the MUF).

It is expected that the increase or reduction of radio emissions due to the entry of cometary dust into the Jovian magnetosphere during the weeks around impact may be strong enough to be detected by shortwave equipped listeners.

Information Sources/ Reporting What You Hear

Up-to-date information will be the key to successfully listening in on the big crash next month. A variety of sources is available.

If you have Internet anonymous FTP capability, check tamsun.tamu.edu or seds.lpl.arizona.edu for images and information. The Grove Bulletin Board System (BBS) will also have comet related files in a special download section with images and the latest information on the event. Most major metropolitan areas have a least one BBS dedicated to astronomy. These will be excellent sources of information. Table Two has a list of some of the more popular astronomy bulletin board systems that are available. Some of these BBS's may require a fee or membership for full access.

The June and July issues of *Sky and Telescope* and *Astronomy* magazines will have full coverage of the events surrounding the impending crash. These are available on most of the better magazine stands.

The Society of Amateur Radio Astronomers (SARA) is embarking on a research program involving the planet Jupiter and Shoemaker-Levy 9. All observers are welcomed; of course, a preference is for individuals who will see this project to the end. You can receive more information from: SARA Comet Watch Program, Tom Crowley, 3912 Whittington Drive, Atlanta, GA 30342. A donation of a least $3.00 should be sent to cover expenses.

Now is the time for you to prepare for the Big Crash on Jupiter. No one knows for sure what the outcome will be. One thing is certain: all of Comet Shoemaker-Levy's offspring will live in our memories for a long time to come.

Get started with your preparations now, because the countdown clock is running. MT

Larry Van Horn is a staff writer for Monitoring Times and Technical Editor for the just-announced bi-monthly Grove publication, Satellite Times.

BOLIVIA:

Radio Under The Gun

By Don Moore

When I first spotted Radio Nacional Huanuni while walking up a dusty street in a rundown mining town, I knew there was something different about this station from the dozens of others I had visited.

It was surrounded by a high fence topped with barbed wire, the building had thick fortress-like walls, and the antenna towers were on the building itself, not outside of town. Inside was even stranger.

Although the offices were on the first floor, the studio, transmitters, and generator were in well-shielded corners in the basement. I asked the assistant director, who was giving me a tour, about this. He looked up and calmly replied, "We need to keep the station on the air while we are defending ourselves from the army. In 1980 we held out for three days."

In the unstable world of Latin American politics, nowhere has the sudden coup and a new presidente been the rule of the day more than in Bolivia. Since obtaining independence from Spain in 1825, Bolivia has had nearly 200 governments—an average of one every nine months!

Nearly two-thirds of Bolivia's people are Aymara or Quechua Indian. In colonial times those not working in the fields were forced into near slavery in the silver mines. An entire mountain of silver in Potosi made Spain the world's wealthiest nation in the 1500s, although the Indians that mined it gained nothing but hardship and death.

By the late 1800s, the silver was gone, but the world had discovered the tin can, and Bolivia had the world's richest deposits of tin. The mineral was different, but the game was the same. A small elite class lived in luxury produced by miners with a lifespan of 30 years who worked twelve hours a day, lived in dirt-floored huts, and barely made enough to feed their families. In this harsh environment, half the children died before the age of two. Some said they were the lucky ones.

In La Paz, alleys such as this have turned into battle grounds during Bolivia's frequent coups. Bolivia's government has been democratic now for thirteen years.

But this brutal life produced strong bonds among the miners. They knew they produced Bolivia's wealth and they knew they deserved better. Periodic strikes and rebellions were always bloodily crushed, but the miners never lost their spirit. Around 1946 some miners and teachers in the Siglo Viente mines began to fight back through clandestine radio. Using homemade equipment, "Radio Sucre" broadcast to the miners irregularly until discovered by the army and destroyed in 1949.

The Revolution Comes

Before 1951, Bolivia had had few elections and in those, laws restricting the vote to those with education had effectively reserved power for the upper classes. However, in 1951, Bolivia's small, growing middle class altered the equation by giving victory to Victor Paz and his reformist MNR party. But before Paz could take office, the military took over the government, annulled the elections, and outlawed the MNR.

This time the forces of change were stronger than anyone imagined. In April 1952, urban workers and university students joined tin miners and Indian peasants under the MNR banner in a truly populist coup against the military. Early on, the MNR captured the government radio station, Radio Illimani, and turned the station into their communciations center. It was just two blocks from the focus of military resistance at the Presidential Palace, and a bloody street battle raged between the two sites and elsewhere in the city for three days before the army surrendered.

The new government went to work and new laws were enacted to protect workers, legalize trade unions, allow rural peasants to acquire land, and extend the vote to all adult citizens. To end political manipulations by the big mine owners, the mines were nationalized. Obtaining broadcasting licenses also became easier, and

within a few months the new miners' union had started two stations, La Voz del Minero in Siglo Viente and nearby Radio 21 de Diciembre (commemorating a 1942 massacre of striking miners).

The Indians' strong oral traditions made radio a very effective means of communication, as the miners quickly realized. Each mining community and local union wanted its own station. In some towns, miners donated a day's pay each month towards equipment. Radio San Jose in Oruro raised money by collecting empty burlap sacks and jars for their deposits. By 1956, the miners had 19 stations averaging 220 watts. Some operated without a license until they got around to applying for one. Some never got around to it.

Because the station staff were of the mines, there was a sense of oneness between station and audience not often found in broadcasting. The miners remained poor, but now they had strength and hope. As other unions, including the peasants' union and railroad workers' union, established their own stations, Bolivia became the only country in the world where small grassroots unions were an important part of the broadcasting system.

Politics Again

The strong bonds of the miners and their well-organized unions, and the growing network of radio stations, soon made them one of the most powerful political and economical forces in Bolivia. Although they represented less than ten percent of the work force, the miners produced two-thirds of the country's export earnings. The miners worked with the government, but refused to become subserviant to it, causing the MNR to see them as a threat to its power.

Meanwhile, the Catholic Church had decided that Latin America was about to fall to Communism, starting with Bolivia's mines. Several Canadian Oblate priests were sent to Siglo Veinte to save the people, and their main tool would be radio. With financial support from the Church and political support from the MNR, Radio Pio Doce (Pius XII) was founded in 1959 to eradicate "alcoholism, psychosis, and Communism."

The most modern and professional station in Bolivia, its 2000 watt transmitter effectively covered most of the country. The miners' stations, especially cross-town La Voz del Minero, were the enemy and the priests went after them with a vengeance. For the next five years, the icy mountain air was heated by a vicious war of words between Pio Doce and the miners' network. A few miners, not content with words, put Pio Doce off the air briefly twice by dynamiting the antenna towers.

Selected active Bolivian stations

3200	Radio 9 de Abril*
4600	Radio Perla de Acre
4809	Radio Libertad*
4845	Radio Fides@
4875	La Cruz del Sur
4925	Radio San Miguel@
4965	Radio Juan XXIII@
4991	Radio Animas*
5945	Radio Pio Doce@
5964	Radio Nacional Huanuni*
6135	Radio Santa Cruz@
6195	Radio Metropolitana

* miners' stations
@ Catholic stations

But the effect of Pio Doce was not totally bad. The competition forced the miners to improve their stations, and previously amateurish broadcasting gave way to professional standards. The stations developed a programming formula still in effect today with a mix of news, folk music, education and information, and union messages. Local events including festivals and meetings were broadcast live. Either Spanish or Indian languages were used, depending on what was spoken in each community. Union dues covered most expenses with carefully selected advertising adding a bit extra.

Pio Doce was the impetus for the 1959 founding of Radio Nacional Huanuni, the first miners' station with professional imported equipment (from France). It became the pilot station of the Cadena Nacional Minera network as additional stations brought the network up to 28 stations. Actually, there has never been a formal network structure. Each station was independent, but the stations sometimes listened to and talked to one another on the air to exchange information. It wasn't efficient, but it promoted a deep unity among the stations, a unity that would be needed in the years ahead.

Return to Repression

Corrupt with power, the MNR leadership gradually moved away from its populist roots and began to align with the old power structure by nominating General Rene Barrientos for vice president in 1963. When pressure was put on the miners' unions to endorse Barrientos, they refused. A few days later a small army unit attacked Radio Nacional Huanuni, briefly fighting the hastily assembled miners protecting the station. It was a small incident, but the first in a long string of violence against the miners' stations.

The miners' reservations were justified when just weeks after the 1964 election, vice-president Barrientos mobilized the military and ousted

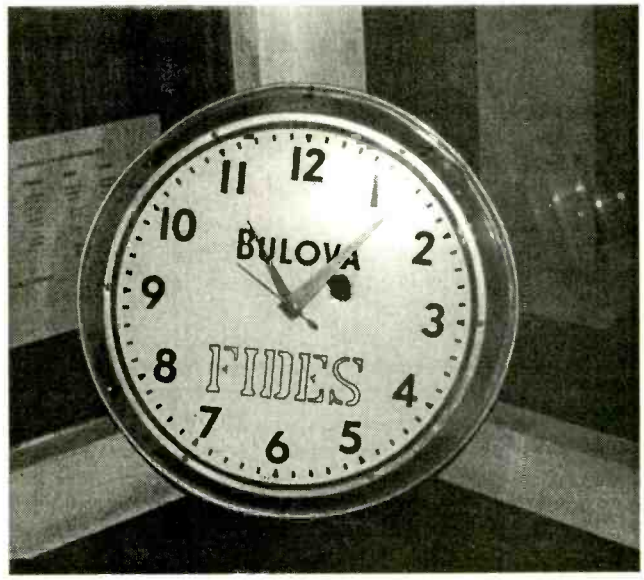
the president and congress. Unlike the MNR, Barrientos would tolerate no dissent. The miners' stations were closed and some destroyed. Then he placed the mining communities under military occupation and slashed the miners' already low wages by forty percent.

The sudden repression by the Barrientos government, however, caused an unexpected political shift. The reality of how the miners lived and were treated had sunk in slowly to the priests at Radio Pio Doce. Communist subversion, they saw, was not the enemy here, but rather a brutal economic system that might make Communism the only hope for change.

When Barrientos placed the mines under military rule, the priests made a 180 degree turn and became strong defenders of the miners and their rights, heavily criticizing the government. The miners' stations were closed, but this new voice took their place. The switch of Radio Pio Doce gave the miners renewed strength and hope just when it was needed most.

By 1967, the miners could take no more and strikes broke out across the country. At Siglo Viente when hundreds of miners and their families gathered outside the mines, the army marched in and opened fire, massacring men, women, and children. The event was to have been covered up, but Radio Pio Doce went on the air detailing the massacre to the rest of the country, so the troops retaliated by destroying the station. But political pressure from the Catholic church forced the government to allow Pio DOce to reopen, and funds from abroad poured in to rebuild it. The events in Siglo Viente had created a bond of blood between Radio Pio Doce and the miners, who now considered the station as one of their own.

The miners' fortunes changed in 1969 when Barrientos was killed in a helicopter crash. The next two years Boliva had two military presidents, but they were less authoritarian and allowed the miners' stations to reopen and rebuild. But the iron hand struck again on August 21, 1971, with a coup by General Hugo Banzer. Again, political dissent was strictly repressed and one of his first acts was to close the miners' stations (although a few were eventually allowed to reopen).



This studio clock was pulled from the rubble after Radio Fides was demolished in the 1980 coup. Stopped by a bullet, it forever marks the exact moment of the attack.

But Banzer couldn't touch Pio Doce without alienating the Church, so it became an important voice for the miners' rights. Other religious stations such as Baptist La Cruz del Sur and Catholic Radio Fides in La Paz joined in supporting the miners. Some stations, such as these two, offered training programs to personnel from the miners' stations, making them more effective once they got back on the air. In an unusual move in 1974, the Banzer government distributed 5,000 TV sets in mining communities trying to get the miners to watch commercial TV instead of listening to the radio, but it never proved popular.

In 1978, after seven years of Banzer, four miners' wives began a hunger strike demanding the reopening of miners' radio stations and amnesty for miners arrested for political reasons. Within two weeks, two thousand more women joined the strike and it became a catalyst for more widespread opposition to the government. Embarrassed, Banzer was forced to call elections, but when his hand-picked successor was fraudulently declared the winner, Bolivia erupted into political chaos.

For two years, coup followed coup, sometimes just weeks apart, as factions within the military jockeyed for power. But gradually a consensus emerged that Bolivia had to be returned to democratic rule. An interim civilian government under Bolivia's first woman president, Lydia Guelier, was formed, and elections scheduled for May, 1980. When Hernan Siles, a moderate politician from the old MNR won, everything seemed well on track for his August inauguration.

The Final Coup

But not everyone wanted to see Siles take power. Many military officers were still opposed to civilian rule and Bolivia's cocaine lords were disturbed by Siles' promises to work more closely with the US DEA. Neighboring Argentina's military government wasn't happy about the example Bolivian democracy might make to the Argentine people. With advice from exiled Nazi Klaus Barbie ("the butcher of Lyon"), they planned and carried out one of the most systematic and ruthless coups in Latin American history.

On July 17, 1980, the coup began with a garrison uprising in a provincial capital. When the military in La Paz remained loyal, the congress and officials of Guelier's government met in the Presidential Palace to discuss a plan of action, just as the coup leader, General Luis Garcia, had expected. The La Paz forces now moved in on the palace and easily arrested almost the entire civilian government in one move. Squadrons of soldiers and the cocaine

Bolivia's radio stations currently include Radio Altiplano, Radio La Cruz del Sur, Radio Nueva America, and Radio Panamericana.

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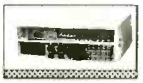

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lords' paramilitary units fanned out over La Paz and other major cities arresting all potential opposition leaders, including Catholic Church, union, civil, and university officials. Even international reporters were picked up to prevent them from filing stories. While most officials were simply locked up and tortured, a few were gunned down on the spot, such as the losing presidential candidate of the trade unions' party. President-elect Siles managed to stay in hiding and make his way safely out of the country.

Any coup requires control of the media and soldiers quickly occupied all the radio and TV stations in La Paz and other major cities. One station, however, had been marked for special treatment. Jesuit-owned Radio Fides had long been a thorn in the side of both the military and the drug lords for its strident commentaries criticizing their power. When drug smuggler Fernando "Mosca" Monroy led a group of soldiers and paramilitary thugs to the station, they didn't bother to ask for a formal surrender. Instead, they opened up with machine-guns and a tank, demolishing the station and killing the announcer on duty, Luis Espinel.

Garcia now controlled the cities, but he hadn't gone after the miners yet. The miners' stations allowed the scattered mining towns to communicate with one another and gave hope to the rest of the country listening in. Renaming their network the Cadena de la Democracia, the miners called for Bolivians to defend democracy through a total and indefinite strike. Their stations became the center of resistance, and Garcia's declared that anyone caught listening would be jailed. But, some listened anyway ...

> "The troops are approximately five kilometers from Siete Suyos and very near Santa Ana ... therefore we are preparing to defend ourselves ... This is Radio Animas for all the south of the country." (O'Connor)

> "... Women of Catavi, come to our station to defend it. We know very well that Radio 21 de Diciembre is part of our homes, part of our husbands' salaries ... We have to unite ourselves as never before. Come as fast as possible to defend our radio station." (Lozada & Kuncar)

No one knows how many miners and their wives died fighting in the following days. The miners fought savagely, but the military was stronger. At least one station was bombed by the Air Force. Gradually the miners were conquered and their stations silenced. The last miners' station, Radio Viloco, held out until August 6, 19 days after the coup. Even then resistance didn't end as the miners used dynamite to sabotage the military and stolen shortwave radiotelephone transmitters for irregular clandestine broadcasts in the five and seven MHz bands.

Chief Engineer Rene Usquiawo (left) and an assistant in the main control room at Radio Illimani. The station was rebel headquarters during the 1952 revolution.

But Garcia hadn't won. The bloody coup followed by the drawn-out fight with the miners, which the international press had eagerly listened in on, had exposed Garcia's government as a gang of murderous thugs. Without international support, it couldn't survive. Much of the Bolivian military had remained neutral during the coup, and a year later they rose up and ousted Garcia. Bolivia was now ready for democracy and Hernan Siles finally became president.

The Mines Today

Military might never truly silenced the miners, but economic realities are gradually taking their toll. By the mid-80s, outmoded technology and a decline in markets had made many of Bolivia's smaller mines unprofitable. To save money, the government shut down 17 mines and laid off 75% of the miners. Several miners' stations closed and others barely got by. In 1984, Radio Nacional Huanuni had just $880 a month from union dues to pay 18 workers and operating costs. Radio Animas had only $150 a month.

On these budgets, no money was left to maintain equipment and buy replacement parts, so more stations left the air. Then in 1985, the bottom dropped out of Bolivia's economy and inflation skyrocketed to an unbelievable 30,000%. By 1988 only nine miners' stations were regularly on the air, with a few more making occasional broadcasts.

As mines closed, miners had to look elsewhere for work, and as they and their families moved to the cities or the booming farmlands of the north and east, local unions began to disintegrate and the miners' movement began to weaken. Radio Pio Doce has tried, with some success, to keep the sense of group cohesiveness through special programs on shortwave to former miners throughout the country. But even for the miners who are left, times continue to be tough. In April 1993, many were earning just $30 a month. To keep their network functioning, the miners put a priority on keeping three key stations on the air, Radio Animas in the south, Radio Nacional Huanuni in the center, and Radio Milluni in the north. Of course,Catholic Pio Doce will be there as well.

But perhaps we shouldn't write the orbituary to miners' radio in Bolivia just yet. Mining experts have recently discovered silver deposits outside Potosi missed by the Spanish that may be worth as much as six billion dollars. This could become the biggest mining operation in Bolivian history. And, of course, mines have miners, and, in Bolivia, miners have radio stations. MT

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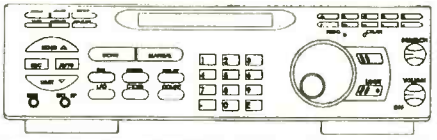

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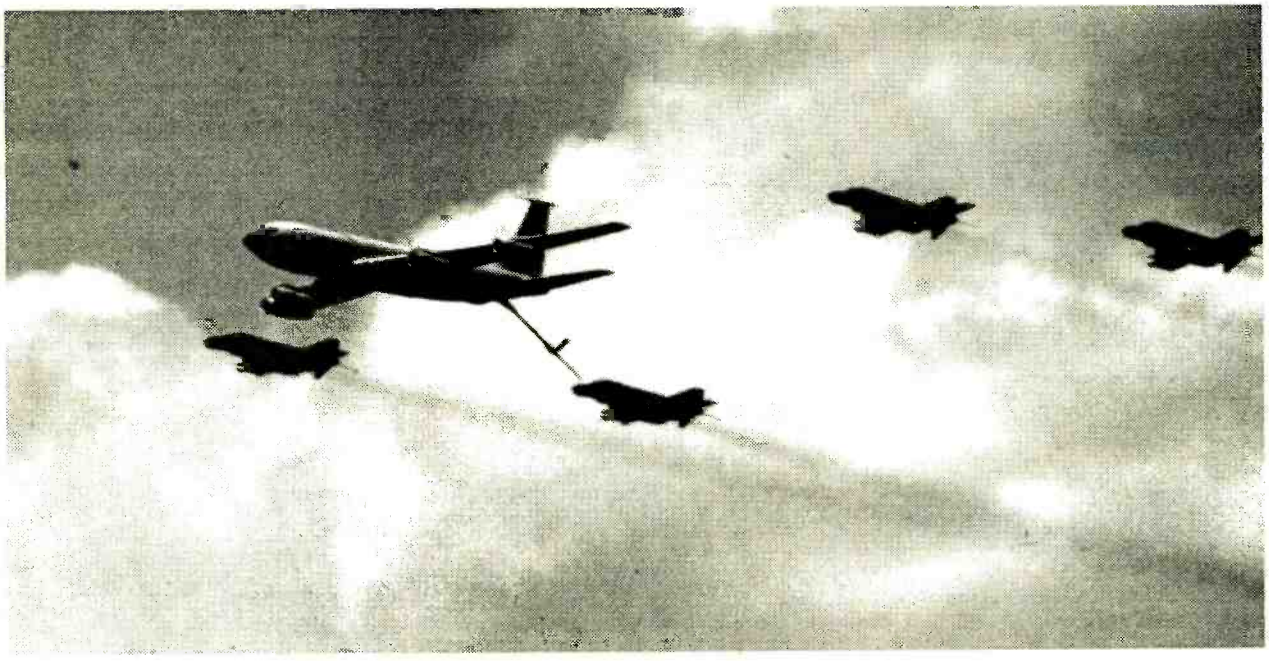


The United States Air & Trade Show

Story and photos by John T. Ward

From the B-2 "Stealth" bomber to World War II-vintage B-17s, the skies over Dayton, Ohio, will swarm with activity this next month as the United States Air & Trade Show celebrates its 20th anniversary on July 20-24.

As the largest civilian/corporate/military aviation event held in the United States, the U.S. Air and Trade Show, or USATS, offers the monitoring enthusiast a real smorgasbord of listening fare.

The Dayton International Airport, site of the USATS, hosts flights from most of the major airlines, several commuter airlines and also serves as a hub for Emery Air Freight, one of the nation's largest air cargo handlers.

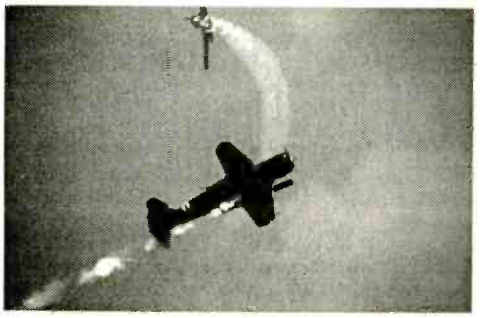
Wright-Patterson Air Force Base, just a few miles away, is the center for Air Force purchasing and is a major research and development facility. The base is also home to C-141 "Starlifter" jet transport aircraft of the 907th Airlift Group (U.S. Air Force Reserve).

During the four days of the USATS hundreds of airshow officials, volunteers, police and paramedics use portable radios and cellular telephones to coordinate the safety and comfort of the estimated 500,000 spectators, exhibitors, participants and media representatives who attend. The "air boss" uses VHF aviation frequencies to coordinate the civilian performers while Air Force controllers use UHF frequencies to coordinate the military demonstrations, all while scheduled airline arrivals and departures take place on the other side of the field.

This combination of civilian and military activities makes for nearly non-stop listening.

One of a Kind

A clue to what really makes this event different from other air shows can be found in its name — the U.S. Air & Trade Show. While most airshows include a few aircraft on static display and some souvenir vendors, at Dayton a 130,000 square-foot exhibition hall is crammed with more than 300 exhibits by major aviation and electronics manufacturers. Many of these exhib-



its feature the latest in communications equipment, and much information valuable to the avid scanner and HF utility listener is available.

Outside the exhibit hall nearly 200 military, corporate and commercial aircraft are lined up on the pavement. Many of them are open for inspection and crewmembers are available to answer questions.

Unlike many trade shows, all exhibits at the USATS — which runs Thursday through Sunday — are open to the public on the weekend. The first two days are reserved for industry professionals and the media.

Airborne performers for 1994 will include the U.S. Air Force Thunderbirds, the U.S. Army's Golden Knights parachute team, about a dozen civilian aerobatic performers, and flight demonstrations by some of the latest military and civilian aircraft.

"We're 90 percent sure that we'll have both the C-17 and the B-2 here this year," Henry Ogrodzinski, USATS's newly-named president, said recently.

The B-2, of course, is the "bat-winged" stealth bomber built by Northrop Aviation, while the C-17 is a twin-engined jet cargo aircraft designed to operate from short and unimproved airfields, much the same as the venerable C-130 "Hercules" turboprop transport.

Also expected is an "airborne assault" mass parachute drop by more than 300 members of the Army's 82nd Airborne Division, and aerial demonstrations of military aircraft from Germany, Italy, England and Russia, Ogrodzinski said.

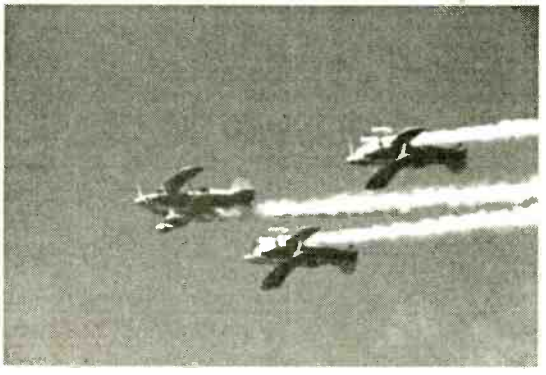
Other Summer Air Shows

USAF Thunderbirds

June		
	1	McEntire ANGB, SC
	7-8	Dover AFB, DE
	15	NAS Lemoore, CA
	21	Kelly AFB, TX
	22	Goodfellow AFB, TX
	26-29	Avoca, PA
July		
	2	K.I.Sawyer AFB, MI
	4	Battle Creek, MI
	16-17	Portland, OR
	23-24	Dayton, OH
	27	F.E.Warren AFB, WY
	30-31	Broomfield, CO
August		
	6	Elmendorf AFB, AK
	7	Eielson AFB, AK
	10	Misawa AB, Japan
	13	Osan AB, Korea
	17	Bangkok, Thailand
	19	Changi, Singapore
	21	Kuala Lumpur, Malaysia
	23	Andersen AB, Guam
	27	Oahu, HI

Blue Angels

June		
	4-5	Huntington, WV
	11-12	Selfridge ANGB, MI
	18-19	McConnell AFB, KS
	25-26	Davenport, IA
July		
	2-3	Traverse City, MI
	9-10	Eau Claire, WI
	16	Pensacola Beach, FL
	23-24	Minot, ND
	30-31	Springfield, IL
August		
	6-7	Seattle WA
	13-14	Abbottsford, BC
	19-21	NAS Miramar, CA
	27-28	Chicago, IL



Airborne performances include civilian and military aircraft from the U.S. and several foreign countries, and well as demonstrations by parachute teams.

Attractions at Wright Patterson

For the aviation history buff a side trip to the U.S. Air Force Museum, located on the grounds of Wright-Patterson AFB, is time well spent.

The museum's displays span the history of flight, from dioramas depicting Leonardo DaVinci's earliest attempts to an Apollo spacecraft used to carry men to the moon. More than 250 aircraft and more than 14,000 other items are on display in the museum's two large main buildings and the annex hanger.

One of the best spots to monitor aircraft landing and taking off at Wright-Patterson Air Force Base is from the Wright Brothers Memorial, located high on a hill overlooking the base's main runway. Landing aircraft pass directly overhead, only a few hundred feet above the crest of the hill.

For an event of its size, the USATS is surprisingly affordable. Admission is just $10 ($8 if purchased in advance) for adults and $5 for children under 12. Parking in fields around the airport is free, although to beat the traffic you might want to park in one of the designated lots around the Dayton area and take a shuttle bus to the airshow.

For more information on the USATS, write to: The United States Air & Trade Show, Dayton International Airport, Dayton, Ohio 45377-0460. You can also request information by calling 800-848-3699. See you there! MT

Radio Frequencies for the United States Air & Trade Show

All frequencies MHz

Airshow Officials

USATS (KB31054)	461.1625/466.1625
USATS	461.0875/466.0875
USATS	461.4625/466.4625
USATS	461.8875/466.8875
USATS	462.1125/467.1125

Twenty mobile units are licensed to each frequency pair, although a recent change in FCC regulations allows additional units to be added without notification. The lower frequency of each pair is likely to be the base station or repeater frequency.

Airshow Safety and Security

Most fire and EMS communications during the airshow are on the statewide mutual aid frequency of 154.280 with 155.160 MHz used as back-up.

Law enforcement during the airshow is the responsibility of the airport police department, with assistance from Wright-Patterson Air Force Base security forces, the Montgomery County Sheriff's Office, the Ohio State Highway Patrol and several commercial security firms.

Airport police
851.0125

Wright Patterson AFB security

173.4735 173.5375

Ohio State Highway Patrol
44.74 45.01

Air-to-ground and Air-to-air Communications

Although exact frequencies for the U.S. Air & Trade Show won't be assigned until mid-July, the following are frequencies commonly used across the country for air show control.

Common air show control frequencies:

123.4 122.9 123.45
122.85 122.775

Other frequencies likely to be in use during the airshow

• USAF Thunderbirds
(All freqs AM unless noted)

Air to air	294.70 394.00
	382.90 322.30
	322.60 236.60
	141.85* 141.40
Team leader	250.85
Solos (5 & 6)	283.50/241.40/236.55
Operations	120.45
Ground Support	413.025 (NBFM)

• U.S. Army Golden Knights

Operations	32.30 (NBFM)
Primary	42.35 (NBFM)

(= Confirmed in use 3/24/94)*

Non-airshow frequencies of interest

• Dayton International Airport

Tower	119.90 / 257.80
TRACON	118.00 / 327.10
	126.50 / 324.50
	118.85 / 294.50
	124.65 / 316.70
	134.45

• Wright Patterson AFB

Tower	236.60 289.60
	115.20 126.90
Weather station	344.60
Pilot to dispatcher	372.20 / 122.85
Command Post	397.00

• Miami Valley Hospital

Ambulance	155.28 155.34
Care Flight dispatch	462.975 463.175

Local public safety agencies

Dayton police and fire are on an 800 MHz trunked system, although initial fire dispatches are simulcast on VHF.

• Dayton Fire Department 154.430 (station alerting)

NOTE: *Information sources included Police Call, Monitor America, the Official Aeronautical Frequency Directory and the Federal Communications Commission.*

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ZAP PROOF Your Radio Room

By Bob Grove

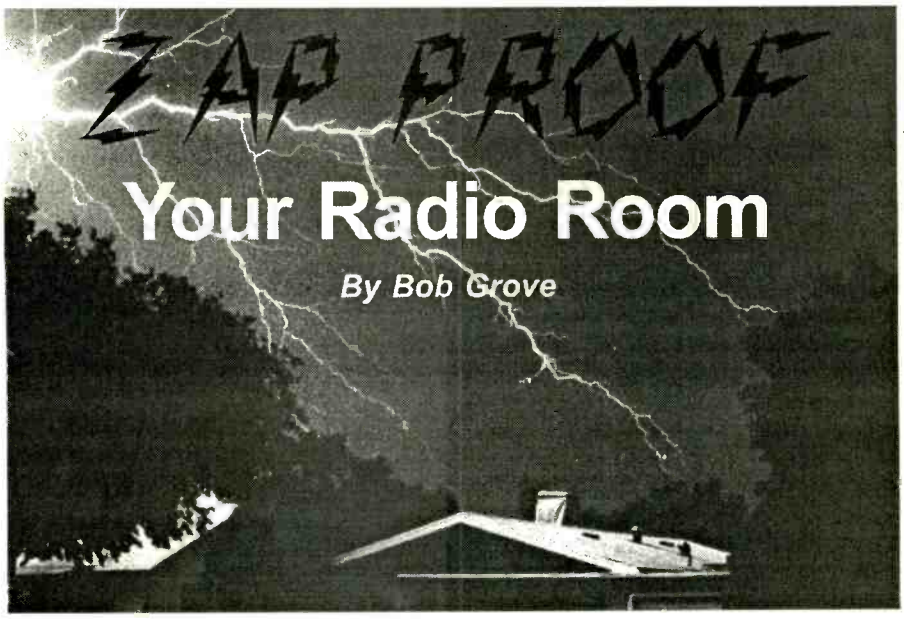


Photo by Steve Douglass

Years ago things were simpler:

Vacuum tubes were the workhorses of the electronics industry and voltage spikes were not a problem. Then came the transistor. Operating at voltages 100 times lower than tubes, even the most momentary transient pulse can rupture the delicate innards of these little devices.

As more and more applications for solid state (transistorized) circuits were found, more and more hazards became apparent: static electricity from clothing, shoes and furniture; accidental surges from appliance-induced voltage spikes; and, worst of all, catastrophic failures caused by nearby (not to mention direct) lightning strokes.

While semiconductors (transistors, diodes, ICs) are vulnerable to these energy impacts, other components (resistors, capacitors, small coils and transformers) are more resistant. Least disturbed of all are components with large cross-sectional current-carrying area (power transformers, motors, wiring, relays and solenoids).

Since any outside antenna is a potential target for lightning, and even nearby hits can induce thousands of volts on your antenna line, it is clear that protective measures must be taken to protect modern communications equipment and accessories. The protection must be both in the antenna and power lines.

Antenna systems and power lines aren't the only potential targets for lightning; CATV and telephone cables, metal piping, structural steel, fences, metal roofing—any sizable metallic lengths are likely conductors of these massive bursts of electrical energy which may exceed 10 million volts and 50 thousand amps!

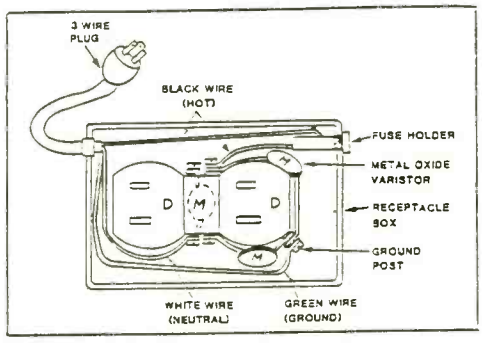
...And Atom Bombs, Too!

While a nuclear threat is at the lowest level in decades, it is worth noting that a single overhead nuclear detonation unleashes a devastating electromagnetic pulse (EMP) capable of disabling electronic equipment over thousands of square miles.

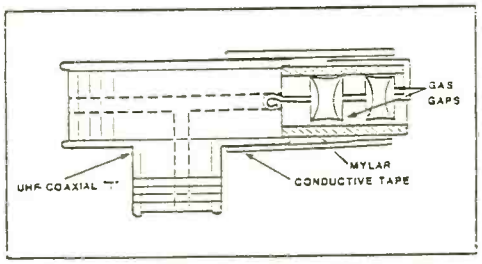
Early doomsday forecasters recommended the purchase of additional radios to be wrapped in metal foil and stored in metal boxes for backup after the holocaust (assuming there is anyone left to listen to them!). Fortunately for us optimists, more recent tests conducted by the National Communications System (NCS), a confederation of 22 federal government agencies, show that such measures are not necessary.

With antenna lines and power cords disconnected, nearly all communications equipment, especially those with metal enclosures, will withstand repeated EMP and nearby lightning discharges without damage. The disconnected cabling should be pulled substantially away from their mating connectors to avoid arcing.

Since disconnection of all cabling from radio equipment is not always practical or even possible, we must examine the next best bet: the installation of protective devices on these lines. With such simple safeguards installed on connected antenna and power cables, repeated lightning and EMP simulations once again failed to harm the equipment.



AC Power Protector



Antenna Connection Protector

Since lightning and EMP are remarkably alike, the same devices and procedures may be used to protect systems from both threats. Commercial safeguards are available and, if you're handy with tools and a soldering iron, your entire communications installation may be protected for about $100!

Proper Grounding

It isn't surprising that radio hobbyists and engineers alike are confused as to what constitutes a good ground—the literature is filled with inconsistencies and contradictions.

The most recently published tests show that approximately 100 feet of heavy gauge wire (#6 or larger) on the surface of the ground, stapled down with 6" metal pegs every four feet or so, provides excellent lightning dissipation.

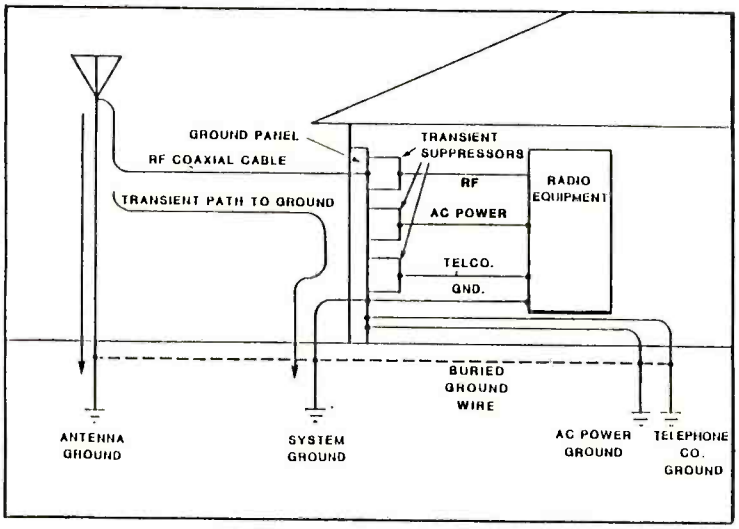
Just as effective is a loop of wire around the building, buried approximately 1" below the surface, clamped together like a giant lasso where the end meets the ground wire which is brought to the tower and equipment by a common lead.

In the radio room, a metal bus of #2 gauge wire, strap or even the copper braid from an old piece of RG-8/U coax runs behind the equipment to provide common grounding to all equipment and accessories. It is attached to the ground wire.

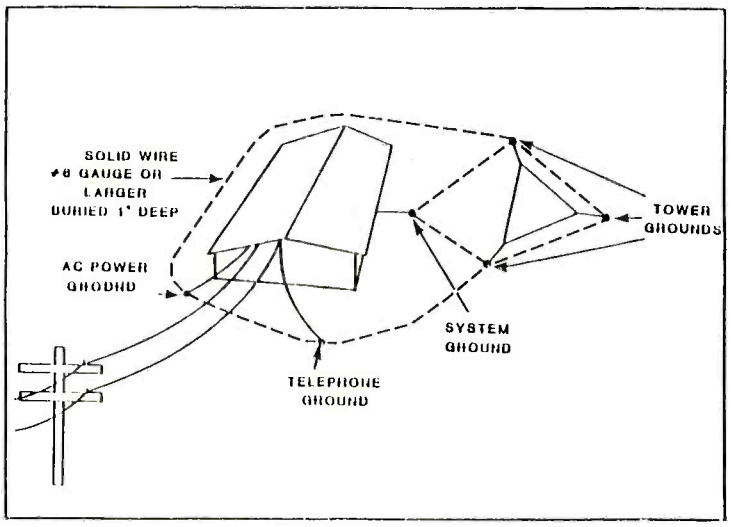
Antenna Suppressors

The longer the cable (and this includes rotator control cables and guy wires as well as coax), the more efficiently it couples to low frequency (lightning and EMP) energy. The old standby gap-type lightning arrestor may have worked for vacuum tubes, but offers little protection for solid state circuitry. By the time thousands of volts have built up to discharge across the gap, the tiny circuit components have been fried!

VHF/UHF enthusiasts are more fortunate than SWLs from an equipment survival standpoint. Damaging pulses from lightning (and EMP) crest in the medium and long wave spectrum, rapidly dissipating at higher frequencies. VHF/UHF antennas, happily, aren't efficient collectors of this unwanted energy (but long coax cable runs are).



Transient path to ground with ground panel (single point ground) and transient suppressors.



Proper method of tying all grounds points together.

Antenna Rotator Systems

The multiconductor line going from the control box to the rotator motor is an excellent collector of induced energy. For protection, MOVs (metal oxide varistors) must be installed at the control box from each line to the common ground bus. Assuming an operating voltage in the 24-28 volt range, use an MOV with a 50 volt rating.

Naturally, the 120 volt power line to the control box will have to be protected as well; use MOV suppression as described below.

Power Line Suppressors

Whether struck directly or induced by a nearby lightning discharge, power lines can deliver formidable high voltages to your radio equipment. Fortunately, step-down power transformers used in solid state electronics reduce the damaging output voltage somewhat, and the reactance of their windings filters out much of the pulse's bandwidth, further limiting the destructive voltage transformation.

House wiring resistance itself limits excessive current; some protection is offered simply by locating the radio room some distance from the distribution panel.

High voltage induced in two- and three-phase power lines are nearly equal, balancing out against the neutral, thus posing little threat. Unfortunately, all consumer electronic equipment is designed to work with single-phase, 120 VAC circuits which are returned to neutral ground. They are very vulnerable to induced voltages.

Neither fuses nor circuit breakers offer any degree of protection because of the fast rise time of the pulse which gets through the panel before the "protective" device has a chance to react.

The most consistent and dependable protection device for power lines is the MOV. It is readily available as a circuit component and in assembled accessory form. It may be placed in the service panel or plugged into the wall outlets; a combination of both is recommended.

While gas discharge tubes also work well to protect line-voltage-operated equipment, once the pulse triggers ionization in the tube, it continues to conduct as an arc-over, destroying itself quickly because of the sustained line voltage present. A circuit breaker between the AC source and the tube should prevent this from occurring.

Computers

It is hardly surprising that the solid-state composition of home computers invites disaster when confronted by high voltage pulses. Damage can range from simple logic upset through data loss, to permanent damage from fused microcircuits.

Long interconnect cables between mainframes and peripherals are as vulnerable as power lines to lightning-induced voltages. MOV protective devices, grounding and shielding are recommended wherever possible.

Telephone Systems

Older mechanical telephone systems and handsets with their rugged line protection devices are quite resistant to high-voltage transients. Newer solid-state telephone equipment, however, is vulnerable and should be protected like other electronic equipment.

Conclusion

It is encouraging to note that in NCS field tests, solid-state base station equipment survived nearby high energy pulses, even when short cables (microphone, power supply, speaker, transmatch, etc.) were attached, only failing from direct lightning strikes.

Similarly, VHF and UHF hand-held and mobile equipment proved virtually immune to induced pulses, both because their antennas are short and because the higher frequencies have little energy content.

Even with short interconnecting cables attached (microphones, antenna tuner, power supply, external speaker, etc.), all equipment proved totally immune to EMP and lightning simulation. Their metal enclosures were probably helpful. Only when connected to power lines or long antenna cables did the simulations damage the equipment.

A total of 56 separate transient suppression devices were tested by NCS; of these, 40 were effective in preventing any damage to 15 different solid-state radio systems. NCS concludes that solid state equipment is far more survivable than had been previously anticipated.

Ideal Protection

The best protection of fixed (base station) equipment from lightning or nuclear EMP is to disconnect it from all external collectors, including antenna lines, power cables (chassis interlock cables remove the chance of a dangling power cord becoming an EMP collector), control cables, microphone and speaker lines—and even the ground wire! The equipment should then be secured in a metal storage box (grounded if possible).

Obviously, those conditions are impractical in a hobby installation. Fortunately, there are effective preventives for those of us who live in the real world.

1. During a nuclear threat, spare backup equipment (tube-type, with spare tubes, if possible) should be kept disconnected for possible use following an EMP event. Spare solid-state equipment should be kept in a metal box or wrapped in metal screen or foil. Consider a source of

emergency power (batteries, gasoline generator) as well.

2. Surge arrestors should be installed on all power and antenna lines. NCS tests showed those devices made by General Semiconductor, General Electric and Siemens all performed reliably.

3. All equipment should be kept turned off (a common circuit breaker switch is handy for this application) and disconnected from power lines when not in use.

4. Antenna lines should be disconnected when not in use. An antenna switch with one position grounded (and set to that position) may also be employed during periods when the radio equipment is idle.

5. Accessory cabling which is not in immediate use (phone patch, modem, demodulator, etc.) should be disconnected from the primary equipment.

6. All equipment cabinets should be tied through one cable to a single point earth ground to avoid current loops which could destroy interconnected units.

7. The substitution of non-metallic guy lines and other long, supportive lines will help reduce induced voltages.

Commercial Devices

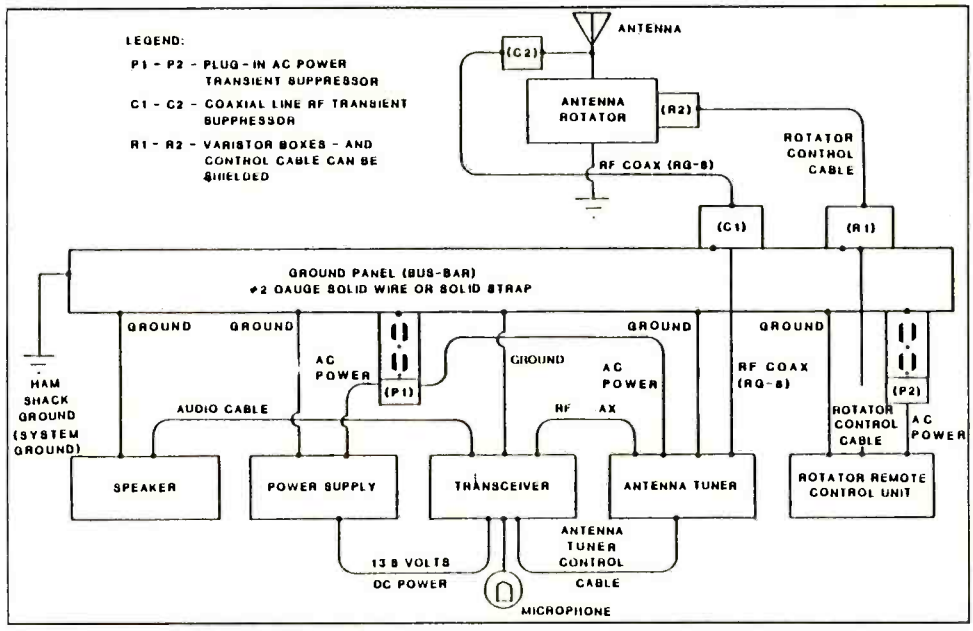
Several manufacturers provide excellent equipment protection accessories. For coaxial antenna systems, try Alpha Delta Communications, Fischer Custom Communications or Polyphaser Corporation. Their gas-discharge antenna protection units proved very effective in the NCS tests. A low-cost, gas-discharge protector is also available from Grove Enterprises.

For power line protection, many manufacturers offer MOV devices including General Semiconductor, Joslyn, Fischer, TII, Electronic Protection Devices, S.L. Waber and even Radio Shack. All were judged effective within their ratings.

The highest recommendation for power line protection was awarded to TII for their low cost model 428 plug-in power protector. Consisting of three MOVs and a three-electrode gas-discharge tube, it offers fast response and high power dissipation for hot and neutral lines to ground (common mode) as well as between hot and neutral lines (normal mode).

In mobile applications, especially if there is a long 12 volt (actually 13.8 volt) line between the battery and the equipment, transient protection can be provided by a single MOV. NCS recommends the General Electric V36ZA80 across the DC power cord. It lists at under $2.00.

Coaxial antenna lines may be best protected by the Fischer Spikeguard, available for about $55. The Spikeguard operates over a wide frequency range and does not attenuate transmitted or received signals.



Fixed Station (Ham Shack) Transient Protection

Since the Polyphaser device was higher in cost (about $83) and limits output power to around 100 watts, it was not rated as high, nor was the Alpha Delta Transi-Trap which, although much lower in cost, permitted a transceiver to fail during the test because of its excessively high clamping voltage.

Rejects

Generally speaking, the lowest voltage rated components failed because they started their protective clamping action at considerably higher voltages than their advertising data claimed. Least reliable from this standpoint were General Instrument's TransZorb series of zener devices.

Roll Your Own

How would you like total power line protection for about $11 or antenna cable protection for $9? If you're handy with a soldering iron and simple tools and don't mind doing a little shopping for parts, this may be the way to go.

An extremely effective power line protector which protected equipment in 100% of the EMP and lightning simulation tests is detailed in the first illustration. Built into a standard metal wall receptacle box, components include: a 6-foot, 3-wire power cord with plug; 3 Siemens S14K130 MOVs (with leads as short as possible); a 2-outlet, 3-wire AC receptacle; and a fuseholder with a fuse rated for the appropriate current for that circuit (10-15 amps should work).

If you are unable to find the Siemens device, you may wish to substitute a virtually identical part made by General Electric (now Harris Semiconductor): GE Stock #V130LA20A.

Theoretically, an existing wall outlet in the radio room could be fitted with the three MOVs, relying on the distribution panel's circuit breaker to throw if one of the devices shorts out during a pulse, but the fuse provides additional fire protection. In any case, be sure that lead lengths are as short as possible and the wires must not touch the metal box.

Since MOVs are designed to dissipate incredible quantities of electrical energy, it is possible that they may explode during a transient event. It is wise for the home builder to locate them where they can cause minimal damage to persons, equipment and adjacent components during such detonation.

Home construction of an antenna line protector is even simpler, requiring nothing more than a coax T connector, two Siemens B1-A350 gas gaps and some tape (preferably metal). The two gas gap devices are soldered in series with the shortest possible lead length between them (approximately 1/4").

A small piece of mylar insulation is rolled around them and one crimped lead is fitted into the center hole of the UHF adaptor while the other end lead is brought down along the adaptor's side and tightly taped in place.

As in the case of the home-brew power line protector, this antenna line protector was effective in 100% of the NCS simulations. MT

References

Technical Information Bulletin 85-10 (EMP protection) from National Communications System, ATTN: NCS-TS, Washington, DC 20305-2010 (ph. 202-692-2124)

Major Distributors

- Siemens Components: Hall-Mark, Marshall.
- S.L. Waber: Southeastern, Kirkman, Dixie, Hammond, Newark.
- General Electric (Harris Semicondictor): Arrow, Newark, others.
- General Semiconductor: Square D Co., 2001 W. 10th Pl., Tempe, AZ 85281.

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GATHERING COMMUNICATIONS INTELLIGENCE

By F.J. Harris

Communications listening is a discipline, a form, a skill, and an art. How you practice this art it is up to you. Whether you do it on a hobby or a professional level, to become skillful at the craft involves constant preparation, discovery, and teamwork. Either way, you'll discover a real pleasure in becoming more proficient at a complex task such as radio communications monitoring. It will also dramatically increase your awareness of certain surroundings that you would normally ignore.

The **Frequency Intelligence Administration**, of which the author is founder and president, is a private organization that does exactly what its name implies: It offers intelligence and information pertaining to a variety of subjects, primarily radio-related, but on other matters as well, such as military operations, law enforcement procedures, surveillance and counter-surveillance techniques.

The FIA has prepared briefing portfolios which range from laser and radio technology to the latest projects being developed at Motorola. Our sources are varied, unique, and very reliable. The philosophy behind the founding of the FIA is a belief in the right of the public to know what is going on around them at all times, whether locally, nationally, or internationally.

In order to provide several levels of information, it is best to gather it in as many ways as possible. One of the best ways is to listen to radio transmissions, and to be informed about the varied organizations who use radios as their source of communication and information.

As more and more people become computer literate and recognize the importance of information gathering as a way of making their world more complete and secure, we anticipate a substantial increase in this type of networking.

An Information-Gathering Strategy

As previously mentioned, the FIA's primary goal is to provide as many frequencies for public perusal as possible. One way to gather this information is from road trips. Our investigators travel as far as they can for a day, a weekend, or even a week or so, and document their observations and activities. Whether it's a mapping adventure, or a photographic trek to a specific site, all of the information gathered is relayed back to our headquarters in Tamarac, Florida, and catalogued into the existing database on that particular subject for future reference or publication.

Several of the Administration's foremost missions include exposing low profile government installations. The **Jonathan Dickinson Missile Tracking Annex** in Tequesta, Florida, is just one such place. It took four days by a team of three people to locate, identify, map out, and photograph the active station. The Department of Defense Police staff were helpful but had little knowledge themselves of the global purpose of the "Missile Tracking Annex."

To our surprise, the DOD police group assigned to the annex were using a variety of VHF frequencies: (CH1) 150.000 MHz and (CH2) 150.050 MHz for security operations, 150.200 MHz for maintenance, and 151.000 MHz for developmental research.

Some citizens who lived in the area seemed to feel that the annex was a Loran tracking and transmitting station. You can tune your AM radio in your car and all over the spectrum you will hear beeps and clicks that are similar to Loran transmissions. More research revealed that the United States Coast Guard did once operate a Loran A station in the area, but it was decommissioned years ago.

The United States Navy also has a small active installation near the Jupiter Inlet. This installation was accidently discovered when the tracking team made a wrong turn. This road and installation are not found on any map, sign post, or government property register; nevertheless, there it was, utilizing a FACSFAC (Fleet Area Control and Surveillance FACilities) frequency of 393.855 MHz.

At right, one of the five FIA monitoring posts which enable the FIA to compile information they believe the public has the right to know. The Jonathan Dickinson Missile Tracking Annex is shown in the photo above.

Assembling a Profile

Definitely not a low-profile military installation is the much-admired **USN Surface Weapons Center** at the International Airport in Fort Lauderdale, Florida. This station is very active and has several groups of personnel assigned to it, including Department of Defense Police, SeaCon Communications Sector,

FACSFAC personnel, Range operations personnel, and Optical tracking personnel. All persons stationed at this installation have a security clearance of secret or higher.

The DOD police frequency is 140.150 MHz, the Surface Weapons Center group uses 149.350 MHz, and the Fire and Crash crew, in conjunction with the Ft. Lauderdale Int'l Airport Fire-Rescue Squadron, utilizes 140.220 MHz for operations. The SWC is also known to use the following frequencies for special experiments on weapons in Port Everglades: 140.125, 140.550, 140.580, and 141.000 MHz. The FACSFAC frequency for the SWC is 138.525 MHz.

The USN Surface Weapons Center *is not* on the map, nor if you call 411 information can you find a listing for the SWC, SeaCon, or Department of Defense. The Broward Sheriff's Office confirmed that the Surface Weapons Center is located in District 3 at the International Airport, but knew nothing else about the station.

Tools of the Trade

Tracking and research involve a wide variety of expert man power and the most versatile monitoring equipment available. Direction finders such as Techcomm's TC-5100 can locate frequencies in all bands and give bearing and direction to the source of the transmission in question. Frequency counters such as the Optoelectronics UTC3000 and Startek's 35-BG are among the best for quick and dirty frequency detection. Motorola and Cushman service monitors with their spectrum displays greatly facilitate working with 800 MHz trunking control channels and 900 MHz digital multi-banded carriers.

The Administration's tracking department utilizes such tools as mentioned above, but they are no substitute for taking a group of experts in different fields on a tracking and discovery mission. A typical team of four may consist of a photographic specialist, a surveillance specialist, a frequency band plan specialist, and a mapping and hardware specialist. Equipment used by the photographer may include camcorders, 35mm cameras, and a remote-control helicopter equipped with a small camcorder for recording areas that may be otherwise impossible to access.

The surveillance specialist will carry the IF detectors, frequency counters, PL/DPL decoders, service monitors, RF direction finders, scanners, and spectrum analyzers. His job is the hardest, requiring a good knowledge of radio transmissions and quick hands to lock onto what we've come for: the frequencies.

The frequency band plan specialist records and logs all information encountered by the surveillance specialist into a 486 laptop computer. This person must know what he/she is listening for; such as channel information, operation in progress, and PL/DPL coding utilized. The band plan specialist will also have the entire *Frequency Intelligence Directory*, NTIS (National Technical Information Service), and FCC (Federal Communications Commission) databases on location so information can be quickly cross referenced and confirmed or discounted.

The mapping and hardware specialist is the co-pilot and maintenance man for the tracking team. His job is to see where we are, where are we going, and use a Loran or handheld GPS to give longitude and latitude of a radio tower to the band plan specialist for frequency and callsign cross references in the FCC database. This person also records and logs radio tower information onto a county map for future use. All agencies that utilize radio frequencies are logged on this map.

Other intelligence is also recorded and stored on huge databases or maps. This information, gathered on-site during a road trip, includes such features as: hydrologic wells, paging sites, commercial radio sites, navigational beacons, discreet beacons, satellite links, public schools, government entities, low profile military installations, federal agencies, field offices, section numbers, radio tower longitude and latitude, high areas of drug distribution, accident fatalities, CB base stations, ham repeaters and nets, and private frequency operation sites.

During photographic missions, any type of antenna, obvious or disguised, is carefully researched for frequency compatibility and band spectrum operability. This often opens up additional avenues for discovering new frequencies or unlicensed users.

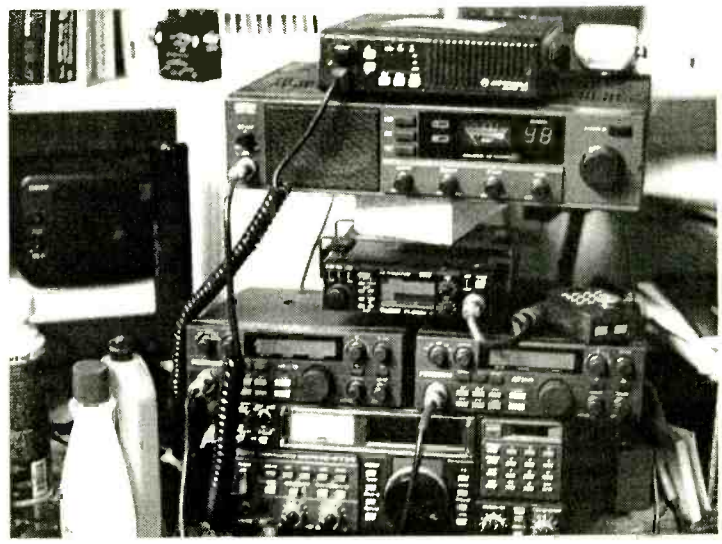
All information is compiled and reviewed before printed.

Still On the Burner

Currently there are two missions pending for the Administration's tracking team. The highest priority is the re-opening of Homestead Air Force Base. It is our opinion that the Homestead AFB never really closed, but merely re-organized its powerful communications group and air strike command for better utilization.

Construction of a new 800 MHz Type 11 Motorola trunked system for Homestead AFB has been confirmed. The AFB's security group uses MTS2000 handheld radios. The 482nd Reserve Unit at Homestead is using Spectra radios on Homestead's old VHF frequencies. Did you save your Homestead AFB frequency list?

The trunked system may now be in use, or perhaps Homestead has acquired a local 800 MHz SMR for air time. This is not unusual, since such Federal agencies as the USCG Law



A closeup look at the radios used at the FIA monitoring post.

Enforcement Group, Customs NBIS, and Seminole Indiwi Tribe are already doing this in South Florida. Since March of 1994, we have reviewed dozens of intelligence proposals for military 800 MHz trunking systems to be activated within the next few months.

Our interest in Homestead's communications led to the discovery that the National Telecommunications and Information Administration (NTIA) has approved trunking systems for many federal agency operations. The United States Air Force has had Eglin AFB on a 33 channel trunked system since 1989, Tyndall AFB has been on a five channel trunked system since 1991, and Barksdale AFB has been operating a 10 channel trunked system since 1991.

Approved for, and in the process of installing 5 and 10 channel trunking systems, are Patrick AFB, Homestead AFB, Langley AFB, Robins AFB, Arnold AFB, Wright Patterson, and MacDill AFB. Marshall Space Flight Center and Stennis Space Flight Center have been operating a 5 channel trunked system since 1992. Kennedy Space Center will have their trunked system operating by September 31, 1994.

The United States Navy is operating a 10 channel trunked system at Kings Bay and a 7 channel trunked system at Pensacola NAS. The USN has ordered trunked systems from Motorola for Key West / Boca Chica NAS, Mayport, USN Special Warfare Group, USN FLETC, *USS George Washington* (CVN-73), and Norfolk Navy Base. These systems will be operating before the 1994 year ends.

Camp Lejeunne has had a 10 channel trunked system since 1990 and Cherry Point has been operating a 5 channel trunked system since 1992. The United States Army is utilizing a 10 channel GE EDACS trunked system at Fort Polk since 1993 and a 5 channel trunked system at Fort Benning since 1992. Fort Bragg, Fort Meade, Fort Campbell, Fort Lee Richmond, and Fort Belvoir will install Motorola trunked systems by 1995.

The Department of Justice is operating 5 channel trunked systems in Manchester, Florida; Camp Butner in North Carolina; and Estill, South Carolina. The Miami MDC trunked system will be installed by August of 1994. The Department of Energy is also employing 5 channel trunked systems in Oak Ridge, Tennessee, and at the Pinellas Engine Plant in Florida.

The second mission is gathering information, if any is to be had, on the unknown military installation in Miramar, Florida. This installation has three bunkers large enough to house helicopter hardware. The small and short "runway" in front of the three bunkers seems to confirm this theory. There are two smaller buildings well hidden under brush and small holly trees. There have been confirmed sightings of Army or National Guard personnel traversing between the two buildings at the bunker site.

One of these two buildings is outfitted with several fiberglass VHF monopole antennas, one military radar of an older design, and two discone antennas. According to the Broward County mapping division, this area is labeled *"Restricted Area"* and is blanked out from any printing of any street map. The photographic aerial survey plat shows three bunkers, a small, freshly painted runway or landing site, a mobile home, and two small concrete block buildings.

The Miramar Police Department shows the restricted area on their dispatch zone map but have no idea how to gain access to the installation, nor do they have an emergency phone number. This installation has a unique shape to its cutout brush around the bunkers, runway, and small square man-made lake. If your altitude is high enough over the installation, it then takes on the shape of a huge arrow. The arrow points directly south-southeast to Miami's Richmond Naval Air Station. No other securable information can be found anywhere on the unknown military installation in Miramar.

Information Sources

It is the business of the Frequency Intelligence Administration to collect, review, and publish intelligence on all areas of radio related topics. Information is good to have, providing you know how to get accurate information. You, as a radio hobbyist, can also access much of this information on government, law enforcement, military, and surveillance agencies, if you know where to look.

The National Security Archive is a public depository of military, military intelligence, federal, and foreign government sectors. By executive order of the President of the United States, all classified information must be declassified and made known to the public after 25 years.

The National Intelligence Study Center contains information on all surveillance, counter-surveillance, and intelligence operations within the United States.

The U.S. Department of Commerce National Technical Information Service (NTIS) is the first choice of our organization for accurate information. The NTIS addresses a multitude of topics including, accoustoptics, aerospace technology, antisubmarine warfare, arrays, artificial intelligence, cellular radio, civil defense, communication satellites and systems, computer aided design, electronic counter-measures, frequency allocations, information retrieval systems, infrared communications, laser technology, light communications, microwave communications, optical communications, programming languages, radar technology, pulse communications, radio communications, satellite communications, security and cryptography, telecommunications, and television technology ... just to name a few! There are more than 3,000 current topics of information that you can obtain.

The local county library is also a good source of information, especially if your library has a federal and govemment sector. These are good places to start when researching a new subject, keeping up-to-date on topics of interest such as worldwide research and development, or reviewing intelligence and surveillance operations.

When it comes to communications monitoring, you get out of it only what you put into it. "Gathering communications intelligence" is just a fancy way of expressing what all scanner or utility hobbyists are involved in: frequency collection. Those of you who belong to a club or a net already have your monitoring team in place. As your monitoring becomes more intentional and more informed as a group, you will start to discover your surroundings in an entirely new way. After you have mapped the world of communications around you, you may never view your neighborhood in the same light again. MT

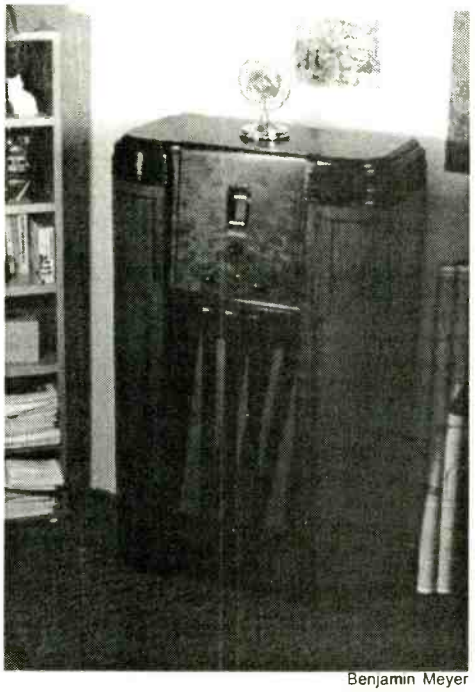
The frequencies and systems researched and verified by Harris and his associates are revealed in his new book, Federal and Intelligence Directory. See the review by Bob Grove on page 96.

D-DAY Day of Discovery

By Brian Rogers

June 6, 1944, known as D-Day, was the date Allied soldiers under General Dwight D. Eisenhower landed on the French beaches of Normandy during World War II.

And June 6, 1944, was the sixth birthday of my little sister's girlfriend, Carol.



Benjamin Meyer

Those two seemingly unrelated events joined in great significance for me when in the late afternoon of that day, my mother dispatched me down the street to Carol's house to fetch sister back from the party for dinner.

Carol's father, who was friendly to me in spite of my being a seven-year-old boy who regularly rode a bicycle at high speed across his lawn, was crouched with his ear in front of a large, glossy, wooden cabinet that occupied most of the bottom four feet of the wall separating their living room from the dining room.

The cabinet, which bore a gold-colored nameplate that read "Philco," represented state of the art mid-1940s electronic home entertainment technology. It had lots of tubes, a 78-rpm record player with changer, and a radio that tuned both the "standard broadcast" and "foreign" bands.

"Do you want to listen to General Eisenhower?" Carol's dad asked me. I crouched down next to him and heard the famous military leader all the grownups called "Ike" announcing that earlier that day American and Allied troops had crossed the English Channel and landed in France.

"Where is he?" I asked.

"In England," Carol's dad replied. "This program is coming in on shortwave from the British Broadcasting Corporation in London."

It was my first experience with shortwave listening. I recall the next minute or two very clearly, even though half a century has passed. I began shivering even though it was a warm June day, and the excitement that swept over me caused goose bumps to appear on my arms.

I didn't know precisely where England was, but I knew where the Atlantic Ocean was. And I knew England was on the other side of it. The idea that something unseen like a radio wave could nearly instantly travel the great distance between London, England, and Carol's living room in Detroit, Michigan, USA, thrilled me deeply.

I retrieved my frosting and ice cream smeared sister and walked happily down our street thinking pleasant thoughts about radio waves from far away places traveling around the world and being snatched out of the air and heard by people crouched on their living room floors in front of radios.

To my surprise, my dad said our "Silvertone" could receive foreign radio programs, too; and soon we were in the basement searching for a length of copper doorbell wire Dad knew was there. The wire was covered with red and white striped, waxed fabric and looked like a long, skinny piece of candy cane.

That evening 50 years ago, a stripped tip of that wire was attached to the antenna screw on the back of the Silvertone, and soon I was sitting cross-legged on the floor, listening to far off London in my very own living room.

Since my days with that Silvertone console, I've operated sets bearing names like Hallicrafters, Drake, Kenwood, and Sangean; and listening to shortwave radio broadcasts from far away still excites me.

My arms still get goosebumps once in a while. But now when I have 'em, I get a sweater.

Utility World

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

NORAD

"HOMER 01 flight this is OAKGROVE, recover blocks 21-240." "OAKGROVE this is HOMER 01 flight we have intercepted aircraft-tail number N201RU."

Transmissions like the above are common for listeners on NORAD UHF military frequencies, but not on HF. When Larry Fowler in Massachusetts first reported the above HF transmissions, my curiosity was immediately aroused. In the six-plus years I have done this column, I have never seen a logging attributed to a tactical military jet aircraft on HF. That has changed now.

Fowler reported, and I have verified through other sources, that Air Defense Fighter (ADF) aircraft now have HF/SSB capability for long range communications.

Specifically, the General Dynamics F-16A/B ADF Block 15 model aircraft coming into service in the air defense role has this HF/SSB capability. Two hundred and seventy airframes in this F-16A/B series are being converted to the Air Defense Fighter design. In an October 1986 announcement, the US Air Force announced that these aircraft would take over the Air National Guard (ANG) fighter-interceptor mission.

During NORAD scrambles, all interceptor aircraft use the "NORAD Callsign of the Day." They do not use their static cross country or training callsigns. On occasion, during practice scrambles, these aircraft may use their NORAD identifier for a callsign. Some examples of these type of identifiers follow:

NORAD Identifier	Aircraft	Unit
AK = ALPHA KILO	F-15A/B	102nd FW, 101st FS, Otis ANGB, MA
EL = ECHO LIMA	F-16A/B	177th FG, 119th FS, Atlantic City, NJ
LK = LIMA KILO	F-16A/B	158th FW, 134th FS, Burlington, VT

The 177th Fighter Group out of Atlantic City use "ACES" as their cross country callsign. Some of the training callsigns associated with the squadron include: BAT, DEVIL, DOG, HAMMER, PANAMA, SMASH, SNAKE and many more. It is widely believed that these training callsigns are the pilots' nicknames, rather than tactical callsigns issued by someone.

The 177th FG UHF operations frequency is 261.0 MHz; they have also been heard on the following VHF interplane frequencies: 138.050, 138.100, 138.125, 138.250, 138.300, 138.425, 138.475, 138.500, 138.600, 138.875 MHz (all in the AM mode).

158th Fighter Wing, home based in Burlington, VT, uses the cross country callsign "MAPLE." The MAPLES can be heard on their UHF operations frequency of 293.7 MHz and 138.000, 138.125, 138.200, 138.525, 138.575, 138.625 MHz tactical interplane frequencies.

Larry Fowler also mentioned that the Air National Guard NORAD Alert Detachment at Charleston AFB, SC, is maintained by the 177th Fighter Group's F-16s. The command post at Charleston is referred to as GATOR OPS. Sometime in the next month or two, the 177th FG will remove their detachment at Charleston and assume alert duty from their home station in Atlantic City.

Moving into the detachment spot at Charleston will be the F-16s from the 158th FG. When their detachment was at Bangor, ME, they used 138.0 MHz in AM for a detachment operations frequency and called it "BEAR OPS." Since the detachment at Charleston has been called "Gator Ops" since at least the late 70s, when the F-4s from the 107 Fighter Intercept Group (Niagara Falls, NY), had that duty, Larry is not sure if the 158th will change the name and frequency. VHF/UHF listeners in the Charleston area might look out for new activity on 138.0 MHz.

HF equipped listeners might want to check out the following NORAD channels for air defense fighter intercept activity. Sometimes the aircraft do use slight variations of the following frequencies such as 11215 for 11214, etc.

Charlie 1 - Unknown	Charlie 2 - 6735.0 kHz
Charlie 3 - 6750.0	Charlie 4 - 8967.0
Charlie 5 - 9023.0	Charlie 6 - 11214.0
Charlie 7 - 13207.0	Charlie 8 - 18027.0
Charlie 32 - 4735.0	Charlie 33 - 4085.0

Some of these channels are also shared with the US Navy Foxtrot Tango network participants. At least one channel, 8967, is a USAF Global HF System channel. So do not confuse the Navy/GHFS activity with NORAD operations. Look for the NORAD ROCC (Regional Operations Control Center) stations like OAK GROVE (SE), HUNTRESS (NE), SIERRA PETE (SW) and BIG FOOT (NW) working the various interceptor flights.

Now it's time to give the NORAD channels a listen; be sure to report your results to the logging section of this column via the address in the masthead.

Coast Guard News

Larry Fowler also dispelled a common Coast Guard callsign myth. "I have always been told that when you hear the callsign SWORDFISH-## used by a Coast Guard fanjet, the aircraft is on a drug interdiction mission. Not so...Anytime the fan jets get into the ADIZ (Air Defense Identification Zone), the crew checks in with NORAD and they use the SWORDFISH-## callsign. Whether it is a SAR (Search and Rescue), fisheries violation or drug interdiction case, the callsign SWORDFISH-## is used." The two numbers that form part of the SWORDFISH callsign represent the last two digits of the aircraft's tail number.

Another new development in Coast Guard callsigns also involves the fanjets. These aircraft have started using WORD-## callsigns when working Coast Guard Cutters on the marine VHF frequencies. Like the SWORDFISH-## calls, the two numbers in the WORD-## calls also represent the last two digits of the aircraft's tail number. Some recent examples include: TRACY 13 and CATCH'EM 13 (Coast Guard aircraft tail number 2113).

Now the practice of word callsigns has apparently been extended to HF on the frequency 6516.0 kHz. Recently, a Coast Guard helo with the callsign RED FOX 18 was monitored on 6516.0 securing guard with station CTU. The next minute Red Fox 18 comes up on 5696.0 and requests CAMSLANT Chesapeake take his guard. Rather than using RED FOX 18, the callsign COAST GUARD 6018 (HH-60 from Air Station Cape Cod, MA) was noted.

The frequency 6516.0 has really become interesting lately. Aircraft and cutters alike are working on this channel using communications in the clear and scrambled (red/green). All stations appear to be working a station known as CTU. That call is not spelled out phonetically, you just hear the letters C-T-U. Most units go through CTU to pass any traffic, establish communications schedules, etc. At this point nothing else is known about CTU. If any of you Coast Guard buffs can shed some light on this, please drop me a note.

Finally, you may have noticed the voice callsign above: CAMSLANT Chesapeake. Something new, you say? Not hardly. CAMSLANT Chesapeake is just a name change—long overdue. The old call is probably familiar to most utility monitors: COMSTA Portsmouth, VA.

Shortly after I heard the new call on the air, I contacted the station directly and the duty radio chief told me that they were just following the name convention established by their sister station on the west coast, CAMSPAC San Francisco. CAMS stands for Communications Area Master Station and of course, LANT is Atlantic and PAC is Pacific.

Regular Ute World contributor Gordon Levine recently received a full data verification card (QSL) from CAMSLANT Chesapeake. While the voice call changed, the international callsign of NMN did not.

The QSL provided the following information on the station. The receiver/ operations site is located in Chesapeake on the North Carolina/ Virginia border (36-36.57N 076-15.25W) with its transmitter site located in a remote section of Virginia Beach known as Pungo (36-43.43N 076-00.36W). NMN's mission is to provide long-haul East Coast communications services to Coast Guard vessels, aircraft, National Ocean and Atmospheric Administration (NOAA) vessels, a worldwide merchant fleet and US Navy vessels, as well as weather broadcasts, marine information advisories and distress communications to the boating public.

CAMSLANT uses the Harris R-2368/URR receiver with a variety of vertical and loop array antennas. The transmitters consist of 20 Harris HF-80 (10 kilowatts each) transmitters for High Frequency-Voice/CW/ SITOR/RTTY communications. The station also has two Nautel NX 5000TT/6 Medium Frequency transmitters (5 kilowatts each) for CW and NAVTEX modes of operation through vertical antennas. One receive and transmit Rotatable Log Periodic Antenna provides directional communications support when required.

NMN - CAMSLANT Chesapeake can be heard on a variety of frequencies. Some of the most active are:

CG Air to Ground	5696.0 8984.0 11201.0 (USB)
Morse Code	8741.0 12718.5 16976.0 (CW)
Weather Broadcast	5870.0 8090.0 12135.0 16180.0 20225.0 26725.0 Scheduled 24 hours a day. (CW) NMN also has code practice on these frequencies from 0200-0445 UTC with speeds from 6 to 24 words per minute (wpm).
SITOR transmissions	6314.3/6264.5 8426.3/8388.0 12590.8/12490.0 16817.8/16695.0 22387.8/22297.5 (Transmit/Receive) (SITOR-A/B)
Voice transmissions	4426.0/4134.0 8764.0/8240.0 13089.0/12242.0 (USB)

If you would like to receive a QSL card from NMN, listen to any of the aforementioned frequencies and send a report to: USCG CAMSLANT c/o NSGA Northwest, Chesapeake, VA 23322. Attention: RM3 Morales. The verification signer is Sergio M. Morales, ham call KP4FFW. Thanks to Larry Fowler, Gordon Levine and Petty Officer Sergio Morales for input to this US Coast Guard update.

VOLANT Scorpion Identified

Several readers responded to my request for information on the US Air Forces's VOLANT Scorpion. In fact, one reader enclosed a complete feature article on the mission of VOLANT Scorpion.

VOLANT Scorpion is the name of the Air Mobility Command's Security Police training course located at Little Rock, Arkansas. Security policemen from the U.S. Air Force train in infantry type tactics for the concept of Air Base Ground Defense. Usually units deploy from their home bases and set up simulated air fields and practice defense tactics. The radios used are PRC/77, PRC/124 & 128's as well as standard VHF DES encrypted police band radios. The course normally lasts about two weeks. The next time you hear a REACH aircraft running a phone patch to Little Rock on the GHFS regarding VOLANT Scorpion personnel, you'll know what that mission is.

One reader did provide identification of some of the other U.S. Air Force VOLANT missions. Here is that synopsis.

VOLANT Chuck	Southern hemisphere recon for headquarters, USAF
VOLANT Curry	Special weather mission
VOLANT Dome	Domestic recon for headquarters, USAF
VOLANT Fish	Water sample to detect underwater nuclear test
VOLANT Speck	Special recon for headquarters, USAF
VOLANT Track	Special sample request

VOLANT Combat, VOLANT Constant, VOLANT Pony Express are all related varieties of aerial sampling for nuclear weapons detection. VOLANT Constant Fish are special operations sorties flown against foreign nuclear atmospheric and underground test sites. VOLANT Check is Air Force Applications Center Regs CENR55-3.

The aircraft that were used for these operations included U-2, P-3, C-135 and B-52. Seawater sampling was accomplished with the HC-130. The unidentified source of this information believes the above VOLANT information may be dated.

Then again, maybe not. On a recent C-SPAN 2 broadcast during some Senate hearings on lessons from the Gulf War, Senator Dingle asked an Army representative if we would use VOLANT technology in Bosnia, since it worked so well in the Gulf War. The Army rep stated its details were classified, but it would be useful to control radio and television propaganda in Bosnia. Thanks to Pat McBride for that interesting tidbit of information.

This Month's Pot Luck

Since we are on a military theme this month, this month's pot luck will carry on in that vein.

- Possible U.S. Air Force Special Operations channels
  13207.0 (Fox 1) 5732.0 (Fox 2) 9017.0 (Fox 4)
  Other information on these frequencies would be appreciated.
- Several utility military monitors have reported some interesting comms on a variety of frequencies using such calls as Bomber, Dispel, Durant, Missionary, Acrobat, Butter, Yoglund, etc. Some of the frequency designations noted seem to use a letter/number combination (ie-Alpha 7). These stations always seem to be setting up duplex comm channels and VFT circuits.

It is believed that the below list represents both U.S. Air Force and U.S. Navy comms. If anyone has any more on the intercepts listed below, I would like to hear from you at the address in the masthead.

4062.0	USB	Dispel working Bomber, QSY Alpha 5
6830.0	LSB	USAF-Acrobat working Butter, QSY to 6753.0
6910.0	LSB	USAF-Yoglund working Acrobat,Transmit Echo 3, Receive Echo 2
6989.0	USB	Durant working Bomber
7425.0	LSB	Missionary working Butter 9
7921.0	USB	USAF-Gold Bloom working Acrobat, channel Alpha 7
8041.0	LSB	Missionary calling unid station
	USB	Durant working Kilgore
9190.1	LSB	USAF-Acquire working Acrobat, QSY to Mike 3, mention Mike 4
9260.0	USB	Carpenter switched Alpha 5/Alpha 11
10648.0	LSB	Best Judge working Missionary
10665.0	USB	Missionary working Global
10905.0	USB	USAF-Acrobat calling Zulu
11410.0	LSB	Durant working Gold Bloom Alpha
11535.0	USB	Missionary working Butter
12056.5	LSB	USAF-Day Letter calling Acrobat
15175/0	USB	Broadsword working unid station, QSY to Juliet 5
17460.0	LSB	Durant working unid, QSY to Bravo 7

Thanks to all who contributed to the column; I'm looking forward to hearing from all of you again. In fact, if you haven't reported before, take some time this month and jot down a few logs from your logbook. It only takes a few minutes. We all want to see what you have been hearing. Now let's check with this month's reporters and see what they heard in this month's edition of Utility World logs.

Utility World

Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	MENA	Middle East News Agency
AM	Amplitude Modulation	Meteo	Meteorology
ARQ	Synchronous transmission and automatic repetition teleprinter system	m/v	Motor Vessel
		NORAD	North American Air Defense Command
ARQ-M2	Multiplex ARQ teleprinter system	NUCO	Numerical Code follows
ATC	Air Traffic Control	Ops	Operations
CAMSLANT	Communications Area Master Station-Atlantic	RAAF	Royal Australian Air Force
		RAF	Royal Air Force (UK)
CANFORCE	Canadian Forces	Red	Communications in the clear (not scrambled)
CG	Coast Guard	Romeo Mike	Radioman
Comms	Communications	RTB	Return to Base
COMSTA	Communications Station	RTTY	Radioteletype
CW	Continuous Wave (Morse Code)	SAM	Special Air Mission
		SELSCAN	Selected Scan
Delta Fox	Data Frequency	SITOR-B	Simplex teleprinting over radio system, mode B
Diplo	Diplomatic		
EAM	Emergency Action Message	TACAMO	Take Charge and Move Out
FAA	Federal Aviation Administration	Telecom	Telecommunications
		UHF	Ultra High Frequency
FEMA	Federal Emergency Management Agency	UN	United Nations
		Unid	Unidentified
GHFS	Global HF System	US	United States
Green	Scrambled communications	USAF	United States Air Force
HF	High Frequency	USCG	United States Coast Guard
IDs	Identifications	USB	Upper Side Band
KCNA	Korean Central News Agency	USN	United States Navy
kHz	Kilohertz	UTC	Universal Time Coordinated
LDOC	Long Distance Operational Control	Whiskey	Location/position of ship (US Navy)
LSB	Lower Side Band	XBH	Transmit Minimum Power
MARS	Military Affiliate Radio System		

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

1642.0 6557-Fish driftnet beacon in CW at 0645. (D.Gasque-SC)

1651.0 A381/B147-Fish driftnet beacon in CW at 0600. (Gasque-SC)

1652.0 B297-Fish driftnet beacon in CW at 0602. (Gasque-SC)

1913.0 92R174-Fish driftnet beacon in CW at 0742. (Gasque-SC)

1934.0 93W235-Fish driftnet beacon in CW at 0600. (Gasque-SC)

2025.0 FTL comms transmitting "FTN, FTN going NT at 06 zulu" after a coded message. FTL received message "AC" in USB at 0523. (Barry Williams via Grove BBS)

2406.0 *USS Long Beach* (CGN-9) with phone patch traffic to WOM-AT&T Ft. Lauderdale, FL, at 0118 in USB. (Mike Hardester-NC)*Ship side of the duplex channel with WOM-Larry.*

3134.0 Bear Trap called by Sandberg on X-208. Negative comms, returned to P-381 (5700.0) in USB at 0428. (Brian Scott-White Settlement, TX)

3337.0 HEP-Interpol Zurich, Switzerland, with V CW marker at 0410. (Mike Hardester-NC)

3410.0 Single letter call signs with tactical comms in USB at 0450. (Fernandez-MA)

3610.0 ROO70-Rostov-na-Donu Meteo, Russia, with fax chart at 2210. (Ary Boender-Netherlands)

3745.0 RIS70-Tbilsi Meteo, Georgia, with Black Sea fax chart at 225. (Boender-Neth)

4029.0 US Army MARS net in USB at 0215. (David Chapchuk-Scranton, PA)

4090.0 Foxtrot Mike/Foxtrot Charlie nets noted here in USB between 2300-0800. (Fernandez-MA)

4335.0 UDH-Riga Radio, Latvia, working YLAW*m/v Pablo Neruda* using 50 baud RTTY at 2040. (Robin Hood-UK)

4372.0 R6 working 3L in USB at 0744. Advised him to have his Romeo Mike (Radioman) go XBH (transmit minimum power) on new Delta Fox (data frequency). (Scott-TX)

4458.0 SAM 26000 working Andrews. Phone patches to the US State Department in USB at 0215. (Charles Funk-Baltimore, MD)

4623.0 US Navy Rota, Spain, with wind fax chart at 2158. (Boender-Neth)

4721.0 Blue Crab working Huntress in USB at 1007. Came from 9023 at 0352 were Sierra Pete working Blue Crab. This frequency used not only by NORAD, but by US Navy also (at times). (Scott-TX)

4722.5 RAAF Air Force Sydney working 6103 in USB at 0309. Heavy interference from RAF Volmet on 4722. (Scott-TX)

4725.0 McClellan working unid station in USB at 0636. (Jeff Haverlah-Houston, TX)

4375.0 US Navy FT net monitored here in USB at 0412. (Haverlah-TX)

5275.0 Cairo News Agency (MENA) with English news in 75 baud RTTY at 1858. (Hood-UK)

5325.0 RCW75-Alma Ata, Kazahstan, with fax chart at 0005. (Boender-Neth)

5335.0 RBW41-Murmansk Meteo, Russia, with fax chart at 0155. (Boender-Neth)

5437.0 PRT2-Israeli Mossad number station in AM interfering with Air Force 2 and Andrews AFB, MD, Mystic Star network comms in USB at 0351. (David Chapchuk-Scranton, PA) SAM 682 working Andrews AFB for data circuit setup at 0230 in USB. (Jeffery Jones-Tracy, CA)

5700.0 Several two word IDs heard here every morning about 1400 with radio checks on a net. Have also heard an EAM by a female at 1940, among many other strange comms heard here occasionally. (Fernandez-MA) *USAF P-381 channel-Larry.* Station calling Nightwatch on X-209 in USB at 0207. (Nicolas Gagnon-Montreal, PQ)

5732.0 Octane 91 calling Jockey 16 in USB at 0218. (Haverlah-TX)

5823.0 Andrews AFB working SAM 205 with signal checks on F-390 in USB at 0158. (Jones-CA)

6510.0 GDC working MB with mention of 170-Harare, 92-Beira, Mike Base, Bravo Base and mobiles in USB at 0535. Suspect Zimbabwe Police or Customs. (Glenham Duffy-Durban, South Africa, via Grove Fax)

6516.0 Atlantic 13 called by CTU at 1754. Sandwich Island working CTU at 1801. CG *Cutter Reliance* working Cutty 03 at 1833. Redsox 18 (HH-60) in red request CTU secure guard at 1404. CG Group Woodshole working several cutters around 2030. All comms in USB. (Larry Fowler-MA)

6586.0 Springbok 201 passing position reports to Accra Air Radio in USB at 2317. (Hood-UK)

6716.0 Sierra 4 Juliett Golf (S4JG) working Halifax Military (CANFORCE) in USB at 0822. Within past year S4JG has been heard on 5716, 6716, 8984, 8972 and 11176. Who is this?? (Scott-TX)*Brian, S4JG is a general callsign that denotes the aircraft is a US Navy aircraft.It is not a TACAMO aircraft as listed in other pubs. Any Navy aircraft on HF can use the call-Larry.*

6721.0 Deerhunter working Blue Crab in USB at 0346. Came from 9023 then went to 6735 to attempt green comms, but no joy. (Scott-TX)

6732.0 FAA/Customs type Selscan tones heard here in USB or 6735.0 in LSB at 2210. (Metcalfe-KY)

6738.0 Single Selscan burst noted in USB at 0518. (Haverlah-TX)

6750.0 US Navy FT net noted here in USB at various times. (Fernandez-MA) MacDill called by Alpha Delta November Foxtrot (ADNF) in USB at 0523. (Haverlah, TX)

6812.0 Nightwatch working Andrews on F-888 in USB at 0308. (Haverlah-TX)

6815.6 Single letter call signs in USB at 0658. Tango was getting current Whiskey's (location/position) of units. This frequency is currently being used in coordination with Haiti blockade. (Scott-TX) Foxtrot Charlie working Whiskey in USB at 0511. (Haverlah-TX)

6817.0 SAM 605 working Andrews AFB on USAF Mystic Star F-064 in USB/LSB at 0756. (Scott-TX)

6840.0 Spanish female 4-digit number station in AM at 0312. (Gagnon-PQ)

6873.0 Single SELSCAN pulse noted here in USB at 0428. (Haverlah-TX)

6933.5 Spanish female 4-digit number station in AM at 0431. (Haverlah-TX)

6981.0 CCS-Chilean Navy Santiago, Chile, with 100 baud RTTY RY's then scrambled messages at 0310. (Bill McClintok-Minneapolis, MN, via Grove BBS)

6989.0 Durant working Bomber asking what was status after outage in USB at 0257. (Williams via Grove BBS)

7451.5 RFFP-French Military, Paris, France, with message concerning UN flight from Ancona, Italy, to Sarajevo using 200 baud ARQ-M2 at 1400. (Hood-UK)

7558.6 YAQ working 5 letter groups and some Spanish text for YAO, 75 baud ASCII at 2353. Associated with Spanish language net 7557.0 USB. Associated with Spanish language net on 7557.0 USB. Only ASCII I've seen ouside of US Government, MARS and amateurs. (Metcalfe-KY)

7640.0 Unid language female 5-digit number station in AM at 0510. (Steve Dowling-Washington, DC)

7741.0 Thunder 75 calling *USCG Cutter Vigilant* on safety of flight channel in USB at 0903. *Cutter Escanaba* accepted Thunder 75's guard. (Scott-TX) *USCG/USN joint ops safety of flight channel, also air-to-ground USCG-Larry.* CTU working Chase 30 stating that Pinstripe 716 was overhead vessel in distress, in USB at 2120. (Williams via Grove BBS)

7762.0 Arkhanglsk Meteo, Russia, with fax chart at 1645. (Boender-Neth)

7871.7 LN2A-Norweigan Telecom Sveio, Norway, with CW LN2A ID and pulses at 1838. (Boender-Neth)

8020.0 HME46-KCNA Pyongyang, North Korea, with English RTTY 50 baud

news bulletin at 1816. (Duffy-RSA)

8026.0 Andrews AFB in comms with Trout 99 on F-516 in USB at 0412. (Jones-CA)

8029.0 SAM 26000 working Andrews AFB on F-953 with phone patch traffic in USB at 0105. (Jones-CA)

8037.0 20 Bravo working 21 and 22 Bravo. Mentioned A-10 just were in sector at 0417 in USB. (Jones-CA)

8041.0 Missionary in LSB calling another unid station. I've heard this call sign for a number of years, any idea as to location? (Metcalfe-KY)*I do believe this is the same US Navy station I have heard for years at the COMSTA at Driver, VA. I believe the only time we hear them is when they are doing voice coordination for setting up long haul data circuits or fleet broadcast circuits in the HF arena-Larry.*Durant working Kilgore for message status report in USB at 0052. (Jones-CA)

8057.5 Delta Company working Comstop in USB at 1527. (Haverlah-TX)

8074.5 Spanish female 4-digit number station in AM at 0430. (Haverlah-TX)

8075.0 Spanish female 4-digit number station in AM at 0420. (Jeff Woodard-CA)

8086.0 Andrews AFB in voice comms with SAM 970 on F-736. Checking this frequency for use as a backup at 0158 in USB. (Jones-CA)

8089.3 US Navy Link 11 type transmission in USB at 0502. (Haverlah-TX)

8120.0 Shadow 11 noted here at various times in USB. (Scott-TX)

8122.0 Royal Australian Navy unit X4 working Darwin Control on Channel 4A4 in USB at 1000. *Townsville* heard later along with *Mermaid* and *Saltwater* (referred to as cutters). A lot of red (speech inversion) comms noted. (Scott-TX)

8324.5 Juliett Whiskey working Papa Charlie in USB at 0902. This is some branch of the Australian military. (Scott-TX)

8453.0 XSM-Xiamen Radio, China, with CQ CW marker at 1112. (Dix-NY)

8474.0 HCG-Guayaquil Radio, Ecuador, with CQ CW marker at 0101. (Dix-NY)

8478.0 FUF-French Naval Radio, Fort de France, Martinique, with DE CW marker at 0033. (Ron Pratt-Oak Harbor, WA)

8655.0 UAI3-Nakhodka Radio, Russia with V CW marker at 1102. (Dix-NY)

8698.0 9MB-Georgetown Radio, Malaysia, with CW marker at 1910. (Duffy-RSA) 7TF-Boufarik Radio, Algeria, working 7TQV-*m/v Ain Oussera* in CW at 1630 (message headers confirm this is Boufarik Radio). (Hood-UK)

8705.5 PKN-Balikpapan Radio, Indonesia, with CQ CW marker at 1108. (Dix-NY)

8906.0 Bombay and Delhi Air Radios passing flight position reports in USB at 1630. (Hood-UK) *Robin, is this ATC or LDOC air radios-Larry?*

8965.0 DHM91-German Air Force, Muenster, Germany, with aviation weather forecast in English in USB at 0855 on channel Kilo. (Hood-UK)

8972.0 Lima working Picker 601 regarding aircraft they were looking for. Hersey and Stingray also joined in the hunt. Hershey also advised that Almighty (USN Guantanamo Bay) didn't have radar contact either. In USB at 0740. (Scott-TX) Bluestar working Pinstripe 716 and LC809 in USB at 2111-2130. (Jeff Kennedy-Cape Coral,FL) Bluestar 01 working Pinstar 01 with comms about switching to UHF. (Fernandez-MA)

8984.0 USCG CAMSLANT Chesapeake, VA, working CG 1720 in USB at 2000. (Kennedy-FL)

8989.0 Camp Lejuene, NC, heard asking any station for a radio check on GCCC in USB at 1902. (Williams via Grove BBS)*Boy, are they in a time warp-Larry.*

8997.0 Two unid stations trying to go green but having trouble on frequency 'Xray Kilo' in USb at 2140. (Fernandez-MA)

9010.0 Halifax Military working Canadian J54T in USB at 0319. (Haverlah-TX)

9013.0 Royal Navy, Prestwick, Scotland, calling 'X0F' in USB at 0815. (Hood-UK)

9017.0 Memorial calling Nightwatch 01 in USB at 1428, no contact. (Larry Van Horn-Brasstown, NC) Jockey 88 (aka Pinup 88) working Jockey 16 in USB at 1318. (Haverlah-TX)

9018.5 Data transmissions and SELSCAN burst noted here in USB at various times. (Scott-TX)

9020.0 Shoe Gum calling MacDill AFB GHFS in USB at 1725. Moved to 11226.0 at 1731. (Metcalfe-KY)

9023.0 Lajes working a phone patch to Robins AFB for Head Dancer Ops in USB at 0620. Also ran patches to Raymond 11 (Eglin AFB, FL) and Raymond 25 (Seymour Johnson AFB, SC). They shifted to 11226, no joy and returned to 9023.0. This is the first time I have ever heard these two frequencies being used in a GHFS manner. (Scott-TX)

9043.5 Gray Team working Green Team in LSB at various times. (Scott-TX) *I have heard some interesting stuff here, possible National Guard channel. Calls have included Gold Team, Elvis and Razorback-Larry.*

9049.0 English female repeating in USB "352 352 352 1234567890" T 2106. (Dix-NY)

9056.5 US Navy Link 11 type transmission in USB at 2013. (Haverlah-TX)

9057.0 SAM 203 working Offutt with phone patch to Travis in USB at 1530. (Haverlah-TX)

9065.5 KNY82, unid US Government station going off the air until 1900. Some sort of exercise involving WGY906 FEMA, Denton, TX in USB at 1744. (Metcalfe-KY)

9720.0 SAM 204 working Andrews AFB with phone patch request in USB at 0215. (Jones-CA)

9960.0 3G (Battalion) calling Blacklist 1st Marines Camp Pendelton/11th Marines and possible other divisions) coordinating air strike at Rainbow Ridge. Mentioned Stingers (F-18s) were RTB at San Diego. Also mentioned Lancer type aircraft (type unknown) at 1858 in USB. (Jones-CA)

10203.5 174 Forward calling 174 Rear for radio check and status of the net at 0205 in USB. (Jones-CA)

10250.0 ECA-Madrid Meteo, Spain, with fax chart at 0750. (Boender-Neth)

11053.6 P1Y, P3T and V3R working a net. Frequency is a confirmed USN channel in USB at 1842. (Scott-TX)

11056.0 Andrews AFB working SAM 972 on F-443 with signal checks at 0405 in USB. (Jones-CA)

11117.5 AIC7 trying to raise MacDill AFB in USB at 2119. (Jones-CA)

11118.0 Andrews AFB working SAM 26000 on F-441 with signal checks in USB at 0055. (Jones-CA)

11130.0 Scrambled comms noted here in USB at 2031. (Williams via Grove BBS)

11155.0 Rockwell Flight Test (ground) in comms with Commlab (ground) in USB at 2253. (Jones-CA)

11176.0 Memorial working MacDill GHFS, looking for Nightwatch 01 frequencies, passed X904/X212. In USB at 1433. Anybody have a bead on X212 yet? The frequency will probably be somewhere between 15038 and 18023. (L. Van Horn-NC) Bookshelf working MacDill AFB, FL, with phone patch traffic in USB at 1855. (Kennedy-FL)

11226.0 Skybound with signal check with Nightwatch 01 in USB at 1954. Churchman on X-905 signal check with Nightwatch 01 at 2006. (Fowler-MA)

11229.0 Spar 64 working Andrews with phone patch to Phantom in USB at 2002. (Fowler-MA)

11243.0 Yokota GHFS station with Skyking broadcast in USB at 0719. Nightwatch 01 calling Nightwatch 02 in USB at 1349. (Haverlah-TX)

11250.0 Twin Pod (submarine) working Relentless (aircraft carrier) and Grey Ghost 01 (E-2) in USB at 2344. (Haverlah-TX)

11254.0 US Navy Link 11 type transmission in USB at 2000. (Haverlah-TX)

11407.0 Aria Sim working Aria 1/2 in USB at 1637 appeared to be a training exercise for Eastern Test Range. (Lonnie Bunn-Raleigh, NC)

11494.0 Slingshot working Omaha 12 in USB at 1450. (Haverlah-TX)

11615.0 Air Force One working Andrews AFB on USAF Mystic Star channel F-125 in LSB at 2321. (Scott-TX)

12886.5 WLO-Mobile Radio, AL, with traffic list and weather in SITOR-B at 2238. (Metcalfe-KY)

13089.0 USCG Boston COMSTA working *USCG Cutter Eagle* in USB at 1556. (Bunn-NC)

13205.0 Andrews working 511 with departure time, in USB at 2055. (Fowler-MA)

13207.0 Jackey 49 working Jockey 16 in USB at 1820. (Haverlah-TX)

13217.0 Night Long working MacDill with phone patch to Charleston in USB at 2032. (Haverlah-TX)

13528.5 NNN0CYJ-*USS Stark* working NNN0VGW-Republic, WA, for phone patch traffic and aksed to move to 7684.0, in USB at 0154. (Gagnon-PQ)

14838.5 NNN0CVG-*USS Eisenhower* working NNN0NUW-Oak Harbor, WA, with routine phone patch traffic in USB at 0322. (Gagnon)

15018.0 SAM 206 working Andrews AFB, MD, in USB at 2153. (Scott-TX)

15449.0 Decurrent, Skylight and Talent working on Whiskey 110 (W-110) in USB. Stations came from Xray 904 (X-904). (Scott-TX)

16100.0 K7V working P8Z in USB at 1858. Having problems hearing each other, moved to 18100 and 15100. Eventually back to 17100. One of the few times I've heard US Navy units giving frequencies without 'nuking' (NUCO) them. (Scott-TX)

16870.0 KMI-AT&T Inverness, CA, with ship list/frequency list and weather information in SITOR-B at various times. (Bill Cole-N Cape May, NJ)

17975.0 Spar 84 running phone patch to Lobo (Howard AFB) in USB at 2252. (Scott-TX)

18002.0 Rockwell Ground test working Aircraft 253 testing equipment in USB, LSB and AM modes at various times. (Scott-TX)

18331.0 Andrews FAB in comms with SAM 200 on F-889. Using this frequency for secondary from primary of 11118.0 at 1908 in USB. (Jones-CA)

19689.5 KMI-AT&T Inverness, CA, with ship traffic list, frequencies and weather information in SITOR-B at various times. (Cole-NJ)

22530.0 PWZ33-Rio Naval Radio, Brazil, with navigation warnings in English using CW at 1348. (Hood-UK)

22983.7 Phone patch on what sounded like one half of a radio duplex channel from someone on Ascension Island to a female on east coast of US in USB at 2240. Male was talking about the airstrip in the Falkland Islands and said, "...the runway is full of British planes." The caller went to great lengths to emphasize that point to his female caller. (Todd Dokey-Lodi, CA) *I checked around and no one knew of any increased tensions between Argentina and the UK, Todd. Maybe it was an exercise-Larry.*

23687.0 Andrews AFB in comms with SAM 200 on F-303. Testing this frequency for use as a possible secondary. Andrews had poor copy, went to F-889 at 1901 in USB. (Jones-CA)

23853.7 100 baud RTTY Cuban Diplo traffic running here at 2210. (Metcalfe-KY)

The Scanning Report

Bob Kay
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Brasstown, NC 28902

Vacation Tips

Have you ever tried to enjoy the hobby of scanning during your vacation? If so, you already know that it isn't easy. When you're on vacation, there's always one more attraction to see, or one more shop to visit. By the end of the day, you're too tired to even think about scanning. If you do find the time for a listening session, weak reception, inaccurate frequency listings and limited resources can frustrate the most experienced scanner buff.

To solve these problems, all you need are a few ideas, a little ingenuity and one or two high tech gadgets. Did you know, for example, that you can listen to your hotel's radio transmissions without knowing a single frequency? The "Interceptor" from Optoelectronics locks onto any near field radio transmission between 30 MHz and 2 GHz. It doesn't display the frequency, but it allows you to listen in. Plug an amplified speaker into the Interceptor and the audio will fill an entire room. Best of all, the squelch on the Interceptor can be adjusted to block out radio signals from outside of the hotel complex. For more information, contact Optoelectronics, (305) 771-2050, 5821 NE 14th Avenue, Fort Lauderdale, FL 33334.

Unattended scanning is possible if you remember to pack a "tape saver." Tape savers are voice activated, mechanical devices that can automatically start and stop a tape recorder. It is not uncommon for a tape saver to condense eight hours of monitoring onto 30 minutes of tape. One of the more popular tape savers is the "Nitelogger," by Benjamin Michael Industries. For more information, contact BMI directly: 1139 E. Tower Road, Schaumburg, IL 60173, (312) 884-7077.

Another valuable vacation item is the magnetic base antenna. It can be used for mobile monitoring or taken to your hotel room and attached to a variety of metal surfaces. Magnetic base antennas are often attached to A/C ducts or to metal, outdoor balcony rails. Don't be afraid to test several different locations for the best reception. Magnetic base scanning antennas are sold by Grove Enterprises and Radio Shack. Check out their catalogs for the latest in scanning equipment and accessories.

If you don't want to attract undue attention to your vehicle during vacation, consider the Grove, "No-Tenna." The No-Tenna is designed to provide mobile scanner buffs with a performance antenna that cannot be seen. In addition to its mobile applications, the No-Tenna can also be used in a hotel room. Simply clip the No-Tenna to metal window frames, curtain rods, bed frames or other large metal objects for a temporary installation. The No-Tenna, (Cat. #ANT-20) is a single-wire, proven performer than can easily be carried in your shirt pocket! If you prefer to scan in the stealth mode, the Grove No-Tenna is the ideal candidate. For more information, Call Grove at (704) 837-9200.

To enjoy your vacation and the hobby of scanning, don't forget to pack a tape saver.

Table 1

35.02	McDonald's
40.50	Army search & rescue
46.75	Presidential Helicopter
47.42	Red Cross
122.900	Govt. aircraft
123.450	Pilot chit-chat
155.34	Hospital/ambulance
156.80	Coast Guard distress
163.20	U.S. Marshall
165.375	Secret Service
165.95	IRS
415.20	Federal Protection Service

A sampling of the national scanning frequencies can be seen in Table 1. In addition to the frequencies listed, don't forget that cordless phones (46.61 to 46.97 MHz), baby monitors (49.83, 49.845, 49.86, 49.875, 49.89 MHz), and the Itinerant frequencies (27.49, 35.04, 43.04, 151.505, 151.625, 158.40, 451.80, 456.80, 464.50, 464.55 MHz) can be monitored throughout the United States.

Be mindful that valuable scanning gear, left unattended in your hotel room, is subject to theft. If the cleaning maid opens your room, it only takes a few seconds for someone to slip in and remove personal items. Most people don't realize that hotel management is not responsible for items stolen from your room. Valuable items should be placed in the hotel's safe or locked in your vehicle.

In fact, unattended scanning from a parked vehicle is another option that should be considered. Twelve volt scanner radios and accessories can be powered directly from your vehicle's battery. Scanning from a locked vehicle, especially if your equipment can be concealed, will provide you with reasonable security and peace of mind. However, there are a few drawbacks. During the summer, the heat inside a locked vehicle can damage your scanning gear. It's also possible to drain your car battery—requiring a service call to get you going again.

Scanning in the nineties is a high tech hobby that doesn't necessarily require your presence. With a few high tech accessories, it's possible to enjoy superb reception and to produce high quality audio recordings. So even if you don't have time to monitor while on vacation this year, don't leave home without your scanner radio!

Treasure Hunt

Having difficulty hearing the audio from your mobile scanning rig? Can't get your scanner's volume above the road noise? All you need is the HTS-2 amplified speaker from Naval Electronics. The HTS-2 features a tape trigger, external power jack, low stand-by current drain, a level control and 12 dB of audio gain. With the HTS-2 you can boost your scanner's audio with a lightweight amplified speaker that will fit into the palm of your hand. Best of all, the HTS-2 can be powered by four internal AA batteries, or by your vehicle's 12 volt battery.

To win the HTS-2, here are the clues:

1. In the March 94 issue of *MT,* what page features the HTS-2?
2. The HTS-2 features automatic shut-off. True or False?
3. Is the Pro-2027 cellular restorable? Yes or No?
4. I purchased the new ANT-20 from Grove. How much did I pay, including UPS ground shipping?
5. Refering to March 94 issue of *MT,* what is a DC440?

The HTS-2 is available from Naval Electronics Inc., 5417 Jet View Circle, Tampa, Florida 33634. Retail price is $29.95 plus shipping and handling. For more information, give them a call: (813) 885-6091, FAX: (813) 885-3789.

Frequency Exchange

Roger West lives in ***Amery, Wisconsin,*** and he has invited us to monitor the U.S. baseball teams.

Major League Baseball Frequencies (MHz)

Atlanta	464.325			
Baltimore Orioles	464.6375	464.4375		
Boston Red Sox	464.075	463.325		
California Angels	461.925	153.020		
Chicago Cubs	469.3125	469.5875	464.525	
Chicago White Sox	151.625	151.835		
Cincinnati Reds	462.165	467.175		
Cleveland Indians	154.515			
Colorado Rockies	466.8125			
Detroit Tigers	464.8125	469.95		
Houston Astros	463.30			
Kansas City Royals	467.825			
Los Angeles Dodgers	151.625	151.775		
Milwaukee Brewers	151.625	151.805		
Minnesota Twins	155.025	464.775		
New York Mets	151.625	151.835		
New York Yankees	151.625			
Philadelphia Phillies	154.57	464.95		
Pittsburgh Pirates	151.625	467.85		
St. Louis Cardinals	464.675			
San Francisco Giants	151.805	154.60		
Seattle Mariners	462.55	462.60		
Texas Rangers	464.5375	463.7125		
GoodYear Blimp	123.05	151.625	464.912	465.9375
	465.9625			

Our next stop is ***Brandon, Florida.*** John Ward sent in a list of his favorite frequencies.

154.25	Hillsborough County tactical
155.22	Hillsborough County EMS
155.325	Hillsborough County EMS
450.05	WLFA radio
450.0875	WFLA radio
450.35	WXVT TV
450.70	WLFA radio
453.55	Tampa PD West
453.70	Tampa PD East
453.85	Tampa PD Emergency

An anonymous reader from ***Sacramento, California,*** has invited us monitor the following:

42.12	California Highway Patrol (CHP)	450.312	KGNR radio
		450.55	KCRA Channel 3
42.18	CHP	450.587	KVIE Channel 6
42.20	CHP	450.65	KXTV Channel 10
42.34	CHP	450.80	KFBK radio
153.41	PG&E utility	453.25	Sacramento Sheriff
153.96	KCRA Channel 3	453.675	Sacramento Sheriff tactical
161.73	KGNR Air Watch		
450.112	KCRA Channel 3	453.90	Sacramento Sheriff
455.925	KFBK radio	460.325	Sacramento Police
453.95	Sacramento Jail	460.425	Sacramento Police records
460.05	Sacramento Police		

Since we're already in California, let's travel North, to ***Vancouver, Washington.*** Philip Yasson lives nearby, and he listens to the 800 megahertz band:

Portland Police & Fire (Trunked)

856.2625	856.4625	857.2625	857.4375	857.4625	857.7375
858.2625	858.4375	858.4625	859.7125	860.2625	860.4375
860.4625					

There's a new airport in ***Denver, Colorado,*** and Mike Dockery wants to be the first to provide the new frequencies:

118.750	Clearance	124.300	Tower
118.970	Approach, South	125.600	Arrival ATIS
119.300	Approach, North	126.100	Departure, West & South
120.800	Departure, final	127.500	Ground, West
121.850	Ground		

Let's try out the new airport and catch a flight to ***Fayetteville, North Carolina.*** On our arrival, B. J. Morrisey will be waiting to take us on another scanning adventure.

38.90	Fort Bragg range control
42.52	State Police
42.70	State Police
142.40	Fort Bragg range support
148.55	Pope AFB ramp control

149.55 Pope AFB supply
165.065 Fort Bragg fire
173.49 Fort Bragg military police
360.30 Fayetteville Police
460.025 Cumberland Co. Sheriff
460.075 Hope Mills, PD
460.40 Fayetteville Police
460.450 Cumberland Co. Sheriff
460.55 Spring Lake, PD
461.925 Cross Creek Mall security

Did you know that you can invite the Frequency Exchange to your home town? Send a list of your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. Handwritten, typed and/or computer lists are welcomed.

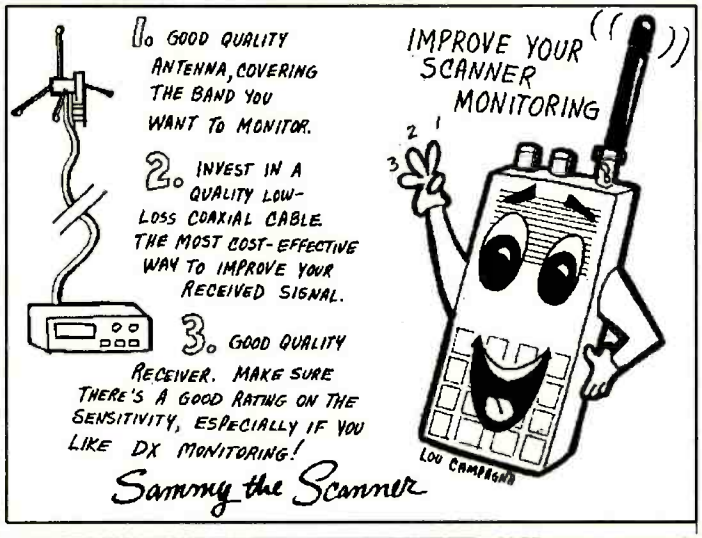
Computer Corner

I have a computer disk that contains vacation frequencies for the Baltimore Aquarium, Bush Gardens, Colonial Williamsburg, Disney Land, Disney World, Virginia Beach, Las Vegas Casinos, Las Vegas Police, Sea World and Universal Studios. The frequencies are in ASCII mode and can be retrieved into most word processing software. When printed, double spaced, the list contains over eight pages of frequencies.

You can obtain the disk absolutely free by sending a formatted disk (disk size & density is your choice), with return postage and the proper mailer to: Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If you don't care to provide the disk, mailer and return postage, send $5.00 dollars to the above address and I'll provide everything that's needed. Lastly, I ask for your patience. As most of you know, copying disks is a time consuming process. Please allow five weeks for delivery.

Radar Detector Detection

As you probably already know, radar detectors have been banned from commercial vehicles throughout the United States. The ban specifically affects vehicles involved in interstate commerce that have a gross vehicle weight rating or combination of 10,001 pounds. In addition, any vehicles designed to carry 16 or more passengers or used to transport hazardous material are also affected.



To enforce the ban, police officers are using a new gadget that can detect the presence of a radar warning device. The "Interceptor VG-2," is plugged into a cigarette lighter and sounds a tone when a radar detector signal is encountered. The VG-2 operates while a patrol vehicle is moving or stationary and is not affected by police radar units. (News clipping from Steve C. Gibson.)

Scanner Tips

In Napa, California, a man walked into a Shell service station with a shotgun and demanded the clerk hand over cash. The suspect fled on foot with the weapon concealed beneath his coat. Moments later, a scanner buff reported seeing a man matching the suspect's description, changing clothes and climbing into a rental truck.

When a sheriff deputy stopped the rental van, the driver was arrested and a search of the van netted a shotgun and the clothing that was worn during the hold-up. (News clipping from the *Napa Register*.)

Cellular 911

Cellular phone users may not reach the nearest emergency provider when dialing 911. When 911 is dialed from a cellular phone, it may be answered in another county. The routing of the call is determined by the location of the nearest cellular repeater site. If the repeater is in another city or county, the caller will be required to give their exact location to the 911 dispatcher.

Many cities and states are attempting to remedy the situation by providing specialized cellular numbers that are displayed on highway signs.

Somebody's Listening

An alert security guard in Morristown, New Jersey, overheard a strange conversation on his portable radio. Two teenagers were heard discussing the theft of property from a nearby high school. Based on the radio conversation, the security guard learned that the two suspects were throwing portable phones and other property out a second story window.

When the police arrived, they found one 18 year old and a 16 year old using a pair of VHF radios to co-ordinate the robbery. After the pair were arrested, police verified that the two-way radios used by the boys were on the same frequency as the security guard's two-way radio.

Wash and Wear Radio

During the restoration of an old Hallicrafter radio, Model 43, Mort Arditti wanted to clean the variable capacitors. Realizing that the capacitors were irreplaceable, Mort removed them from the radio and placed them in the top rack of his dishwasher. Instead of using standard dish washer detergent, Mort used a small amount of liquid dish soap.

After 45 minutes in the dishwasher, the capacitors came out clean and undamaged. Mort lubricated the capacitor bearings, reinstalled them and enjoyed his vintage radio.

Thanks for all your wash and wear radio stories! It's been fun. What shall we take up next—do you have other experiences that fly in the face of reason? If so, send them to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Next Month

More hot scanning tips for the hot days of summer. MT

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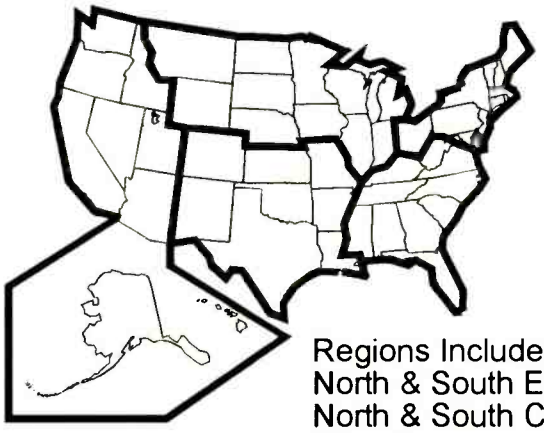

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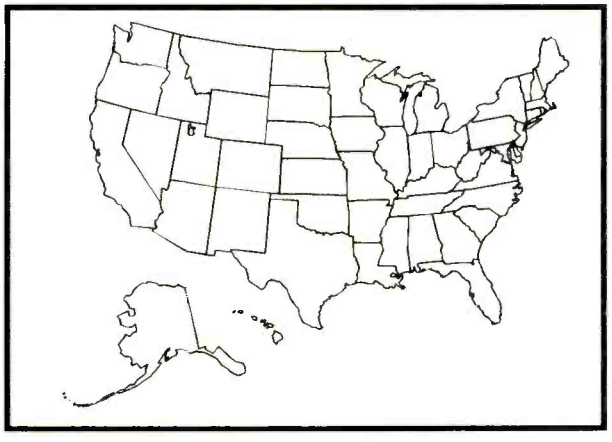

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The Beginner's Corner

"Uncle Skip" Arey, WB2GHA
GEnie T.AREY1

UNCLE SKIP'S GUIDE TO SUMMER SHORTWAVE ALTERNATIVES

By the time you read this column the static crashes of summer should be driving you from your basement shortwave monitoring post and out into the sunlight. You know the sun— that big bright ball of light in the sky? After you have scraped the fungal growths off of your epidermis you should be ready to embark on another summer of "alternate" radio activities. You can't fight the static, but you can do some things to make next winter the best DX season of all. So take off those headphones and relax your grip on that receiver dial. Here's a list of "10 Things To Do This Summer":

1. Start Planning for Winter

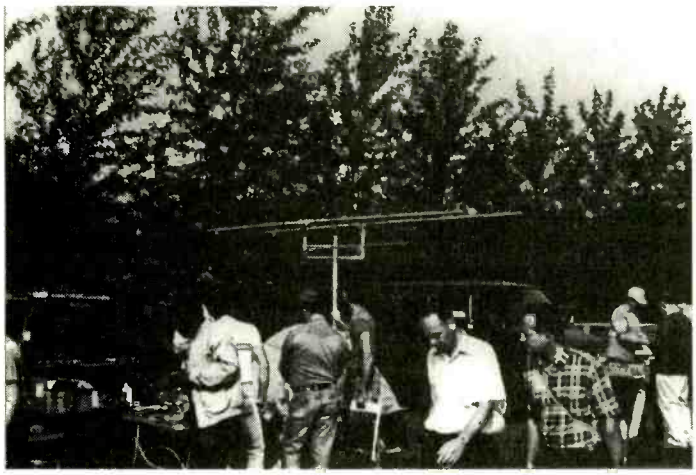
Remember the old story of the ant and the grasshopper? A little summertime preparation makes for better winter survival. While you're out and about this summer, take along your frequency resources such as *Passport to World Band Radio* and/or *The World Radio TV Handbook*. Also, grab a pen and a stack of 3x5 index cards.

Go through these books country by country to see what signals you want to suck up next winter. I usually make two sets of cards. One card lists a particular country and the likely times and frequencies that country may be heard. If you're like me and have limited listening time in the real world, you will want a second set of cards organized by time. These cards would then contain the countries and frequencies that fit into my infrequent listening schedule.

By doing this, you will maximize the use of your listening time when the shadows of winter start to bring in the DX. Keep in mind that many shortwave stations modify their schedules and frequencies, so you will still want to keep one eye on *MT* for late breaking changes that will keep your "hit lists" current. I'm sure the ant has a lot more QSL cards than the grasshopper.

2. Antenna R&R

Since your listening is curtailed, the summer is a great time to go over your antennas and get them rehabilitated for the next DX season.



Summer is a great time to take in a hamfest.

Get your safety gear, a sturdy ladder and a friend to act as spotter. Go over your antenna systems from end to end. Check for corrosion and weakness. Our friend the sun can do quite a job on any plastic parts or insulation.

Also, the acidic content of the rain can do a number on just about any metal, given enough time. Living in the Northeast, I find that I need to replace my copper antenna wires every three or four years. Aluminum antennas and fittings can go a lot longer but only with annual care and feeding. As with most things, your mileage may vary. An annual check is the only way to make sure you do not suffer a serious antenna failure in the height of the listening season. Restringing an antenna in an ice storm is enough to make you take up knitting.

3. Time For a Tweak or Two

Ever think of sending your receiver to summer camp? Summer down time is a great time to arrange for your equipment to go into the shop for realignment and examination. A quick phone call to your shortwave dealer or manufacturer will help you figure out how often this service is recommended for your particular equipment. They can also clue you in on prices and turn around time.

If you use equipment that contains any vacuum tubes, summer is a good time to check and see if any of those "bottles" are going stale. Besides, these days it can take you all summer to locate a tube testing machine. Call around to older established radio/tv repair services or look in the yellow pages for parts suppliers that cater to same. Do it early and you can then spend the summer scouring catalogs and hamfests for replacements.

4. Traffic In Fleas

Flea markets, hamfests, swap meets, all are great places to dig up deals on used parts and equipment. Judicious hamfesting can locate a receiver with twice the performance for half the price. As I said above, hamfests are a great place to get replacement tubes without getting price gouged. You will also find all those things you need to get your antenna system into shape as well.

Make up two lists: one for the things you want, one for the things you NEED! Put the list of things you want in the bottom of your shoe. Do not refer to it until you have all the things you really need. If you have any cash left for additional purchases you can always take off your shoe.

Don't discount non-radio oriented flea markets. I have found at least two fine receivers at ridiculously low prices by dutifully following my spouse along her Saturday morning swap meet route. You might also scout around for a desk or some file cabinets to make your listening post a bit more ergonomic.

5. Clean Your Shack

Somewhere under the pile of papers in my office I have a little plaque that reads "A clean desk is the sign of a sick mind." Cute sentiment but really not true, especially if you want to enjoy all that DX you cataloged on those file cards. Think of the stations you have missed because you

were too busy routing through all the effluvia that seem to congregate at a listening post. The only trick to being successful in the shortwave hobby is organization. As much as it may pain you to break down and do it, take a few hours this summer to go through all that "STUFF" that is around your radios so you can actually find what you're looking for when the DX starts rolling in next winter.

6. Ham It Up

It's probably been a few months since I mentioned this, so I am overdue. Getting an entry level amateur radio license has never been easier. Either the Novice or "No-Code" Technician class license can be yours with very little trouble. Just take a few hours each week that you would have spent listening during the winter and dedicate that time to some applied study in any one of the amateur license study guides available from the advertisers in the pages of *MT*. If you are going after the Novice class or "enhanced" technician class license you can also plan on taking about twenty minutes a day with an instruction tape to master the code at the necessary five words per minute. The best way to find out how to get started and to locate your nearest volunteer examiner would be to contact The American Radio Relay League, 225 Main Street, Newington, CT 06111.

What's that, Compadre? You say you are already a bona fide ham? Summer is a great time to study for an upgrade. Grab a study guide and some code tapes and head on down the road that leads to the Extra Class license.

Now, I know there are more than a few Extra Class folks sitting out there reading this column and thinking that Old Uncle Skip is going to let them off the hook. No way, Jose! You Extra types should spend a few hours this summer reaching out to young folks, helping them to get started on the pathway to ham radio fun. Old Uncle Skip believes that nobody has "earned" their ham privileges until they have helped at least five people get their licenses.

7. Reverification

Summer is a good time to go through your log books to see which stations have yet to respond to your verification requests. As you grow in experience in the shortwave hobby you will discover that some stations are infinitely harder to QSL than others. If you have not heard from a station after about six months, it is a good idea to send a follow up report. Ideally, you may want to listen to the station again and send out a new report. However, this is not always possible with the more rare catches. In those cases, send along a copy of your original report. You may want to include a few lines explaining that you are sending out a second report. Be very, very, very polite. No station is under any obligation to respond to you at all, and probably won't if you get pushy.

You can also go back to your *WRTVH* or *Passport* and check the names and addresses of stations to see if you can get your report out to a "better" person. Several SW club journals publish lists of verification signers. Gayle Van Horn's QSL Corner column right here in *MT* will give you an idea of what is currently working for other folks.

8. Read Any Good Books Lately?

If you flip through the pages of any shortwave hobby catalog, it will become clear to you that there are dozens of books dedicated to our hobby. Summer down time is a great time to pick out a book or two that can help you hone your listening skills. I'll leave your choices up to your imagination and perceived needs. Studying can be fun if you enjoy the subject. Don't forget to have a "highlighter" pen handy as you peruse these tomes of radio wisdom. Highlighting pertinent facts will make them quickly accessible when winter rolls around and you really need them.

9. Take Your Show on the Road

Even with the generally poor conditions that summer brings, you will be surprised what a little change in location can do for your ability to hear stations. If you're going to go off on any trips or vacations this summer, take along a portable receiver. Don't get too complicated in this effort. Even if you drag along a ton of gear and spend all your time listening, you won't hear all that much more in the summer. You will also have your family wanting to rent you out as fish bait for ruining their vacation. Still, a quiet hour after the kids and spouse have bedded down for the night may reveal some light, fun listening. If you snag a new station or two, fine; just don't become obsessed.

10. Do Nothing

Yep, that's right, Pal. Nobody says you have to do a darn thing. Chill out. Relax. Get reacquainted with the family and friends. This is just a hobby, remember? A few months' sabbatical from the receivers might just give you some perspective when you return to the dials next fall or winter. Personally, this is the time of year when I try to convince my boss that I have a rare disease that requires frequent immersion in salt water as part of its treatment. Call it a prescription for surfing! Get the picture? It is my "other" interests that help to keep shortwave monitoring exciting with each new DX season. So have fun, folks! (Don't forget the sun screen.) MT

Shortwave Broadcasting

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

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.

ALASKA KNLS Z-94 in English and Japanese: 0800-0900 on 9615, 1300-1400 on 7355. Mandarin via Khabarovsk, Russia, 9800, Fri., Sat., Sun. 1300-1500, which we cannot QSL (KNLS)

ARMENIA R. Yerevan English retimed to: 2130 on 11790, 11950; 2230 on same plus 11945 (Eugene, RVI*Radio World* via Diane Mauer, Steven Cline)

AUSTRALIA R. Australia Z-94 has dropped 21740; now the highest Shepparton outlet is 17860 at 2130-0600 // 15365; 0000-0730 on 13605; 0630-1200 on 9860, 9580; 1200-1530 on 11800; 1200-1630 on 5995; 1430-2030 on 11695; 1630-2100 on 11880 (British DX Club)

AUSTRIA RAI Z-94 to us: 1130 on 13730; 0130 on 9655; 0530 and 0630 via Canada 6015 (via Gigi Lytle, Diane Mauer) often better here at 0130 on Latin American frequency 9870 // 13730. One UT Sun. mailbag segment mentioned that Elizabeth Blane had retired and gone back to Oregon (gh, OK)

BELGIUM RVI's 11740 to us at 2330 is a disaster, already used by Taiwan/WYFR; check // 13655 for replacement (*World of Radio*)

BOLIVIA Different stations have been reported on 4508.7, perhaps a transmitter testing (gh) R. San Joaquín at 0046 breaking up and then suddenly off (Hans Johnson, MD, *Fine Tuning*) R. Emisora San Ignacio at 2305-2345 (Rocco Cotroneo, Dario Monferini, Italy *Play-DX*) Radio Santa Cruz, at 0030-0056*, ID at s/off (MSHD, Germany, *ibid.*) R. Emisora San Joaquín is the name, from Guayaramerín (Finn Krone, Denmark, DSWCI *SW News*) R. Cosmos, 6095.00 at 1040-1100, canned IDs at 1058 (Chuck Bolland, FL)

BRAZIL Despite the climate, short pants are prohibited when visiting stations here, such as R. Cultura, São Paulo, mostly inactive on SW (Dario Monferini, *Play-DX*)

BULGARIA R. Bulgaria cut English by 45% to six one-hour broadcasts: 0330 on 9700, 11720; 1200 on 17625; 1400 on 15460, 17705; 1900 on 9700, 11720; 2100 on 9700, 11645, 11720; 2245 on 9700, 11720 (BBC Monitoring, Bob Thomas, John Norfolk, Edwin Southwell) Contrary to published schedule, 12-minute DX program *Bulgaria Calling* is not only on Fridays; announced and some confirmed as: Fri. 1945, 2330; Sun. 2145; Mon. 0415, 1245, 1445 (John Norfolk, OK) Z-94 gives Varna site, 100 kW: 7240 at 0200-0400, 0430-0600 exc. Suns. 0200-0300, 0430-0630 in Bulgarian, Greek, Albanian, Turkish, Serbo-Croat; 7260 at 1930-2100 in Greek and S-C; 9775 at 1500-1800 Bulgarian (via Bob Thomas) New 7239.43 at *0159-0359*, *0430, had to use ECSS-LSB to separate from Moscow 7240 (Brian Alexander, PA) R. Bulgaria reorganized, trimmed staff to 275, plans to add Russian, Japanese, Arabic, Romanian (RB director, R. Netherlands *Media Network*)

BURUNDI RTNB tech. dir. Leonidas Batungwanayo maintains that Gitega SW transmitter breaks down frequently due to age and lack of spare parts, unrelated to strife. 6140 was off from Jan. 25 to March 19 (BBCM)

CAMEROON R. Cameroon, Garoua, 5010 at 0428-0650, 1630-2300, 7240 at 0650-1630, includes English news from Yaoundé at 0500-0515 weekdays (BBCM) Believed Garoua is the only SW active (Wian Stienstra, Holland, BBS)

CANADA Support restoring RCI funding by faxing: (613) area: 947-2104 to Senate Communications Committee; 995-8343 Sen. Raymond Perrault; 996-5148 Sen. Finlay MacDonald; and 992-2005 Sen. Lorne Bonnell who challenges us to prove RCI has support (Wojtek Gwiazda, PQ) RCI's best info and entertainment from CBC is at 0207-0258 on 6120, 9535, 9755, 11845, 11940—UT Sun. *Double Exposure* and *Royal Canadian Air Farce*; UT Mon., *Quirks and Quarks* (gh) R. for Peace International project at Salmon Arm, B.C., is slow going—has land and buildings, legally established, but needs $80,000 to finish (James Latham, RFPI Costa Rica)

CHINA CRI loses about 37 announcers per year, deserting for better paying jobs elsewhere; Laotian, Finnish and Bulgarian services may have to close, Hakka and Japanese also in trouble (Reuter via *DXPL*)

COLOMBIA La Voz del Samán, Bochalema, heard every morning around 1100 on 2715v, verified as 80 "woltios" and dipole antenna on 1355, ex-1610 kHz, Mon.-Sat. 1000-1300, 2100-2400, Sun. 1000-1500 (Santiago San Gil, Venezuela) Suspect it's unofficial.

COSTA RICA AWR closed down its last Alajuela transmitter, TIAWR-6, April 15, from 11870; to be moved to TGMU, Guatemala; new studios at Alajuela inaugurated April 30, we hope with all five Cahuita transmitters now operational. Tentative plans for N. American service in English on 9725, 50 kW at 0900-1000, 1100-1400, 0000-0100 (Adrian Peterson, AWR)

RFPI plans to broadcast June 2-4 from a conference in Venice, Toward International Governing of the Environment (RFPI *Mailbag*)

CUBA DST of UT-4 lasts from Apr. 2 to Oct. 9 (Manolo de la Rosa, RHC *En Contacto*) RHC in Spanish on 11880 and 11760 produced mix on 11640; // 11970 with awful buzz spreading ±20 kHz, peaking about ±15, all around 0430 (gh) Typical Cuban whine jammer bothering BBC evenings on 9590 (George Thurman, IL) Here's why: 9590 formerly used mornings by R. Martí. Arnie Coro should tell his pals at the jamming stations to turn them off except when needed; save precious energy, too (gh) (non) R. Martí expanded to two SW frequencies at once: 1200-1400 on 11815, 9600; 2300-0400 on 11930, 9525; also new 6055 at 0200-0600 [Mon. 0400] (John Vodenik, VOA via Diane Mauer)

CZECHIA R. Prague Z-94 to us: 0000 and 0100 on 7345, 9485; 0300 on 5930, 7345; 0330 on 5930, // 9440 and 11640 to ME, E. Africa. Site Litomyšl, except for Rimavská Sobota, Slovakia on 9485 at 0000, 5930 at 0300 and 0330. Evening features (local days) after *News*: Mon., *Magazine 94*; Tue., *Talking Point*; Wed., *Calling All Listeners*; Thu., *Economic Report, Stamp Corner*; Fri., *I'd Like You to Meet...*, *From the Archives*; Sat., *Probe/Encounter, The Arts*; Sun., *Musical Feature*. Fax: +42 2 24218239; phone the English department at +42 2 24218349. Exactly 1/3 of output is currently in English, and 13.3% of output is to N. America (via Bob Thomas, Bill Westenhaver)

DODECANESE ISLANDS Fifth reunion of C.G.C. *Courier* crew, VOA relay 1952-1964, takes place Sept. 24-249 in Las Vegas, NV; help find lost shipmates by contacting Dave Newell, P.O. Box 1319, Pepperell, MA 01463 (USIA *On the Air*)

ECUADOR Ken MacHarg has become director of HCJB's English Language Service. *Música del Ecuador* (in English) airs Fri. 0800, 1030, 1930, UT Sat. 0100, 0330, 0530 (HCJB *Program Notes*) Also in Spanish Fri. 2330-2400 on 15140. Our choice for name of Wed. DX update is *MOW-DX* for middle-of-week, also interpretable as "more DX" (gh) HCJB runs special DX test on MW 690, UT May 29 at 0500, no SW parallel, special QSL; site is Mt. Pichincha, not Pifo; may repeat later in year at later hour (DXPL)

FRANCE RFI at 1200-1300 on new 17575 ex-21645, // 15530 (Joe Hanlon, PA, *W.O.R.*) Direct?

GABON AWR closed relay via ANO here April 30, offered special QSL the final week; AWR-Africa continues via Russia, Slovakia, giving Ivory Côte address (Adrian Peterson, AWR)

GERMANY DW moved new SW service in English to Europe one UT hour earlier March 27, to 1900; a week later moved it back to 2000-2050 on 9615 and new 7170 (Eugene, RVI *Radio World*)

GREECE VOG to Boreal America Z-94: 1200-1350 on 17535,

15630-K; 0000-0350 on 9380, 9420, 11645-Kavala (via John Babbis, MD) R. Station Makedonias at 0500-2200 on 9935 to ME; 0500-2115 on 11595, 1700-2200 on 7430 to Europe (via John Babbis, MD)

GUIANA FRENCH SRI expects its 500 kW transmitter in Montsinéry to go into operation in June, for Central America, western N. America, rotary antenna, full frequency flexibility (P. Baderscher, SRI Engineering, via Larry Nebron, FIDONET *SW Echo* via George Thurman)

HONDURAS R. Litoral, 4830, QSLed with nice letter from José A. Mejía, gerente proprietario, with info: 5 employees, 500 watts, HRLW, antenna 30' high, 96' horizontal, no MW, started 15 May 1993, my report first from abroad, adequate address is La Ceiba, Atlántida Province; I heard it at *1308 in January, late for New England (Jerry Berg, MA, HCJB *DXPL*) But on Mar. 6-7, *1200-1345, gave address as Centro Comercial San José, La Ceiba (Eliesel Perdomo C., Cuba)

R. Internacional is new on 4930, 0330-0500*, only on 1220 MW in 1994 *WRTH* (Ed Rausch, NJ, *DX Daily*) Booms in from before 0100 past 0400, mostly music, asking for reports from Americas, Europe, to Apartado Postal 1473, San Pedro Sula, "la emisora de las estrellas" on 4930.7, also FM 92 (gh, OK)

R. Copán Internacional, 15675, moved Jeff White's mailbag in English to weekdays 2230-2245 (WRMI)

HONG KONG For the record, RTHK did reactivate SW 3940 for the South China Sea Yacht Race, weather in English heard April 1 1020-1028* (Nobuyoshi Aoi, RJ*MR*) Next time in 1996; did typhoon ruin this year's race?

HUNGARY R. Budapest now has half-hour broadcasts at 1900 and 2100 to Europe on 3955, 6110, 7220; N. America 0100 on 6025, 9835, 11910, 0230 on 5970, 9835, 11910. One set of features is at 1900 and 0100, another on the 2100 and 0230, local days: 2-Mon. May 30, the large family as a way of life. 2-Tue. May 31, *Zip and Jazz.* 1-Sat. June 4, *History in Operetta.* 2-Mon. June 6, *Country File*—Pecs. 2-Tue. June 7, *Charlie and Folk.* 1-Sat. June 11, *History in the Novel.* 1-Sat. June 18, *History in Rock.* 2-Mon. June 20, *The Business Handbook* 2-Tue. June 21, *Carl and Classics.* 2-Fri. June 24, *Medical and Scientific.* 1-Sat. June 25, *History in Film.* 2-Mon. June 27, *Team Europe and the Single Market* (via John Carson, OK)

INDIA Add AIR to the 22 m.b.—13750 at 1330-1500 in English // 15120, also 13700 at 1115-1215 in Tamil (Victor Goonetilleke, Shri Lanka, RN*MN*)

INDONESIA Sorry about the "Scrui" typo last month—it's SERUI on 7173.2 (gh) The unID on 3578.3 turns out to be RSPKDT2 Masohi, on Seram Island, NE of Ambon in Maluku Tengah (David Martin, Australia, via David Clark, Ont., *FT*) Presumed this at 1135-1205 peaking at 1150, good mod on music but poor on mike, also much weaker at 1430-1500 (Guy Atkins, WA, *FT*)

ISRAEL Kol-Israel during DST until 27 August: 0400-0415 on 9435, 11605, 17545; 1000-1030 on 17575, 15650, 15640; 1300-1325 Sun.-Thu. on 15640, 15650; 1900-1930 on 17575, 15640, 11675, 11603, 9435; 2130-2200 on same except 7465, not 15640. Feature programs: *You're On the Air*, Sun. 1000. *Calling All Listeners* and *DX Corner*, Sun. 1300, 1900, Mon. 2130. *Israel Sound* and *The Cutting Edge*, Sun. 2130, Mon. 1300, Thu. 1900. *Israel Mosaic* and *Business Update*, Mon. 1900, Tue. 1300, 2130. *Talking Point*, Tue. 1900, Wed. 1300, 2130. *Eco Alert* follows. *The Aliyah Page*, Wed. 1900, Fri. 2130. *Jewish News Review*, Wed. 1900, Thu. 1300, 2130. *Studio 3*, Thu. 1300, 2130. *TGIF*, Fri. 1900. *What the Papers Say*, Fri. 1900, 1300. *Spotlight*, Sat. 1900, 2130 (via Bill Westenhaver, Steven Cline, Diane Mauer)

ITALY NEXUS-IBA, IRRS-Shortwave, Milan, daily 0500-2000 on 7125, mostly in English with UN, UNESCO, religious programs, and its own mailbag *Hello There*: Fri. 0600, Sat. 0515, 0715, Sun. 0500, 0715, Mon. 0515, 0615 (via Greg Jordan)

JAPAN R. Japan Media Roundup expanded from 24 minutes to 25 and starting 5 minutes earlier: UT Sun. 0525, 0725, 1425, 1725, 2125. UT Mon. 0125 on 5960 via Canada (via John Norfolk)

KALININGRAD See RUSSIA

KOREA NORTH R. Pyongyang announced English to Americas, at end of each 50-minute broadcast: 2300 on 11700, 13650; 0000 on 11335, 13760, 15130; 1100 on 6576, 9977, 11335; 1300 on 13760 15230. Best here is 6576 (gh, OK)

KOREA SOUTH Echo of Hope, clandestine to the North, summer schedule changed to 3-hour broadcasts at 2000 and 0300 on 6348, 0800, 1100 and 1400 on 3985; the 2000 broadcast moves to 3985 in the fall (Tooru Yamashita, RJ*MR*)

LITHUANIA (non) R. Vilnius on new 11770 at 2300-2330, English on weekends, first 5 mins. in English weekdays (Brian Alexander)

MÉXICO Besides UT Thu. 0430, another time confirmed for *DX-6185* is UT Sat. 0630 from R. Educación; includes info on Mexican media, well-done, N. American mailbag, but only in Spanish (gh)

NETHERLANDS RN previews: *Newsline Specials* between news and features on first weekends of month: June 4/6, the working mother; July 2/4, education for the future. *Mirror Images*, on the Holland Festival, Tues. in June at 52 past 07, 09, 11, 14, 18, Wed. 00, 02, 03. *Bats, Balls and Baselines*—May 28, men's and women's shockey Eurocup, Bloemendaal; from June 17, behind the scenes at the World Cup in the U.S.; from July 2, Tour de France cycling, Fris. at 52 past 17, 19, Sats. 02, 08, 10, 12, 14, 23. *Sounds Interesting* specials the first weekend every summer month, on roads and rivers, rails and runways in Holland, 52 past Sat. 07, 09, 11, 13, 15, 18, Sun. 00, 03. *Towards 2000* in June, babies and animals in society, who can't speak for themselves, 52 past Fri. 07, 09, 11, 13, 15, Sat. 00, 03. *Encore*, 6-part *A Future from the Past*, on the Holland Festival starts June 1, Weds. 52 past 01, 08, 10, 12, 14, 18, 23 (RN, *SWL-List* via Will Martin)

NEW ZEALAND Radical changes from RNZI J-94, we hope until Oct. 1: 1650-1849 (Mon.-Fri. as before?) on 6100, 1850-2136 on 11735, 2137-0458 on 15115, 0459-0758 on 11900, 0759-1206 on 6100 ex-9700. We realise North Americans heard us well on 9700, but our prime target Pacific and Asia needs a lower band now (Adrian Sainsbury, RNZI *Mailbox*) Also 6100 when needed in 1206-1649 period (Sainsbury via Bruce MacGibbon, RJ*MR*) In April first transmission was on 7125, also tested 7160, 7185, 7195 (Arthur Cushen, HCJB *DXPL*)

NORWAY NRK's *Norway Now*, English only on Suns. to Americas: 0500 on 9560, 11865; 2300 on 9655, 11860; 0100 UT Mon. on 9560, 11925. To elsewhere: 0500 on 7165, 9590; 1200 on 17860; 1300 on 9590; 1800 on 5960, 9590, 11745, 15220; 2000 on 9590, 15220 (RN and via Joe Hanlon)

PAPUA NEW GUINEA NBC Karai service reactivated on 4890, English heard at 1050, and 9675 now missing, so replacing it? (Ed Rausch, NJ, *DX Daily*)

PARAGUAY R. Nacional heard at 1050-1206 on 3802 announcing 920 MW (Fernando Viloria, Venezuela, *W.O.R.*) Would be 4x only if actually on 950.5.

PERÚ There are two towns named Paucartambo and two Radio Paucartambos, the first one on 4510 in Cerro depto., the newer one on 5894.7 in Cuzco depto., the latter heard well before 1100. R. Horizonte,

Catholic station in Chachapoyas at 2330 on 5019.9, reactivated after two years, ex-5008.7 (Henrik Klemetz, Colombia, *DXPL*) R. Frecuencia San Ignacio, 5699.98, took over a year to QSL, says 100 watts, asks for transmitter tubes, CDs (Dave Valko, PA, *FT*) R. La Oroya reactivated on 4905 at 1100, folk music, greetings (Santiago San Gil, Venezuela, *W.O.R.*) Mining has turned the area into "a vision from hell," La Oroya a quintessential company town (San Francisco *Examiner*, Internet via Don Moore, *FT*)

PORTUGAL RDP Int'l summer English weekday announced: 1530 on 21515, 1900 on 17680, 11975, 9815, 9780; Tue.-Sat. 0130 on 9505 (9555?), 9570, 9600, 9705, 11840, but nothing heard on 9505, 9555, 9600 (John Norfolk, OK) Best on 9570, 9705 (gh)

RUSSIA We count only 46 languages left on BBCM's latest R. Moscow schedule—no more minority tongues from Africa, Asia (gh) R. Slavyanka, Ministry of Defence station for Armed Forces: 1600-1800 Mon.-Sat. on 12025, 12015, 9890, 9540, 7310, 4975, 4940, and exc. Mon. on 4740; 0100-0300 Tue.-Sun. on 9540, 9490, 9480, 7390, 7310, 7160, 4975, 4940, 4740. Fax +7 095 296-6506 (BBCM)

GPR-2 operates 17 x 200 kW SW transmitters at Popovka near St. Petersburg; and 9 x 80 kW SW in Kaliningrad at Bolshakovo (often considered a separate radio country). The Z-94 portion for Kaliningrad: 6015 kHz 0300-0600 and 1430-2300 R. Nadezhda. 7280 kHz 1430-1500 and 2000-2200 RM English, 1500-2000 RM German. 7310 kHz 0527-0726 and 1627-1726 R. Nederland in Dutch. 9480 kHz 0100-0300 R. Slavyanka Tue.-Sun., R. Mayak Mon.; 0300-0430 and 1600-2100 R. Mayak. 9580 kHz 0300-0330 RM English, 0330-0400 R. Aum Shinrikyo, 0400-0700 RM English. 11745 kHz 0730-1400 RM English. 11965 kHz 0630-1400 R. Nadezhda. 15380 kHz 0500-1530 R. Mayak. QSL for two IRCs to GPR-2 Verification QSL Service, ul. Akademika Pavlova 13A, St. Petersburg 197376, Russia (GPR-2 and via Edwin Southwell) complete 2-page schedule is in *DX Listening Digest*. See also ALASKA

SA'UDI ARABIA BSKSA at 0345 on 4790, good on sub-harmonic (Dario Monferini, Italy, *Play-DX*) Also heard on fundamental 9580 (Finn Krone, Denmark, DSWCI *SW News*)

SLOVAKIA Mystery: what keeps Slovak Radio building from toppling over on innocent Bratislavans? Look at the RSI QSL—precarious inverted pyramid. I bet no buildings in Los Angeles are shaped like this! (Dan Brame, SPEEDX *SW Radio Today*) Contrary to previous info, R. Prague still shares two transmitters at Rimavská Sobota, but no longer uses Velke Kostolany (Oldrich Cip, R. Prague via Greg Hodgson, AWR-Europe via Adrian Peterson) see CZECHIA

SWITZERLAND SRI Z-94 to N. America: 0100-0130 UT 6135, 9885, via Brasília 5905; 0400-0430 UT on 6135, 9860, 9885. Some other targets may be audible here: 0600 UT on 6165, 9885, 13635, 15430; 0900 UT on 9885, 13685, 17515; 1100 UT on 13635, 15505, 17515; 1300 UT on 13635, 15505, via Beijing on 7480, 11690; 1500 UT on 11960, 13635, 15505; 1700 UT on 9885, 13635, 15635; 2000 UT on 9885, 13635, 15505. No longer any English between 2030 and 0100 UT (Swiss Telecom) SRI playing games again, starting next day's program on 0400 UT broadcast, which ought to carry last airing of previous day's (gh)

UKOGBANI BBC's curtailed hours of service to us means *Newshour* at 2100 can be heard only by eavesdropping on S. American/African channels from Ascension, 15260, 15400, or perhaps direct on 15070, 12095 (gh) 5975-Antigua at 2100-0600, but not for us until 0000. 9515 and 15260 Sackville end at 1715, and 15260 does not open until 1500. 15220-Angtigua only at 1200-1400 (via Kevin Hecht, PA) Cryptic annotation in *London Calling* that Europeans and some N. Americans get programs one hour earlier in 0300-0600 GMT period; so far, I find this happening only on 6195, with *Newsdesk* at 0300, *Newshour* at 0400, and *Europe Today* replacing other features at 0330, 0530 (gh, *BBC Worldwide*)

UKRAINE Contrary to own outdated announcements, RUI in English at 0000-0100 best on 15580, 15180 (gh) Also on 9685, 9860 then and at 0300-0400 (John Norfolk, Bob Thomas) Also 12030, 11720 for both (Thomas) And 2100-2200 on 12030, 11950, 11720, 7285, 7240, 7150, 6090, 4825 (RVI *Radio World*)

USA New director of VOA is Geoffrey Cowan, 51, UCLA professor, author and playwright, whose sister wrote a book about VOA, and whose father directed it in WW II (Thomas B. Rosenthal, *L.A. Times* via Thomas Risher)

New head of Office of Cuban Broadcasting, overseeing Radio and TV Martí is Richard Lobo, from Ybor City, previously with WTVT Tampa, and his latest position was president and G.M. of WTVJ, NBC in Miami (Michael Sznajderman, *Tampa Tribune*, via Rusty Screnberg) Lobo is accused of being an extreme right-wing "Foundation man"; the Cuban American National Foundation immediately expressed its support for him (Prensa Latina via BBCM) see also CUBA (non)

Feb. 9 ice storm caused arcing but no fire, downtime at Bethany only a sesquiday. OAS decided to extend SW until further notice, Spanish 2330-2400 now on 9670-Delano, 11730-Bethany, 15155-Greenville (John Vodenik, VOA-BY) Portuguese moved to 0015-0030 Sun., Mon. on same (gh)

WRMI Miami started testing 50 kW on April 1, but by April 9, off due to complaints of 12th harmonic of 9955 interfering with air traffic on 119.45 MHz; also 10th and 11th harmonics. Once fixed, program authority requested as good reports on 9955 from all over the Americas (Jeff White, WRMI)

WEWN refutes previous reports that we have a "hissy" transmitter, or that we would move further from WWV than 9985, though there was a temporary spur on 10003. Local consultant checked signals a few miles away in various directions and found no splash from us exceeding FCC standards. We find 350-400 kW is sufficient except to China and Russia, 500 kW (Frank Phillips, WEWN Manager)

KJES, Vado, NM, Z-94: 1300-1600 on 11715, one hour each at 80, 350, and 160°; 1800-1900 260° to Australia, 2000-2100 110° to Puerto Rico, both on new 15385 (via Gigi Lytle) ex-15545.

WHRI *DX Radio Show* moved the KWHR repeat on 17510 to UT Sun. 0300, but then the original 0200 on 7315 was replaced by paid programming. Remember the *Indy 500* is here; see last month.

Balancing its Nazi programs, WRNO has added *Shalom America Worldwide*, a Jewish ethnic entertainment show from Cleveland's WRDZ-1260, a little of everything but non-political. UT Mons. 0300-0500 on 7395 (gh)

To become "the most widely heard preacher in the world," Bro. Stair bought up more WWCR time, extending 5810 overnight until 1300* (gh)

WWV inserts another leap second between June 30 UT and July 1 (ASWLC)

Via WCSN, WVHA Sabbath service now from 1450 on 15665 Sats. continues to be source of info on SW and other development; in a hurry to buy log-periodic antennas to cover U.S., Latin America. Has that "everybody's against us, but only we are saved" attitude, denouncing Catholics, other Adventist factions, ecumenism. When will the shoot-out or Kool-Aid party come? (gh)

Although WYFR head Harold Camping is on record with a book predicting the end of the world by Labor Day, 1994, tentative frequency registrations have been made for Sept. 27 onwards.

UZBEKISTAN Uzbek R. Second Pgm., 0000-2300 uses 15330 and 15165 daytime; 9545 and 8081.1-USB evening/night; 9540 evening; 9148.1-USB, 7105, 4850 at unspecified times, throughout? First Pgm. 0000-2100 uses only 5995 on SW (BBCM)

VIETNAM R.-TV Bac Thai, *1155-1355* on 6470 ex-6625 (Isao Ugusa, Japan, RJ*MR*)

WESTERN SAHARA National R. of the Dem. Arab Sahara Rep., 2350-0110+ on new 11800, Arabic into Spanish at 2356, ex-11320 (Brian Alexander, PA, *W.O.R.*) 11800 at 0600-0800 exc. Fri. 0700-0900, daily 1800-2400 Arabic, 0000-0100 irregular in Spanish (BBCM)

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.*

0010 UTC on 11915
BRAZIL: Radio Gaucha. Portuguese. Whistle sound-effects to announcer and sports program promotional. (Dan Smith-N2PTF, Morrisville, NY) Other Brazilians monitored; Radio Amazonia on 11780 kHz at 1238, Radio Alvorado on 2460 kHz at 0300. (Maywoods DX Team: Ed Shaw, Dr. Joel Roitman, Charles Everman, Jim McClure, Jerry Johnston, John Hafendorfer, John Long, Loy W. Lee, plus Jerry Lineback.) *Thanks, guys!*

0019 UTC on 4990
INDIA: All India Radio-Madras. Tamil. Male announcer's talk to regional music. ID/frequency quote to 0045*. AIR Madras site audible on 4920 kHz at 0050. Urdu service monitored on 4910 kHz at 1615. Conversation to music and signal time pips at 1730. English newscast repeated in Urdu at 1735. Female announcer to sign-off at 1740. (Giovanni Serra, Rome, Italy) AIR-Delhi noted on 11620 at 2050. (Bob Fraser, Cohasset, MA)

0020 UTC on 9735
PARAGUAY: Radio Nacional. Spanish. ID, "Radio Nacional del Paraguay." Paraguayian folk music program. (Virgil Carlson, Kirkland, WA)

0030 UTC on 7100
IRAN: VOIRI. ID/frequency schedule. Newscast and feature on the Islamic revolution at 0048 audible on // 9022. (Smith, NY) Closing announcements, IS and ID heard on 9575 at 1226. (Maywoods DX Team, KY)

0045 UTC on 11715
MALI: China Radio Int'l Relay. *Listener's Letterbox* with chat on the Tiensen Mtns., temperature extremes and "Ear Canal" alley. (Fraser, MA)

0143 UTC on 9580
ALBANIA: Radio Tirana. Station ID in progress at tune-in. Feature on an Albanian painter. *Mailbag* and ID audible on parallel 11840 kHz. (Smith, NY)

0245 UTC on 6280
LEBANON: King of Hope. Religious programming with co-channel interferences. (Maywoods DX Team, KY) Lebanon's Wings of Hope noted on 9960 kHz at 0440. Dr. Gene Scott's programming. (Jerry Witham, Keaau, HI)

0310 UTC on 3250
HONDURAS: Radio Luz y Vida. Spanish. *Bible Hour* with fair signal quality. (Maywoods DX Team, KY) Station audible this frequency at 1145 with news and commentary. (David Williams, Pinson, AL)

0328 UTC on 6000
CANADA: Canadian Forces Network (via RCI). Sports news roundup to ID at 0330. Dual IDs to French programming. (Larry Zamora, Albuquerque, NM) Canada's CFCX heard on 6005 kHz at 2130. (Smith,NY) Canadian BBC Relay monitored on 9515 kHz at 1715. Feature program *Conductors At Work* on Leonard Slatkin. (Fraser, MA)

0332 UTC on 6185
MEXICO: Radio Educacion. English/Spanish. Station identification to station QSL address. Announcements to pop music. (Smith, NY) Station monitored this frequency at 0500-0600. (Williams, AL)

0420 UTC on 4919
ECUADOR: Radio Quito. Spanish. Promotionals to news correspondent. Spanish music vocals to ID, "la voz de la capital" and frequency quote. (Serra, Italy) Ecuador's HCJB audible on 17790 kHz at 1925. Interview with local doctor on epidemic of chicken pox among local Indians. (Fraser, MA)

0422 UTC on 5034
CENTRAL AFRICAN REP.: RTV-Centrafrique. French regional news. Station ID at 0430 with fair signal quality. (Williams, AL) French news audible this frequency at 0530. (Maywoods DX Team, KY)

0502 UTC on 5020
NIGER: Voix du Sahel. French. ID, "ici la Voix du Sahel." Frequency quote to Arabic vocals. Heard this frequency at 1758 with extended tribal chant. (Serra, Italy) Good signal on 7155 kHz at 0610 kHz. African flute music and announcers' conversation. (Maywoods DX Team, KY)

0508 UTC on 4870
BENIN: ORTM. French/Vernaculars. News briefs on Parakuo to local African chant effect. Male DJs local dialect talk at 0520. Signal splatter from Colombia's La Voz del Cinaruco on 4865 kHz. (Serra, Italy) Station heard at 2233 on 4870 kHz. (Maywoods DX Team, KY)

0512 UTC on 5047
TOGO: RTV Togolaise. French. Pop music by male DJ. Station promo to pop vocal. IDs between chat. "Radio Lome" to news summary and music dedications. Audible this frequency at 1925 with regional news covering Lome, pop music and IDs. (Serra, Italy) Also on 5047 kHz at 2317. French DJ's talk to Ray Charles tune. (Maywoods DX Team, KY)

0515 UTC on 4904
CHAD: Nationale Tchadienne. French. Native African vocals. Male DJs chat to brief regional news topics. (Serra, Italy)

0535 UTC on 17895
SAUDI ARABIA: BSKSA. Islamic prayers to 0547. Arabic monologue to station frequency quote, and 0600 sign-off. Strong signal without signal fading. (Witham, HI)

0600 UTC on 4915
GHANA: GBC/Radio One. Regional news to international headlines. "This is Radio One" ID at 0630 with fair signal. (Williams, AL) Station noted this frequency at 2235. (Maywoods DX Team, KY) GBC noted 0454 on 3366 kHz with news, and music. GBC audible on 4915 kHz at 1823-1830. *Stock Exchange* report, IDs, time check and vernacular programming. (Serra, Italy)

0637 UTC on 4865
COLOMBIA: La Voz del Cinaruco. Spanish. Caracol network programming. Latin American pop vocals from male/female DJs. Numerous IDs, time checks, Caracol promos, jingles. Caracol Colombia audible on parallel 5075. (Serra, Italy) Caracol heard on 5075 kHz at 415. (Smith, NY)

0720 UTC on 7190.3
EQUATORIAL GUINEA: Radio Africa. Scripture readings to ID. Local Malabo and California QSL addresses. Announcement to national anthem at 0750. (Ed Rausch, Cedar Grove, NJ) Also on 7200 kHz at 2240. (DX Team, KY)

0913 UTC on 11760
OMAN: BBC Relay. Features and ID, "you are listening to the Middle-Eastern service of the BBC." (Maywoods DX Team, KY) Radio Oman heard on 7170 kHz at 1645. Arabic DJ's Elvis tunes and ID heard over Radio Beijing's signal. (Witham, HI)

0935 UTC on 11690
PHILLIPINES: FEBC. Station ID, "this is FEBC broadcasting from the Phillipines." Newscast to regional music and feature programming. (Serra, Italy) FEBC audible on 11995 kHz at 1405. (Zamora, NM) FEBC heard on 11760 kHz at 0945. (Maywoods DX Team, KY)

1050 UTC on 5049.8
ECUADOR: Radio Jesus Gran Poder. Spanish. Vocal music variety to ID at 1100. (William, AL) Ecuador's Ondas Quevedenas monitored on 3325 kHz at 1133. Station ID into lively music program. (Maywoods DX Team, KY) HCJB noted on 15279 kHz at 1730. (Tom Banks, Dallas, TX)

1145 UTC on 4925
INDONESIA: (Sumatera) RRI-Jambi. Indonesian. Regional pop music. SCI interval signal *(Song of the Coconut Island)* to station ID at 1158. (Rausch, NJ) RRI-Jakarta (Java) monitored on 9525 kHz at 1550. Pop music, ID, interval signal to 1600*. (Carlson, WA)

1216 UTC on 9530
SINGAPORE: Radio Singapore Int'l. *Press Review* with editorials from Asian newspapers. Preview for music program *Hot Traxs.* Station ID and news at 1230. (Zamora, NM) Monitored on 6155 kHz at 2320. Station IDs, pop music and Asian news. (Rausch, NJ; Maywoods DX Team, KY)

1352 UTC on 11900
SOUTH AFRICA: Channel Africa. Swahili. Updated musical version of standard interval signal. Usual bird call signal included with 1400 sign-on and time pips signal. (Zamora, NM) English news and ID heard on 15240 kHz at 1705. (Witham, HI; Maywoods DX Team, KY)

1534 UTC on 7370
TURKEY: Turkye Polis Radyosu. Turkish chants to lady DJ. Pop music tune from Mariah Carey. ID "Ankara Polis Service..." (Serra, Italy)

1619 UTC on 5035
KAZAKHSTAN: Radio Alma-Ata. Folk music to announcer duo's chat. Station ID to interval signal. Monitored on parallel 5260 with fair signal. (Serra, Italy)

1650 UTC on 7285
UZBEKISTAN: Radio Tashkent. Regional tunes to news in unidentified language. Interval signal/ID at 1700. News in Arabic, returning to folk music at 1709. (Witham, HI)

1700 UTC on 9325
NORTH KOREA: Radio Pyongyang. Station sign-on followed by commentary on the remaining communist countries. Report on the use of nuclear weapons by the U.S. against countries that threaten to use chemical and biological weapons. (Witham, HI)

1725 UTC on 9373
PAKISTAN: Radio Pakistan. Middle-Eastern music followed by excerpt from Anderson's *Typewriter Song,* used as introduction to news at 1730. Presumed Pakistani dialect covering news of Kashmir. (Witham, HI) Station monitored on 9855 kHz at 1712 with editorials and IDs. (Smith, NY; Serra, Italy)

2013 UTC on 15340
RWANDA: Radio Rwanda. French. Afro to disco, male/female announcer duo. Station ID given as, "Radio Rwanda vous etes a l'ecoute de Kigali Radiodiffusion de la Republique Rwandaise." (Serra, Italy) Station heard on 9610 kHz at 1700. (Witham, HI)

2130 UTC on 15165
CUBA: Radio Havana. *Sports Roundup* featuring news of Mexican-Cuban baseball, chess, and Pan-American Games. (Fraser, MA) Great signal at 0330 on 6010. (Frank Hillton, Charleston, SC)

2250 UTC on 15675
HONDURAS: Radio Copan Int'l. Spanish/English. Vocal tunes to Spanish ID, with occasional USB interference from WWCR on 15685 kHz. (Zamora, NM) Multilingual programming, talk and poetic readings. (Smith, NY)

Attention Ditto Heads!

Do you find yourself needing a daily Rush update? Why not add a Rush Limbaugh QSL card to your collection? That's right ... Rush has a picture QSL card! Send program details, a self-addressed-stamped-envelope to; WRNO World Wide, P.O. Box 100, New Orleans, LA 70181. Rush is heard on WRNO from 1600-1900 on 15420 kHz.

The Voice of the OAS has reactivated after a brief absence on shortwave. OAS is being monitored Monday-Friday in English on 15160, 11835, and 9670 kHz. Send your report and mint stamps for return postage to; Voice of the OAS, 17th St. & Constitution Ave., Washington, DC 20006.

Don't forget, contributors: when sending in your QSL data to the *MT* headquarters, please include the station address. For a personal reply to your questions and information please enclose a self-addressed-stamped envelope.

AIRCRAFT TRAFFIC

CG (Rescue) 6008 (HH-60J Jayhawk Helo), 5696 USB kHz. Full data QSL letter signed by W. Hayes-CMDR (KQ4GB). 8x10 color photo of HH-60J & C130 included. Received in 13 days for an English utility report. QSL address: USCG Air Station, Elizabeth City, North Carolina, 27909-5004. (Steve McDonald, Port Coquitlam, B.C. Canada)

Primo 36-KC10 Tanker, 11176 USB kHz. Full data prepared QSL verified. Received in 120 days for an English utility report. QSL address: March AFB, Riverside, CA 92518. (McDonald, CAN)

BOLIVIA

Radio San Miguel, 4925 kHz. Full data station QSL card signed by Director, stamped with station's seal. Form letter on station letterhead, signed by Felix A. Rada Q. Received in 42 days for a Spanish report. Station address: Casilla 102, Riberalta, Bolivia. (Gigi Lytle, Lubbock, TX)

GUATEMALA

TGNA-Radio Cultural, 3300 kHz. Partial data "Quetzal" bird/microphone card, signed by Wayne Berber-C.E. Received in 43 days for an English report and $2.00. Station address: Apartado 601, 01901 Guatemala. (Charlie Washburn, Robbinston, ME)

GREECE

VOA Kavala relay, 9700 kHz. Full data "Washington Mall" card signed by John Vodenik. Received in 10 months and 3 weeks for an English report. Station address: c/o Bethany Relay Station, P.O. Box 227, Mason, OH 45040. Washington DC address: 330 Independence Ave. SW, Washigton, DC 20547. (Marie Lamb, Brewerton, NY)

JAMAICA

6YX, 5696 USB kHz. Full data prepared QSL verified, and personal letter from G.S. Reynolds-LCMDR. Received in 32 days for an English utility report. Station address: JDF Coast Guard, HMJS Cagway, Port Royal, Kingston, Jamaica. (McDonald, CAN)

MOROCCO

VOA Tangier relay, 6005 kHz. Full data "Cherry Blossoms" folder card verified by John Vodenik. Received in 6 months for an English report. Station address: c/o Bethany Relay Station (see above). (Lamb, NY)

PHILIPPINES

VOA Tinang relay, 15425 kHz. Full data "50th Anniversary" card, signed by John Vodenik. Received in 10 months for an English report. Station address: c/o Bethany Relay Station (above). (Lamb, NY)

SERBIA

Radio Yugoslavia, 9580 kHz. Full data "Sights of Belgrade" card, unsigned. Received in 242 days for an English report. Station address: Hilandarska 2, 11000 Beograd, Serbia. (Washburn, ME)

SHIP TRAFFIC

SEA-LAND QUALITY-KRNJ, 4110 kHz (Container). Full data prepared QSL card signed by Ron Willoughby, stamped with ship's seal. Received in 60 days for an English utility report, one U.S. dollar, and an SASE. Ship address: c/o Sea-Land Service Inc., P.O. Box 800, Iselin, NJ 08830. (Russ Hill, Oak Park, MI)

USS LONG BEACH (CGN-9)-NLBH, 2406 kHz. Full data prepared QSL card signed by Radio Officer. Received in 22 days for an English utility report. Ship address: FPO AP 96671-1160. Per the Radio Officer, the *USS Long Beach* is scheduled for decommissioning this year. (Mike Hardester, Jacksonville, NC)

COLUMBUS OLINDA-ELHH9, 156.65 MHz (Container). Full data prepared QSL verified by Capt. H.J. Schmidt/Master. Received in 55 days for an English utility report. Ship address: Hamburg Sudamerikanische, Dampfschiffahrts-Gesellschaft, Eggert & Amsinck, Ost-West-Str 59-61-Postfach 11 15 33, 2000 Hamburg 11, Germany. (Hank Holbrook, Dunkirk, MD)

SPAIN

Radio Nacional de Espana, 657 kHz. Full data color photo card showing "Casa de la Radio" in Madrid. Received in four months for an English report. Station address: Prado del Rey, 28023 Madrid, Spain. (Dr. Adrian M. Peterson, Indianapolis, IN)

SRI LANKA

VOA Colombo relay, 15250 kHz. Full data "Edward R. Murrow Transmitting Station" card, signed by John Vodenik. Received in 1 month for an English report. Station address: c/o Bethany Relay Station. (Lamb, NY)

SWITZERLAND

HEP, Zurich State Police, 3332 kHz. Full data letter signed by H.J. Spring. Received in 39 days for an English utility report, one IRC and address label (used). Station address: Postfach 370, 8021 Zurich, Switzerland. (Hardester, NC)

THAILAND

Bangkok Radio-HSA, 8686 USB kHz. Full data blue on yellow QSL card signed by B. Sutkas. Received in 19 days for an English utility report. Station address: 53 Tivanon Rd., Nonthaburi 11000, Thailand. (McDonald, CAN)

UNITED STATES

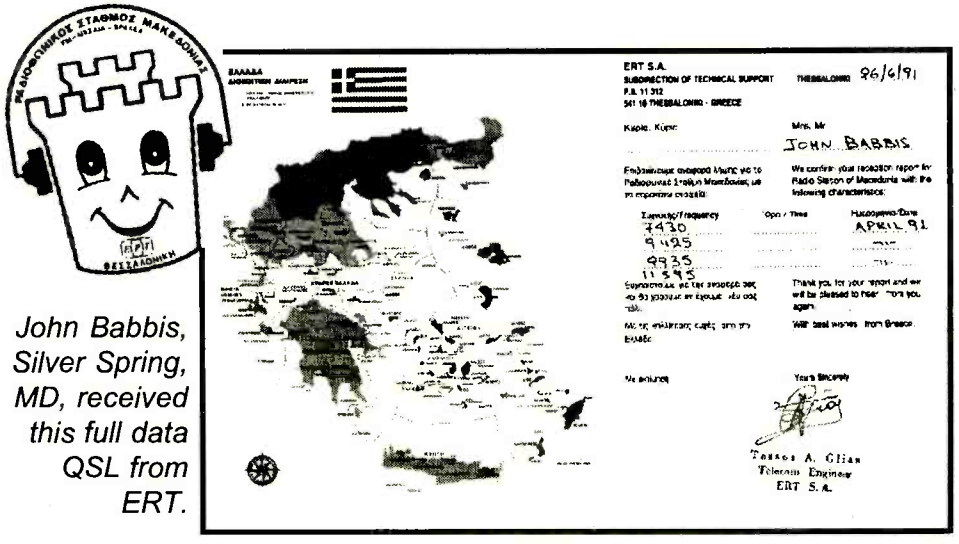
WVNN-770 AM. Frequency only letter signed by Dave Stone-Operations Manager. Received in 14 days after 2nd followup AM report (total time 362 days). My follow-up report and prepared QSL were returned unsigned! Address on letterhead: P.O. Box 11457, Huntsville, AL 35814. Envelope address (where report was sent) P.O. Box 389, Athens, AL 35611-1043. Phone: 205-820-2277 and 233-1414. (Mike Hardester, Jacksonville, NC)

KATL-770 AM. Date/frequency letter signed by Shirley Lawrenz-Secretary/Traffic. Station coverage map and key chain included. Received in 85 days for an English AM report, mint stamp, address label (used) and cassette tape of reception. Station address: P.O. Box 700, Miles City, MT 59301. Phone; 232-7700. (Hardester, NC)

WOW, 13093/22738 USB kHz. Full data multicolored QSL card verified. Received in 3 months for an English utility report. Station address: WOW, c/o AT&T Radiotelephone, 1350 NW 40th Ave., Ft. Lauderdale, FL 33313. (Peterson, IN)

WJFK-1300 AM. Full data friendly letter signed by Dan Ryson-C.E. Station coverage map included. Received in 7 days for an English AM report, one mint stamp and address label (used). Station address: P.O. Box 3649, Washington, DC 20007. Phone: 703-691-1900, FAX: 703-385-0189. Per the Chief Engineer, WJFK is full time simulcast of WJFK-FM (106.7). (Hardester, NC)

WZCM-750 AM. Full data prepared QSL signed by Garland Johnson-Production Assistant. Personal letter included. Received in 30 days for an English AM report and one mint stamp. Station address: Box 860, Young Harris, GA 30582. (Loyd Van Horn, Brasstown, NC)



John Babbis, Silver Spring, MD, received this full data QSL from ERT.

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 Savings 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 "John Dunn 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—space does not permit 24-hour listings except for the "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 rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

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

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

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

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

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

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

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

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

Hot News and Hot Spots

Crisis Monitoring

Is there anywhere in the world today that ISN'T hot?! Take the African continent, for example. Glenn Hauser reports last hearing Deutsche Welle's relay from Rwanda in English 2100-2150 on 15135 April 9. According to Radio Netherlands' *Media Network*, DW had to evacuate staff in next few days, and managed to replace some transmissions by utilizing Germany, Malta, Portugal sites. Radio Rwanda (RRR) was not heard on 3330, was intermittent on 9610 and 6055 during heavy killing, and 15340 was blocked in Europe, according to Richard Measham and Jorma Mantyla, via RN*MN*.

In Somalia, the pro-Aydid Radio Mogadishu has been heard until 0500 closing sometimes on 6850, 6840, and 6830 rather than its regular 6970, according to the BBC Monitoring Service.

To follow the aftermath of the elections and other South African developments, tune in Channel Africa, whose summer English schedule is as follows: 0300-0700 on 5955, 0300-0500 on 3220, 0500-0600 on 9695, 0600-0700 on 15220, 1000-1100 on 17810, 1500-1800 on 4945 and 11770. Thanks to Bill Westenhaver, PA, for forwarding the schedule.

Glenn Hauser reports Channel Africa was audible, though poorly, due to WYFR splash at 0400 on 5955; 1500 on 11770 kHz was probably longpath, since it soon faded. Craig Jordan of CA reports excellent reception on 9695; sounds like a N. Am. service, and recommends it for news. Tim Hendel of Florida concurs, even though the transmission is inconveniently late for North America.

For a different point of view on conflicts involving Serbia, stay tuned to Radio Yugoslavia, whose new summer schedule in English to N. America is: 0000-0030 exc. Sun. (UT Mon.?) and daily 0430-0500 on 11870, 9580. That's via John Norfolk, Victoria. Radio Yugoslavia transferred all transmitters formerly in Bijeljina (Bosnia) to Belgrade some time ago, says Tony Jones (*NU* via NASWA)

Here are some other "hot spots" in the news; provided by Glenn Hauser.

BOUGAINVILLE R. Free Bougainville says it plans to move from 3870 to 3840 (Nobuyoshi Aoi, RJ*MR*)

CAMBODIA V. of Great National United Front of Kampuchea, Khmer-Rouge section on 5408, was silent two days as government forces advanced on Pailin site; subsequently only in Cambodian at *1200-1400*, previously with English and Thai in second hour (Isao Ugusa, RJ*MR*)

GUATEMALA La Voz Popular, URNG clandestine, presumed, Fri. into UT Sat. 2339-0040* jumping among these precise frequencies, suspect crystal controlled: 6950.53, 6972.68, 6976.46, 6980.34, 7008.82 (Dave Balko, PA, *FT*) Another Friday I heard this behavior, but no definite ID at 2338-2359 on 6985+, 6983+, 6952+, talking about UN, human rights (gh, OK)

KURDISTAN V. of Independent Kurdistan, of the PKK, which calls the Turkish government "fascist," varies 7024-7420 kHz, such as 7400, at 0700-0800, 0900-0940, 1400-1600 (BBCM)

TIBET Xizang PBS, Lhasa, Tibetan service has program for overseas Tibetans daily 0600-0645, 1000-1045 and 1500-1545 on 11950, 11765, 7110, 6200, 5995, 5020, 4820, 4035 kHz. Chinese service has Tibetan language lessons at 0240-0300, 1330-1350, and two other programs: *Time and Space on the Plateau* 0200-0230, 0530-0600, 1130-1200; and *Peoples Soldiers on the Plateau*, 0515-0530, 1115-1130, all daily, on 9580, 9490, 7170, 5935, 5240, 4750. (BBCM)

Audio Resources

Shortwave Radio Today (SPEEDX) printed an item sent them by Jim Streitnatter that caught my eye, both for entertainment and as a language resource. Audio-Forum (Suite M20A, Broad St., Guilford, CT 06437; 800 243-1234) publishes a catalog called *About Music* (I've sent for one), which includes audio and video recordings from around the world, plus language tapes for 86 different languages! From the *Singing Bowls of Tibet* to the *Howling Dervishes of Turkey*, this should be interesting fare when the shortwave bands aren't cooperating! The language lessons could be useful, too, if not too expensive.

Some languages can be learned on air; several broadcasters offer language lessons. Kol Israel apparently offers Hebrew lessons every two or three years in English, but currently the Hebrew course is offered in Easy Hebrew following the news in Easy Hebrew. Daniel Rosenzweig, who offered this information on the SW Echo BBS, adds, Easy Hebrew "is relatively slow, but not *truly* slow ... Some non-English speaker might think the same of VOA's 'special English'! You might try recording it and playing it back while holding a dictionary!" (rb)

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Next Reporting Deadline
June 22, 1994

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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
China Radio Int+l
Monitor Radio Int+l [T-F]
Radio Australia
Radio Havana Cuba
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Int+l
Radio Yugoslavia [M-A]
Spanish National Radio
Voice of America (am/as/ca)
WWCR (5810) [S]
0003
Radio Pyongyang
0008
China Radio Int+l*
0010
Radio Havana Cuba [T-S]*
Voice of America (ca) [T-A]*
0022
Radio Ukraine Int+l [W]*
0030
HCJB
Radio Havana Cuba
Radio Moscow
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int+l
Radio New Zealand Int+l [M-F]
Radio Sweden [T-A]
Voice of America (am) [T-S] (Special English)
Voice of America (as) (Special English)
0045
Korean World News Service
0050
RAI Italy
0055
Vatican Radio [S-W-F]
0057
Spanish National Radio [F]

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
All India Radio
BBC
Deutsche Welle
FEBC (Philippines)
Monitor Radio Int+l [T-F]
R Slovakia Int+l
Radio Australia
Radio Budapest Int+l
Radio Canada Int+l
Radio Havana Cuba
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Norway Int+l [M]
Radio Prague
Radio Tashkent
Radio Thailand
Spanish National Radio
Swiss Radio Int+l
Voice of America (am/as/ca)
Voice of Indonesia
0110
Radio Australia [M-F]*
Radio Havana Cuba [T-S]*
0130
BBC (as)*
Radio Austria Int+l
Radio Havana Cuba
Radio Japan [S]*
Radio Moscow [T-A]
Radio Netherlands Int+l
Radio Portugal Int+l [T-A]
Radio Sweden [T-A]
Radio Tirana
Voice of Greece [M-A]
0145
BBC (ca) [T-A]*
0155
Voice of Indonesia

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
BBC ("Newsdesk")
Christian Science Sentinel [A]
Deutsche Welle
KVOH [T-A]
Monitor Radio Int+l [T-F]
Radio Australia
Radio Canada Int+l
Radio Havana Cuba
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Romania Int+l
Radio Thailand
Voice of America (am) [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
WWCR (7435) [S]
WWCR (5810) [T-A]
0203
Voice of Free China
0210
Radio Havana Cuba [T-S]*
0215
Radio Cairo
Radio Nepal
0230
Radio Budapest Int+l
Radio Havana Cuba
Radio Moscow
Radio Netherlands Int+l
Radio Pakistan
Radio Sweden [T-A]
Radio Tirana
0245
Korean World News Service
Radio Yerevan

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC
China Radio Int+l
Deutsche Welle
HCJB
KVOH [T-A]
Monitor Radio Int+l [T-F]
Radio Australia
Radio Havana Cuba
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Int+l
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of Turkey
WHRI (7315) [T-A]
WWCR (7435) [T-S]
WWCR (5810) [M-A]
0303
Voice of Free China
0308
China Radio Int+l*
0309
BBC*
0310
Radio Havana Cuba [T-S]*
0315
Radio Cairo
0320
Radio Philipinas [M-A]
0322
Radio Ukraine Int+l [W]*
0330
BBC (af)*
Radio Bulgaria
Radio Dubai
Radio Havana Cuba
Radio Japan [A]*
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int+l
Radio Sweden [T-A]
0340
Voice of Greece [M-A]
0355
Radio Japan

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
BBC ("Newsdesk")
BBC (af)
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+l [T-F]
Radio Australia
Radio Canada Int+l
Radio Havana Cuba
Radio Moscow
Radio New Zealand Int+l [A]
Radio New Zealand Int+l [M-F]*
Radio Romania Int+l
Radio Tanzania
Radio Thailand
Swiss Radio Int+l
Voice of America (af/me)
Voice of Israel
WHRI (7315) [T-A]
WWCR (7435) [T-A]
0403
Radio Pyongyang
0408
China Radio Int+l*
0409
BBC (af) [T-S]*
0410
Radio Havana Cuba [T-S]*
0411
Channel Africa [T]
0415
RAI Italy
0430
Channel Africa [A]
Radio Finland
Radio Havana Cuba
Radio Moscow
Radio Yugoslavia
Voice of America (af) [M-F]*
0431
Channel Africa [T/H/F]
0445
BBC (af) [T-F]*

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC ("Newshour")
Channel Africa
Christian Science Sentinel [S]
Deutsche Welle
HCJB
Monitor Radio Int+l [T-F]
Radio Australia
Radio Cameroon
Radio Canada Int+l [M-F]
Radio Havana Cuba
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-F]
Radio Norway Int+l [M]
Radio Thailand
Spanish National Radio
Swiss Radio Int+l (eu)
Vatican Radio [T/F]
Voice of America (af/me)
WWCR (7435) [M-F]
0510
Radio Australia [M-F]*
Radio Havana Cuba [T-S]*
0530
Channel Africa [S-F]
Radio Austria Int+l
Radio Dubai
Radio Havana Cuba
Radio Japan [A]*
Radio Moscow
Radio Romania Int+l
Radio Thailand
Voice of Nigeria

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
BBC (af) [A-S]*
BBC (af) [M-F]
Channel Africa
Deutsche Welle
Monitor Radio Int+l [T-F]
Radio Australia
Radio Havana Cuba
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int+l
Radio Prague
Swiss Radio Int+l
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Malaysia
WWCR (7435) [S]
0603
Radio Pyongyang
0609
BBC*
0610
Radio Havana Cuba [T-S]*
0627
BBC (af) [M-F]*
0630
Radio Austria Int+l [T-S]

Radio Havana Cuba
Radio Moscow
Radio Vlaanderen Int+l
Vatican Radio [M-A]
Voice of Nigeria [M-F]
0632
Radio Romania Int+l
0640
Vatican Radio [T]
0645
Radio Finland
Radio Romania Int+l
Voice of Nigeria [M-F]*
0650
Voice of Med. (Malta) [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC
Monitor Radio Int+l [T-F]
Papua New Guinea
Radio Australia
Radio Ghana
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-F]*
Swiss Radio Int+l (eu)
Voice of Myanmar (Burma)
0703
Radio Pyongyang
Voice of Free China
0710
Radio Australia [W]*
0730
BBC (af) [A]*
HCJB
Radio Austria Int+l [T-S]
Radio Japan [A]*
Radio Moscow [M-A]
Radio Netherlands Int+l
Radio Prague
0740
Voice of Greece
0750
Radio New Zealand Int+l [M-F]*
Voice of Med. (Malta) [M-F]
0755
Radio Japan

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
Christian Science Sentinel [T/F]
KNLS
Monitor Radio Int+l [T-F]
Radio Australia
Radio Finland
Radio Korea
Radio Moscow
Radio New Zealand Int+l [S-F]
Voice of Indonesia [A-H]
Voice of Malaysia
0803
Radio Pyongyang
0810
Radio New Zealand Int+l [M-F]*
0830
R Slovakia Int+l
Radio Austria Int+l
Radio Moscow
Radio Netherlands Int+l
0845
Radio Yerevan [S]
0855
Voice of Indonesia [A-H]

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
China Radio Int+l
Christian Science Sentinel [T/F]
Deutsche Welle
Monitor Radio Int+l [M-F]
Papua New Guinea [M]*
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-F]
Radio Vlaanderen Int+l [T-A]
Swiss Radio Int+l
0908
China Radio Int+l*
0915
Korean World News Service
0930
FEBC (Philippines)
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+l
0940
Voice of Greece
0945
Deutsche Welle [M-F]*
0955
Radio Japan

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
BBC
China Radio Int+l
Christian Science Sentinel [A]
FEBC (Philippines) [M-F]*
HCJB
Monitor Radio Int+l [M-F]
Papua New Guinea
Radio Australia
Radio Moscow
Radio New Zealand Int+l [S-F]
Radio Tanzania
Vatican Radio [M-A]
Voice of America (as/ca)
Voice of Israel
Voice of Kenya
WYFR (Satellite Network) [M-A]
1008
China Radio Int+l*
1010
Radio New Zealand Int+l [M-F]*
1030
Radio Austria Int+l [M-A]
Radio Dubai
Radio Korea
Radio Moscow
Radio Netherlands Int+l
Radio Prague
Voice of Nigeria
1040
Voice of Greece
1045
Radio New Zealand Int+l [M-F]*
Voice of Nigeria [A-S]*

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC ("Newsdesk")
Channel Africa
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+l [M-F]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Jordan
Radio Moscow
Radio Mozambique
Radio New Zealand Int+l
Radio Pakistan
Radio Singapore Int'l
Swiss Radio Int+l
Voice of America (as/ca)
WWCR (15685) [M-F]
1103
Radio Pyongyang
1110
Radio Australia*
1115
Korean World News Service
1130
Radio Austria Int+l
Radio Finland [M-A]
Radio Japan [A]*
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+l
Radio Singapore Int'l
Radio Sweden [M-F]
Voice of Asia
WYFR (Satellite Network) [M-A]
1135
Radio Thailand
1145
Deutsche Welle [S-F]*
1155
Radio Japan

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
China Radio Int+l
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Papua New Guinea [M-A]
Radio Australia
Radio Bulgaria
Radio Canada Int+l [M-F]
Radio France Int+l
Radio Moscow
Radio New Zealand Int+l
Radio Norway Int+l [S]
Radio Singapore Int'l [S-F]
Radio Tashkent
Radio Thailand
Voice of America (as)
WYFR (Satellite Network) [M-A]
1203
HCJB [M-F]
Radio Korea
1208
China Radio Int+l*
1209
BBC [W]*
1230
HCJB [M-F]
Radio Bangladesh [S-M]
Radio Cairo
Radio Canada Int+l
Radio Finland [M-A]
Radio Moscow [M-A]
Radio Netherlands Int+l
Radio Singapore Int'l [S-F]
Radio Sweden [M-F]
Radio Vlaanderen Int+l [S]
Voice of Turkey
Voice of Vietnam
WYFR (Satellite Network) [M-A]
1240
Voice of Greece
1254
Radio France Int+l

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
China Radio Int+l
Christian Science Sentinel [A]
KNLS
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l [S]
Radio Ghana
Radio Korea
Radio Moscow
Radio Norway Int+l [S]
Radio Romania Int+l [M-A]
Radio Singapore Int'l [M-F]
Radio Tanzania [A-S]
Radio Tashkent [S]
Radio Vlaanderen Int+l [M-A]
Swiss Radio Int+l
Voice of America (as)
Voice of Israel [S-H]
Voice of Kenya
WWCR (15685) [M-F]
WYFR (Satellite Network) [M-A]
1301
Radio Romania Int+l [S]
1303
Radio Pyongyang
1308
China Radio Int+l*
1310
Radiobrços [M-F]
1315
Radio Nepal
1324
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
FEBC (Philippines)
Korean World News Service
Radio Austria Int+l
Radio Canada Int+l
Radio Dubai
Radio Finland
Radio Moscow
Radio Netherlands Int+l
Radio Sweden [M-F]
Radio Tashkent [M-A]
Voice of America (as)
(Special English)
Voice of Vietnam
1335
Voice of Greece

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
All India Radio [M/W/F]
BBC
BBC (as) [M-F]*
China Radio Int+l
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Bulgaria
Radio Cameroon
Radio Canada Int+l [S-F]
Radio France Int+l
Radio Ghana
Radio Japan
Radio Jordan [A]
Radio Korea
Radio Moscow
Voice of America (as)
WWCR (15685) [M-F]
1408
China Radio Int+l*
1424
HCJB [M-F]
1430
FEBC (Philippines)
Radio Austria Int+l
Radio Canada Int+l [S]
Radio Japan [A]*
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+l
Radio Romania Int+l [T-S]
Radio Tirana
RTM Morocco [S]
Voice of Myanmar (Burma)
WYFR (Satellite Network) [M-A]
1431
Radio France Int+l [T]*
Radio Romania Int+l [M]
1440
FEBC (Philippines) [S-F]*
1445
BBC (as) [M-F] (Special English)
Voice of Myanmar (Burma)
1450
All India Radio
Voice of Med. (Malta) [M-F]
1453
Radio France Int+l [M-H/A]
1455
All India Radio

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
BBC (af) [M-F]
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l [S]
Radio Japan
Radio Jordan
Radio Moscow
Radio Omdurman
Radio Prague
Radio Tallinn
Swiss Radio Int+l
Voice of America (as/me)
WHRI (15105) [A]
WYFR (Satellite Network) [M-A]
1503
Radio Pyongyang
1505
Radio Algiers [M]
1508
China Radio Int+l*
1525
BBC (af) [S]*
Radio Veritas [T-F]

1530
All India Radio
Deutsche Welle [M-F]*
FEBC (Philippines)
Radio Austria Int+l
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+l
Radio Portugal Int+l [M-F]
Voice of Greece [M-A]
Voice of Nigeria [M-H]
1540
Radio Veritas [A-M]
1545
Korean World News Service
1550
Voice of Med. (Malta) [M-F]
1555
Radio Veritas [A-M]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+l [M-F]
Radio Australia
Radio France Int+l
Radio Jordan
Radio Korea
Radio Moscow
Radio Pakistan
Radio Tanzania
Voice of America (af) [A-S]
Voice of America (as/me)
Voice of Kenya
Voice of Nigeria [M-F]
WRNO [M-F]
WWCR (15685) [M-F]
WYFR (Satellite Network) [M-A]
1605
Radio Yemen
1608
China Radio Int+l*
1609
BBC*
1611
Radio France Int+l [T]*
1612
Vatican Radio [S-F]
1615
Radio Sweden [M-F]
1630
Radio Canada Int+l
Radio Dubai
Radio Moscow [S-F]
Voice of America (af) [M-F]
Voice of America (as/me) (Special English)
1645
BBC (as)*
1652
Radio France Int+l [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
BBC (af)
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
HCJB [M-F]
Monitor Radio Int+l [M-F]
Polish Radio
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-F]*
Radio Pakistan
Radio Prague
RTM Morocco [A]
Swiss Radio Int+l
Voice of America (af/as)
Voice of America (me)
WWCR [M-F]
1703
Radio Pyongyang
1708
China Radio Int+l*
1710
Radio Australia*
1715
Korean World News Service
1725
Radio New Zealand Int+l [F]*
1730
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+l
Radio Romania Int+l
Radio Sweden [M-F]
Vatican Radio [F]
Voice of America (af) [S]
1740
BBC (af)*
1745
All India Radio
1755
Radio New Zealand Int+l [M-H]*

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Cameroon
Radio Moscow
Radio Mozambique
Radio New Zealand Int+l [M-F]*
Radio Norway Int+l [S]
Radio Omdurman
Radio Tanzania
Radio Vlaanderen Int+l
Voice of America (af/me)
Voice of Kenya
WHRI (9485) [M-F]
WWCR [M-F]
1805
Radio New Zealand Int+l [H-F]*
1830
R Slovakia Int+l
Radio Austria Int+l
Radio Kuwait
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+l
Radio Yugoslavia
Voice of America (af) [A-S] (Special English)
Voice of America (me) (Special English)
1835
Radio New Zealand Int+l [F]*
1840
Voice of Greece [M-A]
1845
Radio Yerevan
1855
Radio New Zealand Int+l [S-H]*
1857
BBC (af) [M-F]*

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio [W]
BBC
China Radio Int+l
Christian Science Sentinel [A]
Deutsche Welle
HCJB
Monitor Radio Int+l [M-F]
Radio Australia
Radio Budapest Int+l
Radio Bulgaria
Radio Finland
Radio Japan
Radio Moscow
Radio New Zealand Int+l
Radio Portugal Int+l [M-F]
Radio Romania Int+l [T-S]
Spanish National Radio
Voice of America (af/as/me)
Voice of Israel
WHRI (9485) [M-F]
WWCR (15610) [M-A]
1901
Radio Romania Int+l [M]
1908
China Radio Int+l*
1910
All India Radio [W]
Radio Australia [M-F]*
1911
Voice of Israel [W]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
Polish Radio
Radio Japan [A]*
Radio Moscow [A-S]
Radio Netherlands Int+l
1933
Deutsche Welle [M]*
1935
RAI Italy
1955
Radio Japan [M-W]

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
China Radio Int+l
Deutsche Welle
KVOH [A-S]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Moscow
Radio New Zealand Int+l [S-F]
Radio Norway Int+l [S]
Radio Prague
Swiss Radio Int+l
Voice of America (af/me)
Voice of Greece [M-A]
Voice of Indonesia
Voice of Nigeria [M-F]
Voice of Turkey
WHRI (9485) [M-W/F]
WWCR (15610) [S-F]
2003
Radio Pyongyang
2008
China Radio Int+l*
2010
Radio New Zealand Int+l [S-H]*
2025
RAI Italy
2030
HCJB [M-A]
Radio Canada Int+l
Radio Korea
Radio Moscow
Radio Riga Int+l [M-F]
Radio Sweden [M-F]
2031
HCJB [S]
2045
All India Radio [A]
Korean World News Service
2055
Voice of Indonesia [M]

2100 UTC
(5:00 PM EDT, 5:00 PM PDT)
All India Radio
BBC ("Newshour")
China Radio Int+l
Deutsche Welle
KVOH [S]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Budapest Int+l
Radio Bulgaria
Radio Cameroon
Radio Canada Int+l [A-S]
Radio Damascus [F]
Radio Havana Cuba
Radio Japan
Radio Moscow
Radio New Zealand Int+l [A-H]
Radio Prague
Radio Romania Int+l
Radio Ukraine Int+l
Radio Vlaanderen Int+l [M-F]
Spanish National Radio
Voice of America (af/as/me)
WWCR (15610) [S-F]
2105
Radio Yemen
2108
China Radio Int+l*
2110
Radio Damascus [S-M]
Radio New Zealand Int+l [S-H]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
2120
Radio Cairo
2130
Radio Austria Int+l
Radio Cairo
Radio Havana Cuba
Radio Havana Cuba [M-A]*
Radio Moscow [M-A]
Radio Nacional de Venezuela [M-A]
Radio Sweden [M-F]
Voice of Israel
2142
Voice of Israel [H]*
2145
Radio Damascus [W]
Radio Korea
Radio Yerevan

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
China Radio Int+l
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l
Radio Havana Cuba
Radio Korea
Radio Moscow
Radio New Zealand Int+l
Radio Tirana
Radio Yugoslavia
RAI Italy
Voice of America (as)
Voice of Turkey
WWCR (12160)
2203
Voice of Free China
2208
China Radio Int+l*
2215
All India Radio [M/F]
Radio Cairo
2230
Radio Canada Int+l [A-S]
Radio Finland
Radio Havana Cuba [M-A]*
Radio Moscow
Radio Sweden [M-F]
Voice of America (as) (Special English)
2240
Radio Cairo
Voice of Greece [S-F]
2245
Radio Bulgaria
Radio Yerevan

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
BBC ("Newsdesk")
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l [A-S]
Radio Japan
Radio Moscow
Radio New Zealand Int+l [A]
Radio Norway Int+l [S]
Radio Singapore Int'l
Radio Vilnius [M-A]
Radio Vlaanderen Int+l
Voice of America (as)
WWCR (5810/12160) [A-S]
2303
Radio Pyongyang
2330
Radio Japan [A]*
Radio Moscow
Radio Netherlands Int+l
Radio Sweden [M-F]
SLBC (Sri Lanka) [M]
2335
Voice of Greece [S-F]
2355
Radio Japan

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Lawrence Magne
Monitoring Times

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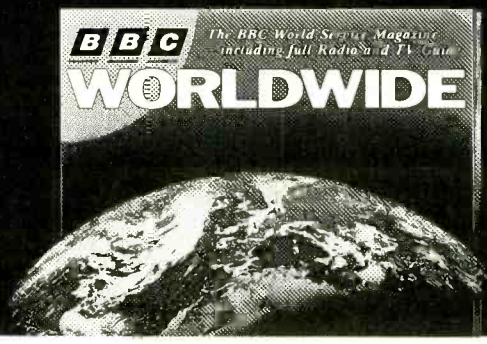

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BBC WORLD SERVICE

0000 UTC SHORTWAVE GUIDE 8:00 PM EDT 5:00 PM PDT

FREQUENCIES

0000-0100	Australia, Radio	13605pa	15320pa	15510as	17750as
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0015	Cambodia, Natl Voice of	11938as			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, China Radio Intl	9780na	11715na		
0000-0100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0027	Czech Rep, Radio Prague	7345na	9485na		
0000-0100	Guam, KSDA AWR Agat	17645as			
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
0000-0100 vl	Italy, IRRS Milano	7125eu			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do			
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do		
0000-0030	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na		
0000-0100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
0000-0100 vl	Papua New Guinea, NBC	9675do			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow Intl	7165na	7180af	7195am	7210af
		7295am	9480na	9620na	9885am
		10344as	11675am	11790am	11970as
		12050na	15425am	17570as	17610as
		17690na	17890as	21480na	21690na
0000-0030	Serbia, Radio Yugoslavia	9580eu	11870eu		
0000-0100	Spain, Spanish Natl Radio	9540na			
0000-0100	Thailand, Radio	9655as	11905as		
0000-0100	Ukraine, R Ukraine Intl	9685na	9860na	11720na	12030na
		15180na	15580na		
0000-0100	United Kingdom,BBC London	5975na	6175na	6180na	7180eu
		7325na	9580na	9590na	9915na
		11750sa	11955as	12095sa	15260sa
		15310as	15360as		
0000-0100	USA, KCBI Dallas TX	13740na			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	5850na	9430ca		
0000-0030	USA, R Bosnia H via WHRI	7315am			
0000-0100	USA, VOA Washington DC	5995am	6130am	7215au	7405am
		9455am	9770au	9775am	11580am
		11695am	11760as	15120am	15185as
		15205am	15290as	17735as	17765as
		17820as			
0000-0100	USA, WCSN Scotts Cor ME	9850am			
0000-0100	USA, WEWN Birmingham AL	7425na	9410eu	9985sa	
0000-0100 vl	USA, WHRI Noblesville IN	7315am			
0000-0100	USA, WINB Red Lion PA	11950am			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCR Nashville TN	5810am	7435am	13845am	
0000-0100	USA, WYFR Okeechobee FL	6085na			
0030-0100	Australia, Radio	11720pa	11880pa	13605as	15240pa
		15365pa	15510as	17795pa	17860pa
		17880as			
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	7100na	9022na		
0030-0100	Netherlands, Radio	6020na	6165na	9840na	9860as
		12025as			
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	Sweden, Radio	6065sa	9850sa		
0050-0100	Italy, RAI Rome	6005na	9725na	11800na	

SELECTED PROGRAMS

Sundays

0000 FEBC (Philippines): Good Morning from Manila
0010 Voice of America (as): VOA Monday Morning
0011 Radio Moscow: Moscow Mailbag
0015 BBC: Good Books. Recommendation of a book to read.
0030 BBC: The John Dunn Show. A melodic mix of songs old and new.
0030 Voice of America (ca): Weekend Magazine
0031 Radio Pyongyang: Listeners' Newsletter
0052 Radio Netherlands Int'l: Sounds Interesting

Mondays

0000 FEBC (Philippines): Good Morning from Manila
0011 Radio Moscow: Moscow Mailbag
0015 BBC: Feature. Marriage and the Throne (6th,13th). Dramatic stories of marriage and divorce in the British royal family. A Step Too Far (20th). See S 0445.
0015 BBC: Music Feature. Pop the Question (27th). See S 0445.
0017 Radio Havana Cuba: Mailbag Show
0030 BBC: In Praise of God. Weekly programme of worship and meditation.
0030 Radio Sweden: In Touch with Stockholm (biweekly)
0035 Radio Netherlands Int'l: Happy Station
0040 China Radio Int'l: Listeners' Letterbox
0044 Spanish National Radio: Radio Club

Tuesdays

0000 FEBC (Philippines): Good Morning from Manila
0006 Monitor Radio Int'l: Magazine Program
0013 Radio Prague: Magazine '94
0015 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way.
0015 Spanish National Radio: Panorama
0030 HCJB: Studio 9
0044 Monitor Radio Int'l: Letterbox

Wednesdays

0000 FEBC (Philippines): Good Morning from Manila
0006 Monitor Radio Int'l: Magazine Program
0015 BBC: Concert Hall. See S 1515.
0015 Spanish National Radio: Panorama
0030 HCJB: Studio 9
0040 China Radio Int'l: Listeners' Letterbox
0044 Monitor Radio Int'l: Letterbox

June Program Listing Features

Mailbag programs and magazine programs are featured during this month, in addition to our usual listing of BBC World Service. Since some magazine programs include a mailbag feature, it seemed appropriate to combine these two program types within the same column.

If we omitted one or more of your favorite mailbag or magazine programs, please let us know. Also tell us if you would like to see more listings which focus on a program theme and the subject matter you would like presented.

0015 BBC: Feature. Marriage and the Throne (4th,11th). See M 0015.
0015 BBC: Music Feature. The Time Machine (18th,25th). Tracks from the best-selling albums of the past.
0015 Spanish National Radio: Panorama
0030 BBC: From the Weeklies. Review of the British weekly press.
0030 HCJB: Studio 9
0045 BBC: The Learning World. See M 0615.

Thursdays

0000 FEBC (Philippines): Good Morning from Manila
0006 Monitor Radio Int'l: Magazine Program
0012 Radio Prague: Calling All Listeners
0015 AWR Latin America: Listener Mail
0015 BBC: Ray on Record. Robin Ray presents some of the best in classical music.
0015 Spanish National Radio: Panorama
0030 HCJB: Studio 9
0044 Monitor Radio Int'l: Letterbox

Fridays

0000 FEBC (Philippines): Good Morning from Manila
0006 Monitor Radio Int'l: Magazine Program
0015 BBC: Music Review. News and views from the world of music.
0015 Spanish National Radio: Panorama
0030 HCJB: Studio 9
0044 Monitor Radio Int'l: Letterbox
0052 Radio Netherlands Int'l: Media Network

Saturdays

0000 FEBC (Philippines): Good Morning from Manila
0010 Radio Australia: Feedback
0015 BBC: Feature. Marriage and the Throne (28th). Dramatic stories of marriage and divorce from the history of the British royal family.

This 1963 Radio Americas QSL was submitted by Martin Gallas of Jacksonville, IL.

FREQUENCIES

0100-0200	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	15510as	17630as	17750as
		17795pa	17860pa	17880as	21595as
0100-0200 vl	Australia, VL8A Alice Spg	4835do			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Canada, RCI Montreal	6120na	9535na	9755na	11845na
		11940na			
0100-0200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0127	Czech Rep, Radio Prague	7345na	9485na		
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9650na
		9700na	11740na	11865na	
0100-0130	Hungary, Radio Budapest	5970na	9835na	11910na	15220na
0100-0200	Indonesia, Voice of	9675as	11752as		
0100-0130	Iran, VOIRI Tehran	7100na	9022na		
0100-0200 vl	Italy, IRRS Milano	7125eu			
0100-0110	Italy, RAI Rome	6005na	9725na	11800na	
0100-0200	Japan, NHK/Radio	5960na	9610as	11840as	11860as
		11910as	15195as	17810as	17845as
0100-0130	Laos, National Radio of	7116as			
0100-0200	Netherlands, Radio	9860as	12025as		
0100-0125	Netherlands, Radio	6020na	6165na	9840na	
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0130 m	Norway, Radio Norway Intl	9560ca	11925na		
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow Intl	5980na	7150na	7165na	7180na
		7210na	7295na	9620na	9675me
		9695me	9885me	11675am	11875as
		12050na	15425na	17570na	17610as
		17690na	21480na	21690na	
0100-0200	Slovakia, AWR Europe	7270as			
0100-0130	Slovakia, R Slovakia Intl	5930na	7310na	9810na	
0100-0200	South Korea, KBS/R Korea	7550eu			
0100-0200	Spain, Spanish Natl Radio	9540na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Switzerland, Swiss R Intl	5905am	6135am	9885am	
0100-0200	Thailand, Radio	9655as	11905as		
0100-0200	United Kingdom,BBC London	5975na	6175na	6180na	7325na
		9590na	9915sa	11750sa	11955sa
		15260sa	15280as	15310as	15360as
		17790as	21715na		
0100-0200	USA, KCBI Dallas TX	13740na			
0100-0200	USA, KTBN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, KWHR Naalehu HI	17510as			
0100-0200	USA, Monitor Radio Intl	5850na	9430ca		
0100-0200	USA, VOA Washington DC	7115as	7205as	7405am	7651as
		9775am	11580am	11705as	15120am
		15205am	15250as	17740as	21550as
0100-0200	USA, WCSN Scotts Cor ME	9850af			
0100-0200 vl	USA, WEWN Birmingham AL	7425na			
0100-0200 vl	USA, WHRI Noblesville IN	7315am			
0100-0200	USA, WINB Red Lion PA	11950am			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCR Nashville TN	5810am	5935am	7435am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0100-0130	Uzbekhistan, R Tashkent	7190as	9715as		
0130-0200	Albania, R Tirana Intl	9580na	9760na		
0130-0200	Austria, R Austria Intl	9655na	9870na	13730na	
0130-0150	Greece, Voice of	9380na	9420na	11645na	
0130-0200	Netherlands, Radio	9860as	12025as		
0130-0200 twhfa	Portugal, Radio	9505na	9555na	9570na	9600na
		9705na	11840na		
0130-0200	Sweden, Radio	9695au	11695as		
0140-0200	Vatican State, Vatican R	7335as	9650as		

SELECTED PROGRAMS

Sundays

0100 FEBC (Philippines): Good Morning from Manila
0101 BBC: Play of the Week. No Bed for Bacon (5th). A dramatization of Shakespeare himself. As You Like It (12th,19th). A two-parter of one of Shakespeare's best. The Puritan (26th). A contemporary play from the Shakespearean era.
0105 Swiss Radio Int'l: The Saturday Magazine
0109 Swiss Radio Int'l: The Grapevine
0110 Radio Prague: Calling All Listeners
0110 Voice of America (am/ca): Communications World
0110 Voice of America (as): VOA Monday Morning
0113 Deutsche Welle: Mailbag (biweekly)
0130 Radio Austria Int'l: Report from Austria
0130 Voice of Indonesia: Listener's Mailbag
0135 Radio Korea: From Us to You
0137 Radio Netherlands Int'l: Happy Station
0145 Radio Austria Int'l: Postbox

Mondays

0100 FEBC (Philippines): Good Morning from Manila
0101 BBC: Feature. The Village Where Time Stood Still (6th). NEW. D-Day remembered. Last Post (13th). Letters from German troops at the Eastern front in 1942. The Great Leveller (20th) A music feature about Fritz Reiner of Chicago Symphony Orchestra fame. A Day in the Life of Heathrow (27th). Focus on the busiest international airport in the world.
0128 Radio Canada Int'l: The Mailbag
0130 Radio Austria Int'l: Report from Austria
0130 Radio Sweden: In Touch with Stockholm (biweekly)
0130 Voice of America (as): VOA Tuesday Morning
0144 Spanish National Radio: Radio Club
0145 BBC: Music Feature. Crossing the Border (6th,13th,20th). The mixing and merging of serious and popular music is examined. Music As It Was (27th). The popularity of early music played with original instruments.

Tuesdays

0100 FEBC (Philippines): Good Morning from Manila
0105 BBC: Outlook. See M 1405.
0106 Monitor Radio Int'l: Magazine Program
0111 Radio Canada Int'l: Spectrum
0115 Spanish National Radio: Panorama
0120 Radio Japan: Spectrum
0130 BBC: Folk Routes. Ian Anderson extends the range of folk music to include country, cajun and blues.
0130 Radio Austria Int'l: Report from Austria
0130 Voice of America (as): VOA Wednesday Morning
0144 Monitor Radio Int'l: Letterbox
0145 BBC: Health Matters. Keeps track of new developments in the world of medical science, as well as ways of keeping fit.

Wednesdays

0100 FEBC (Philippines): Good Morning from Manila
0105 BBC: Outlook. See M 1405.
0106 Monitor Radio Int'l: Magazine Program
0111 Radio Canada Int'l: Spectrum
0112 Radio Prague: Magazine '94
0115 Spanish National Radio: Panorama
0130 BBC: Feature. Playing a Part (8th,15th,22nd). Leading actors continue to discuss how they interpret major Shakespearean roles. Sound business (29th). Advice and pitfalls of starting a business.
0130 Radio Austria Int'l: Report from Austria
0130 Voice of America (as): VOA Thursday Morning
0139 Radio Tirana: PO Box Radio Tirana
0144 Monitor Radio Int'l: Letterbox
0145 BBC: Country Style. With David Allan.

Thursdays

0100 FEBC (Philippines): Good Morning from Manila
0105 BBC: Outlook. See M 1405.
0106 Monitor Radio Int'l: Magazine Program
0111 Radio Canada Int'l: Spectrum
0115 Spanish National Radio: Panorama
0120 Radio Japan: Spectrum
0130 BBC: Waveguide. Hear World Service better.
0130 Radio Austria Int'l: Report from Austria
0130 Voice of America (as): VOA Friday Morning
0140 BBC: Book Choice. Short book reviews every week.
0144 Monitor Radio Int'l: Letterbox
0145 BBC: The Farming World. Reports on new developments from around the world.
0152 Radio Netherlands Int'l: Media Network

Fridays

0100 FEBC (Philippines): Good Morning from Manila
0105 BBC: Outlook. See M 1405.
0106 Monitor Radio Int'l: Magazine Program
0111 Radio Canada Int'l: Spectrum
0115 Spanish National Radio: Panorama
0130 BBC: On the Move. A weekly program about travel and transport with Malcolm Billings.
0130 Radio Austria Int'l: Report from Austria
0130 Voice of America (as): VOA Saturday Morning
0144 Monitor Radio Int'l: Letterbox
0145 BBC: Global Concerns. Update on environmental issues.

Saturdays

0100 FEBC (Philippines): Good Morning from Manila
0105 BBC: Outlook. Interview with Henry Kissinger (1st). The role of the French Resistance in World War II (6th).
0105 BBC: Outlook. See M 1405.
0110 Voice of America (as): VOA Sunday Morning
0111 Radio Canada Int'l: Spectrum
0115 Radio Budapest Int'l: Letter Home
0115 Spanish National Radio: Panorama
0130 BBC: World Brief. 1246 - The Radio Reading Circle
0130 Radio Austria Int'l: Report from Austria
0136 Radio Portugal Int'l: Mailbag (triweekly)
0140 Radio Korea: Listeners' Forum
0145 BBC: Jazz Now and Then. George Reid presents a mixture of jazz for all ages.

0200 UTC SHORTWAVE GUIDE 10:00 PM EDT 7:00 PM PDT

FREQUENCIES

0200-0300 mtwhf	Argentina, RAE	11710am			
0200-0300	Australia, Radio	11880pa	15240pa	15320pa	15365pa
		15510as	17630as	17750as	17795pa
		17860pa	17880as	21525as	21595as
0200-0300 vl	Australia, VL8A Alice Spg	4835do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0230	Canada, RCI Montreal	6120na	9535am	9755na	11845na
		11940am			
0200-0300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0200-0300	Cuba, Radio Havana Cuba	6010na	9510na	9815na	
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11600na		
0200-0250	Germany, Deutsche Welle	7285as	9580as	9615as	9650as
		9690as	11945as	11965as	12045as
		15185as			
0200-0300 as	Guam, KSDA AWR Agat	13720as			
0200-0300 vl	Italy, IRRS Milano	7125eu			
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0230	Myanmar, Radio	7185do			
0200-0300	Netherlands, Radio	9860as	12025as		
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0230 mtwtf	Philippines, FEBC Manila	15450as			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, Radio Moscow Intl	5940am	7130na	7165na	7180na
		7295na	9620na	9695af	9775af
		11675as	11875as	12050as	15425na
		17570as	17605na	17655au	17690na
		21480na	21690as		
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0300	Taiwan, VO Free China	5950na	9680na	9765au	11740ca
		11860as	15345as		
0200-0300	Thailand, Radio	9655as	11905as		
0200-0300	United Kingdom,BBC London	5975na	6175na	6195me	7135me
		7155me	7325na	9410eu	9590na
		9630af	9915am	11705sa	11730af
		11750sa	11955me	15260sa	17790as
0200-0230 vl	USA, KCBI Dallas TX	9815am	13740am		
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	USA, KWHR Naalehu HI	17510as			
0200-0300	USA, Monitor Radio Intl	5850na	9430ca		
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, WCSN Scotts Cor ME	7465am			
0200-0300	USA, WEWN Birmingham AL	7425na			
0200-0300	USA, WHRI Noblesville IN	7315am			
0200-0300	USA, WINB Red Lion PA	11950am			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	USA, WWCR Nashville TN	5810am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0245	USA, WYFR Okeechobee FL	15440na			
0215-0255	Nepal, Radio	3230do	5005do	7165do	
0230-0245	Albania, R Tirana Intl	9580na	9760na		
0230-0300	Hungary, Radio Budapest	5970na	9835na	11910na	15220na
0230-0300 s	Kenya, Kenya BC Corp	4935do			
0230-0245	Pakistan, Radio	7290as	15190as	17705as	17725as
		21730as			
0230-0300	Sweden, Radio	6040na	9850na		
0245-0300	United Kingdom,BBC London	6110sa	9515sa	9895sa	11965sa
		15390sa			
0250-0300	Vatican State, Vatican R	6095na	7305na		

SELECTED PROGRAMS

Sundays

0200 KSDA (Guam): AWR Magazine
0200 WWCR #3: Spectrum (WWCR)
0210 Voice of America (as): VOA Monday Morning
0211 Radio Moscow: Moscow Mailbag
0216 Deutsche Welle: Asia-Pacific Mailbag
0230 BBC: Feature. Peace Can Live (5th). Young people from Sarajevo appeal for action in Yugoslavia (prerecorded). The Greatest Music Festival in the World (12th,19th,26th). The annual Henry Wood Promenade Concerts.
0230 HCJB: Musical Mailbag
0231 Voice of Free China: Mailbag Time
0245 Radio Cairo: Listeners Mail
0245 Radio Romania Int'l: Radio Romania DX Mailbag

Mondays

0205 Radio New Zealand Int'l: In Touch with New Zealand
0211 Radio Moscow: Moscow Mailbag
0217 Radio Havana Cuba: Mailbag Show
0220 Radio Romania Int'l: Listeners' Letterbox
0230 BBC: Composer of the Month. Antonio Vivaldi is featured during June.
0230 Radio Sweden: In Touch with Stockholm (biweekly)
0230 Voice of America (as): VOA Tuesday Morning
0235 Radio Netherlands Int'l: Happy Station
0250 Radio Cairo: Listeners Meeting
0252 Radio Romania Int'l: Listeners Club

Tuesdays

0205 Radio New Zealand Int'l: In Touch with New Zealand
0206 Monitor Radio Int'l: Magazine Program
0230 BBC: Quiz. Brain of Britain. See M 1215.
0230 Voice of America (as): VOA Wednesday Morning
0244 Monitor Radio Int'l: Letterbox

Wednesdays

0205 Radio New Zealand Int'l: In Touch with New Zealand
0206 Monitor Radio Int'l: Magazine Program
0230 BBC: Andy Kershaw's World of Music. Recordings of diverse music from around the world.
0230 Radio Romania Int'l: Youth Club
0230 Voice of America (as): VOA Thursday Morning
0244 Monitor Radio Int'l: Letterbox
0245 Radio Cairo: Listeners Mail

Thursdays

0205 Radio New Zealand Int'l: In Touch with New Zealand
0206 Monitor Radio Int'l: Magazine Program
0211 Radio Moscow: Moscow Mailbag
0230 BBC: Omnibus. See T 2330.
0230 Voice of America (as): VOA Friday Morning
0244 Monitor Radio Int'l: Letterbox

Fridays

0205 Radio New Zealand Int'l: In Touch with New Zealand
0206 Monitor Radio Int'l: Magazine Program
0211 Radio Moscow: Mailbag
0230 BBC: Feature. Lord Edgware Dies (3rd,10th,17th). Into the Blue (24th). See H 1130.
0230 Voice of America (as): VOA Saturday Morning
0244 Monitor Radio Int'l: Letterbox
0245 Radio Cairo: Listeners Mail
0252 Radio Netherlands Int'l: Media Network

Saturdays

0210 Radio Australia: Feedback
0210 Voice of America (as): VOA Sunday Morning
0211 Radio Moscow: Moscow Mailbag
0230 BBC: People and Politics. Background to the British political scene.

Thank You...

Additional contributors to this month's Shortwave Guide:

John Babbis, Silver Spring, MD; C. Clifford Coffman, Hammond, IN; Alfredo E. Cotroneo-President NEXUS; Bob Fraser, Cohasset, MA; John Gomer, Sacramento, CA; Semon Hachikian, Upper Darby, PA; Clyde Harmon, Anniston, AL; Christopher Hynes, Erie, PA; Kevin Nauta, Grand Rapids, MI: Ed Rausch, Cedar Grove, NJ; Robert E. Thomas, Bridgeport, CT; Alden Wires, East Point, GA; *BBC Summary of World Broadcasts*; Grove Enterprises BBS; Internet Shortwave Newsgroup via Larry Van Horn.

FREQUENCIES

0300-0400	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	15510as	17750as	17795pa
		17860pa	17880as	21525as	21595as
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
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, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9780na	11715na	
0300-0400	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0300-0400	Costa Rica,Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6010na	9510na		
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11600na		
0300-0350	Germany, Deutsche Welle	6085na	6185na	9535na	9640na
		9700na	11715na	11750na	
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 vl	Italy, IRRS Milano	7125eu			
0300-0400	Japan, NHK/Radio	5960am	9610as	11875am	15210am
		15325am	17810am	17845am	
0300-0330	Japan, NHK/Radio	11880na	11885na	15230na	
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0325	Netherlands, Radio	9860as	12025as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0350	North Korea, R Pyongyang	6522eu	9345eu		
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia, Radio Moscow Intl	5940am	7130na	7150na	7165na
		7180na	7295na	9675me	9755me
		11675na	12050na	15425na	17570as
		17605na	17655as	17690na	21480na
0300-0400	S Africa, Channel Africa	3220af	5955af		
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765au	11860as
		15345as			
0300-0400	Thailand, Radio	9655as	11905as		
0300-0350	Turkey, Voice of	9445na			
0300-0400 vl	Uganda, Radio	4976do			
0300-0400	Ukraine, R Ukraine Intl	9685na	9860na	11720na	12030na
		15180na	15580na		
0300-0330	United Kingdom,BBC London	11750sa	15260sa	15310as	15380as
0300-0400	United Kingdom,BBC London	3955af	5975na	6005af	6175na
		6180eu	6195eu	7230eu	7325na
		9410eu	9600af	9630af	9915am
		11730af	11760me	11985me	12095ca
		15310me	15420af	21715as	
0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785am			
0300-0400	USA, KWHR Naalehu HI	17510as			
0300-0400	USA, Monitor Radio Intl	5850na			
0300-0400	USA, VOA Washington DC	7105af	7265af	7280af	7405af
		9575af	9885af	11965af	
0300-0400	USA, WCSN Scotts Cor ME	7465am			
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315am			
0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400 vl	USA, WWCR Nashville TN	5810am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0315-0330 sh	Greece, Voice of	9380na	9420na	11645na	
0315-0345	Vatican State, Vatican R	7360af	9695af		
0330-0400	Bulgaria, Radio	9700na	11720na		
0330-0357	Czech Rep, Radio Prague	5930eu	9440eu	11640af	
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	Sweden, Radio	6040na	9850na		
0330-0400	Tanzania, Radio	5050af			
0330-0400	UAE, Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0340-0350	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Armenia, Radio Yerevan	7105na	10344na	17605na	17650na
0345-0400	Tajikistan, Radio	7245as	13675na	15400eu	17890eu
		21485na			

SELECTED PROGRAMS

Sundays
0300 Radio Cairo: Listeners Mail
0310 Voice of America (af): VOA Sunday Morning
0313 Deutsche Welle: Mailbag (biweekly)
0315 BBC: Sports Roundup. The latest sports news.
0330 BBC: From Our Own Correspondent. BBC correspondents comment on the background to the news.
0330 Radio For Peace Int'l: RFPI's Mailbag
0335 BBC (af): Postmark Africa
0350 BBC: Write On. Air your views about World Service: write to PO Box 76, Bush House, Strand, London WC2B 4PH.
0352 Radio Netherlands Int'l: Sounds Interesting

Mondays
0300 WWCR #1: Spectrum (WWCR)
0305 Radio New Zealand Int'l: In Touch with New Zealand
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Radio Japan Magazine Hour
0330 BBC: Anything Goes. See S 1430.
0330 Radio Sweden: In Touch with Stockholm (biweekly)
0335 Radio Netherlands Int'l: Happy Station
0335 Voice of Free China: Mailbag Time
0340 China Radio Int'l: Listeners' Letterbox

Tuesdays
0300 HCJB: Studio 9
0305 Radio New Zealand Int'l: In Touch with New Zealand
0306 Monitor Radio Int'l: Magazine Program
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Radio Japan Magazine Hour
0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
0344 Monitor Radio Int'l: Letterbox

Wednesdays
0300 HCJB: Studio 9
0300 Radio Cairo: Listeners Mail
0305 Radio New Zealand Int'l: In Touch with New Zealand
0306 Monitor Radio Int'l: Magazine Program
0312 Radio Prague: Magazine '94
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Radio Japan Magazine Hour
0315 Radio Philipinas: Listeners and Friends
0330 BBC: Discovery. In-depth look at scientific research.
0330 Radio For Peace Int'l: RFPI's Mailbag
0340 China Radio Int'l: Listeners' Letterbox
0344 Monitor Radio Int'l: Letterbox

Thursdays
0300 HCJB: Studio 9
0305 Radio New Zealand Int'l: In Touch with New Zealand
0306 Monitor Radio Int'l: Magazine Program
0312 Radio Prague: Calling All Listeners
0312 Voice of Turkey: Letter Box
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Radio Japan Magazine Hour
0330 BBC: Assignment. A weekly examination of a topical issue.
0344 Monitor Radio Int'l: Letterbox

Fridays
0300 HCJB: Studio 9
0300 Radio Cairo: Listeners Mail
0305 Radio New Zealand Int'l: In Touch with New Zealand
0306 Monitor Radio Int'l: Magazine Program
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Radio Japan Magazine Hour
0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.
0344 Monitor Radio Int'l: Letterbox
0352 Radio Netherlands Int'l: Media Network

Saturdays
0300 HCJB: Studio 9
0310 Voice of America (af): VOA Saturday Morning
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Each week a classic Top 20 from the past with Paul Burnett.

Here's another QSL from Martin Gallas showing us just how extensive his collection is. This one is from Radio Brazzaville, 1969.

0400 UTC SHORTWAVE GUIDE 12:00 AM EDT 9:00 PM PDT

FREQUENCIES

0400-0500	Australia, Radio	11720pa	11800pa	13605pa	15240pa
		15320pa	15365pa	15415pa	17630pa
		17700pa	17750as	17795pa	17860pa
		21525as	21595as		
0400-0500 vl	Australia, VL8A Alice Spg	4835do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bahrain, Radio	6010do			
0400-0430	Bulgaria, Radio	9700na	11720na		
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9650me	11905me	11925me	15275me
0400-0500	China, China Radio Intl	11680na	11840na		
0400-0500	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0400-0500	Cuba, Radio Havana Cuba	6010na	6180na	9510na	
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0400-0450	Germany, Deutsche Welle	5980af	6015af	6185af	7150af
		7225af	7275af	9565af	9765af
0400-0500	Guatemala, Radio Cultural	3300do			
0400-0415	Israel, Kol Israel	9435na	11605na	17545as	
0400-0500 vl	Italy, IRRS Milano	7125eu			
0400-0500	Kenya, Kenya BC Corp	4935do			
0400-0500 mtwhf	Lebanon, Wings of Hope	9960me			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0425	Netherlands, Radio	6165na	9590na		
0400-0500	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	6130as	15230as	17755as	
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0400-0500	Russia, Radio Moscow Intl	5940eu	7130eu	7150na	7165eu
		7180eu	7270na	7295eu	9465na
		9480na	9580na	9865na	11765af
		12050af	15320me	15375me	15385me
		15425me	17590af	17610af	17655af
		21585af			
0400-0500	S Africa, Channel Africa	3220af	5955af		
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Swaziland, Swazi Radio	6155af			
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	
0400-0430	Tanzania, Radio	5050af			
0400-0430	Thailand, Radio	9655na	11905na		
0400-0500 vl	Uganda, Radio	4976do			
0400-0430	United Kingdom,BBC London	6175na	6180na	7105na	7325na
		9630af	9915am	11760me	11955me
		12095eu	15310as	15575me	21725as
0400-0500	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180af	6195eu	9410af	9600af
		11760af	11820af	21470af	21715as
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, KWHR Naalehu HI	17510as			
0400-0500	USA, Monitor Radio Intl	7465eu	9840af		
0400-0500	USA, VOA Washington DC	5995me	6040me	6140eu	6873eu
		7170eu	7265af	7280af	7405af
		9575af			
0400-0500 vl	USA, WEWN Birmingham AL	7425na			
0400-0500 vl	USA, WHRI Noblesville IN	7315am	9495am		
0400-0500	USA, WINB Red Lion PA	11950eu			
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	5810am	5935am	7435am	
0400-0500	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0458	USA, WYFR Okeechobee FL	9770eu			
0415-0440	Italy, RAI Rome	7275eu	9575eu		
0430-0457	Czech Rep, Radio Prague	5930na	7345af	9440me	
0430-0450	Finland, YLE/Radio	6120af	9655af	11755me	15440af
0430-0500	Nigeria, Radio	3326do	4770do	4990do	
0430-0500	Serbia, Radio Yugoslavia	9580na	11870na		
0430-0500	Swaziland, Trans World R	5055af	7200af	7215af	
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		

SELECTED PROGRAMS

Sundays

0400 HCJB: Sports Spectrum
0405 Swiss Radio Int'l: The Saturday Magazine
0409 Swiss Radio Int'l: The Grapevine
0410 Radio Australia: Feedback
0410 Voice of America (af/me): VOA Sunday Morning
0411 Channel Africa: Good Morning Africa
0411 Radio Prague: Calling All Listeners
0430 BBC: Seeing Stars (1). A discussion of astronomical observations and special events for the near future.
0430 BBC: Short Story. The Wake (12th). The Last Canoe (19th). I Remember Pama (25th). Listeners send in their short stories.
0445 BBC: Music Feature. Pop the Question (29th). First of another series of programs that answer questions about pop music.
0445 BBC: Science and Technology Feature. A Step Too Far (5th,12th,19th). Are Scientific and technological failures forseeable?

Mondays

0407 Radio Canada Int'l: The Mailbag
0417 Radio Havana Cuba: Mailbag Show
0420 Radio Romania Int'l: Listeners' Letterbox
0430 BBC: Off the Shelf. Daily readings from the best of world literature.
0430 Radio New Zealand Int'l: RNZI Mailbox (biweekly)
0430 Voice of America (me): VOA Monday Morning
0440 China Radio Int'l: Listeners' Letterbox
0445 BBC: Feature. All the World's a Football Pitch (6th,13th). A World Cup feature about the social and economic back ground of soccer. A Question of Science (20th,27th). Topical issues which pose dilemmas to scientists are discussed by experts and decision-makers.

Tuesdays

0406 Monitor Radio Int'l: Magazine Program
0411 Channel Africa: Good Morning Africa
0411 Radio Canada Int'l: Spectrum
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America (me): VOA Tuesday Morning
0444 Monitor Radio Int'l: Letterbox
0445 BBC: On Screen. Film reviews and movie news from around the world.

BBC Reminders:

Here are some late-May specials courtesy of Glenn Hauser, in case you don't have your May issue of *MT* handy: *Between Russia and the Reich*, (Latvia) Sun. 29th 1401, 2330, Mon. 0630, 1001. *Cannabis—Weed or Wonderdrug?, Sun. 22nd 0230, 1615, Mon. 0730, Wed. 2215.* Marriage and the Throne, 3 weeks from Sat. 28th 0015, Mon. 1930, Tue. 0915. *Nansen-Explorer and Statesman*, Sun. 29th 0230, 1615, Mon. 0730. Play of the week is *Racing Demon*, Sun. 29th 0030, 1130, 1830. *Brain of Britain* begins 17-week season, Sun. 29th 2030, Mon. 1215, 1715, Tue. 0230. *The Reduced Shakespeare Radio Show*, thru most of June, Weds. 1530, Thurs. 1030, 2330. *The Musician's Musician*, 5 weeks from Sat. 21st 2330, Tue. 1030, Fri. 1715.

Wednesdays

0406 Monitor Radio Int'l: Magazine Program
0411 Channel Africa: Good Morning Africa
0411 Radio Canada Int'l: Spectrum
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America (me): VOA Wednesday Morning
0440 China Radio Int'l: Listeners' Letterbox
0444 Monitor Radio Int'l: Letterbox
0445 BBC: Country Style. See W 0145.

Thursdays

0405 Radio New Zealand Int'l: In Touch with New Zealand (biweekly)
0406 Monitor Radio Int'l: Magazine Program
0411 Channel Africa: Good Morning Africa
0411 Radio Canada Int'l: Spectrum
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America (me): VOA Thursday Morning
0444 Monitor Radio Int'l: Letterbox
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0406 Monitor Radio Int'l: Magazine Program
0411 Channel Africa: Good Morning Africa
0411 Radio Canada Int'l: Spectrum
0430 BBC: Off the Shelf. See M 0430.
0430 Voice of America (me): VOA Friday Morning
0444 Monitor Radio Int'l: Letterbox
0445 BBC: Folk Routes. See T 0130.

Saturdays

0400 HCJB: On Line
0410 Voice of America (af/me): VOA Saturday Morning
0411 Radio Canada Int'l: Spectrum
0430 BBC: Jazz Now and Then. See A 0145.
0430 Radio For Peace Int'l: RFPI's Mailbag
0445 BBC: Worldbrief. Roundup of the week's news headlines, plus everything from sport and finance to best-sellers and weather.

FREQUENCIES

0500-0530	Australia, Radio	17750as			
0500-0600	Australia, Radio	11720pa	11800pa	13605pa	15240pa
		15320pa	15365pa	15415pa	17630pa
		17795pa	17860pa	21525as	21595as
0500-0600 vl	Australia, VL8A Alice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0600	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			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	15430af
		17840af			
0500-0600	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0500-0600	Cuba, Radio Havana Cuba	6010na	6180na	9510na	
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 as	Eqt Guinea, R East Africa	9585af			
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	9515na
		9670na	11705na		
0500-0600	Guatemala, Radio Cultural	3300do			
0500-0600 vl	Italy, IRRS Milano	7125eu			
0500-0600	Japan, NHK/Radio	5975eu	7230eu	9610as	9725am
		11740as	11885as	15410as	17810as
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 mtwhf	Lebanon, Wings of Hope	9960me			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600	New Zealand, R NZ Intl	11900pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0550	North Korea, R Pyongyang	9640me	9977af		
0500-0530 m	Norway, Radio Norway Intl	7165na	9590na		
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia, Radio Moscow Intl	5940na	7105na	7130af	7150na
		7165na	7180na	7330na	9890eu
		11675af	12050me	15465af	17570af
		17590af	17610me	17655af	17835af
		21690af			
0500-0600	S Africa, Channel Africa	9695af			
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Spain, Spanish Natl Radio	9540na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0600	Swaziland, Swazi Radio	6155af			
0500-0530	Swaziland, Trans World R	5055af	7200af	7215af	
0500-0600	Thailand, Radio	9655as	11905as		
0500-0600 vl	Uganda, Radio	4976do			
0500-0600	United Kingdom,BBC London	3955eu	5975na	6005af	6180eu
		6195eu	7325af	9410af	9600af
		9640ca	11735eu	11760me	11820as
		12095af	15070me	15310as	15400af
		15420af	15575me	17830as	21470af
		21715as			
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, KWHR Naalehu HI	17510as			
0500-0600	USA, Monitor Radio Intl	9840af			
0500-0600	USA, VOA Washington DC	6035af	7210af	7405af	9665af
		12080af	15600af		
0500-0530	USA, VOA Washington DC	5995eu	6140eu	6873eu	7170eu
		9530eu	9700eu	11825me	15205me
0500-0600 vl	USA, WHRI Noblesville IN	7315am	9495am		
0500-0600 vl	USA, WINB Red Lion PA	11950am			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	5810am	5935am	7435am	
0500-0600	USA, WYFR Okeechobee FL	5985na	11850eu		
0500-0545	USA, WYFR Okeechobee FL	9870af			
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0510-0520	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, GBC Radio 2	3366do			
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	11810af	15340af	15380af	17790af
0530-0600	Swaziland, Trans World R	7200af	11740af		
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

SELECTED PROGRAMS

Sundays
0510 Voice of America (af/me): VOA Sunday Morning
0513 Deutsche Welle: Mailbag (biweekly)
0516 WYFR: The Mailbag
0530 Radio Austria Int'l: Report from Austria

Mondays
0500 Vatican Radio: Letterbox (monthly)
0500 Voice of Nigeria: Morning Flight
0511 Radio Moscow (na): Moscow Mailbag
0511 Radio Moscow: Mailbag
0517 Radio Havana Cuba: Mailbag Show
0520 Radio Japan: Spectrum
0530 Radio Austria Int'l: Report from Austria
0530 Voice of America (af/me): VOA Monday Morning
0544 Spanish National Radio: Radio Club

Tuesdays
0500 HCJB: Studio 9
0500 Voice of Nigeria: Morning Flight
0506 Monitor Radio Int'l: Magazine Program
0515 Spanish National Radio: Panorama
0530 Radio Austria Int'l: Report from Austria
0530 Voice of America (af/me): VOA Tuesday Morning
0544 Monitor Radio Int'l: Letterbox

Wednesdays
0500 HCJB: Studio 9
0500 Voice of Nigeria: Morning Flight
0506 Monitor Radio Int'l: Magazine Program
0515 Spanish National Radio: Panorama
0520 Radio Japan: Spectrum
0530 Radio Austria Int'l: Report from Austria
0530 Voice of America (af/me): VOA Wednesday Morning
0544 Monitor Radio Int'l: Letterbox

Thursdays
0500 HCJB: Studio 9
0500 Voice of Nigeria: Morning Flight
0506 Monitor Radio Int'l: Magazine Program
0515 Spanish National Radio: Panorama
0530 Radio Austria Int'l: Report from Austria
0530 Voice of America (af/me): VOA Thursday Morning
0544 Monitor Radio Int'l: Letterbox

Fridays
0500 HCJB: Studio 9
0500 Voice of Nigeria: Morning Flight
0506 Monitor Radio Int'l: Magazine Program
0515 Spanish National Radio: Panorama
0530 Radio Austria Int'l: Report from Austria
0530 Voice of America (af/me): VOA Friday Morning
0540 Channel Africa: Letterbox
0544 Monitor Radio Int'l: Letterbox

Saturdays
0500 HCJB: Studio 9
0510 Voice of America (af/me): VOA Saturday Morning
0515 Spanish National Radio: Panorama
0530 Radio Australia Int'l: Report from Austria

John Flake of Charlotte, NC, received this QSL from Radio Australia. If you've received a unique QSL recently, send it to MT and we'll use it as space permits (all original cards are returned).

0600 UTC SHORTWAVE GUIDE 2:00 AM EDT 11:00 PM PDT

FREQUENCIES

0600-0700	Australia, Radio	6020pa	11720pa	11800pa	15240pa
		15320pa	15365pa	17630pa	17670as
		17880as	21525as	21595as	
0600-0700 vl	Australia, VL8A Alice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
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 Peace Intl	7375am	9400am	15030am	21465am
0600-0700	Cuba, Radio Havana Cuba	9510na			
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0700 as	Eqt Guinea, R East Africa	9585af			
0600-0650	Germany, Deutsche Welle	11915af	13790af	15185af	15205af
		17820af	17875af	21680af	
0600-0630	Ghana, GBC Radio 1	4915do			
0600-0615	Ghana, GBC Radio 2	3366do			
0600-0700 vl	Italy, IRRS Milano	7125eu			
0600-0700	Japan, NHK/Radio	11860as	21610as		
0600-0625	Kenya, Kenya BC Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, National Radio of	7116as			
0600-0700 mtwhf	Lebanon, Wings of Hope	9960me			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700	New Zealand, R NZ Intl	11900pa			
0600-0700	Nigeria, Radio	3970do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia, Radio Moscow Intl	5905eu	5940eu	7165eu	7180eu
		7270eu	7330eu	9890eu	11765eu
		13650eu	15190eu	15480me	15550me
		17805me	21610af		
0600-0700	S Africa, Channel Africa	15220af			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, KBS/R Korea	11945na	15155na		
0600-0700	Swaziland, Swazi Radio	6155af			
0600-0700	Swaziland, Trans World R	5055af	7200af	11740af	
0600-0630	Switzerland, Swiss R Intl	9885af	13635af	15430af	
0600-0615 mtwtf	Switzerland, Swiss R Intl	3985eu	6165eu		
0600-0700	United Kingdom,BBC London	3955eu	5975ca	6180af	6195af
		7325af	9410eu	9600af	9640na
		11780eu	11820af	11940af	12095eu
		15360as	15420af	15575eu	17790as
		17830as	17885af	21470me	
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785am			
0600-0700	USA, KWHR Naalehu HI	17510as			
0600-0700	USA, Monitor Radio Intl	9840eu	9870eu		
0600-0700	USA, VOA Washington DC	6035af	7120af	7405af	9530af
		9665af	11950af	12080af	15080af
		15600af			
0600-0630	USA, VOA Washington DC	3980eu	5995eu	6040eu	6060eu
		6140eu	6873eu	7120eu	7170eu
		7325eu	11805me	11825me	15205me
0600-0700	USA, WEWN Birmingham, AL	7425na			
0600-0700 vl	USA, WHRI Noblesville IN	7315am	9495am		
0600-0700 vl	USA, WINB Red Lion PA	11950na			
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5810am	5935am	7435am	
0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu	11770eu	13695af
0625-0700	Kenya, Kenya BC Corp	4935do			
0630-0700	Australia, Radio	9580pa	9860pa	11910pa	
0630-0700	Austria, R Austria Intl	6015na			
0630-0700 mtwtf	Belgium, R Vlaanderen Int	9925eu			
0630-0645	Vatican State, Vatican R	9695af	11625af	15090af	
0632-0641	Romania, R Romania Intl	7225eu	9550eu	9665eu	11810eu
0640-0700	Monaco, Trans World Radio	7385eu			
0645-0700	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

Sundays

0600 HCJB: Musical Mailbag
0605 BBC (af): Postmark Africa
0610 Radio Australia: Feedback
0610 Voice of America (af/me): VOA Sunday Morning
0610 Voice of America (me): VOA Sunday Morning
0611 Radio Moscow (na): Moscow Mailbag
0611 Radio Moscow: Mailbag
0615 BBC: Letter from America. Alistair Cooke shares his inimitable view of contemporary American life.
0615 Voice of Nigeria: Listeners' Letters
0630 BBC: Jazz for the Asking. Record requests with Malcolm Laylock.
0630 Radio Austria Int'l: Report from Austria
0635 Radio Korea: From Us to You
0636 Radio Vlaanderen Int'l: P.O. Box 26

Mondays

0615 BBC: The Learning World. News and views about worldwide education.
0615 Radio Japan: Radio Japan Magazine Hour
0630 BBC: Features. After the Revolution (6th,13th,20th). All Dressed Up (27th). See S 1401.
0630 Radio Austria Int'l: Report from Austria
0630 Voice of America (me): VOA Monday Morning
0640 Radio Korea: Shortwave Feedback

Tuesdays

0606 Monitor Radio Int'l: Magazine Program
0611 Radio Moscow: Moscow Mailbag
0615 BBC: The World Today. See M 1645.
0615 Radio Japan: Radio Japan Magazine Hour
0630 BBC: Music Feature. Duke Ellington—Jazz Genius (7th). Profile of the musician. Notes from Brazil (14th,21st,28th). The music and the musicians of this country.
0630 HCJB: On Line
0630 Radio Austria Int'l: Report from Austria
0630 Voice of America (me): VOA Tuesday Morning
0644 Monitor Radio Int'l: Letterbox

One of the varied QSLs from HCJB, Ecuador.

Wednesdays

0606 Monitor Radio Int'l: Magazine Program
0611 Radio Moscow: Mailbag
0615 BBC: The World Today. See M 1645.
0615 Radio Japan: Radio Japan Magazine Hour
0615 Voice of Med. (Malta): Mailbag
0630 BBC: Meridian Documentary. One of three topical programmes weekly about the world of the arts.
0630 Radio Austria Int'l: Report from Austria
0630 Voice of America (me): VOA Wednesday Morning
0644 Monitor Radio Int'l: Letterbox

Thursdays

0606 Monitor Radio Int'l: Magazine Program
0615 BBC: The World Today. See M 1645.
0615 Radio Japan: Radio Japan Magazine Hour
0630 BBC: Assignment. See H 0330.
0630 Radio Austria Int'l: Report from Austria
0630 Voice of America (me): VOA Thursday Morning
0644 Monitor Radio Int'l: Letterbox

Fridays

0600 Voice of Nigeria: Listeners' Letters
0606 Monitor Radio Int'l: Magazine Program
0615 BBC: The World Today. See M 1645.
0615 Radio Japan: Radio Japan Magazine Hour
0630 BBC: Meridian Books. See W 0630.
0630 Radio Austria Int'l: Report from Austria
0630 Voice of America (me): VOA Friday Morning
0640 Voice of Med. (Malta): Lost Letters
0644 Monitor Radio Int'l: Letterbox

Saturdays

0605 Swiss Radio Int'l: The Saturday Magazine
0609 Swiss Radio Int'l: The Grapevine
0610 Voice of America (af/me): VOA Saturday Morning
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian Reports. See W 0630.
0630 Radio Austria Int'l: Report from Austria
0640 Radio Korea: Listeners' Forum

0700-0730	Australia, Radio	15320pa			
0700-0800	Australia, Radio	6020pa	9580pa	9710pa	9860pa
		11720pa	11880pa	11910pa	15240pa
		15365pa	17695as	17790as	21525as
		21595as			
0700-0800 vl	Australia, VL8A Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio	6010do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0700-0727	Czech Rep, Radio Prague	5930do	7345do	9505do	
0700-0800	Ecuador, HCJB Quito	6205eu	9600eu	9745au	11835eu
		21455eu			
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0715	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do			
0700-0800	Italy, AWR Europe	7230eu			
0700-0800 vl	Italy, IRRS Milano	7125eu			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740af	15270af
		15380me	15410as	17810me	21610au
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 mtwhf	Lebanon, Wings of Hope	9960me			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800 mtwtfa	Monaco, Trans World Radio	7385eu			
0700-0730	Myanmar, Radio	9730do			
0700-0758	New Zealand, R NZ Intl	11900pa			
0700-0800	Nigeria, Radio	3326do	4770do	4990do	
0700-0800	Nigeria, Voice of	7255af			
0700-0800 vl	Papua New Guinea, NBC	9675do			
0700-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, Radio Moscow Intl	5905eu	5930eu	7130af	7165eu
		7180na	7270na	7345na	7370eu
		9890eu	11765me	13650eu	15190eu
		15480me	15550me	17725af	17835af
		21610af			
0700-0715 vl	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Swazi Radio	6155af			
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0715 as	Switzerland, Swiss R Intl	3985eu	6165eu		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom,BBC London	3955eu	5975ca	6190af	6195eu
		7150af	7325eu	9410eu	9600af
		9640na	9660eu	9760eu	11760me
		11780ca	11940af	12095eu	15070eu
		15310as	15400af	15575me	17790af
		17885af	21470af		
0700-0800	USA, KCBI Dallas TX	9815na			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785am			
0700-0800	USA, KWHR Naalehu HI	17510as			
0700-0800	USA, Monitor Radio Intl	9840eu			
0700-0800	USA, WEWN Birmingham AL	7425am	9350am	13615am	
0700-0800 vl	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800 vl	USA, WINB Red Lion PA	11950na			
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5810am	5935am	7435am	
0700-0800	USA, WYFR Okeechobee FL	13695af			
0700-0745	USA, WYFR Okeechobee FL	7355eu	11770eu		
0730-0800	Australia, Radio	9580pa	17750as		
0730-0800	Austria, R Austria Intl	6155me	13710me	15410eu	17870eu
0730-0757	Czech Rep, Radio Prague	17535as	21705af		
0730-0745 sh	Greece, Voice of	9425eu	11645eu	15650eu	
0730-0745 mtwhf	Iceland, Natl BC Service	9265am			
0730-0800	Netherlands, Radio	9630pa	9720pa		
0745-0800	Guam, KTWR Agana	15200as			

0800-0900	Australia, Radio	6020pa	6080pa	7240pa	9580pa
		9710pa	9860pa	11720pa	11910pa
		15240pa	17695as	17750as	21525as
		21595as			
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, Radio	6010do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0800-0830	Ecuador, HCJB Quito	6205eu	9600eu	9745pa	11835eu
		11925pa	17490au	21455eu	
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0900	Finland, YLE/Radio	15445au	17800as		
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900	Guam, KTWR Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752as		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0900 mtwhf	Lebanon, Wings of Hope	9960me			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0820 mtwtfa	Monaco, Trans World Radio	7385eu			
0800-0825	Netherlands, Radio	9630pa	9720pa		
0800-0900	New Zealand, R NZ Intl	6100pa			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	11335na	13760na	15180as	15230as
0800-0850	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	9675do			
0800-0900	Russia, Radio Moscow Intl	7130af	7165eu	9680eu	11690eu
		12010eu	12055af	12070eu	13650eu
		15190eu	15210eu	15485eu	15540eu
		17595eu	21515eu		
0800-0815 vl	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, KBS/R Korea	7550eu	13670me		
0800-0830	South Korea, KBS/R Korea	15575af			
0800-0900	United Kingdom,BBC London	3955eu	6195eu	7150au	7325eu
		9410eu	9640na	9660eu	9760eu
		11760me	11940af	15070eu	15400eu
		15575me	17790as	17885af	21470af
		21660af			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900 vl	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	13615pa			
0800-0900 vl	USA, WEWN Birmingham AL	7425sa	7465eu	9350na	
0800-0900 vl	USA, WHRI Noblesville IN	7315am	7355am		
0800-0900 vl	USA, WINB Red Lion PA	11950na			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5810am	5935am	7435am	
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	15450au	17870au		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Netherlands, Radio	5955eu	9720pa	9895pa	
0835-0845 s	Monaco, Trans World Radio	7385eu			

5th Anniversary

1994 MONITORING TIMES CONVENTION

October 21, 22, 23, 1994

Airport Hilton
Atlanta, Georgia

OVER $8000 IN ICOM PRODUCTS TO BE GIVEN AWAY!

Must be convention registrant in attendance to be eligible.

Enjoy accommodations at the ***Atlanta Airport Hilton*** and receive the special nightly rate of only **$71** (save 50% off the regular $140 per night rate!) which includes the following:

- **Same rate single or double!**
- **Free parking!**
- **Complimentary airport shuttle!**
- **Baggage check-out for Delta!**

REGISTER NOW!

Call the Hilton TODAY at 1-800-HILTONS to make your room reservation— SPACE IS LIMITED!

Be sure to mention Monitoring Times when making your reservation to receive the special room rate. Reservations must be made by September 21, 1994!

This three day weekend is full of activities for the radio enthusiast—*for only $50 registration:*

- ***Dozens of exhibitors*** with the latest equipment and accessories for radio monitoring, including: Christian Science Monitor, Grove Enterprises, ICOM America, Optoelectronics, Sony, and many more!
- Join your fellow monitors at a ***professional listening post*** featuring the Grove SDU-100 Spectrum Display Unit as well as other products designed to enhance your radio monitoring.
- A ***two hour international broadcasters forum*** starts off the weekend Friday evening and is hosted by moderator Ian McFarland.
- Attend any of ***over 20 seminars*** covering such topics as the future of shortwave broadcasting, choosing a scanner or shortwave rad o, LOWFER monitoring, digital communications, spy numbers stations, surveillance, clandestine and pirate broadcasting, antenna theory, military and aero monitoring, and much more!
- Saturday evening's banquet will feature ***guest speaker international broadcaster Ian McFarland.***
- Get your scanner charged and ready for the ***"Bug Hunt"***—a highlight at each convention!
- Visit ***Delta Airline's Communication Center*** and ***Delta's Maintenance and Flight Operations Division***. Tours will be conducted on Friday.

SCHEDULE

Friday, October 21
11:00 am to 5:00 pm
Registration Open
12:00 to 5:00 pm
Exhibits and Listening Post Open
7:00 to 9:15 pm
"International Broadcaste"s Forum"

Saturday, October 22
8:00am to 3:00 pm
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
9:30 pm
Transmitter Bug Hunt

Sunday, October 23
9:00 am to 12:30 pm
Morning Seminars

PRE-REGISTRATION FORM

Deadline 9-21-94

[ ] Enclosed is my $50 registration fee!
[ ] Enclosed is my $21.95 banquet fee!

Name: _____

Address: _____

City: _____ State: _____ Zip: _____ Phone #: _____

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ICOM™ IC-R7100
Sweeping 1800 Channels/Minute

DELTACOMM™ I-7100 communication manager and your MS-DOS computer gives you a custom interface integrated with optimized software that will not just control but will maximize the potential of your R7100. Here are a few (there are many more) examples of the advanced features DELTACOMM™ I-7100 has to offer.

- DELTACOMM™ I-7100 CYBERSCAN feature for monitoring systems employing cluster or frequency hopping techniques.
- Individually programmable database volume levels (by channel) while scanning.
- Spectrum log function will sweep a frequency spectrum, generate a histogram and log frequency/activity to screen and/or disk in real time.

- Dual squelch detect electronics integrated with DELTACOMM™ I-7100 software guarantees optimum speed and performance during a frequency search or database scan.
- Programmable signal strength threshold limits with full 8-bit accuracy allow selective monitoring and logging. Only stations having signal strength less than or greater than or within upper/lower user defined signal strength window limits will be monitored and/or logged.
- Continously updating activity information window displays the last 19 active channels.
- Channel activity status is displayed in real time with activity log function. To determine system loading when first 5 channels are simultaneously busy, "All Trunks Busy" message is logged to disk.
- Receiver characterization with DELTACOMM™ I-7100 birdie log function automatically logs any receiver birdies prior to a frequency search operation. Birdie channels are then locked out during a frequency search operation, thus eliminating false channel logging.
- Custom interface allows selective program control of relay contact. Possible uses include activating an operator alert, switching antennas via coax relay or turning on a tape recorder when user defined frequencies are found to be active.

DELTACOMM™ I-7100 communication manager comes complete with Delta Research custom (CI-V) communication interface, UL listed power supply, manual and receiver interface cable for $349.00 + $8.00 (U.S.) or $25.00 (foreign) S&H. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7000, R71A, R72 and IC735. Performance is proportional to video card, type of computer and receiver squelch detection method.

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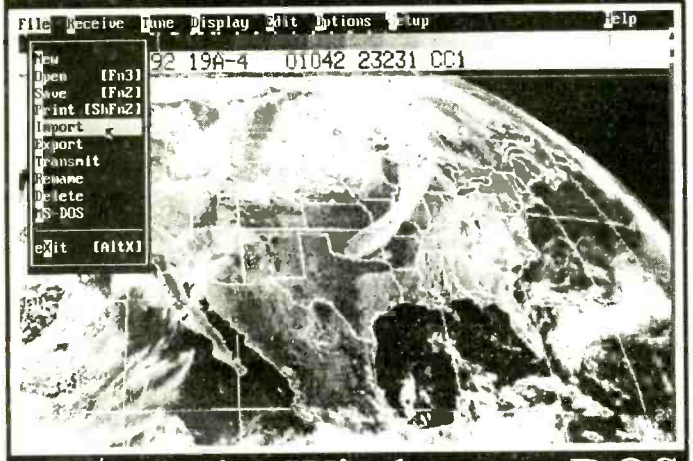

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0900-1000	Australia, Radio	6020pa	9510as	9580pa	9710pa
		9860pa	13605as	15170as	21745as
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-0930 mtwtf	Belgium, R Vlaanderen Int	6035eu			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa	17710pa	
0900-1000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-1000 as	Eqt Guinea, R East Africa	9585af			
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	15435as	17715as	17780as
		17800af	21600af	21680as	
0900-0915 mtwtf	Ghana, GBC Radio 1	4915do			
0900-0915	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWR Agana	11805au			
0900-0915	Guam, KTWR Agana	15200as			
0900-1000 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio	9610as	9750as	11815as	15195as
		15270au			
0900-1000 mtwhf	Lebanon, Wings of Hope	9960me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0930	Netherlands, Radio	5955eu	9720pa	9895eu	
0900-1000	New Zealand, R NZ Intl	6100pa			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwtfa	Palau, KHBN Voice of Hope	9830as			
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Radio Moscow Intl	9680eu	12070eu	13650eu	15190eu
		15210eu	15345eu	15380eu	15440eu
		15495eu	15540eu	17595eu	17605eu
		17760eu	21515eu	21540eu	

0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9660eu	9740eu	9750eu	9760eu
		11760me	11940af	12095eu	15070eu
		15190sa	15310as	15400af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af		
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	9840pa	13615pa	
0900-1000	USA, WEWN Birmingham AL	9350na	12160eu		
0900-1000 vl	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000 vl	USA, WINB Red Lion PA	11950na			
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-1000	Ghana, GBC Radio 2	6130do	7295do		
0920-0935 sh	Greece, Voice of	15650au	17525au		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	5955eu	9715pa	9720pa	9895eu
		12065as	15470as		
0930-1000	Philippines, FEBC Manila	11690as			
0940-0950	Greece, Voice of	15650au	17525au		
0945-1000 s	Armenia, Radio Yerevan	15455eu	15485eu	15510eu	

1000-1100	Australia, Radio	9580pa	9860pa	15170as	21745as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa	17710pa	
1000-1100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 as	Eqt Guinea, R East Africa	9585af			
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1030	Israel, Kol Israel	15640na	15650as	17575eu	
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 vl	Italy, IRRS Milano	7125eu			
1000-1100 mtwhf	Lebanon, Wings of Hope	9960me			
1000-1100 vl	Malaysia, RTM Kota Kinaba	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	Netherlands, Radio	12065as	15470as		
1000-1030	Netherlands, Radio	5995eu	9715pa	9720pa	9895eu
1000-1100	New Zealand, R NZ Intl	6100pa			
1000-1050	North Korea, R Pyongyang	15340as	17765as		
1000-1100 mtwhfa	Palau, KHBN Voice of Hope	9830as			
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC Manila	11690as			
1000-1100	Russia, Radio Moscow Intl	7205eu	9750eu	11675na	12015eu
		12020eu	12070eu	13650eu	15175eu
		15210eu	15320na	15380eu	15435na
		15465na	15470na	17710na	17760eu
		21515eu	21540eu		
1000-1100	S Africa, Channel Africa	17810af			
1000-1100	United Kingdom,BBC London	6190af	6195af	9410eu	9660eu
		9750eu	9760eu	11750me	11940af
		12095eu	15070eu	15190sa	15310as
		15400af	15575me	17640eu	17705eu
		17790af	17885af	21470af	21660af
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	7395sa	7465na	13625pa	17555as
1000-1100	USA, VOA Washington DC	5985as	7405am	9590am	11915am
		15120am			
1000-1100	USA, WEWN Birmingham AL	9370as			
1000-1100 vl	USA, WHRI Noblesville IN	7315am	7355am		
1000-1100 vl	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5810am	5935am		
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1030-1100	Austria, R Austria Intl	15450au	17870au		
1030-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1030-1100	South Korea, KBS/R Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605eu

FREQUENCIES

1100-1200	Australia, Radio	5995pa	6020pa	6080as	7240pa
		9510as	9580pa	9710as	9860pa
		13605as	15170as	17910as	
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af	21600af	
1100-1115	Ghana, GBC Radio 1	4915do			
1100-1200 vl	Italy, IRRS Milano	7125eu			
1100-1200	Japan, NHK/Radio	6120na	9610as	15295as	
1100-1200 mtwhf	Lebanon, Wings of Hope	9960me			
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do			
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do		
1100-1200	New Zealand, R NZ Intl	6100pa			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1120	Pakistan, Radio	17900as	21520as		
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as			
1100-1200 vl	Papua New Guinea, NBC	4890do	9675do		
1100-1200	Russia, Radio Moscow Intl	7205eu	9705eu	11675eu	12015eu
		12020eu	12055eu	12070eu	15150as
		15175as	15210eu	15280as	15290as
		15320as	15335eu	15435as	15480as
		15585eu	17605eu	17690eu	17710as
		17760eu	17805as	17880eu	21515eu
1100-1200	S Africa, Channel Africa	9730af			
1100-1200	Singapore,R Singapore Int	9530as			
1100-1130	Sri Lanka, SLBC Colombo	11835au	15120as	17850as	
1100-1145	Switzerland, Swiss R Intl	13635as	15505as	17515as	
1100-1200	United Kingdom,BBC London	5965na	5975na	6190af	6195na
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11770me	11940af
		12095eu	15070eu	15220na	15310as
		15400af	17640eu	17705eu	17790sa
		17885me	21470af	21660af	
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	7395ca	7465na	9425pa	
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9760as	11720au	11915am	15120am
		15160au	15425as		
1100-1200	USA, WEWN Birmingham AL	9350na	9370as		
1100-1200 vl	USA, WHRI Noblesville IN	7315am	9850am		
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCR Nashville TN	5935am	15685am		
1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1130-1200	Austria, R Austria Intl	6155eu	13730na		
1130-1157	Czech Rep, Radio Prague	7345eu	11990eu	15355eu	
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1200 mtwhfa	Finland, YLE/Radio	11900na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790as	11910as
		11930as			
1130-1200	Netherlands, Radio	5955eu	9850eu		
1130-1200	Sweden, Radio	13775au	15120as	15240as	
1130-1200	Thailand, Radio	9655as	11905as		
1130-1200	Vietnam, Voice of	6115as	10059as	12025as	15010as

SELECTED PROGRAMS

Sundays

1130 BBC: The John Dunn Show. See S 0030.
1130 Radio Austria Int'l: Report from Austria
1130 Radio For Peace Int'l: RFPI's Mailbag
1130 Radio Sweden: In Touch with Stockholm (biweekly)
1135 Radio Netherlands Int'l: Happy Station

Mondays

1100 WYFR (Satellite Network): Good Morning
1130 Radio Austria Int'l: Report from Austria
1130 Radio Japan: Radio Japan Magazine Hour
1130 Voice of America (ca): VOA Monday Morning

Tuesdays

1100 WYFR (Satellite Network): Good Morning
1106 Monitor Radio Int'l: Magazine Program
1115 AWR Latin America: Listener Mail
1130 BBC: Megamix. Compendium of music, sport, fashion, health, travel, news and views for young people.
1130 Radio Austria Int'l: Report from Austria
1130 Radio Japan: Radio Japan Magazine Hour
1130 Voice of America (ca): VOA Tuesday Morning
1144 Monitor Radio Int'l: Letterbox

Wednesdays

1100 WYFR (Satellite Network): Good Morning
1106 Monitor Radio Int'l: Magazine Program
1130 BBC: Meridian Documentary. See W 0630.
1130 Radio Austria Int'l: Report from Austria
1130 Radio For Peace Int'l: RFPI's Mailbag
1130 Radio Japan: Radio Japan Magazine Hour
1130 Voice of America (ca): VOA Wednesday Morning
1144 Monitor Radio Int'l: Letterbox

Thursdays

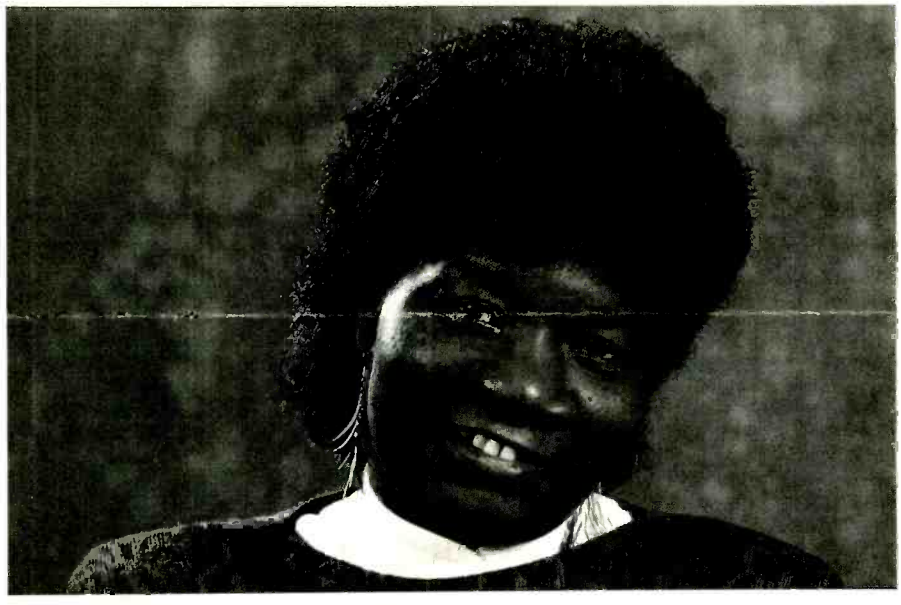
1100 WYFR (Satellite Network): Good Morning
1106 Monitor Radio Int'l: Magazine Program
1130 BBC: Feature. Lord Edgware Dies (2nd,9th,16th). Investigations of an Agatha Christie thriller. Into the Blue (23rd,30th). Dramatization of Robert Goddard's best selling novel.
1130 Radio Austria Int'l: Report from Austria
1130 Radio Japan: Radio Japan Magazine Hour
1130 Voice of America (ca): VOA Thursday Morning
1140 Radio Japan: Crosscurrents
1144 Monitor Radio Int'l: Letterbox
1152 Radio Netherlands Int'l: Media Network

Fridays

1100 WYFR (Satellite Network): Good Morning
1106 Monitor Radio Int'l: Magazine Program
1130 BBC: Meridian Books. See W 0630.
1130 Radio Austria Int'l: Report from Austria
1130 Radio Japan: Radio Japan Magazine Hour
1130 Voice of America (ca): VOA Friday Morning
1144 Monitor Radio Int'l: Letterbox

Saturdays

1100 Voice of Asia: Letterbox/Songs by Request
1100 WYFR (Satellite Network): Good Morning
1105 Swiss Radio Int'l: The Saturday Magazine
1109 Swiss Radio Int'l: The Grapevine
1130 BBC: Meridian Reports. See W 0630.
1130 Radio Austria Int'l: Report from Austria
1134 Deutsche Welle: Mailbag Africa
1152 Radio Netherlands Int'l: Sounds Interesting



Veronica Wilson hosts "Airtime Africa" as well as special documentaries for Radio Netherlands.

1200 UTC SHORTWAVE GUIDE 8:00 AM EDT 5:00 AM PDT

FREQUENCIES

1200-1300	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		11800pa	13605pa	15170pa	15565pa
		17910as			
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	15445na			
1200-1300	Bulgaria, Radio	17625au			
1200-1215	Cambodia, Natl Voice of	11938as			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635na	9705na	11855na	17820na
1200-1300	China, China Radio Intl	9655na	9715as	11660as	11795as
		15440pa			
1200-1300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1200-1300	France, Radio France Intl	9805eu	15155eu	15195eu	15530na
		17575na			
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790as	11910as
		11930as			
1200-1300 vl	Italy, IRRS Milano	7125eu			
1200-1300	Jordan, Radio	9560eu			
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1206	New Zealand, R NZ Intl	6100pa			
1200-1230 s	Norway, Radio Norway Intl	17860as			
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as			
1200-1230 a	Palau, KHBN Voice of Hope	9830as			
1200-1300 vl	Papua New Guinea, NBC	4890do	9675do		
1200-1300	Russia, Radio Moscow Intl	9705af	11980eu	11985eu	12020eu
		12030eu	12055eu	12070eu	13670eu
		15175af	15280af	15290eu	15320eu
		15335af	15380na	15440eu	15465af
		15480me	15495eu	15525af	15540eu
		15585eu	17760na	17880eu	
1200-1300	Singapore,R Singapore Int	9530as			
1200-1300	South Korea, KBS/R Korea	7180as			
1200-1230	Thailand, Radio	9655as	11905as		
1200-1300	United Kingdom,BBC London	5965af	6190af	6195am	9410eu
		9515na	9660eu	9740na	9750eu
		9760eu	11760me	11940af	12095eu
		15070eu	15220na	15310as	15400af
		15575me	17640eu	17705eu	17790af
		17885af	21470af	21660af	
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300 vl	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	7465ca	9425pa	9455na	13625as
1200-1300	USA, VOA Washington DC	6110as	9560as	9760as	11715au
		15160as	15425as		
1200-1300	USA, WEWN Birmingham AL	9350na	9985ca		
1200-1300 vl	USA, WHRI Noblesville IN	7315am	9850am		
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCR Nashville TN	5935am	15685am		
1200-1300	USA, WYFR Okeechobee FL	5950na	6015na	11830na	17750na
1200-1230	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17745as
1200-1300	Vietnam, Voice of	6115as	10059as	12025as	15010as
1207-1300 ocasnal	New Zealand, R NZ Intl	9700pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1230 vl	Ghana, GBC Radio 1	4915do			
1230-1300	Bangladesh, Radio	11770as	13620as		
1230-1300 s	Belgium, R Vlaanderen Int	17775as			
1230-1300	Canada, RCI Montreal	9660as	15195as		
1230-1300 mtwhfa	Finland, YLE/Radio	11900na	15400na		
1230-1300	Ghana, GBC Radio 2	6130do	7295do		
1230-1300	Netherlands, Radio	5955eu	9650eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1230-1300	Sweden, Radio	15240as	17870na		
1230-1300	Turkey, Voice of	9675as			
1240-1250	Greece, Voice of	11645af			

SELECTED PROGRAMS

Sundays

1201 BBC: Plays of the Week. See S 0101.
1230 Radio Sweden: In Touch with Stockholm (biweekly)
1232 Radio France Int'l: Club 9516
1235 Radio Vlaanderen Int'l: P.O. Box 26
1236 Radio Korea: Shortwave Feedback
1237 Radio Canada Int'l: The Mailbag
1240 China Radio Int'l: Listeners' Letterbox

Mondays

1200 HCJB: Morning in the Mountains
1200 Radiobras: Brazilian Panorama
1200 WYFR (Satellite Network): Good Morning
1209 BBC: Words of Faith. People of all faiths share how their scripture gives authority and meaning to their lives.
1210 Radio Canada Int'l: The Mailbag
1215 BBC: Quiz. Brain of Britain. The first round of this popular general knowledge contest continues.
1230 Voice of America (as): Magazine Show
1241 Radio Canada Int'l: Spectrum
1245 BBC: Sports Roundup. See S 0315.

Tuesdays

1200 HCJB: Morning in the Mountains
1200 Radiobras: Brazilian Panorama
1200 WYFR (Satellite Network): Good Morning
1206 Monitor Radio Int'l: Magazine Program
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Multitrack 1: Top 20. See M 2330.
1230 Voice of America (as): Magazine Show
1240 China Radio Int'l: Listeners' Letterbox
1241 Radio Canada Int'l: Spectrum
1244 Monitor Radio Int'l: Letterbox
1245 BBC: Sports Roundup. See S 0315.

Wednesdays

1200 HCJB: Morning in the Mountains
1200 Radiobras: Brazilian Panorama
1200 WYFR (Satellite Network): Good Morning
1206 Monitor Radio Int'l: Magazine Program
1209 BBC: Words of Faith. See M 1209.
1215 BBC: New Ideas. See M 1615.
1230 Voice of America (as): Magazine Show
1235 BBC: Feature. Personal Obsessions. See T 1635.
1241 Radio Canada Int'l: Spectrum
1244 Monitor Radio Int'l: Letterbox
1245 BBC: Sports Roundup. See S 0315.
1245 Voice of Turkey: Letter Box

Thursdays

1200 HCJB: Morning in the Mountains

Voice of Asia announcer Andri Theodores.

1200 Radiobras: Brazilian Panorama
1200 WYFR (Satellite Network): Good Morning
1206 Monitor Radio Int'l: Magazine Program
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Multitrack 2. See W 2330.
1230 Voice of America (as): Magazine Show
1241 Radio Canada Int'l: Spectrum
1241 Radio France Int'l: The Americas Magazine
1242 Radio Bangladesh: Panorama
1244 Monitor Radio Int'l: Letterbox
1245 BBC: Sports Roundup. See S 0315.

Fridays

1200 HCJB: Morning in the Mountains
1200 Radiobras: Brazilian Panorama
1200 WYFR (Satellite Network): Good Morning
1206 Monitor Radio Int'l: Magazine Program
1209 BBC: Words of Faith. See M 1209.
1215 BBC: Feature. Shakespeare on Trial (3rd). Re-examining the playwright's reputation from a global and contemporary point of view. The Living Soil (10th,17th). Digging into the rich life of topsoil.
1215 BBC: Quiz. Brush Up Your Shakespeare (24th). Testing the panelists knowlege of the works of the great bard.
1230 Voice of America (as): Magazine Show
1241 Radio Canada Int'l: Spectrum
1244 Monitor Radio Int'l: Letterbox
1245 BBC: Sports Roundup. See S 0315.

Saturdays

1200 WYFR (Satellite Network): Good Morning
1209 BBC: Words of Faith. See M 1209.
1210 Voice of America (as): Communications World
1215 BBC: Multitrack 3. See F 2330.
1230 Radio For Peace Int'l: RFPI's Mailbag
1230 Voice of America (as): Weekend Magazine
1235 Radio Korea: From Us to You
1245 BBC: Sports Roundup. See S 0315.

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240pa	11800pa	
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1330 mtwtf	Belgium, R Vlaanderen Int	17775as			
1300-1320	Brazil, Radiobras	15445na			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	9715as	11660as	15440pa	
1300-1400 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330	Ghana, GBC Radio 1	4915do			
1300-1325 smtwh	Israel, Kol Israel	15640na	15650as		
1300-1400 vl	Italy, IRRS Milano	7125eu			
1300-1400 mtwhf	Lebanon, Wings of Hope	9960me			
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400 ocasnaf	New Zealand, R NZ Intl	9700pa			
1300-1350	North Korea, R Pyongyang	13760na	15230na		
1300-1330 s	Norway, Radio Norway Intl	9590eu			
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			
1300-1400 vl	Papua New Guinea, NBC	9675do			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	
1300-1400	Russia, Radio Moscow Intl	7205as	7295as	9560as	9635as
		9830af	9890eu	11675eu	11980eu
		12030eu	12065eu	15105eu	15210eu
		15290me	15380eu	15440eu	15455me
		15480me	15495eu	15540eu	17760eu
		17880eu	21540eu	21610af	21785af
1300-1400	Singapore, SBC Radio One	6155do			
1300-1330	South Korea, KBS/R Korea	9570as	13670as		
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
1300-1400	United Kingdom,BBC London	5965af	6190af	6195am	7180as
		9410eu	9515na	9580as	9660eu
		9740na	9760eu	11750as	11760me
		11820na	11940af	12095eu	15070eu
		15220na	15310as	15400af	15420af
		15575me	17640eu	17705eu	17790af
		17885af	21470af	21660af	
1300-1400	USA, KCBI Dallas TX	9815am			
1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400 vl	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400 vl	USA, KWHR Naalehu HI	9930as			
1300-1400	USA, Monitor Radio Intl	7465na	13625as		
1300-1400	USA, VOA Washington DC	6110as	9560as	9760as	11715au
		15160as	15425as		
1300-1400	USA, WEWN Birmingham AL	9350na	15695na		
1300-1400 vl	USA, WHRI Noblesville IN	9465am	15105am		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	5935am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
		17750na			
1300-1330	Vietnam, Voice of	6115as	10059as	12025as	15010as
1330-1400	Austria, R Austria Intl	15450as			
1330-1400	Canada, RCI Montreal	9535as	11795as	11935eu	15315eu
		15325eu	17820eu	17895af	21455eu
1330-1400	Finland, YLE/Radio	11900na	15400na		
1330-1400 tw	Ghana, GBC Radio 1	4915do			
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	15530as
1330-1400	Sweden, Radio	15240na	17870na		
1330-1400	UAE, Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17745as
1335-1345	Greece, Voice of	15630na	17535na		
1345-1400 vl	Myanmar, Radio	7185do			
1345-1400	Vatican State, Vatican R	11640as	15090as	17525au	

SELECTED PROGRAMS

Sundays
1307 Radio Korea: Shortwave Feedback
1307 Voice of Israel: Calling All Listeners
1311 Radio Canada Int'l: Sunday Morning
1320 Radio Romania Int'l: Listeners' Letterbox
1330 IRRS: Hello There
1330 Radio Austria Int'l: Report from Austria
1335 Radio Netherlands Int'l: Happy Station
1340 China Radio Int'l: Listeners' Letterbox
1340 FEBC (Philippines): Mailbag
1352 Radio Romania Int'l: Listeners Club

Mondays
1311 Radio Moscow: Mailbag
1330 Radio Austria Int'l: Report from Austria
1341 Radio Canada Int'l: Spectrum

Tuesdays
1306 Monitor Radio Int'l: Magazine Program
1330 Radio Austria Int'l: Report from Austria
1340 China Radio Int'l: Listeners' Letterbox
1341 Radio Canada Int'l: Spectrum
1344 Monitor Radio Int'l: Letterbox

Wednesdays
1306 Monitor Radio Int'l: Magazine Program
1311 Radio Moscow: Moscow Mailbag
1320 Radio Vlaanderen Int'l: PO Box 26
1330 Radio Austria Int'l: Report from Austria
1341 Radio Canada Int'l: Spectrum
1344 Monitor Radio Int'l: Letterbox

Thursdays
1306 Monitor Radio Int'l: Magazine Program
1330 Radio Austria Int'l: Report from Austria
1341 Radio Canada Int'l: Spectrum
1344 Monitor Radio Int'l: Letterbox
1352 Radio Netherlands Int'l: Media Network

Fridays
1306 Monitor Radio Int'l: Magazine Program
1311 Radio Moscow: Mailbag
1330 Radio Austria Int'l: Report from Austria
1341 Radio Canada Int'l: Spectrum
1341 Radio Romania Int'l: Listeners' Letterbox
1344 Monitor Radio Int'l: Letterbox

Saturdays
1305 Swiss Radio Int'l: The Saturday Magazine
1307 Radio Korea: From Us to You
1309 Swiss Radio Int'l: The Grapevine
1330 Radio Austria Int'l: Report from Austria
1344 Radio Romania Int'l: Radio Romania DX Mailbag
1352 Radio Netherlands Int'l: Sounds Interesting

1400 UTC SHORTWAVE GUIDE 10:00 AM EDT 7:00 AM PDT

FREQUENCIES

1400-1500	Australia, Radio	5995pa	7240pa	9580pa	9710pa
		11660pa	11695pa	11800pa	
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500	Bahrain, Radio	6010do			
1400-1500	Bulgaria, Radio	15460as	17705as		
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820am		
1400-1500	China, China Radio Intl	7405na	9785na	11815as	15165as
1400-1500 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1400-1500	France, Radio France Intl	11910as	12035as	17650me	
1400-1420	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	6130do	7295do		
1400-1500	India, All India Radio	11760as	15120as		
1400-1500	Iraq, Radio Iraq Intl	15250as			
1400-1500 vl	Italy, IRRS Milano	7125eu			
1400-1500	Japan, NHK/Radio	9535na	9750as	11705as	11840as
		11915am			
1400-1500 mtwhf	Lebanon, Wings of Hope	9960me			
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500 vl	Malaysia, RTM Sarawak	4950do			
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af			
1400-1500 vl	Myanmar, Radio	7185do			
1400-1500	Netherlands, Radio	9890as	13700as	15530as	
1400-1500 ocasnal	New Zealand, R NZ Intl	9700pa			
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow Intl	7105na	7135na	7170na	7345as
		9550na	9560as	9890eu	15105eu
		15210na	15290na	15320na	15345af
		15380na	15455eu	15540eu	17595eu
		17685eu	17760eu	21610eu	
1400-1500 vl	Rwanda, Radio Rwanda	9610do			
1400-1500	Singapore, SBC Radio One	6155do	9740as		
1400-1500	Slovakia, AWR Europe	13790as			
1400-1500	South Korea, KBS/R Korea	5975as			
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1400-1500	United Kingdom,BBC London	6195as	7180as	9410eu	9515na
		9660eu	9740eu	9750eu	11750as
		12095eu	15070eu	15260af	15310me
		15400af	15575me	17640af	17705eu
		17790af	17840af	17880af	21660af
1400-1500	USA, KCBI Dallas TX	15725am			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510na			
1400-1500	USA, KWHR Naalehu HI	9930as			
1400-1500	USA, Monitor Radio Intl	9355as	11900na		
1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
		11705au	15160as	15205au	15395au
		15425as			
1400-1500 vl	USA, WEWN Birmingham AL	9350na			
1400-1500 vl	USA, WHRI Noblesville IN	9465am	15105am		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WWCR Nashville TN	13845am	15685am		
1400-1500	USA, WYFR Okeechobee FL	6015na	11830na	17750na	
1400-1415	Vatican State, Vatican R	11640as	15090as	17525au	
1415-1425	Nepal, Radio	3230do	5005do	7165do	
1430-1500	Australia, Radio	5995pa	6060pa	6080as	7260as
		9510as	9580pa	11660pa	11680as
		11695pa	11800pa		
1430-1500	Austria, R Austria Intl	6155eu	9870af	13730af	15450as
1430-1500	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am
1430-1500	Myanmar, Radio	5990do			
1430-1500	Netherlands, Radio	15150as			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1445-1500	Guam, KTWR Agana	15610as			
1445-1500 smha	Mongolia, R Ulaanbaatar	7260as	7780as		

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. After the Revolution (5th,12th,19th). NEW. The breakup of the Soviet Union's effects on the Baltic states of Latvia, Lithuania, and Estonia. All Dressed Up (26th). Exploring the art of embalming.
1405 Radio Canada Int'l: Sunday Morning (Centerpoint)
1430 BBC: Anything Goes. A variety of music and much more with Bob Holness.
1430 Radio Austria Int'l: Report from Austria
1432 Radio France Int'l: Club 9516
1436 Radio Korea: Shortwave Feedback
1440 China Radio Int'l: Listeners' Letterbox

Mondays

1400 BBC (as): Dateline East Asia
1405 BBC: Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
1406 Monitor Radio Int'l: Magazine Program
1420 Radio Japan: Spectrum
1425 All India Radio: Faithfully Yours
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Austria Int'l: Report from Austria
1444 Monitor Radio Int'l: Letterbox
1445 BBC: Feature. Marriage and the Throne (6th,13th). See M 0015.
1445 BBC: Sports. Sportsworld - Wimbledon (20th,27th). Tennis action from the All England Club.

Tuesdays

1400 BBC (as): Dateline East Asia
1405 BBC: Outlook. See M 1405.
1406 Monitor Radio Int'l: Magazine Program
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Austria Int'l: Report from Austria
1440 China Radio Int'l: Listeners' Letterbox
1444 Monitor Radio Int'l: Letterbox
1445 BBC: Music Feature. Crossing the Border (7th,14th). See M 0145.

Wednesdays

1400 BBC (as): Dateline East Asia
1405 BBC: Outlook. See M 1405.
1406 Monitor Radio Int'l: Magazine Program
1415 Voice of Med. (Malta): Mailbag
1420 Radio Japan: Spectrum
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Austria Int'l: Report from Austria
1444 Monitor Radio Int'l: Letterbox
1445 BBC: Good Books. See S 0015.

Thursdays

1400 BBC (as): Dateline East Asia
1405 BBC: Outlook. See M 1405.
1406 Monitor Radio Int'l: Magazine Program
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Austria Int'l: Report from Austria
1444 Monitor Radio Int'l: Letterbox
1445 BBC: Sports. Sportsworld - Racing from Ascot, The Gold Cup (19th). Sportsworld - Wimbledon (23rd,30th). See M 1445.
1445 BBC: The Learning World. See M 0615.

Fridays

1400 BBC (as): Dateline East Asia
1405 BBC: Outlook. See M 1405.
1406 Monitor Radio Int'l: Magazine Program
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Austria Int'l: Report from Austria
1440 Voice of Med. (Malta): Lost Letters
1444 Monitor Radio Int'l: Letterbox
1445 BBC: Global Concerns. See F 0145.
1445 BBC: Sports. Sportsworld - Wimbledon (24th). See M 1445.

Saturdays

1401 BBC: Sportsworld. The weekly sports magazine.
1415 Radio Bulgaria: Answering Your Letters
1430 Radio Austria Int'l: Report from Austria
1435 Radio Korea: From Us to You

Howard Shannon is the host of "Bats, Balls and Baselines" for Radio Netherlands.

FREQUENCIES

1500-1600	Algeria, R Algiers Intl	11715af	15205me	17745eu	
1500-1600	Australia, Radio	5995pa	6060pa	6080pa	7240pa
		7260as	9510as	9710pa	9770as
		11660as	11680as	11695pa	11800pa
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600	Bahrain, Radio	6010do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955na	17820na		
1500-1600	China, China Radio Intl	7405na	9785na	11815as	15165as
1500-1600 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1500-1600	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am
1500-1600	Ethiopia, Voice of	7165do	9560do		
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	21600af
1500-1600	Guam, KTWR Agana	15610as			
1500-1600	Iraq, Radio Iraq Intl	15250as			
1500-1600 vl	Italy, IRRS Milano	7125eu			
1500-1600	Japan, NHK/Radio	9535na	9750as	11955na	15355af
1500-1600	Jordan, Radio	9560eu			
1500-1600 mtwhf	Lebanon, Wings of Hope	9960me			
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600	Malaysia, RTM Sarawak	4950do	7160do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as			
1500-1600	Netherlands, Radio	9890as	13700as	15150as	
1500-1600 ocasnal	New Zealand, R NZ Intl	9700pa			
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13185eu
1500-1600	Philippines, FEBC Manila	11995as			
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as	
1500-1600	Russia, Radio Moscow Intl	7105na	7250eu	7260na	7345na
		9735eu	9890eu	11965eu	12045as
		12065eu	15105eu	15210eu	15210as
		15290eu	15320as	15345eu	15380as
		15440eu	15465as	15540eu	15550eu
		17760eu	17780eu		
1500-1600 vl	Rwanda, Radio Rwanda	9610do			
1500-1600	S Africa, Channel Africa	4945af	11770af		
1500-1543 mtwhfa	Seychelles, FEBA Radio	7170as	11870as		
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Slovakia, AWR Europe	9455as			
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1500-1530	Switzerland, Swiss R Intl	11960as	13635as	15505as	
1500-1600	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9660na	9740me	9750eu
		9760eu	11750as	11940af	12095eu
		15070af	15260na	15310as	15400af
		17640af	17705eu	17760na	17840na
		17880af	21470af	21490af	21660af
1500-1600	USA, KCBI Dallas TX	15725am			
1500-1600	USA, KJES Mesquite NM	11715na			
1500-1600	USA, KTBN Salt Lk City UT	7510na			
1500-1600	USA, KWHR Naalehu HI	9930as			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, VOA Washington DC	6110as	7125as	9645as	9700as
		9760as	11705as	15205as	15395as
		19379me			
1500-1600	USA, WCSN Scotts Cor ME	15665eu			
1500-1600	USA, WEWN Birmingham AL	9350na	17510eu		
1500-1600	USA, WHRI Noblesville IN	9465am	15105am		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WRNO New Orleans LA	15420na			
1500-1600	USA, WWCR Nashville TN	13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL	11705na	11830na	17750na	
1530-1600	Austria, R Austria Intl	11780as			
1530-1545	India, All India Radio	7412as	9910as	11740as	
1530-1600 mtwhf	Portugal, Radio	21515me			

SELECTED PROGRAMS

Sundays

1500 BBC (af): Postmark Africa
1505 Radio Canada Int'l: Sunday Morning
1515 BBC: Concert Hall. Classical music concerts.
1530 Radio Austria Int'l: Report from Austria
1535 Radio Netherlands Int'l: Happy Station
1540 China Radio Int'l: Listeners' Letterbox

Mondays

1506 Monitor Radio Int'l: Magazine Program
1515 BBC: Features. See M 0101.
1515 Radio Japan: Radio Japan Magazine Hour
1530 Radio Austria Int'l: Report from Austria
1530 Voice of America (as/me): Magazine Show
1544 Monitor Radio Int'l: Letterbox

Tuesdays

1506 Monitor Radio Int'l: Magazine Program
1515 BBC: A Jolly Good Show. See T 0015.
1515 Radio Japan: Radio Japan Magazine Hour
1530 Radio Austria Int'l: Report from Austria
1530 Voice of America (as/me): Magazine Show
1540 China Radio Int'l: Listeners' Letterbox
1544 Monitor Radio Int'l: Letterbox

Wednesdays

1506 Monitor Radio Int'l: Magazine Program
1515 BBC: From Our Own Correspondent. See S 0330.
1515 Radio Japan: Radio Japan Magazine Hour
1515 Voice of Med. (Malta): Mailbag
1530 BBC: Feature. The Reduced Shakespeare Radio Show (8th,15th,22nd). An irreverent, abbreviated, crash-course in Shakespeare. Two Cheers for June 29th (29th). No description available.
1530 Radio Austria Int'l: Report from Austria
1530 Voice of America (as/me): Magazine Show
1544 Monitor Radio Int'l: Letterbox

Thursdays

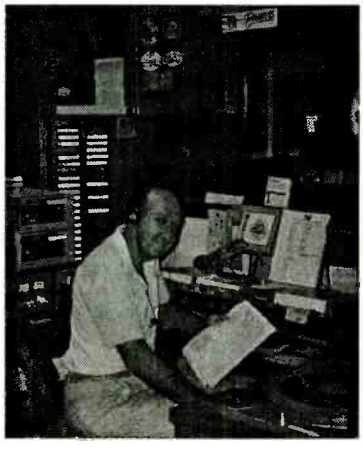
1506 Monitor Radio Int'l: Magazine Program
1515 BBC: Ray on Record. See H 0015.
1515 Radio Japan: Radio Japan Magazine Hour
1530 Radio Austria Int'l: Report from Austria
1530 Voice of America (as/me): Magazine Show
1531 Radio Japan: Crosscurrents
1544 Monitor Radio Int'l: Letterbox
1552 Radio Netherlands Int'l: Media Network

Fridays

1506 Monitor Radio Int'l: Magazine Program
1515 BBC: Music Review. See F 0015.
1515 Radio Japan: Radio Japan Magazine Hour
1530 Radio Austria Int'l: Report from Austria
1530 Voice of America (as/me): Magazine Show
1536 Radio Portugal Int'l: Mailbag (triweekly)
1540 Voice of Med. (Malta): Lost Letters
1544 Monitor Radio Int'l: Letterbox

Saturdays

1505 Swiss Radio Int'l: The Saturday Magazine
1509 Swiss Radio Int'l: The Grapevine
1515 BBC: Sportsworld. See A 1401.
1530 Radio Austria Int'l: Report from Austria
1540 FEBC (Philippines): Mailbag
1552 Radio Netherlands Int'l: Sounds Interesting



The newly-rebuilt studios of shortwave broadcaster WWCR in Nashville, TN, is now home to "the world's oldest living disc jockey." Ken Berryhill has been hosting "The Old Record Shop" since 1951, but he is now recording new shows for a worldwide audience on WWCR. Tune in on Friday at 1200 UTC (15,685 kHz), or on 0400 UTC (7435 kHz) and 0630 UTC Sunday (5810 kHz) and be surprised. You may hear the first Victor Talking Machine recording ever released (a banjo solo in 1901), a 1905 Edison cylinder, or a 1907 Scott Joplin piano roll. Berryhill plans, writes and announces each of these shows featuring great recordings from the turn of the century to about 1935.

1600 UTC SHORTWAVE GUIDE 12:00 PM EDT 9:00 AM PDT

FREQUENCIES

1600-1700	Australia, Radio	5995pa	7240pa	7260as	9510as
		9580pa	9710pa	9770as	9860pa
		11660pa	11695pa	11800pa	11880pa
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700	Bahrain, Radio	6010do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, China Radio Intl	11575af	15110af	15130af	
1600-1700 vl	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1600-1627	Czech Rep, Radio Prague	5930as	7345me	11630eu	
1600-1700	Ecuador, HCJB Quito	21455am			
1600-1700	France, Radio France Intl	6175eu	11705af	11975me	12015af
		17620af	17795af	17850af	
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	15595as
		17810as	21680as		
1600-1700	Guam, KSDA AWR Agat	7455as			
1600-1700	Guam, KTWR Agana	15610as			
1600-1627	Iran, VOIRI Tehran	11790eu			
1600-1700	Iraq, Radio Iraq Intl	15250as			
1600-1700 vl	Italy, IRRS Milano	7125eu			
1600-1700	Jordan, Radio	9560eu			
1600-1630 mtwhf	Lebanon, Wings of Hope	9960me			
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as		
1600-1700	Netherlands, Radio	9890as	13700as	15150as	
1600-1649 ocasnal	New Zealand, R NZ Intl	9700pa			
1600-1630	Pakistan, Radio	9470as	11570as	13590as	15555as
		15675as	17660as		
1600-1655	Poland, Polish R Warsaw	7285eu	9525eu		
1600-1700	Russia, Radio Moscow Intl	7105na	7150eu	7205eu	7250na
		7260na	7345na	9540na	9550na
		9560eu	9890eu	12045eu	15105na
		15290eu	15320na	15380eu	17760eu
1600-1700 vl	Rwanda, Radio Rwanda	9610do			
1600-1700	S Africa, Channel Africa	4945af	11770af		
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
1600-1700	South Korea, KBS/R Korea	5975as			
1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1600-1700	Swaziland, Trans World R	9500af			
1600-1645	UAE, Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9630af	9740me	9750eu
		9760eu	11750as	11940af	12095eu
		15070af	15260na	15400af	17640af
		17705eu	17860af	17880af	21470af
		21660af			
1600-1700	USA, KCBI Dallas TX	15725am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	7425as			
1600-1700	USA, Monitor Radio Intl	9355af			
1600-1700	USA, VOA Washington DC	6110as	6180eu	7125as	9645as
		9700as	9760as	11855eu	11930af
		12040af	13710af	15205as	15255af
		15320af	15395as	15410af	15445af
		17790af			
1600-1700	USA, WCSN Scotts Cor ME	15665eu			
1600-1700	USA, WEWN Birmingham AL	13615na	15695eu		
1600-1700 vl	USA, WHRI Noblesville IN	9465am	15105am		
1600-1700	USA, WINB Red Lion PA	15715eu			
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700	USA, WWCR Nashville TN	13845am	15610am	15685am	
1600-1700	USA, WYFR Okeechobee FL	11705na	11830na	15355eu	17750na
		21525af	21615eu		
1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1615-1645	Sweden, Radio	6065eu			
1620-1630 mtwtf	Estonia, Estonian Radio	5925eu			
1630-1700	Australia, Radio	6060pa	11660pa	11880pa	
1630-1700	Canada, RCI Montreal	7150as	9550as		
1630-1700	Ecuador, HCJB Quito	15270me	17790me	21455me	
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Liberia, Radio ELWA	4760do			
1645-1700	Afghanistan, Radio	9635as			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwtf	New Zealand, R NZ Intl	6100pa			

SELECTED PROGRAMS

Sundays
1600 KSDA (Guam): AWR Magazine
1615 BBC: Feature (5th). See S 0230.
1615 BBC: Music Feature (12th,19th,29th). See S 0230.
1615 Radio Sweden: In Touch with Stockholm (biweekly)
1632 Radio France Int'l: Club 9516
1635 Radio Korea: Shortwave Feedback
1637 Radio Canada Int'l: The Mailbag
1640 China Radio Int'l: Listeners' Letterbox
1645 BBC: Letter from America. See S 0615.

Mondays
1606 Monitor Radio Int'l: Magazine Program
1615 BBC: New Ideas. Window on the world of technology, innovation and new products.
1615 BBC: Sports. Sportsworld - Wimbledon (20th,27th). See M 1445.
1635 BBC: Feature. Personal Obsessions (9th,13th). People talk about the collections of unusual items.
1641 Radio Canada Int'l: Spectrum
1644 Monitor Radio Int'l: Letterbox
1645 BBC: The World Today. Examines thoroughly a topical aspect of the international scene.

Tuesdays
1606 Monitor Radio Int'l: Magazine Program
1615 BBC: Megamix. See T 1130.
1615 BBC: Sports. Sportsworld - Wimbledon (21st,28th). See M 1445.
1640 China Radio Int'l: Listeners' Letterbox
1641 Radio Canada Int'l: Spectrum
1644 Monitor Radio Int'l: Letterbox
1645 BBC: The World Today. See M 1645.

Alice Yu presents the BBC's "Rock 'N' Rice."

Wednesdays
1606 Monitor Radio Int'l: Magazine Program
1613 Radio Prague: Calling All Listeners
1615 BBC: Music Features. Duke Ellington—Jazz Genius (1st,8th). Notes from Brazil (15th) See T 0630.
1615 BBC: Sports. Sportsworld - Wimbledon (22nd,29th). See M 1445.
1641 Radio Canada Int'l: Spectrum
1644 Monitor Radio Int'l: Letterbox
1645 BBC: The World Today. See M 1645.

Thursdays
1606 Monitor Radio Int'l: Magazine Program
1611 Radio Moscow: Mailbag
1615 BBC: Network UK. Issues and events affecting the lives of people throughout the UK.
1615 BBC: Sports. Sportsworld - Wimbledon (23rd,30th). See M 1445.
1641 Radio Canada Int'l: Spectrum
1644 Monitor Radio Int'l: Letterbox
1645 BBC: The World Today. See M 1645.

Fridays
1606 Monitor Radio Int'l: Magazine Program
1615 BBC: Science in Action. The latest in science and technology.
1641 Radio Canada Int'l: Spectrum
1644 Monitor Radio Int'l: Letterbox
1645 BBC: The World Today. See M 1645.

Saturdays
1610 Voice of America (as/me): Communications World
1615 BBC: Sportsworld. See A 1401.
1616 WYFR: The Mailbag
1635 Radio Korea: From Us to You

1700-1800	Algeria, R Algiers Intl	7155eu			
1700-1800	Australia, Radio	6060pa	6080as	7240pa	7260as
		9510as	9580pa	9860pa	11660pa
		11695pa	11880pa		
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800	Bahrain, Radio	6010do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	7405af	9570af	11575af	
1700-1800	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 vl	Eqt Guinea, Radio Africa	7200af			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio	6150na	9535na	9580as	11930as
1700-1730	Jordan, Radio	9560eu			
1700-1713 mtwhfa	Lebanon, Voice of	6550eu			
1700-1800	Liberia, Radio ELWA	4760do			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwtf	New Zealand, R NZ Intl	6100pa			
1700-1750	North Korea, R Pyongyang	9640af	9977af		
1700-1750	Pakistan, Radio	7485eu	9855eu		
1700-1800	Russia, Radio Moscow Intl	7105na	7170eu	7205eu	7260na
		7330eu	7340eu	7345na	9540na
		9890eu	13670eu	15380eu	17760eu
1700-1800 vl	Rwanda, Radio Rwanda	9610do			
1700-1800	S Africa, Channel Africa	4945af	11770af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as	15425as	
1700-1715	Swaziland, Trans World R	7120af			
1700-1730	Switzerland, Swiss R Intl	9885af	13635me	15635af	
1700-1730	United Kingdom,BBC London	6005af	17860af		
1700-1800	United Kingdom,BBC London	3955eu	6180eu	6190af	6195eu
		7160me	9410eu	9515eu	9630af
		9740me	11750as	11940af	12095af
		15070af	15260af	15400af	15420af
		17860af	17880af	21470af	21660af
1700-1800	USA, KCBI Dallas TX	15725am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7425as			
1700-1800	USA, Monitor Radio Intl	9355af			
1700-1800	USA, VOA Washington DC	6040eu	6110as	7125as	9645as
		9700eu	9760eu	11855as	11920af
		12040af	13710af	15205eu	15320af
		15395as	15410af	15445af	17790af
		19379me			
1700-1800	USA, WEWN Birmingham AL	13615na	15695eu		
1700-1800 vl	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WINB Red Lion PA	15715eu			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	13845am	15610am	15685am	
1700-1800	USA, WYFR Okeechobee FL	21500eu			
1715-1730 mtwhf	Swaziland, Trans World R	7120af			
1730-1800	Netherlands, Radio	6020af	9605af	17655af	21590af
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af
1730-1800	Sweden, Radio	6065af	9655eu	15390me	
1730-1800	Vatican State, Vatican R	11625af	15090af		
1745-1800	Bangladesh, Radio	7190eu	9700eu		
1745-1800	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		

1800-1900	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	5960as	6060pa	6080as	7240pa
		7260as	9580pa	9860pa	11660pa
		11695pa	11855as	11880pa	
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bahrain, Radio	6010do			
1800-1900	Bangladesh, Radio	7190eu	9700eu		
1800-1830 mtwtf	Belgium, R Vlaanderen Int	5910eu			
1800-1900	Brazil, Radiobras	15268eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1800-1827	Czech Rep, Radio Prague	5930af	7345me	9420eu	
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900 vl	Eqt Guinea, Radio Africa	7200af			
1800-1815	Ghana, GBC Radio 1	4915do			
1800-1815	Ghana, GBC Radio 2	3316do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	11990na			
1800-1900	Liberia, Radio ELWA	4760do			
1800-1900	Netherlands, Radio	6020af	9605af	17655af	21590af
1800-1900 mtwtf	New Zealand, R NZ Intl	6100pa			
1800-1850	North Korea, R Pyongyang	9640as	13750as	15435as	
1800-1830 s	Norway, Radio Norway Intl	5960eu	9590af	11745me	15220af
1800-1855	Poland, Polish R Warsaw	5995eu	7270eu	7285eu	
1800-1900	Russia, Radio Moscow Intl	7105eu	7170na	7250na	7260na
		9540eu	9550eu	9890eu	12050na
		13670eu	15105eu	15290eu	15380eu
		17760eu			
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	Sudan, Radio Omdurman	9170af			
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		9630af	9740me	11940af	11955as
		12095af	15070af	15400af	15420af
		17880af			
1800-1900	USA, KCBI Dallas TX	15725am			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625as			
1800-1900	USA, Monitor Radio Intl	9355pa	13770eu	17510af	
1800-1900	USA, VOA Washington DC	6040eu	9700eu	9760eu	11920af
		12040af	13675af	13710af	15410af
		15580af	17800af	19379me	
1800-1900 vl	USA, WEWN Birmingham AL	13615na	15695eu	18930sa	
1800-1900	USA, WHRI Noblesville IN	9485am	13760am		
1800-1900	USA, WINB Red Lion PA	15715eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900	USA, WWCR Nashville TN	13845am	15610am	15685am	
1800-1845	USA, WYFR Okeechobee FL	21500eu			
1800-1830	Vietnam, Voice of	9840eu	12020eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900	New Zealand, R NZ Intl	11735pa			

1900-2000	Australia, Radio	5960as	5995pa	6060pa	6080as
		7240pa	7260as	9580pa	11680pa
		11695pa	11720pa	11880pa	
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do			
1900-1918	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	9700eu	11720eu		
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	9440af	11515af		
1900-2000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
1900-2000	Ecuador, HCJB Quito	15270eu	17490eu	17790eu	21455eu
1900-2000 vl	Eqt Guinea, Radio Africa	7200af			
1900-2000	Finland, YLE/Radio	9730eu	9770eu	11755eu	15440eu
1900-1930	Georgia, Radio Georgia	6080eu			
1900-1950	Germany, Deutsche Welle	7285eu	9615eu	9640af	9735af
		11740af	11785af	11810af	13690af
		13790af	15350af		
1900-1930	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1900-1930	Israel, Kol Israel	9435eu	11603na	11675na	15640na
		17575af			
1900-2000 vl	Italy, IRRS Milano	7125eu			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535as	9580au
		9610as			
1900-2000	Kuwait, Radio	11990eu			
1900-2000	Liberia, Radio ELWA	4760do			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-1925	Netherlands, Radio	6020af	9605af	17655af	21590af
1900-2000	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Radio	3326do	4770do	4990do	
1900-2000	Nigeria, Voice of	7255af			
1900-2000 vl	Papua New Guinea, NBC	9675do			
1900-1930 mtwhf	Portugal, Radio	9780na	9815na	11975na	17680na
1900-2000	Romania, R Romania Intl	9690eu	9750eu	11810eu	11940eu
1900-2000	Russia, Radio Moscow Intl	7105eu	7170na	7260eu	9470na
		9550eu	9685eu	12050eu	12055eu
		13670eu	15105af	15290af	15580af
		17710na	17760eu		
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	Spain, Spanish Natl Radio	11775af			
1900-2000	Swaziland, Trans World R	3200af	3240af		
1900-2000 vl	Uganda, Radio	4976do			
1900-2000	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	9410eu
		9630af	9740me	11955as	12095af
		15070af	15400af	17880af	
1900-2000	USA, KCBI Dallas TX	15725am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625as			
1900-2000	USA, Monitor Radio Intl	13770eu	15665eu	17510af	
1900-2000	USA, VOA Washington DC	3980eu	6040eu	9525as	9700eu
		9760eu	11870as	11920af	12040af
		13710af	15180au	15205af	15410af
		15580af	17800af		
1900-2000	USA, WCSN Scotts Cor ME	15665am			
1900-2000	USA, WEWN Birmingham AL	13615na	18930sa		
1900-2000 vl	USA, WHRI Noblesville IN	9485am	9590am		
1900-2000	USA, WINB Red Lion PA	15715eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WWCR Nashville TN	13845am	15610am	15685am	
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Iran, VOIRI Tehran	9022me	9745me		
1930-2000	Netherlands, Radio	17605af	17655af		
1930-2000	Slovakia, R Slovakia Intl	5915eu	7345eu	9440eu	
1935-1955	Italy, RAI Rome	7275eu	11800eu		

1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1945-2000	Armenia, Radio Yerevan	4810me	4990me	6065me	
2000-2100	Australia, Radio	5960as	6060pa	6080as	7240pa
		7260as	9580pa	11695pa	11720pa
		11880pa			
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	9440af	9920eu	11500eu	11715af
		15110af			
2000-2100	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2000-2100	Ecuador, HCJB Quito	21455am			
2000-2100 vl	Eqt Guinea, Radio Africa	7200af			
2000-2030 mt	Estonia, Estonian Radio	5925eu			
2000-2030	Ghana, GBC Radio 1	4915do			
2000-2030	Ghana, GBC Radio 2	3366do			
2000-2010 mtwhfa	Greece, Voice of	9375eu			
2000-2100	Indonesia, Voice of	9675as	11752as		
2000-2100 vl	Italy, IRRS Milano	7125eu			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	11990eu			
2000-2030 as	Latvia, Radio	5935eu			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2025	Netherlands, Radio	17605af	17655af		
2000-2100	New Zealand, R NZ Intl	11735pa			
2000-2100	Nigeria, Radio	3326do	4770do	4990do	
2000-2100	Nigeria, Voice of	7255af			
2000-2030 s	Norway, Radio Norway Intl	9590eu	15220af		
2000-2100 vl	Papua New Guinea, NBC	9675do			
2000-2100	Russia, Radio Moscow Intl	7250eu	7260eu	9450na	9470na
		9550na	9685na	9890eu	10344eu
		11730na	12050na	12055na	15425na
		17605na			
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do		
2000-2100	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2000-2045	Swaziland, Trans World R	3200af	3240af		
2000-2050	Turkey, Voice of	9900eu			
2000-2100 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom,BBC London	6190af	6195eu	7160me	9630af
		9740me	15070af	17880af	
2000-2100	United Kingdom,BBC London	3255af	3955eu	4570af	5975am
		6005af	6180eu	6195af	7325eu
		9410eu	12095af	15070af	15260sa
		15400af	17800af		
2000-2100	USA, KCBI Dallas TX	15725am			
2000-2100	USA, KJES Mesquite NM	15385na			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100 as	USA, KVOH Los Angeles CA	17775am			
2000-2100	USA, KWHR Naalehu HI	15405as			
2000-2100	USA, Monitor Radio Intl	13770af	15665eu		
2000-2100	USA, VOA Washington DC	3980eu	6040eu	7415af	9700eu
		9760na	11820af	13710af	15160af
		15410af	15445af	15580af	17800af
		19379me	21485af		
2000-2100 vl	USA, WEWN Birmingham AL	13615na	18930sa		
2000-2100	USA, WHRI Noblesville IN	9485am	13760am		
2000-2100	USA, WINB Red Lion PA	15715eu			
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100	USA, WWCR Nashville TN	13845am	15610eu	15685am	
2000-2100	USA, WYFR Okeechobee FL	17612af	21525af	21615eu	
2000-2045	USA, WYFR Okeechobee FL	15355eu			
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
2005-2100	Syria, Radio Damascus	12085eu	15095eu		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2100	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670me
		15325me	17820me	17850af	17875af
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2030-2100	Poland, Polish R Warsaw	5955eu	6135eu	7285eu	
2030-2100	Serbia, Radio Yugoslavia	9620eu			
2030-2100	South Korea, KBS/R Korea	5975eu	9870as	11715af	
2030-2100	Sweden, Radio	6065af	9655me		
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	11880pa	15265pa	

REMEMBER WHEN A ROOM FULL OF COMPUTERS COULDN'T DO WHAT YOUR PC COULD DO TODAY...

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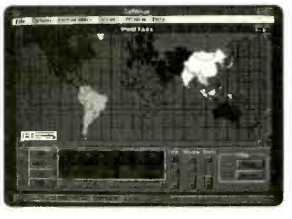

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* Domestic sales only, less shipping & handling of approximately $ 30.00. System Requirements: IBM Compatible 386 or 486 and Microsoft Windows Version 3.1 or higher. Windows is a registered trademark of Microsoft Corporation.

2100-2200	Australia, Radio	9645as	11720pa	11855as	
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2106	Bahrain, Radio	6010do			
2100-2130 mtwtf	Belgium, R Vlaanderen Int	5910eu			
2100-2200	Bulgaria, Radio	9700eu	11645eu	11720na	
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	Canada, RCI Montreal	7235eu	13650me	13670me	15325af
		17820af	17850af	17875af	
2100-2200	China, China Radio Intl	9920eu	11500eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2100-2200	Cuba, Radio Havana Cuba	17760eu			
2100-2127	Czech Rep, Radio Prague	5930na	7345na	9420au	
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9670as	9765as	11785as	13690as
		15350af	15435af		
2100-2130	Hungary, Radio Budapest	3955eu	6110eu	7220eu	
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265pa		
2100-2200 vl	Italy, IRRS Milano	7125eu			
2100-2200	Japan, NHK/Radio	6035as	6185as	9610af	9625af
		9750me	11925eu		
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4770do	4990do	
2100-2200	Nigeria, Voice of	7255af			
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2200 vl	Papua New Guinea, NBC	9675do			
2100-2125	Poland, Polish R Warsaw	5995eu	6135eu	7285eu	
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7225eu	9690eu	9750eu	11940eu
2100-2200	Russia, Radio Moscow Intl	7150na	7170eu	7180eu	7390eu
		9470eu	9550eu	9620eu	9685eu
		9750na	9795eu	9885eu	12050na
		15425na	17605na	17690na	
2100-2115 vl	Sierra Leone, SLBS	3316do			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	South Korea, KBS/R Korea	6480eu	15575eu		
2100-2200	Spain, Spanish Natl Radio	6125eu			
2100-2130	Sri Lanka, SLBC Colombo	9720eu	15120eu		
2100-2105	Syria, Radio Damascus	12085eu	15095eu		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6020eu	6090eu	7150eu
		7240eu	7285eu	11705eu	12030eu
2100-2200	United Kingdom,BBC London	3255af	3955eu	5975am	6005af
		6180eu	6195eu	7325eu	9410eu
		9590na	11955as	12095na	15260sa
		15400af	15575eu		
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200	USA, KWHR Naalehu HI	13720as			
2100-2200	USA, Monitor Radio Intl	13770eu	13840pa	15665eu	
2100-2200	USA, VOA Washington DC	6040eu	6095eu	9760eu	11870as
		13710as	15185au	15410af	15580af
		17735as	19379me		
2100-2200	USA, WEWN Birmingham AL	13615na	18930sa		
2100-2200 vl	USA, WHRI Noblesville IN	13760am	17830am		
2100-2200	USA, WINB Red Lion PA	15715eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200	USA, WWCR Nashville TN	13845am	15610am	15685am	
2100-2200	USA, WYFR Okeechobee FL	15566eu	17612af	21525af	
2100-2145	USA, WYFR Okeechobee FL	21615eu			
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom,BBC Carib	6110am	15390am	17715am	
2130-2200	Australia, Radio	15240pa	15320pa	15365pa	17795pa
		17860pa			
2130-2200 vl	Australia, VL8A Alice Spg	4835do			
2130-2200 vl	Australia, VL8K Katherine	5025do			
2130-2200 vl	Australia, VL8T Tent Crk	4910do			
2130-2200	Austria, R Austria Intl	5945af	6155af	9880eu	13730eu
2130-2200	Ecuador, HCJB Quito	11835eu	15270eu	17490eu	17790eu
		21455eu			
2130-2200	Israel, Kol Israel	9435sa	11603na	11675na	17575sa
2130-2140 mtwhf	Latvia, Radio	5935eu			
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu		
2130-2200 mwa	Moldova, R Dnestr Intl	9620eu			
2130-2200	Sweden, Radio	6065eu			
2138-2200	New Zealand, R NZ Intl	15115pa			

2200-2300	Australia, Radio	9645as	11720pa	11855as	15240pa
		15320pa	15365pa	17795pa	17860pa
2200-2300 vl	Australia, VL8A Alice Spg	4835do			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	11705as			
2200-2300	Canada, RCI Montreal	5960na	9755na	11845am	11875na
		13760am	15305am		
2200-2300	China, China Radio Intl	7170eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2300	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2230	Czech Rep, Radio Prague	5930na	7345af	9420eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 vl	Eqt Guinea, Radio Africa	7200af			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2300 vl	Italy, IRRS Milano	7125eu			
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2300	Nigeria, Radio	3326do	4770do	4990do	
2200-2300	Nigeria, Voice of	7255af			
2200-2250	North Korea, R Pyongyang	9325eu	13185eu		
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2300	Russia, Radio Moscow Intl	7150eu	7180eu	7295eu	9550eu
		9620na	9725eu	9750na	10344eu
		12050na	15425na	17605na	17655na
		17690na	21655na		
2200-2215 vl	Sierra Leone, SLBS	3316do			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, KBS/R Korea	7275as	9640as		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21720eu		
2200-2250	Turkey, Voice of	7185me	9445na	11710eu	
2200-2300	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2200-2300	United Kingdom,BBC London	3955eu	5975am	6195eu	7325eu
		9410eu	9590na	9915am	11750sa
		11955as	12095af	15260sa	15400af
		15575eu			
2200-2300	USA, KCBI Dallas TX	15725am			
2200-2230 s	USA, KGEI San Fran CA	15280sa			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, KWHR Naalehu HI	17645as			
2200-2300	USA, Monitor Radio Intl	13625as	13770na	15405as	17555sa
2200-2300	USA, VOA Washington DC	6035as	7215as	9770as	11760as
		15185au	15290as	15305as	17735au
		17820as			
2200-2300	USA, WEWN Birmingham AL	13615na			
2200-2300	USA, WHRI Noblesville IN	9485am	13760am		
2200-2300 vl	USA, WINB Red Lion PA	15715eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 vl	USA, WWCR Nashville TN	12160am	13845am	15685am	
2200-2245	USA, WYFR Okeechobee FL	17612af	21525af		
2230-2300	Finland, YLE/Radio	11755na	13750as		
2230-2300	Sweden, Radio	6065eu			
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	7440eu	9480eu	9705eu	10344eu
		11920eu			
2245-2300	Bulgaria, Radio	9700na	11720na		
2245-2300	Ghana, GBC Radio 1	4915do			
2245-2300	Ghana, GBC Radio 2	3366do			
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as
2245-2300 mtwtf	USA, Voice of the OAS	9670am	11835am	15160am	
2245-2300	Vatican State, Vatican R	9600au	11830pa		

FREQUENCIES

2300-0000	Australia, Radio	11720pa	11855as	15240pa	15320pa
		15365pa	17795pa	17860pa	
2300-0000 vl	Australia, VL8A Alice Spg	4835do			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-2345	Bulgaria, Radio	9700na	11720na		
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Canada, RCI Montreal	5960na	9755na	13670na	
2300-0000 as	Canada, RCI Montreal	11940am	15235am		
2300-0000	Costa Rica, R Peace Intl	7375am	9400am	15030am	21465am
2300-0000	Ecuador, HCJB Quito	9745am	21455am		
2300-0000	Guam, KSDA AWR Agat	15610as			
2300-0000	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2300-0000 vl	Italy, IRRS Milano	7125eu			
2300-0000	Japan, NHK/Radio	5975eu	6125eu	6185as	9610as
		9625as			
2300-2330 as	Lithuania, Radio Vilnius	9400eu	11770eu		
2300-0000 vl	Malaysia, RTM Kota Kinaba	5980do			
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do			
2300-0000	New Zealand, R NZ Intl	15115pa			
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-2330 s	Norway, Radio Norway Intl	9655sa	11860na		
2300-0000 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2300-0000 vl	Papua New Guinea, NBC	9675do			

2300-0000	Russia, Radio Moscow Intl	7210na	7295na	9450na	9480na
		9620na	9695na	9750na	11675as
		12050na	15425na	15470as	17570as
		17610as	17675as	17690na	21480na
2300-0000	Singapore,R Singapore Int	9530as			
2300-0000	Thailand, Radio	9655as	11905as		
2300-0000	UAE, Radio Abu Dhabi	9605na	9770na	11885na	
2300-0000	United Kingdom,BBC London	3955eu	5975na	6175na	6195na
		7180eu	7325na	9410eu	9590na
		9915am	11750sa	11955as	15260sa
		15280as	15370as	15400af	
2300-0000	USA, KCBI Dallas TX	13740am			
2300-0000	USA, KTBN Salt Lk City UT	15590na			
2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	USA, Monitor Radio Intl	13625as	13770na	15405as	17555sa
2300-0000	USA, VOA Washington DC	7215as	9770as	11760as	15185as
		15290as	15305as	17735as	17820as
2300-0000	USA, WEWN Birmingham AL	9985eu	11820sa	13615na	
2300-0000 vl	USA, WHRI Noblesville IN	7315am			
2300-0000	USA, WINB Red Lion PA	15715eu			
2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000	USA, WWCR Nashville TN	12160am	13845am	15685am	
2300-2315	Vatican State, Vatican R	9600au	11830as		
2330-0000 mtwtf	Belgium, R Vlaanderen Int	5910eu			
2330-0000	Netherlands, Radio	6020na	6165na		
2330-0000 m	Sri Lanka, SLBC Colombo	15425na			
2330-0000	Sweden, Radio	11910as			
2330-0000	USA, R Bosnia H via WHRI	7315am			
2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	
2345-0000	Armenia, Radio Yerevan	9480eu	11920eu	12010eu	

SELECTED PROGRAMS

Sundays

2300 KSDA (Guam): AWR Magazine
2310 Voice of America (as): VOA Monday Morning
2322 Radio Vilnius: Letterbox
2330 BBC: Feature. See S 1401.
2335 Radio Vlaanderen Int'l: P.O. Box 26
2336 Voice of the UAE: Mailbag

Mondays

2306 Monitor Radio Int'l: Magazine Program
2315 Radio Japan: Radio Japan Magazine Hour
2330 BBC: Multitrack 1: Top 20. World Service Top 20.
2330 Voice of America (as): VOA Tuesday Morning
2332 Voice of the UAE: Editorial/Weather/Letters
2344 Monitor Radio Int'l: Letterbox

Tuesdays

2306 Monitor Radio Int'l: Magazine Program
2315 Radio Japan: Radio Japan Magazine Hour
2330 BBC: Omnibus. A D-Day remembrance (7th). Wimbledon interview (14th).
2330 BBC: Omnibus. Each week a half-hour programme on practically any topic under the sun.
2330 Voice of America (as): VOA Wednesday Morning
2332 Voice of the UAE: Editorial/Weather/Letters
2344 Monitor Radio Int'l: Letterbox
2349 Radio Vlaanderen Int'l: P.O. Box 26

Wednesdays

2306 Monitor Radio Int'l: Magazine Program
2315 Radio Japan: Radio Japan Magazine Hour
2330 BBC: Multitrack 2. New pop records, interviews, news and competitions.
2330 Voice of America (as): VOA Thursday Morning
2333 Voice of the UAE: Editorial/Weather/Letters
2344 Monitor Radio Int'l: Letterbox

Thursdays

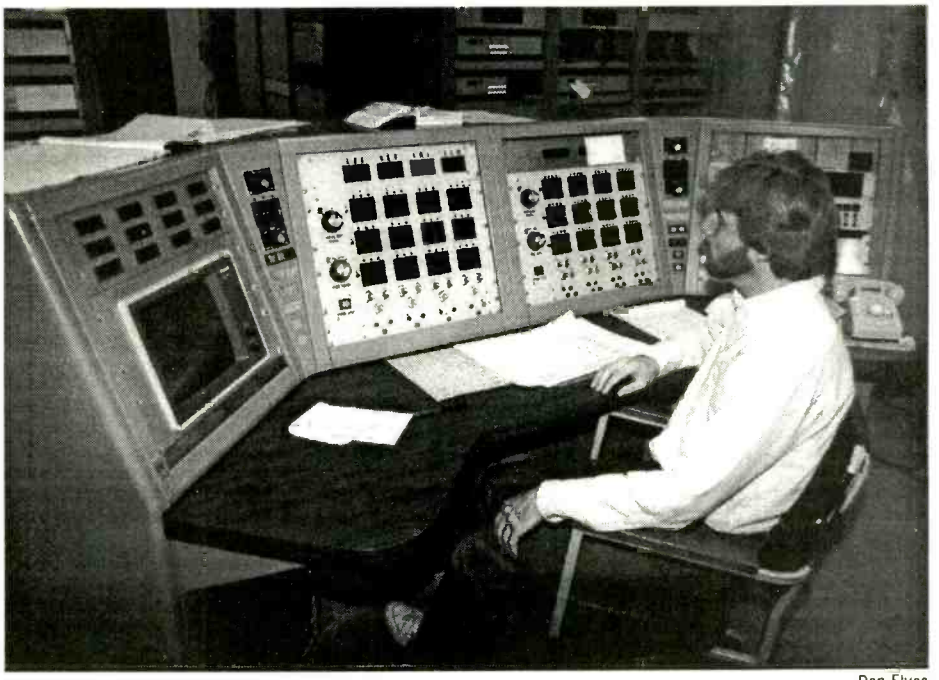
2306 Monitor Radio Int'l: Magazine Program
2315 Radio Japan: Radio Japan Magazine Hour
2330 BBC: Feature. The Reduced Shakespeare Radio Show (9th,16th,23rd). See W 1530. Two Cheers for June 30th (30th). No details available.
2330 Voice of America (as): VOA Friday Morning
2344 Monitor Radio Int'l: Letterbox

Fridays

2306 Monitor Radio Int'l: Magazine Program
2315 Radio Japan: Radio Japan Magazine Hour
2330 BBC: Multitrack 3. Latest developments on the British music scene.
2330 Voice of America (as): VOA Saturday Morning
2344 Monitor Radio Int'l: Letterbox

Saturdays

2310 Voice of America (as): VOA Sunday Morning
2330 BBC: Classical Music Feature. The Musician's Musician (4th,11th,18th). Talks with some of today's accomplished performers about the great musicians of the past. Best on Record (25th). Helping classical music lovers pick their way through selections.

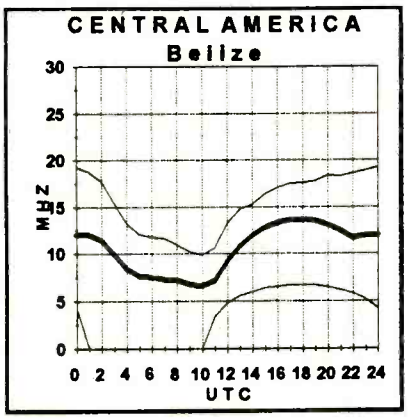


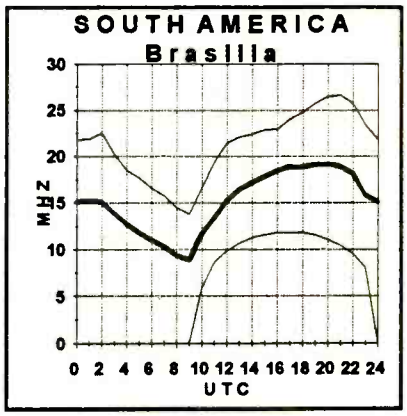
Dan Elyea

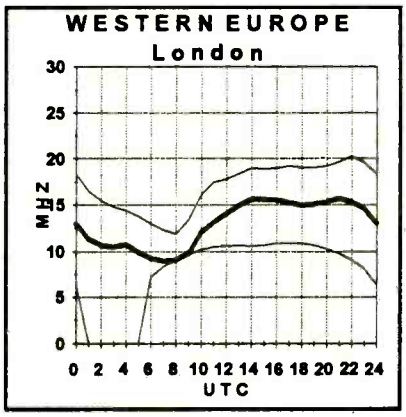
Inside the studios of WYFR.

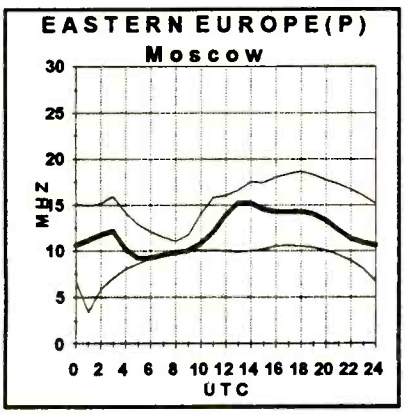
Propagation conditions: Eastern United States

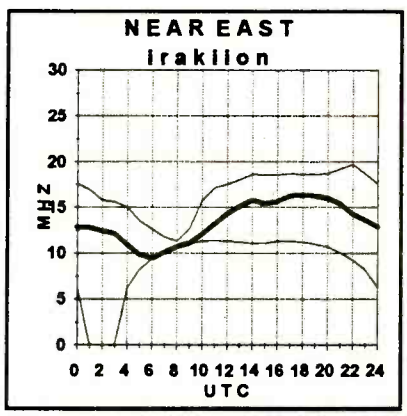
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

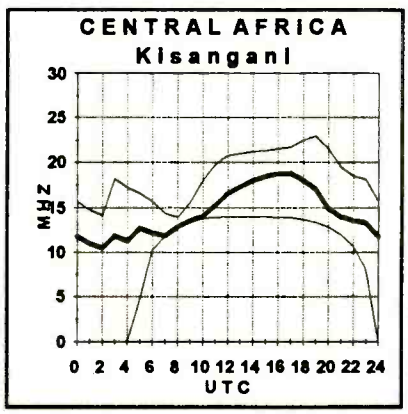


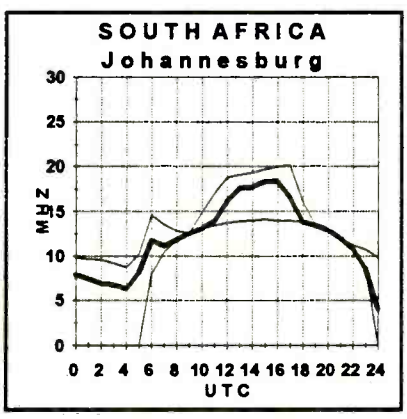


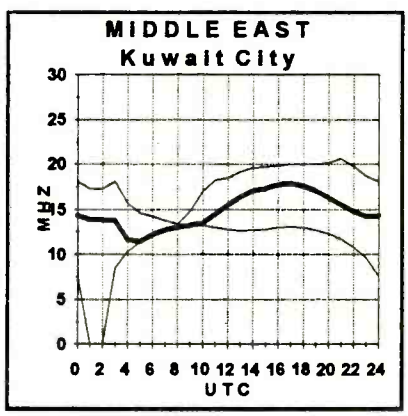


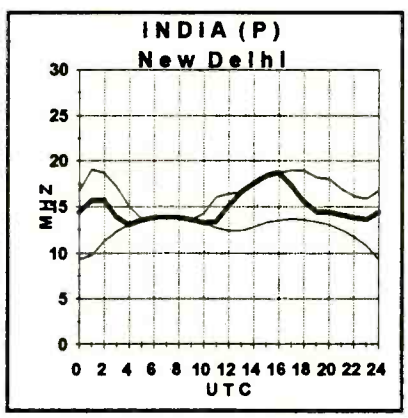


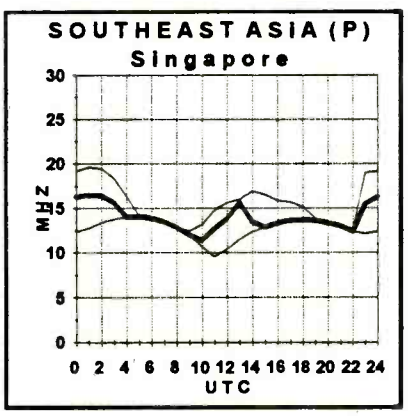


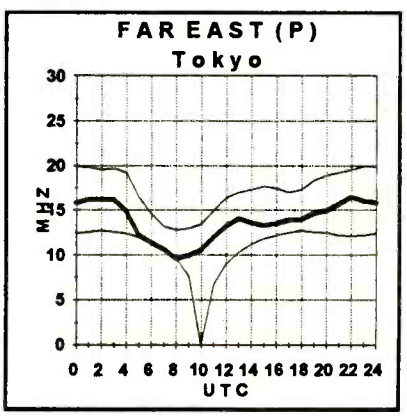


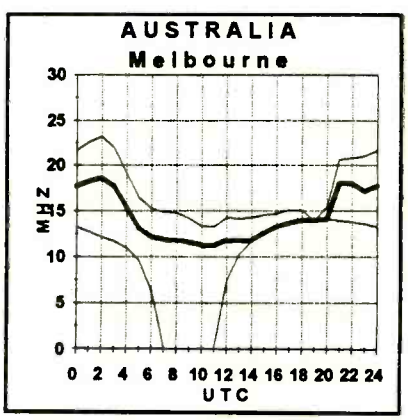






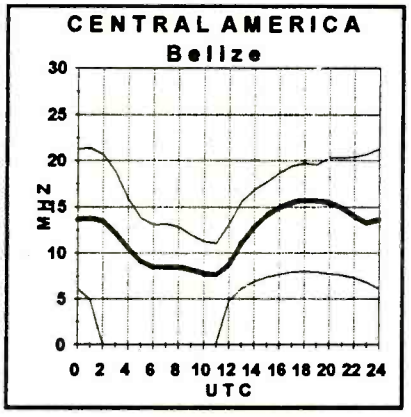


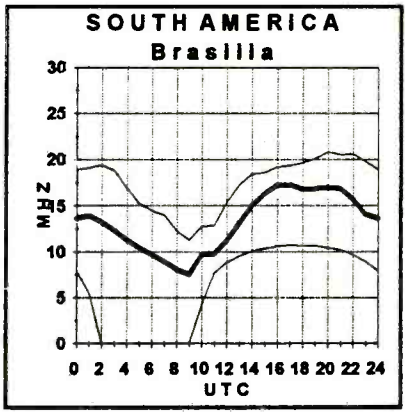


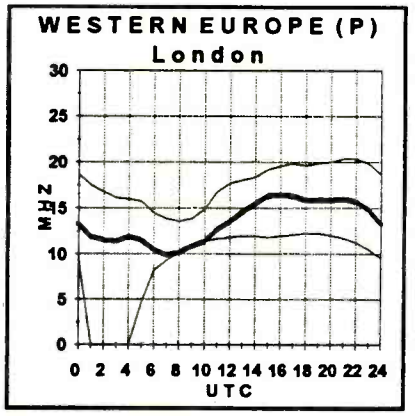


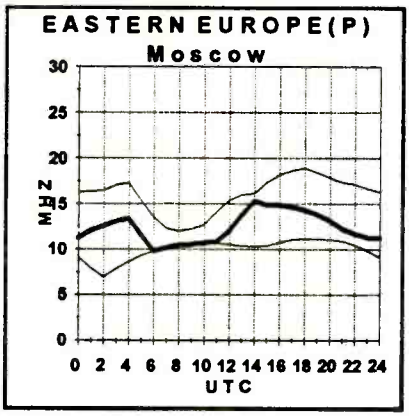
Propagation Conditions: Western United States

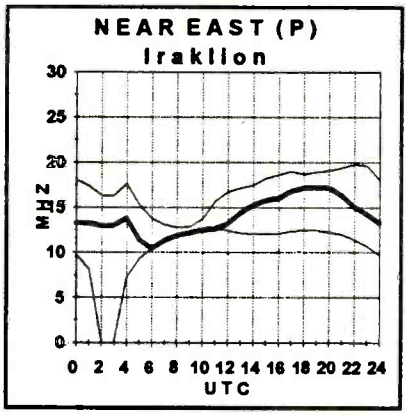
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom 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.

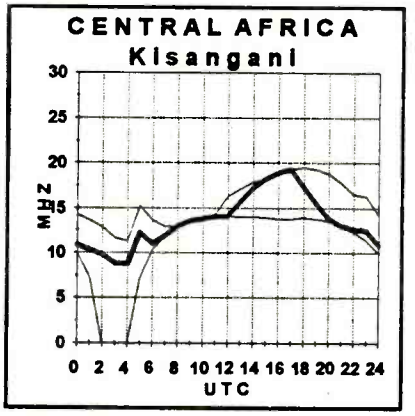


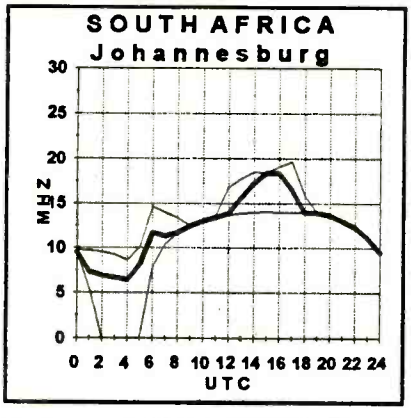


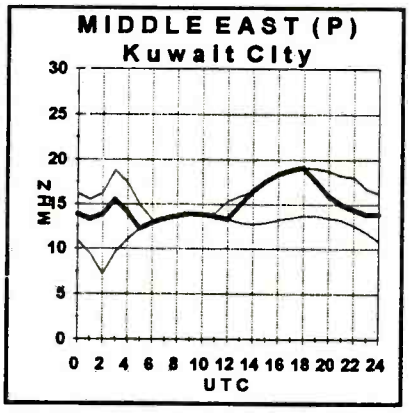


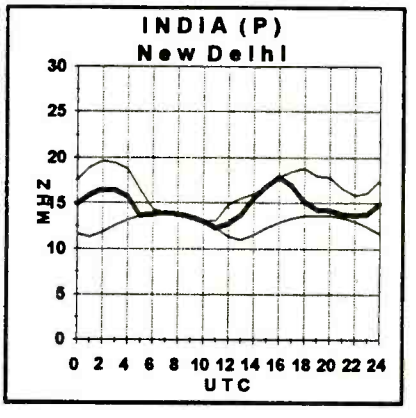


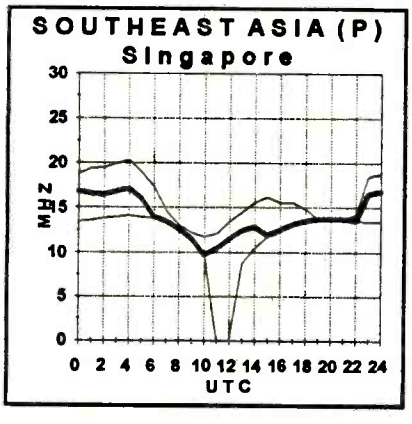


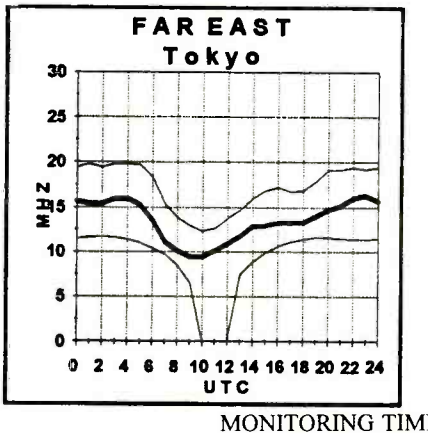


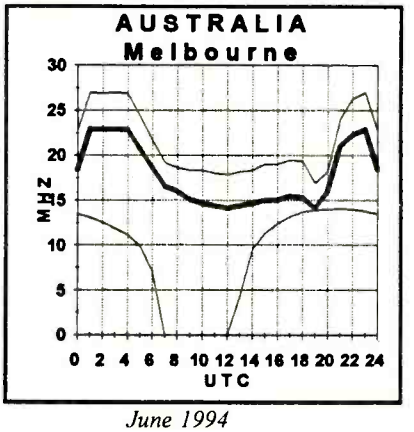












RAMSEY America's #1 Source For Hobby Kits

TONE GRABBER

Grab Touch-Tone numbers right off the air, phone or tape. A simple hook-up to any radio speaker or phone line is all that is required to instantly decipher touch-tone phone numbers or codes. A 256 digit memory stores decoded numbers and keeps its memory even in the event of power loss. An 8 digit LED display allows you to scroll through the memory bank to examine numbers. To make it easy to pick out number groups or codes, a "dash" is inserted between sets of digits that were decoded more than 2 seconds apart. A "central-office" quality crystal controlled decoder is used allowing rapid and reliable detection of numbers at up to 20 digits per second! For a professionally finished look, add our matching case set. Start cracking those secret codes tomorrow with the Tone Grabber!

TG-1 Tone Grabber kit	**$99.95**
CTG Matching case set	**$14.95**
TG-1WT Fully assembled TG-1 and case	**$149.95**

FM RECEIVER/TRANSMITTER

Keep an ear on the local repeater, police, weather or just tune around. These sensitive superhet receivers are fun to build and use. Tunes any 5 MHz portion of the band and have smooth varactor tuning with AFC, dual conversion, ceramic filtering, squelch and plenty of speaker volume. Complete manual details how the rigs work and applications. 2M FM transmitter has 5W RF out, crystal control (146.52 included), pro-specs and data/mike inputs. Add our case sets for a nice finish.

FM Receiver kit	**$29.95**
Specify band: FR-146 (2M), FR-6 (6M), FR-10 (10M), FR-220 (220MHz)	
CFR Matching case set	**$14.95**
FT-146 Two Meter FM trans kit	**$79.95**

SCRAMBLER/DESCRAMBLER

Descramble most scramble systems heard on your scanner radio or set up your own scrambled communication system over the phone or radio. Latest 3rd generation IC is used for fantastic audio quality-equivalent to over 30 op-amps and mixers! Crystal controlled for crystal clear sound with a built-in 2 watt audio amp for direct radio hook-up. For scramble systems, each user has a unit for full duplex operation. Communicate in privacy with the SS-70. Add our case set for a fine professional finish.

SS-70 Scrambler/Descrambler kit	**$39.95**
CSSD Matching case set	**$14.95**
SS-70WT Fully assembled SS-70 and case set	**$79.95**

DSP FILTER

FULLY WIRED & TESTED

What is DSP? DSP allows the "construction" of various filters of great complexity by using computer code. This allows us to have easy access to a variety of filters, each perfectly optimized for whatever mode we are operating. The DSP II has been designed to operate in 10 different modes. Four filters are optimized for reducing interference to SSB phone signals from CW, heterodynes and random noise interference. Four more filters operate as "brick-wall" CW bandpass filters. the remaining two filters are designed for reliable recovery of RTTY and HF packet radio information signals. A single front panel switch selects any of these filters. Easy hookup to rigs speaker jack.

W9GR DSP Filter	**$299.95**
12V DC Power Supply	**$11.95**

SCA DECODER

Tap into the world of commercial-free music and data that is carried over many standard FM broadcast radio stations. Decoder hooks to the demodulator of FM radio and tunes the 50-100 kHz SCA subcarrier band. Many radios have a demod output, but if your radio doesn't, it's easy to locate, or use our FR-1 FM receiver kit which is a complete FM radio with a demod jack built-in. These "hidden" subcarriers carry lots of neat programming-from stock quotes to news to music, from rock to easy listening-all commercial free. Hear what you have been missing with the SCA-1.

SCA-1 Decoder kit	**$24.95**
CSCA Matching case set	**$14.95**
FR-1 FM receiver kit	**$19.95**
CRR Matching case for FR-1	**$14.95**

SCANNER CONVERTER

Tune in on the 800-950 MHz action using your existing scanner. Frequencies are converted with crystal referenced stability to the 400-550 MHz range. Instructions are even included on building high performance 900 MHz antennas. Well designed circuit features extensive filtering and convenient on-off/bypass switch. Easy one hour assembly or available fully assembled. Add our matching case set for a professional look.

SCN-1 Scanner converter kit	**$49.95**
CSCN Matching case set	**$14.95**
SCN-1WT Assembled SCN-1 and case	**$89.95**

BROADBAND PREAMP

Ever wish you could "perk up" your counter to read really weak signals? Or, how about boosting that cable TV signal to drive sets throughout the house, or maybe preamping the TV antenna to pull in that blacked out football game. And, if you're into small broadcasting, boost your transmitter power up to 100 mW! The PR-2 broadband preamp is the answer to all those needs as well as many others. You can use the PR-2 anywhere a high gain, low noise, high power amp is called for: digging out those weak shortwave signals or putting new life into that scanner radio-especially at 800 MHz. The PR-2 has a high power compression point, meaning that it does not overload easily-in fact many folks use it for boosting the power on their FM-10A stereo transmitters. Newly designed microwave MMIC chips from NEC in Japan enable the PR-2 to have gain all the way up to 2 GHz, although we only spec it to 1 GHz-believe it or not, the connector lead length is the limiting factor! Customers tell us the PR-2 outperforms professional lab units by the "big boys" that go for hundreds more. The PR-2 is the ideal general purpose amp you'll wonder how you got along without.

PR-2 Specifications: Gain: 25dB, Noise Figure: 2.5 dB, Input/Output Impedance: 50-75 ohms, Compression point: +18 dBm

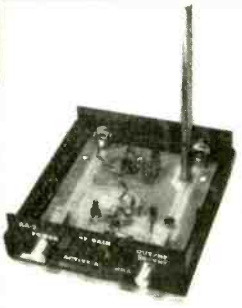
PR-2 Broadband Preamp, Fully Wired and Tested **$59.95**

STEREO TRANSMITTER

Run your own Stereo FM radio station! Transmits a stable signal in the 88-108 MHz FM broadcast band up to 1 mile. Detailed manual provides helpful info on FCC regs, antenna ideas and range to expect. Latest design features adjustable line level inputs, pre-emphasis and crystal controlled subcarrier. Connects to any CD or tape player, mike mixer or radio. Includes free tuning tool too! For a pro look add our matching case set with on-board whip antenna.

FM-10A Stereo transmitter kit	**$34.95**
CFM Case, whip ant set	**$14.95**

ACTIVE ANTENNA



Cramped for space? Get longwire performance with this desktop antenna. Properly designed unit has dual HF and VHF circuitry and built-in whip antenna, as well as external jack. RF gain control and 9V operation makes unit ideal for SWLs, traveling hams or scanner buffs who need hotter reception. The matching case and knob set gives the unit a hundred dollar look!

AA-7 Kit	**$24.95**
CAA Matching case & knobset	**$14.95**

AIRCRAFT RECEIVER

Tune into the exciting world of aviation. Listen to the airlines, big business corporate jets, hot-shot military pilots, local private pilots, control towers, approach and departure radar control and other interesting and fascinating air-band communications. You'll hear planes up to a hundred miles away as well as all local traffic. The AR-1 features smooth varactor tuning of the entire air band from 118 to 136 MHz, effective AGC, superheterodyne circuitry, squelch, convenient 9 volt operations and plenty of speaker volume. Don't forget to add our matching case and knob set for a fine looking project you'll love to show. Our detailed instruction manual makes the AR-1 an ideal introduction to two life-long, fascinating hobbies at once-electronics and aviation! See *Kit Planes* magazine (January 1991) or *Popular Electronics* (January 1993) for excellent product reviews of the AR-1.

AR-1 Aircraft Receiver Kit	**$29.95**
C-AR Case and Knobset for AR-1	**$14.95**

INTERCEPTOR

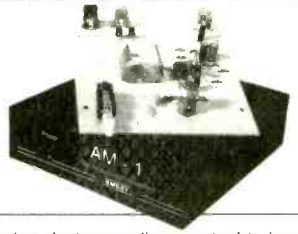
The Interceptor will lock on instantly to the nearest transmitter and allow you to listen with perfect audio quality. Since the Interceptor does not have to search through all frequencies, those quick transmissions that are hopelessly lost on scanners are captured easily. The Interceptor does not need tuning, making it ideal for hands-free surreptitious monitoring of nearby transmissions. The Interceptor is complete self-contained with internal speaker and earphone jack for private listening. Included are: Nicad battery pack, AC/adaptor charger, antenna and earphone. Increase your security and awareness-intercept the communications around you with the Interceptor. Fully wired with 1 year warranty. Covers 30-2000 MHz frequency range, FM deviations from 5 kHz to 200 kHz.

R10 Interceptor,
Fully Wired 1 year warranty **$349.95**

AM BROADCAST TRANSMITTER

High quality, true AM broadcast band transmitter is designed exactly like the big commercial rigs. Power of 100 mW, legal range of up to 1/4 mile. Accepts line level inputs from tape and CD players and mike mixers, tunable 550-1750 kHz. Complete manual explains circuitry, help with FCC regs and even antenna ideas. Be your own Rush Limbaugh or Rick Dees with the AM-1! Add our case set for a true station look.

AM-1 Transmitter kit	**$24.95**
CAM Matching case set	**$14.95**



FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Foxhound direction finder connects to theantenna and speaker jack on any radio receiver, AM or FM from 1 MHz to 1 GHz. The antenna (a pair of dipole telescopic whips) is rotated until the Null meter shows a minimum. A pair of LEDs indicate to turn Left or Right. The Foxhound is ideal to use with a walkie-talkie, if you wish to transmit, go ahead, a build-in T/R switch senses any transmitted RF and switches itself out of circuit while you talk. It doesn't get any easier than this! We provide all parts except for a few feet of 1/2 inch PVC pipe available at any hardware store for a dollar or two. Add our matching case set for a complete finished unit. Be the one with the answers, win those transmitter hunts and track down those jammers, you'll do it all with your Foxhound.

DF-1 Foxhound direction finder kit	**$59.95**
CDF Matching case set for DF-1	**$14.95**
FHT-1 SlyFox Foxhunt transmitter kit	**$129.95**
FHID-1 Voice ID option	**$29.95**
CFHT Heavy duty metal case set for FHT-1	**$29.95**

SHORTWAVE CONVERTER

The SC-1 converter brings the sounds of the world right into your car radio or home stereo (set to AM broadcast band). Front panel push switches let you choose easily between regular AM radio and the shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy to log stations or set presets. A built-in antenna switch automatically switches the existing AM antenna to either the radio or converter, making hook-up easy and fast. As with many of our kits, a handsome matching case and knob set is available to put the finishing touches on your kit.

SC-1 Shortwave Converter Kit	**$27.95**
CSC Matching Case and Knob Set	**$14.95**

SHORTWAVE RECEIVER

Here's a complete shortwave radio guaranteed to inspire awe in any listener. Imagine tuning in the BBC, Radio Moscow, Radio Baghdad and other services with just a couple of feet of antenna. This very sensitive (about a microvolt!) receiver is a true superhet design with AGC, RF gain control and plenty of speaker volume. Smooth varactor diode tuning allows you to tune any 2 MHz portion of the 4 to 11 MHz frequency range, and the kit conveniently runs on a 9 volt battery. Add our matching custom case and knob set to give your radio a finished, polished, look. Amaze yourself-and others-see how you can listen to the world on a receiver you built in an evening.

SR-1 Shortwave Radio Kit	**$29.95**
CSR Case and Knob Set	**$14.95**

ORDERS ONLY CALL 1-800-446-2295

(No tech info at this number)

TECH/ORDER/INFO 716-924-4560 FAX 716-924-4555

TERMS: Satisfaction guaranteed. Examine for 10 days. If not pleased return it in original form for refund. Add $4.95 for shipping, handling and insurance. For foreign orders add 20% for surface mail. COD (U.S. only) add $5.00. Orders under $20 add $3.00 NY residents add 7% sales tax. 90-day parts warranty on kit parts. 1-year parts and labor warranty on wired units

RAMSEY ELECTRONICS, INC.
793 CANNING PARKWAY, VICTOR NY 14564

Attention Shortwave Listeners

Introducing
Wide Band Audio - DSP Noise Reduction

JPS Communications introduces the **NTR-1**, a wideband (7kHz) DSP noise and tone remover that can be used for AM broadcasts as well as SSB and other narrow band modes. Two front panel push buttons allow you to select the spectral NOTCH and/or NOISE REDUCER independently, while a third button lets you select WIDE or NARROW bandwidth. The spectral NOTCH removes ALL tones or whistles in 3 to 5 milliseconds. The NOISE REMOVER reduces or removes most noise types instantly.

Simple installation: Unit goes between your receiver speaker output and your external speaker.

Power required: 11 to 16 VDC @ 500 ma.

Also available:

NIR-10 Noise Reduction Unit	$349.95
NRF-7 General Purpose Noise Remover	$249.95
NF-60 Notch Filter	$149.95
115 VAC to 12 VDC Adaptor	$ 16.00

"First and Finest in Noise Reduction"

JPS Communications, Inc.

The NTR-1 Noise and Tone Remover
Only $169.95

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We accept Mastercard, VISA, checks, money orders in US$.
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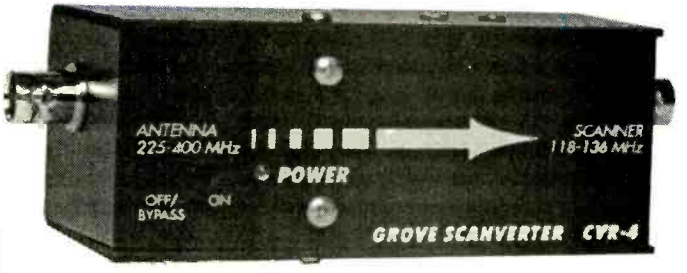
For Airshows, this is what you need;
plane and simple!



Now, hear 225-400 MHz military aircraft on your scanner's 118-136 MHz band! Ideal for monitoring Thunderbirds and Blue Angels air show stunt coordination, military flights, combat training, midair refueling and more!

The **CVR-4 Scanverter** comes with a universal adaptor kit so that it can be connected directly to a handheld scanner for portability, or to the rear of a base or mobile scanner (BNC and Motorola adaptors included).

Frequency Range: 216-406 MHz
Sensitivity: 1 microvolt
Power Required: Alkaline battery; 9 volt @ 13 mA
Connectors: BNC
Dimensions: 4"H x 1-1/2"W x 2"D
Weight: 6 oz.
Bypass Loss: 2 dB @ 400 MHz, 6 dB @ 800 MHz

only $99.95*

* plus $5* UPS Ground Shipping

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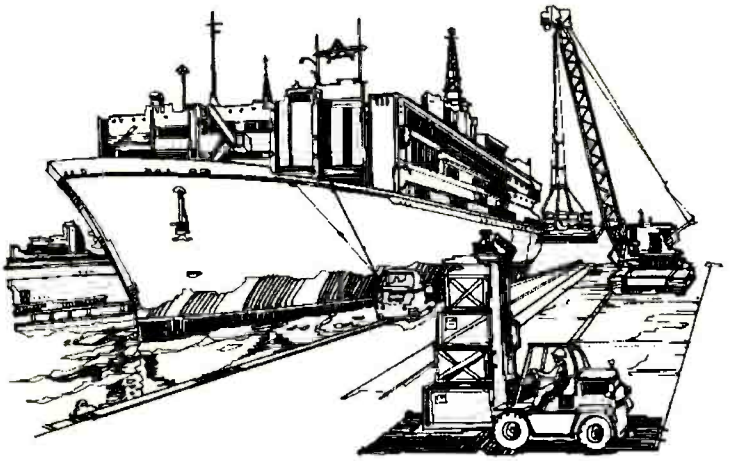
300 South Highway 64 West
Brasstown, NC 28902
(704) 837-9200 (business office)

GROVE ENTERPRISES

"When you know it's Grove, you know it's good"

Tuning in on World Business

By Dean B. Mahin



Executives of companies involved in international trade or overseas operations can obtain much useful information from world band radio.

A major fraction of the output of international broadcasters is economic and business news, including reports on stock averages, currency exchange rates, oil and other commodity prices, taxation, economic policies, news of major corporations, labor-management relations, unemployment, international trade agreements, international economic conferences, and activities of major international economic organizations.

MT's editor informs me that Limestone College in Gaffney, SC, is also using shortwave broadcasts as a real-time resource in teaching global economics. The uses for business broadcasting are many.

Monitoring Tips

To access broadcasts relevant to your business interests, you need appropriate equipment and time for experimental monitoring. Reception will be influenced by your location, receiver, antenna, listening time, season, and the location and power of the broadcast or relay station. If you are in eastern North America, you can receive many useful programs at home in the early morning and evening hours with a relatively inexpensive "portatop" receiver and a simple exterior wire antenna. If you are interested in news from small countries with low-powered transmitters, you may need a more expensive receiver and a higher antenna. Reception is better in winter, and when there is darkness between transmitter and receiver.

Shortwave monitoring at the office is often impractical due to poor reception within steel-framed buildings, the impracticality of erecting an effective antenna, and the morning or evening timing of most broadcasts to North America.

This "Programming Spotlight" gives the times that programs with substantial economic news were broadcast in English early in 1994. All times are in Universal Time (UTC), the time in London when the program begins. UTC is four hours ahead of EDT, seven hours ahead of PDT. A program broadcast on Tuesday at 0300 UTC is received in New York on Monday at 11:00 PM EDT and in San Francisco on Monday at 8:00 PM PDT. If no day of the week is indicated, the program is broadcast each weekday but may not air on weekends.

For frequencies, see the Shortwave Guide in each *Monitoring Times*. Try each frequency listed for broadcasts to your region from countries you select. Since propagation conditions in 1994 will require many broadcasters to shift to lower frequencies, check *MT* each month for the frequencies being used by broadcasters you monitor.

Europe and Canada

Aside from BBC's *Newsdesk* at 1100 and other BBC programs during the day, the best and most audible European news programs are received in North America in evening hours (2200 to 0500). British, German, and Dutch programs are rebroadcast from relay stations in Canada and the Caribbean. The most comprehensive coverage of economic and business news in western Europe is found on German and Dutch broadcasts, especially Deutsche Welle's *European Journal* (0108, 0208, 0308, and 0508) and Netherlands Radio's *Newsline* (2337, 0037 and 0337).

The BBC is the only international broadcaster transmitting to North America almost continuously around the clock. The BBC worldwide broadcasts give priority to British economic news and to British positions on international economic issues. Much of the British news in BBC programs is economic and business news, although some programs are not well timed for business listeners in North America. *Newshour* (0500, 1300, 2100) includes financial news at 0525, 1325, and 2125. *World Business Report* (0905, 1705, 2205) provides closing stock, commodity, oil, and currency prices and other major business stories. *Europe Today* (0330, 0530), broadcast to Europe but often audible in eastern North America, contains more European economic news than the BBC broadcasts to North America.

Spanish economic news is prominent in the Spanish National Radio's news program at 0000, 0100 and 0500. Swiss Radio International covers Swiss business news in broadcasts at 0100 and 0400. Radio France International broadcasts *RFI Europe* at 1231, 1431, and 1631, but does not broadcast in English later in the day.

Most European broadcasters have a weekly program of business news. BBC's *World Business Review* is on Sundays at 1705, 2205. Radio Finland's *Business Monday* is on Mondays at 1145, 1245, and 1345. Netherlands Radio's *Let's Get to Business* is aired Mondays at 1250, 1450, 1850, and 2350. *Money Matters* is broadcast by Radio Sweden on Wednesdays at 1249 and 1349.

Shortwave can inform you about the rapidly changing economic conditions and business climate in former Iron Curtain countries. But you will need good equipment and patient monitoring. Several countries of eastern Europe and the former Soviet Union broadcast to North America, but programming is unpredictable, most transmitters are low powered, and reception is often poor. Radio Moscow's *Contacts and Contracts* (Sundays at 1530) stresses activities of foreign companies in Russia. Radio Budapest International schedules *Business Partners* on some Saturdays at 0315.

The best source of Canadian economic-business news is CBC's *The World At Six*, rebroadcast on shortwave by Radio Canada International at 2200.

Business News from Asia

Radio Australia provides the most comprehensive coverage of economic developments in the Asia-Pacific region. None of its programs are relayed in North America, but reception of direct Australian broadcasts is often excellent in eastern North America in the early morning. *Asia Focus* at 1010 covers commercial relationships in the region. *International Report* at 1030 includes a stock exchange report at about 1048. The *Australian News* segment of the news program at 1100 is often mainly economic and

business news, and there is more in *International Report* at 1230, 1430, 1630, and 1830. The week's business developments in the Asia-Pacific region are reviewed in *Business Weekly* on Saturdays at 1130 and 1530. Reception of Australian broadcasts is poor in North America in the afternoon and evening hours. Financial news from Sydney and other exchanges is broadcast at 1425. *Business Report* reviews the day's business developments in Asia at 2330

News from Japan Radio and Radio Korea is relayed to North America from Canada at 0100 and 1100. China Radio International's *China's Open Windows* (Mondays at 0000) is relayed via Mali in Africa; it focuses on business opportunities in China, and has commercials! Voice of Free China broadcasts from Taiwan are relayed at 0200 and 0300 via Florida; they include *Taiwan Economic Journal* on Tuesdays at 0232 and Wednesdays at 0332.

The Voice of America's *Asia Report* is at 1410. Radio Moscow's *Focus on Asia and the Pacific* is at 0011, 0511, 1211, 1511, and 2111.

Third World Countries

The BBC's news programs—notably *Newshour* at 0500, 1300, and 2100 — provide the best coverage of developments in Africa and South Asia, especially the former British colonies. Radio Australia covers Southeast Asia and South Asia. News of Latin America is hard to find in shortwave broadcasts in English; the best source is the Voice of America broadcasts in English to Central America and the Caribbean.

Several broadcasters have weekly programs on economic developments in Third World countries, although some are not included in broadcasts to North America. VOA's *Development Report* is in slow "special" English (Monday at 0040, 1110, and 1340). BBC broadcasts *Development '94* on Saturdays at 0930, 1701, and 2015. Deutsche Welle airs *Economic Notebook* on Tuesday at 0300, and Saturday at 0200 and *Development Forum* on Saturday at 0900, 1500, and 1900. Radio China International's *In the Third World* is on Saturdays at 0040, 0340, and 0440.

Agriculture and Science

If your business is related to agriculture, look for VOA's *Agriculture Today* (Saturday at 1110 and 1810, and Sunday at 0010) or *Agriculture Report* in special English (Tuesdays at 1110, 1340, 1640, and 1840), BBC's *Farming World* (Thursdays at 0415, 0930, and 1945).

If you are in a high-tech company, you may be interested in programs focusing on science and technology such as VOA's *Science Report* (In Special English, Wednesdays and Thursdays at 1110, 1340, 1640, 1840, and 2240), Radio Australia's *Science File* (Wednesday at 1130 and 1530), Deutsche Welle's *Science and Technology* (Friday at 0300), and BBC's *Science in Action* (Friday at 1615, 2030, Sunday at 1001).

Additional Recommendations
by Jim Frimmel, *MT* Program Mgr.

BBC (alternative for Africa)
0450 (T-F): World Business Report for Africa

Radio Vlaanderen Int'l, Belgium
1320 (Fri): Economics
2344 (Thu): Economics

Radio Canada Int'l
0111 (T-S): Spectrum
0411 (T-S): Spectrum
2041 (M-F): Spectrum

Radio Finland
1140/1240/1340 (M) Economic Comments in the Finnish Press

Voice of Israel
1924 (Mon): Business Update

Radio Moscow World Service
0511/1911/2011 (Sun) Newmarket
1611 (Mon) Newmarket
0211/1311 (Tue) Newmarket
20111 (Wed) Newmarket
1611 (Fri) Newmarket
1311 (Sat) Newmarket

Radio New Zealand
0055 (M-F): International Business News
1050 (M-F): The Asia-Pacific Business Report

Radio Singapore
1120 (M-F): Business and Market Report

Voice of America
0010 (M-F): VOA Business Report
0510 (M-F): VOA Business Report

Final Notes

Many broadcasters are making programming changes this year due to tight budgets. Although most broadcast times given here should remain valid, they cannot be guaranteed. This *Spotlight* and the *MT Shortwave Guide* should help you find many interesting programs, but your patient monitoring will produce a listening schedule fine-tuned to your interests and situation.

Even if you find little on shortwave that is specifically relevant to your business, monitoring world band radio can increase your understanding of political, social, and economic trends in other countries and enhance your ability to operate effectively in today's complex international business environment. MT

Duopolies and DXing

With recent changes in FCC rules regarding multiple station ownership, there are now groups of as many as three stations in a single radio market that are all owned and oftentimes programmed from one facility. A station owner can have two FMs and one AM, or two AMs and one FM station in the same market as long as the combined market share does not comprise more than 25% of the market at the time of the acquisition. After that time, there is no limit to the precentage the owner may hold. These are called duopolies, as they give one company two outlets in the same band—something impossible under previous regulations.

A similar development is taking place with regard to physical facilities, due to the public's growing resistance to large broadcast tower construction, even in rural areas. Their opposition stems from fears of the loss of their view, to lightning strikes, to increased interference with broadcast reception due to blanketing by the strong signals. Such opposition has resulted in several radio stations entering into joint ventures when erecting towers in order to share the costs and expenses as well as reduce the number of such towers in the area. This shared usage, combined with the new groupings of radio stations under the same ownership umbrella, can be both a boon and a burden to the DXer, depending on where the DXer resides.

When more than one station share the same tower, they are required to use filters on their feedlines to eliminate the effects of the other nearby station signals on their own signal.

Here in Lincoln, for example, we had 1 kW omnidirectional stations on 1240 and 1400 kHz and a 5 kW directional on 1480 kHz. The signals from each station reached each other's towers with sufficient strength to mix with the transmitted signal, resulting in a transmitted spurious signal on 1560 that made DXing there impossible. This is due to the fact that 1240 and 1400 were 160 kHz apart, resulting in a signal at 1560. Also, 1400 and 1480 were 80 kHz apart, resulting in a signal at 1560, as well. It sounded like a mush of all three stations when listening to 1560!

But, with the combination of the stations on 1240 and 1400 on the same tower, a combiner network couples their signals together and traps make sure that the two signals do not make the interference on 1560. With a trap to eliminate 1480 from both stations, the result is that 1560 can finally be enjoyed as a DX frequency, clear of local interference.

This same relationship can benefit FM DXers, as well, when FM stations join forces through common ownership or tower interests to use the same sites or even antennas to broadcast their programming. The main*dis*advantage for DXers is confined to those hobbyists who live in the shadow of these new combined station transmitter sites. Although the problem of transmitter produced spurious signals has been eliminated, receiver problems for these folks are aggravated by having so many very strong signals close by.

On the other hand, for those living a good distance away, the ability to null out several local stations at once with a directional antenna is enhanced by having them all in one or two places.

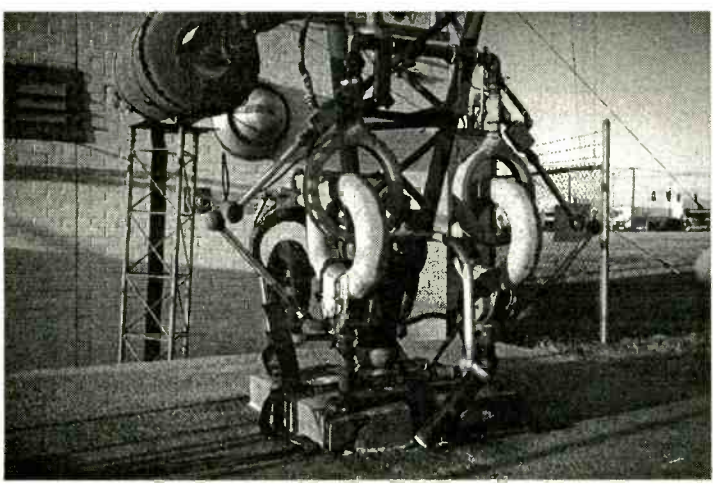
We have two such sites here, one 18 miles southwest of the city with three FM stations sharing a 1000' tower. KUCV 90.9, KTGL 92.9, and KKNB 104.1 all beam from the same site, yet all have different ownership. The other site, located near the center of the city, is home to four stations. KFOR 1240 and KFRX 102.7 of May Broadcasting, and KLIN 1400, and KFGE 105.3 of Warner Stations share the single 500' tower (pictured below). DXers using effective traps and good antennas can reduce the bad effects of these RF sources, yet take advantage of them as long as they are far enough away.

A big thank you goes out to Bill Seier, WB0SIP, chief engineer for KLIN/KEZG/KFGE/KWBE for making their facilities available to me and for the information about combined transmitter sites.

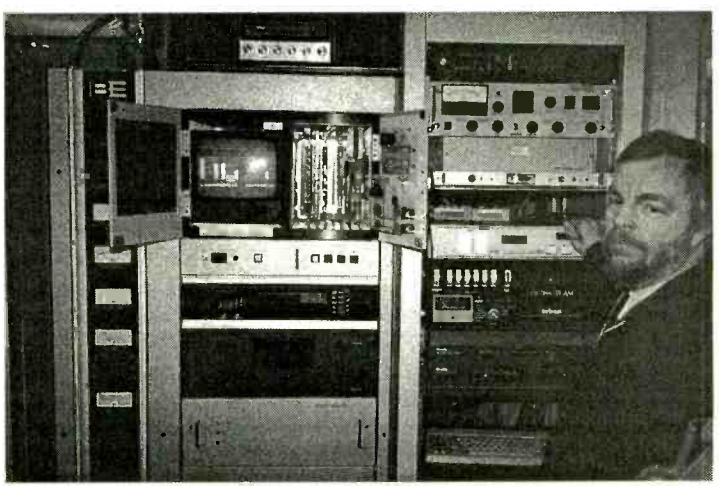
Vacation DXing

With the vacation season upon us, DXing can be a big part of our summer trips. A visit to a favorite DX catch may be possible and some of you might want to send in to *MT* a few pictures of your favorite station visits. A good idea is to write or call the station well in advance of a possible visit so that a tour can be arranged. Most radio stations will extend this courtesy, especially if your inquiry includes a tape or logging of that station.

If you are interested in the technical side, write to the attention of the engineer, who might be able to get you into some very interesting transmitter sites. Be sure to never visit a transmitter site without supervision. This is for your own safety. There is a lot of high voltage and RF present that could comprise a hazard to you unless you only walk where directed by the engineer. There can be hidden hazards like ground



The huge lightning discharge points and the "ring" isolation transformers that allow AC voltage to be coupled to the tower for the warning lights.



Bill Seier, WB0SIP, Chief Engineer, alongside the KFGE transmitter.

wires, falling ice, or other things that you may be unaware of that could hurt you or your vehicle, such as cattle or other livestock. Sophisticated security systems often monitor these premises.

Presenting station personnel with proof (such as a good tape) that you heard their station can sometimes net you a T-shirt, mug or other souvenirs with the station logo on it! Remember to write a letter of thanks to stations you visit during your vacation.

DXing While Traveling

Most of us do our traveling by driving. Whiling away the long hours on the road by DXing or just listening to the new stations as they come into our range makes the trip go a lot faster.

If you travel by airline, listening to the radio is prohibited by FAA rules in most cases. But, with the permission of the cockpit crew, DXing can be a unique experience in a plane. AM DXing is almost impossible, but FM DXing can be fun. It can be a challenge, too, as every channel is full of stations as your altitude increases. On trains, radio listening is a natural.

To keep a record of your DXing, there are a few models of Walkman-type radios that will allow you to record. A digital tuner helps a lot, too, as the crowded analog dials of such small receivers make it very difficult to know exactly what frequency you are listening to. Carrying a guide such as the *FM Atlas* (available through Grove Enterprises), can make DXing while traveling a pleasure.

A Case in Point

A recent trip took me to Berkeley, CA, where I was privileged to tour KPFA 94.1 FM. KPFA is the flagship station of the Pacifica Foundation and has a very diverse format. Talk shows, poetry readings, news, alternative music and other programming not normally heard on commercial outlets is the rule at KPFA. Considered to be the first non-commercial station of its kind, KPFA serves the San Francisco Bay area with its unique blend of thought provoking and sometimes offbeat style.

I am grateful for a tour by one of the engineers, Chupoo Alafonte, of their studios, located a few blocks from the campus of the University of California Berkeley campus. Chupoo has been instrumental in training several women to be broadcast engineers. Ms. Alafonte also hosts a show each Friday morning at 8:30 AM all about computers.

This station is truly a community-based operation, with most of its funding coming from donations by listeners. Computer users can e-mail KPFA at kpfa@well.sf.ca.us via the Internet.

Bits and Pieces

Alan Masyga forwarded an interesting mailing from KNXR in Rochester, MN. This MOR (middle of the road) formatted station is struggling to keep its format intact, despite relatively low ratings. The mailing includes pre-addressed postcards to current and potential sponsors for listeners to send to show their support for the station.

Kudos to Chet Copeland for clipping an article about a program on WUST 1120 AM. On Sundays from noon to 1:30 PM, WUST carries "Jewish Community Radio." The programming includes Yiddish music and other features of interest to the Washington, D.C., area Jewish community.

Robert Thomas sends in a few articles about the continuing saga of one of radio's more controversial voices, Howard Stern. The FCC is considering two new complaints against Stern, stemming from broadcasts between November 17th, 1993, and February 22nd, 1994, on WWKD in Buffalo. Howard Stern's program is heard on several stations nationwide via satellite.

In future columns, we will list your prize loggings, we will look at tropospheric propagation and how to better take advantage of it, and we'll check out those all-digital stations which use no or very few traditional tape cartridges for spots, jingles and other announcements. Low-power TV stations are also on the agenda, so keep sending in your articles about local broadcasting activities to the Brasstown address or to my e-mail address. I am on Prodigy at JPGC40A and the Internet at jpgc40a@prodigy.com, or via the Grove BBS. Happy E-skip season!

Listener's Logs

These logs by Joe Eisenberg, Lincoln, NE:

KXEL 1540 Waterloo, IA, 0100Z Religious, ID "KXEL, 1540 Waterloo." Heard Brother Stair's Overcomer Ministry simulcast also on WRNO on SW.

CBW 990 Winnipeg, MB, 0235Z News/Talk. Heard CBC Egnlish programming.

KELO-FM 92.5 Sioux Falls, SD, 1325Z Adult Contemporary. Heard ad for Empire Mall.

KTIV 4 Sioux City, IA, 1800Z Local Newscast. Gave weather for "Siouxland." MT

John Fulford, WA4VPY

The Sounds of Silence

The President is in town, local security channels are hopping, and Secret Service should have been audible. What did I hear? You guessed it!

The President was in town recently, and every monitor I know either took off work or took their scanners with them to monitor the Secret Service traffic. The first stop was in Miami, FL, where he gave a speech and spent the night. Security was very tight with encrypted traffic on 165.375 and 164.650 MHz. There were probably some low power channels used, but from my vantage point, they could not be heard. However, the City of Miami and Dade County Sheriff's Department channels were hopping.

President Clinton then went up to Deerfield Beach, FL, which is about five miles from my work location, to deliver his speech on health care reform to a senior citizen retirement community. A monitor was directly across the street from him at his job and heard ... squat. The above two Secret Service channels were active, the Broward County Sheriff's Department was active on 154.710, and the security patrol at the retirement community was active. But from the Feds, nothing. Things sure have changed from the days of Presidents Bush and Reagan when the radios had non-stop activity.

What turned out to be the most interesting point of the visit was the airborne command post. It was heard on the old "Nighthawk" channels as part of NEACP (National Emergency Airborne Command Post—pronounced "kneecap"). It was heard on two frequencies talking to ground units: 382.35 and 397.05 MHz.

Let's discuss this system for a minute. This is an FDM (Frequency Division Modulation) system. It has a center carrier and numerous subcarriers running FM and SSB. It is part of the Department of Communications Agency. The channels are designated as:

Channel	Uplink from Ground	Downlink to Ground
01	326.000	382.350
02	246.950	305.550
03	344.000	336.800
04	366.000	397.050
05	390.000	322.750

The system has undergone a name change and is now called the **Advent Command System.** It is best received by detuning your radio to one of the subcarriers and demodulating it in the SSB mode. For the true monitoring technocrat, the best readability is obtained by taking off the IF (intermediate frequency) of the radio and then picking out the subcarriers with a shortwave receiver.

The airborne command post puts out lots of power and is thought responsible for the mysterious garage door openings (which usually operate at 395 MHz) and other assorted weirdness when the Presidential Party is in town. It never hurts to keep 415.700 MHz (Echo/Foxtrot) programmed in your scanner, just in case.

Agency of the Month

This month our spotlight falls on the Department of Labor ... Boring, you say? Not by a long shot. If you read the official government description, it says the Department of Labor is responsible for administration of federal regulations dealing with minimum wage, overtime, minority contracts and affirmative action. All well and good, but do you know what else they do? They head up the Organized Crime Task Force for the Attorney General's Office. These people are the intelligence gatherers for the OC units. I have been in their offices only once in my life and it was like going into the Situation Room of the White House.

To start with, it is a "no lone zone." This means you are never allowed in there by yourself; you must travel in pairs. Second, it is inside the biggest walk-in vault I have ever seen. The entire office, with the exception of the reception area, is totally shielded from the outside (which prevents hidden bugs from working). To coin a phrase from the gangster movies: "this is where the bodies are buried."

USAF

Though you won't hear State secrets, the Echo/Foxtrot channel of 415.700 MHz provides interesting listening from Air Force 1 as Congressmen call home, etc. Even the President himself is heard occasionally.

Remember the first organized crime conference in Appalachia many years ago that was interrupted by the Feds? That was the Department of Labor at work. It was there that it was realized there was an organized conspiracy of crime lords at work. The frequency assignments are as follows:

Channel	Freq (MHz)	Use
01	406.200	Simplex
02	414.775	Control/Mobile
	406.200	Repeater Out
03	412.400	Simplex
04	411.350	Simplex

There are two VHF assignments of 166.200 and 164.700 MHz. These were never associated with any of the Strike Force Activity, but were part of the Wage and Hour units.

Reader Input

Joann Haines of Phoenix, Arizona, wrote in with some interesting questions on the mode of transmissions. I will attempt to answer them for her and hope this enlightens other readers as well.

The frequencies for the Federal Aviation Administration are narrow band FM. So are the frequencies for the Federal Railroad Administration, Federal Maritime Administration, and the National Transportation Safety Board. The Department of Transportation low VHF frequencies are also narrow FM.

Table 1 shows how the modes are allocated. I hope it helps to clear up the confusion.

Corrections

The April 94 column listed the FBI frequencies in use in south Florida. Two minor corrections were noted: 165.2875 MHz is the main channel for Alcohol, Tobacco, and Firearms (ATF); it is their main repeater output. 166.4625 MHz is Treasury Common—used by all branches of the Treasury Department. Could it be used for body surveillance? You bet. That's what we will get into next month—electronic surveillance.

Until then, happy monitoring and 73's.

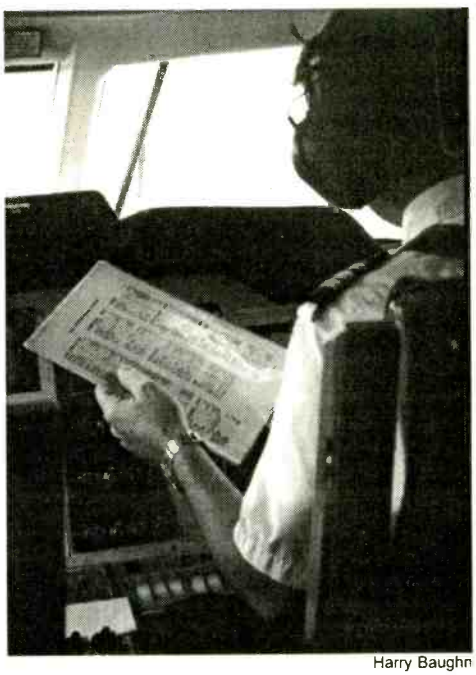
Table 1: Mode Allocations

Freq Range (MHz)	Emission Type(s)
1.6-25	AM, CW, SSB, whatever
25-26.8	NFM, LF in the petroleum oil spill or remote broadcast, otherwise anything goes
29.7-30.0	Forest products (NFM)
30-50	This is an interesting band. If the channels are part of a regular two-way network, then they will be narrow FM. Examples are police on 42-46 MHz, government on 40-42 MHz (such as the 40 MHz Department of Transportation channels), paging in the 35 MHz band, and low band business. If the frequencies are part of a military net (using military radios such as PRC-77's etc.), then it is *wideband* FM. These channels are 50 kHz from each other and can appear anywhere in the 30-88 MHz band. Some even show up in the six meter ham band, such as 51.5 MHz, which is used as a guard channel for Army airfields in the northeast.
72-76	Narrow paging and point-to-point links
118-138	Aircraft *always* AM
138-144	Military narrow FM
150-174	Narrow FM
225-400	Military aircraft AM
400-406	Data, never voice
406-420	Narrow FM

Jean Baker, KIN9DD

Welcome aboard and fasten your seat belts! Spring has sprung and, at last, nicer weather conditions give us the opportunity to take our receivers and scanners outdoors. Be careful if a thunderstorm approaches, though. Shut 'em down and get indoors.

How To Get More Out of Listening to HF Aero Comms



Harry Baughn

Let's start with the most basic item of all: **BE PREPARED!** That's a motto intended not only for Boy Scouts! Gather up your logbooks, note pads, pencils, frequency guides, and tape recorder (with tape cassette already in it) and have them ready at hand before you start. Nothing is more frustrating than having to jump up and search for something right in the middle of an interesting transmission.

The tape recorder is a great tool to use if the operator and/or pilot is talking too fast or indistinct for you to follow; just have your tape recorder ready to go and record the conversation. Later on, when you have more time, you can replay the transmission and get the real gist of the message.

The second important thing to remember is **PATIENCE!** If you're a beginner, you may not hear much the first couple of times you sit down to monitor, but once you get the hang of it, you'll be able to do it with the best of 'em. So, the first couple of times you monitor, just sit and listen so you'll get familiar with these transmissions.

Along with this reminder, remember that time and seasonal differences are important factors to take into consideration. As an example, when it's 2 PM in the midwest, it's only 9 AM in Hawaii, so don't expect to hear much of anything from the East Central Pacific frequencies if you live in Chicago. In other words, what you hear depends on the time of day or night in the area you're monitoring. Also, propagation conditions have quite a bit to do with it, too. Check Jacques d'Avignon's Propagation Forecast Charts right here in *MT* every month, because certain conditions relating to ionospheric influences can contribute to how well, if at all, you will be able to hear anything on your favorite bands.

Finally, allow yourself enough monitoring time so that you don't feel rushed. If your spouse or significant other isn't interested in monitoring, try to pick a time when he/she is engaged in a hobby of his/her own. If you don't have a special room set aside for your equipment and if you're monitoring while they're in the same room, use a set of headphones so you don't disturb them. If you're fortunate enough to have a separate room of your own or even a little nook for monitoring, you're in luck.

Decide which frequency band you're going to start with and either scan that band (if your receiver has this capability), or input one of the frequencies you know from previous experience has a lot of activity on it. Some monitors with two HF receivers like to use one of them set on a favorite frequency or band and frequency surf with the other receiver. That may be a bit distracting at first for beginners, but after a while it becomes a little easier to do.

Okay, now you have your physical set-up all ready, your favorite frequency has lots of activity on it—what's next? You're going to start monitoring, right?

LISTEN carefully—not just to *what* the pilot or radio operator is saying, but **how** they are saying it. You can tell a lot about what's really going on from a tone of voice. If a pilot is saying that he may have a minor problem aboard, the way he describes it can tell you if he's really concerned or not.

Suppose a pilot is giving a position report and says that there's intermediate moderate chop at his cruising altitude. His voice may indicate whether it's a real problem or just slightly annoying. Of course, if it's a real problem, then he'll ask the radio operator to request a new altitude from ATC.

Perhaps a radio operator needs to get in touch with a certain flight and he's been Selcaling him for several minutes as well as calling by voice with no response. The reason he needs to talk to the pilot of that flight is very important—or even urgent—so he may ask another pilot to try to raise him on the international emergency frequency (VHF-121.500), and if he succeeds, to call the radio operator on the HF he's working. You may hear an actual emergency in progress and the radio operator will clear all flights, except the one with the emergency, to another frequency. You will notice that 95% of the time, the radio operator's tone of voice is very calm and collected.

Use oceanic planning charts to follow the progress of the flights you're monitoring. We mentioned last time that they're an invaluable tool for use in HF monitoring, and believe me, it cannot be stressed enough times. It makes a visual reference to what you're hearing and with luck, you can follow a flight across an oceanic area.

Logging your "catches" is interesting; you can go back through them later on and see how many times you've logged a particular flight, or you can see when you sent that special reception report from which you're hoping for a QSL. I don't try to log *everything* I hear as that would have me buying log books every week. What I do log are the more unusual transmissions, such as one I heard recently where there was a "small animal loose on board." (They never did identify what that "small animal" was!) After a while, you learn to be discriminating about what is worthy of keeping for posterity.

The most important thing of all is to relax and **ENJOY** yourself. Aero monitoring is a hobby, and hobbies should be fun. With that in mind, good luck and good hunting.

VHF Monitoring at the Crossroads

Now, on to VHF. I know we promised some more airline addresses and military tail numbers for this issue, but something came across my desk that I really have to share with you. One of our readers sent in a wonderful description of VHF aero monitoring called "Living On The Crossroads," written and contributed by David Chatterton (NJ). Although we had to edit this somewhat for space purposes, we kept the "gist" of it for you to enjoy. The floor's all yours, David:

"Being one of the fortunate listeners to live close to four major airports—JFK, La Guardia, Newark and Teterboro—I enjoy a form of monitoring that is both interesting and hectic. At the crossroads it is possible not only to hear the interchange between the pilots and ground control but on a clear day or night you can verify a specific aircraft's flight pattern. (Of course, I can only do this when I have my scanner alongside me when I'm sitting in the garden.) With a little practice you will get to recognize the voices of some of the ground controllers and even some of the pilots. You can watch them climb, turn, and descend on a single controller's command.

The roar of a 727 with its three Pratt and Whitney engines climbing to eleven thousand feet after taking off from La Guardia (120.400 MHz) will take the breath away from any monitoring enthusiast.

My small North East town in New Jersey is literally the **Crossroads** for planes departing La Guardia, arrivals at Newark, as well as countless smaller corporate jets, cargo aircraft, and general aviation flights arriving and departing from Teterboro (127.600 MHz).

Planes departing La Guardia take about three minutes to arrive over my house. Here is a typical conversation between a plane and La Guardia Ground Control. In this case the aircraft is Delta Flight 1741:

Tower (118.700 MHZ): 'Delta 1741 cleared for take off; contact New York Departure when airborne on 120.400 MHZ.'

Delta 1741 repeats the command. 'New York Departure, 1741 is with you out of two point five for five thousand, heading three two zero.'

Control: 'Delta 1741, Radar Contact, climb and maintain fifteen thousand; turn left, heading three one zero.'

Delta 1741: 'Up to fifteen thousand, on heading three one zero, Delta 1741.'

As I sit on my porch awaiting the arrival of Delta 1741, it is not long before I hear the sound of the 727 in the distance and within seconds it is passing directly overhead.

Controller: 'Delta 1741, turn left heading two seven zero, contact New York Departure on 120.850.'

Delta 1741: 'Two seventy, Twenty Eighty Five on freq...See ya!'

Even as the pilot is speaking, the right wing of the aircraft is rising high into the air as it makes a left turn on the 270 heading and I have the satisfaction of knowing that the controller who is fifty miles away is watching this on a radar screen *while I am seeing it for real.* I should also add that while the controller was handling Delta 1741, he was also talking to about a half dozen other planes at the same time, spacing them accordingly like the professional he is (it could also be a she!).

Meanwhile, a fleet of planes is invading my porch from the west. This is Newark-bound traffic. They are flying at 4,000 feet as they arrive, spaced about three miles apart; speed anywhere from 180 to 200 knots. These join the "pattern," as it is called (a pattern being one big circle). When the number of aircraft exceeds a given limit, a second and even a third pattern is formed one above the other. This is called **stacking**. The pattern forms above Robinsville, NJ, where they proceed north descending and turning further east at the controller's command.

Switching over to one of the following frequencies (120.150, 127.600, 132.700), you will hear the controller tell a plane to *turn right heading 190 degrees to intercept the Localizer for ILS runway Two-Two Left, three thousand feet, to join, not exceed 180 knots to the marker.* This allows the pilot to set up for the instrument landing system that guides the plane on the right course for runway 22.

Runway 22 corresponds with the compass point 220 degrees. All runways correspond in the same manner. For example, runway 19 is 190 degrees, and so on.

As I watch the plane turn above my head and disappear from sight, it is told to contact the tower on 118.3. Many pilots reply by saying 'Eighteen Three, thanks a lot—nice job.'

The controller for Newark Approach may handle up to *a dozen* aircraft at one time and sometimes at peak rush hours does not seem to pause to take a breath. It is not uncommon to hear a little humor to slip into the normally precise transmissions between the pilot and controller. The other day a controller asked that well wishes be given to a passenger. Pilots appear to oblige requests by the controller, and in this case the pilot responded, 'You should have said something before we took off, I would have had her moved up front.' The controller replied 'Oh, that's ok, it's only my mother-in-law.' The pilot laughed and said 'Well, in that case, do you me to drop her off some place?'

To sum it all up, monitoring the airlines is a hobby anyone can enjoy. All you need is an inexpensive scanner that receives 108 to 136 MHz and a decent antenna like the PRO Wideband Discone from Grove Enterprises, which does an excellent job. If you live within 50 miles of the New York City area and you look up and see a commercial airliner pass overhead, the odds are it passed over my porch earlier at the **crossroads**!"

Thanks, Dave, for summing up the excitement and human interest to had in aero monitoring!

Bringing Up The Tale

While monitoring one of New York ARINC's many frequenciest, I overheard a rare expression of frustration. It was on a Sunday and I gathered they were rather short-staffed. One of the NY radio operators grumbled to his counterpart in Gander: "I feel as if I've got the whole world in my hands!"

That's it for now, folks. Next time, we'll take a look at the brand new Denver International Airport, which is (allegedly) due to open in early May. We'll try to include some airline addresses and military tail markings, too. Until then, 73 and out. MT

NASA, WXSATs, AMSATs, Teletext and More

In the course of several months lots of interesting little tidbits of information cross my littered desk/ham station/computer table/workbench. (Here, in fact, is where many of them are last seen, slipping silently into the wrong stack of accumulated information.)

None of these items are enough to base an entire column and together they are unrelated. Yet, they are of interest. So, in the spirit of Spring Cleaning, I give you: The contents of the top of my desk (in no discernable order).

Teletext

Several months ago in this column I reported the final collapse of Electra, the longtime teletext service found on the Vertical Blanking Interval of TBS Superstation. Not so fast, Hydrazine Breath. While Electra did indeed find the telecommunications superhighway ditch, it should be noted that several other services lumber on: notably, Tempo Text and SportScreen, both found on the old TBS VBI, and *USA Today* Decisionline, which is on the VBI of Home Shopping Club II (F3, 10).

Tempo Text offers stock quotations and is advertising supported. Decisionline takes up where Electra left off with headline news, sports, etc. Reception is via a stand-alone teletext decoder which sells for $279. A computer card teletext decoder is also available for $179. SportScreen is a Vegas style tout service for gamblers and will cost over $600 per year for a subscription.

None of the services nor the hardware come close to the capabilities of the InfoCipher 1500R data receiver from General Instrument. Full featured text from the world's top wire services (including all market activities) is fed at 9600 baud packet rates and connects directly from your VCII equipped satellite receiver to your home computer. Cost of the InfoCipher is around $250 and annual subscriptions to X*Press X*Change start at $60 per year. So impressive is X*Press X*Change that I will go into detail on this service in a future column.

For more information on any of these call:

- Astro Products (Teletext Decoders) 619-471-9930
- International Teletext Communications 408-735-8833
- X*Press Information Services 800-7PC-NEWS

NASA NOTES

NASA's Office of Space Communications is initiating an opportunity for private industry to conduct experiments and demonstrations of future telecommunications technologies via the Tracking and Data Relay Satellite System (TDRSS).

According to a NASA press release: "...the Mobile Satcom TDRSS (MOST) Experiment Program...will enhance U.S. competitiveness in the rapidly expanding global satellite telecommunications arena...Use of the TDRSS space and ground segments will be made available free of charge to interested parties. It will be offered to U.S. entities for experiments and demonstrations only. Experimenters cannot use the system for routine business operations.

The commercial applications these experiments enable, must be implemented in nearby non-government frequency bands. In addition, experimenters will be responsible for providing all equipment and personnel required to perform the experiments..."

According to a NASA spokesperson, Shuttle Amateur Radio Experiments (SAREX) are not scheduled on STS flights until shortly before launch. Since there are not that many shuttle flights per year it's a simple task to determine when SAREX will be available on current missions. STS missions for the rest of this year are as follows:

Spacecraft	Launch	Declination
Columbia	July	28.45 degrees
Endeavor	August	57 Degrees
Discovery	September	57 Degrees
Atlantis	October	57 Degrees
Columbia	December	28.5 Degrees

According to Keith Baker, KB1SF, in his book *How To Use The Amateur Radio Satellites,* monitoring the shuttle is easiest as it flies over your particular location on the higher inclination of 57 degrees. Amateur operators wishing to actually contact the shuttle may be frustrated by the competition of hundreds of fellow hams doing likewise.

Monitor NASA Select Television to be ready for an orbit which will bring the Shuttle over your location. Monitor 145.55 MHz on your 2 meter transceiver or scanner to get in on the action. Remember that 145.55 MHz is the downlink frequency. The uplink frequency for FM voice will be one of the following: 144.91, 144.93, 144.95, 144.97, or 144.99 MHz. Packet uplink will be 144.49. Missed it? Shuttle orbits are usually around 90 minutes. Maybe you'll have better luck on the next go-round.

Speaking of AMSAT, here's the latest on the Phase 3-D satellite. AMSAT took delivery recently of seven main propellant tanks which were manufactured in Russia under contract from AMSAT-DL and in accordance with AMSAT specs. The tanks are now in Orlando, Florida, where integration of the satellite is scheduled to begin this summer. Work continues on the communications aspects of the craft. Among features which will be employed onboard are advanced high speed modems, Digital Signal Processing (DSP) techniques and new communications protocols.

Other "neat stuff" will include Earth-imaging CCD digital cameras, all manner of cross-band capabilities and transmitter outputs of a whopping 80 to 200 watts in a Molniya (highly elliptical) orbit. The up-shot is that this satellite will be a major international workhorse for all hams, and may do more than any other single satellite to bring this mode of operation into wide acceptance.

To order Keith Baker's book or to get more information about AMSAT, write AMSAT-NA, 850 Sligo Avenue, Silver Spring, MD 29010-4703 or call 301-589-6062.

TVRO NEWS NOTES

According to published reports, Telesat Canada, operator of the lost Anik E-2 satellite, will attempt to recover the bird through a six month long series of maneuvers involving the satellite's on-board position rockets to gain control of the satellite.

Meanwhile, Galaxy 1R has successfully replaced G1 with its more powerful transponders providing excellent pictures on the ground. The satellite was to be launched in February but the mission was scrubbed when the rocket failed to ignite. A rescheduled March launch proved successful and now another C band satellite has at least 12 years of service to go.

Galaxy 6 has replaced Galaxy 2 at 74 degrees west which is particularly good news to SCPC experimenters and baseball fans alike. This is the location for the majority of the SCPC backhauls and transmissions for most teams in Major League Baseball. Listeners should be experiencing a slight increase in signal strength between the 9 watt G2 and the 10 watt G6.

The National Football League has announced that beginning with this season it will encrypt all its backhaul feeds via the VideoCipher IIRS. Further, there will be made available to dish owners programming packages to be able to view all the games. All the backhauls will be fed on the same satellite, making it much easier to flip from game to game.

PBS's plans to transmit via the DigiCipher I compression system may start as early as August 15. According to published reports, Ku band PBS services will be fed in the clear during the evening prime time. General Instrument is said to be pacing the DigiCipher I technology to be incorporated into TVRO receivers by the summer of 1995.

Speaking of digital technology, the Digital HDTV Grand Alliance which is comprised of America's heavyweights in the electronics field

(AT&T, General Instrument, MIT, Phillips, Sarnoff, Thomson, and Zenith) have announced their plans for field testing of what will probably be America's HDTV transmission standard.

Tests begain in April in Charlotte, NC, on the Grand Alliance's modulation subsystem. The tests measure the digital data signal received at a large number of sites in order to evaluate radio frequency propagation effects, including multipath. According to a Zenith press release, Charlotte will also be the site of a second round of testing for the full system planned for early 1995.

Meanwhile, the Japanese are clinging stubbornly to their own analog HDTV system which, for a brief time and to an exclusively small audience, was the world's standard for HDTV. According to industry trade journals, Japan's Ministry of Posts and Telecommunications announced that it would not abandon the "old fashioned" HDTV standard.

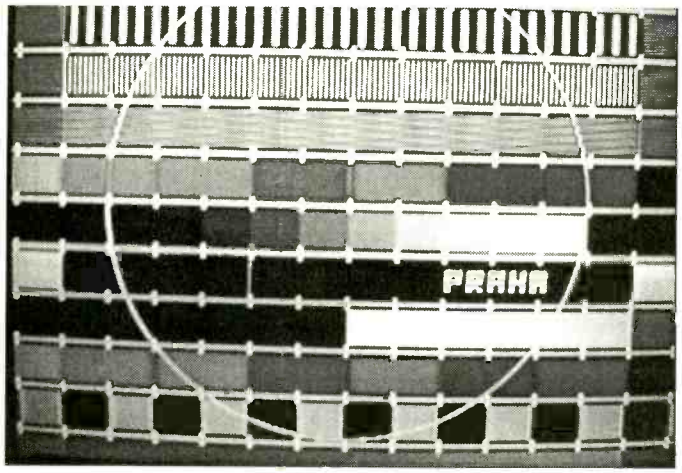


Photo 1: Russian Gorizont test pattern

Photo 2: Arianspace control room during a failed launch.

In launch news, the scheduled launch of DBS-2, the second satellite in DirecTv's universe, will not be conducted by Arianespace as first announced. Following the failure (January 24) of one of their rockets which resulted in the loss of Turksat 1 and Eutelsat 2F5, DirecTv has opted to launch via a General Dynamics Atlas IIA. Launch is anticipated late this year or early 1995.

Meanwhile, DirecTv's would-be rival, EchoStar Communications Corp., will launch its EchoStar 1 DBS satellite via a Long March 2E rocket from Xi-chang, China. Pencil in a launch date of July 1995 for a second DBS bird, EchoStar 2, a year later.

Weather Satellite News

By the time this makes it to print the U.S. will have launched its latest Geostationary weather satellite GOES 7. The new GOES promises to deliver vastly improved resolution for its imaging systems as well as special infrared detection for monitoring the ozone layer. It is reported that the satellite will be in full operation by the middle of October, when it will be stationed at 75 degrees west. Next year, assuming a successful launch, the next GOES satellite will be put into orbit and GOES 7 will be moved to 135 degrees west.

The Locker Report

And, finally, it wouldn't be right to end the column without the pictorial check-in from John Locker of the U.K. This month John sends a test pattern snagged from the Russian Gorizont satellite at 14 degrees West. The transmission had to do with coverage of U.S. President Bill Clinton's visit to Moscow.

The second photo captures the tension of the control room at the launch facilities of Arianspace at Kourou, French Guiana, during the ill-fated lift-off of Eutelsat 2F5. The transmission was via Eutelsat 1FS at 21.5 East.

John reports that severe winter winds left his rooftop dish in need of repair. In spite of that he has logged some interesting transmissions. He writes, "There has been a ...sighting in TCOM band on Intelsat 513 at 53 degrees West which caused quite a stir..it was a Canadian test card from Lake Cowichan...We never found out any more...everyone over here insisted 513 didn't carry TCOM!"

John also says he's found a cure for the deep Winter blues: a month or so in Lanzarote, The Canary Islands!

Summertime Strategy

The longwaves are best known for their wintertime DX potential; but, that doesn't mean you should call it quits when summer arrives. Perhaps you won't hear as many distant stations, but the opportunities for new signals are far from over.

At this time of the year, several navigation-season-only (NSO) beacons are back in full operation. Although this mainly applies to marine beacons, there are a number of small, private airfields that have re-opened for the season, bringing new beacon signals to the band.

Summer is also the best time to listen for maritime CW traffic. With shipping lanes now wide open, you'll notice increased activity from 415 to 500 kHz. This is an excellent way to practice for that "code required" ham license. Log them while you can, though—the marine band is seeing much less traffic than in previous years, with many shipping companies turning instead to satellites and HF digital modes for their communication needs.

The warmer months provide the perfect opportunity to pack up your portable and go on a "DXpedition." Whether on an extended vacation, or just a short day trip, bringing your portable can result in quite a few new beacons for your list. While you're at it, why not sharpen your skills by tracking down some of those local beacons you've been wondering about?

Finally, with the Coast Guard shutting down several of its coastal beacons, you may be able to copy some weaker stations that were once covered up by stronger signals. This is especially true if you live near any of the coasts or the Great Lakes.

The bottom line: Don't leave the basement when the temperature climbs! Summertime listening can still yield some excellent results.

OMEGA Update

If you monitor the OMEGA status reports on WWV (16 minutes past the hour), you've probably heard the good news. OMEGA Station Australia will *not* be shut down as previously expected. Here's the official release contained in the Coast Guard Bulletin:

"OMEGA Station G, Australia, remains on-air and is expected to continue normal operation. The governments of the United States and Australia are in the final stages of concluding an agreement to extend operation of OMEGA Station Australia. We will provide additional information as it becomes available."

There are eight OMEGA sites altogether. They are: USA (North Dakota and Hawaii), Australia, Japan, Liberia, Argentina, Norway, and Reunion Island in the Indian Ocean. You may be able to hear their signals by tuning from 10 to 14 kHz.

An Inside Job?

What does the Brinks robbery of Boston (1950) have to do with longwave? More than you might think! Bill Fernandez (MA) passed along an interesting story that ties the event to present-day beacon "OW" (379 kHz) in Stoughton, MA.

Soon after the heist, several suspects were brought in for questoning, but were later released due to a lack of evidence. A couple of years later the owner of a local landfill discovered the remains of the get-away truck in his scrap yard, and after notifying the authorities, he collected a $75,000 reward for finding the evidence.

Some parts of the truck were kept by investigators, but the majority of the vehicle was left at the scrap yard. When the landfill was closed some years later, the truck was buried along with old appliances, swing sets, vacuum cleaners, and all sorts of other metallic trash. Here's where "OW" comes in.

The FAA chose the former landfill site to install OW—perhaps because of the improved ground conductivity the site offered. As it turned out, they installed the beacon directly over the area where the truck was buried! To this day, the get-away truck remains buried beneath OW's antenna.

Bill refers to OW as the "Brinks Beacon"—and for a good reason. As he puts it, "When you hear OW on the band, why not take a moment to think about the signal you're hearing and how the antenna's signal may be propagated by a bit of our country's infamous criminal past."

Good tip, Bill, and I'll be tuned to 379 kHz. By the way, the stolen money was never recovered, but Bill says that didn't dissuade the townspeople from rummaging through the junk yard in search of that special find.

Is there a beacon near you with a special story behind it (unusual locaton, interesting site history, etc.)? Send it in to "Below 500 kHz," and I'll include it in a future column. Pictures are especially appreciated.

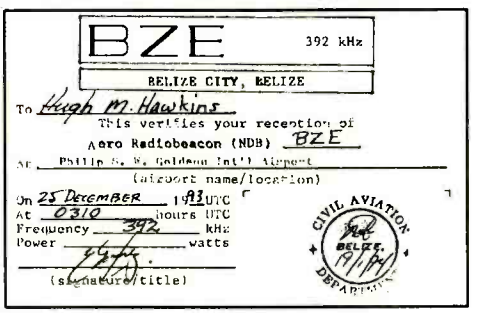
Loggings

Our featured DXer this month is Bob Follett (WA7FCU) of Park City, Utah. Bob uses a Lowe HF150 receiver along with a 175' wire antenna. He credits much of his DXing success to his quiet location at 6700 feet in the mountains. Bob's future plans include experimenting with audio filters, noise reductor circuits and specialized antennas, such as loops or active whips. See Table 1 for a sampling of his latest catches.

Other logs for this month are brought to you by Bob Ferguson (PA), Rich Frcho (OH) and Perry Crabill (VA). My thanks to all for sending in your logs. All contributors are listed in Table 1 by their initials and their state. Do you have a list of beacons to share? Your local catch may be someone else's rare DX, so tell us what's on the air in *your* area. You can reach this column by writing to *MT*, in care of *Below 500 kHz*, P.O. Box 98, Brasstown, NC 28902.

Table 1: Beacon Loggings

Freq	ID	Location	By
194	TUK	Nantucket, MA	BF-PA
198	DIW	Dixon, NC	BF-PA
257	HCY	Cowley, WY	BF-UT
260	AP	Denver, CO	BF-UT
278	ADG	Adrian, MI	PC-VA
290	AOP	Rock Springs, WY	BF-UT
294	BMC	Brigham City, UT	BF-UT
296	G	Galveston, TX	RF-OH
300	PPR	Pointe A Pitre, Guadeloupe	PC-VA
305	RO	Boswell, NM	BF-UT
314	OI	Oregon Inlet, NC	PC-VA
322	IC	Wichita, KS	BF-UT
350	RG	Oklahoma City, OK	BF-UT
359	BO	Boise, ID	BF-UT
365	AA	Fargo, ND	RF-OH
375	DW	Tulsa, OK	RF-OH
391	DDP	San Juan, PR	RF-OH
394	DTE	Dayton, TN	PC-VA
396	ZBB	Bimini, Bahamas	BF-PA
400	FN	Ft. Collins, CO	BF-UT
516	YWA	Petawawa, ONT.	BF-PA


BZE 392 kHz
BELIZE CITY, BELIZE
To Hugh M. Hawkins
This verifies your reception of
Aero Radiobeacon (NDB) BZE
At Philip S. W. Goldson Int'l Airport
(airport name/location)
On 25 December 1993 UTC
At 0310 hours UTC
Frequency 392 kHz
Power watts
(signature/title)
CIVIL AVIATION BELIZE DEPARTMENT

A QSL from Hugh Hawkins, MS.

Contest Winners

We close out this month with results from the 1994 Longwave DX Award (LDXA) contest. The object of the contest was to send in QSLs from at least three beacons more than 300 miles away. Our two grand prize winners for this year are Ernie Lawrence (NY) and Hugh Hawkins (MS), both of whom managed to snag beacons that were over 1000 miles away.

All who entered received a special certificate acknowledging their participation. In addition, as our top winners, Ernie and Hugh received complementary copies of the *1994 Airport/Facility Directory* which lists beacons and other navigation aids.

Enjoy the nice weather, and I'll see you next month! MT

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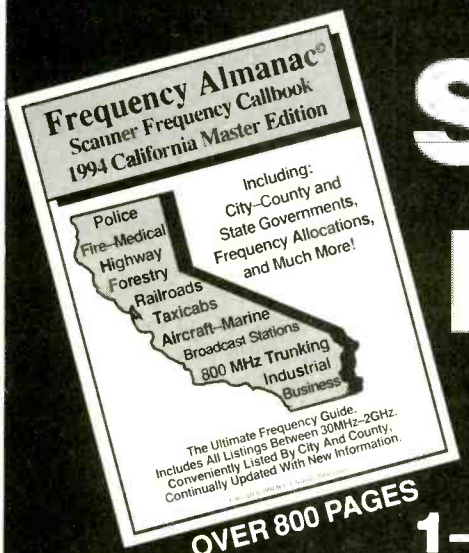

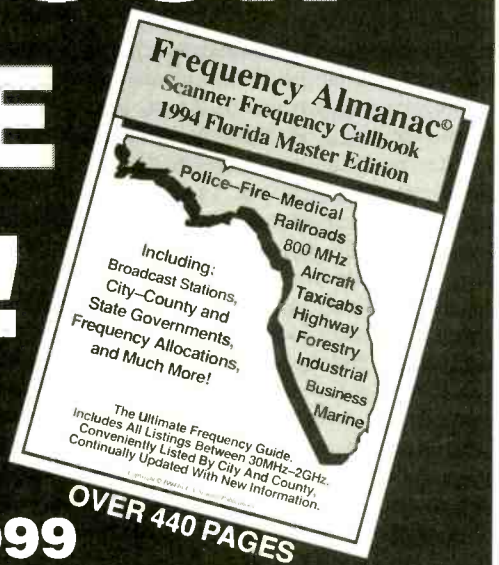

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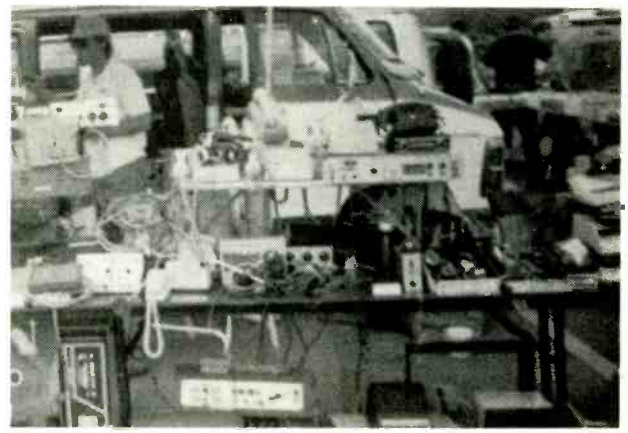
Building Blocks



Bob Grove

During the early days of ham radio everyone built their own rigs. That was because no one was building equipment commercially. At any rate, hams got the reputation for being builders and tinkers. Today many different types of rigs are available at reasonable prices. (Yes, I said "reasonable.") The average modern rig will cost something under 1000 dollars and provide the user with at least 100 watts of power and operate SSB, CW, AM and often FM. The receiver usually covers from about 100 kHz to 30 MHz with superb selectivity, and the whole thing usually weighs in at only a few pounds, can be used mobile, portable or at home.

Compared to a commercial rig from, say, the 50's, this is a heck of a bargain. The early rigs, if of comparable quality to a modern rig, would cost in the neighborhood of a thousand bucks (and that's 1950's dollars instead of the '90's mini-bucks).

So, you ask in light of this: why would anyone want to mess around building a rig? 'Cause it's fun, that's why! Can you imagine building a rig and then working hams all over the world with it? I promise you it is a thrill you will never forget!

How Do I Start

Few newcomers are able to sit down and design a rig from scratch. The nice thing is that you do not need to. Literally thousands of good circuits are available to anyone willing to spend a little time looking. The ARRL has many project books in their publication list (many excellent ARRL manuals are by our own Doug DeMaw W1FB). *CQ* and *73* magazines both publish lots of do it yourself circuits.

Most of these circuits are modern in nature and use integrated circuits and transistors, although a few vacuum tube circuits are occasionally published. The older tube circuits can be fun to build and loads of circuits can be obtained from ARRL handbooks published during the 40s, 50s and 60s. Often these older manuals can be had for a few dollars at your local hamfest (use caution when working with vacuum tubes as the high voltage used can be lethal).

Junkbox Projects is the title of a nice little manual of transmitter circuits. The book is written and published by Robert Null, N4QR, and is available from him for $4.00pp in the USA. The address is Robert D. Null, 501 North First Avenue, Maiden, NC 28650-1105. There are 20 circuits in the book of transmitters and power supplies. Most of the circuits use tubes. There is a crystal receiver and solid state lowfer (code practice) rig, too.

"The second most important source of parts is hamfests."

Where Do I Start?

If you are embarking on your first adventure in home brewing (as home built projects are often called) pick up a copy of W1FB's *QRP Note Book* available from the ARRL or most ham radio dealers. This book contains all the info you need to build your first receiver and transmitter, including where to purchase the parts. If you have built a few projects then simply choose a circuit and begin to gather parts.

Gathering Parts

The toughest part of any project is getting started, and most of us find that the hardest part of getting started is finding the required parts.

Mail order parts houses are your best chance of finding new and surplus parts. Here is a list of them from W1FB's *QRP Note Book*:

ALL Electronics Corp., P.O. Box 567 Van Nuys, CA 91408
BCD Electro, P.O. Box 450207, Garland, TX 75045
Digi-Key, 701 Brooks Ave. S., P.O. Box 677, Thief River Falls, MN 56701
Mouser Electronics, 2401 Hwy 287 N., Mansfield, TX 76063
Fair Radio Sales, P.O. Box 1105, Lima, OH 45802.

Between this small list, and a larger one in this month's DeMaw's Workbench, you have more than enough to get you started.

The next most important source of parts is hamfests. At every hamfest you will see fellow hams scurrying through the flea markets with bags and boxes loaded with what looks like JUNK. It is. It's junk for the junk box (or hell box). At most ham fests, you can purchase new (or surplus) components as well as used gear that can be taken apart for whatever is inside. I might caution you against purchasing military electronics. A lot of military stuff is really useless for salvage. I only buy military gear that is obviously radio related and only when the price is right.

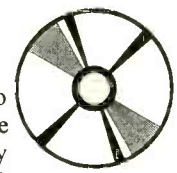
When buying used or surplus equipment keep your eye open for a nice cabinet, and look for good dial drive mechanisms. The secret to making a home brew piece *look* good is to put it into a nice clean cabinet.

The next step is to get some boxes (cigar boxes are great) to put the parts in (forget the fancy plastic see-through drawers in a cabinet—they jam and nothing ever fits in them).

Carefully unsolder the good components (throw away anything that looks burned or covered in wax or oil, unless you can test it). If you must take a drive mechanism apart, make a drawing or take a photo of it so you can put it back together. Save the hardware, too; here is where those plastic drawers work OK, but I still prefer jars to save the assortment of screws and nuts that comes with every piece of gear you take apart.

OK, you are on your way. Send me a photo of your next project!

A Great Product!



A recent sale at "Radio Shack" allowed me to purchase a CD-ROM drive for my computer. I have wanted a CD Drive ever since I saw the first one about six years ago. I knew that as soon as I purchased a CD-ROM drive, the first disk I purchased would be the Buckmaster Hamcall CD. So I did, and I'm one happy customer!

This is what Hamcall contains: 350,000 international hams, 600,000+ US hams: the listings include license class, birth year, expiration date, latitude and longitude, as well as county, time zone, area phone code, elevation (ASL) and station address. There are also club, Military and RACES listings; over 100,000 cross referenced US calls (old to new); and *15,000* public domain computer programs. In addition, you can retrieve info by call, name, zip, town or city, and copy the output to disk or printer. It is possible to print mailing labels from any label program.

The first day I had Hamcall, I extracted several programs from it. One was a CAD program for drawing schematics, another was a tracking program for the Shuttle, and a CW copying program that uses the serial port as I/O (no modem or terminal required). I also extracted data files for CAP freqs, Air Force freqs, and a shortwave data base. By itself, the included software is easily worth the price of the CD!

Rob Leonard's

Ham DX Tips

Ask most people what the month of June is famous for and they will more than likely reply, "The month for weddings!" But, those of us in the real world of DX know it is the height of the VHF DX season. So, along with our regular plethora of HF DX tips this month, there are some VHF ones, as well. Now, let's get started...

AUSTRALIA VK6AE (A. Hackett, 90b Drummond St., Bedford, Western Australia, 6052, Australia) can be found on 10105 kHz CW weekends at 0425 UTC. ***BRAZIL*** 1 to 4 June a group of Brazilian amateurs, headed up by Jaime Lira (P.O. Box 08, 88010-970 Florianopolis, Sc, Brazil), will be on DXpedition from Santa Catarina Island. The group will operate CW and SSB 80 to 10 meters using the callsign ZZ0LL. ***CANADA*** July 1st is Canada Day and time once again for the annual Canada Day Ham contest. Look for many Canadian amateurs who will be using special prefixed callsigns such as: CF, CG, CH, CI, CJ, VA, VB, XK, and XL, plus many others, on or near the "Canadian Calling Frequencies" on 40 meters 7060 kHz SSB, and on 20 meters 14142 kHz. VO1XA/VE8 will be active 'til October from the weather station in Alert, NWT. He has been checking in to the 14226 kHz DX net at various times of day. His QSL manager is WB2YQH, P.O. Box 73, Spring Brook, NY 14140. VE3TBX (Edward John Kucbel, 2048 Victoria Ave., Thunder Bay, Ontario P7C 1E3) operates a CW beacon (please note as with most VHF/UHF beacons, this beacon cannot be heard with a receiver in FM mode!) on 144.280 MHz with 25 watts into a two element Yagi pointed west. John is in Grid Square EN-58 and is eager to receive reception reports. ***DX NETS*** The last Sunday of every month the International Amateur Radio Hosts Net meets on 14177 kHz at 0001 UTC, with amateurs checking in from around the world. ***GREENLAND*** OX3DU is on 14189 kHz at 1530 UTC most days. QSL to his manager: OZ1DKU, Per Moeller Jensen, Bosageraardeng 1 th, DK-6400, Soenderborg, Denmark. ***GHANA*** Proving that 10 meters does indeed still live in these low sunspot cycle times, 9G1NS has been on 28470 to 28475 kHz SSB at 1630 UTC Saturdays and Sundays. His address is: Samir, P.O. Box 13291, Accra, Ghana. ***GIBRALTAR*** T.G. Kelly (78 Alameda House, Gibraltar), ZB2AZ, is often on 10101 to 10106 kHz CW at 0600 UTC. ***MARSHALL ISLANDS*** V73C appears on 24950 kHz SSB at 2145 kHz when that band is open. QSL via: The Oklahoma DX Association, P.O. Box 88, Wellston, OK 74881. ***SABLE ISLAND*** East Coast VHF DXers, especially those in the Canadian Maritime Provinces, take note: it has been reported that there are several VHF/UHF CW beacons active from this Canadian Island/DXCC country in Grid Square GN-03. Using the callsign VE1SMU on the following frequencies (MHz-FM transmissions only where noted; other CW AM mode): 145.298, 147.930 FM, 222.055, 222.060, 432.300, 926.520 narrowband FM, and 1295.998. If you hear these beacons you might wish to report your reception to VE1SMU, Saint Mary's University Amateur Radio, Robie St., Halifax, Nova Scotia B3H 3C3, Canada. ***ST. PAUL ISLAND*** A DXpedition to this Canadian Atlantic Island, which also is a separate DXCC country, is supposed to operate 1 to 7 July on all bands, CW, RTTY and SSB. ***TAIWAN*** Look for Special Events Station BV0RI June 12th to 15th to celebrate the Rotary International Convention taking place that wekeend in Taipei. They ask that QSL requests be sent via the new address for the Taiwanese QSL Bureau: BV QSL Bureau, P.O. Box 73, Taipei, Taiwan, ROC. ***TRINIDAD AND TOBAGO*** 9Y4TSB is Trueman Braithwaite (Bon Accord, Tobago, West Indies) newly licensed and looking for contacts on 21360 kHz between 2000 and 2100 UTC when that band is "open." ***USA*** The Central Arizona DX Association reports a "DX repeater" (where the Association members meet to pass along DX info and tips as well as other communications) on 147.320 MHz (FM). They also have monthly meetings on the 1st Thursday of the month at the Pera Club in Scottsdale. Don't forget the annual ARRL VHF/UHF QSO Party the weekend of 4 and 5 June! And, be sure to look for me, N9LAG, and the "Ball Knob DX Hogs" using my callsign 50.135, 144.210, 222.110 and 432.115 MHz SSB and CW at the top of each hour (and Canadians we *will* be looking north for you, as well). For those in Western KY, SE MO, SW IN and SO IL, we will be on 146.550/146.580, 223.5 and 440.000 MHz FM at the bottom of each hour. QSL to: P.O. Box 91, Benton, IL 62812. ***ZAMBIA*** Bridgett, 9I2M, is active daily on 21295 kHz at 2030 UTC. QSL to DL7VRO, Fritz Bergner, Sterndamm 199, 0-1197, Berlin, Germany.

Best of wishes to those of you who are either celebrating weddings this month or are planning them. To the rest of us, enjoy the benefits of the month! 73 de Rob.

In short, this CD has something for most everyone in the radio hobby, hams, SWLs and scanner fans.

Extracting programs from Hamcall is as easy as falling off a log. The various programs are in archived files (i.e., zip files). Included with Hamcall is a unzip program that automatically unzips the files to the drive you specify. When you select a program to extract, Hamcall asks you where you want it sent (A drive, C drive, etc.). It then sends it to that drive and unzips it at the same time (NEAT!).

Hamcall puts out two CD's each year in April and October so you can keep up to date with new hams and new software. The price is $50.00 plus $5.00 shipping and handling. Hamcall is available from Buckmaster, Route 4, Box 1630, Mineral, VA 232117.

Bamboo

In the April issue I asked for help finding bamboo for some antenna projects. Well, I could not believe the response. It seems there are several places out there where bamboo is available. I expect to order some soon, and bring you two real nice antenna projects using bamboo this fall.

Don't Forget

June is ARRL VHF contest month and Field Day month. Field Day is the ideal way to get your feet wet in contesting, and have the most fun at the same time. Most clubs make it into a two day party with activities for everyone. The VHF contest is the premier VHF event of the year, and lots of rare grids will be looking for takers.

See ya on the bands, 73 de Ike, N3IK MT

FCC Gives Subpoena Powers to Itself

In a November 19 ruling released on December 17, the Federal Communications Commission voted to give authority to issue subpoenas to its Chief of the Field Operations Bureau. The new authority applies to investigations of unlicensed radio operation or illegal marketing of radiofrequency devices capable of causing harmful interference. According to the FCC, since the subpoena power "will facilitate investigations of illegal activity, ... (it) is in the public interest."

The new administrative subpoena authority has raised some eyebrows in the DX community. The new powers allow the FCC to "subpoena the production of books, papers, correspondence, memoranda, and other records deemed relevant to the investigation of an alleged violation."

The broad scope of this FCC order has the potential to create controversy, especially since the administrative nature of the subpoenas does not require consent of a judge. It remains to be seen what the FCC means by "other records."

The new authority became effective this year when published in the *Federal Register*. The FCC issued its order without meeting ordinary *Federal Register* requirements of notice and public comment during the rule making process, saying that this was a matter of agency organization, procedure, and practice that does not require a comment period. *MT* will keep you informed of any future developments.

Radio USA Fine Upheld

The FCC recently announced in a Press Release that it had denied the appeal of a $17,500 fine issued to Andrew Yoder of Chambersburg, PA, alleged operator of pirate **Radio USA.** We originally covered this incident in the September 1992 "Outer Limits." The fine was the largest one ever issued to a North American pirate station.

In several previous cases, the FCC has reduced the original amount of fines levied following appeals. In this instance, the Commission reasoned that since Yoder has written many books and articles about pirate radio, he should have known that unlicensed broadcasting is prohibited by FCC regulations. Therefore, the FCC made no downward adjustment to his fine.

In an interview with *MT*, Yoder strongly criticized the FCC's action. He said that the FCC admits in writing that all of their evidence in the case is completely circumstantial. He also claimed that the FCC is dealing harshly in the case because Yoder is a prominent figure in the radio hobby, despite the fact that they have not proven that he operated Radio USA. Stay tuned.

American Dissident Voices

Kevin Strom of **American Dissident Voices** sends in the latest revised and expanded schedule for this semi-clandestine station. **WRNO** in New Orleans carries it at 1630 UTC Saturdays on 15420 kHz and at 0100 UTC Sundays on 7355 kHz. **WINB** in Pennsylvania airs the program at 2030 UTC Saturdays on 15715 kHz, 0000 UTC Sundays on 11950 kHz, 1830 UTC Sundays on 15715 kHz, and 0330 UTC Mondays on 11950 kHz.

Strom notes that reception reports still go to PO Box 330, Hillsboro, WV 24946. He points out that we miswrote the station name in a prior *MT* issue; the above name is the correct one.

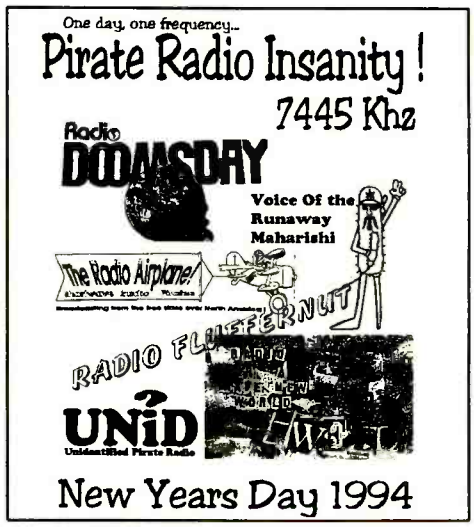
In a related matter, an *MT* reader from Appleton, WI, told us about some stickers that appeared in downtown Appleton. The stickers read, "Earth's Most Endangered Species: The White Race. Help preserve it. Write or call NATIONAL ALLIANCE ... Tune to 7355 MHz (sic) Shortwave." The Hillsboro address is printed on this sticker.

It seems clear that American Dissident Voices and the ultra-far right wing National Alliance are closely associated. The April 1994 *Vista* newsletter from **Radio For Peace International** in Costa Rica covers this point in more depth. Sample copies of the newsletter are available for $1 US return postage from RFPI at University for Peace, Apartado 88, Santa Ana, Costa Rica.

Weiner vs. FCC

MT received a follow up news release from Alan Weiner on the m/v *Fury* bust incident, which we have been covering for the last couple of months. The FCC alleges that pirate broadcasts were traced to the *Fury* on January 14 between 0510-0821 UTC. Weiner says that he was aboard the vessel at that time, and that no transmissions took place from the boat. He notes that none of the ship's four transmitters were in working order on that date, and that the power supply generator was also not functioning.

Weiner complains that the *Fury's* radio installation was destroyed by the FCC without a hearing and with no due process. Like Brother R. G. Stair, Weiner charges that somebody at the FCC in Washington "apparently doesn't like Brother Stair or me." Weiner confirms Brother Stair's intent to seek restitution from the federal government, as we reported in this column last month.



Some of the stations involved in Pirate Radio Insanity.

7415 kHz Carrier

Many DXers have noticed a loud and unmodulated carrier that frequently appears for about an hour around 0230 UTC on 7415 kHz. According to VOA Bethany engineer John Vodenik, the VOA uses this frequency to tune up its powerful 7405 kHz transmitter in Greenville, NC. John has been a good friend to the DX hobby, and we thank him for this information. It arrived via the Fidonet BBS by way of J. D. Stephens of Huntsville, AL.

Pirate Radio Insanity

Earlier this year we printed various loggings of **Pirate Radio Insanity,** which appeared to be a widely heard new unlicensed broadcaster. Sharp-eyed DXer Scott Gentry of Matteson, IL, sets us straight on this one. The PRI name was actually a slogan for marathon pirate activity associated with New Years Day in 1994. Several stations cooperated with each other to create nonstop free radio activity on 7445 kHz. So, PRI was an event, not a station. Scott sends in visual evidence to illustrate his point.

What We Are Hearing

Our readers have found that plenty of North American pirates are still on the air. Schedules are always intermittent, but activity peaks on weekends and major holidays. Most pirate activity remains in the 41 meter band, but frequencies

shift at a moment's notice. 7385 kHz is an increasingly good place in which to find them.

Maildrop addresses used for correspondence with pirates listed this month include: P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; P.O. Box 493, Boys Town, NE 68010; P.O. Box 220342, 5600 Wuppertal 22, Germany; and Kammarsvagen 133:220, 22646 Lund, Sweden. Remember, three mint first class stamps go to USA maildrops; $1 US is the standard to foreign addresses for return postage costs.

Action Radio- 7415 at 2300. A. J. Michaels had been inactive for months, but he has returned with a show that is among his best ever. He blends rock, comedy, and commentary on the pirate radio scene. This was Dick's first pirate log; congrats! As all these logs prove, A. J.'s signal is greatly improved. Addr: Boys Town. (Dick Pierce, Brattleboro, VT; Skip Arey, Waterford Works, NJ; Gary Heinonen, Cook, MN; Patrick Gonzales, Bowling Green, OH; Don Zeigler, Princeton, WV, Gentry)

Baby Pirate Radio Relay League- 7466 at 0000. So far this previously unheard station has limited itself to odd music and siren sound effects. It's hard to say if it was a one shot operation. Addr: None. (Gentry)

Christian Rock Radio- 7416 at 2345. Also known as **WGBR,** they feature Christian hard rock music. The shows often include elaborate interviews with the musicians, so it is clear that CRR puts effort into its productions. Addr: Wellsville. (Zeigler, Heinonen, Gentry, Arey, Gonzales)

Ground Level Network- 7440 at 2330. "Just Bob" is the calm host on this pirate with a health advocacy format. He generally advises DXers to give up harmful habits like smoking, drinking, eating Bill Clinton food, not exercising, etc. The tips are carefully researched from medical literature. Addr: Wellsville. (William Hassig, Mt. Prospect, IL)

Heavy Dude Radio- 7415 at 2230. This previously rare Europirate station has now been widely heard via the **North American Pirate Relay Service.** Despite the address in Sweden, this rock music station's announcers speak in English. Addr: Lund. (Max Syko, Gaylord, MI; Michael Folk, Cincinnati, OH)

KULP- 1610 at 0300. Just as **RBCN** seems to have adopted the Monitoring Times convention, this station surfaces to promote the Kulpsville Winterfest every year with a mix of rock and comedy. Addr: Blue Ridge Summit. (Arey)

North American Pirate Relay Service- 7415 at 2230. Richard T. Pistek at NAPRS continues to actively relay other pirates, particularly European stations, but he sometimes takes to the air with his own programming. Scott found that he is an excellent verifier. Addr: Wellsville. (Scott Krauss, Cleveland, OH)

Radio Airplane- 7385 at 0000. Captain Eddy must be flying high these days, since he won the coveted first place award in ACE's 1994 pirate poll. William points out that at the end of a recent broadcast, a fat lady sang. Addr: Wellsville. (Hassig)

Radio Azteca- 7412 at 2330. This station produces an outstanding parody of DX programs, DX'ers, and the shortwave hobby in general. It tied for second with the **Voice of Laryngitis** in the 1994 "Pirate Popularity Poll" in *The ACE* bulletin. Addr: Wellsville. (Hassig, Arey)

Radio Free Euphoria- 7475 at 0030. Captain Ganja seems to have hired the Maharishi as a regular character on his pro-marijuana station. Whether or not you sympathize with the station's politics, you will find their well produced comedy to be fun. Addr: Wellsville. (Gentry)

Radio Garbanzo- 15050 at 0445. Veteran pirate Fearless Fred is one of the most entertaining announcers on shortwave radio. Skip liked the ad for Jeffrey Dahmer Barbecue Sauce, but he does not say if he bought any. Addr: Wellsville. (Arey)

Radio Gumby International- 7465 at 0015. Master Gumby spices his rock music with news and advice, such as "All residents of Gumbia are cautioned to stay indoors." Some Americans have had trouble calling the station's announced Canadian phone number. Gumby probably was sickened when he found that he came in second as worst pirate station in the 1994 ACE "Pirate Popularity Poll." Addr: Merlin. (Randy Ruger, Brandon, FL; Krauss)

Radio Lollipop- 7435 at 2215. This unusual Europirate has a format that is oriented toward children, mainly in English, but with some German language comedy. Since they now have a North American relay arrangement, we can hear them with a decent signal. We congratulate Robert, since this was his first pirate! Addr: Wuppertal. (Robert Compton, Mertztown, PA; Hassig, Syko, Gentry, Krauss, Folk)

Radio North Coast International- 1610 at 0445. Captain Willie's classic station has been dormant for a decade, but somebody dusted off an old tape for relay in association with the 1994 Winterfest. Skip says that the relay was announced via **KULP.** Addr: Old Moorhead, MN, drop is defunct. (Arey)

Radio Poncho Villa- 7415 at 1500. This is not the same station as the other Pancho Villa discussed this month. Its spelling is different, and it operates in upper sideband mode. Addr: None, but has verified loggings in *The ACE.* (Krauss)

Radio USA (fake)- 7416 at 2315. This jerk's latest jamming incident was targeted at A. J. Michaels. He still slanders DXers over the air, so he justifiably finished dead last in the 1992 ACE "Pirate Popularity Poll" as the world's worst unlicensed shortwave broadcaster. Addr: None. (Arey, Gentry, Hassig)

Solid Rock Radio- 7415 at 2345. As his station name implies, Dr. Love programs rock music. But, recent shows have also included mailbags, a pirate DX segment, and plugs for *The ACE* bulletin. Addr: Wellsville. (Gentry, Ruger)

Voice of Laryngitis- 1610 at 0330. The Huxleys made a rare medium wave appearance in association with the Winter SWL Festival. These guys use the slogan of "The best damn radio station you'll ever hear." The slogan is actually true, so I can't understand why they only came in second in the ACE poll. Addr: Wellsville. (Arey)

Voice of Pancho Villa- 7415 at 0500. Pancho made his annual appearance in association with the Winter SWL Festival in Kulpsville, PA. This year he featured Beavis and Butthead trying out Glenn Hauser's new 900 DX telephone tip number. Unfortunately, neither MTV character endorsed Glenn's service. Addr: Blue Ridge Summit. (George Zeller, Cleveland, OH; Arey)

Wire Line Radio- 7415 at 2300. This one generally features rock music, but lately they have increased the amount of jazz music and comedy in their broadcasts. Like all 7415 kHz pirates, they suffer slop interference from **WEWN** on 7425 kHz when they broadcast later in the evening. Addr: Blue Ridge Summit. (Hassig, Ruger)

WJLR- 7415 at 2300. "John Lennon Radio" still plays classic rock tunes by many artists, but Scott points out that the station interval signal is Lennon's "Power to the People." Addr: Blue Ridge Summit. (Gentry, Ruger)

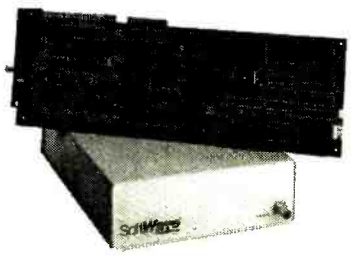
WPIG- 7415 at 2245. Ira's broadcasts to pigs have not been heard since its FCC bust that we discussed last month, but our readers have sent in loggings of the station's last broadcast from the BunndyMobile on February 19. Addr: Wellsville. (John Peedell, Long Branch, NJ; Gentry; Arey; Krauss; Hassig)

WREC- 7465 at 0030. P. J. Sparx played rock music and Weird Al Yankovich comedy during Radio Free East Coast's special anniversary broadcast. Addrs: Wellsville and Blue Ridge Summit. (Gentry, Hassig)

WRFW- 7405 at 2315. Ben Dover and Dick Bender are the hosts on this new rock, comedy, and information station. Their nice signal and good production values have led to comparisons with the old **WSRN** and **Radio Free Willy,** but they seem to be a different broadcaster. Addr: Blue Ridge Summit. (Gentry)

what's new?

Larry Miller



Digital Dynamite

Recently announced by ComFocus Corporation and scheduled for debut at the Dayton Hamfest, SoftWave is the first digital communications receiver to run using an IBM compatible 386 or 486 PC under the Microsoft® Windows™ environment. Grove's engineer, Chuck Morrison, indicated that if SoftWave succeeds in all that it attempts, it could indeed be the wave of the future, providing functions of high-end receivers at a third of the cost. This approach also offers options and flexibility not possible with receivers which are not computer controlled.

SoftWave consists of an RF module (receiver) and Digital Signal Processor module (PC board), both powered from the host computer, and PC software. Six different radio personalities are housed within SoftWave, including AM radio, VHF scanning radio (108 to 174 MHz), worldband radio (0.5 to 30 MHz), and a wideband spectrum analyzer.

The RF module contains a downconverter tuning 0.5 to 30 MHz and 108 to 174 MHz, with sensitivity and dynamic range matched by only the most expensive communications receivers. The 450 kHz IF is then sent to the Digital Signal Processing module, which is where the real magic happens.

SoftWave can manipulate the signal using 46 IF bandwidth settings from 11 kHz to 56 Hz, with excellent shape factors. These filter shapes are represented graphically on the real time spectrum analyzer, found in the upper right corner of the communications receiver display. IF bandwidth, IF shift, and notch filter frequency and depth can be adjusted visually via the spectrum display. If you spot an interesting-looking signal while viewing the spectrum analyzer, a mouse click automatically tunes the receiver there.

Softwave also has fully adjustable digital AGC, squelch, noise blanker, and nine different digital demodulation modes including synchronous AM and two FM modes. It even includes an automatic Morse code translator with a "word guess" mode for weak signals or bad "fists." Future software upgrades will include RTTY, SSTV, and FAX demodulators.

Other monitoring aids in the package include extensive databases of worldband time and frequency schedules, the FCC database of AM stations in North America and the Caribbean, and a world map.

ComFocus is offering the SoftWave package — receiver, DSP card, and software — for $1495 through July 31, 1994, with a 14 day money back guarantee for purchases within the United States. For more information contact ComFocus at 1-800-763-8983 or write 6160 Lusk Blvd., San Diego, CA 92121.

Power is Information

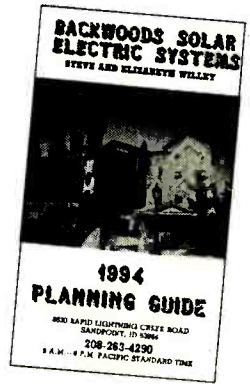
Tom Kennedy, who is a partner in Glenn Hauser's 900 telephone DX line (now on "hiatus, " we hear), hyped the service saying that "information is power." Never missing an opportunity to view the flip side, we propose that power is information. It's simple, really. When it comes to radio listening, if you don't have electrical power, you don't get the information. (Your radio doesn't work.)

Because your shortwave or scanner radio can literally be a lifesaving piece of equipment in time of emergency, we've long encouraged the serious listener to develop a source of backup power. For the short term situation, a supply of well-charged batteries can provide a satisfactory solution. But as the earlier part of the year proved — earthquakes in the west and sustained blizzards in the east — longer power outages are possible. For the serious communications monitor, serious systems are necessary

ATI Power Products has introduced something that might just fit the bill. It's called the Lightning Charger. The Lightning Charger is a 16 pound generator. Yes, that's 16 pounds — no typo. It produces up to 900 watts of continuous DC power. Fitting into a space of less than 1 cubic foot, it's a versatile workhorse, capable of not only jump-starting stalled vehicles, but operating emergency lighting, power tools utilizing brushless DC motors (like Skil Saws) and any radio that has a 12 volt jack in the back. That makes it perfect for all kinds of uses, from emergency communications and monitoring, to field operations and DXpeditions.

The Lightning Charger is manufactured by ATI Power Products in the United States and has a suggested retail price of $349.95.

We'll be conducting a hands-on test of the Lightning Charger in coming months. In the meantime, you can get more information or order one for yourself by calling 1-800-545-5348. ATI's address is 1117 LaVelle Rd., Alamogordo, NM 88310.

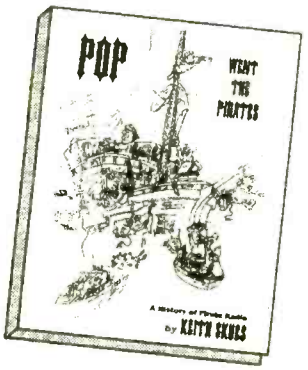


Generators are but one of a dozen ways you can power your shack without being hooked to the electric company. Communications monitors interested in exploring areas of alternative energy production should write for a copy of the *Backwoods Solar 1994 Planning Guide.* A helpful guide to such sources of clean energy as solar panels, wind and hydroelectric, it includes everything you'd want to know to get started, including prices.

The catalog usually costs $2.00, but we've arranged with Steve and Elizabeth Willey for you to get a copy of the catalog for free. Mention *MT* and write to Backwoods Solar Electric Systems, 8530 Rapid Lightning Creek Road, Sandpoint, ID 83864; 208-263-4290 8-6 Pacific time.

Popping Pirates in England

Pop Went the Pirates is a new book on offshore broadcasting by Keith Skues. Skues knows his subject well. After a brief stint with the RAF where he broadcast programs over British Forces Radio in Germany, he joined the staff of Radio Caroline in 1965. As a DJ on Radio London, he was acclaimed as one of the top jocks in England. He was one of the first voices heard on Radio One and later became founder/director



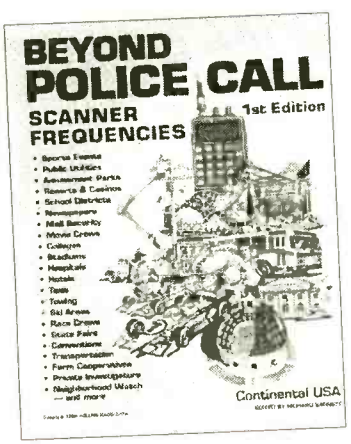
of Radio Hallam, one of the UK's first independent local radio stations.

Pop Went the Pirates is being called the "definitive book on offshore radio." With 594 pages, Skues starts with pirate broadcasting in the 1920s and traces the story through the excitement of the 60s. Lavishly illustrated with both photographs and quotes from the pirate players, *Pop Went the Pirates* even includes coverage of RNI, Laser and Caroline through the 90s.

You can get your copy by using your Mastercard or Visa to charge £14.99 plus £5 shipping. The address is EAP, Studio House, 21-23 Walton Road, Frinton-On-Sea, Essex, CO13 0AA, UK or by calling (0255) 676252. Please tell them that *MT* sent you.

Beyond Police Call

For fans of Gene Hughes' *Police Call,* the arrival of the long-awaited companion book, *Beyond Police Call,* is the answer to a dream. Where *Police Call,* the bible of VHF/UHF public safety communications leaves off, *Beyond Police Call* picks up. The book is packed with frequencies for everything else — sporting events, public utilities, hospitals, taxis, farm cooperatives, and more.



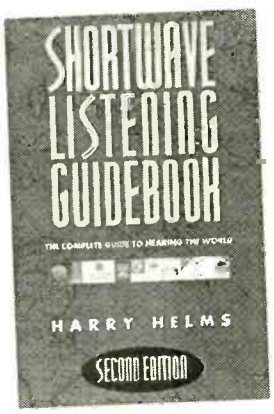
To cover the entire United States, *Police Call* takes seven volumes; *Beyond Police Call* does it in one. Needless to say, a book of this sort must be selective, so there's no guarantee that what you're looking for will be found in the book.

Naturally, our first impulse was to grab the book and look up our hometown — Wagontown, Pennsylvania — to see what licensees were listed. You cannot do this. Licensees are listed by state, but once you find your state, the next category is type of service, not community. So you'll find "Pennsylvania," then the heading "taxis," then a list of every taxi service in the entire state. Of course, this is fine if you know the name of the taxi company you want to scan — they're listed alphabetically.

Note, too, that in many cases, you'll also need to know the actual name of the licensee, not the name of the company. So you won't be able to find the frequencies for Johnny's Lightning Cab Service unless you know that John F. Hardscrabble is the actual licensee. Inversely, if you see John F. Hardscrabble listed as a licensee under taxis, you won't necessarily know that this is the frequency for Johnny's Lightning Cab Service.

Of course, this isn't necessarily going to be a big problem. *Beyond Police Call* is, no matter how you look at it, an incredible value. Although at press time there seems to be some question about retail price — it will be either $9.95 or $12.95 — it covers an enormous amount of information in 430 pages.

Beyond Police Call is available from Grove Enterprises, numerous *MT* advertisers, and at local Radio Shack stores.



Shortwave Guidebook

Few names in shortwave listening are as recognizable as that of Harry Helms, a leading figure for more than two decades. The second edition of his popular *Shortwave Listening Guidebook* is packed with excellent information for the beginner; it is also pithy enough to provide tutorial guidance to experienced listeners.

An introductory chapter overviews topics which are covered in detail in successive chapters. Receivers, antennas and accessories are discussed in considerable detail, and in easy-to-read language.

Shortwave broadcasters — legitimate, clandestine and pirate — are presented extensively, along with a brief overview of utilities, the two-way users of the spectrum.

The 334-page *Shortwave Listening Guidebook* is available for $19.95 plus $2 shipping from Grove Enterprises; also available from other *MT* advertisers.

DX Tip Sheet

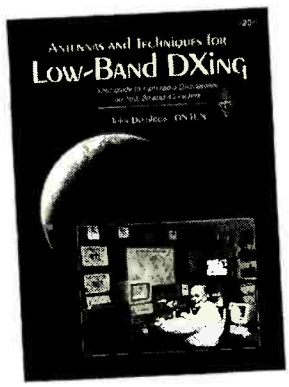
It's billed as an "educational calendar for global awareness" but, to us, it's a shortwave DXing tool. The *World Calendar* includes the national, civic, and religious holidays of more than 100 countries plus an international time zone map.

How do you use a map like this to increase your DX totals? By knowing when a particular country celebrates an event, you can tune in to stations likely to extend their normal operating schedules with special programming. The best example of this is the Arabic stations which often extend schedules during Ramadan.

For those hoping to expand their knowledge of other cultures, you can tune into a particular station to hear more about the event mentioned on the calendar.

While the year is already half over — this is, what, June? — it's still a decent investment. And, if not right now, save the address for later this year and get the '95 calendar.

The cost of the *World Calendar* is $8.50 plus $1.45 postage from EES, Educational Extension Systems, P.O. Box 259, Clarks Summit, PA 18411.



Antennas for Low-Band DX

To scanner listeners, "low band" refers to the 30-50 MHz VHF spectrum but to hams, it is the lowest three amateur frequency ranges: 1.8-2, 3.5-4 and 7-7.3 MHz (160, 80 and 40 meters).

John Devoldere, ON4UN, has written an antenna book for this range, entitled *Antennas and Techniques for Low-Band DXing*. Highly technical and ham-oriented, this new publication is packed with solid theory and practice for maximizing long-distance communications on this noisy portion of the radio spectrum.

Considerable coverage is given to radio wave propagation, and the explanation of receiver specifications is extensive. Bob Grove, who reviewed the book, says both are extraordinarily well done.

The remainder of the book — nearly 90% — concentrates on antenna systems, their design and construction. "Solid stuff for the technically inquisitive," says Bob.

The approximately 400 page-book is $20 from the American Radio Relay League, 225 Main Street, Newington, CT 06111-1494.

Project Scrambled

In the April issue, we mentioned an upcoming Tab book called *Incredible Audio and Video Projects You Can Build.* One of the projects that caught our attention — and that of many *MT* readers — was for the digital audio scrambler/descrambler.

Reader Larry Wright of Kansas City, Missouri, bought a copy of the book only to find that the project was missing. Yet, there it was on the cover, along with 24 other projects. Inside the book, however, were only 10 projects.

We called Tab Books and spoke to Kim Martin. Kim told us that, ooops, this sort of thing happens from time to time. Marketing, she says, writes the press releases and cover copy. Editorial handles the insides of the book and sometimes the left hand doesn't find out about what the right hand is doing until...

Anyone who bought the book for the Digital Scrambler/ Unscrambler project may return the book to Tab for a full refund.

Computer-Controlled Radio

Optoelectronics has announced a computer interface for the PRO-2005/6 scanner which includes hardware and software for full computer control of all scanning functions. Called Opto Scan 456, it will sell for $299 including software and cables.

The software, based on Scan*Star programming, includes CTCSS Tone, DCS Code and DTMF Character reading and logging. Other features include: 25 channels per second scanning; PC software for computer log, scan, and search; RS-232 and CI-V interface with multi-radio capability; solderless installation; and video instructions. For more information contact Francis Wertz at Optoelectronics Inc, 4821 NE 14th Ave., Ft. Lauderdale, FL 33334; 800-327-5912.

Lowe Electronics and TRS Consultants have teamed together to produce three software products for the Lowe HF-150 communications receiver. These packages provide computer control within Microsoft® Windows™, shortwave schedules, and memory management. Scan capabilities and data capture are also built in to the program.

For more information, contact Tom Sundstrom, TRS Consultants, P.O. Box 2275, Vincentown, NJ 08088-2275; (609) 859-2447. Information on the Lowe receiver can be obtained from authorized dealers in the US, or from John Wilson, Lowe Electronics Production, The Arkwright Workshop, Cromford Mill, Cromford, Derbyshire, DE4 3RQ, UK; 044-629-826287.

These are brief initial announcements; watch *MT* for feedback and more information on these new software/hardware products as they enter the real world marketplace.

Reviews

By Bob Grove

Frequency and Intelligence Directory

The *Frequency and Intelligence Directory* by Jay Harris is unquestionably one of the most unusual publications we've ever seen. Although concentrating on south Florida, the federal listings apply nationwide. And this is where the interest begins.

Clearly, author Harris has access to lists most of us haven't; VHF and UHF frequencies and identifiers for CIA, Customs, DEA, Secret Service, military departments, and other sensitive agencies are the most comprehensive and accurate we've ever seen.

Interestingly, these stand in stark contrast to many of the book's HF listings which are quite dated — such as the USAF Global Command and Control System — or even extinct, like SAC and MAC.

We also had some problem with the book's pretentious attempt to imitate a legitimate government intelligence publication, which it isn't. The address for the publication begins "The Frequency Intelligence Administration, Department of Intelligence Affairs."

Tutorial sections are titled "briefings"; the author's club is named the "Secret Scanning Society" ("Triple S"). I expected to learn of a secret handshake or code ring.

But these overinflated theatrics are outweighed by copious amounts of valid information. Instructions are provided for conducting communications intelligence operations; there is a good explanatory text on cellular telephone systems; and the techniques for surveillance and countermeasures will prove enlightening to many readers.

Prowords and agents' radio slang are defined; there is a current list of nationwide Secret Service code names, Customs tactical callsigns and locators, DEA frequency bandplans, Armed Forces tactical identifiers and mission designators. Even bugging frequencies used by a prominent supplier are quite revealing.

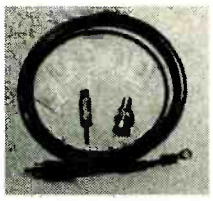
For south Florida scanner buffs, this book is a bonanza with its

Continued...

regionalized listings of business, public safety, cellular, cordless, tourist attractions, aircraft, press, marine, broadcasting, medical, railroad, sports, and transportation frequencies. And for nationwide federal/military VHF/UHF monitors, this may well be the most accurate frequency list published so far.

The 130 page *Frequency and Intelligence Directory* is $24.95 plus $2.50 bookrate shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902; phone order 800-438-8155. It is also available along with a unique monitor's registration for $30 plus $2 shipping from Wolfslayer Publishing, PO Box 100474, Ft. Lauderdale, FL 33310-0361.

Grove No-Tenna



For decades radio enthusiasts have complained about antennas protruding from their vehicles, inviting theft, breakage and suspicious glances. Grove Enterprises has addressed that concern with the "No-Tenna," a unique approach to all-band signal reception.

The No-Tenna consists of an eight-foot length of RG-174/U miniature coax fitted with an RCA phono connecter; adaptors for BNC and 1/8" miniplug are included for mating with scanners and shortwave portables, along with an alligator clip and screw lug for attachment to the vehicle body or other metallic mass in portable locations. Several self-stick clips are also provided to route the coax out of the way, and an optional Motorola adaptor is available for the older style scanners.

While phono plugs and miniature coax are taboo at higher frequencies, they actually seem to work quite well in this application with minimal loss. Full instructions are included.

The business end of the No-Tenna consists of a single coax center conductor surrounded by a ferrite bead. Installation is easy — a few seconds loosening a sun visor screw for the slot-feed attachment.

So How Does it Work?

Is it possible for a car body to act as an effective antenna? Apparently so. On a recent trip we compared the Grove No-Tenna with a top-of-the-line rooftop scanner antenna.

In nearly every case the relative performances were virtually indistiguishable. Most impressive was the fact that the No-Tenna, due to the large mass of the antenna (the car body) and its non-resonance, had continuous, broad spectrum response, clearly delivering signals from below 1 MHz clear up through 1000 MHz.

Ignition noise, which we anticipated would be a problem, never materialized. While some vehicles will cause more noise than others, this is a problem with all mobile installations, and no greater with the No-Tenna.

For mobile monitors and apartment dwellers who cannot erect an outside antenna, the Grove No-Tenna is a welcome relief.

The Grove ANT-20 No-Tenna is $19.95 plus $4 shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902; order line 800-438-8155.

Ramsey Kits

Two recent kits from Ramsey Electronics (793 Canning Parkway, Victor, NY 14565; phone 800-4-HOBBYKIT) caught our eye because of their applicability to radio monitoring.

In 1986 Congress passed the Electronic Communications Privacy Act outlawing, among other things, speech descramblers. But the Ramsey SS-70 speech scrambler is actually a duplex scrambler/descrambler intended for use on two-way radios and radiotelephones.

However, when used in its receive only mode, it becomes an effective scanner descrambler for decoding speech inversion commonly used by small law enforcement agencies (and sounding like badly-tuned single sideband). It will not, however, descramble digital systems like Motorola's DVP (which sounds like background noise when the signal comes on the air).

Our sample was easy to hook up with its RCA phono jacks, and its 2 watts of audio was plenty to drive an external speaker. The SS-70 has an external volume control and a bypass switch for monitoring clear speech.

There is no external "clarifier"; an internal trimpot must be adjusted for the specific coding frequency of the speech inverter being monitored.

The SS-70 needs 12 VDC to operate. Quite a bit of noise is generated by the amplifier which operates near the point of oscillation, but this should be tolerable for the brief periods in which the scrambled mode is invoked.

The SS-70 kit sells for $29.95; add another $12.95 for the case, or buy the unit factory wired and tested for $69.95 (plus shipping).

The other item, a model SCN-1 converter, shifts the entire 800-950 MHz spectrum down to 400-550 MHz where it can be received on scanners not equipped for 800 MHz reception. But with the anti-cellular scanner/converter law now enacted, only the kit form is lawful ($49.95 plus $12.95 optional case).

We tested the factory wired version, but found the sensitivity to be rather poor, possibly due in part to the use of RCA phono jacks for the RF connectors. It required about 10 microvolts worth of signal even to be marginally heard, 20-30 dB down from conventional 800 MHz scanners.

Worse, the lack of a double-balanced mixer or adequate filtering enables 400-500 MHz signals to come in just as strong as the converted 800-900 MHz signals.

But for experimental purposes, or for experience in kit building, the SCN-1 will provide an evening's entertainment, and once it's built and connected to a decent antenna, you will hear signals in metropolitan areas.

Bob Grove, WA4PYQ

AOR AR3000A Scanner

Approximately five years ago, Tokyo-based AOR Limited introduced their wide-frequency coverage, multimode scanner: the AR3000. It certainly took the monitoring world by storm, allowing continuous, uninterrupted frequency coverage from 100 kHz through 2036 MHz, with commendable selectivity, sensitivity and SSB stability.

During Operation Desert Storm the AR3000 became scarce because of military purchases; now the new AR3000A has been introduced. So how does it compare? Let's take a look.

Compact (5-1/2"W x 3"H x 8"D) and lightweight (2-1/2 lbs.), the 3000A still offers 100 kHz-2036 MHz continuous frequency coverage, although when the present U.S. inventory is depleted, replacement models will be missing cellular frequencies (824-849, 869-894 MHz). A single BNC antenna connector is provided for all frequency ranges.

Audio output is 1.2 watts into a 4 ohm speaker (10% THD), lowering to 0.7 watts at 8 ohms. Power required is 12 VDC at 500 mA; an AC power adaptor is included, as are a DC power cord for mobile or portable installations, and a telescopic whip.

Selectable reception modes include AM, narrow and wide FM, upper and lower sideband, and CW (Morse code). The receiver employs triple conversion (quadruple on WFM) for reduced images, and will store 400 frequencies in four memory banks of 100 channels each. The first channel of each bank may be selected for priority.

Up to 100 individual channels may be locked out of the scan sequence to skip over continuously-transmitting or other temporarily-unwanted signals, and channels are individually programmable for scan delay. Scan and search rates have been increased dramatically to 50 channels per second.

All program contents are backed up by an internal lithium battery to prevent accidental loss during prolonged periods of power outage.

Although the scanner is touted to have wide dynamic range (specification not given), there is an attenuator switch just in case (see "Our Lab Tests" below).

A real time clock and clock timer are included with tape output from an eight-pin DIN connector for versatile logging and recording. The LCD is brightly edge-lit for night viewing, and the contrasty display is easy to read, although some of the legends are quite tiny.

Computer control is possible through the rear-panel RS232 (25 pin sub-D) connector. Frequency, mode, tuning step, memory contents, signal strength, attenuator and bank selection are some of the functions accessible by this link. A simple command routine is included in the manual. A rear-panel switch deactivates the keypad when the computer function is selected.

Sensitivity of the AR3000A is a respectable 0.25 microvolts SSB (10 dB S/N) and 0.35 microvolts NFM (12 dB SINAD) throughout the 2.5-1800 MHz range, and somewhat less sensitive outside these limits.

Selectivity is optimized for each mode: SSB/CW, 2.4/4.5 kHz (-6/-60 dB); AM/NFM, 12/25 kHz (-6/-70 dB); and WFM, 180/800 kHz (-6/-50 dB). While the AM selectivity is rather broad for shortwave listening, the other specifications are very respectable. So how do they hold up when an antenna is connected?

Our Lab Tests

Selectivity is always a question in our minds; this is one specification that manufacturers can save money on, and which very few customers can validate. We are pleased to report that the published AR3000A specs are honest.

But selectivity isn't the whole story. How does the AR3000A hold up to its advertised "outstanding dynamic range and freedom from

intermodulation effects"? On shortwave, better than the portables but not as good as tabletops. On VHF/UHF, about the same as most other scanners.

While the small tuning knob is touchy, the ability to choose tuning increments as low as 50 hertz (and multiples of 50 Hz to as high as 1 MHz) allows easy fine tuning of SSB signals.

On our randomly-selected sample, frequency display accuracy was within 200 hertz; since this varied with time, there is some thermal drift noticeable in the SSB and CW modes. This is consistent with the +/-5 ppm stability specification stated in the manual.

For quick dial spinning without having to program another step increment, two pushbuttons--X10 faster and X5 slower—are provided. But at the faster tuning rate the encoder system has jitter, causing frequent reversals of frequency stepping.

When receiving SSB or CW, the squelch has two-second-delayed dropout to prevent clipped syllables or notes. We found this delay a little long, resulting in prolonged background noise.

Some 23 pushbuttons on the front panel can be confusing, especially when 19 of them are dual-function! While they may take some getting used to, you do get used to them.

The small speaker and lack of noise limiter or tone control can make listening under noisy conditions somewhat fatiguing, and different reception modes have different audio qualities.

The Bottom Line

Will the compact AR3000A perform as well as a Drake R8 on shortwave or an ICOM R7100 on VHF/UHF? Not by a long shot. Is it worth $1000? Absolutely, if you need the wide frequency coverage, multimode reception, computer control, and many of the other features in a box as small as this unique product.

The AOR AR3000A is priced at $1028.95 plus $10 shipping from Grove Enterprises; also available from other *MT* advertisers. MT

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Sony's New High-Tech ICF-SW100 Pocket Radio

Like Mohammed with the mountain, folks increasingly want to take communications devices along with them. Stereos, cellular phones, computers and more are being downsized to appeal to this footloose lifestyle.

The new Sony ICF-SW100 fits right into this trend. The size of an ordinary audio cassette case and weighing only half a pound with batteries, it's a true shirt-pocket/handbag radio. Although pocket shortwave radios have been around for years, they haven't had synchronous detection, and few have had sophisticated displays or advanced tuning systems.

Not so the SW100.

Love at First Sight

The first thing that hits you about the radio is...well, the radio. Its unusual clamshell design opens up to reveal a sophisticated, but ergonomically correct, operating panel with fully 28 decent-sized keys. These include a numeric keypad, in telephone format; two-speed up/down slewing and scanning controls; synchronous detector and SSB controls; snooze and alarm controls; plus buttons to program and operate the 50 presets—which store station names, as well as frequencies. On the cabinet sides are the volume, power-lock and two-step tone controls, as well as four sockets. There is no tuning knob.

The upper half of the clamshell incorporates a thumb-sized speaker and an illuminated LCD, which displays station data when the radio is on. Displayed for shortwave are station name for frequencies stored in presets, tuned frequency to the nearest kHz, and meter band. When the radio off, 24-hour local time is given for whichever of many the world's cities you wish, along with an indicator to show how many hours, plus or minus, that local time is off from UTC.

However, there is no UTC setting as such. If you want to use that clock for UTC without having to add or subtract the displayed UTC offset each time in your head, you have to use the "London" setting—*not* adjusted for DST—after you've set the clock to your local time. This will give you the correct UTC year round, plus the correct London Time winters.

The overall effect of all this technical pizazz in such a tiny package is nigh irresistible. We showed the radio to several non-shortwave men and women, all of whom reacted by wanting to know how much it cost and where they could get one. It's been a long time since we've come across a radio which reaches out and goes, "Gotcha!"

What It Does

The SW100 covers longwave, used in Europe, from 150-529 kHz; AM from 530-1620 kHz; shortwave from 1621-29999 kHz (3850-29999 kHz in the Italian version); and the Japanese and regular FM bands from 76-108 MHz. AM tunes in either 9 or 10 kHz steps, which are chosen automatically according to where you "tell" the clock you are. This means you have to fiddle with the clock when traveling to or from the Americas if you wish to have the correct AM channel spacing. (Sticklers will notice that starting this year or next, the AM band in the United States actually goes to 1700 kHz, but no matter.)

The ICF-SW100 comes in two versions—a cheaper basic set, and the "S" version, which lists at $449.95 in North America. The only model available in North America is the "S" version, which includes a carrying case, 120 VAC adaptor, active telescopic antenna and earbuds. Elsewhere, that same "S" version provides a 100-240 VAC adaptor instead. The cheaper "E" version is currently the only model available in Europe, and it includes a case, tape-reel-type passive antenna and earbuds.

The extras that come with the "S" version are worthwhile, but it is disappointing that globetrotting North Americans have to make do with a single-voltage adaptor—even if it is, commendably, UL approved.

Presets are clustered into "pages," as they are on some larger Sony models. Each page consists of five station presets, which is handy for clustering stations according to category. For example, all BBC World Service channels can be in page four, Arab shortwave music channels in page two, local FM stations in page three, and so on. Fortunately, these pages are easy to understand and operate. The radio comes from the factory with some presets already loaded, but these can be overwritten by the owner at any time.

The signal-seek scanner stops for three seconds at an active channel, then moves on to the next active channel. It works well enough that all but DXers will probably find themselves comfortable with this feature, rather than a tuning knob, to bandscan.

The synchronous detector is also a lazy person's delight. The lone "SYNC" button carousels among regular (DSB) reception, synchronous upper sideband and synchronous lower sideband. It's a snap to operate, and when you tune to another station or resume scanning, the synchronous detector automatically goes off until the new station is selected, then goes back on. No fiddling with extra controls, no unwanted howls, no fuss.

How Well It Works: Pluses

The psychology of tiny radios is simple: People don't expect much, and so are delighted when performance is merely okay. Sony could have played this tune on its fiddle, but went much farther, instead.

To begin with, selectivity is quite good. Add to that the synchronous detector's ability to slice off interference on either sideband, and the result is less station interference than you hear on nearly any other portable, regardless of size.

That synchronous detector works well, too. It locks in nicely, and doesn't howl or rumble. Although sideband selection, via phasing, is only in the minus-twenty-something-decibel range, it's quite adequate. And the synchronous detector's stable artificial carrier means *adios* to much of the fading distortion encountered not only on shortwave, but also at night on the AM band.

Sony pioneered the use of synchronous detection a decade ago, and with the SW100 has refined its operation to a fare-thee-well. Especially with earphones, you'll probably find yourself using it on non-FM bands most of the time.

Spurious-signal rejection is good, though the occasional image or birdie peeks through. And the radio is as stable as a rock, which helps in reception of single-sideband signals, which it tunes to ±50 Hz resolution.

Dynamic range on shortwave is also quite good, which is especially important if you're listening in Europe, North Africa or the Near East. On FM, dynamic range is pedestrian.

Battery consumption varies with volume and the band tuned, but generally varies from 15-20 hours per set of alkaline cells. That comes to about six cents per hour.

How Well It Works: Minuses

That's the good news. The bad news is two-fold. First, sensitivity to weak signals is only fair with batteries and the built-in telescopic antenna, which has little gain. This is true throughout the shortwave spectrum, but tropical-band DXers will be frustrated to find that even regular "benchmark" stations are awash in hiss.

Fortunately, when you're listening at home the AC adaptor and the "S" version's active telescopic antenna both help boost sensitivity a bit. However, that adaptor, like all such devices, sometimes introduces local electrical noise that can degrade reception. The active antenna tends to help only when its lead-in cord is fully extended.

Recently, we came across two broadcast reviews stating that the SW100 is very sensitive to weak signals. Puzzled, we obtained a second sample, but found its sensitivity to be virtually identical to that of the first.

The most obvious conclusion is that those claiming the radio has high sensitivity are bringing in the test signal at the antenna input—a technique appropriate for tabletops, which use significant outboard antennas, but misleading for portables, which run off telescopic antennas. At International Broadcasting Services, we measure the *field* sensitivity of portables; that is, the sensitivity to weak signals with the prescribed antenna(s) in use. We developed this technique several years ago to resolve this problem of lab tests showing a portable to be sensitive when listeners can't hear weak signals that should be audible.

Second, that "incher" speaker, while a remarkable performer for its size, is only a notch or two better than a telephone handset. Although not distorted at low volume levels, it is tinny and can't handle much without "breaking up," especially when the clamshell is shut. This proved true on both samples.

Sony's engineers seem to have taken this into account by limiting volume to avoid pushing the speaker into mass distortion. The result is that some faraway signals can be received only at barely listenable levels. Switching the tone control to "music" helps, but the resulting added punch sometimes overwhelms the speaker during modulation peaks.

The saving grace here is that the radio comes with earbuds. If you don't mind feeling like there are thumbs in your ears, these sound excellent not only on shortwave and AM, but especially in FM stereo. If earbuds bother you, try regular Walkman headphones. They sound great.

Overall: A Remarkable Radio

Sony's new miniature ICF-SW100 looks and operates like a blue-ribbon winner. As the handiest way in existence to bring world news and entertainment to people on the move, it may appeal to the public-at-large. However, it would have had even greater general appeal had it incorporated a wire antenna within the earpieces so the radio could function as a true World Band Walkman.

For experienced shortwave listeners, the SW100 is in many ways a dream come true. It is tiny. Yet, it has advanced features, excellent ergonomics and sometimes-outstanding performance. However, it would have had been much more attractive had it incorporated a decent speaker—even at the expense of slightly greater cabinet size—and had superior sensitivity to modest signals without having to be connected to a pair of devices as large as the radio itself.

Even at that, this is a remarkable radio. MT

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

PASSPORT® TO WORLD BAND RADIO'S Radio Database International White Paper® equipment reports contain virtually everything found during IBS' exhaustive tests of premium receivers and outdoor antennas. These are available in the U.S. from Grove Enterprises, Universal Radio, EEB and DX Radio Supply; in Canada from Sheldon Harvey (Radio Books), 79 rue Kipps Street, Greenfield Park PQ, J4V 3B1; in the United Kingdom from Lowe Electronics Limited, Chesterfield Road, Matlock, Derbyshire DE4 5LE, England; and in Japan from IBS Japan, 5-31-6 Tamanawa, Kamakura 247. For a complete list of available reports, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

John Catalano

Computer IDs DX

HP Wipes Windows(s) Clearer

Lost Company Found in Temple

MAN BITES RFI

AICRAFT TRACKED DOWN

Is Your Computer A Shortwave Station Interval Signal Player?

What shortwave broadcast station are you listening to? If it is not broadcasting in your native tongue, or the conditions are poor, you need all the help you can get to identify it. A good method is to use the musical theme, or interval signal, that most SW stations use along with a verbal ID. In the past there have been companies that have offered tape recordings of these signals for reference; however, to find the desired one took up lots of time fast forwarding and rewinding. Too bad we just couldn't call up the interval signal by name.

Well, that's the intent of a program called SWBC Interval Signals v1.2 written for the IBM XT or AT with clock speeds between 4.77 and 35.8 MHz. No special sound card is required since it plays the notes through the computer's internal speaker (not the best fidelity for musical compositions, but adequate for IDing a station).

Seventy-nine different station interval signals are included, ranging from the common, such as Radio Netherlands, to the rarely heard Malawi BC. The seventy-nine are a good mixture, though Oceania is not well represented. Since the program was last updated in 1992, you'll find some stations no longer exist.

INTSIG12 is a Shareware program written by M. J. Fine. It is available on HamCall CD-ROM, April 1993, available from Buckmaster Publishing, Route 4, Box 1630, Mineral, VA 23117, Tel 703-894-5777. Check with them for the latest prices.

HP's DASHBOARD "Windex" for Windows

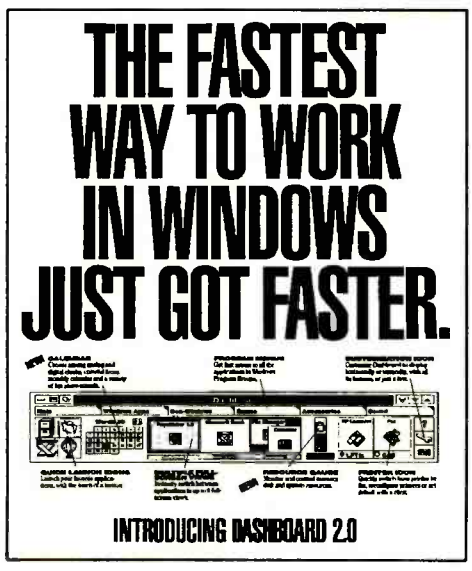
As more and more new monitoring programs are configured to work under the Microsoft Windows environment, the limitations of Windows become more obvious (well, at least to me). The "cute" little icon pictures with their dragging movement become a cluttered screen of little gremlins each eating a piece of my valuable memory. It's no longer a very user friendly environment once we start multi-tasking (running a number of programs at the same time). Keeping track of which programs are open, running and how they are being displayed is darn hard, almost impossible.

If you don't do your housekeeping you could find yourself out of memory and your Windows program crashing after hours of inputting frequencies, times, programming details and other valuable information. That's when you smash a Window and drown your troubles in a cold (root) beer. Do I hear some of you saying "Done it. Been there. Got the T-shirt"? Sooner or later it happens to us all if we really push Windows.

Some people at Hewlett-Packard (HP) saw the need to create a utilities launching and system monitoring panel program for Windows 3.1. The result is Dashboard 2.0. Quoting from HP, Dashboard allows push button control over everything you do with Windows. A set of mini-screens on the panel shows which programs you are working with, and a gas-gauge-like meter shows you how much memory you have left in your computer as you fire up more program windows. Dashboard can run on any computer that can run Windows 3.1, has at least 640K of RAM, 2MB of extended memory and 1.5MB of hard disk space. It comes on a 3.5 inch, high density floppy disk.

Dashboard appears as either a vertical or horizontal bar on the screen taking up about one-seventh of the screen. See Figure 1. Every Windows command/action, as well as DOS commands, can be started from here—no more opening a series of windows before you get to the program you want. Printing, faxing and other functions are just one click away.

For me, the constant visibility of what programs are open and running is Dashboard's greatest virtue. The center of the Dashboard bar displays three, seven or nine mini-screens (user's choice). By clicking on the small line under each screen you make that one the visible screen; the program that is displayed occupies the other six sevenths of your screen. For example, if you start a word processor program while the first mini-screen is the active one, and then get bored and want to do some monitoring while you work, clicking on the line beneath the second mini-screen (which might be Ham Windows in our example) will leave the icon for your word processor outlined in the first mini-screen, but it will no longer be visible on the main part of your monitor.



Now the main screen is filled with Ham Windows. On the memory fuel gauge you'll be able to see how much memory you are now using, and how much is left, with the two programs open.

Dashboard is a great time saver if you move between different types of program screens often. The different program screens no long need to be sized and adjusted to be visible. Dashboard takes care of it all and makes screen switching fast and painless. To switch between the word processor and Ham Windows you only need one click on the line at the bottom of the mini-screen where the one you want to display is running. If the program is set to its "minimize" form, a dot appears in the mini-screen instead of the application icon.

With one glance you can tell what's happening throughout the entire Windows environment. I am impressed.

In the coming months we will be reviewing programs such as AEA's PC PakRatt for Windows, and Log Windows, both of which promise lots of capability to the monitor/Ham computer user. We'll see how HP's Dashboard 2.0 performs with these complex data transferring Windows applications. Will it slow them down? We'll see.

You can gauge my first impressions of Dashboard by the fact that it is now installed in the Start-Up of my Windows 3.1 and I don't use Windows without it. Now I can "see" when I am in danger of running out of memory "fuel" and what programs are still open and using memory, even though they may be covered by other windows.

Dashboard version 2.0 is available from Hewlett-Packard dealers for $99. To get the name of your nearest dealer call 800-554-1305 or Fax 408-720-3441.

Where in the World ... is that Aircraft?

No, we're not looking for a new variation on the computer adventure game, but we're addressing a real need by avid aviation monitors. International flights can be heard over long distances giving position reports to ground stations while en route. New York Radio and Santa Maria Radio (Azores), for example, can be heard in North America working transatlantic aircraft giving their current position in map co-ordinates, while African ground stations are commonly monitored in Europe.

Norman Dowling of New Jersey writes to ask if I "have ever heard of a Shareware ... program which can aid you in locating airplanes..." He says that since the aircraft report their positions in longitude and latitude, a program that would plot these on a world map would be very useful.

You've come to the right place, Norman. A Shareware program called World29, version 2.97, by R.L. Lloyd is a program that does the trick. The program runs on CGA/EGA/VGA and Hercules monitors on an IBM AT compatible 286, 386 or 486. Although I couldn't find any other technical details, I believe it may even run on an XT.

The program is menu driven with thirteen choices displayed when it is started. The function Norman is looking for can be performed in various ways by World29. If you know the exact coordinates, then choice one (1) "Select by LAT and LONG," draws a map centered on the coordinates. A plot of the aircraft's travel can be made using choice eight (8) "Enter new info on Tracks."

Choice ten (10) "Point At Location," works pretty good, too. It displays a map of the world and an arrow. The position of the arrow on the map can be changed using the cursor keys and its longitude and latitude are displayed as you move it. By repositioning the arrow and hitting the Enter key, the area around the arrow's position is magnified to show details of countries, cities, island and other geographical features.

It's simple and easy to use, but then so is an atlas! A disclaimer by the author found in the WORLD.INF file indicates he "...guarantees nothing..." on the operation of the program. At times it showed some unexpected screen results on my VGA system and my laptop computer. But, in my opinion, it's worth having.

World29 can be found on Amsoft's World of Ham Radio CD-ROM, January 94. Amsoft's address is P.O. Box 666, New Cumberland, PA 17070, phone 717-938-8249. Price is $40 plus $3 shipping USA/$5 foreign air.

Bits of Bytes

Is there such a thing as a company tracking program? I think that's what Ed Ashley from Augusta, GA, needs. Ed has been trying to purchase a copy of Scanner Buff that we spoke about in the February 1994 Computers and Radio column. After monthly updates on the very mobile company, his latest info puts the authors of Scanner Buff, Vista Software and Comms, at 5533 Welland Ave., Temple City (see headline), CA 91780. Thanks, Ed, for your tracking and that latest info.

On a subject which seems never ending—computer generated radio frequency interference—I can suggest some additional "try 'ems" to reduce this bane of monitors. Plastic computer cases can be very stylish, but if they don't have internal metal enclosures, they can reduce to zero any chance of catching that rare DX. At the very least, make sure that the metal cover of your computer has had the paint removed from the point it is suppose to make mechanical/electrical contact to the main metal chassis. That's a start. Many of the earlier desk-style computer cases were actually two cases. The outer case was for esthetics while the inner metal case enclosed the electronics top and bottom. Most of the cases you can buy today are for looks, reduced cost and made mostly from non-shielding plastic.

Armed with the measurements of your motherboard, the number of add-on board slots, and the number and size of disk drive slots you require (both hard and floppy) some great cases can be bought at flea markets. May the Electronics Gods forgive me, but I have bought old 8088s for $25 just for the case and then trashed the electronics.

The double case approach really decreases the RFI, but make sure the cooling fan is fully operational or you'll have a 486 toaster oven. Other RFI culprits to watch out for are poorly designed and shielded color monitors, poor quality joysticks and cables, and dirty or poor quality cooling fans.

Isolation of the receiver's audio from your decoder, via a transformer, can make a big difference. Using a 600 ohm audio isolation/matching transformer from Tandy (Radio Shack) between my Apple II and my RTTY decoder was the only way to reduce RFI so I could heard anything! This modest investment (under $4 for stock number 273-1374) is probably worth a try for any computer decoder set-up.

Remember, since this interference is made up of many different internal computer "signals," don't look for one cure for all interference frequencies. True, some remedies will decrease the overall interference level. But in most cases you'll find that fixing a problem results in less interference in a given monitoring frequency range. It's a never ending quest, and we'll bring you more "try 'ems" in future columns. Don't be surprised if some of the fixes don't work for you. The combinations of equipment types, electrical wiring and relative physical locations makes each listener's problems almost unique.

But then most of us listeners are pretty "unique," too. (I wonder what my wife means by that?) As for this month's column title, we all need extra money these days, and I'm thinking of trying a technical column in a supermarket tabloid. Think it will sell? No, I don't think so either. MT

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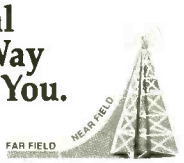

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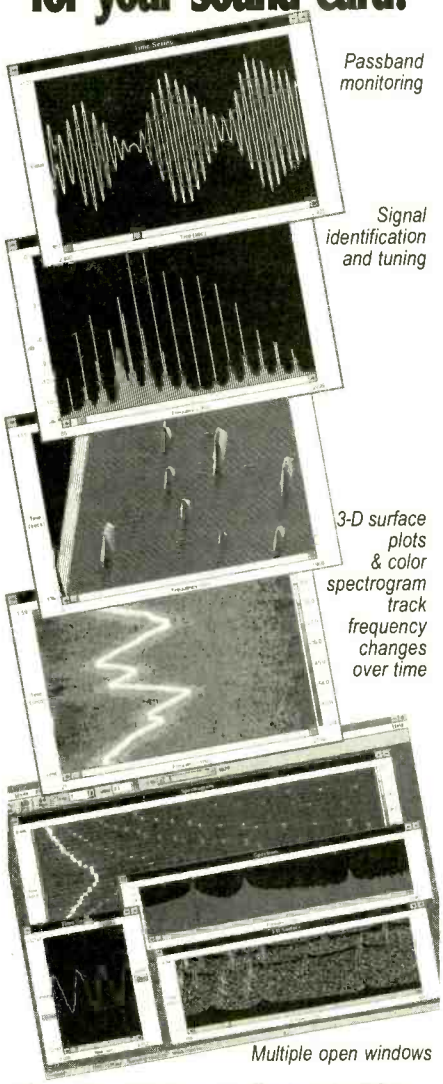

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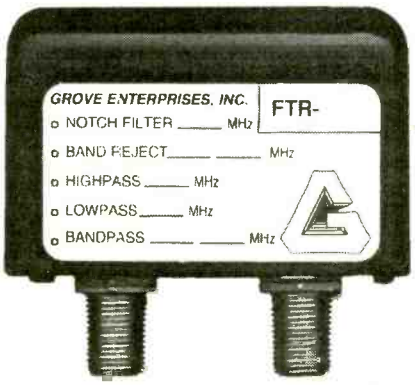

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Components
How To Find Them

It is not unusual to receive letters from readers who complain that electronics parts are hard to find or are too expensive for the project described by the writer.

Components have never been entirely at hand when experimenters sat down to build a project. In fact, at the dawning of the radio pastime, SWLs and radio amateurs had to hand-build many of the components they needed (see May's "Radio Reflections"). Such items as wet-cell batteries in Mason jars, tubular capacitors, tuning capacitors, crystal holders and transformers were often crafted by the experimenter. Although some nostalgia enthusiasts tell of the "corner parts store" having everything one needed for a project in bygone days, it really wasn't true. The nearest thing we have to the corner parts emporium today is Radio Shack.

Despite the vast assortment of parts available at Radio Shack, it is seldom possible to garner everything one needs to complete an electronics circuit. We must be willing to do some mail-order shopping, scrounging and trading with friends if we are to ensure a complete bill of goods.

One of the problems we face today is our reliance on packaged kits that contain a PC board, easy-to-follow "road map," and all of the parts required to make the gadget "play." This form of instant gratification seems to have become a way of life with some builders, but it's not a viable solution to most of our needs. A dedicated designer, experimenter or circuit duplicator needs to have as complete a catalog library as possible. Most vendors of surplus and new electronics components provide catalogs at no charge when you call them on their 800-number phone line. The reference at the end of this article lists a number of mail-order parts vendors from whom I order components.

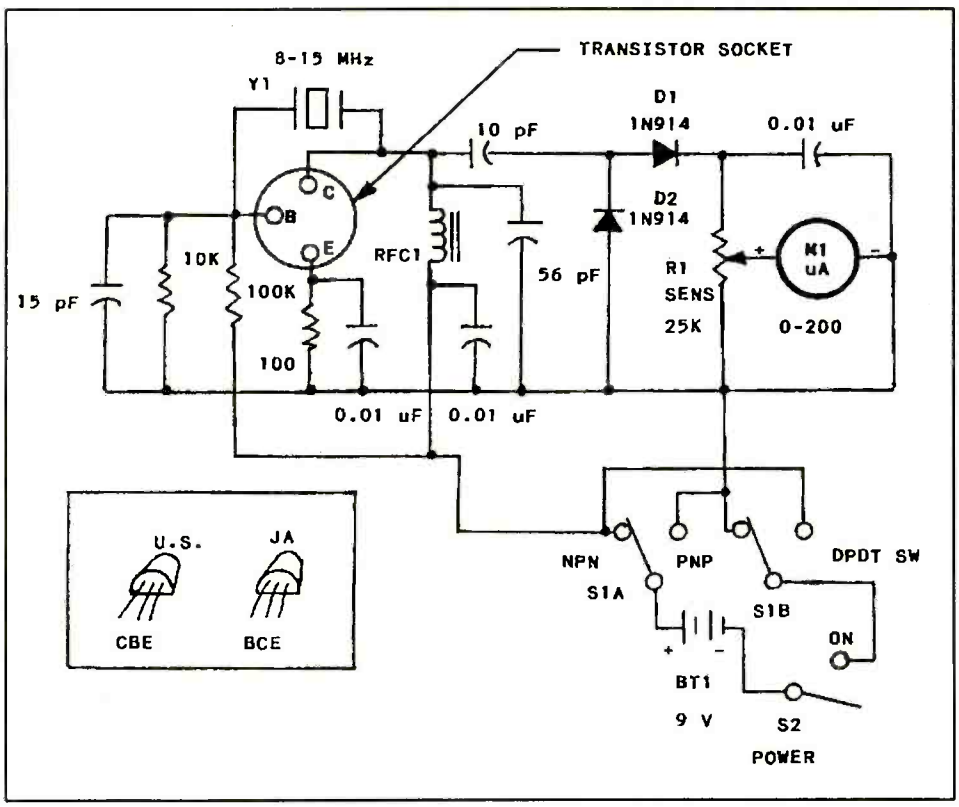

Figure 1: Schematic diagram of a simple transistor tester. Capacitors are disc ceramic and resistors are 1/4-W carbon film units. M1 is a low-cost 100- or 200-uA meter (see text). R1 is a linear taper control. S1 and S2 are toggle switches. Y1 is a surplus computer crystal and can be for any frequency from 8 to 15 MHz with the parts values shown. RFC1 is a miniature 500-uH or 1-mH RF choke. Pinout data is included for some U.S. and Japanese small-signal transistors. R1 is used to set the meter deflection at approximately half scale during tests. The lower the meter reading the lower the transistor gain at the Y1 frequency.

How to Scrounge Parts at Home

The development of a personal goodie trove minimizes the need to send for components. Where might we find these free parts? Most of us have discarded electronics gadgetry stashed in the basement, attic or garage. We are often reluctant to send these treasures to the landfill in the hope that we might repair them some day!

Since most of today's entertainment devices are expendible, costing more to repair than to replace, it's prudent to strip them of usable parts and place these useful components in our private stocks. Such items as transistor radios, hi-fi units, microwave ovens and TV receivers contain all manner of reusable parts. A 40-watt pencil type of soldering iron, a solder sipper (or solder wick) and simple hand tools are all that you need to strip the PC boards and chassis of their parts.

Sorting and Identifying Components

Once you learn the resistor color code you will have no difficulty grading out the various resistor values for storage. If you're in doubt about the value, check it by means of your VOM while using the ohms function. Discard all discolored resistors because they were probably overheated and may no longer be of the marked value.

Most disc ceramic and electrolytic capacitors have their values marked on them. Nonetheless, a capacitor checker is a tool that each of us should have in the shop. This device will enable you to verify the value marked on a capacitor and those with no markings can be measured and marked for use later on.

If you don't want to spend a lot of money for a capacitor checker you can order a low cost kit that can be used with a digital VOM. It is available at low cost from Hosfelt Electronics (see ref. list) as item no. CA-2. This add-on circuit will enable you to measure values from

2 pF to 2.2 uF. Hosfelt also markets an inexpensive kit (part no.1A-1) that works with a VOM to let you measure inductances from 3 uH to 7 mH. This vendor sells digital VOMs for as little as $17. If you can measure small inductances you will be able to reuse the RF chokes found in radios and TV sets.

Be sure to save the audio and low-voltage power transformers. These will be handy for a number of future projects. Measure the power transformer secondary winding AC voltage with your VOM and mark the value on the transformer frame.

The shielded RF and IF transformers will be useful as they are, or you may elect to rewind them for use on other frequencies. The IF transformers in AM-FM radios are usually resonant at 455 kHz (AM band) and 10.7 MHz (FM band).

You will be able to gather a useful supply of hardware when you strip discarded electronics items. Even though you can't think of a good use for some of the hardware, save it. It might be just what you need when innovation becomes necessary later on.

What About Transistors?

Most hi-fi and radio gear contains numerous small transistors that can be used again. You should be aware that some Japanese transistors have a different lead arrangement than is used for U.S. transistors. The inset drawing in Figure 1 shows both pinouts.

You can build a simple go-no-go transistor tester if you use the circuit in Figure 1. It is a 10-MHz oscillator (any frequency from 8 to 15 MHz is fine) whose rectified RF output is used to deflect a microammeter, such as a low-cost edgewise tuning meter from an FM radio. Most of these have 200-uA movements. If the transistor under test is okay it will make the crystal oscillate and you will have an output indication on M1.

Transistors that produce a high meter reading are probably good to at least 150 MHz. The transistors found in the oscillator circuits of TV and FM receivers are generally useful as high as 500 or 1000 MHz.

The tester will also let you know if the transistor is an NPN or PNP type by cycling S1. There will be no meter reading if S1 is in the wrong position. The upper frequency limit (fT) of a transistor is the frequency at which its gain is unity or 1. Therefore, the 10-MHz tester is not able to provide accurate information about the fT.

Some Final Comments

Amateur radio hamfests and conventions are excellent events to attend if you are looking for radio parts. Most of these conclaves feature large flea markets. An ardent scrounger can easily fill a shopping bag with goodies for a modest outlay of cash! If you are a computer-oriented experimenter, take heart. Computer parts are widely available these days at ham radio flea markets.

It was once said, "It is better to light a candle than to curse the darkness." Perhaps the parallel to that sage remark could be, "It's better to shop for parts than to claim they can't be found."

I confess that some annoyances go with ordering by mail. There's always that doggone shipping and handling fee, without which the vendor would lose money for his labor and shipping materials. Back orders should be avoided so that shipping charges are not added each time a back-ordered item is sent to you. I always mark my orders in red "DO NOT BACK ORDER." This allows me to look elsewhere for the part, or to make a substitution. MT

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Bill Cheek

Heavy Duty Regulated Power Supply for CB & Ham Radio

You guys are gluttons for punishment, judging from your responses to my March 1994 power supply article. I was overwhelmed with requests for an article on heavy-duty power supplies. Hey, I was just joking! Heavy-duty power supplies are not for the faint-of-heart. OK, OK, never let it be said I don't listen!

The main difference between heavy duty and light duty is HEAT and what to do with it. Heat is a form of power that's generally useless in electronics; in fact, it's destructive! Heat results from applications of high voltages, high currents or both. Power equals voltage multiplied by current (P = EI); or voltage squared divided by resistance, ($P = E^2 \div R$); or current squared multiplied by resistance, ($P = I^2R$) (Ohm's Law). Power consumed by a circuit equals the voltage supplied to that circuit multiplied by the current.

Consider a CB radio fed with 13.8-v, drawing 1.5-amperes in the transmit mode. The power consumed by that radio is (13.8 x 1.5) = 20.7-watts! A legal CB rig puts out 4-watts of RF, so the difference—16.7-watts—is HEAT! It can't be helped. But that heat has to be removed. If energy is fed into a point from which it can't escape, sooner or later something blows; but mushroom clouds are not popular any more.

The power supplies in the March column are considered light to medium duty. A 3-port voltage regulator handles 1.5 to 3 amps, so "heavy duty" is anything that delivers 4-amps or more. Don't confuse the meanings of heavy, heavier and behemoth, though. Figure it out: (13.8-v x 4-amps = 55.2 watts). Cup your hands around a 50-watt light bulb and you'll feel the meaning of "heavy." Wrap thermal insulation around that 50-watt bulb and the glass will melt!

A major consideration of a heavy-duty power supply is how to efficiently dissipate the heat. You can bone up on the science of thermal radiation, conduction, and convection, while I provide brass tacks solutions for a basic, but functional, heavy duty regulated power supply. This power supply is voltage adjustable from about 1.2v to 18v, but max current specs are possible ONLY in the range of about 10v-14v. Reduce your current needs for voltages outside this range.

The heart of a heavy duty power supply is the power transformer. It must be capable of doing the job and a bit more. An 18-volt, 2-amp transformer is good for about 1 to 1.5-amps at 13.8 volts. My research has determined that 6 to 8-amps is about tops for the kind of power supply that could be called "easy" or within the range of the average experimenter. Any more than that, and the number of parts and their specifications tend to go through the roof, increasing complexity and costs.

Your transformer should be rated for 18-24 volts at 8-10 amperes. The following STANCOR models, available from national electronic distributors, meet this spec: P-8695, P-8666, and P-8647. If the desired transformer is not to be found, you can use two matched transformers rated at half-spec each, wired in parallel, wire for

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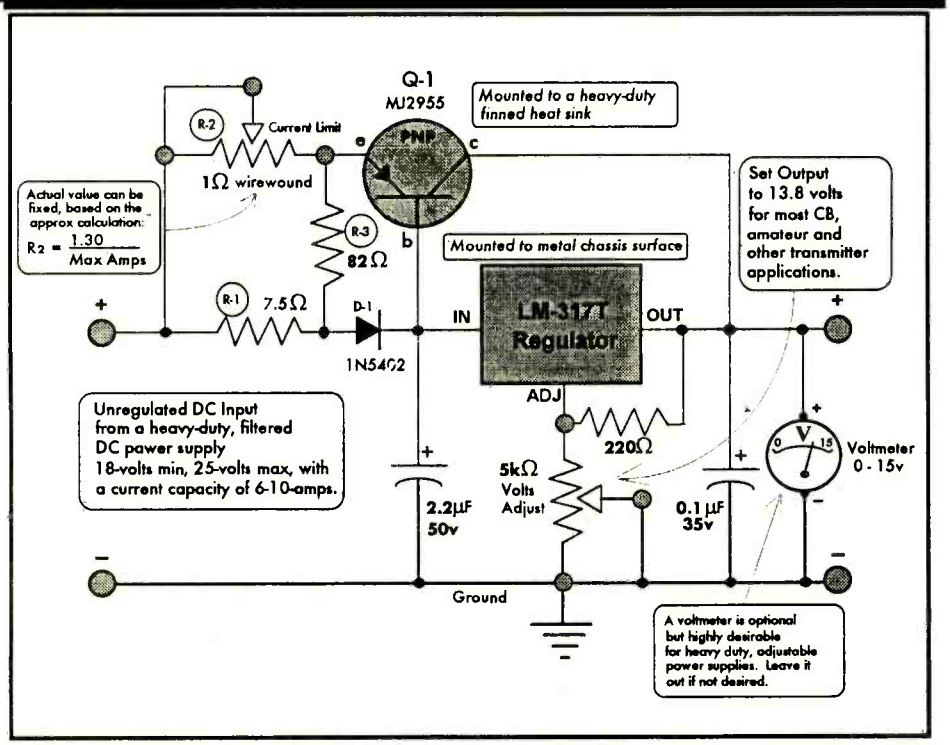

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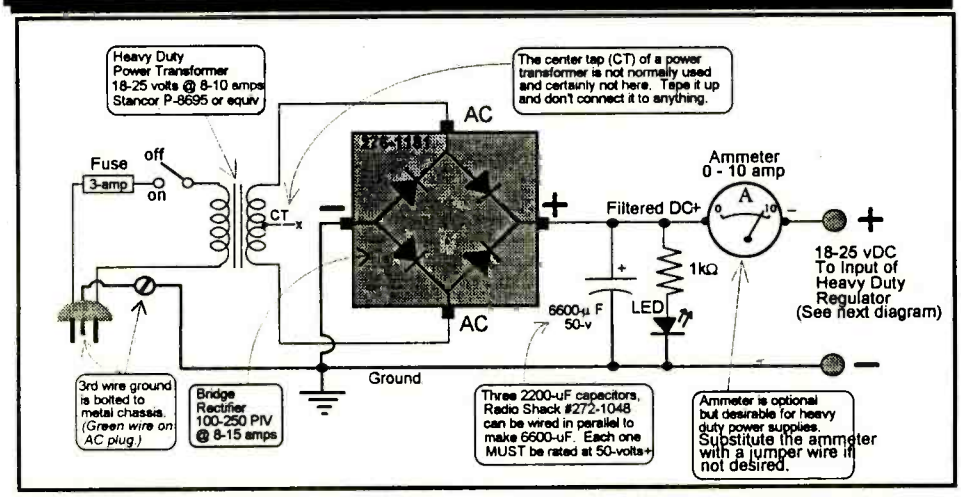


wire, to achieve full spec..(Ex: two transformers, each rated for 24-volts @ 5-amps will meet the 24-v @ 10-amp spec). The exact secondary voltage of the transformer is not too important, but should be less than 25.2 volts and greater than 18.0 volts.

The full-wave bridge rectifier specs must equal or preferably exceed maximum requirements. The Peak Inverse Volts (PIV) rating must equal or exceed four times the applied AC voltage. If your transformer supplies 25 volts, then the bridge rectifier should be rated for 100-PIV at 8 amps or more. Radio Shack does not have the ideal bridge rectifier for our needs, but in a pinch, their #276-1181 will be OK for less than 8 amps. Otherwise, select Motorola's MDA2501 or MDA2502, or International Rectifier's 16MB10W or 17MB10W.

Brand name is less important than specs here: if you want the max, your bridge rectifier should be rated at 100-PIV @ 10 amps or greater. Check the mechanical configuration of the bridge rectifier. If it is designed to be mounted flush to the chassis (as a heat sink), then install it that way.

The sub-circuit, R1, R2, R3, D1 and Q1, must be properly designed and selected. I took most of the hard work out of this for you with Radio Shack's MJ-2955 for Q-1, 1N5402 for D-1, and 82W for R-3. Two of Radio Shack's 15W resistors wired in parallel yield 7.5W for R-1.

R-2 can be calculated with the approximation of 1.3 divided by the maximum current to be produced by the supply, (not to exceed 10-amps). If your maximum current is 8-amps, then $1.3 \div 8$ equals 0.162W for R-2. I spec'd a 1W/25watt adjustable resistor by which to set this value.

You can calculate the desired resistance of R-2 and select some parallel fixed resistors to yield that value. For instance, six 1W resistors in parallel could produce a desired value. Heed the power dissipation rating of R-2 because most of the current will flow through it. Given 8-amps through 0.162W, and $P = I2R$, then $8^2 \times 0.162 = 64 \times 0.162 = 10.3$ watts! The safe power rating of R-2 should be at least twice the minimum calculated. Therefore, the ClaroStat VP25KA (0-1 W/25W) adjustable resistor is an excellent choice for R-2.

Q-1 is used as a "pass transistor," the purpose of which is to "pass" most of the current around the low powered LM-317T voltage regulator, which can handle a maximum of 1.5-amps, if everything is perfect. In practice, it is best to not exceed 1amp. I selected R-1 and D-1 to limit that current to about 0.75amp just to be conservative. This leaves 7.25 to 9.25 amps to be passed through Q-1.

Guess what? Q-1 is going to get pretty HOT if you run your power supply above three or four amps. Powerful as the MJ-2955 transistor may be (150-watts), it will fry if not sufficiently cooled. Therefore, you need a good sized **heat sink** on which to mount Q-1. The black aluminum type with fins to absorb heat from the body of the transistor and radiate it into the surrounding air is absolutely mandatory. DigiKey (800-344-4539) has one heat sink that might be adequate: part #HS-117-ND.

This or any heat sink like it should be installed on the back panel of the power supply's metal box so that it is exposed to open air and with the vanes or fins positioned vertically, up and down, to enhance a natural air flow. (Heat rises!). Install Q-1 with special mounting hardware (RS #276-1371) so that it is insulated from ground (metal). A mica insulator goes between the transistor's base and the surface of the heat sink.

You must, however, apply a thin layer of "heat sink grease" (RS #276-1372) on either side of this mica insulator before seating the transistor on it. This special grease is thermally conductive to aid in the evacuation of heat from the transistor. Mica is also thermally conductive, but neither it nor the grease are electrically conductive.

The LM-317T adjustable regulator must be mounted on a heat sink, too, since it will get quite warm, even at 0.75-amps. It's not critical, though, and a good spot will be anywhere against the metal surface of the power supply's case! Use appropriate mounting hardware for it, too, (RS #276-1373) since no part of the LM-317T can actually contact ground or metal. Apply heat sink grease on either side of its mica insulator, too, before mounting. Also, apply the heat sink grease to the mounting surface of the bridge rectifier if it's designed to be installed against a metal surface.

Be sure to include a fuse in your power supply. I show a 3-amp fuse, but you should select one as small as possible that does not blow when the supply is under full load. Depending on your maximums, this might be 1 or 2 amps. You should also consider using a panel type ammeter and a voltmeter as shown in the diagrams. They're not necessary but will lend a touch of elegance to your work.

Adjustment of R-2 should be performed only when the power supply is under the highest expected load, say, 13.8-volts at 8-amps. First, adjust the LM-317T output voltage to 13.8-volts with nothing connected to the output. (Transceivers usually run best from 13.8-v!) Then connect the equipment to be powered and if the output voltage drops below 13.6-volts @ 6 to 8 amps, then adjust R-2 so that 13.6 to 13.8-volts is maintained.

In conclusion, your heavy duty power supply should deliver a constant voltage from 0-amps to the full rated current. A drop of 0.1 to 0.2 volts from 0 to max current can occur over the internal wiring, but a drop of more than that spells trouble. Therefore, all high current wires in the supply should be soldered and of #12 or larger gauge. It's all pretty simple, actually. By now, you've seen the difficulty to be in the mechanics and the cost of a "heavy duty" supply, not in the electronics.

What now? You tell me. 73/Bill

MT

The BALUNcing Act

A balun is a device which can be used to connect a balanced circuit to an unbalanced circuit while preserving the balanced and unbalanced nature of each. The name "balun" is derived from this "balanced-to-unbalanced" function.

Baluns can also facilitate impedance matching between circuits which they connect. For instance a 1-to-1 ratio (1:1) balun will match a 75-ohm, centerfed, halfwave, dipole antenna (a balanced device) to a 75-ohm, coaxial cable feedline (an unbalanced device); a 4:1 balun can match a 300-ohm center-fed folded-dipole antenna to a 75-ohm coax (75 x 4 = 300); or a 6:1 balun could be used to match 50-ohm coax to the same 300-ohm antenna (50 x 6 = 300).

Why Use a Balun?

If your antenna is a balanced antenna (such as a centerfed dipole) and you use an unbalanced feedline (such as coaxial cable), and it is important to you to have the antenna's directivity pattern actually resemble its theoretical pattern, then you should use a balun or some balanced-to-unbalanced feed between the antenna and the feedline.

If, however, nearby electrical wiring, metal buildings, power lines, etc. are likely to distort your antenna's pattern such that you can only guess at the orientation of your antenna's directivity pattern, a balun for HF receiving may be a waste of time and money.

When erecting a beam antenna, we usually do try harder to preserve the beam's original directivity pattern, and a balun is one way to help do this if the beam is a balanced antenna with an unbalanced feed.

At frequencies above HF (and in the upper half of the HF band in electrically-quiet locations), matching the antenna feedpoint impedance to the feedline impedance can also improve reception by passing maximum received signal strength from the antenna to the feedline (see the answer to last month's Radio Riddle below for more on this).

The use of a balun is sometimes considered more important for transmitting purposes than for receiving. A balun can keep signals from flowing onto the feedline where it not only distorts the directivity pattern but also wastes power that should go into the antenna's main lobes.

Balun Kits

If you want to build a state-of-the-art balun your best bet is to get a catalog from Amidon Associates Inc., 2216 East Gladwick St., Dominguez Hills, CA 90220 and purchase one of their balun kits. Completed baluns are also available from Amidon and several other radio supply houses.

On the other hand, for the homebrew aficionados among us, baluns with a respectable performance in both receiving and low-power transmitting can be made from easily obtainable materials. In fig. 1. you see a 6:1 balun designed to match a 50-ohm receiver antenna input to the 300-ohm feedline of last month's T2FD antenna. This balun, which performs well from 3.8 MHz to at least 32 MHz (the highest I could test), can also be used in other receiving and low-power transmitting applications. It can match a 50-ohm antenna input to other 300-ohm balanced antenna designs, or match 75-ohm coax to 450-ohm, open-wire feedline. If you'd prefer directions for making a 1:1 or 4:1 balun, send me a stamped, self-addressed envelope in care of *Monitoring Times.*

Let's Make a Balun

1. The balun is wound on 1-3/4" lengths of 3/8" diameter ferrite rod salvaged from an AM broadcast receiver rod-antenna. To paraphrase one antenna expert: "Just use any piece of ferrite you find being used as an AM antenna rod." To help a rod break cleanly use a file to etch a ring around the rod where you want it to break. Be careful, as the edges of the rod can be sharp where it breaks.

2. The size of the wire used is not critical but it must be insulated. I used number 24 with plastic insulation. You will need two lengths of wire each about 18" long for the two-winding rod and two lengths each about 12" plus one about 8" long for the three-winding rod. Tag the ends of the wires to indicate the numbers shown in fig. 1. The wires for the separate windings are wound side-by-side on the rod as shown. When soldering the wiring in place, keep the leads as short as is reasonable.

3. A 4-inch square, plastic, electrical-wiring junction-box cover is a good base for mounting these baluns. The box can be purchased, too, if you want full enclosure of the balun.

4. Hold the windings in place on the rods with narrow, black electrical tape. When the winding ends are soldered to their respective terminals the rods will be held in place by the wires with no other bracing needed.

5. Keep the work neat and follow the layout shown in fig. 1. Align the two rods at right angles to one another as shown.

6. Rod baluns will respond to noise fields if they are placed in one, so use care to avoid locating the balun near sources of electrical noise such as light dimmers or electrical motors.

Happy monitoring!

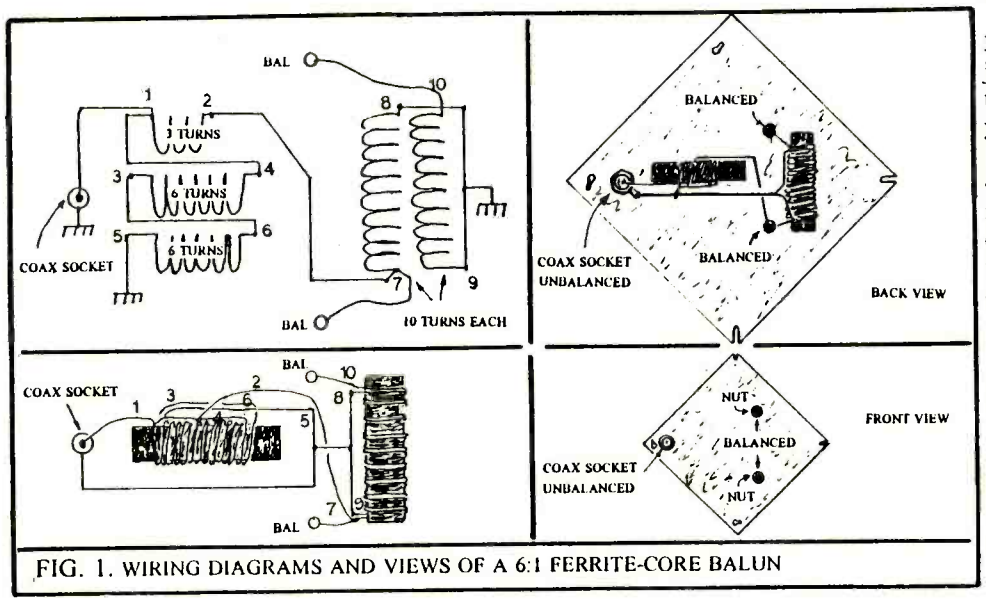


FIG. 1. WIRING DIAGRAMS AND VIEWS OF A 6:1 FERRITE-CORE BALUN

RADIO RIDDLES

Last Month

Last month I asked you, "Which will cause more loss in HF receiving capability (signal-to-noise ratio), a certain amount of loss (10-dB for example) in transmitted power due to transmission line losses at the transmitter, or the same amount of loss (10-dB) in received power due to transmission line losses at the receiver? Would the answer to this be different for VHF, UHF or microwave?"

Well, if an HF transmitting antenna's signal output decreases by a certain amount due to transmission line loss then obviously the transmitted signal is decreased by that amount on the receiving end of the circuit. In our case this will cause the signal to drop 10 dB at the receiving antenna, but note that received-noise level will not be reduced. So, because on HF the "receivability" of a signal is generally determined by the strength of the signal as compared to received-noise level, the signal's receivability will be degraded.

On the other hand, if the 10 dB loss is in the HF receiving antenna's transmission line rather than at the transmitting antenna, then both the received signal and the received noise will be reduced by an identical proportion. This means that the signal-to-noise ratio will not change and reception will not be worse for the loss.

There are two exceptions to the above answer. First, if the received HF signal is near the receiver's lower limit of detectability, so near that a 10-dB loss will put the signal below this limit, then the 10-dB loss at the receiving antenna will prevent reception of the signal. Second, when there is very little or no noise received by the antenna, as is generally true for VHF, UHF and microwave, then the signal-to-noise ratio is essentially determined by noise generated within the receiver rather than by received noise. In this case the effect of signal loss due to the receiving transmission-line will be the same as signal loss due to the transmitting transmission-line.

This Month

Yes, you know what a "balun" is, but what is an "unun?" No, it not is not a garlic-like vegetable that makes you cry when you peel it! And by the way, there's an unun hidden in this month's 6:1 balun.

Find the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73. MT

ask bob

Bob Grove, WA4PYQ

Q. *I recently tested several different AC wall adaptors with a multimeter and discovered that the output of every one of them was higher than the voltage specified; how come? (Ricardo Molinar, Fort Lee, NJ)*

A. This is normal. Read the specification again and notice that it also states the current (50 mA, 300 mA, etc.). These power supplies are unregulated, designed to provide the specified voltage during the rated current drain. Had you been drawing the rated current from the device, the stated voltate would have been much closer.

If your wall adaptor is not used close to its rated current, the voltage will be higher than specified. Voltage-adjustable supplies should be switched to a lower setting, or a fixed-voltage adaptor should be chosen for a lower output voltage.

Bob's Tip of the Month

Realistic® PRO-2032 Modifications

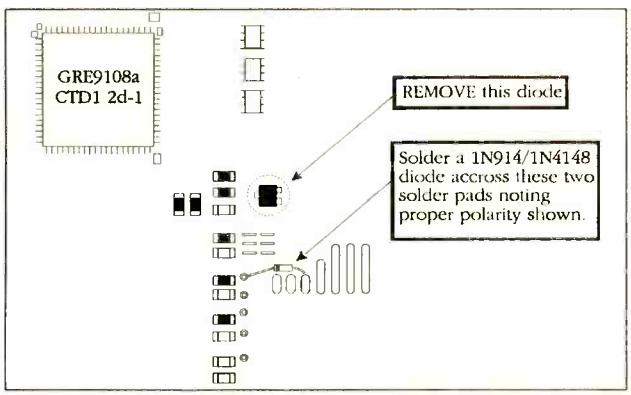
We would like to thank veteran scanner modifier Larry Wiland for this contribution to *MT* readers. **NOTE:** *Monitoring Times* assumes no responsibility for damages or injury resulting from attempts to follow the procedures listed below.

Mod. 1: Cellular Restoration
Tools needed: small-tip soldering iron, small gauge rosin-core solder, desoldering wick, Philips screwdriver, 1N914 or 1N4148 switching diode.

1. With the scanner unplugged from power, remove both upper and lower covers (four screws in the rear of the cabinet), taking care not to damage the speaker wires.
2. Set the scanner upside-down with the back facing you. Locate the microprocessor shield (upper left corner near volume and squelch controls). Unsolder and remove this shield.
3. Refer to the diagram and locate the three-legged diode at the lower right of the microprocessor chip. Carefully unsolder and remove this diode.
4. Referring again to the diagram, place a 1N914 or 1N4148 switching diode across the solder pads as shown (note correct polarity!); remove any excess leads and carefully solder it in place. Be sure its leads will not contact any other components, paths or the reassembled shield. A small piece of tape may be used as insulation if necessary.
5. Plug the scanner into power, turn it on and test it by entering an 869-894 MHz cellular frequency into the scanner.

If successful, unplug the power, reassemble the shield and cabinet. The radio will now operate normally with no break in the cellular telephone band, which it will now search in appropriate 30 kHz steps.

Mod 2: Increased scan/search speed (10 MHz microprocessor crystal required).
While the scanner is apart, locate and remove the blue-colored 8 MHz ceramic resonator near pins 3-4-5 on the solder side of the microprocessor chip. Solder in place the 10 MHz crystal.
Scan and search speed will now be approximately 15% faster with no loss of sensitivity.



Mod 3: Tighter squelch (0.47 uF tantalum capacitor required).
While the scanner is apart, locate squelch chip (IC#3361); locate, unsolder and remove the surface-mount resistor between pins 12 and 14. Replace it with the tantalum capacitor, positive (+) soldered to pin 14, and negative (-) soldered to pin 12.
Squelch sensitivity will be much improved, with just a slight squelch tail and hysteresis.

Q. *I notice that my recording bandwidth on my VCR is 6 MHz wide; why couldn't I attach my shortwave antenna to the video input and record the first 6 MHz of radio spectrum for later playback through my receiver attached to the video output? (Rob Cave, Princeton, TX)*

A. The National Security Agency (NSA) does just this very thing; they call it "predetection recording". Of course their recorders are a little better, offering greater dynamic range and wider bandwidths.
Rob—and other readers—try it and let us know how it works!

Q. *Recently, while experimenting with a portable multiband radio, I noticed that when I came near the AC cord, it seemed to improve reception. Will an extension speaker connected to the earphone jack also act like an antenna? (Bob Brock, Phoenix, AZ)*

A. Any conductive surface (your body, an extension cord, a speaker cable) may have some effect in allowing radio waves to be led to the radio where they will be amplified and detected. This is especially noticeable when using only a short whip antenna for reception.
If you have a good outside antenna connected to a receiver, the tiny increase in signal strength which those incidental conductors contribute will not be noticeable.

Q. *What frequency do the tracking ankle bracelets for convicts on release operate on? (name witheld, Manchester, NH)*

A. According to B.I., Incorporated, a prominent manufacturer of home arrest monitoring products, their anklets operate in the 303 MHz (garage door opener) range. B.I. manufactures for JurisMonitor, a prominent domestic alarm company, but spokesmen for that company refused to discuss frequency details which might compromise the security of their systems.

Questions or tips sent to "Ask Bob," c/o MT, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

***Q.** Can I use my scanner in 1 kHz increments, NFM mode, to look for SCA transmissions in the FM broadcast band? (Bob Stewart, Ft. Worth, TX)*

A. No. SCA stands for "subsidiary carrier authorization" (now called SCS—subsidiary carrier service—by the FCC), and "subsidiary" is the key to your answer. You must first detect the audio from the wideband FM carrier, then detect from it the SCS subcarrier which will be at 67 or 92 kHz.

The pickoff point for this in the circuit is the wide FM detector output before any audio filtering.

***Q.** Why put a manual tuning knob on a scanner when exact channel steps are known? Tuning off frequency will simply result in distorted audio and weaker signals. (Claude Mangum, Layton, UT)*

A. Continuous tuning allows exploration for signals which may not use the standard bandplan. These may include unlicensed stations, interference, hams, and Part 15 (low power) devices.

***Q.** I have noticed law enforcement officers using laptop computers in their patrol cars, apparently sending and receiving criminal records, license checks and so forth. How does it work? (Barry Cartner, Ft. Meade, MD; Richard Ireton, New City, NY)*

A. Mobile data terminals are very popular in larger cities where huge quantities of data may be exchanged between the dispatchers and their fleets. No *MT* reader has ever reported successfully copying one of these transmissions, probably because of the non-standard protocol, possibly 9600 baud ASCII.

Motorola pioneered the "Modat" system commonly in use.

MT

Like Clockwork

The two clocks pictured are from Thomas Marcotte of Lafayette, LA. There is nothing at all special about the clocks: their faces, which he designed on computer using MacDraw II, are what make them unique. "The small one is a copy of a Swiss aircraft clock. It is made from an instrument case, which originally housed a British made Mach meter, with a cheap Spartus movement installed inside. The hour, minute, and second hand all run; the others are faux (fancy word for "fake"), but are faithful in design to the original.

"The large clock is a copy of a Hamilton Navy clock designed for ships during WWII. It also has Spartus movements, but this one has two: one for the hour and minute hands, and a second movement for the second hand, both run from one AA battery."

Sunrise, Sunset

Einar Sandoz of Reykjavik, Iceland, submitted a formula to calculate sunrise/set times, which he thought some readers might find useful. He found the formula in a *73* magazine article by J.G.Lee, entitled "An Introduction to Radio Wave Propagation," published in October 1984.

Sunrise/Sunset

$$\text{sunrise} = \frac{\text{longitude W}}{15} + \frac{\cos^{-1} * (\tan a * \text{latitude N})}{15} = \text{UTC}$$

$$\text{sunrise} = \frac{\text{longitude W}}{15} - \frac{\cos^{-1} * (\tan a * \text{latitude N})}{15} = \text{UTC}$$

(a)ngle:
for 1th & 15th of each month
(-) = minus

Jan	= 23 & 21 (-)	Jul	= 22 & 20
Feb	= 17 & 13 (-)	Aug	= 17 & 23
Mar	= 7 & 2 (-)	Sept	= 7 & 2
Apr	= 4 & 9	Oct	= 3 & 8 (-)
May	= 14 & 18	Nov	= 14 & 18 (-)
Jun	= 21 & 22	Dec	= 21 & 23 (-)

Example for NY, 1 April:

$$\frac{75}{15} + \frac{\cos^{-1} * (\tan 4 * 40)}{15} = 10.77 \text{ UTC}$$

$$\frac{75}{15} - \frac{\cos^{-1} * (\tan 4 * 40)}{15} = -0.77 \text{ UTC}$$

(24 - 0.77 = 23.23)

e.g. sunrise just before 11 UTC and sunset just after 23 UTC

Railroaded

Our apologies for a "faux pas" in the April issue. Among the excellent sources for railroad frequencies and lore is one we neglected to mention—written by the provider of the cover photo—*Heald's Scan Rail*. The 7th Edition was due out in May. Bruce Heald says it is still only $9.95, including shipping, from Heald, 6886 Jefferson St., North Branch, MI 48461. Bruce adds that it is the only railroad directory which includes a frequency cross-reference.

The Price of Doing Business

William Lauterbach, Jr., owner of DWM Enterprises, expressed his appreciation for the Beginner's Corner topic in March, entitled "Guide to Consumer Complaints." "I'm using your article as a primer for any future complaints from irate customers," says Lauterbach.

"But there are two sides to every story," he goes on to say. "Just as there are a rare amount of businesses who seem to take advantage of customers, so too are there a few customers who have vendettas against businesses. And these people seem to get their 'kicks' from hassling the small business owner.

"You wouldn't believe some of the people I run into! They literally smash my products, send them back...and then demand a full refund PLUS their shipping and handling costs. One didn't read his instructions and when things didn't work right, he writes back and tells me he's not going to demand a refund, but I'm going to send him this product and that product for free ... to make up for his inconvenience.

"But the clincher was from a man who had his merchandise smashed in the mail. His claim was with the U.S. Postal Service. But since he didn't insure the return, he really had no claim. So he came to us and said that we didn't make the product 'strong enough' so it's our fault and we'd better give him a full refund AND his postage costs. We refused, so he calls Chuck Harder's Show on WHRI and slandered our product in front of the whole world (of course, without telling the complete story).

"I think consumer advocates should be a bit more aware of these types of troublemakers and be more sympathetic to the plights of the small business owner. Thank goodness these people only seem to show up once a month, usually during the full moon!"

Playing Fair

Thomas Frank of Middletown, RI, says if Frank Spillman was never repaid the $75 with which he unknowingly purchased a Milstar amplifier in a salvage auction (March "Communications"), "I hope he has a good lawyer, because he is entitled to rather significant compensation, as there is existing precedent for this type of snafu. During the Vietnam war, the AF sold off as surplus their entire inventory of 'bombing computers' from the F-105 Thunderchief. The purchaser expected slide rules—he got black boxes of electronics: Paid $5 each, as I recall. They were worth roughly $10K each. As the war dragged on, the AF needed spares, and in the end had to buy them back from this guy for several thousand dollars apiece (they worked out a mutually satisfactory deal).

"If they are now behaving in 'bad faith' toward him, Mr. Spillman should demand the full $363,735 for the item, or return of same. He is legally entitled to it."

Mailbags

"Any number of shortwave stations have dropped the mailbag segment from the station format," laments Mrs. Leslie Edwards of Doylestown, PA. (See this month's "Selected Programming" in *MT*'s Shortwave Guide for Jim Frimmel's compilation of such programs.)

"But there is some good news for those who enjoy shortwave listening and pen friends for sharing the exceptional finds on shortwave.

"A group called Worldwide Radio Friends is headquartered in Boulder Junction, Wisconsin. One can write to the club president Terry L. Nichols (an *MT* subscriber), 4245 County Highway H, Boulder Junction, Wisconsin 54512, for information. All members are radio fans and shortwave listeners. There are no membership fees or annual dues; one participates by giving the Worldwide Radio Friends' address to pen friends who are SW listeners."

Short Subjects

• "I bought a Realistic® COMP 100 programmable scanner, model #20-100, from a flea market at a very good price, and I thought that since it was a Radio Shack product I would have no problem getting information on this scanner. The local Radio Shack dealers tell me the books are no longer available. Can anyone help provide manuals or information on how to program this scanner?"

Jim Graham, 953 Birch Road, Virginia Beach, VA 23462-4902

• "I live in Columbus, Ohio, and I read the report about the baby monitor incident here in your April issue. I would like to share some information that wasn't included in the "Scanning Report" article.

Continued on page 119

They're almost *gone*...

The Realistic® PRO-2006

One of the most renowned scanners of ***ALL TIME*** is now being produced ***WITHOUT*** the ability to be restored to full coverage. All our current stock is still restorable to ***FULL COVERAGE***. Don't miss this opportunity.

Call *NOW!*

It is now ***ILLEGAL*** to manufacture or import into the United States ***ANY*** scanner that receives the cellular telephone range. The only way to buy one of these scanners is from stock imported ***BEFORE*** April 26, 1994. We have a few left, but they are selling ***FAST***, so call ***NOW*** to get the last of these free-listening-era scanners!

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Frequency Range: 25-520, 760-1300 (less cellular, restorable)
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Dimmer: Yes
Receiving Modes: Am, wide & narrow FM
Memory: 400 channels; frequency and mode
Scan: 26 channels per second
Banks: 10
Lockout: Individual channel
Priority: Any channel
Search: 26 channels per second
Audio Output Power: 1.3 watts @ 8 ohms
Conversion Scheme: Triple up-conversion
Sensitivity: 0.5 uV NFM 25-1100 MHz; 2 uV AM, 3 uV WFM
Selectable Attenuator: Yes, 10 dB
Selectivity: (-6/-50 dB) 18/30 kHz NFM/AM; 300/600 kHz WFM
Antenna Connector: BNC
Dimensions: 8-1/2"W x 4"H x 8"D
Weight: 4-3/4 lbs.
Accessories Included: Telescoping whip, manual

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Memphis Area Shortwave Hobbyists (MASH): P.O. Box 3888, Memphis, TN 38173, Jim Pogue (901)873-4291 or Brandon Jordan 373-8046. Memphis area; SW, MW, FM, TV, utilities, pirates, etc.

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter.*

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. E-mail via Internet MARE/Ken Zichi ab415@leo.nmc.edu. Great Lakes Region. All bands. *Great Lakes Monitor.* $9.50 annual US & Canada. $1 sample.

Minnesota DX Club: Al Samson, P.O. Box 10703, White Bark Lake, MN 55110, 612-822-1186 for meeting info. Minnesota. All bands. *MDXC Newsletter.* $10 annual.

Monitoring the Long Island Sounds: Ed, 2134 Decker Ave, North Merrick, NY 11566. Primarily scanner, some SWL. 50 mi. radius of LI. Net Tues 8pm 146.805. *Monitoring the Long Island Sounds.*

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 Third St., West Chester, OH 45069-2212, (513)777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

Mountain NewsNet: James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group. *Mile High Pages.*

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711, (913)266-5707. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp. Annual Labor Day convention.

National Radio Club - DX Audio Service: Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164, (315) 387-3583. Worldwide. North American Broadcasters. *DX-Audio Service* (90-min.tape). Sample $3.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities. *NYC Radio FRE(ak)Qs.* No dues.

North American SW Assoc.: Bob Brown, 45 Wildflower Lane, Levittown, PA 19057, (215) 945-0543. Worldwide; Shortwave broadcast only. *The NASWA Journal.* Regional meetings.

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. North Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities. Meet 3rd Tuesdays.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).* $29 annual.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce; (905) 841-6490 BBS. Predominantly Province of Ontario; All bands. *DX Ontario.* Meet 3rd Wednesdays, Toronto; bi-monthly, Ottawa.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. Pacific NW and BC Canada. DXing all bands. *PNBCDXC Newsletter.* Irregular meetings.

Pitt Co SW/Scanner Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; All bands. *The DX Listener.* Irregular meetings.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749, (808) 982-9444; Puna, HI; SW and MW. Meet 1st Tuesdays. No dues.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland, (410) 239-7366; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD.* Meet irregularly.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal.*

Regional Communications Network (RCN): Jay Delgado or Public Information Unit, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group. #10 SASE for info.

Rocky Mountain Radio Listeners: Mike Curta, P.O. Box 470776, Aurora, CO 80047-0776. Metro Denver, Colorado. All bands. Meets monthly 2nd or 3rd Sundays 1-4pm, Aurora Central Library.

Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. *Scanning Wisconsin* ($2 for sample)

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *Shortwave Radio Today.* $23 annual in US. Sample $2 or 6 IRCs. $2 for award program info open to non-members.

Susquehanna Co Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801-0023. PA area; Scanning. Meets irregularly.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur. Meets 3rd Tuesdays 7pm Holland Big Boy.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Wasatch Scanner Club: Jon Van Allen, 2872 West 7140 South, West Jordan, UT 84084. State of Utah. VHF/UHF. Newsletter/directory.

Worldwide TV/FM DXers Association (WTFDA): P.O. Box 514, Buffalo, NY 14205-0514. Worldwide membership; TV DX, FM BC, VHF utilities. *VHF-UHF Digest.* Annual convention. $20 annual in U.S. $2 for sample.

Monitoring Clubs Outside North America

British DX Club: Colin Wright, 54 Birkhall Road, Catford, London, SE6 1TE, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine. *Communication.* L10 UK, L12 Eur, L16 ww. Sample 3 IRCs or $2 US cash. Meets monthly in Twickenham (London).

DX Australia: P.O. Box 422, Moonee Ponds, Victoria 3039, Australia. MW, SW. *DXers Calling.*

DX Club of India: Navin Patel, 1-Dutt Niwas, 809 - M.G. Road, Mulund, Bombay-400 080, India. India; MW/SW/Ham. DX World (quarterly) Rs 50/ -, 30 IRCs outside India. 3 IRCs sample.

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).

Finnish DX Association: Mr. Arto Mujunen, Suomen DX-Liitto, P.O. Box 454, FIN-00101 Helsinki, Finland; +358-0-8512410 fax. Finland and worldwide. SW and BCB. *Radiomaailma.*

Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. International. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 and 14113 kHz. Membership free.

International Listeners Organization: Mohsin Abbas, St. Nisar Ali Shah Ahamed Pura, Sheikhupura, Pakistan, 1-(50359) 2-(50561). South Asia. Broadcasting. *Listener Times.*

New Zealand Radio DX League: P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV. *New Zealand DX Times.*

New Zealand DX Radio Association: Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In.*

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhupura , 39350 Pakistan; Pakistan; SWBC.

QSL Club de France: Patrick Frigerio, 40 Rue de Haguenau, 67700 Saverne, France. SWBC, pirates, CB-DX, hams, etc. Courrier (in French). 6 bulletins, 72 FF, EEC=16 IRCs, elsewhere 20 IRCs.

Shortwave Radio Communications Club: Atiqur Rehman, Dawood Street, Khalid Road, Sheikhupura, P.C. 39350 Pakistan. South Asia; MW/SW. *The Amateur* (Urdu language). Meets 1st Fri on SW Complex, S.K.P.

Southern Cross DX Club Inc.: Stephen Newlyn, G.P.O. Box 1487, Adelaide, SA 5001, Australia. Worldwide and Pacific. All bands. *DX Post.* $25 annual in Australia. Meets last Fridays, 8pm, Thebarton.

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). Worldwide. All bands with emphasis on SW. *Contact.* $20 overseas airmail. Meets every 6 weeks in Reading, UK.

Umbrella Organizations

Association of North American Radio Clubs (ANARC): Richard d'Angelo, 2216, Burkey Drive, Wyomissing, PA 19610. 18 member clubs across North America.

European DX Council (EDXC): Michael Murray, P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE, England. 16 member clubs across Europe.

South Pacific Association of Radio Clubs (SPARC): Arthur Cushen, 212 Earn Street, Invercargill, New Zealand.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
June 4	**Wilmington, NC**	Seafest/Azalea Coast ARC, P.O. Box 4044, Wilmington, NC 28406; (919) 675-6180 or (919) 799-4195. Location: Trask Coliseum-UNC, 9 am-3 pm, $5 admission, talk-in on 147.180+.
June 4	**Knoxville, TN**	RAC of Knoxville Hamfest/Angela S. Crigger, P.O. Box 124, Knoxville, TN 27901. Location: Chilhowee Park, Tennessee Valley A and I Fairgrounds, Jacob Bldg., 8am-?.
June 5	**Princeton, IL**	Princeton Hamfest and Computer Show/Starved Rock RC, KU9A, 1153 Union Street, Marseilles, IL 61341; (815) 795-2201. Location: Bureau County Fairgrounds, $5 admission, talk-in on 146.355/955.
June 5	**Manassas, VA**	Hamfest & Computer Show/Virginia Hams ARC, P.O. Box 1255, Manassas, VA; (703) 368-5180. Location: Prince William County Fairgrounds, $5 admission.
June 5	**Indianola, PA**	Breezeshooters Hamfest/Rey Whanger, W3BIS, Box 8 RD 2, Cheswick, PA 15024 (412) 828-3694. Location: Butler Farm Show Fairgrounds, 8am-4pm, $1 admission, talk-in on 147.96/36.
June 11	**Loveland, CO**	Northern CO ARC Superfest/Musser Moore, AA0PB, (303) 221-3698. Location: Larimer Co Fairgrounds, 8am-3pm, $3 admission, $8 tables, talk-in on 144.515/145.115.
June 11	**Winston-Salem, NC**	Hamfest and Computer Fair/Forsythe ARC, Don Edwards, WB4KQN, P.O. Box 11361, W-S, NC, 27116; (910) 723-7388. Location: Dixie Classic Fairgrounds, 9am-5pm, $7 admission, talk-in on 146.04/64.
June 11	**Brewster, NY**	PEARLfest '94/Shirley Dahlgren, N2SKP, (914) 736-0717. Location: JFK Elementary School, Foggintown Road, 8am-2pm, $5 admission, talk-in on 145.130.
June 12	**Pleasant Hill, MD**	Computer and Hamfest/Hanover Area Hamming Association Location: Pleasant Hill Fire Co. carnival grounds, $5 admission, opens 8 am, talk-in on 145.41/146.895.
June 12	**Lancaster, NY**	Lancaster ARC Hamfest/Nick, WA2CJJ, 5645 Genesee St., Lancaster, NY 14086; (716) 681-6410. Location: Darien Center Fire Co. on Rt. 77 at Rt. 20, $5 admission, talk-in on 147.266/146.550/443.850.
June 12	**Willow Springs, IL**	Six Meter Club of Chicago, Inc. Hamfest/Joseph Gutwein, WA9RIJ 7109 Blackburn Avenue, Downers Grove, IL 60516; (708) 963-4922. Location: Santa Fe Park, $5 admission, gates open 6 am, talk-in on 146.52 or 146.37/97.
June 18	**Nashville, TN**	Hamfest Nashville/Nashville ARC, Bob Malone, WB5ZDS, 62 The Arcade, Nashville, TN 37219; (615) 256-6994. Location: Tennessee State Fairgrounds, 7am-5pm, $5 admission, talk-in on 145.47.
June 18	**Cortland, NY**	Cortland International Hamfest/SARC, P.O. Box 5241, Cortland, NY 13045; (607) 756-6550. Location: Cortland Co Fairgrounds, 7am-3pm, $5 admission, talk-in on 147.780/180.
June 18	**Dunellen, NJ**	Raritan Valley RC '94 Hamfest/John Manna, WA2F, (908) 722-9045. Location: Columbia Park, 7am-2pm, $5 admission, talk-in on 146.625.
June 19 & July 17	**Cambridge, MA**	MIT Radio Society and Harvard Wireless Club Flea Market 9am-2pm, Albany and Main Sts., $2 admission.
July 9	**Oak Creek MI**	Swapfest '94/So. Milwaukee ARC (414) 762-3235. Location: American Legion Post 434, $4 admission, talk-in on 146.52.
July 10	**Baltimore, MD**	Maryland Hamfest/BRATS, P.O. Box 5915, Baltimore, MD 21208 (410) 467-4634. Location: Timonium Fairgrounds, 8am-?.
July 16-17	**Maplewood, MN**	Electronics Fair '94/North Area Repeater Assoc, P.O. Box 26331, St. Paul, MN 55126 (612) 653-9999. Location: Aldrich Arena, Friday 6pm-10pm, Saturday 6am-3:30 pm, $6 admission.
July 17	**Chicago, IL**	ACLR Hamfest/P.O. Box 34446, Chicago, IL 60634 (312) 714-5411. Location: DeVry Institute of Tech, 3300 N. Campbell, doors open 8 am, $4 admission, talk-in on 147.225 107.2PL.
July 17	**Washington, MO**	Zero Beaters ARC Hamfest/PO Box 24, Dutzow, MO 63342 (314) 764-2777. Location: Hillerman Park (Washington Fairgrounds).
July 23-24	**Stratford, NY**	Fulton Co. Mahlon Loomis Committee will operate W2ZZJ from 1300-2000Z on the General class portion of 40, 20, and 15 meters; Novice on 10 meter. QSL with SASE to: W2ZZJ, 5738 STHWY 29A, Stratford, NY 13470.
July 24	**Queens, NY**	HOSARC Hamfest/Arnie Schiffman, WB2YXB, (718) 343-0172. Location: Hall of Science, Flushing Meadow Park, 9am-3pm, $5 admission, talk-in on 444.200 repeater 146.52 simplex.
July 24	**Stickney, IL**	Dupage ARC Hamfest '94/7511 Walnut Ave., Woodridge, IL 60517 (708) 985-9256. Location: Hawthorne Race Course, $4 admission, talk-in on 145.250/442.55+/146.52s
July 31	**Racine, WI**	Racine Megacycle Club Hamfest/WB9USI P.O. Box 3, Racine, WI 53401 (414) 554-7565. Location: South Hills Country Club, $3 advance admission with SASE.

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 publication date. All ads must be paid in advance to *Monitoring Times*.
Ad copy must be typed for legibility.

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SCANNERS & SECRET FREQUENCIES. Bestselling new 320 page book covers scanning from A to Z. "Useful, knowledgeable, and readable" *(Popular Communications).* "Wry, cynical, and immensely entertaining" *(Paladin Press).* "An enormous collection of information... plenty of great reading" *(Monitoring Times).* "You can't miss" *(American Survival Guide).* "A high point of scanner publication" *(RCMA).* Only $19.95 plus $3 s/h. Check/MO to Index, 3368 Governor Dr., Ste. 273-T, San Diego, CA 92122. Credit Cards only 800-546-6707.

SHORTWAVE AND SCANNER Computer Service. ShortWave Paradise— 1019 Cambridge Drive, #2, Kalamazoo, MI 49001. 6 mo $15, 1 yr $25. Call our Computer System today! (616) 383-4979.

FREQUENCY DIRECTORIES for Georgia, Illinois, Kentucky, North Carolina, South Carolina, Tennessee, Virginia. $24.95 plus $3 shipping. For list of other directories, send SASE to DBK RESEARCH, 120 E. Mary St., Bristol, VA 24201. Telephone orders (703) 466-8912.

Hacking/Phreaking/Cracking/Electronics information available on computer disk or books. Send $1 for catalog to: SotMESC, Box 573, Long Beach, MS 39560.

UNIDEN SCANNERS, catalog $1, cash, credited. Strawberry Communications, P.O. Box 601, Schenectady, NY 12301.

SPEECH INVERSION DESCRAMBLER (Decodeur de Voix Inversee SSB) works with any scanner for Canada and USA. Radio Scanner, C.P. 193 Lac-Megantic, Quebec, G6B 2S6 (819) 583.187.

THE ANARCHIST'S BBS is a resource for anarchists, investigators, researchers, computer hackers and phone phreaks. Categories include: Computer hacking, Investigation techniques, Telecommunications technology and Surveillance. Call (214)289-8328 for free trial access.

Take heed SHORTWAVE LISTENERS. Are you planning to deal with Mike Papagorgio's coin show "Money Makes Money"? Please contact me before you buy from him. George DiPrinzio, 837 E 232 St., Bronx, NY 10466; or call collect (718) 231-5638.

Highest price paid for used scanners! (614) 544-5842.

HQ180A-DRAKE R8, both mint, 601-825-8108.

WANTED: UNIVERSAL M-7000/v7 Call Ron (303) 879-2736.

SONY HIGHLY RATED 2010, like new, used little. I pay for shipping. $245 (718) 816-5727.

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INFOTECH M600 RTTY AND CW DEMODULATOR. Decodes BAUDOT, RTTY, multi-speed CW, FEC, ARQ, SITOR and ASCII. Has unshift on space feature, bit inversion, threshold control, variable baud rates and more. Includes monitor, all hook-up cables, manuals and original boxes. Mint condition, $350 includes shipping; YAESU FRG-7 with Gilfer GAR-7 frequency readout. Includes 4 kHz high quality Murata ceramic filter, manuals, original box, and "D" battery operation. Cosmetically in excellent condition, electronically in good condition. $160 includes shipping; NATIONAL NC140 GENERAL COVERAGE RECEIVER $40 includes shipping. KENWOOD TS-520 with handheld Astack microphone. Original box, manual, very good condition. $350 includes shipping; MFJ VERSA TUNER III 1.8 to 30 kHz coverage with SWR meter. $65 includes shipping. Call Dean (914) 961-8477.

WANTED: HQ-100A or HQ-180A mint to excellent condition. Mike Todd, 742 99th Ave. N., Naples, FL 33963.

ICOM COMMUNICATIONS RECEIVER IC-R71A includes SSB filter, FM board, mint, first $650. (407) 830-6775.

Desperately seeking an Elmer in Brooklyn, NY, to help me get my first license, teach proper radio technique and purchase and operate a rig. Please contact Steve, beeper (212) 380-4642.

CLUB START-UP: If you're in the Atlanta area and are interested in forming a local all-band radio club, please call J.P. O'Connor at (404) 249-0944; leave message if no answer.

"The Sheriff's Dept. gave the woman (that was screaming at her child), toys for the child, and also counseled her on child abuse. The realistic actions that the Police took were noticed, not only by me, but by many others. I did want to add a good note to a seemingly bad story. Old fashioned love and respect still exist, even behind badges in Columbus, Ohio!

Steve Henderson

• "As a serious SWL having owned all manner of receiver and many related gadgets, I have gradually become enlightened to the facts of radio life. It appears we enthusiasts are often looked upon as fools to be snookered by bold claims. I guess that must hold true, as this fool has spent a fair amount of hard-earned money on relatively unnecessary accessories. In reality, with current technology [*or in spite of it--ed*] there is no substitute for good reception. Weak DX will always be weak DX, compared to strong, clear signals. Clem Small's article in the March issue about the 'real McCoy' antenna, "Debunking Antenna Resonance,"was right on target.

Jon Schwartz, Mercer Island, WA

From the Editor

As you can probably tell, excitement is high at *MT* headquarters as we look forward to a new publication, and our fifth annual convention. I want you to know, however, that these projects will never detour us from our reason for being, namely, to provide the information and the resources you need to make the most of all your monitoring times.

Rachel Baughn, Editor

Computer Bulletin Boards:
The New CB

There was something painfully familiar about it: the operators were using ego-inflating "handles" instead of names; they ranted on in their self-importance, these self-proclaimed experts on anything you cared (or didn't care) to mention; they were insulting, abusive and name calling. Anyone with whom they disagreed, or of whom they were jealous, was a ready target. Weekend CB? No, a computer bulletin board system (BBS).

Of course CB is not the only radio hobby where ne'er-do-wells seek an audience. Many of these obnoxious misfits possess amateur radio licenses and can be heard jamming anyone who threatens their insecurities.

A favorite target of the hare-brained hams are the new no-code licensees; after all, the old-timers had to learn the code, so why shouldn't the young whipper-snappers? It's sad to listen to the squabbling elders decompose while the no-code newcomers lead us into the future.

It would seem that the BBS is the great leveller: all you need is a computer and very little sense. It is unparalleled in the information world. Where else can you find equal billing for credible journalism and raving lunacy? Eloquence, bobbing in a sea of paranoids flashing their sabres against imaginary pursuers?

But just as it would be unfair to castigate all CB operators and hams, it would be unfair to impugn all BBS users. Most are respectful participants who use the valuable medium for enlightenment and camaraderie, and who are embarrassed by the mental midgets who succomb to the irresistable urge to hurl epithets and joust their imaginary enemies in public.

Responsible media, both print and electronic, police themselves, filtering out the psychotic diatribes from legitimate issues: *Newsweek* versus the *Enquirer;* Brokaw versus Geraldo; credible versus crackpot.

The Federal Communications Commission (FCC), having given birth to CB and amateur radio, has now abandoned these services. Hopefully, alert BBS sponsors will adopt self-discipline — without censorship — before their medium, too, suffers the indignities of humiliation and contempt.

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.

JRC Japan Radio Co., Ltd.

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WHY ICOM?

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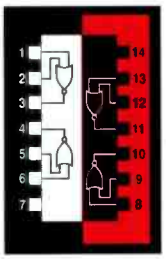

HIGH PERFORMANCE

ICOM's reputation is built on crystal-clear reception; levels of dynamic range, sensitivity and selectivity unobtainable just a few years ago. Circuitry, filtering and operating features designed to give you top performance.

INNOVATION

ICOM *means* technological leadership! Every new product advances the hobby, sets new standards for others to reach.

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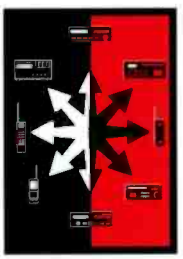
ICOM offers many different models, each designed for a specific purpose. No need to compromise –choose the ICOM that meets *your* particular needs.



COMPATIBILITY

Once you learn one ICOM, you can operate them all. We planned it that way to make upgrading a snap. The same idea is behind the extraordinary interchangability of ICOM products. You're not buying a radio–you're building a system!

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SERVICE

You'll probably never need it, but it's good to know that ICOM service is the "pride of the industry." We get you back on the air in days instead of weeks.

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